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ABSTRACTS

7TH WORLD CONGRESS OF THE INTERNATIONAL SOCIETY OF PHYSICAL AND REHABILITATION MEDICINE

JUNE 16–20, 2013, BEIJING, CHINA

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ABSTRACTS
THE 7TH WORLD CONGRESS OF INTERNATIONAL SOCIETY OF PHYSICAL AND REHABILITATION MEDICINE

JUNI 16–20, 2013, BEIJING, CHINA

WELCOME TO BEIJING

2013 7th World Congress of the International Society of Physical and Rehabilitation Medicine (ISPRM 2013)

WELCOMING ADDRESSES

Dear colleagues,
Welcome to the 7th World Congress of the ISPRM!

Amidst the historical and cultural heritage of Chinese wisdom, the ISPRM will begin yearly World Congresses with a geographically balanced International scientific committee and new operational procedures for our World Congress organization.

The ISPRM International Education and Development Fund has provided 10000 Euro to sponsor selected participants from developing countries.

While being inspired by state-of-the-art & cutting-edge new technology that is currently available for Disabled people, you will be able to experience the beauty of Western meeting Eastern» in Rehabilitation Medicine practice during the Plenary and Parallel sessions, workshops and oral presentations! You will also be able to view all posters from your smart phones and iPads.

Along with the scientific sessions, there are rich cultural and social events, as well as a participants talent›s show and the opportunity to exercise in the Olympic campus.

Among the exhibit booths, you will find famous tailors who can produce a suit or dress and deliver it to you on site!

We are looking forward to your educational and scientific contributions to help us raise a loud voice on behalf of the health of the people with disability!

It will be a time to inspire, to network and to bring your collaboration! We hope you will treasure it!!

See you in Beijing,

Marta Imamura
ISPRM President

Dear friends and colleagues,

On behalf of the Chinese Society of Physical Medicine and Rehabilitation, the Chinese Association of Rehabilitation Medicine and the Hong Kong Association of Rehabilitation Medicine, I am honored to invite you to attend the 7th World Congress of the ISPRM from June 16-20, 2013 in Beijing, China.

The theme of the Congress is to ENJOY the process of rehabilitation, ENRICH the knowledge for rehabilitation professionals, patients and their families, and ENABLE better quality of living for all. The theme indicates the goal of physical medicine and rehabilitation, which is to make the disabled to resume the ability of independent living and have better quality of life through active, positive and delighted methods with the help of rehabilitation professionals and their families.

Plans for this congress are progressing extremely well. About 220 of the most distinguished clinicians, scientists and health professionals will give lectures in this Congress. Papers will be presented in the form of oral presentations and E-posters. We hope that you will participate in this Congress.

In addition to scientific programs, this meeting will also offer you abundant choices for social programs, such as Welcoming Reception and Performances, Gala Dinner & Peking Opera Show in the Summer Palace, Acrobatics Show, and Beijing Night show.

You will have an amazing experience exploring Beijing the most rapidly developing city of the world, the host city of the 2008 Olympic Games, and learn the Chinese culture in all aspects.

Look forward to seeing you in Beijing.

LI Jianan, MD
President, 7th World Congress of the ISPRM
ISPRM President Elect

doi: 10.2340/16501977-1177

PLENARY LECTURES (JUNE 16–20, 2013)

PL17-01

WHO GLOBAL STRATEGY OF DISABILITY AND REHABILITATION

WHO officer

Abstract is missing.

PL17-02

CHINESE EXPERIENCE TO IMPLEMENT WRD

Xiaowei Ma

Abstract is missing.

PL17-03

BRAZIL EXPERIENCE TO IMPLEMENT WRD

Linamara Battistella

Abstract is missing.

PL17-04

DEVELOPING POLICY LEADERSHIP IN PRM

Gerold Stucki

Chair, Department of Health Sciences and Health Policy, University of Lucerne; Director, Swiss Paraplegic Research; Director, ICF Research Branch

To be able to provide optimal rehabilitation care to patients, PRM physicians need to be proactive in shaping the health system. As a consequence, PRM physicians must facilitate the implementation of the rehabilitation strategy at all levels and across all six WHO health system components. The three levels include the macro-level (policies and programs), the meso-level (organization of and finances of health services) and the micro-level (professional practice in the interaction with patients). The six components of WHO's health systems framework include leadership/governance, service delivery, financing, interventions, health information, and workforce [1]. Instrumental for the successful implementation of the rehabilitation strategy is the active engagement of PRM physicians with the International Society of Physical Rehabilitation Medicine (ISPRM). As a non-governmental organization in official relation with WHO, ISPRM continuously develops and implements its policy agenda, focusing on the three mandates: humanitarian, professional, and scientific. The work of ISPRM has recently been summarized in a special issue of the Journal of Rehabilitation Medicine [2]. Ultimately, the success of ISPRM depends on PRM physician's understanding of the policy process and the application of relevant tools, most importantly the ability of PRM physicians to act as policy advisors and advocates at the national and international level [3]. Moreover, it would be essential that ISPRM offers formal workshops in health policy as well as a regular "on the job training" i.e. by participating in collaboration efforts with WHO. An easy way to develop health policy knowledge and skills of PRM physicians is to regularly participate as ISPRM delegates in the annual World Health Assembly meetings. During the time of the assembly, participating PRM physicians can meet to further develop the ISPRM-WHO policy agenda. Important developments at the international level can then be introduced to their national societies.

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2. DeLisa JA, Melvin JL, Stucki G. Developing the International Society of Physical and Rehabilitation Medicine (ISPRM). Special Issue: J Rehabil Med 2009;41:785-852.
3. Reinhardt JD, von Groote PM, DeLisa JA, Melvin JL, Bickenbach JE, Stucki G. Chapter 4: A policy process and policy tools for international non-governmental organizations in the health sector using ISPRM as a case in point. J Rehabil Med 2009;41:823-832.

PL17-05

INTEGRATION OF WEST AND EAST THEORY AND PRACTICE IN PHYSICAL AND REHABILITATION

Jianan Li[1], Lidian Chen[2]

[1]Jiangsu Province Hospital, Jiangsu, China, [2]Fujian University of Traditional Chinese Medicine, Fujian, China

Background: West-East cultural differences gave birth to Rehabilitation Medicine in both West and East. Rehabilitative therapies from both biomedical and traditional Chinese medicine (TCM) perspectives are being widely used, manifested as numerous examples of their integration in theory and practice. *Methods:* History review was taken to analyze development of physical and rehabilitation medicine (PRM) in west and east approaches. The differences of clinical reasoning in functional assessment and therapeutic interventions were analyzed by literature review. *Results:* Both west and east PRM have historical foundation in theory and practice for thousand years. Western PRM has been developing more rapidly under strong scientific support of biomedical findings and modern equipment in functional assessment and intervention. Eastern medicine including TCM and other practice in eastern countries focused more on philosophy interventions based on adjustment of functional balance and tonics, as well as relationship between biomedical and environmental factors, which has been documented beneficial for more than billions of people. Modern trend leads to integration medicine by multi-disciplinary approaches and combination of western and eastern medicine. Eastern medicine is not an alternative approach of western medicine but a complementary component to modern medicine in PRM. *Conclusion:* Integration of western and eastern medicine is leading to a new modern PRM theory and practice.

PL17-06

ADVANCES IN REHABILITATION ROBOTICS

Alberto Esquenazi

MossRehab, United States

Research in patients after central nervous system injury has demonstrated that robotically mediated therapy leads to improvement in arm and leg function. Robotic therapy has the potential to deliver intense functionally directed activity, which has been shown to achieve improvements in function in a safe and efficient manner.
For nearly 2 decades now, research has shown that robotic devices may be used to augment walking and arm function outcomes of patients recovering from stroke, traumatic brain injury and other central nervous system diseases. Researchers have shown that patients who received robot-assisted therapy have greater recovery compared to a placebo and that these relative improvements were maintained in the robot group at a three-year follow-up. Some therapy protocols are possible only through robotic intervention.
The Veterans Administration Rehabilitation R&D Center in California explored the use of robotics in a bi-manual, master slave orientation, in conjunction with robot-facilitated interaction. Patients who performed robotic therapy in addition to their normal therapy demonstrated significant improvements in strength and function.
Other studies of the efficacy of robotic mediated therapy have been conducted to varying degrees of success in the US Reinkensmeyer, et al., 2000, Stein et al., 2012, Esquenazi et al., 2012 and Europe Louoreiro, et al., 2003; Hesse, et al., 2003; Riener, Nef, Colombo,

2005, Scwartz et al., 2011. More recently robots have been transformed from tethered devices to untethered mobility systems that have expanded greatly the ambulation options for Individuals with thoracic Spinal Cord Injury (SCI) Esquenazi et al., 2012. The wheelchair is the most common mode of locomotion for this population. ReWalkTM is a lower extremity powered exoskeleton that allows thoracic or lower level motor complete SCI patients to walk independently. ReWalkTM has bilateral hip and knee joint motors, rechargeable batteries and a computerized control system carried in a backpack. ReWalkTM users control their walking through subtle trunk motion and changes in center of gravity through a sensor placed on the thoracic region that determines the torso's angle and generates a step forward. Crutches are used for stability. The innovation of ReWalkTM is in the unique manner in which the user is actively involved in the walk, through a specially designed computer algorithm. Because the system is battery powered, completely untethered and individuals are fully in control of their steps, ReWalkTM offers a real option to improve upon the current ambulation standard for individuals with thoracic level SCI. Esquenazi et al., 2012 Moreover, because of its similarity to upright bipedal walking, it may offer some of the physical and mental health benefits provided by natural walking.

PL20-01

NEURAL REGENERATION AND REHABILITATION

Xiao-Ming Xu
Spinal Cord and Brain Injury Research Group, Indiana University School of Medicine,United States

After spinal cord injury (SCI), axonal regeneration in a rostrocaudal orientation is essential for significant functional recovery. Because the formation of cavities inevitably occurs following SCI, an important strategy is to construct growth-permissive substrates, such as cell-laden tissue engineered bridges, e.g. seeded with Schwann cells (SCs). This strategy supports successful regeneration of axons across the lesion gap to reach the distal graft-host interface. However, due to the presence of a growth-inhibitory environment associated with reactive astrocytes and CNS myelin on the host side of the graft-host interface, additional treatment is necessary to promote further axonal growth from the bridging transplants back into the host spinal cord. Here we report the construction of a continuous growth-promoting pathway, formed by grafted SCs overexpressing GDNF (SCs-GDNF), which not only bridges the lesion gap but also extends into the caudal host spinal cord to enhance axonal growth through and beyond an SCI. We demonstrate that such a growth-promoting pathway promoted regeneration of CNS axons, particularly those originated from descending propriospinal neurons (DPSNs), through and beyond the lesion gap of a spinal cord lateral hemisection. Within the distal host spinal cord, regenerated DPSN axons formed synapses with host neurons leading to the restoration of action potentials and partial recovery of function. When SCs were grafted into a cavity of a clinically-relevant contusive SCI, they proliferated, supported axonal growth and formed myelin on regenerated axons. Thus, autologous SC transplantation, combined with delivery of GDNF, can be a strong candidate of cell-based therapy for repair after SCI.

PL20-02

NUEROMODULATION OF BRAIN FUNCTION AND REHABILITATION

Leonardo Cohen
National Institutes of Health/NINDS, United States

Disability after the initial cerebrovascular episode, with motor impairments accounts for most poststroke disability. Exercise and training have long been used to improve motor function after stroke. Improved training strategies to enhance the effects of these rehabilitative protocols are being developed for poststroke disability. The improvement of our understanding of the neuroplastic changes associated with poststroke motor impairment and the mechanisms of repair is substantially important to this endeavor. Ttreatments that augment neuroplasticity are being explored to further extend the boundaries of poststroke rehabilitation. Potential rehabilitation therapies, such as stem cell therapy, exogenous tissue engineering and brain–computer interface technologies, could be integral in helping patients with stroke regain motor control. As the methods for providing motor rehabilitation change, the primary goals of poststroke rehabilitation will be driven by the activity and quality of life needs of individual patients. This presentation aims to provide a focused overview of neuroplasticity associated with poststroke motor impairment, and the latest experimental interventions being developed to manipulate neuroplasticity to improve motor rehabilitation. There has been recently significant progress in our understanding of the neural substrates of motor skill learning. Advances in neuroimaging provide new insight into functional reorganization associated with the acquisition, consolidation, and retention of motor skills. Plastic changes involving structural reorganization in gray and white matter architecture that occurs over shorter time periods than previously thought have been documented as well. Animal data provided crucial information on plausible cellular and molecular substrates contributing to reorganization underlying skill acquisition in humans. The presentation will revirew findings demonstrating functional and structural plasticity across different spatial and temporal scales that mediate motor skill learning while identifying converging areas of interest and possible avenues for future research particularly using brain stimulation. This presentation aims to provide a focused overview of neuroplasticity associated transcranial magnetic and electrical stimulation with poststroke motor impairment, and the latest experimental interventions being developed to manipulate neuroplasticity to enhance motor rehabilitation.

PL20-03

HOW TO BRIDGE THE GAP BETWEEN RESEARCH AND CLINICAL PRACTICE IN P&RM (SIDNEY LICHT AWARS LECTURE)

Stam Henk
Erasmus Univ Medical Centre, Netherlands

Evidence based rehabilitation medicine, (cost)effectiveness of diagnostic procedures and therapies and up to date teaching can only be accomplished by high quality research & development.
Without a scientific foundation there will be no progress and no future for P&RM. This lecture addresses the current situation of rehabilitation research in an international perspective. A numbers of barriers prevent an easy and fast translation of research outcomes in daily clinical practice. Most research is done by non-clinicians, the number of relevant research papers is too big to read, English is not a native language for all clinicians, journals are expensive, electronic publications have limited access etc. On the other side of the gap between research and clinical practice it appears that acceptance and implementation is slow. Clinicians are reluctant to change their habits and insurance companies are less than enthusiastic to pay for new, sometimes expensive, treatments such as robotics, telerehabilitation, new medications, complex prostheses etc. With the audience I will discuss potential solutions and ways to bridge the gap between research and clinical practice. These solutions may include the free ISPRM smartphone app MediGrip (www.medigrip.org), evidence based ISPRM guidelines selected and published by the Clinical Sciences Committee, supporting open access publications, teaching courses for clinicians who have research ambition, restructure international P&RM congresses and supporting international exchange of researchers.

PL20-04

MEETING THE CHALLENGE: UNVEILING MUSCULOSKELETAL NON SPECIFIC PAIN

Marta Imamura
Abstract is missing.

SYMPOSIA (JUNE 16–20, 2013)

SY17-301AB-01

EXERCISE IN ELDERLY: THE CASE FOR TAI CHI

Walter Frontera
Department of Physical Medicine and Rehabilitation, Vanderbilt University School of Medicine, Nashville, TN, USA

The WHO has reported dramatic demographic changes in the last 2 centuries. Both, life expectancy and the number of people in older age groups, have increased significantly in most, although not all, countries of the world. Aging is associated with a multifactorial loss of functional capacity and independence. The neuromuscular and cardiovascular systems show a substantial age-related decline. During the last 3 decades, several investigators have examined the potential for exercise interventions to delay or reverse some of these changes. In addition to traditional aerobic and strengthening exercises, Tai Chi has been identified as an effective intervention. It has been reported that Tai Chi can induce significant acute physiological changes that are known to result, when regularly repeated, in long-term physiological adaptations that have health benefits. This is particularly true in older persons. For example, some studies show increases in aerobic capacity, muscular strength, balance, and metabolic profiles. At the same time, a reduction in falls, stress and anxiety levels, and pain have also been noted. These results have been noted in healthy elderly as well as in people with chronic conditions such as heart disease, osteoarthrosis, and fibromyalgia. In summary, Tai Chi is a safe and effective intervention in older persons with the potential to enhance physiological functions, reduce impairment, and increase activity and participation.

SY17-301AB-02

ANALYSIS OF TAI CHI EXERCISE PROTOCOLS FOR OLDER ADULTS WITH BALANCE DEFICIT

Hao (Howe) Liu
University of North Texas Health Science Center, United States

Objective: Tai Chi (TC) has been extensively studied in last two decades, particularly since the beginning of 21st century. The objective of this review was to identify exercise parameters and the most common outcome measures used in tai chi (TC) studies for geriatric population. *Methods:* Ovid Medline, CINAHL and PubMed were used to evaluate longitudinal studies published in English with the key words tai chi, tai ji, tai chi quan, tai ji quan, balance, falls, and falling. Subjects in the studies must be aged 60 years or older. *Results:* In all 19 qualified prospective studies, older vigorous and likely transitional frail individuals seemed to benefit more from TC than did older frail individuals. The most commonly used TC parameters were Yang's style, with 12 or fewer forms, durations of 12 weeks or longer, frequencies of twice a week or more, and session lengths of at least 45 min. The most common outcome measures observed were a combination of 2 to 5 of the following 10 measures (from most to least common: fear of falling, single-leg stance, posturography, rate of falling, flexibility, walking velocity, Berg Balance Scale, Timed up and Go, Functional Reach, and ankle and knee joint strength and range of motion. Improvements were reported in almost all of these measures. *Conclusions*: This review indicates that TC may be an economic and effective exercise program for improving balance and balance confidence in older adults.

SY17-301AB-03

IMPROVEMENT OF MOTOR CONTROL BY TAI CHI

Alice May-Kuen Wong
Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital, Chinese Taipei

TCC requires delicate control and slow motions of the upper extremities in accordance with the semi-squatting motion of the lower extremities. We had conduct a study is to evaluate the effect of motor control of eye-hand coordination in older individuals by Tai Chi Chuan (TCC) by using a test device with computer records. Significant better results of motor control in upper extremities through eye hand coordination was found in elderly TCC practioners than those healthy and active non TCC practioners who participated in some physical exercise such as jogging. Decrease of movement displacement, movement time and pause time, increase of skewness coefficient was noted in TCC group than control group. For lower extremities, we used balance master and dance machine to evaluate the effect od TCC in static and dynamic balance. Practice of TCC reduced such deterioration, providing that in lower limbs response time and computerized posturography the TCC group performed better than their age-controlled counterparts in more challenging (dynamic balance, duel feet responses) scenarios. The practice of TCC results in improvement of motor control, not only in improved postural balance, but may also improve the ability of the upper extremity in performing accurate repetitive movements similar to the exercises that use mainly the upper body musculature.

SY17-301AB-04

THE PROMISE OF TAI CHI: AN ANTI-AGING AND THERAPEUTIC TOOL FOR BALANCE

Christina Hui-Chan
Department of Physical Therapy, University of Illinois at Chicago, United States

With aging, degeneration occurs in the sensory and motor systems mediating balance control, and contributes to 1/3 of elderly falling > once a year. What could be done? In four cross-sectional studies comparing older TC practitioners and healthy subjects with young healthy controls, we found that Tai Chi practitioners had (1) better knee proprioception sense, (2) less body sway in the sensory Organization Test (SOT) when standing under conditions requiring an increased reliance on the visual and vestibular systems, (3) improved abilities to lean further with better directional control in the limits of stability (LOS) test, and (4) to step down with less body sway than older controls. These practitioners even achieved a level of performance similar to that of young controls. Another prospective study further showed that, after just 4 weeks of TC practice, older subjects already achieved significantly better balance control than control subjects receiving general education with a similar schedule, as shown by improved (1) vestibular ratio in the SOT and (2) directional control in the LOS. Could the anti-aging effects of TC be applied to balance rehabilitation? In a randomized control clinical trial on subjects with chronic stroke, we found that, after 12-weeks, 4h/week, those practicing TC performed significantly better in the SOT and LOS tests than those receiving general conditioning exercise, with most balance gains outlasting training for 6 weeks. Given that TC could be practiced anytime, anywhere, it is an ideal, low cost home- or community-based fall prevention program for older subjects prone to falling.

SY17-302AB-01

TELE-REHABILITATION KNOCK THE DOOR – A NEW SERVICE MODEL IN NEED

Yun Qu
Rehabilitation Dept. of West China Hospital of Sichuan Univ., China

Telerehabilitation (telerehab), or named as long-distance rehabilitation, remote-rehabilitation, telerehab is a service method in which

professionals provide rehabilitation assessment and services to clients through the use of telecommunication technologies. The telerehab, which has been very hot in the last decade, has attracted huge investment and researches, and has made delightful progresses. There are, however, still a lot of barriers in practice. Who can benefit the most from the telerehab, clients, professional, enterprise or government? Who are the active advocators of telerehab industry? Does present technology satisfy the requirements of telerehab? Does current telerab satisfy the requirements of clients? Does the current policy suit telerehab situations? We are investigating and trying to reach those answers from five aspects, such as needs for telerehab, advantage of telerehab, our telerehab practice, telerehab today and tomorrow.

SY17-302AB-02

STATE OF THE ART OF TELEMEDICINE IN PRM (OK)

Daniel Wever
Het Roessingh, The Netherlands

The possibilities of telemedicine become more important in PRM. Especially because of ageing and increase of chronic diseases. A scenario of the future of health care in the Netherlands shows, that 25% of the people is older than 65 years in 2050 and an increase of chronic diseases with 25% from 2010 to 2025. As a consequence waiting lists and times become longer. 25% of the people have to work in health care and costs of health care become unaffordable ICT can help to solve this problem. There are many possibilities like colleague consultation, patient consultation, monitoring health status and supervised training. The goal of these rehabilitation treatments is quality of care, which should at least be as good as traditional care against lower costs. These methods will be discussed related to paediatric rehabilitation, patient consultation of ALS (amyotrophic Lateral Sclerosis), rehabilitation treatment of neck complaints, LBP (low back pain) and pulmonary rehabilitation. MyoTel, accredited in UEMS-PRM, is such a telerehabilitation treatment. It addresses motor behaviour of patients with non-specific neck- and shoulder pain by assessing and feedback surface EMG (sEMG) in the daily environment. Especially a method like CLEAR (supervised training combined with monitoring health status) has advantages: it enables patients to translate learned skills to everyday life more easily, to exercise more at moments preferred by the patients. It fits in the current trend of self-management of the patient and will contribute to a reduction of costs. The implementation and research project CLEAR (Clinical Leading Environment for the Assessment of Rehabilitation protocols in home care), subsidised by a fund of the European Union, ran in Italy, Spain, Poland and The Netherlands. A European platform was developed for supporting patients with their treatment at home. The project finished in 2012. *Results:* (including HTA= Health Technology Assessment) with LBP and pulmonary rehabilitation in the Netherlands and results concerning diagnoses in the other 3 countries, will also be presented.

SY17-302AB-03

A TELE-COGNITIVE REHABILITATION SYSTEM FOR PATIENTS WITH ACQUIRED BRAIN INJURIES

Xiaoping Yun
China Rehabilitation Research CenterFaculty of Rehabilitation Medicine, Capital University of Medical Science, China

Cognitive deficits are common in patients with stroke, head injury, attention deficit and mild dementia and the incidence of stroke, head injury and AD are at high levels in China. As a result, there is a large population of the patients with cognitive deficits. However, patients who experience cognitive deficits are usually accompanied by physical disabilities and do not live close to hospital; it is not convenient and realistic for them to go to hospital alone on a daily basis. On the other hand, lack of neuropsychologists or rehabilitation professionals striving to deliver assessment, diagnosis and the latest evidence-based interventions in cognitive rehabilitation, especially in small town or under-service areas in China makes timely diagnosis and treatment of cognitive impairments impossible. In this presentation, a brief description of the development of an internet-based tele-rehabilitation system (Center for Tele-cognitive Rehabilitation, CTCR) for patients with cognitive deficits, including design and structure of the system will be presented. CTCR is currently being used for diagnosis and rehabilitation treatment at five hospitals or clinic (including tertiary hospitals, small town hospital and community clinic) and even at patients' home. More than 300 patients with cognitive problems, who lived in twelve different provinces of China, have received services through CTCR. Clinical validation of this new modality of cognitive rehabilitation services for persons following acquired brain injuries will be discussed. The results from this research suggest that tele-cognitive rehabilitation seems to be an appropriate assessment and treatment modality for individuals with acquired brain injury.

SY17-302AB-04

IN VIVO 3D KINEMATIC ANALYSIS OF HUMAN JOINTS AND THE INNOVATION OF TELE-REHABILITATION

Kazuomi Sugamoto
Osaka Univ, Japan

One of the purposes of rehabilitation is the recovery of human joints which consists of a pain relief and a normal function. The functional evaluation is essential to estimate the clinical results, and it is enabled by the analysis of the joint kinematics. Thousands of cadaveric studies were already reported but those may differ from the in vivo condition because of the lack of ligamentous or muscular effects. Development of in vivo 3D kinematic analysis system was needed for the diagnosis of pathological movement or the planning of rehabilitation. Two systems were developed in our institute. One is a system using 3D CT or MRI and it is available for the analysis of the joint movement. The targeted joint is placed in serial positions of the motion plane to evaluate 3D kinematics of the motion, and the images are obtained in each position. The data are saved and transmitted to a computer workstation. Kinematics is measured by automatically. Animations of the joint movement are created from the calculated motions in manner of making a 3D flip book. The other is a system using a radiographic image intensifier. It can evaluate real-time 3D dynamic motion of the metal implant and it is available to evaluate the kinematics after the arthroplasty. The 3D pose-estimation technique is built on a 2D/3D registration algorithm, which determines the spatial pose for each component from the implant contours and computer-assisted design models of the implant. Sequential fluoroscopic images are taken in the sagittal plane. The kinematics of human joints has diversity as the wrist joint can move in any direction. But it has been clarified in more than hundred international papers from our lab. the kinematics of each carpal bone is mostly uniform and the combination of the motion of bones makes the diversity of the wrist joint. The new information according to the kinematics have already changed the way of rehabilitation. We also launched the website in which 3D motion of all joints in the human body are visualized. It can help the planning of rehab. We already established the network with many institutes. If the image data of the patients by CT, MRI or image intensifier are sent to our lab., those are analyzed and the surgical planning or rehabilitation strategy is returned soon. IT technology changed our living environment and it is now changing the medicine. I want to show you the details of our technique and the fruits of using it.

SY17-303AB-01

THE STUDY ON THE INTERVENTION MECHANISMS OF ANGELICA SINENSIS AND ACTIVE COMPONENTS FOR THE ISCHEMIC CEREBRAL INJURY

Weijing Liao

Abstract is missing.

SY17-303AB-02

DISTRIBUTION OF MECHANOSENSITIVE ION CHANNELS AND CHARACTER OF CORRELATIVE MEMBRANE PROTEIN ON RAT DORSAL ROOT GANGLION

Shouwei Yue, Yang Zhang, Xinli Ding, Chao Wang
Department of Physical Medicine & Rehabilitation, Qilu Hospital, Shandong University, Jinan, China

Objective: To investigate the role and molecular mechanisms of transient receptor potential vanilloid 4 (TRPV4) in mediating mechanical and thermal allodynia in rodent models of chronic compression of the dorsal root ganglion (CCD). *Method:* The levels of TRPV4 expression and calcium responses were analysis respectively at 7, 14, and 28 days post-CCD. Then after intrathecal administration of TRPV4 antisense ODN, ruthenium red (RR, TRPV4 antagonist), l-NAME (inhibitor of NO synthase), ODQ (soluble guanylate cyclase inhibitor), Rp-8-pCPT-cGMPS (a PKG inhibitor), NF-B inhibitors (PDTC and BAY), mechanical withdrawal threshold, thermal withdrawal latency and nitrite production was measured. *Results:* The levels of TRPV4 mRNA and protein expression increased significantly at 7–28 days post-CCD. The percentage of DRG neurons responsive to 4α-PDD was also enhanced significantly in CCD group. TRPV4 antisense ODN partly reversed the CCD-induced mechanical allodynia. Intrathecal administration of RR, l-NAME, ODQ, or Rp-8-pCPT-cGMPS induced a significant and dose-dependent increase in the thermal paw withdrawal latency. RR, TRPV4 AS or l-NAME decreased nitrite in the DRG of CCD rats. CCD rats exhibited nuclear NF-B protein expression and low levels of cytoplasmic inhibitory-kappa B (I-B) expression; the increase in NF-B expression and decrease in I-B expression were reversed after intrathecal injection of PDTC. *Conclusion:* TRPV4 plays a crucial role in CCD-induced mechanical allodynia and the TRPV4-NO-cGMP-PKG pathway could be involved in CCD-induced thermal hyperalgesia. It may help us to better understand the molecular basis for nervous injury and chronic neuropathic pain.
Key words: TRPV4; Dorsal root ganglion; Neuropathic pain; NF-κB.

SY17-303AB-03

A TISSUE ENGINEERING STRATEGY FOR PERIPHERAL NERVE REGENERATION

Xiaosong Gu
Nantong University, China

We previously demonstrated that a natural and biodegradable polysaccharide, chitosan, was biocompatible with neuroglial cells by virtue of its positive effects on the adhesion, survival, migration, and proliferation of Schwann cells. We also demonstrated that the in vivo biodegradation product of chitosan, chitooligosaccharide, could support neural cell adhesion and encourage neuronal differentiation and neurite outgrowth through the up-regulation of neurofilament and N-cadherin expression. We fabricated chitosan-based nerve grafts, using an injection molding method, which were composed of a chitosan conduit filled with polyglycolic acid (PGA) filaments. These nerve grafts were used to bridge a 30 mm long sciatic nerve gap in dogs. Six months later, the results showed that the injured nerve trunk was reconstructed with restoration of nerve continuity and axonal functions such as electrical conduction and axoplasmic transport. Further, the target muscles were re-innervated with improvements in the locomotor activity of the injured limb, while the nerve graft had been completely degraded and absorbed by the body. Other nerve grafts constructed with the same methods were also used to bridge a long-term delayed sciatic nerve gap in rats, and experimental observations confirmed the possibility of using chitosan-based nerve grafts for such repairs. Our chitosan-based nerve graft invention has been patented in China. With approval from the Chinese State Food and Drug Administration (SFDA) for the use of chitosan-based nerve grafts in clinical trials, we have launched a prospective randomized controlled multicenter study in four Chinese public hospitals. Two human case studies have been reported, in which 30 and 35 mm long median nerve gaps were repaired with chitosan-based nerve grafts. The three-year follow-up indicated that overall motor and sensory function of both patients' injured nerves had recovered to M_4 or S_3+ levels, according to British Medical Research Council (MRC) grading scale.

SY17-306A-01

CENTRE FOR BIONIC RECONSTRUCTION - CHRISTIAN-DOPPLER LABORATORY

Veronika Fialka-Moser
Department of Physical Medicine and Rehabilitation, Medical University of Vienna, Austria

The loss of a limb (or of significant parts thereof) always represents a dramatic turning point in the history of any individual. Coping with a loss of bodily integrity, general mobility, manual dexterity, and perhaps most importantly a loss of personal independence is a heavy burden for any individual. The dream of restoring the loss of function by way of biological and/or technical reconstruction has long preoccupied both physicians and patients who have confronted this severe challenge. When biological reconstructive measures are not possible, myoelectric prostheses offer a promising technical solution. In recent years this option has been improved tremendously through the introduction of Targeted Muscle Reinnervation (TMR) into the arsenal of reconstructive surgery. Depending on the level of amputation, several options are possible to enlarge the "neurological landscape" of the amputated extremity. Modern myoelectric prostheses have multiple degrees of freedom that require a complex control system to provide reliable operation for the patient. As upper limb prostheses increase in complexity, the importance of providing sensory feedback to the amputee has become increasingly apparent, but has not yet been realized in available products. Through the technique of Targeted Sensory Reinnervation (TSR), or through random sensory reinnervation as a result of targeted nerve transfers, new mechanisms are provided to channel sensory input from the electronic sensors of an artificial extremity, offering the possibility to provide real sensation to the amputee. After undergoing the previously described nerve transfer procedures the amputee must enter a staged, closely monitored TechNeuroRehabilitation Program to help integrate the newly created neurological landscape and to learn how to control the prosthetic device. Finally, specialized interfaces for mechanical attachment of these prostheses must be developed to maximize patient comfort and to allow the freedom necessary to reach the full potential of the previously described innovations. Joint efforts between different specialties as are outlined in this session will help patients to overcome these difficult losses of body function and integrity in a much better way.

SY17-306A-02

BIONIC RECONSTRUCTION OF THE UPPER EXTREMITY

Oskar Aszmann
Austria

The upper extremity is by far the most frequently injured body part. This reflects the immense importance of this part of human anatomy to handle the world around us. Loss of function and/or actual loss of any of its parts disables any human being dramatically. The dream to reconstruct this loss with biologic and/or technical means has been in the centre of our endeavors since many years. Recently we have developed different strategies that combine complex technical systems with sophisticated surgical techniques that create novel neurological landscapes with which patients can interact with prostheses in an intuitive and natural way. Here we present the method of selectively transferring nerves that have lost their targets to muscles in the environment of the stump, to provide a new neurological surface to express lost function. In patients that have lost significant parts of one or both extremities at different levels we have designed nerve transfer matrices that allow patients to govern the most important prosthetic functions intuitively. Different specific movements, such a flexing the elbow, opening and closing the hand or pro-and supination will lead to contractions of different muscle portions. These muscles then act as bioamplifiers of peripheral nerve signals that can power specific movements of a prosthetic device with several degrees of freedom. Here we present long-term follow-ups of patients with amputations at different levels and will present future perspectives.

SY17-306A-03

IMPROVEMENTS OF THE BIOTECHNOLOGICAL INTERFACE IN TRANSHUMERAL AMPUTEES

Stefan Salminger[1], Manfred Frey[2], Christian Hofer[3], Oskar Aszmann[2]
[1]CD Laboratory for Extremity Reconstruction/Medical University of Vienna, [2]Division of Plastic and Reconstructive Surgery, Department of Surgery, Medical University of Vienna, [3]Otto Bock, Austria

Purpose: Amputation of an upper extremity results in severe functional and also psychological changes. Even though vascularized homologous tissue transfer is possible at this level, classic treatment options consisted of body-powered prosthesis or in the recent years myoelectrical prosthesis with only two linear signals. These systems are not able to move multiple prosthetic joints simultaneously or intuitively. Furthermore skeletal-attachment has been difficult due to poor soft tissue management at the amputation site and results in rotational instability. *Material*: We present 5 male transhumeral amputees. Referrals were either due to multiple neuroma pain, soft tissue problems at the stump with subsequent prosthetic problems. Solutions included bone lengthening with homo- and autologous bone reconstruction, implantation of artificial custom made titanium condyles, enlargement of soft tissue envelope with regional myocutaneous flaps and multiple nerve transfers for neuroma treatment and creation of intuitive control matrix. In some patients additional free functional muscle transfers have been performed to gain additional myosignals. *Results:* Due to reafferentiation and progressive prosthetic use after selective nerve transfers, neuroma pain and phantom limb pain is reduced or even abolished. The possibility of intuitive and concurrent control of different functions, stable skeletal attachment and improved range of motion of the shoulder joint, allows a more natural cognitive and mechanical translation of arm/hand movements which results in an overall improvement of prosthetic use. *Conclusions*: Targeted Muscle Reinnervation together with the above described improvements of the skeletal-attachment provide numerous benefits for this special group of patients that are otherwise difficult to treat from a reconstructive surgeon's perspective. The described benefits are intrinsic due to improvements at the amputation site itself (scar/neuroma/soft tissue problems) and have far reaching consequences for intuitive and reliable prosthetic use.

SY17-306A-04

A QUANTITATIVE ANALYSIS OF THE SENSORY AND MOTOR FIBERS OF THE BRACHIAL PLEXUS IN MAN

Bernhard Gesslbauer[1]*, Marie Hahn[1], Roland Blumer[2], Oskar C. Aszmann[1]
[1]Division of Plastic and Reconstructive Surgery, Department of Surgery, CD Laboratory for Restoration of Extremity Function, [2]Center of Anatomy and Cell Biology, Integrative Morphology Group, Medical University of Vienna, Austria

Introduction: Any surgical nerve reconstruction must take into account the topography and quantity of individual nerve fibres at any given level of injury. To date, however, literature on qualitative and quantitative assessment of axons of the peripheral nerves of the upper extremity is scarce. Furthermore, none of these studies have depicted the topography of motor fibres along the entire course of these peripheral nerves. The aim of the present study is to count the total number of motor fibres of the brachial plexus and its peripheral nerves. *Material and Methods:* Nerve samples have been harvested from 5 organ donors immediately after death. From 8 incisions ranging from the neck to the wrist a total of 36 nerve samples were gained per organ donor. Immunofluorescence was applied to visualise the specific structure of interest. Antibody against neurofilament served to determine the total amount of axons. Antibody against choline acetyltranferase (ChAT) was used to detect cholinergic/motor fibres. *Results:* Around one-tenth of all axons in a mixed peripheral nerve are cholinergic fibres (motor fibres). In a pure motor nerve (thoracodorsal nerve) one-third of the axons are cholinergic. Furthermore, a pure motor cranial nerve (accessory nerve) also has an afferent fibre proportion. As expected, sensory nerves do not contain axons exhibiting ChAT immunoreactivity. *Conclusion:* Here we present for the first time a quantitative analysis of all cholinergic fibres of the brachial plexus and its consecutive nerves. These results should contribute to improve the functional outcome after nerve suture.

SY17-306A-05

FUNCTIONAL OUTCOME OF TRANSRADIAL TRANSPLANTATION VS. BIONIC RECONSTRUCTION

Stefan Salminger[1]*, Agnes Sturma[1], Stefan Schneeberger[1], Oskar Aszmann[1]
[1]Medical University of Vienna/CD Laboratory for Extremity Reconstruction, [2]Division of Plastic and Reconstructive Surgery, Department of Surgery, Medical University of Vienna, [3]Department of Visceral, Transplant and Thoracic Surgery, Innsbruck Medical University, Innsbruck, Austria

Background: Loss of hand function due to severe injury or amputation is a devasting event. Homologe transplantation as a vascularized tissue transfer and bionic reconstruction with a myoeletric prosthesis are the two main concepts evolved for the reconstruction of hand function after amputation at forearm level. Of course, a prosthetic device cannot replace the normal appearence and qualities like a transplanted hand, but it gets along without long-term immunosuppression and all its riks, immense therapeutic effort and the need of life-long physiotherapy to keep the achieved function

constantly. *Material and Methods:* We include 4 male patients with unilateral prosthetic reconstruction of the hand and 4 male transplanted patients, 3 of them bilateral and 1 unilateral hand transplantation. The hand function of all patients was tested with ARAT (Action Research Arm Test) and SHAP (Southampton Hand Assesment Procedure) and the results of both groups compared. *Results:* At this stage of study progress, we see no significant difference between tranplanted and prosthetic hands in ARAT and SHAP. Both groups achieved very good results in hand function. The gained sensibility in the reconstructed limb is probably the greatest advantage of the transplantation, but also the use in wet conditions and the physical appearence of transplanted hands are not negligible. *Conclusions*: Due to the preliminary results, hand function is not crucial for the choice of reconstruction. Patients should be selected very carefully for both methods and indications can be stated clearly that hardly no patient is recommended for both concepts.

SY17-306A-06

TECHNEURO REHABILITATION (TNR): A NEW CONCEPT IN PROSTHETIC REHABILITATION

Malvina Herceg[1]*, Agnes Sturma[1,2], Veronika Fialka-Moser[1], Oskar Aszmann[1]

[1]Department of Physical Medicine and Rehabilitation, [2]CD Laboratory for Restoration of Extremity Function, and [3]Division of Plastic and Reconstructive Surgery, Department of Surgery, Medical University of Vienna, Austria

Basic myoelectric prostheses for upper limb amputees are usually being operated by using two myosignals generated from muscles via surface electrodes. Though this allows good prosthetic function, it is still limited to few degrees of freedom and does not allow intuitive control over the device. To achieve a greater amount of signals and thus a greater variety of possibilities for prosthetic maintenance, surgical interventions such as targeted reinnervation of selected muscles (TMR) have now made it possible to process up to seven signals. TechNeuroRehabilitation (TNR) describes the refined process that aims to combine the consequently newly created neurological landscapes with technology in order to achieve independence and the best functional benefit possible.

SY17-306A-07

APPLIED VIBROTACTILE FEEDBACK PATTERNS FOR UPPER LIMB PROSTHESES

Cosima Prahm

Medical University of Vienna, Austria

Objective: Intuitive control resulting from sensory feedback are of high importance for upper limb amputees. In this regard, this study deals with providing haptic feedback in prostheses.Currently, users of prosthetic devices are limited to visually monitor their performance,demanding high cognitive effort. *Method:* Vibrotactile feedback patterns were generated using a motor attached to the skin of healthy participants. It employed vibrations within a defined setting of a maximum frequencyof 60Hz, corresponding to the mechanoreceptors of the skin. Three types of patterns wereadopted: static, dynamic and pulsed ones, which differed in amplitude and frequencycombinations as well as break time in between one amplitude and frequency display. Those patterns were subsequently evaluated for intuitiveness and preference according to the following prosthetic movements: grip force, position of hand and contact with objects – which resulted in four dynamic movements and four static states. While one pattern was applied, participants could choose between two movements to be coded by it and rate their choice afterwards. *Results:* Analysis showed distinct mapping of static patterns to static states and dynamic and pulsed patterns to dynamic movements. Moreover, one pattern per movement could beidentified as the most prominent in cast votes as well as rating. This study provides a catalog of patterns to be used as guidance in vibrotactile feedback. *Implications on rehabilitation*: By providing intuitive sensory substitution in the form of vibrotactile patterns to the users, prosthetic control can be improved and resulting cognitive effort in handling be diminished.

SY17-306A-08

EMG-GUIDED TRAINING AND TESTING IN REHABILITATION FOR PATIENTS AFTER TARGETED MUSCLE REINNERVATION

Agnes Sturma[1], Malvina Herceg[1,2], Peter Göbel[3], Veronika Fialka-Moser[2], Oskar Aszmann[1,4]

[1]Christian Doppler Laboratory For Restoration of Extremity Function, Medical University of Vienna, [2]Department of Physical Medicine And Rehabilitation, Medical University of Vienna, [3]Otto Bock Healthcare Products Gmbh, Vienna, [4]Division of Plastic And Reconstructive Surgery, Department of Surgery, Medical University of Vienna, Austria

Objective: Targeted Muscle Reinnervation (TMR) provides an opportunity to improve prosthesis control for patients with high amputations of the upper extremity. It leads to additional myosignals that can be used to control the prosthesis intuitively. Following TMR surgery, the so-called "TechNeuroRehabilitation" starts. Within this process the patient has to learn how to control his new muscular interface in order to govern a prosthesis with sEMG signals. Therefore, EMG biofeedback is used. To evaluate the patient's ability of generating myo-signals a new sEMG testing tool was developed. *Method:* In our sEMG test tool, specific motor tasks are presented to the patient on a computer screen. He/she needs to activate myo-signals according to predesigned specific geometric profiles. Depending on the standard deviation between the sEMG and the given targeted contraction task, the patient is classified. So the ability to generate sEMG-signals can be quantified and further training can be planned. *Results:* First testing shows that the sEMG test tool is able to detect an improvement in coordination within healthy subjects tested 3 times. The tool has also successfully been tested for amputees. *Implications/Impact on Rehabilitation*: The sEMG test tool is used to support Rehabilitation, since it shows special needs for training.

SY17-306A-09

DEVELOPMENT OF CLOSED LOOP BIOFEEDBACK CONTROLLING IN TRANSRADIAL AMPUTEES

D Farina, Strahinja Dosen, Andrei Ninu

Afghanistan

After amputation, the patient suffers a loss of both motor and sensory functions. Motor functions can be restored to a certain extent by using a myoelectrically controlled prosthesis. However, none of the commercially available systems implements somatosensory feedback, and the closed loop control of these devices is therefore an important goal yet to be achieved. In this talk, we will present several methods to provide sensory feedback to amputees, and give an overview of experimental paradigms to evaluate and compare those methods. Electrical and mechanical stimulation of the skin are used to provide sensory substitution and cognitive control using these sensory modalities is evaluated within closed loop paradigms. We will describe both virtual implementations and simulations as well as real systems that include modern robotic prosthetic hands. The final goal is, on the one hand, to improve the everyday utility and controllability of prosthetic devices and, on the other hand, to promote embodiment and integration of the prosthesis into the body scheme. This can increase the acceptance of myoelectric prostheses and also decrease the occurrence of phantom limb pain.

SY17-307AB-01

ROBOTIC OFFAXIS SENSORY-MOTOR REHABILITATION OF MUSCULOSKELETAL INJURIES AND NEUROLOGICAL DISORDERS

Li-Qun Zhang
Rehabilitation Institute of Chicago, Departments of Physical Medicine & Rehabilitation, Orthopaedic Surgery, and Biomedical Engineering, Northwestern University, Chicago, United States

Although major motion of the knee is flexion/extension in the sagittal plane, knee injuries often occur about the offaxes (pivoting movement in the axial plane and abduction/adduction movement in the frontal plane). Offaxis instability and reduced neuromuscular control are also common impairments in neurological disorders such as cerebral palsy and stroke. However, most existing training and rehabilitation devices mainly involve sagittal movements. An offaxis elliptical training system is developed to train and evaluate neuromuscular control in pivoting and mediolateral sliding for the purposes of rehabilitation of musculoskeletal injuries and neurological disorders. The offaxis elliptical training involves controlling two footplates individually or simultaneously through robotic control so that the footplates behave like pivoting and sliding springs with adjustable offset and stiffness, slippery surface, or under external perturbations during sagittal stepping movement. The offaxis training system in improving pivoting neuromuscular control and pivoting neuromechanical properties was used to train patients with knee injuries and patients with neurological disorders, with reduced pivoting/sliding instability and reaction time, and improved proprioceptive acuity following training. The offaxis training system can in general be used as a therapeutic and research tool to investigate mechanisms underlying pivoting-sliding related injuries, and train human subjects for improving offaxis neuromuscular control and functional performance.

SY17-307AB-02

CARDIAC-RESPIRATORY RESPONSES TO ROBOTIC TRAINING IN INDIVIDUALS WITH CHRONIC, MOTOR, COMPLETE, HIGH SPINAL CORD INJURY

Gabi Zeilig
Sheba Medical Center, Tel Hashomer, Israel

Lack of exercise is a serious public health concern for all people, but those with spinal cord injury (SCI) are at much greater risk of the serious health problems associated with physical inactivity. The findings of a cross-sectional study of 101 men with chronic complete traumatic SCI on follow up for more than 20 years in our center indicated that coronary risk factors were hypercholesterolemia (33%), hypertension (36%) and physical inactivity (40%). Coronary heart disease prevalence was 17.2%. Patients with complete tetraplegia or high complete paraplegia have very limited options for physical activity that would provide cardiovascular benefits and general physical fitness. Failure of the sympathetic nervous system and having reduced muscle mass for exercising are among the main limiting factors. Further, personal and environmental barriers associated with spinal cord injury restrict access to physical activity venues and services. A single session of passive body weight supported treadmill training assisted with a robotic driven gait orthosis for individuals with high complete paraplegia or tetraplegia resulted in an increased level of metabolic activity with similar increase in ventilation. The metabolic level increased by a factor of 2.5 as measured by the oxygen consumption. Based on these findings, 7 males with chronic motor complete high paraplegia or tetraplegia followed a training program consisting of twenty two sessions of body weight supported treadmill training assisted with a robotic driven gait orthosis. Plasma levels of total cholesterol, LDL-C, HDL-C, TC/HDL, LDL/HDL, CRP, Triglycerides, Interleukin 6 (IL-6), fasting glucose and fasting insulin as well as blood pressure, O_2 consumption, CO_2 production, O_2 saturation, heart rate, respiratory exchange ratio (RER) max, minute ventilation (VE), anaerobic threshold (AT) and work rate max have been monitored and measured at the beginning and at the end of the training program. The preliminary results of this study indicate that robotic assisted gait has the potential to provide cardiovascular fitness exercise activity for those with complete high spinal cord lesions. We also propose that personalized training programs adapted to each subject and to the level of lesion should be studied, implemented and integrated into the regular lifestyle of people with SCI in order to reduce the likelihood of secondary complications and to enhance their physical capacity.

SY17-307AB-03

THE DEVELOPMENT OF ROBOTIC TRAINING AND RESEARCH ON REHABILITATION IN CHINA

Bi Sheng[1], Ji Linhong[2]
[1]Rehabilitation Medicine Center, Chinese PLA General Hospital Beijing, [2]Department of Precision Instruments and Mechanology, Tsinghua University Beijing, China

Robot-aided training exploiting recent technological advances can supply safe, intensive and task-specific help to persons with mild to severe motor impairments. There have been a lot of papers reporting the use of different robots for neurorehabilitation in many countries since 1997. We started to develop the robot training for rehabilitation in China since 2002 and produce the robot for upper limb in patients with stroke or brain injury in 2004. Our study was designed to test the effectiveness of upper limb in patients with stroke or TBI by using an upper extremity compound movement (UECM) training robot. The robot was designed to assist not only with constrained, straight-line path exercises, but also with outward-oriented circular path tracking exercises to decrease abnormal synergies of upper limb. According to a preliminary study, the use of the UECM rehabilitation training robot can significantly improve motor outcomes in the rehabilitation of the upper limbs of stroke and brain injury survivors. Constrained straight path training blocked incorrect movement patterns, exterior-oriented circle path training opposed abnormal synergies and repetitive stretching movements reduced spasticity.

SY17-308-01

EVIDENCE BASED SOSORT GUIDELINES ON SCOLIOSIS CONSERVATIVE TREATMENT: BRACING, EXERCISES AND PRACTICAL APPROACH

Stefano Negrini
University of Brescia - IRCCS Don Gnocchi Milan, Italy

Background: The International Scientific Society on Scoliosis Orthopaedic and Rehabilitation Treatment (SOSORT), that produced its first Guidelines in 2005, felt the need to revise them and increase their scientific quality. The aim was to offer to all professionals and their patients an evidence-based updated review of the actual evidence on conservative treatment of idiopathic scoliosis (CTIS). *Methods:* All types of professionals (specialty physicians, and allied health professionals) engaged in CTIS have been involved together with a methodologist and a patient representative. A review of all the relevant literature and of the existing Guidelines have been performed. Documents, recommendations, and practical approach flow charts have been developed according to a Delphi procedure. A methodological and practical review has been made, and a final Consensus Session was held during the 2011 Barcelona SOSORT Meeting. *Results:* The contents of the document are: methodology; generalities on idiopathic scoliosis; approach to CTIS in different patients, with practical flow-charts; literature review and recommendations on assessment, bracing,

physiotherapy, Physiotherapeutic Specific Exercises (PSE) and other CTIS. Sixty-five recommendations have been given, divided in the following topics: Bracing (20 recommendations), PSE to prevent scoliosis progression during growth (8), PSE during brace treatment and surgical therapy (5), Other conservative treatments (3), Respiratory function and exercises (3), Sports activities (6), Assessment (20). No recommendations reached a Strength of Evidence level I; 2 were level II; 7 level III; and 20 level IV; through the Consensus procedure 26 reached level V and 10 level VI. The Strength of Recommendations was Grade A for 13, B for 49 and C for 3; none had grade D. *Conclusion:* These Guidelines have been a big effort of SOSORT to paint the actual situation of CTIS, starting from the evidence, and filling all the gray areas using a scientific method. According to results, it is possible to understand the lack of research in general on CTIS. SOSORT invites researchers to join, and clinicians to develop good research strategies to allow in the future to support or refute these recommendations according to new and stronger evidence.

SY17-308-02

STATE OF THE ART IN CONSERVATIVE MANAGEMENT OF SCOLIOSIS

Hans-Rudolf Weiss
Orthopedic Rehabilitation Services, Gensingen, Germany

Objective: Long-term follow-ups of untreated patients with Adolescent Idiopathic Scoliosis (AIS) indicate that the consequences of AIS over a lifetime are minimal, sometimes moderate in more severe cases, however, never life threatening. In light of these findings, the historical indications for treatment should be investigated according to current evidence. *Method:* Recent reviews have been investigated for their contribution to evidence in the field of scoliosis treatment. Especially, the impact of the results obtained may have on the historical modes of treatment. *Results*: From the findings, we may conclude that there is promising evidence for the application of physiotherapy in the treatment of scoliosis in children or adolescents and for adults with curvatures exceeding 35° Cobb. There is stronger evidence for the application of (hard) braces during growth. There is no evidence for spinal fusion surgery for AIS. The use of surgery should be limited in patients with scoliosis of other origin. *Implications on Rehabilitation*: Pattern specific approaches of physiotherapy and bracing are demonstrated and discussed in more detail. Emphasis is laid upon the fact that both modes of treatment, physiotherapy and bracing, according to current evidence should be highly corrective in order to foster the best possible outcome.

SY17-308-03

APPLICATION OF SOFT BRACE IN SCOLIOSIS TREATMENT

Shawn He
Palmer College of Chiropractic, United States

The spine is unique because of its balance between flexibility and stability. Scoliosis disrupts balance in both the coronal and sagittal planes. The treatment of scoliosis has advanced in the areas of effectiveness of the maintenance and restoration of such balance. Currently, besides surgery as a major treatment, bracing is still a critical component of non-surgical treatment. However, although most studies are in favor of bracing as a form of treatment, hard bracing exhibits some limitations such as compliance, three dimensional corrections, temporal decline of QoL, psychological discomfort and a weakened musculoskeletal system. With better understanding of the etiology and pathophysiology of scoliosis, soft bracing has emerged as a replacement of/or supplement to hard bracing. Although existing literature on soft bracing is sparse, the results of soft bracing on well-selected patients are encouraging. The advantages of soft bracing include maintenance of muscle and joint mobility, classification specificity, multi-dimensional correction, dynamic adjustment and modification, neuromuscular enhancement, and an adjunct to other therapies. The effectiveness of soft bracing depends on many factors, including the type of curvature, maturation, hours of wearing, exercising and progressive risk factors which may have a direct impact on the outcomes of soft bracing. Less social and psychological discomfort as well as better aesthetic appearance and QoL are other positive aspects for patients to choose soft bracing. It is important for treating clinicians to understand the theory behind soft bracing and apply the soft brace correctly so that patients can achieve maximums benefits.

SY17-308-04

CONSERVATIVE TREATMENT FOR SCOLIOSIS: DEVELOPMENT, OBSTACLES & OPPORTUNITIES

Joseph P. Obrien
National Scoliosis Foundation Inc., Stoughton, MA, United States

Objective: To present a professional and patient perspective on the issue of conservative treatment for scoliosis. *Methods:* A critical review of the historical development of scoliosis treatments, and the current state of the art of conservative care, highlighting the patient's needs and the opportunities that lie ahead. Formidable obstacles that still exist globally today will be identified along with an outline of the current efforts being made to confront these challenges to realize evidence based acceptable standards of physical and rehabilitative care for the scoliosis community. *Results:* Patients, parents and advocates yearn for effective, efficient, non invasive methods to prevent the progression of scoliosis and the potential onset of physical, emotional and psychological sequelae. This group of spinal deformity patients has endured the burdens of their musculoskeletal condition for far too long, and they deserve to be able to believe in, and truly achieve a better quality of life. More than any other time in scoliosis history, there are scientific, medical, clinical and patient organizations working together to enhance the patient care pathway. *Implications/Impact on Rehabilitation*: Many walls are beginning to come down, and be collaboratively rebuilt, to attain the vision to enjoy, enrich and enable the advancement of physical and rehabilitation medicine in scoliosis.

SY17-309A-01

HOW DO YOU MEASURE UP? QUANTITATION IN EDX MEDICINE

Jorge Eduardo Gutierrez Godoy
Potenciales, Colombia

The duty of Electrodiagnosis (EDX) is to determine if a patient more likely belongs to a healthy or a disease group. There is not clear boundary among those groups. EDX indicate rather the level of probability that a result came from a healthy or a diseased person. For this reasons it is better to speak of *reference values* instead of *normal values*. Several factors affect the EDX results including temperature, age, height, EMG machine settings (filters, sensitivity, sweep speed, etc.) and the experience of the EDX physician to select reference values that balance sensitivity and specificity, to recognize false-positive and false-negative results and to evaluate the clinical context. The measuring of electric biological responses usually does not follow a bell-shaped curve. EDX parameters are often skewed, for this reason, parametric statistical analysis produces erroneous reference values. One option is to transform the data to produce a bell-shaped curve, another option is to use non-parametric analysis (ranges, percentiles) not dependent upon data distribution. When using multiple studies the chance of a false-positive result by chance is high. One way to deal with this is to require multiple results to be abnormal before calling a diagnosis. Another approach is to combine multiple measures into one combined index to be compared with the reference group. The use of adequate quantitation in EDX should

lead to improve sensitivity and reproducibility of the available tests, making our field competitive and an important tool among many new modalities to study neuromuscular diseases.

SY17-309A-02

COMMON PITFALLS EN EMG AND HOW TO AVOID THEM

Carlos Rangel
Colombia

Abstract is missing.

SY17-309A-03

CONTROVERSIES IN ELECTRODIAGNOSIS. THE THORACIC OUTLET SYNDROME

Juan Lacuague
Uruguay

The thoracic outlet is the area contained by the anterior and middle scalene muscles, the first rib, the clavicle and the apex of the lung. The term thoracic outlet syndrome (TOS) comprise a group of disorders that involve the neurovascular structures located in this area (1). The term TOS has been used indiscriminately including malignant or traumatic cases. In order to clarified this issue Wilbourn (2) has classified the TOS in 5 types: True neurologic (TN), Arterial, Venous, Non Specific (disputed) and Combinations of the first three types. In TN-TOS the lower trunk of the brachial plexus (BP) is involved usually by an anomalous bone or fibrous band. Wasting and weakness of both thenar and hipothenar muscles and paresthesias in the ulnar aspect of the forearm , palm and fifth digit can be present. The first aim for EDG is to exclude the carpal tunnel syndrome, an ulnar neuropathy or radiculopathy (3). Important signs are: small or absent sensory nerve action potentials of the medial cutaneous nerve of the forearm and the ulnar nerve, prolonged latency of the F wave recorded in hypothenar muscles, and EMG abnormalities in muscles supplied by the lower trunk of BP. The SEP studies from ulnar nerve are usual abnormal in TN-TOS, but the standard studies also are abnormal, additional information are generally not relevant. There are not electrophysiological abnormalities in Non Specific, Arterial and Venous TOS.

SY17-309A-04

COMMON PITFALLS IN EDX AND HOW TO AVOID THEM

Juan Manuel Guzman Gonzalez
Mexican Society of Physical Medicine and Rehabilitation, Mexico

In this symposium we want to describe some of the factors that may lead to erroneous interpretations of nerve conduction studies. Such errors may be due either to technical or to biological factors, and it is imperative that the consequent limitations of the methods be considered in a diagnostic setting. Electrodiagnostic findings should always be interpreted in the clinical context, and since they are rarely specific for a particular disorder or pathology, it is necessary to satisfy several criteria to make a specific diagnosis. Nerve conduction studies are carried out to ascertain whether motor or sensory myelinated fibers are lost, and whether the primary pathology is due to demyelination or axonal loss or to both. Conduction studies investigate only large myelinated fibers, and therefore in some instances there is discordance between the morphology and physiology. Acquired demyelinating neuropathies are sometimes associated with focal slowing of conduction or with conduction block. The demonstration of conduction block is important, but several requirements must be fulfilled in terms of technique, clinical context, and temporal development in order to avoid errors. It is very important to have standardized values in every laboratory with the purpose of the obtained results can be reproduce. An important factor is to know the anatomy and the most common anatomical alterations; as well as, the specific technics and measurements adapted to get latencies and nerve conduction studies reliable.

SY17-311A-01

EFFECTS AND MECHANISM OF PHYSICAL MODALITIES IN KNEE OSTEOARTHRITIS

Chengqi He
Huaxi Hospital Affiliated to Sichuan University, Chengdu, China

Osteoarthritis (OA) is the most common chronic joint disorder involving the degradation of articular cartilage, the remodeling of subchondral bone and the inflammation of synovial membrane. OA commonly affects knees, hips, and hands and is characterized by clinical symptoms and signs, such as pain, stiffness and motor dysfunction. Many guidelines about OA treatment containing medication and (or) non-medication approaches have been recommended by plenty of associations and societies of orthopaedics and rheumatology. Physical modalities as the very important non-drug approaches could have impact on articular cartilage, subchondral bone and synovial membrane in various biochemistry and biomechanics pathway. We searched the Cochrane Library, Medline and Embase from first published to April, 2013, with the search terms “knee osteoarthritis”, “cartilage”, “subchondral bone”, “synovial membrane”, “exercise”, “transcutaneous electrical nerve stimulation (TENS)”, “pulsed electromagnetic fields (PEMFs)”, “therapeutic ultrasound (TU)”, “shock wave therapy (SWT)”, “microwave”, “whole body vibration (WBV) ” and “low level laser therapy (LLLT)” and various topic-specific terms. Studies were considered eligible if they contained the application of the above physical modalities on knee OA. Essential data and information were extracted and concluded from these preclinical and clinical studies. There is evidence to support effectiveness via provision of exercise, TENS, and therapeutic ultrasound. Potentially beneficial treatment options for cartilage regeneration include PEMFs. Promising interventions that would be beneficial to improve dysfunction of OA patients include SWT and WBV. LLLT and microwave could relieve synonitis and even reestablish the knee functioning. We a strategy that combine different physical modality according to individual underlying effects. Several novel therapies (e.g. an electrode array, biofeedback rehabilitation and so on) underway to inform the future practice. The review emphasized the effectiveness, mechanism, parameter, precaution and side effect of each physical modality. This may provide an evidence-based reference for clinical professional.

SY17-311A-02

RECENT ADVANCED REHABILITATION OF OSTEOARTHRITIS

Mao-Hsiung Huang
Kaohsiung Medical University, Chinese Taipei

The pathogenesis of OA is divergent with biomechanical and non-biomechanical factors. The former are characterized by the incongruence of the articular surface, and the properties of the subchondral bone. In addition to heritability, nutrition and hormonal, cytokine influences belong to the non-biomechanical factors. Cytokines interact with transcription factors and enzymes. For instance, IL-1β actives synthesis of MMP-3 and 13. TNF-α induces the enzyme COX2. VEGF increase the secretion of MMP 1,3 and 13 and at the same time induce IL-1β and TNF-α. In which IL-1β, TNF and IL-6 seem to be the main pro-inflammatory cytokines involved in the pathophysiology of OA. Obesity also contribute to hand OA due to a systemic effect involving the pro-inflammatory and degenerative

role of adipokines secreted by adipose tissue. Exercise is generally considered anti-inflammatory and may be an important treatment for reducing osteoarthritis risk, especially in obese individual. Studies showed that cyclic passive joint motion reduced the expression of IL-1β and cyclooxygenase-2, and increased the expression of anti-inflammatory cytokine IL-10. Further, cyclic loading also reduces the expression of inflammatory induced cartilage catabolic mediators, metalloproteinases and aggrecanases. The subchondral bone is involved in the pathophysiology of OA, both by biochemical and mechanical pathways. Over-loaded OA subchondral bone osteoblast express a pro-angiogenic and pro-inflammatory phenotype which contributes to the structural changes sclerosis and bone marrow lesion visible in OA. From the physical therapy studies showed that extracorporeal shockwave therapy has chondroprotective effect associated with improvement in subchondral bone remodeling in the initiation of induced OA.

SY17-311A-03

EVIDENCE BASED MEDICINE IN THE DIAGNOSIS AND MANAGEMENT OF HAND OSTEOARTHRITIS

Fitnat Dincer
Hacettepe Medical Faculty, Dept of PRM, Ankara, Turkey

Introduction: In this abstract, especially the Diagnosis & Management of HOA is outlined depending essentially on the recent EVIDENCE BASED RECOMMENDATIONS (EBR) and literature. *Material and Method*: EBR for the Diagnois of HOA, according to; risk factors, clinical, subsets, differential diagnosis, images and laboratory tests is mentioned in details with Levels of Evidence. Also EBR for the Management of HOA developed through three Delphi rounds, according to; general, non-pharmacological, pharmacological, invasive, surgical, with levels of evidence is given through the lecture. *Results*: The results of 3 Delphi rounds, for Diagnosis 108, for Management of HOA 309 literature depending on Evidence Based Medicine and Hierarchy with Levels of Evidence is presented. *Conclusion*: • Pain relief , restoration of function remain the primary treatment objectives; • These are best achieved by a combination of pharmacological & nonpharmacological treatment especially by application of PRM procedures; • Surgery remains the last resort for restoration of function if all else fails.

SY17-311B-01

USING CARF STANDARDS TO BUILD EXCELLENCE IN REHABILITATION PROGRAMS

Christine M. Macdonell
CARF International, United States

As rehabilitation providers develop and grow, a systematic management tool is needed to ensure that a person-centred, quality framework that focuses on returning individuals in need of rehabilitation to their most integrated setting is utilized in various rehabilitation settings. The Commission on Accreditation of Rehabilitation Facilities, (CARF International), an international peer-review accreditation system, has been in existence since 1966. It is the only accreditation organization that has standards that focus specifically on the medical rehabilitation continuum of services for all ages of individuals with medical rehabilitation needs including those with stroke, brain injury, spinal cord dysfunction, limb loss, pain, orthopedic, and neurological issues. The standards are dynamic tools that allow rehabilitation providers to aspire toward excellence in their daily work. It also links rehabilitation providers around the world with a collaborative family of providers that are focused on sharing and learning from each other about current and best practices that are resulting in more individuals participating in their homes and communities. This session will focus on sharing the framework of the CARF standards, the role of the rehabilitation physician as well as consulting physicians in the interdisciplinary team, and how to begin the journey of accreditation. Participants will be able to identify the main components of the standards framework; their role as a rehabilitation physician, and know the beginning steps toward accreditation by the end of the session.

SY17-311B-02

BENEFITS OF CARF ACCREDITATION

John Melvin
Jefferson Medical College, United States

Objective: To provide participants information on the benefits medical rehabilitation facilities gain from CARF accreditation. *Method*: Expert observation. The author has been the medical leader of facilities that have been CARF accredited for more than 30 years and has been a member of five CARF standards advisory committees. *Results:* CARF accreditation provides the following major benefits: (1) the CARF standards and surveys provide medical rehabilitation facilities with expert input on the best practices for service and business excellence, (2) they supply external professional validation of the need for the professional staffs of medical rehabilitation facilities to adopt the consensus procedures included in the standards, (3) they furnish external validation to the management of medical rehabilitation facilities of the need to provide the resources necessary to achieve program excellence and (4) they supply a means for facilities through successful accreditation to demonstrate their commitment to and implementation of programs that achieve high quality standards, use resources wisely and focus on outcomes important to their patients. *Implications/Impact on Rehabilitation*: Participating in the CARF accreditation process is one approach a medical rehabilitation facility can use to improve its programs and operations. Achieving CARF accreditation permits facilities to distinguish themselves from the numerous programs that label themselves as rehabilitation, but which provide limited services and outcomes.

SY17-311B-03

REHABILITATION QUALITY METRICS IN THE WAKE OF AMERICAN HEALTH CARE REFORM AND THEIR IMPLICATIONS FOR OTHER NATIONS

Gerben Dejong
The Center for Post-acute Innovation and Research at the MedStar National Rehabilitation Hospital (NRH) and the MedStar Health Research Institute, United States

The Affordable Care Act, America's health care reform law, creates new quality reporting requirements for rehabilitation providers. Beginning this year, hospital-based rehabilitation centers must report select quality indicator or face a 2% reduction in payment under the Medicare program, the nation's largest health insurance program for older and disabled beneficiaries. In 2016, Medicare will link payment more directly to a rehabilitation center's performance, i.e., performance-based payment. The health care reform law requires similar reporting and payment changes for other types of post-acute rehabilitation providers such as skilled nursing facilities and home health agencies. This presentation will consider issues related to the validity, reliability, need for risk adjustment, potential for gaming, timing of reports, linkage to payment, unintended consequences, and above all the utility for end users including patients, payers, accreditors, and providers alike. The presentation will conclude with observations about the extent to which proposed quality indicators under the health care reform law are universally applicable and which are distinctively American and thus not as generalizable.

SY17-311B-04

GETTING BRAZIL ON CARFS MAP

Chistina May Moran Brito
Brazil

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SY18-301AB-01

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SY18-301AB-02

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SY18-301AB-03

F WAVE AND H REFLEX AS A MEASURE OF EXCITABILITY OF THE SPINAL MOTONEURONS

Jun Kimura
University of Iowa Healthcare, Iowa City Iowa, United States

H-reflex amplitude shows a significant reduction after voluntary immobilization of calf muscles for 1-2 h and a quick recovery following muscle contraction. Similarly, sustained volitional muscle relaxation for 1 to 12 h causes a muscle specific reduction of F-wave persistence in proportion to the rest period. Mental simulation of movement without actual muscle contraction suffices to block the effect of volitional relaxation. A reversible change at the level of the anterior horn cells can alter the MEP amplitude, commonly used as a measure of cortical excitability. Additionally, reduced amplitude of H reflex and the absence or low persistence of F wave, ordinarily taken as a sign of conduction block, may result from reduced excitability of the spinal motor neurons rather than a peripheral nerve involvement.

SY18-301AB-04

NEUROPHYSIOLOGICAL STUDIES FOLLOWING TOTAL C7 NERVE TRANSACTION FOR RESTORATION OF INJURED PERIPHERAL AND CENTRAL FUNCTION

Yu Zhu[1,2,3]*, Xu-Yun Hua[3], Mou-Xiong Zheng[3], Yan-Qun Qiu[3], Tie Li[3], Yun-Dong Shen[3], Su Jiang[3], Jian-Guang Xu[3], Yu-Dong Gu[3], Mark Hallett[2], Wen-Dong Xu[3]
[1]Upstate Medical University State University of New York, [2]Human Motor Control Section, National Institute of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, USA, [3]Department of Hand Surgery, Huashan Hospital, Shanghai Medical College, Fudan University, Shanghai, China

Ipsilateral motor control for upper limb dysfunction of spastic hemiplegic hand have been observed via C7 nerve transfer from the uninjured side by a group of hand surgery and rehabilitation specialists at Huashan hospital, Shanghai China. Clinical neurophysiological studies including nerve conduction studies (NCS), somatosensory evoked potentials (SEP), and motor evoked potentials (MEP) were performed before and after the operation with follow-up of 2 years in 6 patients (7–11 years of age) who underwent the operation of "cross-neck C7–C7 neurotizatio". The C7 nerve root on the healthy side was connected to the C7 nerve on the paralyzed side via a nerve graft at the neck level. It is demonstrate that this novel approach can improve motor function in humans of the paralyzed upper extremity by producing an enhancement of the ipsilateral motor control. The correlative clinical neurophysiology demonstrates the underlying mechanism of the clinical findings of the significantly improved motor function. This novel approach can improve motor function in humans of the paralyzed upper extremity by producing an enhancement of the ipsilateral motor control. This is an exciting new advance in the therapy of hemiplegia extremity and the development of a comprehensive and innovative rehabilitation strategy is deserved.

SY18-301AB-05

MANAGEMENT OF CHRONIC PAIN: WHY AND HOW TO USE A NMULTIDISCIPLINARY REHABILITATION APPROACH

Sridhar Vasudevan
Wisconsin Rehabilitation Medicine Professionals, SC, United States

Pain is a complex biological-psychological and social phenomenon. The last 50 years has revealed a better understanding of the complex mechanisms involved in the perception and reaction to pain. From a simplistic peripheralist approach of tissue injury –Translation of mechanical, chemical and thermal stimuli to electrical impulse; then transmission to the brain where pain is perceived, we now understand the constant modulation of pain perception and reaction by central processes, and cognitive appraisal, that includes motivation/affect. Pain frequently leads to "disability." It is important to understanding the complexities of disability and how "pain behaviors" are influenced by legal, social and personality factors. Disability is a "behavioral response to impairments by the individual, as well as, others including family members, friends, physicians, employers and the social-legal-disability systems." Management of chronic pain requires the judicious use of multi-modal therapies that include: pharmacological, interventional, surgical, physical and rehabilitation, and psychological approaches. The goal in treatment is to improve function despite the inability to eliminate the symptom of pain. The goal is to decrease "pain behaviors" and "increase function" using a multidisciplinary rehabilitation approach". WHY rehabilitation approach works well is based on the complex Bio-Psycho-Social aspects of pain and the influence of psycho-social and legal factors that are more relevant in the individual with pain related disability. The HOW of rehabilitation of these individuals with chronic pain, relies on the principles of rehabilitation which is the process of addressing not only the medical, but the physical, psychological, social, vocational, emotional, economic, legal and familial aspects of the individual with impairments, so as to focus on increasing function, prevent and reverse disability, thus improving quality of life for the individual with chronic pain.

SY18-301AB-06

MYOFASCIAL PAIN AND CHRONIC PAIN

Yoonkyo Kang
Korea University Hospital, Korea

Chronic pain is pain that has lasted for a long time, 3 months or 6 months since onset. In addition to the physical pain, chronic pain is associated with higher rates of depression, anxiety, sleep disturbance, and insomnia. Bio-psycho-social model of chronic pain is good to explain that chronic pain is related with myofascial pain. There are 3 factors, predisposing, precipitating and perpetuating factors to transition from acute to chronic pain. All of the above mentioned factors are closely related with physical, psychological and social life situations. Especially almost all perpetuating factors are postural and activities problems. Simply the activities in the human life are the products of interaction of the brain and muscles. Chronic pain may contribute to decreased physical and social activity due to fear of exacerbating pain. During the transition process from acute to chronic pain condition, the passive living attitude, including rest, limited activities, depressed mood, withdrawal from social life etc, resulted in muscle change (weak, tight, contracture). Finally these behaviors brought in negative impact many areas of life. And chronic pain syndromes become complex, involving all aspects of the patient's life and with rare exceptions, include a significant, if not dominant myofascial trigger point component. The statuses of the muscles are the major objectives to manage the chronic pain. So the pain physician must understand above conditions and actively resolve the muscle problem itself and involve in patient's life and try to modify it.

SY18-301AB-07

SINGLE FIBER ELECTROMYOGRAPHIC STUDY IN MYOFASCIAL PAIN SYNDROME

Chein-Wei Chang
National Taiwan University, Chinese Taipei

Myofascial pain syndrome (MPS) is a chronic muscular pain disorder affecting one or more muscles or groups of muscles, accompanied by regional muscular trigger points. It has become one of the most important chronic musculoskeletal problems encountered in clinical practice. Although the true cause of this disease remains unclear, many recent studies demonstrate that neuropathies and disintegration of motor and sensory nerve functions are possibly the most important causes of this disease. Single-fiber electromyography (SFEMG) is known as a sensitive clinical method for test of the stability of the neuromuscular transmission and assessment of functional integrity of peripheral nerves. Stimulated SFEMG examination has evolved into a useful method for studying the physiology of neuromuscular transmission in the muscles over trunk and neck. We performed stimulated SFEMG by inserting a needle electrode directly into the trigger point of upper trapezius and levator scapulae muscles and record the muscle fiber action potential in the patients with cervical MPS. The mean consecutive difference (MCD) values were found significantly increased in the tested muscles. The abnormal MCD values demonstrate the evidence of neuroaxonal degeneration and neuromuscular transmission disorders in the trigger point muscles of MPS patients. This result reveals a synaptic delay of motor endplates in motor unit and may signify evolving instability of neuromuscular transmission. This evidence strongly suggests the dysfunction of neuromuscular junction at endplate region is possible a result of disintegration of spinal motor neurons in MPS patients.

SY18-301AB-08

CURRENT STUDIES OF MYOFASCIAL PAIN SYNDROME

Ta-Shen Kuan
National Cheng Kung University-Department of Rehabilitation Medicine, Chinese Taipei

Myofascial pain syndrome (MPS) is characterized by the existence of a myofascial trigger point (MTrP). The characteristic of electromyographic activities recorded from an MTrP locus is regarded as spontaneous electrical activity (SEA), which includes endplate noise (EPN) and endplate spike. EPN is probably related to excessive leakage of acetylcholine (ACh) in the neuromuscular junction, which causes focal contracture of myofibrils in the endplate zone and then the formation of the taut band, and finally the MTrP. The pathogenesis of MTrP could be attributed to the "energy crisis" hypothesis from local hypoxia. In an MTrP region, multiple hyperirritable loci can be found, and "Multiple Loci Theory" has been proposed. Each MTrP locus consists of a sensory component (a sensitive locus) and a motor component (an active locus). The sensory components of the MTrP locus are sensitized nociceptors that are responsible for pain, referred pain, and local twitch responses (LTR). The motor components are dysfunctional endplates that are responsible for taut band formation as a result of excessive ACh leakage. The prevalence of LTR or EPN has been shown to be correlated to the irritability of an MTrP. Botulinum toxin type A, through blocking the release of ACh in the neuromuscular junction, is beneficial in the management of MPS. Monochromatic infrared photo energy (MIRE), approved for increasing local circulation, has been shown to be effective in decreasing EPN prevalence in recent animal and human studies. Therefore, MIRE could be a useful option in the treatment of MPS.

SY18-301AB-09

COMPREHENSIVE CARDIAC REHABILITATION IN SEVERE HEART FAILURE PATIENTS WITH LEFT VENTRICULAR ASSIST DEVICE

Shigeru Makita
Saitama International Medical Center, Saitama Medical University, Japan

Left ventricular assist device (LVAD) is increasingly used as a bridge to cardiac transplantation and may be used as a long-term therapy for end-stage heart failure. The importance of rehabilitation for improving exercise capacity after implantation of LVAD or maintaining physical activity for heart transplantation has been recognized. Because of shortage of donor hearts in Japan, severe heart failure patients must wait for over 2 years with LVAD. LVAD patients show extremely low exercise performance because of low cardiac output, advanced skeletal muscle atrophy, increasing sympathetic activity and acceleration of inflammatory cytokines. Peripheral metabolic impairments in these patients such as decreasing of oxidative muscle fiber distribution and increasing anaerobic state may be suggested. Exercise training can ameliorate these conditions through improvement of exercise performance. In addition to these physiological impairments, LVAD patients show various cognitive declines and deteriorations of ADL (activities of daily living). Therefore comprehensive cardiac rehabilitation is strongly recommended. Recently, new-generation continuous flow type LVADs such as EVAHEART and DuraHeart have been carried out in a limited group of severe heart failure patients in Japan. In this lecture, I mention following points of rehabilitation for LVAD patients: 1) characteristics of cardiopulmonary exercise testing (CPX); 2) effects of exercise training and trainability; 3) importance of resistance training; 4) new approaches for cognitive decline, swallowing disorder and ADL impairment; and 5) future directions of rehabilitation in new LVAD era.

SY18-301AB-11

CARDIAC REHABILITATION FOR PHYSIATRISTS: CHALLENGES, OPPORTUNITIES AND NEW TECHNOLOGIES

Matthew Bartels
NY Presbyterian Hospital, Columbia Univ., United States

Cardiac rehabilitation is a field where rehabilitation medicine can apply the principles of exercise and mobilization along with the strength of leading multidisciplinary teams to treat the increasingly complex needs of cardiac patients. Even with advances in treatments, cardiac disease is still the number one killer of patients and is a leading cause of disability. This talk will discuss the newest advances in rehabilitation for patients with advanced cardiac disease and will discuss the role of physical medicine and rehabilitation in the care of patients before and after heart transplantation, insertion of left ventricular assist devices (LVAD), and with advanced heart failure. New advances in treatment that decrease length of stay and improve function will be explored, including early mobilization in the ICU, in and outpatient management of LVAD, treatment of advanced heart failure with exercise, post cardiac transplant rehabilitation and consideration of the impact of pulmonary vascular disease and right heart failure. Participants will have an understanding of the range of challenges seen with advanced heart disease and the role of rehabilitation in restoration of function and improving quality of life for patients with severe heart disease and heart failure before and after transplant and LVAD. Brief discussion will also be made the role of physical medicine and rehabilitation in the advancing cutting edge and future technologies such as stem cell treatments and gene therapies.

SY18-301AB-12

PHYSIOLOGICAL ISCHEMIC TRAINING IN REHABILITATION OF ISCHEMIC DISEASES: FROM THEORY TO CLINICAL PRACTICE

Xiao Lu, Jianan Li, Song Lin, Mei Sheng, Jin Gao
The First Affiliated Hospital of Nanjing Medical University, China

Physiological ischemia training means reversible ischemia training of normal skeletal muscles results the collateral formation in remote pathological ischemia organs. Animal research has shown that controlled levels of myocardial ischemia could induce collateral recruitment in ischemia myocardium. However, how to induce the safe and effective myocardial ischemia without eliciting any cardiovascular accidents is still far from clear. Some studies have shown that brief controlled episodes of intermittent peripheral muscular ischemia of the arm or leg can protect against prolonged ischemia occurring in a distant organ. A study by our group showed that ischemic isometric exercise training which induced by electrical stimulation of normal limbs or tourniquet induced ischemia training in normal limb could facilitate collateral formation in remote ischemic limbs or ischemia myocardium of rabbits. Not only in animal studies but also in human studies with patients of coronary artery disease, the results showed that physical ischemia training (PIT) induced by isometric handgrip for one months may facilitate remote collateral recruitment and collateral growth through coronary flow index (CFI) and Single-photon emission computed tomography (SPECT) assessement, respectively.

SY18-302AB-01

THE REHABILITATIVE MANAGEMENT OF CEREBRAL PALSY

Chang-Il Park
Konyang University Hospital, Korea

The definition of cerebral palsy (CP) is a group of permanent disorder of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain. The method of early diagnosis and treatment of CP were reported by many researchers. Diagnostic methods include physical examination, MRI and PET CT. Many assessment tools are used to measure function, spasticity and movement disorders. Managements include physiotherapy, occupational therapy, speech therapy, orthotics, chemical nerve block, orthopedic surgery, neurosurgery and intrathecal baclofen pump. Because CP shows various status, the management method should be selected according to the condition of each patient with CP. The age is one of factors to select management methods. Physical therapy, occupational therapy and orthotics are recommended until the age of 2. Recently some reported the effect of stem cell therapy in infant but this is not popularly used. From 3 years of age nerve block with alcohol or phenol are recommended. Around from 5 year old age, orthopedic operation or neurosurgery may be recommended. Sometimes the patient with CP needs spine surgery to correct deformity of spine. Orally administered medications such as GABA agonist, muscle relaxants and seizure medication are used. The management of CP should be planned according to conditions of patient with CP.

SY18-302AB-02

NEW INNOVATIONS IN PEDIATRIC REHABILITATION

Magrate Turk
SUNY Upstate Medical University, United States

Pediatric rehabilitation encompasses a broad range of childhood-onset disabilities, a knowledge-base of pediatric-specific pathologies and management, and an awareness of developmental progress as it relates to diagnosis and interventions. Strategies have advanced over the years with more attention paid to understanding motor control, use of robotics and functional electrical stimulation (FES), long-term health and functional outcomes for adults with childhood onset disabilities, and the need for an evidence-base for practice. This presentation will review the latest knowledge regarding constraint-induced therapies; use of FES, robotics, and body-weight support to enhance motor progression; programs and promote health and wellness for children and adults with disabilities; and new information about the health of adults with childhood-onset disabilities with increasing use of national registries. Specific information related to outcome measurement tools will also be addressed, specifically in the areas of gross motor function and isolated, selective motor control as measures of outcomes for interventions related to motor performance.

SY18-302AB-03

THE EPIDEMIOLOGICAL CHARACTERISTICS OF CHILDREN WITH CEREBRAL PALSY IN CHINA

Xiaojie Li[1,2], Songpo Yao[3], Qifeng Sun[1,2]
[1]Rehabilitation center for child with cerebral palsy of Heilongjiang province, [2]Rehabilitation medicine college of Jiamusi university, [3]Public health college of Jiamusi university, China

Objection: To define the epidemiological characteristics of 0–6 years old cerebral palsy (CP), including the incidence, prevalence, types and the situation of treatment in China. *Method*: By stratified cluster sampling method and household survey through questionnaires. The range of survey covered 8 provinces and the sample amount was 198,781. *Result*: Preliminary results were the incidence of CP 3.6‰ (0–1 years old) and the prevalence of CP 3.45‰ (0–6 years old). The incidence and the prevalence of CP was difference in the different areas, as the highest incidence of Henan and lowest of Shandong, as well as the highest prevalence of Qinghai and the lowest of Beijing. The percentage of CP types was spastic 52.52%, dyskinetic 11.16%, rigid 2.41%, ataxia 7.22%, hypotonic 13.57% and mixed types 13.13%. 70.19% CP children could be provided the treatment in the local areas but 27.91% could not. 29.23% of CP received treatment in the hospitals, 38.25% in the communities and 32.51% in both hospitals and communities. *Implications*: It was the largest epidemiological investigation and provided the basis for the formulation and implementation of effective control of children with CP in China.

SY18-302AB-04

CURRENT PRINCIPLES AND PRACTICES TO MAXIMIZE FUNCTION IN CHILDREN WITH CEREBRAL PALSY AND SPINAL BIFIDA

Sam Wu
Childrens Specialized Hospital, United States

Cerebral palsy and spina bifida are two of the most common diagnoses that pediatric physiatrists encounter. However, children with both cerebral palsy and spina bifida are less commonly encountered. These children often have functional deficits that are discordant with the level of their spina bifida lesion. Due to these mixed clinical findings, their treatment must be modified accordingly. This presentation discusses the current principles and practices to maximized functions in these children with cerebral palsy and spina bifida. Management options for spasticity, mobility and activities of daily living for these patients are included in the discussion.

SY18-302AB-06

BRIDGING CARE FOR PEOPLE WITH CEREBRAL PALSY: TRANSITIONING CARE FROM CHILDHOOD TO ADULTS

Heakyung Kim
Columbia University, United States

Cerebral palsy (CP) is the most common childhood disability. CP occurs in an estimated 3.9 children per 1000 children. Despite the medical and physical complications in individuals with CP, medical care, rehabilitation and assistive technology will improve life expectancy for those with CP. Approximately 65 to 90% of individuals with CP will live into their adult years. Although CP is traditionally regarded as a childhood condition, it is actually a life-long condition, affecting adults in ways that may be as complex as its impact on children. When transferred from childhood to adulthood care, adults with CP and their families face obstacles in searching for medical, physical and psychological care. The coordination and delivery of care and services for adults with CP need to be multidisciplinary in order to be safe and efficient. This educational course will discuss building a comprehensive transitional patient care center for CP where all ages can access multidisciplinary care, such as setting up a CP registry, providing evidence-based care and education for patients, families and providers.

SY18-302AB-07

THE PROBLEMS WHICH SHOULD BE NOTICED IN REHABILITATION THERAPY OF CEREBRAL PALSY

Nong Xiao
Children's Hospital of Chongqing University of Medical Science, Chongqing, China

Children's rehabilitation therapy for cerebral palsy has been widely carried out in the world. In clinical work, a comprehensive and precise evaluation of patient is necessary in the process of diagnosing, making the therapy plan and assessing curative effect. To distinguish those similar diseases from cerebral palsy can minimize the risk of rehabilitation. To learn how to diagnose and treat cerebral palsy combined with epilepsy is the problem we should specially pay attention to in present rehabilitation therapy of cerebral palsy.

SY18-302AB-08

GENETICALLY TRANSMITTED DISEASES LEADING TO PHYSICAL DISABILITY IN CHILDHOOD

Ajit Kumar Varma
Health Department, Bihar, (Patna Medical College, Patna), India, Head, Dept. of Rehab. Medicine, Patna Medical College, Patna 800004, India

Knowledge of chromosomal aberrations relating to manifestations of childhood disability helps Physiatrists to come over a conclusion in many of these situations. Whenever a child with physical disabilities, mental retardation/facial dysmorphism or with multisystem involvement is encountered in practice, one should always seriously consider karyotyping. It is not possible to mention each and every condition that has got a genetic base, presenting with either physical/mental disabilities, yet it has to be kept in mind while evaluating a child with physical or with multisystem involvement manifesting with disabilities. The severity of these disabilities also depend to a large extent on the pattern of chromosomal involvement. Some disabilities are either physical or may be associated with mental and in some cases may be overlapping. The age of onset of such disabilities are different depending upon chromosomal disorder. Many of them are congenital, that is onset manifests right from birth while some manifest in early childhood and other may be as a late as to appear in adolescent period. While most of the autosomal recessive disorder have early onset period, the autosomal dominant ones have a invariably late onset. Chromosomal anomalies may thus lead to a vast number and varieties of childhood disabilities. Thus genetic analysis and chromosomal study helps to diagnose the reason for childhood physical abnormalities. Not only diagnosis, but also the prognosis of such disorders can be assessed and predicted while planning rehabilitation outcome of such children disabilities.

SY18-302AB-09

DISABILITY AND REHABILITATION IN CHILDREN WITH SPINA BIFIDA

Nobuhiko Haga
The Univ. of Tokyo, Japan

Though the incidence of spina bifida (SB) has decreased in western countries, it has not decreased in Japan and SB is still one of the important diseases in pediatric rehabilitation. Formerly the concept of "selective treatment" was introduced in myelomeningocele (MMC), which is now the main target of treatment. Progression of neurosurgical treatment for MMC and hydrocephalus and urological management led to improved prognosis and recently rehabilitation plays a major role in the team approach for SB. Disability in SB includes those from central nervous system involvement (epilepsy, mental retardation, and cognitive dysfunction), motor and sensory disturbance in the trunk and lower limbs, and bladder/rectal disturbance. Rehabilitation starts in the neonatal period to manage limb deformities and contractures and for gaining motor function, followed by rehabilitation toward standing and walking based on the prediction of future motor function. Though neurosegmental level mostly affects the ambulation, rehabilitation for patients with high-level SB with poor ambulatory prognosis is also important. Rehabilitation specialists who manage SB patients should understand the indication of surgery for tethered spinal cord and orthopedic surgery for limb deformities. Recently prenatal diagnosis of MMC has developed and rehabilitation specialists are expected to join in the explanation for parents. In addition, fetal surgery for MMC has been reported to decrease the incidence of hindbrain herniation and hydrocephalus surgery and improve motor function. This situation may change the concept of rehabilitation approach. Randomized control trial to detect the effectiveness of fetal surgery is in progress in the United States.

SY18-302AB-10

Abstract is missing.

SY18-302AB-11

REHABILITATION CARE FOR THE SPINAL MISALIGNMENT IN CHILDREN BEFORE IT IS TOO LATE

Bong-Ok Kim
Professor and Chairperson, Department of Rehabilitation Medicine, Chungnam National University School of Medicine, Daejeon, Korea

Rehabilitation Medicine has an important and unique role in management of spinal problems in children as we often see patients with congenital muscular torticollis (CMT), congenital scoliosis, meningomyelocele, cerebral palsy, progressive muscular dystrophy, idiopathic juvenile and adolescent scoliosis, etc. Most of the spinal malialignment in children including idiopathic adolescent scoliosis

have been considered as idiopathic for a long time. However, there are cumulated evidences to show more underlying causes which will eventually bring the therapeutic measures into practice aiming possibilities in treatment and prevention from becoming serious musculoskeletal problems in the life ahead. Congenital muscular torticollis is a simple neonatal problem which can be resolved spontaneously with no treatment. But this will also cause cervico-thoracic scoliosis in later childhood if neglected without addressing balance the paracervical muscles. Pelvic malalignment is caused by the various reasons in the lower extremities such as pes planus, leg length discrepancy, abnormal torsional problems in sagittal, transverse and coronal planes of the long bones and joints of the lower extremities. Pelvic malalignment syndrome (PMS) is one of the important causes of the thoraco-lumbar scoliosis in the second decade of life. Therefore, evaluation of biomechanical alignment of lower extremities and spine is critical in the everyday practice in pediatric rehabilitation for early diagnosis of the potential hazard in the growing musculoskeletal system. In this presentation the evaluation and nonsurgical management of congenital muscular torticollis, PMS from various causes and scoliosis of all types including simple stretching or strengthening exercises, shoe modifications, foot and spinal orthoses and appropriate seating systems.

SY18-303AB-01

FUNCTIONAL ELECTRICAL STIMULATION IMPROVES THE WALKING FUNCTION AND ADL OF SUBJECTS WITH EITHER ACUTE OR CHRONIC STROKE

Tiebin Yan, Zhimei Tan, Wenwen Jiang
Sun Yat-sen Memorial Hospital of Zhongshan University, Guangzhou 510120, China

Background and objective: Most stroke survivors have walking deficits. Functional electrical stimulation (FES) has been applying to improve gait deficits after stroke. This study investigated the effectiveness of FES based on a normal gait pattern on improving walking ability and ADL in subjects with ischemic stroke. *Methods*: A total of 101 subjects with first ischemic stroke were recruited. Forty-five were within 3 months (Phase I) and 56 after 3 month (Phase II) post-stroke. Subjects were randomly assigned into the four-channel FES group, four-channel placebo group and a dual-channel group. In Phase I, they were 16,15 and 14 respectively in each group and in Phase II, 27, 14 and 15 (at the rate of 2:1:1), respectively. The electrodes were applied on the four paralyzed muscles of tibialis anterior, quadriceps, biceps femoris, gastrocnemius. The four-channel FES mimics the normal walking pattern, the dual-channel stimulates the ankle dorsiflexion only while no electrical output in the placebo stimulation. Stimulation lasted for 30 min each session, once a day, 5 days a week for 3 weeks. Outcome assessments in Phase I included Fugl-Meyer Assessment (FMA), the Postural Assessment Scale for Stroke Patients (PASS), Berg Balance scale (BBS), Functional Ambulation Category (FAC), and the Modified Barthel index (MBI). Similar assessments were in Phase II except for PASS and FAC but added a gait speed test during a 10-meter walking. All were assessed before treatment, weekly during the 3 week treatment. *Results*: All showed the significant improvement after treatment within group with no significant difference before treatment. After 3 week treatment, the score of FMA, PASS, BBS, FAC, MBI in the four-channel group were significantly improvement than the other two groups in Phase I ($p < 0.05$). In Phase II, the significant increase was also found in FMA, BBS and gait speed after 2 and 3 week treatment between the groups of four channel FES and the other 2 groups ($p < 0.05$). No significant improvements were demonstrated between the placebo and dual-channel group.*Conclusions*: In contrast to the placebo stimulation and conventional dual-channel FES, four-channel FES based on a normal gait pattern significantly improved the balance, walking ability, gait velocity and ADL in subjects with either acute or chronic ischemic stroke.

SY18-303AB-02

SUCCESSFUL ACHIEVING OF EARLY INDEPENDENCE, MOBILITY AND PSYCHIC SUPPORT TO PEOPLE WITH MAJOR BURNS, FROM INFANCY TO ELDERLY

Mario Giraldo-Prieto
University Hospital San Vicente Foundation -HUSVF-, Colombia

Early surgical techniques have decreased the mortality of people who suffered burns; the mean/median Burn surface area (BSA) in death people has increased up to 70 or 87%: it means greater challenges for rehabilitation to higher disability in survivors. A proposal to succeed in Early Rehabilitation since the first day of admission to the emergency room should include at least seven measures: 1. Prevent motor restriction: recognition of risk of profound weakness, major disability and lesser functionality; early techniques for controlling edema, positioning to prevent contractures; alleviating diverse modalities of pain (tissue destruction, limbic, mechanic pain, neuropathic); appropriate exercise prescription according to healing process and related trauma; nurse-physiotherapist coordination to mobilize patients while the sedative analgesia; protective mobilization; early intermittent intensive application of static or dynamic splints; watchful follow up of nerve lesions; prevention of decubitus ulcers. 2. Stimulate early self-care to recover independence by home simulated facility and adaptive orthoses. 3. Protect surgeries by transient stop of segmental mobility. 4. Psychological-social support: understand the narrow connection between the suffering of mind, soul and body; detect higher risk of deranged psychological status or poorer quality of life; self-image; hopes; therapeutic sessions according to psychological development in children; psychiatric support. 5. Education: healing prognosis to family and patient; care of the scars; health available services; resources to regain participation. 6. Timing: precise coordination to set all the measures. 7. Follow up of late skin pathological healing and early use of pressure garments/silicone gel sheets.

SY18-303AB-03

A SURVEY ON THE CURRENT STATUS OF BURN REHABILITATION SERVICES IN CHINA

Jian Chen[1], Wp Cecilia[1], Tsang Li[2], Hong Yan[1], Guangping Liang[1], Jianglin Tan[1], Sisi Yang[1], Jun Wu[1]
[1]Institute of Burn Research, State Key Laboratory of Trauma, Burn and Combined Injury, Chongqing Key Lab for Disease Proteomics, Southwest Hospital, Third Military Medical University, Chongqing 400038, China, [2]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

Background: In China, there is a very long history of burn wound treatment, but the specialized burn care units were built up only from 1958. With more than 50 years of practice, great achievements have been made in burn wound care and surgeries in the country. However, in terms of burn rehabilitation, the development appears to be slow. In order to determine the current status of burn rehabilitation services in China, a survey was conducted targeting various burn centers around the country. *Methods:* A comprehensive survey was conducted and collect data related to (1) the admissions and staffing of the burn centers; (2) availability of rehabilitation services, number and educational background of specialized personnel dedicated in burn rehabilitation therapy; (3) the difficulties leading to the lag of the burn rehabilitation services. The survey was sent to the Chief of 87 burn centers via E-mail. For those who did not respond within one month, a second reminder was sent out. *Results:* A total of 39 (44.8%) burn centers responded to our survey. These centers geographically distribute in nearly 70% of the administrative provinces in China, so the results could well represent the current burn care system. Most centers have recognized the importance of rehabilitation therapy and remarkable improvements of outcome in burn

patients have been achieved. There is a very huge number of burn patients that need rehabilitation therapy, but most centers face the problems of shortage of rehabilitation therapists which apparently could lead to the difficulties in delivering a quality rehabilitation programme for patients. Although the time of rehabilitation therapy is far earlier than before, it is still not widely accepted in acute burn care stage. There are more specialists joining the burn center and become team members of the professional burn team. However, professional education and training in the burn specialty appear minimal. Problems impede the progress of rehabilitation therapy are: lack of rehabilitation knowledge in medical staff as well as the public, the shortage of specialized personnel and relatively low educational background of this team, lack of standard guidelines for rehabilitation treatment instructions, and lack of funding from the government. *Conclusion:* After 20 years of clinical practice, rehabilitation concepts are well accepted and many forms of rehabilitation techniques are carried out in most burn centers who responded to the survey. Yet, the results also indicate that there is a short history of rehabilitation practice among the burn centers. There is a burning need to enhance the development of rehabilitation services so as to meet with the demands of management of severely burn patients in China. Some suggestions are made to improve the current burn rehabilitation services which would include: (1) provide rehabilitation education program to burn surgeons, therapists, nurses, as well as patients, families and the public; (2) set up standard guidelines for clinical instruction of rehabilitation therapy; (3) build an interdisciplinary burn team; (4) more investigation and research on the physical and psychological outcomes of burn patients should be carried out; (5) administrative measures should be implemented in terms of staffing, funding and offering insurance to burn survivors.

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Abstract is missing.

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RECOVERY OF LOCOMOTION AFTER SPINAL CORD INJURY: LUMBAR MICROENVIRONMENT AND ACTIVITY-DEPENDENT PLASTICITY

Michele Basso

Professor and Associate Director, School of Health and Rehabilitation Sciences, The Ohio State University, United States

Spinal cord injury (SCI) results in lasting functional impairments despite neurorehabilitation. At least 3 factors may impede further recovery –type of training, when the intervention is delivered after SCI and severity of neuroinflammation in the cord. Using a murine model of contusive SCI, we examined the interaction of these factors. Specifically, we used manually-assisted treadmill training delivered early or late after SCI while reducing matrix metalloproteinase 9 (MMP-9), an early regulator of inflammation. A timecourse examination of C57BL/6 (WT) mice ($n=23$) 1 week post injury revealed a 4-fold increase in MMP-9 protein by 7 days in the lumbar cord ($p<0.05$). In situ gelatinase zymography localized active MMP-9 in lumbar vasculature. To determine effects on motor relearning, we compared recovery in MMP-9 knock out (KO) and WT mice with SCI divided into 4 training groups acutely: KO + treadmill (TM) training ($n=6$); KO no exercise (No Ex; $n=7$); WT + TM training ($n=8$); and WT No Ex ($n=24$). Acute training occurred 2-9d post SCI. Robust recovery occurred only with TM training plus MMP-9 depletion (BMS: KO+TM=4.08±0.27, WT+TM=1.31±0.31, KO NoEx =2.5±0.67, WT NoEx =1.62±0.43; $p<0.05$). Kinematic and gridwalk improvements outlasted training by 4 wks ($p<0.05$). MMP-9 deletion reduced pro-inflammatory IL-1β over 40% vs WT. Training initiated late after SCI (35-42 d) failed to improve recovery. Together, these findings demonstrate that robust locomotor recovery can be achieved after SCI if task specific training is initiated early under conditions of attenuated local inflammation.

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GLIAL CELL TRANSPLANTATION-MEDIATED AXONAL REGENERATION AFTER SPINAL CORD INJURY

Xiao-Ming Xu

Spinal Cord and Brain Injury Research Group, Indiana University School of Medicine, United States

Oligodendrocyte (OL) replacement can be a promising strategy for spinal cord injury (SCI) repair. However, the poor post-transplantation survival and inhibitory properties to axonal regeneration are two major challenges which limit their use as donor cells for repair of CNS injuries. Therefore, strategies aimed at enhancing the survival of grafted oligodendrocytes as well as reducing their inhibitory properties, such as the use of more permissive oligodendrocyte progenitor cells (OPCs), also called glial restricted precursor cells (GRPs), should be highly prioritized. Schwann cells (SCs) transplantation is a promising translational strategy to promote axonal regeneration after CNS injuries, partly due to their expression and secretion of multiple growth-promoting factors. Whether grafted SCs have any effect on the biological properties of grafted GRPs remains unclear. Here we report that either SCs or SC conditioned medium (SCM) promoted the survival, proliferation, and migration of GRPs *in vitro*. When GRPs and SCs were co-grafted into the normal or injured spinal cord, robust survival, proliferation, and migration of grafted GRPs were observed. Importantly, grafted GRPs differentiated into mature oligodendrocytes and formed new myelin on axons caudal to the injury. Finally, co-grafts of GRPs and SCs promoted recovery of function following SCI. We conclude that co-transplantation of GRPs and SCs, the only two kinds of myelin forming cells in the nervous system, act complementarily and synergistically to promote greater anatomical and functional recovery after SCI than when either cell type is used alone.

SY18-303AB-08

THE NORTH AMERICAN EXPERIENCE WITH STEM CELL TRANSPLANTATION TO TREAT MULTIPLE SCLEROSIS

George Kraft

The University of Washington, United States

Multiple sclerosis (MS) is known to be an immune mediated disease. The current hypothesis explaining the development of MS is as follows: During development of the human immune system, the encounter of a foreign antigen will program the generation of protective antibodies to that antigen if encountered later in life. In persons with a predisposing HLA system, the later encounter of a particular antigen may program an immunogenic attack on that antigen--as well as a similar antigenic "mimicker" in the central nervous system (CNS). No specific antigen has been identified in all patients with MS, making it most likely that different antigens are responsible for programing this antigenic attack on the CNS in persons with different HLA genetic patterns. Thus, the only effective approach to treatment of MS continues to be medications that alter the immune system–so-called disease modifying treatments (or DMTs)–blocking the attack on the CNS mimicker. Research has shown that the more the immune system can be suppressed, the greater the therapeutic benefit on MS. However, with greater immune suppression, the greater the danger of life-threatening side effects; an immunocompromised patient runs the risk of illness or death from a variety of causes.Consequently, in the late 1990s, we considered ways to profoundly suppress the human immune system without producing permanent, severe immunocompromisation. The solution to this dilemma was discovered by Seattle scientists who developed a technique to efficiently harvest and cryopreserve large numbers of hematopoietic blood stem cells

from patients with MS. Once this could be done, we were able to attempt to eradicate patients' immune systems with high doses of chemotherapy, radiation therapy, and immunotherapy (using antithymocytic globulin [ATG]). Ultimately, in further research, we modified this treatment protocol by eliminating radiation therapy and modifying the chemotherapeutic regimen. Since 1998 we have treated over 50 MS patients using these evolving HDIT/HSCT protocols. Subjects have been followed for as long as 12 years. We discovered that the protocol that eliminated radiation therapy and used the modified form of chemotherapy was better tolerated and did not reduce the efficacy of the treatment. Also, we identified that those patients with active inflammatory disease activity, who were early in their disease course, responded best to this treatment. We have found that patients with early, active inflammatory MS respond very well to the HDIT/HSCT treatment, and can be completely disease activity-free, and on no DMTs, for 3 to 4 years or more.

SY18-303AB-09

EXERCISE STIMULATES NEURAL CELLS MIGRATION OF NEUROPROTECTIVE EFFECTS AGAINST ISCHEMIA-REPERFUSION INJURY IN A2A ADENOSINE RECEPTOR KNOCKOUT MICE

Xiang Chen

The Second Affiliated Hospital, Wenzhou Medical College, Wenzhou, China

Objective: To investigate the effects of treadmill exercise and A2AR knock out on the activation of astroglial and microglia in subventricular zone (SVZ) on transient focal cerebral ischemia reperfusion injury in mice. *Methods:* The experiment included in vivo and in vitro. In vivo, the transient focal cerebral ischemia reperfusion model in mice was established with insertion of thread embolish into middle cerebral artery (MCAO). Both A2Areceptor knockout (A2AR (-/-), KO) and wild type (A2AR (+/+), WT) were divided into control group (Sham group, S) and model group (MCAO group, M) and treadmill exercise group (treadmill exercise for 7 days and 14 days,T7d and T14d). Neurological behavior was assessed on mice. One mouse of each group was stained with 2,3,5-triphenyl tetrazolium cholrid (TTC) to observe the infarct volumes. Six mice of each group were observes by HE, Nissl staining and the expression of glial fibrillary acidic protein(GFAP), ionized calcium binding adaptor molecule 1 (Iba1) by immunofluorescence (IF) and were to observe astrocyte and microglia under laser confocal scan microscopy (LCSM). In vitro, microglia was purchased and cultured after transferring 3-5 generation to 60–70%. Microglia oxygen glucose deprivation/reperfusion model (OGD/R) was established. OGD/R microglia were divided into deprivation oxygen and glucose groups in 4 h, 8 h, 12 h (OGD), then reperfusion group (M), antagonists SCH58261 group (MS) and control group (C), respectively; Microglia vitality was assayed by MMT. Microglia were labeled with IBA-1 after cell climbing and the expressions of adenosine A2AR mRNA and TNF-α mRNA were measured by realtime PCR. *Results:* In vivo, the mice MCAO model was established successfully. The neurological behavior scores in M group at 7d were lower than ones in 1d and 3d after reperfusion ($p<0.05$); in M3d groups were lower than in M1d group after reperfusion($p<0.05$); in treadmill exercise groups for 7d and 14d were lower than in control group ($p<0.01$); in groups of KO or MKO with treadmill exercise for 7 days were lower than WT group or MWT group ($p<0.01$, $p<0.05$), respectively. TTC stain of brain slices showed S group had no white infarct lesions; All of mice of M groups had white infract lesion located subcortex of parietal and frontal and temporal lobe and caudate nucleus; The infarct lesions of MKO7d group and MWT7d group were decreased compared to ones of M1d and M3d group in same genotypes; the infarct lesions located in cortex of T7d group were decreased compared to group M; there were no infarct lesions in T14d group. The nerve cells in ischemic penumbra which were some degree of degeneration and losing, with obvious cytoplasm edema and pyknosis and vacuolization in model groups. The number of Nissl's body in the infarction and ischemic penumbra of groups were loosed and arranged in sparse with dissolution and vacuolization. Astrocyte activation in M groups was observed by GFAP expression of mice brain slices. There were more masculine expression of GFAP in model groups. The expression of GFAP in SVZ was enhanced in 1d, 3d in MKO groups and MWT groups, especially in 7d. There were no significant differences between two genotype groups in 1d and 3d. The GFAP expression in MWT7d group was more than in MKO7d group ($p<0.01$); in T7d and T14d groups were lower than control group ($p<0.01$); in T14d group was lower than T7d group ($p<0.01$); in T7d and T14d groups of KO were lower than in group of WT ($p<0.01$). Microglia in SVZ of S groups was in "resting" state and was amoeboid appearance. The expression of IBA1 in SVZ was significantly enhanced in 3d, 7d in MKO groups compared to one in MWT groups ($p<0.05$). There was negative linear correlation between the expressions of GFAP in SVZ in mice and neurological behavior scores ($r=-0.621$, $p<0.01$). In vitro, microglia in group O was activated with synaptic recoil, cells rounding, bigger, and becoming an amoeba-like, spatially in group O8h; cell in group O24h was in fuzzy, cell swelling, edema, different degrees of nuclear hyperchromatism, nuclear collapse. Not obvious changes were observed in group M. Microglia vitality in group O has a significantly difference in compared to group C ($p<0.01$), and has not significantly difference between group M and group C ($p>0.05$). IBA-1 in the microglia cytoplasm is red and clearly shows cellular morphology under fluorescent microscope. However, it can not distinguish the activated microglia from the resting microglia after OGD/R. A2AR mRNA expression is significantly different between group M and group C ($p<0.01$, $p<0.05$); A2AR mRNA expression in group M4h, M8h is increased, and reduced in group M12h; there is not significantly difference between group MC and group MS ($p>0.05$). The expression of TNF-α mRNA in group M is significantly increased in compared with group C ($p<0.01$, $p<0.05$), especially most obvious increased in group M8 ($p<0.01$). TNF-α mRNA in group MS is significantly less than in group MC ($p<0.01$). *Conclusion:* 1. Treadmill exercise is helpful in improving injured animal neurological behavior in early stage by inhibition of glial activation in SVZ of MCAO mice.2. A2AR knock out and A2AR antagonists SCH58261 are also helpful in improving injured neurological behavior by inhibition of glial activation in SVZ of MCAO mice. The neuroprotective mechanism of treadmill exercise and A2AR knock out and A2AR antagonists SCH58261 may be related with down expression of TNF-α mRNA from inhibition of glial activation in SVZ of MCAO mice.

SY18-303AB-10

RECOVERY NEUROBIOLOGY FOR SCI: INSIGHT GLEANED FROM STEM CELL-BASED MULTIMODAL STUDIES

Yang (Ted) D Teng

[1]Departments of Neurosurgery and Physical Medicine & Rehabilitation, Harvard Medical School/BWH/SRH, United States, [2]Division of SCI Research, Veterans Affairs Boston Healthcare System, United States

Emerging evidence suggests that neural stem cells (NSCs) may repair the CNS through multimechanistic strategies that are often concurrent [1]. They may serve not only as tissue engineering mediators, but also as vectors for the delivery of molecules [2]. Buoyed by tangible results derived from a study in which retrievable drug-releasing polymer seeded with human NSCs (hNSCs) was applied for both investigative and therapeutic purposes, I will first discuss that how a polymer based retrievable implant containing hNSCs may hold significant promise for providing unique insight regarding essential neurological mechanisms required for repairing the adult mammalian spinal cord after injury. Data elucidating molecular events underlying rapid loss of donor cells in acutely injured spinal cord will be presented with counteracting

strategies proved effective in a rat model of dual penetrating SCI using a retrievable design of scaffold seeded with hNSCs that was shielded by drug-releasing polymer [3]. Additionally, outcomes obtained by applying stem cell approaches will be analyzed for understanding the critical pathology of motor neuron diseases [4] and role of distal spinal cord adaptation in the process of invoking neuroplasticity for post-SCI recovery. Our findings may help formulate therapeutic tactics for enhancing clinically meaningful functional rehabilitation following SCI.

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SY18-305-01

PHYSICAL MEDICINE AND REHABILITATION IN THE ARAB WORLD

Mohammed Hisham Tenbakji
Pan-Arab Association of PM&R, SAPMR, Syrian Association of PM&R

Introduction: Total populations of more than 360 millions are in the Arab World. The prevalence of disability is accepted by WHO around 10%. Physical medicine & rehabilitation (physiatry) is an independent medical specialty responsible for the prevention, diagnosis, treatments and directing rehabilitation plan of people with disabling medical conditions that provides the best possible outcomes focusing on functional ability and quality of life, across all ages. *Objective*: To define and explore the scope of practice of PM&R in the Arab World. *Methods*: Survey of PM&R Societies, PM&R Boards, curriculum of PM&R training programs, medical schools, in addition to Internet searches, and interviews with experts. *Results*: The Arab countries even that they speak the same language but are dissimilar in terms of climate, government, and the scope of practice of PM&R. Physiatrists have started practicing in Arab countries around the end quarter of the twentieth century. However many countries have professional organizations, few have PM&R training programs, National PM&R Boards, with hundreds of practicing physiatrists in the field. However the 360 million inhabitants of Arab World including approximately 36 million persons with disability are in need for more specialized rehabilitation services. However on some countries the practice of PM&R has not been well defined. *Conclusions*: There is variability among Arab countries regarding the scope of practice. However there is small number of practicing physiatrists and an inadequate representation in many countries across the Arab World.

SY18-305-02

REHABILITATION IN JORDAN

Khalil Alabbadi
Physical Medicine and Rehabilitation in Jordan

Jordan's population is around 6.5 million; disability forms 5% of the population. The main causes of disability are: trauma, diseases, congenital & heredity causes, and elderly problems. Accordingly the Jordan government and the local society paid more attention to improve rehabilitation services and facilities on the country for disabled persons. National strategies were set to help the disabled subjects by annulment of the welfare law for these people, development of the law on the rights with persons with disabilities, and the creation of the higher council for affairs of disabled people. Therefore, the rehabilitation services in Jordan have been developed in the last twenty years; specially by different members of a disciplinary team. This team involves well trained physicians as specialists in the physical medicine and rehabilitation field under the umbrella of Jordan medical council. In addition to the paramedical staff in field of rehabilitation (PT, OT, OP, and speech therapists) embraced under the school of health and rehabilitation. Moreover, medical rehabilitation centres in the big hospitals played a crucial role in the development of the rehabilitation services in Jordan in different regions of the country; middle, north, and south parts of Jordan. Furthermore, Jordan has developed and provided CBR at the rural areas of the country.

SY18-305-03

PHYSICAL MEDICINE AND DISABILITY STATUS IN LEBANON

Turk Nour-M
Former Vice president of the Arab League, Former president of the Lebanese Society of PM&R, Former vice president of the Lebanese society of O&P, Active participation and contracts with national and International NGOs (WHO, UNRWA, WRF, ICRC. CRC, etc.), Physical Medicine and Rehabilitation (Spain) and O&P Meister (ISPO I) Germany, Physical medicine and disability status in Lebanon

Lebanon a country of 3 million people, around a dozen of universities and a zero number of physical medicine academic schools. 90,000 officially labeled handicapped, counts on a couple of dozens of physiatrists (graduated from important and other universities of the four continents). Disabilities in Lebanon were considered as a national issue in 1995 within the Right and Access program involving most of the Physiatrists in the country as a part of the medical team. The great number of disabilities in Lebanon statistically due to (traumatism, congenital, hereditary, vascular reasons etc.) were a base of new concepts in Lebanon to reconsider, such as Down syndrome appear in children of young mothers, Personal landmines traumatize mainly the left TT, etc. Although there are a lack of professionals doctors, but there are on the other hand a sufficient number of paramedical (O&P, therapists etc.). This dilemma (lack of interest in physiatrists) is not only reflected academically, but also at the level of legal organizers in the country, where hospitals, national and international NGOs, Military medical institutions of hundreds of beds showed only interest in poor number of paramedical and symbolic presence of physiatrists, creating a severe pathological situation in the (post op of) total hip replacement patients, geriatric amputees, CVA patients, etc.

SY18-305-04

AN OVER VIEW OF DISABILITY NEEDS OF THE ARAB DISABLED POPULATION AND HOW COLLABORATIVE WORK COULD CONTRIBUTE TO EFFECTIVE REHABILITATION

Firas Sarhan
Address is missing

This paper examines the health services provided to the disabled population (especially those with physical disability i.e. spinal cord injury) in Arab countries and examining the latest legislations to protect the rights of disabled people within the Arab world. The paper reviews issues related to healthcare and social care services available examining the patient–provider relationship barriers that often influence access and compliance with the care provided or recommended to reintegrate within the society and becoming an effective member at a societal level. The literature reviews conducted indicated that the health systems in the region need to acknowledge the specific needs of disabled people and address their needs in a organised and structured holistic approach which need to be impeded within the Arab world government national programmes in order to raise awareness re the need of disabled people. The purpose of this paper is to outline the needs of physically disabled individuals and outline the describe the barriers facing their access to car and re integration in society. It is important to note that access to health care for dependent physically disabled people in the Arab region is an area where there is lack of and gaps in the available data to clearly identify the needs and services available for these

individuals. The literature review outlined that governments in the Arab region need to acknowledge the specific needs of disabled individuals and centrally target the needs of these groups in national health inequalities programmes. Specific treatment guidelines need to be developed where needed. Raising awareness the health needs of such groups is a crucial measure that ought to be undertaken in close collaboration with users' groups, civil society organizations and the media.

SY18-305-05

DISABILITY SITUATIONS, AN ORIGINAL CONCEPT CONNECTING DISEASE, DISABILITY AND REHABILITATION FOR ASSESS AND MANAGE DISABLED PERSONS

Claude Hamonet[1], Jean-Michel Gracies[2]

[1]Department of Medicine, University Paris-East, 94010 Creteil, France, [2]Department of Rehabilitation Medicine, University Paris-East 94010 Creteil, France

Introduction: The debate on the definition of disability has been going round in circles for a long time. The lack of clear conceptualization, induced simplifications, misunderstandings and misinterpretations. The consequences are: the lack of reliable tools affects the assessment of disabled people needs and the correct measurement of effects of Rehabilitation. The WHO biomedical propositions (CIDIH I, CIDIH II, and, since 2001, ICF) initiated by P.H.N. Wood (1980) are useless tools for diagnose, defining and assessing disability. The use of inaccurate and ambivalent terms as "activities" adds to the already great confusion on a subject specifically requiring accurate words. *Material and methods*: The concept of situations of disability is a new look for society and PRM. Disability Identification and Measurement System (DIMS) is an ergonomic and anthropologic approach of disability and an international proposal for the quantified identification of Disabilities with three levels: *The body*: this level encompasses all the biological aspects of the human body in terms of its morphological, anatomical, histological, physiological and genetic aspects. *Aptitudes & Capacities*: this level comprises the physical and mental functions of the human body, Life Situations: This level addresses the confrontation (concrete or not) where a person is faced with the reality of the physical, social and cultural environment. *Subjectivity*: This level addresses the person's point of view regarding his/her health status and social position and includes their personal life history. *Severity scale (dependence):* 0 No hardship. 1 Hardship in a functional or situational realization. 2 Limitation in the realization, including usage of a medication, a technical (including animal) functional, situational. 3 A human aid is partially necessary. 4 The function or the tasks is impossible or must be totally compensated by other person. *Discussion:* Consequences for PMR practice: a best identification of disability, a method for identify the needs of the individual, a method to choose the best rehabilitation solution: technical aid, human aid, physiotherapy, occupational therapy, introduction of the human factor in Rehabilitation (subjectivity). *Conclusion*:There are two pillars in Rehabilitation: subjectivity and environment (situations). "A disabled person is not a disabled one, but a person in a disabling situation."

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Key words: disability, dependence, rehabilitation, assessment, inclusion.

SY18-305-06

PAIN ASSESSMENT IN CHILDREN WITH CEREBRAL PALSY

Zohra Ben Salah Frih[1,2], Soumaya Boudokhane[1], Anis Jellad[1]

[1]Department of PRM, CHU Monastir; Faculty of Medicine, University of Monastir-Tunisia, [2]Tunisian Association of PRM (SOTUMER)

The literature describes serious sequelae of pain in children with CP, ranging from impairments in body functions and structures, to limitations in activities and restrictions in participation. Furthermore, these issues negatively impact their caregivers. As pain is multifaceted, there are many attributes of pain to assess in children with CP. First, clinicians must determine exactly what information is desired from assessment or measurement: pain presence, intensity, frequency, or interference on function. Assessing and managing acute and chronic pain in children with cerebral palsy can present challenges for health-care providers. Often, such children are non communicative, which can make it difficult to pinpoint the source and intensity of their pain. Regardless of the purpose of the measure, self-report is considered the gold standard for pain assessment due to pain's subjective and individual nature. This is particularly challenging with children who are non communicative; thus, there are times when parent proxy-report is necessary. The literature found that parents follow a systematic process when assessing their child's pain: recognizing subtle cues, systematically identifying the presence and potential causes of pain based on context, and instinctively knowing. Aside from parent observation, there have been numerous outcome measures developed to measure aspects of pain in children with CP. The literature offers several outcome measures to identify pain in this population; however, better clinical tools are needed to evaluate change in these symptoms with intervention. Most importantly, further research is required to evaluate effective intervention options in the management of pain in children with CP.

SY18-305-07

FUNCTIONAL ASSESSMENT OF RHEUMATOID HAND: PRESENTATION OF AN ARABIC INDEX

Mohamad Guermazi, Sofiane Ghorbal

Address is missing

Purpose: To develop a rheumatoid hand disability scale in the Arabic language adapted for local socio-cultural specificities and to test its psychometric properties. *Methods*: The choice of hand activities was based on several published indices. The selected items were translated by the forward and backward translation procedures, several modifications were made, and after some questions were added, a provisional scale was obtained. In- and outpatients with rheumatoid arthritis (RA) according to the ACR criteria were chosen to answer the provisional scale and to assess the final scale. Impairment outcome measures (pain as measured on a visual analogue scale, morning stiffness, hand swelling, tenderness), and assessment of disability (on Lee's and Revel's functional indices) were also recorded. The intra class correlation coefficient and the Bland and Altman methods were used to assess reliability. Construct (convergent and divergent) validity was investigated with use of Spearman's rank correlation, and a factor analysis was performed. *Results*: The provisional scale had 21 questions. The adaptation process left 10 questions about hand activity, with four levels of answers. Eighty patients with RA were recruited for the validation of the final scale. The intra- and inter-rater reliabilities of the scale were 0.96 and 0.94, respectively. Analysis by the Bland and Altman method showed no system-

atic trend. The scale had good construct validity, with expected convergence with Lee's functional index (r(s)=0.79) and Revel's functional index (r(s)=0.81) and divergence with age (r(s)=0.05), morning stiffness (r(s)=0.40), pain (r(s)=0.32), and tenderness (r(s)= –0.48). The factorial structure of the scale was satisfying, with two factors explaining 73% of the variance. *Conclusion*: We developed an Arabic index that assesses hand disability due to RA and suits Tunisian people. Further studies are needed to confirm the validity of the scale in other Arabic countries.

SY18-305-08

COMPLICATIONS OF JOINT REPLACEMENT, WHAT PHYSIATRIST SHOULD KNOW BEFORE STARTING REHABILITATION?

Hassan Elshahaly
Physical Medicine, Rheumatology and Rehabilitation, Suez Canal University

Hip arthroplasty techniques have progressed dramatically during the past 30 years, providing valuable data for development of joint replacements for other areas (1). Today, implants are used most commonly for joint replacement of the hip and knee (2, 3). Joint arthroplasty procedures also are performed commonly, however, on the shoulder, elbow, ankle, hand and wrist, and foot (1, 4). The goals of joint replacement arthroplasty are to relieve pain and improve function and quality of life (1, 3). This presentation will focus on postoperative complications associated with joint implants. Clinical and imaging data are presented. Among the complications are poor extensor mechanism, Deep Infection, loosening, instability, fracture, osteolysis and wear of polyethylene. Physiatrists play an important role in pre- and Postoperative assessment of patients selected for joint replacement procedures. It is critical that the extent of complications in post arthroplasty period (in the first 90 days) is determining the plans of rehabilitation designed by the physiatrist and affecting the outcome of the rehabilitation process.

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SY18-305-09

EXTRA-CORPORIAL SHOCK WAVE THERAPY IN MUSCULOSKELETAL DISORDERS (REVIEW)

Tarek Shafshak
Physical Medicine, Rheumatology & Rehabilitation, Faculty of Medicine, Alexandria University, Egypt

Extra-corporial Shock wave (ECSW) is high-energy acoustic waves. It can be produced by different technologies. The best technology is that which produces ECSW that has very little negative pressure, with subsequent no tissue damage (e.g. electrohydraulic technology). The main physiological effect of ECSW is stimulation of tissue healing. The release of energy, cell compression and tension are thought to stimulate tissue healing through: Stimulation of neovascularization and growth factors which leads to an increase in the blood supply to the treated area. Stimulation of fibroblasts and osteoblasts to rebuild injured tissues. Facilitation of resorption of calcifications at tendons & ligaments. Stimulation of migration and/or differentiation of stem cells. ECSW has been proven effective in treating calcific tendinitis of the shoulder, planter fasciitis, Achilis tendinitis, adductor tendinitis, jumper's knee, Tennis elbow, Golfer's elbow, anserine bursitis, peroneal tendon syndrome and Osgood-Schlatter disease. Also, it may be successful in treating patients with early stage of avascular bone necrosis and ostechondritis dissecans. In addition, it has been proven effective in stimulating bone union in patients with delayed union and non-union of bones (60–80% of cases). For each disorder, a specific number of pulses (1000–4000 shocks/session) are given at a specific frequency range (3–5 Hz) and a specific energy levels. For stimulation of bone healing, patients usually receive a total of 1–3 sessions given as one session/12 weeks. In other disorders, 1–3 sessions are given (rarely up to 6 sessions) scheduled as one session every 1–6 weeks.

SY18-305-10

BALNEO CLIMATE THERAPY IN ZARA THERAPY CENTER DEAD SEA-JORDAN

Mohammad Kana'an
Specialist in Physical Medicine Resort medicine and Rehabilitation

The Dead Sea is one of the unique global places for Balneo Climate-therapy, it has the following properties: The lowest point on the Earth 400 m below sea level. The saltiest lake all over the world, with average salinity 280 g/l. Low humidity. Warm climate. 332 sunny days in the year. Naturally filtered ultraviolet radiation. High oxygen level and rich in bromine, magnesium and other minerals in the atmosphere over the Dead Sea. Climate-Therapy at the Dead Sea using the available natural curative factors has shown encouraging results mainly for patients with the following: Skin: diseases-Psoriasis, Neurodermitis, Vitiligo, Acne and others. Cardiovascular diseases: Hypertension, Atherosclerosis. Respiratory problems: Asthma, Mucoviscidosis, Chronic bronchitis. Eye: problems-Uveitis. Joint: problems-Psoriatic arthritis, Osteoarthritis, Ankylosing spondylitis, Rheumatoid arthritis. Psychological and Neurological: problems-Winter depression syndrome and Parkinson syndrome. The Balneo Climate-Therapy in the Dead Sea is a Natural, Safe and Gentle Therapy. It is LESS expensive and has Minimal Side effects compared to other treatment modalities.

SY18-305-11

OPTIMIZATION OF LOWER LIMB ORTHOSES FOR POST-POLIO SURVIVORS

A. Esquenazi
MossRehab Gait & Motion Analysis Laboratory, Philadelphia PA

Poliomyelitis affected tens of thousands of children and adults until the mid-1950s. The infection of the brain and the spinal cord by the polio-virus is associated with death of motor neurons, loss of inervation to muscle fibers, muscle weakness and atrophy. Over the last 2 decades, a large number of polio survivors have developed new slowly progressive muscle weakness years after maximal recovery from the paralytic form of the disease was evident. These symptoms have been termed "post-polio syndrome" (PPS). Published studies indicate that PPS occurs in approximately 30% to 60% of those patients that were affected by the polio-virus, after an average of four decades. PPS complaints can be summarized in three major categories and are presented in order of importance: Increased weakness, fatigue and new pain. Fatigue and increased weakness are most frequently the result of muscle overuse of stronger muscles to compensate for the weaker ones. Pain can be linked to tendonitis and/or bursitis from chronic overuse and muscle strain of the affected and compensatory muscles. Cornil and Lepine in 1875 eloquently described the presentation of these problems by reporting the case of a 27-year-old man who had poliomyelitis as an infant. Although both lower limbs were affected, the patient completely recovered. As a soldier during the Franco-Prussian war, this man was subjected to prolonged

marches and overexertion, and his legs became weak. The weakness progressed, and 8 months later, the left leg became weak and muscle atrophy was evident in both legs. Several years later, weakness and atrophy developed in both arms. Currently acute treatment for this type of pain consists of rest, ice and stretching. Oral and intra-articular anti-inflammatory medications should be sparingly used. Work simplification and altering the weight bearing mechanism of the joints and reducing muscle activation through the use of braces and walking aids produces long term improvement. Ankle foot orthosis (AFO) or knee ankle foot orthosis (KAFO) are the types of braces most frequently utilized. The braces should be as light as possible and have optimal mechanical alignment to work appropriately. Polypropylene, other thermo-plastics and carbon graphite in combination with light metal or plastic joints are available to achieve this goal. In the post-polio population the loss of some of the normal biomechanics of gait, such as the lack of knee flexion in early or late stance when using a locked knee brace or the inability to smoothly transfer weight from the heel to forefoot in stance phase when using a limited motion ankle/foot orthosis will result in decreased energy efficiency. *Gait Analysis*: Informal visual analysis of gait, is routinely done by clinicians for the purpose of performing dynamic alignment of orthoses. This type of analysis does not provide quantitative information and has many limitations due to the speed and complexity of human locomotion and further complicated by the gait deviations and compensations present in the walking pattern of the individuals who use these devices. Orthotic alignment can be achieved through changes in the geometrical relationship of the different orthotic components. Theoretically, each orthotic section should provide for multi planar adjustment capabilities. The reality is different, and in the Ankle Foot Orthosis only foot plantar/dorsi flexion can be adjusted if the device has an adjustable ankle joint. Foot inversion/eversion is determined at the time of fabrication and can not be changed. For the subject that uses a Knee Ankle Foot Orthosis knee angulation can be adjusted in addition to the foot posture. When possible optimal orthotic alignment should be closely established before the fabrication takes place as inappropriate component selection may result in increased overall orthotic weight and cost. Previously published studies by us and others have shown orthotic alignment does affect muscle activation patterns, and show agreement between the biomechanically predicted changes in muscular activity. For example in the case of limited (–5º) dorsiflexion, the ensemble average EMG profile of the soleus muscle showed its phasic activity was reduced (as predicted) as compared to the control data set without motion restraint. This presentation will review the different biomechanical principles used to optimize brace prescription and its alignment.

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SY18-305-12

WFOT GLOBAL HEALTH INITIATIVES WITH EMPHASIS ON PHYSICAL MEDICINE AND REHAB, NEUROREHABILITATION, PSYCHIATRY, AND SERVICES FOR PEOPLE WITH NON COMMUNICABLE DISEASES

E Sharon Brintnell

World Federation of Occupational Therapists (WFOT), Australia

Objective: To provide an overview of the WFOT 's global health initiatives; inform on emerging areas of practice; present examples including inter-professional collaborations with specialty areas of physical medicine and rehabilitation, psychiatry, neurology and services for those with non-communicable diseases (NCDs). *Method:* Key occupation-based perspectives from regional therapists and others will be presented. Audience inclusion will be invited. *Results:* Outcomes from these perspectives will serve to inform program developers and policy makers. Practitioners will be offered an opportunity to stimulate their learning and explore new ideas through promoted discussion. Educators and researchers will be encouraged by developments and the thought of exploring within their local contexts. Evidence of the impact of occupational therapy services will enhance the presentation. *Implications/Impact on Rehabilitation*: Occupational therapists (OTs) bring skill and knowledge to preserve independence and function while living with the results of acquired disability. OTs work to enhance life through enabling participation and meaningful occupations in the contexts of family, work and community. Early intervention ensures optimal outcomes in performance of more complex, integrated tasks and activities.

SY18-305-13

LIVING WITH ACQUIRED DISABILITY: OCCUPATIONAL THERAPY ENABLES COMMUNITY PARTICIPATION

Kit Sinclair

World Federation of Occupational Therapists, Hong Kong, China

Participation is defined in the International Classification of Functioning, Disability and Health (ICF) (WHO, 2001) as 'involvement in life situations', placing emphasis on engagement in daily activities (occupations) as a determinant of health. Research in motor learning has demonstrated that structural, component based improvements do not always translate into functional outcomes. As noted in the ICF, the biological body is not the sole determinant of disability. Social, institutional and physical environments play a large role in determining an individual's performance and level of participation. The emphasis is on participation, as well as recognition of contextual factors which act as barriers to or facilitators of occupational performance. Occupational therapists consider occupational performance and participation in life situations as our primary focus for intervention. This means determining occupational priorities first and assessing limitations in client factors later. Occupational evaluation, including function (purpose of the occupation) and form (demands of a task in the environmental context). Case examples of evidence-based practice including assessment and intervention will be used to demonstrate conventional and innovative occupational therapy approaches to community transition and participation for persons with acquired disabilities.

SY18-305-14

OCCUPATIONAL THERAPY WORKPLACE INTERVENTIONS FOR INJURED WORKERS

Marilyn Pattison
Managing Principal, MPOT Pty Ltd, WFOT Executive Director

A disability is a condition caused by an accident, trauma, genetics or disease which may limit a person's mobility, hearing, vision, speech or mental function. A handicap is a physical or attitudinal constraint that is imposed upon a person, regardless of whether that person has a disability. Workplace injury, disability and handicap are not synonymous so the question is - are we handicapping our workforce? Keeping our workforce illness and injury free is of paramount importance and of course must be supported by sound injury prevention strategies – however whilst workers may have no obvious symptoms they can still be vulnerable to illness or injury. This session will discuss an integrated systems approach to maintaining a fit, healthy and productive workforce using the illness – wellness continuum to design strategies and programmes that can be implemented across a range of work areas including: • Reintegrating workers into the workforce following injury or illness. • Providing a safe work environment. Marilyn Pattison has been working with industry since 1983 both as an allied health practitioner and manager. Her company – MPOT Pty Ltd – has been a finalist in the South Australian Workcover Recovery and Return to Work Awards in 2008, 2009 and 2010. Marilyn is also the Executive Director of the World Federation of Occupational Therapists (WFOT) and has held this position since 2002.

SY18-305-15

EDUCATION AND CONTINUOUS PROFESSIONAL DEVELOPMENT FOR PRM IN ITALY

Stefano Negrini
University of Brescia - IRCCS Don Gnocchi Milan, Italy

Continuous Professional Development is a main task for all professionals, particularly in the medical field. In Italy the Health Ministry established a point systems of Continuous Medical Education (CME) analogous to that of most of the European Countries. Each health professional is engaged in obtaining these points to maintain the professional accreditation, even if there are not yet real. The main actors of this CME system are Universities, Scientific Journals and private initiatives. In this presentation we will focus on two initiatives of the Italian Society of Physical and Rehabilitation Medicine (SIMFER): the European Journal of Physical and Rehabilitation Medicine (EJPRM) and the web-based SIMFER-CME system under development. The EJPRM faced in the last years a big growth, and its standard increased accordingly. Today ranks among the best PRM Journals. A CME system has been developed, with questions on the papers coming from the Special Sections of the journal, that are published in every issue and related specific educational topic with reviews proposed by highly reputed authors. The web-based SIMFER-CME system is under development: it will include specific lessons by some of the most known physiatrists in Italy, together with contributions from abroad. The system will automatically propose the verification questionnaires, and accordingly the required CME in accordance with the Italian Law.

SY18-305-16

ROUTES FOR RESEARCH IN PMR IN ITALY

Vincenzo Maria Saraceni, Maria Gabriella Ceravolo
Address is missing

Research in Rehabilitation Medicine in Italy, after having successfully demonstrated its ability to recover, in the context of evidence-based medicine (EBM), from its former backwardness compared to the more traditional biomedical disciplines, is starting out, with the confidence of soon being able to take on an anticipatory role, towards a qualitative type of research focused on the specificity of the individual with a disability from the perspective of a bio-psycho-social health model. Moreover, the obvious need to study human behaviour rather than biological parameters, with the associated need to identify concrete and specific actions aimed at overcoming functional deficits, should guide rehabilitation medicine mainly in the direction of the study of individual cases instead of making comparisons between groups, as this latter approach does not make it possible to understand the quality of recovery of the individual patient. In this context, the need to specify the proposed rehabilitation is strongly affirmed, firstly demonstrating its consistency with the theory taken as a reference, and secondly, that the result was obtained in accordance with outcomes specific to our discipline. Thus, rehabilitative exercise can assume not only, as it must, the role of an experience that can have therapeutic effects, but also has the value of providing epistemological confirmation of the theory taken as the reference in preparing the exercise. The authors show that, for example, it has been possible to design a therapeutic benefit in conditions of chronic pain starting from the hypothesis of the "decoherence" of information in accordance with the "neuromatrix" of Melzack. In this conception, the pain is seen as an efferent processed at the central level in response to the analysis of peripheral information reporting a discrepancy. A treatment (called a "naval battle") has been proposed, which uses motor images for the reconstruction of a body image that has been altered by the altered somato-aesthetic information. The results achieved, in the absence of any failures of emphasis, seem to confirm the accuracy of the Melzack's vision of chronic pain as a disease and not as a symptom. The authors, furthermore, take into consideration the most recent evidence on mirror neurons within motor behaviours and show that in this case too, it is possible to design exercises consistent with the theory in question.

SY18-305-17

Abstract is missing.

SY18-305-18

THE 2011 NATIONAL PLAN FOR REHABILITATION

Alessandro Giustini
Rehabilitation Hospital SanPancrazio – Arco di Trento, Italy, Kos Santo Stefano Group, Italy

These are the contents to summarize the Italian Plan: 1. Rehabilitation: analysis of the Italian situation; 2. The role of Rehabilitation: the bio-psycho-social model; 3. Interdisciplinary features in rehabilitation; 4. Rehabilitation in the assistance continuum; a) Clinical governance; b) Individual Rehabilitation Plan; c) Places for care; 5. Research in Rehabilitation; 6. Health and Rehabilitation Expenditures. The Italian Plan is an attempt to define, according the national health and social italian situation, a complete Network for Rehabilitation activities, Facilities, Responsibilities and Competences in relation to the cares and services needed by Disabled People everywhere in the Country to fill their rights. - Creating a positive synergistic integration on one hand with Acute medical care and on the other hand with social services and community Agencies. Following and applying International WHO and UN documents (ICF-WRD- UN Convention), European Community indications and laws, scientific and professional evidences and experiences. -Aiming to reach the better suitability, appropriateness and suistenaibility in management and financial fields too. This Plan was defined working in 1 year in very large working committees and meetings on behalf of National Health Ministry, together all Regional Health governments, together all other disciplines involved in medical fields and other professional in health and social affairs: Simfer whish to underline how were PRM experiences, competences, scientifical and professional reliability to carry out the main role reaching so a positive result.

SY18-305-19

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SY18-305-20

SEVERE BRAIN INJURY REHABILITATION: AN EMERGING PROBLEM

Mauro Zampolini

Regional Public Health Service - AUSL Umbria 2, Italy

Objective: The lack of knowledge about epidemiological and clinical data of patients with Acquired Brain Injury (ABI) admitted to Rehabilitation facilities rise the needs to collect information on Rehabilitation Pathways. *Methods:* During the last 10 years in Italy we developed 2 observational studies to evaluate functional outcome of patients with severe traumatic (tABI) and non-traumatic ABI (ntABI) admitted to Rehabilitation facilities in Italy. We included in the 2 studies: 2626 and 1469 respectively. The first study was from 2001 to 2003 and the second 2008 to 2011 allowing a benchmarking between two sequential periods of care. *Results:* Of the whole population studied, the ratio between tABI/ntABI is decreased (44.31% and 55.69% in the second study) with a progressive increase of ntABI. Patients with TBI showed a lower onset-admission interval (OAI), compared with NTBI group; no difference in rehabilitation length of stay (LOS) was recorded between groups. The tABI showed a better outcome compared to ntABI. *Implication on rehabilitation*: The increase of ntABI lead to a different rehabilitation intervention. In fact, the increase of the age of the patient and the decrease of a good outcome lead to the necessity of a specific analysis of functional prognosis to decide the intensity of rehabilitation program. The potential caregiver is different from ntABI to tABI with a different possibility to home discharge. Another emerging problem is the high frequency of infection with bacteria multiresistent to the antibiotics that prolong the length of stay and the time of recovery, increase the costs as well.

SY18-305-21

NEW INSIGHTS IN THE PHYSIATRIC APPROACH TO KNEE OSTEOARTHRITIS

Francesca Gimigliano*, Giovanni Iolascon

Second University of Naples, Italy, Department of Orthopedics and Rehabilitation, Second University of Naples, Italy

The increased aging of the population worldwide has led to a rise in chronic degenerative diseases, including osteoarthritis (OA). Historically osteoarthritis (OA) has been classified as 'primary' and 'secondary' according to the presence or not of a known cause. The classification of OA is usually based on clinical and radiographic observations in subjects with an advanced stage of disease (Kellgren & Lawrence classification). Late-stage OA is usually characterized by articular cartilage attrition and therefore the anatomical basis for disease has been viewed in terms of cartilage, even though the widespread application of magnetic resonance imaging in early OA has confirmed several different anatomical abnormalities within diseased joints. Recently McGonagle et al. proposed a novel classification making a distinction between cartilage-, ligament-, bone-, meniscal- and synovial-derived OA, together with disease that can be classified as being of multifocal origin. This anatomical OA classification permits the development of a logical site-specific approach to both diagnosis and therapy in early disease. This site-specific anatomical classification would certainly help to program the most appropriate rehabilitative approach.

SY18-305-22

Abstract is missing.

SY18-305-23

Abstract is missing.

SY18-306AB-02

SENSORY AND COMMUNICATION DISORDERS IN TRAUMATIC BRAIN INJURY

Henry L. Lew

Defense & Veterans Brain Injury Center, VCU School of Medicine, United States

Objective: To understand the characteristics of sensory and communication problems in patients with traumatic brain injury (TBI), and the potential use of auditory event-related potentials in the diagnosis and prognostication of rehabilitation outcome in TBI, the authors reviewed (1) the use of auditory event-related potentials in the diagnosis and prognostication of rehabilitation outcome in patients with moderate to severe TBI, (2) the characteristics of auditory dysfunction in patients with TBI, and (3) the occurrence of dual (hearing and vision) sensory impairment (DSI) in patients with blast-related TBI, in an effort to examine its effect on functional rehabilitation. *Results:* The results indicated that (1) auditory and visual complaints tend to co-exist, resulting in dual sensory impairment (DSI), (2) auditory complaints were consistently more prevalent than visual complaints in patients with blast-related TBI, and (3) The presence of DSI is associated with decreased functional improvement in the inpatient setting. *Implications/Impact on Rehabilitation*: The presence of auditory dysfunction, especially with the co-occurrence of auditory and visual impairments (DSI), can adversely affect the rehabilitation process of patients with TBI.

SY18-306AB-04

MEDICAL PHYSICAL AND PSYCHOSOCIAL OUTCOMES UP TO TEN YEARS POST TRAUMATIC BRAIN INJURY

John Olver

Epworth HealthCare and Treasurer ISPRM, Australia

Objective: This study examined the long-term outcome of a group of young individuals with traumatic brain injury (TBI) following discharge from a comprehensive inpatient and outpatient rehabilitation program. *Method*: To date, over 2100 patients with TBI have been followed up at 1, 2, 3, 5 and 10 years post injury using a validated structured interview format. *Results:* The average age of the patients at injury was 33.2 years. Their average length of post traumatic amnesia of 31.21 days. Neurological sequelae of headaches and dizziness were reported by 36% and 25% of the patients respectively. Thirty three per cent of the sample had ongoing visual difficulties. Approximately 59% reported having a high level of mobility. Cognitive problems including difficulties with memory, concentration and slowness of thinking were reported in 75%, 61% and 58% of patients. Level of fatigue seemed to decrease from one year post injury (66%) to 10 years post injury (59%). Patients also reported increased irritability (61%), which was more than double the reported rate in controls (25%). Of the group, 58% were employed prior to injury. By 10 years, only half of these remained in employment. *Implications/Impact on Rehabilitation*: Reports of long-term physical, cognitive and emotional affects in patients with traumatic brain injury did not change significantly between 5 and 10 years. This suggests a plateau in neurological recovery after 5 years.

SY18-306AB-06

EVALUATION OF PHARMACOLOGICAL INTERVENTIONS TO AID WITH RECOVERY AFTER TBI

Thomas Watanabe
WHO manuals for amputation and traumatic brain injury rehabilitation, United States

There is much interest but limited scientific support for the use of medications to enhance recovery after traumatic brain injury. The lack of support is related, in part, to the difficulties in designing studies that can take into account the heterogeneity of the study population, including differences in type and severity of injury, age, gender and co-morbidities. Little is known about other variables that may affect the utility of medications to affect TBI recovery such as optimal timing for pharmacological intervention and dosing. This presentation will have three main components, with the goal of providing both clinicians and researchers with useful information. First, some of the available evidence that supports the use medications to help with recovery from TBI will be reviewed. The possible role of different classes of medications will be presented. Second, challenges and problems faced in trying to design studies that may aid in our understanding of the role that medications may play in enhancing recovery will be discussed. Finally, strategies that can be used in the clinical setting to determine whether or not a patient is benefiting from a medication will be shared. Specific examples of protocols that can be used for this determination will be shared.

SY18-306AB-07

AGING WITH TRAUMATIC BRAIN INJURY: RECENT ADVANCES AND LONG TERM MEDICAL

Steven Flanagan
Rusk Rehabilitation, New York University Langone Medical Center, United States

Traumatic brain injury (TBI) is a world-wide epidemic resulting in long-term disability for millions of people. While the short-term consequences of TBI are well known, the longer-term problems of shortened life expectancy and the increased risk of developing other medical problems, including endocrine dysfunction, psychiatric disorders and neurodegenerative diseases are less well recognized. The Institute of Medicine in the United States conducted an intensive review of the literature to determine the association between sustaining a TBI and the risks of early mortality and the development of other medical problems. This comprehensive review resulted in the conclusions that TBI is associated with shortened life expectancy and several medical problems. It has been suggested that TBI be viewed as a chronic disease rather than simply an event that requires only short-term treatment. This presentation will briefly review evidence supporting TBI is a chronic disease that requires life-long follow-up.

SY18-306AB-08

MULTIFUNCTIONAL STRATEGIES TARGETING INJURY MECHANISMS IN TRAUMATIC BRAIN INJURY

Szu-Fu Chen
Cheng Hsin General Hospital, Chinese Taipei

Traumatic brain injury triggers a complex cascade of apoptotic events that cause delayed neuronal damage. Initiation of apoptosis may occur through the deterioration of mitochondrial functions, the "intrinsic" pathway. Intrinsic apoptosis is caused by the release of mitochondrial intermembrane space proteins into the cytosol, leading to subsequent caspase activation. The translocation of pro-apoptotic molecules, Bax and Bak, to the mitochondria is considered to be the main mechanism contributing to mitochondrial dysfunction. On the other hand, the anti-apoptotic survival factors such as Bcl-2 can halt apoptosis by inhibiting Bax from undergoing conformational changes, thus stabilizing mitochondrial integrity. While the injured brain activates several damaging processes to induce apoptosis, it concomitantly triggers self-protective mechanisms to counteract tissue damage and promote neuronal survival. The phosphoinositide-3-kinase /Akt signaling pathway plays a crucial role in regulating cell survival. Activated Akt phosphorylates several downstream target proteins, including Bad and forkhead box O to prevent apoptosis. Pharmacological activation of Akt signaling is therefore an attractive target for the development of new neuroprotective interventions for traumatic brain injury.

SY18-306AB-09

PHYSIOLOGICAL APPROACH TO REHABILITATION OF SWALLOWING

Jeffrey B. Palmer
Johns Hopkins University School of Medicine, United States

This presentation summarizes a physiological approach to rehabilitation of dysphagia (abnormal swallowing). We take an evidence-based approach that emphasizes the importance of understanding the underlying mechanism of the dysphagia and designing a rehabilitation strategy to address those specific abnormalities of structure and function. I will describe the basic anatomy and physiology and explain common abnormalities of the oral and pharyngeal stages of swallowing, including laryngeal penetration and aspiration. I will discuss evaluation of dysphagia, including key points in the history, physical examination, and the videofluorographic swallowing study (also called the modified barium swallow). Treatment of dysphagia will be discussed at some length, including the development of a rehabilitation program based on the abnormalities of swallowing mechanism found in the individual patient. We will also discuss treatment of the upper esophageal sphincter dysfunction. An additional topic will be the use of enteral feeding in cases of severe dysphagia. The presentation will make use of movie sequences taken from videofluoroscopic swallowing studies.

SY18-306AB-10

BASIC MECHANISM OF IMPROVEMENT IN DYSPHAGIA OF STROKE PATIENTS IN SUBACUTE STAGE – BY KINEMATIC ANALYSIS

Tai Ryoon Han
Seoul National University Hospital, Korea

To identify factors related from aspiration in stroke patients, we've done 3 studies. In first study, 28 patients were included. The interval between initial & follow-up VFSS was 2-4 weeks. As a result, temporal variables were improved at follow up studies, whereas spatial variables were not. Comparing between recovered and non-recovered group, recovery of delayed epiglottic movement is one of the conspicuous changes. The purpose of second study was to confirm the epiglottic recovery in a long-term follow-up. We recruited 69 patients and the follow up period was extended to 12 weeks. As a result, only the improved epiglottic rotational angle is associated with the recovery of swallowing. However, only 5 cases showed spontaneous epiglottic recovery. Also some patients can improve the diet level even there's no improvement of the epiglottic angle. So, the purpose of third study was to find the factors for the improvement of diet level and to find the treatment option. In this study, 57 patients were included. And as a result, small pyriform sinus residue at initial VFSS might have favorable outcome and improvements of pyriform sinus residue and vallecular sinus residue are important factors in improving diet level. In conclusion, treatment should be focused on improving epiglottic angle, vallecular and pyriform sinus residue to improve the diet level.

SY18-306AB-11

APPLICATION OF 320-ADCT TO DYSPHAGIA REHABILITATION

Eiichi Saitoh
School of Medicine, Fujita Health University, Japan

We introduce our innovative methodology using CT for revealing swallowing dynamics for dysphagia rehabilitation. In clinical practice of swallowing, videofluoroscopy and videoendoscopy are most commonly used and considered as useful techniques. However, those conventional techniques have limitations in accurate kinematic analysis in three dimensions, and therefore, some swallowing mechanisms have yet-to-be-defined clearly. 320-detector row multi slice CT (320-MSCT), a newest model of multislice CT in the world, has an excellent spatial and temporal resolution (0.5-mm slice thickness, 10frs/sec). By using this CT, it becomes possible to depict dynamic movements of swallowing with exact 3D images these have never been achieved by conventional techniques. This dynamic 3 dimensional depiction has great advantages for swallowing and dysphagia researches: 1) display target structures stereoscopically from multiple directions, and 2) precise quantitative and dynamic simultaneous measurement of bolus and structures through swallowing. Since our group started to use this 320-MSCT for swallowing studies from May in 2008, we have unveiled many un-explained swallowing events such as laryngeal closure mechanism during swallowing. In this presentation, we show beautiful pictures or movies of swallowing you have never seen before.

SY18-307AB-01

Abstract is missing.

SY18-307AB-02

THE ICF: A TOOL TO IDENTIFY AND PRIORITISE INDICATORS FOR PHYSICAL THERAPY INTERVENTIONS TO IMPROVE OR SUSTAIN LEVELS OF FUNCTIONING

Catherine Sykes
World Confederation for Physical Therapy, United Kingdom

ICF based documentation contributes to interprofessional collaborative approaches to rehabilitation, as well as being the key to holistic person-centred data to inform policy and health system organization. This session will illustrate the application of the ICF by physical therapists using examples from around the world.

SY18-307AB-03

EXPERIENCES AND OUTCOMES IN THE EARLY YEARS OF A "SERVICE OF ASSESSMENT AND GUIDANCE IN REHABILITATION" FOR PEOPLE WITH DISABILITY IN BEIJING

Celestina Tremolada
Ovci La Nostra Famiglia, Beijing, China

The "Service of Assessment and Guidance in Rehabilitation" – run since 2010 by *OVCI la Nostra Famiglia* and the local no-profit organization *Womende Jiayuan* – is a reproducible model for the dissemination of the holistic approach at community level. The process of rehabilitation, especially in developmental age, requires an holistic approach with a proper and timely application of the procedures, according to the Individual Treatment Plan developed after a comprehensive assessment focused to identify strengths and needs of the client and his/her family. The involvement of a multidisciplinary team trained to work in coordination and the continue follow up of the clients are among the conditions necessary to develop the clients' abilities, in order to give them the opportunity to become active members of their community. Family participation is also required to the greatest degree possible, given the individual needs as well as family circumstances. The experience gained in these few years through the assessment of about 1,000 clients shows that – especially for the developmental age – the process of inclusion is still at its early stage and that one of the factor that might facilitate inclusion is the introduction of assistive technology considered as an integral part of the rehabilitation process.

SY18-307AB-04

THE EVIDENCE FOR EARLY INTERVENTION BY PHYSICAL THERAPISTS IN INFLUENCING RECOVERY FOR VENTILATED PATIENTS IN ICU

Alice Jones
University of Sydney, Australia

The priority of patient management in an Intensive Care Unit (ICU) is to stabilize core organ function and commence restitution. Consequently, the adverse effects of immobilization have largely been ignored. Recent publications show that neuromuscular dysfunction associated with ICU immobilisation leads to long term post-discharge morbidity. Physiotherapy has a significant role in airway clearance, maintenance of lung volume, ventilation and intubation avoidance, as well as assisting weaning. After reviewing the interventional physiotherapy evidence in intensive care, the European Respiratory Society and European Society of Intensive Care Medicine Task Force recommended early physiotherapy intervention for maintenance of system function and to avoid complications. This talk provides an evidential analysis of physiotherapy techniques commonly employed in ICU for mechanically ventilated patients. These techniques include positioning and the use of tilt table; manual hyperinflation; ventilator hyperinflation; non-invasive ventilation; exercise protocols to encourage early mobilisation; and walking trials for patients receiving mechanical ventilation. The evidence shows that early mobilization by physiotherapists is safe and associated with reduced delirium duration, ICU and hospital stay days, but more importantly, these patients also exhibit improved functional status, muscle strength and SF36 score.

SY18-307AB-05

THE PHYSICAL THERAPIST'S ROLE IN PREVENTIVE EDUCATION AND REHABILITATION FOR MANAGING THE GLOBAL EPIDEMIC – NON COMMUNICABLE DISEASES (NCDS)

Margot Skinner
University of Otago, New Zealand and WCPT Executive Committee, New Zealand

The action plan for the global strategy for the prevention and control of non communicable diseases includes population-wide interventions to reduce common risk factors such as physical inactivity. Physical therapists use their expertise to develop and maintain people's ability to move and function. They have advanced understanding of how the body moves and use this to bring about improvements in health and independence for people of all ages. There is a high level of evidence to support the benefits of physical activity in the prevention and management of obesity, diabetes, cardiovascular disease and respiratory disease. Thus physical therapists are well placed to prescribe activity and movement to improve quality of life through functional rehabilitation programmes and by educating and empowering patients and the public to take action to both reduce risk and build their capacity to improve their health. However success in tackling the global

crisis of non communicable disease requires more than physical therapy services for preventive education and rehabilitation at the patient level. The paper will also discuss the contribution physical therapists can make to national policies and health strategies, health workforce planning, global monitoring of regional and national trends in non communicable diseases, initiatives for healthy lifestyle programmes and active ageing.

SY18-307AB-06

PHYSICAL THERAPIST PRACTICE & THE WORLD CONFEDERATION FOR PHYSICAL THERAPY

Marilyn Moffat Salant
New York University, President WCPT, United States

The introductory session will provide an overview of the roles of physical therapists as autonomous practitioners in the health service delivery systems. The requirements of physical therapists will be presented to: perform a comprehensive examination of the patient/client; evaluate the findings of the examination; formulate a diagnosis, prognosis, and plan; provide consultation; implement a physical therapist intervention/treatment program; determine the outcomes of the interventions; and make recommendations. The key roles of physical therapists as integral parts of the rehabilitation team are noted. A review of the development and organization of the World Confederation for Physical Therapy will be presented. The range of activities from global health initiatives, professional issues, international collaboration, practice issues, education issues, to research issues will be presented. The resources WCPT has to support its member organizations and physical therapists in delivering high standards of clinical practice, education, and research will be highlighted. These include position statements, guidelines, endorsements, and web-based information.

SY18-307AB-07

REHABILITATION ROBOTICS: INVESTIGATING ORDER-EFFECT AND MOTOR INTERFERENCE

Hermano Igo Krebs
Massachusetts Institute of Technology, Department of Mechanical Engineering, Newman Laboratory for Biomechanics and Human Rehabilitation, Cambridge, MA, United States

The last two decades have seen a remarkable shift in the neurorehabilitation paradigm. Neuroscientists and clinicians moved away from the static perception that the brain is hardwired and capable of delivering movement therapy because of compassion for a new dynamic understanding that plasticity occurs and might be harnessed to remap or create new pathways. Capitalizing on this new understanding, we introduced a paradigm shift in the clinical practice in 1989 when we initiated the development of the MIT-Manus robot for neuro-rehabilitation (Aisen, 1997; Krebs et al, 1998). Several studies have been completed since then and the positive results led to the 2010 American Heart Association (AHA) guidelines for stroke care which recommended the use of robotic therapy for the upper extremity (E. L. Miller, 2010). The present challenge is to integrate the technology into the clinic and to optimize therapy. Here we will discuss novel results on the quest for tailoring therapy to a particular patient's need. In particular, we will discuss our results with 190 chronic stroke patients who received 36 sessions of robotic therapy for the proximal and distal upper extremity limb segments. These results demonstrated advantages in training distal limb segments first and disadvantages in training proximal and distal limb segments in the same session. We speculated that training distal limb segments first leads to some level of generalization of gains to proximal segments (but not vice-versa) and that interference limits motor consolidation when training multiple limb segments in the same session.

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Abstract is missing.

SY18-307AB-09

A PHYSICIAN'S GUIDE TO ASSISTIVE DEVICES IN THE 21ST CENTURY: ROBOTIC EXOSKELETONS, AUGMENTATIVE COMMUNICATION DEVICES AND BIONIC EYES

Sam Wu
[1]Department of Physical Medicine and Rehabilitation Medicine, UMDNJ-New Jersey Medical School, [2]Department of Physical Medicine and Rehabilitation Medicine, UMDNJ-Robert Wood Johnson Medical School, United States

Over the last several decades, technological advancements in computers and materials have led to a renaissance in the development of robotics and other assistive devices which have turned science fiction into reality for patients with functional limitations. This presentation discusses the cutting edge assistive devices including robotic exoskeletons, augmentative communication devices and bionic eyes that are or will soon be available to physicians to help improve the quality of life for their patients with functional limitations.

SY18-307AB-10

APPLICATION OF EEG-BASED BRAIN COMPUTER INTERFACE TO MOVEMENT DISORDERS

Tetsuo Ota
Asahikawa Medical University Hospital, Japan

Objective: To examine the effect of the EEG-based brain computer interface (BCI) training for stroke and writer's cramp patients. *Method*: Using the EEG recorded with Ag/AgCl electrodes placed at C3 and C4, as designated according to the International 10/20 system, we gave real time visual feedback to the patients with PC monitor which is placed in front of them. Participants were required to imagine the affected hand opening in stroke patinents and to relax their wrist flexor while extending their wrist in writer's cramp patients. If these tasks were able to have an effect to the affected sensory motor cortex, we can see the change of patient's sensory motor rhythm, for example what is called event-related desynchronization (ERD). While practicing this biofeedback system, patients made an effort to control their affected side EEG activity representing the ERD in stroke patients and diminishing the event-related synchronization (ERS) in writer's cramp patients. *Results:* After the one month BCI training, some stroke patients were able to change their EEG activity easily to have the ERD and after the 6 months training one writer's cramp patient was

able to diminish the ERS. Moreover we could also confirm this change of sensory motor rhythm in stroke patients representing the sensory motor cortex activity by recording the EEG and functional MRI simultaneously. *Implications/Impact on Rehabilitation*: The results suggest that this type of EEG-based brain computer interface training is useful method to improve some kinds of movement disorders.

SY18-308-01

THE MANAGEMENT OF ACUTE TRAUMATIC SPINAL CORD INJURIES.

D. J. Brown
Director, Spinal Research Institute

The long-term outlook for the accident victim with a spinal fracture or vertebral column injury is determined by care available from the moment of injury. Care of the spine is part of the trauma response at the accident scene, during transport, at the first hospital and at the definitive spinal service. Mismanagement will put the patient's life at risk as well as jeopardise the cord. Trauma guidelines must take into account the particular problems of spine protection and the management of complex issues arising from cord damage. Fluid balance, respiratory care, cardiovascular management, paralytic ileus and nutrition, prevention of pressure sores, contractures and management of pain all have significant influences on outcome. The emotional and psychological chaos and distress experienced by the patient and family require sensitive, individualised management by an experienced team from the beginning. Ongoing support is essential if the best outcomes are the be achieved. Patients are best managed in a hospital that can provide comprehensive care. This means that all necessary services are available and coordinated to focus on the needs of the patient and family. The hospital must have all diagnostic and specialised facilities. Staff outside the spinal service, such as those working in the intensive care unit and radiology, must be familiar with the needs and precautions required to manage these unstable patients optimally. In this regard, the spinal cord service has a liaison role to co ordinate care in addition to direct management. It has an education role to ensure that standards are developed and maintained.

SY18-308-02

NATURAL KILLER CELL ACTIVITY DURING EXERCISE IN PERSONS WITH SPINAL CORD INJURY

Fumihiro Tajima[1], Kazunari Furusawa[2], Tomoyuki Ito[1], Takeshi Nakamura[1], Ken Kouda[1], Kazuya Ishida[1], Nami Kannno[1], Yusuke Sasaki[1], Yasunori Umemoto[1], Takashi Kawasaki[1], Motohiko Banno[1], Midori Yamanaka[1], Takashi Ogawa[1]
[1]Wakayama Medical College, Japan, [2]Kibikogen Rehabilitation Center for Employment Injuries, Japan

Moderate exercise increases natural killer cell activities (NKCA) and prolonged and intensive exercise increases and finally decreases NKCA in humans. About 17 years ago, we demonstrated Short-term attenuation of NKCA in persons with spinal cord injury (SCI) during Oita international full-marathon race (Arch Phys Med Rehabil. vol. 79:1116-21) and activation of NKCA in SCI during a wheelchair half-marathon race (Arch Phys Med Rehabil. vol. 84:706-11). NK cells derive mainly from the spleen and are recruited into the circulation by sympathetic outflow and catecholamine action. In the persons with cervical SCI (CSCI), the peripheral sympathetic nervous system are terminated at cervical spinal cord and not controlled by central nervous system. Therefore, we speculated the exercise in CSCI could not increase plasma adrenaline and attenuate NKCA. Our next study demonstrated that the 20 min arm exercise at 60% of maximal oxygen consumption in CSCI did not increase NKCA and the lack of response in adrenaline (Spinal Cord. vol. 48: 734-9). However, we were afraid that the prolonged and intensive exercise in CSCI, such as wheelchair half marathon race, resulted in the decrease of NKCA because of increased consumption of NK cells. However, our study demonstrated that wheelchair half-marathon race increased NKCA despite the lack of increase in plasma adrenaline in CSCI (Spinal Cord. vol. 50 :533-7). Therefore we suggested that the activation of NKCA by mechanisms other than circulating adrenaline level. These studies concluded that exercise except for severe intensity does not attenuate NKCA in persons with SCI and CSCI.

SY18-308-03

INTERNATIONAL AUTONOMIC STANDARDS AND ASSESSMENTS OF AUTONOMIC DYSFUNCTIONS FOLLOWING SPINAL CORD INJURY: PAST, PRESENT, AND FUTURE

Andrei Krassioukov
University of British Columbia, Vancouver, BC, Canada

Over the last decade, we have developed and significantly improved the assessment of individuals with spinal cord injury (SCI). However, until recently we only relied on assessments of motor and sensory deficits and do not evaluated autonomic function following SCI. Autonomic disorders affect a significant number of individuals with SCI. One of the most debilitating consequences of SCI is alterations in cardiovascular control, which combined with paralysis, pre-disposes these individuals to an early onset of cardiovascular disease compared to their able-bodied counterparts. An extremely low resting blood pressure, episodes of orthostatic hypotension or unpredictable hypertensive crises often render these individuals unable to complete many of their daily living requirements or participate in rehabilitation. For all of these reasons, it is crucial to improve the techniques used to diagnose autonomic dysfunctions and establish proper protocols for their management. Historically, completeness of injury has referred to motor/sensory (neurological) completeness of injury, as assessed during the well-established neurological examination which is conducted in accordance with the International Standards for Neurological Classification of Spinal Cord Injury (ISNCSCI). More recently, however, we have started to investigate the concept of autonomic completeness of SCI and its effect on various bodily functions following injury. The lack of standards for the assessment of autonomic function following SCI has led to the development of the International Autonomic Standards in order to examine remaining autonomic functions following SCI. International Standards to Document remaining Autonomic Functions after SCI (ISAFSCI) have been recently revised and recommended to be used as an adjunct with ISNCSCI.

SY18-308-04

Abstract is missing.

SY18-308-05

CONCEPT AND IMPLEMENTATION OF THE INTERNATIONAL SPINAL CORD INJURY (SCI) DATA SETS

Fin Biering Sørensen
Glostrup University Hospital, and Faculty of Health Sciences, University of Copenhagen, Denmark

Common International SCI Data Sets should be collected on individuals with SCI to facilitate comparisons regarding injuries, treatments, and outcomes between patients, centers and countries.

The International SCI Core Data Set standardizes the collection of a minimal amount of information necessary to evaluate and compare results of published studies. This includes gender, age, time and cause of the spinal cord lesion, and the neurologic status. Standardization of data reporting is available to facilitate comparisons between studies. International SCI Basic Data Sets are the minimal number of data elements, which should be collected in daily clinical practice for a particular topic. Therefore the various Basic Data Sets can be the basis for a structured record in centers worldwide caring for individuals with SCI. This record is under development. Further these Basic Data Set elements should be included in future SCI research for the relevant topics. International SCI Extended Data Sets are more detailed data sets, which may be used as optional for a topic, but may be recommended for specific research studies within the particular area. All data sets are available at International Spinal Cord Society (ISCoS) website (www.iscos.org.uk/international-sci-data-sets). International SCI Data Sets are developed and approved in an iterative and consensus process. For each data set a syllabus including definitions, variable names, data collection form, database structure suggestion, and instructions on how to collect each data item are developed. Recommendations for translation and reliability testing of International SCI Data Sets are available. Implementation in daily clinical practice will be exemplified.

SY18-308-06

Abstract is missing.

SY18-308-07

SPINAL CORD INJURY, FROM ACUTE PHASE TO CHRONIC COMPLICATION (EXPERIENCE IN IRAN)

FarzanehTorkan, Pirhossein Kolivand, Hadi Kazemi
Shefa Neuroscience Research Center, Tehran, Iran

SCI prevalence in Iran is high because of the war and road accidents. Several researches have been performed on SCI complications. The importance of these studies which we want to review more than 160 of them is that most SCI victims are now middle aged in Iran and the complications like heterotopic ossification, hemodynamic instability, osteoporosis, neuropathic pain, joint ankylosis, contractures, and psychological problems are chronic. There are 8104 SCI patients in Iran. In a study on 7273 patients (average age 20-40 years), nearly 71% were male and the prevalence of cervical, thoracic, and lumbar lesions was 17.7%, 24.4%, and 57.9% respectively. Nearly 70% were un-employed. In another study, 66% exercised regularly themselves or with a physiotherapist. 49% were married. Nearly 70% had moderate educational level. The most frequent cause was traumatic (57.4%) followed by congenital (14.4%). The prevalence of nephro-urological, psychological and dermatological complications was 51.7%, 40.8%, and 46.3%, respectively. Chronic pain prevalence was 64.9%, with the highest prevalence in lumbar lesions (83.5%). Pressure ulcers were reported in 39.2%. Pressure ulcers were more prevalent in higher age, male sex, and lower educational level. In a study on 132 patients (mean age 37.4 years) prevalence of osteoporosis in femur was 81.5%, and of lumbar spine 16.7%; which was not related to age, injury level, spasm, or employment. In this review sexual problems and hormonal levels of patients, also therapeutic interventions will be addressed. Quality of life of patients and family proves the effect of social support. Comparison of the results of the studies in Iran and other countries shows note-worthy points.

SY18-308-08

LIVES OF WOMEN WITH SCI IN COMMUNITY

Apichana Kovindha
Faculty of Medicine, Chiang Mai University, Thailand

It is said that 'in almost every society women with disability' (WWD) is devalued due to being a woman and impairment, so called 'double discrimination'. This is also true in Thailand, especially for women with spinal cord injury (WWSCI). Since 1981 the very first Rehabilitation for Persons with Disability (PWD) Act was enacted in Thailand and later, the Thai government signed the agreement on the Convention on the rights of PWD (CRPD), it seems that WWSCI have gradually had better quality of life, more chances to voice their needs and expectations to the society. However, very few WWSCI have had a chance to continue higher education and competed in Games for diabled. Interestingly, according to our study on return-to-work of persons with SCI in Chiang Mai, 47% worked (either self-employed or employed); the ratio of working WWSCI is the same as working men with disability. However, very few WWSCI in rural areas got such opportunity. Many still face difficulties and experience inequality and inequity. Some were abused while others asked for reproductive rights for WWSCI. Changing attitude of not only people in society but also of WWSCI, giving them equal opportunity for education and accessibility to information and basic needs for living may be a starting point. Moreover, self-help group of PWD/WWSCI should be encouraged in urban as well as in rural area so that our community will become the rights-based, barrier-free and inclusive society for all PWDs including WWSCI.

SY18-308-09

NEURAL PLASTICITY OR REGENERATION OF THE HUMAN CENTRAL NERVOUS SYSTEM?

Dajue Wang
United Kingdom

An electronic search of relevant publications through PubMed was conducted using two key words: "axonal regeneration" and "neural plasticity". The search included publications of the past three decades of all languages and of both animal and human studies. After confirmation of immense increase of publications on neural plasticity, the report is focusing on neural plasticity. Neural plasticity is about memory and learning. The entire process of neural plasticity is presented in the sequence of (1) lesion-induced plasticity, (2) clearance of debris, (3) collateral sprouting (4) potentiation. The recent discovery and understanding of the important role of Chondroitinase in clearance of debris is discussed in detail. So far, no clinical report suggests structural axonal regeneration. However, according to the author's own observation, transplantation of olfactory ensheathing cells in human spinal cord has brought about some functional recoveries. Although they are minor in scale, the patients receiving the procedure describe them as significant for their activities of daily living. These functional recoveries do not seem to be attributed to axonal regeneration because some of them appear from only a few hours to days after the transplantation, too soon for structural changes to be established. In conclusion, neural plasticity has enormous potentials in facilitating functional recovery. It is a realistic target than structural axonal regeneration at current level of neuroscience.

SY18-308-10

WWW.ELEARNSCI.ORG – A GLOBAL INITIATIVE OF ISCOS TO PROVIDE FREE ONLINE TRAINING TO HEALTH PROFESSIONALS IN THE MANAGEMENT OF SPINAL CORD INJURIES

Lisa Harvey[1], Hs Chhabra[2], S Muldoon[3]
[1]Royal Rehabilitation Centre Sydney, Australia, [2]Indian Spinal Injury Centre, Delhi, India, [3]Livability, Ireland

www.elearnSCI.org is an educational initiative of The International Spinal Cord Society (ISCoS). The website provides free online training in spinal cord injuries (SCI) for students and junior

health professionals. The learning content of the website was developed by over 300 academics and clinicians from nearly 40 different countries. It was developed in an attempt to ensure equal access for all across the globe to high quality education about SCI with the ultimate aim of improving the lives of people with SCI everywhere. The learning content is delivered in a variety of ways including didactic lectures, interactive screens, case studies, interviews with experts and periodic self-assessment. Care and attention has been directed at ensuring the content is multi-cultural and equally appropriate for those from high resource countries as it is for those from low resource countries. People with SCI have been involved in the website's development to capture their perspectives. There are 7 modules targeting the educational needs of the whole team as well as the educational needs of doctors, nurses, physiotherapists, occupational therapists, peer counselors, psychologists and social workers. There is an additional module about the prevention of SCI appropriate for all including policy makers. Each of the 7 modules contains up to 14 submodules covering an array of topics. The website is underpinned by sophisticated software enabling new content to be easily added without costly ongoing IT support. The software also enables countries with low bandwidth to access the learning modules. The website was developed over a 2-year period and involved widespread consultation within the ISCoS community. There are currently plans to translate the website into different languages. The website will no doubt continue to grow and expand over the coming years but it is testament to what can be achieved from the goodwill of organizations such as ISCoS.

SY18-308-11

ASSESSMENT OF THE ABILITY REALIZATION AFTER SPINAL CORD INJURY AS A MODEL FOR THE ASSESSMENT OF ACHIEVEMENT IN REHABILITATION MEDICINE

Amiram Catz
Loewenstein Rehabilitation Hospital, Israel

Background: An original approach to assessing achievement in rehabilitation medicine has been proposed at Loewenstein Hospital, in Israel. The approach is based on defining observed variables as a fraction of their maximum possible value, while controlling for confounding factors. *Objective*: Present the spinal cord injury ability realization measurement index (SCI-ARMI) as a model for the application of the proposed approach. *Methods:* SCI-ARMI represents the ability realization, defined as the ratio of the observed Spinal Cord Independence Measure (SCIM) III score and the maximum possible SCIM III score that reflects the relationship between task execution and ICF capacity. Three versions of the SCI-ARMI formula were developed. The last one is quadratic, based on the 95th percentile of SCIM III values that represents capacities corresponding to given American Spinal Injury Association Motor Scores (AMS). The formula was generalized for international populations and adjusted for age and gender based on data of 661 spinal cord lesion (SCL) patients from six countries. *Results:* The SCI-ARMI formula was found to be valid for large SCL populations from various countries. Age and gender affected its values ($p < 0.04$), but country did not ($p > 0.1$). *Implications:* SCI-ARMI assesses rehabilitation potential and achievements. It can be compared and summed up with other measures that are presented as realization of maximal values, and can contribute to the evaluation of the overall achievements of a person, a rehabilitation ward, or a hospital. The principles of this development may be applied in various areas of rehabilitation to help decision making and improve outcomes.

SY18-308-12

DIETARY STRATEGIES FOR SPINAL CORD INJURY IN RATS

Wolfram Tetzlaff[1,2]*, F. Streijger[1], W.T. Plunet[1], J.H.T Lee[1], J. Liu[1], C.K. Lam[1], S. Park[1], B.J. Hilton[1], B.L. Fransen[1], K.A.J. Matheson[1], P. Assinck[1], B.K. Kwon[1,2,3]
[1]International Collaboration on Repair Discoveries (ICORD), Blusson Spinal Cord Center, Vancouver, [2]Departments of Zoology, University of British Columbia, [3]Combined Neurosurgical and Orthopaedic Spine Program (CNOSP), Department of Orthopaedics, University of British Columbia, Vancouver, BC, Canada

Background and objectives: There are no evidence-based nutritional guidelines for humans with acute spinal cord injury. Over the past years our laboratory focused on therapeutic dietary strategies for spinal cord injury. We discovered in rats that intermittent fasting, i.e. 24 h fasting followed by 24 h of access to food, significantly improved the outcome from cervical or from thoracic spinal cord injury. However, the implementation of fasting in a clinical setting was met with resistance from clinicians who do not like to fast patients that are already loosing weight due to paralysis. *Methods*: We therefore investigated the efficacy of ketogenic diet (KD) as a treatment for acute cervical spinal cord injury (SCI) in rats. Ketogenic diets (KD) are established and effective non-pharmacological treatments for some forms of drug-resistant epilepsy. Ketones reduce neuronal excitation and promote neuroprotection. *Results:* Post-injury KD treatment resulted in increased usage and range of motion of the affected forepaw. Furthermore, KD improved pellet retrieval with recovery of wrist and digit movements. Importantly, after returning to a standard diet after 12 weeks of KD treatment, the improved forelimb function remained stable. Histologically, the spinal cords of KD treated animals displayed smaller lesion areas and more grey matter sparing. These beneficial effects require the function of monocarboxylate transporters responsible for ketone uptake and link the observed neuroprotection directly to the function of ketones. *Conclusion:* Our data suggest that current nutritional treatment standards, which include relatively high carbohydrate contents, should be revisited. Supported by CIHR of Canada and the Craig Neilsen Foundation.

SY18-310-01

REHABILITATION OF THE INDIVIDUAL WITH OSTEOPOROSIS

Heidi Klingbeil
Chief, PM&R Bronx VA Hospital, Bronx, NY, United States

Osteoporosis is a major public health problem. The condition results in significant costs, primarily in the treatment of resulting fractures, which can be ultimately fatal; in addition the impact on quality of life for individuals with progressive deformity is substantial. This lecture first reviews briefly the standard defining characteristics of osteoporosis, and bone structure. We will then proceed to review the newest techniques for fracture management, including vertebroplasty and kyphoplasty. Following this we will explore the newest theories of hormonal control of bone mass, and pharmacologic interventions to minimize progressive osteoporosis. Innumerable controversies exist regarding the benefits vs. risk of some these interventions, as well as dietary alterations and supplements, and we will review the quality of the research on which these controversies are based. A current, and comprehensive rehabilitation treatment algorithm, including exercise, posture altering orthoses, and pharmacological interventions, will be developed for the participants own patient base. Technology, such as the ReWalk, which now allows weight bearing exercise in those with spinal cord injuries, and other conditions which have formerly prevented such, will be integrated within the algorithm.

SY18-310-02

PHYSICAL ACTIVITY FOR TREATMENT AND REHABILITATION IN OSTEOPOROSIS

Mark Lissens
Thomas More University College, Belgium

Physical activity is an important factor influencing peak bone mass. A lack of physical activity is a major risk factor to develop osteoporosis. Several studies showed significant associations between physical activity level and bone mass measures. This has its implications in rehabilitation medicine. In primary rehabilitation the aim is prevention of osteoporosis, whereas in secondary rehabilitation treatment of osteoporosis is the main goal. In tertiary rehabilitation emphasis is put on treatment of fractures and complications. The goal of an osteoporosis rehabilitation program is to help the patient to return to the highest level of function and independence possible, while improving the overall quality of life, physically, emotionally, and socially. The focus of rehabilitation is to decrease pain, help prevent fractures, and minimize further bone loss. Therefore, osteoporosis rehabilitation programs may include the following: 1) exercise programs and conditioning to increase weight bearing and physical fitness; 2) pain management techniques; 3) nutritional counseling; 4) use of assistive devices to improve safety at home; 5) patient and family education, especially prevention of falls (90% of hip and wrist fractures are the result of a fall). Many skilled professionals are part of the multidisciplinary osteoporosis rehabilitation team, including the specialist in physical medicine and rehabilitation or physiatrist as coordinator. Physical activity can help osteoporosis patients gain improvement in muscle strength and cardiovascular endurance, can prevent falls and can reduce functional decline. Benefits from regular exercise include improved bone health, both psychological and cognitive benefits, and enhanced quality of life.

SY18-310-03

THE IMPORTANCE OF PHYSICAL ACTIVITY IN PATIENTS WITH RHEUMATOID ARTHRITIS

Anton Wicker
Paracelsus University Salzburg, Austria

Introduction: Rheumatic diseases are causing a lot of functional problems in the body, like the decrease of the range of motion, atrophy of muscles, swelling of the joints, increase of the joint stability, pain, changes in the joint loading and changes in the movement patterns. There are a lot of scientific papers they show positive effects of physical activity in rheumatic diseases (PLASQUI 2008). *Material and Methods:* Aims of physical activity and sports in patients with rheumatic diseases are: the preserve of joint motion, avoiding of immobility, decrease of inactivity, joy and quality of live. Physical fitness, mental fitness and social fitness are connected very strong together, especially in patients with rheumatic diseases. The umbrella above all of them who gives positive effects is physical activity, even often sports activity. It is well known that aerobic endurance training has positive effects to the mood and the psychological situation has a great influence to the immune system. In another way it is shown that aerobic exercises are stimulating the blood flow in the reference areas of the brain. The start of mobilisation should be soon as possible. It must be given attention to intensive loading and to the individual loading factors. *Results:* Aerobic training is nearly always useful for initiating the increase of physical fitness without negative effects to the joint. You can start physical activity with isometrics but soon as possible it should be done a change to dynamic strengthening. The principles of training methods should be given attention. Effective and safe are more short time loading units. The more acute the disease, they more important the break. Rehabilitation with children means more playing units. Recommended are: Functional strengthening for the knee joint. Functional knee stabilisation. General physical activity and a sensomotoric training of the shoulder girdle. Functional hand- and finger training and little intensive whole body training (OTTAWA PANEL 2004). For sports there are highly recommended aquatic sports, walking, dancing, cycling (hometrainer) and gymnastics. Restrictive use of sports should be done in Golf, Tennis, alpine Skiing and Snowboarding, Cross country, Mountaineering and Volleyball. Not recommended sports are: Judo, Karate, Taek-won-do, etc., Soccer, Handball, Basketball, Apparatus gymnastics, Trampolin and Climbing. In generally every sports recommendation to the patient with rheumatic diseases should be exactly adapted to the person, his disease and in which phase the disease (acute, subacute, chronic) is now. *Discussion*: According to more and more scientific papers to this topic it seems that physical activity, also short-term exercise training of rheumatoid arthritis patients immediately after hospital discharge results in improved regain of function (VAN DEN BERG 2007). Rheumatoid arthritis patients need to be persuaded about the effectiveness and safety of moderate and sometimes even high and middle intensity exercise (BENHAMOU 2007).

SY18-311A-01

ULTRASOUND AND SONOELASTOGRAPHY DIAGNOSIS, AND ULTRASOUND GUIDED PLATELET-RICH PLASMA INJECTION IN TENDON PATHOLOGY

Gi-Young Park, Dong Rak Kwon*
Catholic University of Daegu School of Medicine, Korea

Tendon is made of organized connective tissues and has a linear arrangement of collagen fibers that is determined and maintained by regular deforming forces such as muscle tension. Tendons are particularly appropriate for ultrasound examination because of their superficial location, their high acoustic contrast compared with the surrounding tissues, and their movement-related pathology. Ultrasound can be used to determine the severity of tendon injury, and assess the level of tendon subluxation. On ultrasound, a normal tendon appears hyperechoic with a fibrillar echotexture, and this is best appreciated on a longitudinal scan. Real-time sonoelastography (RTS) is a recently developed ultrasound-based technique that evaluates tissue elasticity in real time, and it is based on the principle that the compression of tissue produces a strain (displacement) that is lower in hard tissue and higher in soft tissue. RTS provides information on tissue elasticity, in addition to the shape or vascularity, which is obtained via B-mode ultrasound. Tissue elasticity not only varies among different tissues but also seems to reflect disease-induced alternations in tendon pathology. Therefore, it is expected to be a useful modality for providing novel diagnostic information in tendon pathology because tissue elasticity is closely related to its pathology. Platelet-rich plasma (PRP) is composed of 3-8 times the concentration of platelets contained in whole blood; therefore it contains a high content of autologous growth factors. Ultrasound-guided PRP injection decreases pain and increases strength in patients with chronic tendinopathy and might be considered as a safe and effective treatment in tendon disease.

SY18-311A-02

PHYSIOTHERAPY AND REHABILITATION FOR HEMOPHILIA AFTER MUSCULOSKELETAL BLEEDS

Ying Liu, Lixia Chen
Department of Physical Medicine and Rehabilitation, Peking Union Medical College Hospital, China

Objective: To introduce the diagnosis and assessment after musculoskeletal bleeds in hemophilia. *Methods:* The common sites of joint bleeds are knees, ankles, elbows and toes. At the early stage of joint bleeds, a patient usually complains of bubbly or tingly sensation, being unable to bear weight. On physical examination,

a joint may feel warm or may have loss of motion especially in the extended direction. If the bleeding is not stopped, joint swelling, pain, tense effusion and limited range of motion and function will come up. The common sites of muscle bleeds are the flexor muscles such as calf, forearm, iliopsoas and hamstrings. At the early stage of muscle bleeds, pain is usually noted as the first intimation. And also the altered function such as limp will be noted. As the muscle bleeding continues, warmth over the area, tender or firm on palpation, muscle spasm, and limited movement at adjacent joints will probably come up. Ultrosound is the best choice to confirm bleeds. Chronic hemophilic synovitis is a good indication of physiotherapy intervention. Usually, chronic swelling of the joint lasts for more than 6 months. The frequency of bleeds increases significantly. If joint problems develop continually, they may become chronic hemophilic arthropathy. So joint health, image, ADL as well as QOL should be assessed annually. The physiotherapy goals for hemophilia are relieving pain, maintaining ROM, strengthening muscles to increase joint stability and improving ADL and QOL. *Implications:* Based on diagnosis and assessment, physiotherapy is very important for hemophilia.

SY18-311A-03

Abstract is missing.

SY18-311A-04

NON-SURGICAL SPINAL DECOMPRESSION SYSTEM (SDS) FOR THE TREATMENT OF SPINAL DISCGENIC PAIN

Lehua Yu
The Second Affiliated Hospital of Chongqing Medical University, Chongqing, China

Spinal discgenic herniation is mainly responsible for cervical radiculopathy and sciatica, which are considered as spinal discgenic pain. Spinal traction as an important intervention in the treatment of these diseases among the conservative therapies has existed for many years, however, its efficacy is limited due to spinal muscles counteraction and angle inaccuracy in targeted disc. Briefly, Non-surgical spinal decompression system (SDS) with intricate sensor and feed-back system minimizes resistance of para-spinal muscles, and maximizes tension on specific intervertebral discs as well as targets the treatment angles for targeted discs, which ensures more effective decompression to the disc and eliminates muscle contraction. The theory behind SDS was based on zero-gravity environment in the outer space, since astronauts have reported both the low back pain was relieved and disc height was restored significantly. Injured discs can be treated by decompressing the affected spinal segment (reducing pressure on roots and the lesion tension) through SDS. SDS features in recovering interveterbral discs nutritionally and sysmatically; while traditional traction only emphasizes on removing intradiscular compression on peripheral tissues. SDS creates up to 150 to 200 mmHg of continuous negative intradiscular pressure, which was previously a challenge in medical field before. Clinical trials demonstrated the clinical effectiveness and safety of SDS for treating discgenic pain, especially for patients with cervical radiculopathy or sciatica failed to spinal traction and other physical therapies.

SY18-311A-05

APPLICATION OF ULTRASOUND-GUIDED INJECTION TECHNIQUE IN THE TREATMENT OF LOW BACK PAIN

Carl PC Chen
Chang Gung Memorial Hospital, Chinese Taipei

Introduction: Ultrasound is an easy-to-use imaging tool in diagnosing soft tissue lesions and in performing ultrasound guided injections. Most importantly, it is radiation-free. Our previous studies have documented that ultrasound can be applied in performing accurate musculoskeletal injections such as caudal epidural, piriformis, and sacroiliac joint injections. Under ultrasound guidance, the advancing motion of the needle can be observed as continuous and real-time images. In our most recent work, we have also shown that ultrasound can also be used as an effective screening tool for judging the success rate of caudal epidural injections. *Material and Method:* Sonographic images of the sacral hiatus were obtained from patients with low back pain and sciatica who were to receive caudal epidural injection treatments. Sonographic images of the sacroiliac joints were also obtained from patients suffering from spondyloarthropathies. The iU22 xMATRIX Ultrasound System (Philips Healthcare, Andover, MA, USA) was used in our studies. Sonographic images were obtained from a physiatrist who had years of experience in handling and interpreting sonographic images. *Results:* In sacral hiatus epidural injections, 100% accuracy in caudal needle placement into the caudal epidural space under ultrasound guidance was confirmed by contrast dye fluoroscopy. Sonographic images indicating a closed sacral canal and sacral diameters ranging from 1.2 to 1.6 mm may suggest a higher failure rate in caudal epidural injection. Ultrasound can also accurately guide the injection needles to the lower one-third of the sacroiliac joint, and the piriformis muscle for successful sacroiliac joint and piriformis muscle injections. *Conclusions*: Ultrasound-guided injection technique can ensure that higher volume of steroid–lidocaine suspension can be accurately infiltrated to the lesion site as compared with the conventional blind injection technique. Ultrasound guidance can ensure accurate needle placement into the sacral hiatus, piriformis muscle, and sacroiliac joint for successful injections to these areas. Sonographic images of the sacral hiatus can also provide us with crucial information on whether caudal epidural injections can be performed successfully.

SY18-311A-06

Abstract is missing.

SY18-311A-07

ULTRASOUND-GUIDED INJECTION TECHNIQUES IN THE TREATMENT OF MUSCULOSKELETAL PAIN SYNDROME

Simon Fuk-Tan Tang
Chang Gung Memorial Hospital, Chinese Taipei

Introduction: Pain is the most frequent chief complaint heard in rehabilitation outpatient clinics. Pain originating from the musculoskeletal system is commonly seen in rehabilitation medicine. In the past, correct diagnosis relies on meticulous physical examination or expensive imaging tools such as magnetic resonance imaging. During the past two decades or so, musculoskeletal soft tissue ultrasound has emerged as a reliable tool in diagnosing musculoskeletal disorders. It is radiation free, portable, relatively in-expensive, and can be used in diagnosing disorders such as muscle and tendon tears, bursitis, ligamental tear and sprain, and fluid accumulation lesions. More importantly, soft tissue ultrasound can offer real-time images, and acts as an adjuct in performing ultrasound guided injection treatments. *Material and Method:* The iU22 xMATRIX Ultrasound System (Philips Healthcare, Andover, MA, USA) was used in our studies. Real-time ultrasound-guided injection sonographic images of the shoulder joint, knee joint, plantar fascia, and retro-calcaneal bursa were obtained. Patients receiving these injection treatments suffered from disorders such as subdeltoid bursitis, supra-patellar bursitis, knee lateral/medial collateral ligament sprain, plantar fasciitis, and retro-calcaneal

bursitis. Sonographic images were obtained from a physiatrist who had years of experience in handling and interpreting sonographic images. *Results:* Based on our studies, ultrasound-guided injection offers 100% accuracy in administering the injectant to the bursa, fascia, tendon, and ligament target sites. As compared with the conventional blind injection technique, ultrasound-guided injection offers better and longer lasting treatment effects. The ultrasound-guided injection process is also less painful as compared with the blind injection technique as multi-angle needle adjustment can be avoided. Injection needles can be effectively guided to the target lesion sites. *Conclusions*: Ultrasound-guided injection technique can ensure that higher volume of steroid–lidocaine suspension can be accurately infiltrated to the lesion sites as compared with the conventional blind injection technique. Ultrasound guidance can ensure accurate needle placement into the subdeltoid bursal complex, suprapatellar bursa, knee lateral/medial collateral ligaments, plantar fascia, and retro-calcaneal bursa for the treatment of musculoskeletal pain syndrome. There is also less pain and less discomfort when injection is performed under ultrasound guidance.

SY18-311A-08

ULTRASOUND-MEDIATED GENE TRANSFECTION AND DRUG DELIVERY

Wen-Shiang Chen
National Taiwan University, Chinese Taipei

Ultrasound (US) -mediated gene therapy and drug delivery is a newly developed biomedical technique that can target gene expression or enhance payload of a certain drug at specific sites, leading to high expression or payload of therapeutic agents locally, thus providing great potentials for the treatment of various diseases. The purpose of this presentation is to introduce the phenomenon responsible for the transient permeability change on cell membranes after US exposure (sonoporation), the significance of cavitation effect on sonoporaiton, and the potential applications of cavitation-facilitated macromolecular transfer on animal models. For example, the enhancement of antitumor effects by US-mediated antiangiogenic gene therapy on the growth of a preclinical hepatocellular carcinoma model, the inoculated liver tumor, will be shown. Our recent work on evaluating the synergic effect of combining nanoparticle carriers (such as polyethylenimine or PEI) and cavitation on gene transfer will also be presented. Strong expression of reporter gene expression could be found at least 45 days after the treatment of DNA-nanoparticle complex with US exposure, both in vitro and in vivo, in contrast to the low efficiency (more than 100 folds less) and short duration (within a week) of gene expression by traditional methods. Examples of US-facilitated drug delivery will also be given.

SY18-311B-01

WHY COLLABORATION WITH THE WHO IS IMPORTANT FOR THE ISPRM AND PRM SPECIALISTS?

Christoph Gutenbrunner
Department for Rehabilitation Medicine Coordination Centre for Rehabilitation Research, Hannover Medical School, Germany

The International Society for Physical and Rehabilitation Medicine (ISPRM) is a Non-Governmental Organisation (NGO) with special relation to the World Health Organisation (WHO). It has a collaboration plan that among others include the contribution to WHO invited meetings, the strengthening of medical rehabilitation, the development, dissemination and implementation of the World Report of Disability (WRD), the implementation of the ICF at the clinical level and in population-based epidemiology, contributions to the community-based rehabilitation guideline, the development, dissemination and implementation of an International Perspective on Spinal Cord Injury (IPSCI) and the contribution to rehabilitation disaster relief. Thus one of the main aspects of the collaboration is to contribute to WHO´s activities especially in the field of disability and rehabilitation but also with respect to the development and update of health-related classifications. Such contribution is done in the projects of the ISPRM-WHO-Liaison-committee and its subcommittee, e.g.: providing WHO with information about the definitions and scope of rehabilitation specialists, concepts to implement the ICF in rehabilitation practice and development of ICF based assessment tools, the development of the IPSCI report and the development of concept of rehabilitation interventions in case of natural disasters. Additionally ISPRM is involved in the discussion about recommendations to improve rehabilitation services throughout the world. On the other hand the question has been asked if ISPRM and individual PRM specialists have any profit from this work. Some important arguments in such a discussion are: • the concept of physical and rehabilitation medicine can be improved using the ICF as a conceptual framework. • the need for medical rehabilitation can be clarified and argued using WHO figures and concept. • the focus of PRM can be widened to fields of special need (e.g. in the community). • PRM will gain knowledge in specific rehabilitation field, e.g. Spinal Cord, Injury, amputation, disaster victims. • new concepts for rehabilitation services can be developed. • relevant fields or research can be identified. • the need of teaching rehabilitation will be underlined. All in all, ISPRM can learn from the collaboration with WHO and can sharpen its scope, and the position of PRM in rehabilitation in health systems can be significantly strengthened. This will be of advantage for the present and future generations of PRM specialists throughout the World. Besides these arguments future perspectives will be discussed too.

SY18-311B-02

ACTIVITIES OF THE UNITED NATIONS WITH RELEVANCE FOR REHABILITATION

Bryan O'Young
Rusk Institute of Rehabilitation Medicine, United States

The United Nations (UN) objective is to promote, protect and ensure the full and equal human rights and fundamental freedoms by all persons including those with disabilities and to promote respect for their inherent dignity. The UN system's disability focal point is the Secretariat for the Convention on the Rights of Persons with Disabilities (SCRPD) in the Department of Economic and Social Affairs (DESA). Its role is to advance the rights of persons with disabilities in society and development, through the Convention on the Rights of Persons with Disabilities (2006), as well as other relevant human rights' instruments. This session will focus on increasing the awareness of the Convention and ways that the International Society of Physical and Rehabilitation Medicine (ISPRM) can partner with the UN in fulfilling the objective of protecting the rights and preserving the dignity of the disabled. The ISPRM through its expert membership can enhance the awareness and abilities of the disabled and provide this knowledge to the post 2015 Development Agenda presently being discussed at the UN. This new Agenda will continue to work to accelerate the achievement of the MDGs and allow for integration into UN agencies and programs that directly or indirectly influence action by developing and developed countries. It is important to enhance the awareness of the role that ISPRM can provide to all levels of government.

SY18-311B-03

Abstract is missing.

SY18-311B-04

CONCEPTUAL FRAMEWORK TO CLASSIFY REHABILITATION SERVICES - A SYSTEMATIC APPROACH

Dimitrios Skempes[1,2]*, Rehabilitation Service Organization Taskforce[2]
[1]University of Lucerne & Swiss Paraplegic Research, Switzerland, [2]ISPRM-WHO Liaison sub-committee on Strengthening Medical Rehabilitation, Switzerland

Objective: Common understanding of the global advances and *transformations* in rehabilitation care delivery processes has been hampered by the lack of an internationally agreed taxonomy of rehabilitation services. The aim of our study is to propose a conceptual framework for a future uniform classification of health related rehabilitation services and service related organizations. *Methods:* Since 2011 the ISPRM-WHO Liaison sub-committee on Strengthening Medical Rehabilitation has undertaken the project International Classification of Service Organizations in Rehabilitation (ICSO-R). A drafting group, comprised of experts in health related rehabilitation, health services and systems research, management, classifications and philosophy identified during technical experts meetings the core concepts related to rehabilitation service delivery and service organization which formed the basic elements of the conceptual framework. A systematic review of existing classifications and search of the international literature were carried out to examine rehabilitation service organization models and complement the existing framework. *Results:* The refined framework consists of high and middle level classes which correspond to existing international classifications and reflect the reality of rehabilitation practice management and service provision. Dimensions of the proposed classification framework include human workforce, financing, rehabilitation related products and technologies, infrastucture, context-level of care provision. Further validation of the framework is planned through an online expert consultation. *Implications for rehabilitation*: The use of internationally agreed standardized terms and definitions related to rehabilitation services will allow for systematic collection, analysis and comparison of data and information. The proposed framework offers the basis to organize existing information into a uniform classification thus facilitating rehabilitation services description, measurement, research and evidence based policy and planning.

SY18-311B-05

INTRODUCTION: IMPLEMENTATION OF THE WORLD REPORT ON DISABILITY - WHAT ISPRM HAS BEEN DONE AND WHAT IS TO BE DONE

Alessandro Giustini
Rehabilitation Hospital SanPancrazio – Arco di Trento , Kos Santo Stefano Group, Italy

ISPRM diffused informations about WRD contents and it's power to enrich rehabilitation and PRM role (Presentations, Documents, Articles, Survey) ISPRM supported in many different ways some events and meetings at national level related to WRD and also in relation in the same time with UN Convention and Disabled People's Rights, World Day (December 3 each year), UN Millennium Development Agenda "The World we want".We cooperated with some Congress Sessions focused on WRD or official national presentation of the Report (and traslations together WHO DAR Office) involving local Health policy responsibles. ISPRM participates WHO General Health Assembly about Disability in May in Geneva. Prepares the presence in next UN General Assembly in September in New York. The way forward: a disability-inclusive development agenda towards 2015 and beyond", UN Department of Economic and Social Affairs in collaboration with UNICEF, working about Disability and this post-2015 agenda, are diffusing documents and important suggestions to gather views from a broad range of stakeholders. This is surely a very favoureable situation and Isprm implements our scientific guidelines and evidences. It is necessary to keep on working WRD implementation, enriching Rehabilitation systems and services aiming to "implement" a strong role for PRM. We have also to implement in the PRM wold "community" the awareness about our responsibility to be actively present in this aim. Relevance of any Rehabilitation System, quality of financial supports and standards in management are totally related with Rights for Disabled People and their aknowledgement in national and international policy. In this perspective we have to implement these contents in PRM education and continuous professional development.

SY18-311B-06

WORLD REPORT ON DISABILITY: IMPLICATIONS TO DISABILITY AND REHABILITATION

Zhuoying Qiu
Research Institute of Rehabilitation Information/ICF Branch of WHO-FIC Collabrating Center China, China Rehabilitation Research Center, Beijing, China

The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) is the most important international treaty aimed to "promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity" and established conceptual fundamental for the development of international and national policies and service delivery in disability and rehabilitation. WRD assembled the best available scientific evidences on disability to facilitate implementation of the CRPD to protect rights and inclusive development for people with disabilities. With the conceptual framework of International Classification of Functioning, Disability and Health (ICF), WRD provides evidence to understand the disability and situations of people with disabilities, and make international and national recommendations for policy development and implementation in the fields of health, rehabilitation, assistance and support, enabling environment, education, and employment. This presentation introduced the background and development of World Report on Disability (WRD), analysed the framework and main content of WRD and discussed implication of WRD to disability and rehabilitation in regard to implementation of UNCRPD and ICF model of disability.

SY18-311B-07

IMPLEMENTATION OF THE WORLD HEALTH ORGANIZATION – WORLD REPORT ON DISABILITY AND INTERNATIONAL PERSPECTIVES ON SPINAL CORD INJURY INTO NATIONAL HEALTH AND REHABILITATION SYSTEMS AND SERVICES

Per Maximilian Von Groote
Department of Health Sciences and Health Policy, University of Lucerne and SPF, Nottwil, Switzerland

The challenge of every public health recommendation is to make it heard and understood by the right audiences. This problem becomes even more pressing when recommendations are targeted at specialized and diverse audiences such as physical and rehabilitation medicine doctors and health systems managers and policy makers. The ultimate goal should be that an evidence-based and actionable recommendation reach the intended audience, and that these audiences can take action to implement them. This process

-- more complex and non-linear than it may at first appear – has been labelled 'evidence-based policy' or 'evidence-based medicine or practice'. The presentation will highlight the methods and strategies described in the scientific literature of implementing recommendations from health policy reports such as the World Report on Disability (WRD) or the forthcoming International Perspectives on Spinal Cord Injury (IPSCI) and describe features of the IPSCI implementation strategy.

SY18-311B-08

IMPLEMENTATION OF THE WHO-WORLD BANK WORLD REPORT ON DISABILITY: WHO PERSPECTIVES AND PRACTICAL EXPERIENCES

Pauline Kleinitz
Address missing

The WHO-World Bank World Report on Disability, released in 2011, is a land mark document compiling the best available evidence on the situation of people with disabilities globally. The report addresses multiple sectors outlining key challenges and identifying steps forward, it provides examples of good practice and finishes with a broad set of recommendations. The report analyses the rehabilitation sector offering recommendations for sector strengthening. This presentation will provide an overview of the report with a focus on rehabilitation sector findings. The dissemination and implementation of report findings will be shared drawing upon the real experiences of this at a national level. Rehabilitation sector strengthening initiatives will be explored with some focus on those underway in low income countries.

SY18-311B-09

HOW TO BECOME A MODEL CENTER OF MEDICAL REHABILITATION – THE EXPERIENCE OF THE KESSLER INSTITUTE FOR REHABILITATION

Joel Delisa
Department of Physical Medicine and Rehabilitation, University of Medicine and Dentistry of New Jersey, United States

In this article I will describe a model medical rehabilitation center in the United States based on my experience as the Medical Director of the Kessler Institute for Rehabilitation (KIR) located in West Orange, New Jersey. KIR has three integrated distinct missions: patient care, education, and research. It is a 336-inpatient bed facility (three separate locations) that runs at approximately 95% occupancy. In 2012, 6,896 individuals were admitted for care. The patient ages are from 18 to 109 with an average age of 69. Forty-five percent of the patients were male and 55% were female. KIR, West Orange, is a freestanding hospital that owns and operates its own x-ray and laboratory facilities. KIR practices the team approach and embraces the best practices concept/model. Patients are typically admitted to Kessler about eleven days post injury. The case mix index (CMI), a standard measure of the medical complexity of patients upon admission, is higher at Kessler than at most centers. The average length of stay is approximately 17 days, however this varies by diagnosis (29 days for SCI; 21 days for traumatic brain injury; 19 days for stroke; 15 days for amputee; 17 days for neurological disorders; 12 days for orthopedic cases.) Approximately 83% of these individuals are discharged to home and the community, not to nursing homes. In the United States, all rehabilitation inpatients must receive at least three hours of therapy (physical, occupational, and/or speech therapy) per day for at least five days per week. Many facilities have added a sixth day. Psychology/neuropsychology, vocational, and recreational rehabilitation are also provided as needed. The percent volume of inpatients treated is listed in Table I.

Table I. *Inpatients treated at KIR by diagnosis*

Orthopedics	45%
Stroke	19%
Brain Injury	15%
General Rehabilitation	8%
Neurological	5%
Spinal Cord Injury*	5%
Amputee	3%

*Ventilation Unit

Measuring Patient Outcomes. Functional Improvement Measures (FIM) reflect both overall and specific improvement in ADL's, such as bathing, dressing, feeding, ambulation and motor function, discharge disposition, and patient satisfaction from the time of admission to discharge. The Kessler scores usually exceed national benchmarks. The system does not use the International Classification of Function (ICF.) Patient satisfaction surveys at KIR indicate a high level of satisfaction with their care. 91% of the patients achieved their predicted outcome and 96% indicated they would recommend Kessler to others. Kessler also has a large ambulatory care service. In 2012, 6,003 people in the KIR system received ambulatory care. 49% were males and 51% females with an average age of 57 years. Outpatient Services are noted in Table II.

Table II. *Kessler Outpatient Services*

ALS Management
Balance and Vestibular Rehabilitation
Cognitive Rehabilitation
Driver Training
Hand Therapy and Upper Extremity Rehabilitation
Locomotor Training
Lymphedema Management
Neuro-rehabilitation
Multiple Sclerosis
Parkinson's Disease Management
Occupational Therapy
Orthotic and Prosthetic Services
Osteoporosis Management
Pain Management
Physical Therapy
Physician's Services
Psychology and Neuropsychology
Spasticity Management
Speech Services
Spina Bifida Management
Swallowing Dysfunction Therapy
Urology Services
Vision Therapy
Vocational Rehabilitation & Career Guidance
Wheelchair Seating Services
Women's Health Services
Work Strategies

Education and Training. KIR is a training site for medical students, PM&R residents, clinical fellows, post-doctoral fellows, physical and occupational therapists, speech pathologists, nurses, and others. The PM&R residency is three years after the completion of a general year following medical school. This is a New Jersey Medical School program and KIR is an affiliated training site, along with Children's Specialized Hospital, the Veterans Administration Hospital and community hospitals. In the PM&R residency, the trainees must have 12 to 18 months of inpatient training and 12 to 18 months of outpatient experience. The residents are exposed to all ages, and all socioeconomic groups. Each rotation n is two months. The residents are given required didactic lectures every Wednesday from 8:00 AM until noon, and the first Friday of each month from 8:00 until

noon. The lectures are in a modular curriculum format (SCI, TBI, CVA, EMG, etc.) There is an examination after each module. The trainees are also observed and evaluated during and at the end of each clinical rotation. The inpatient rotations are diagnostic specific (SCI, TBI, CVA, Orthopedics, etc.) The residents are instructed in procedures such as EMG's, Botox injection, etc. during their training. The program also has a number of one-year fellowships upon completion of the residency. These are in SCI Medicine, TBI, Stroke, Musculoskeletal/Pain Medicine, and Pediatric Rehabilitation Medicine.

Research Agenda. Research is a vital component of the KIR Hospital. There is dedicated space, equipment, personnel, and budget allocated to research. It is expected that the dedicated researchers compete and obtain external research grant funding. The Kessler Research Foundation has the following specific laboratories:

Human Performance and Movement

- Neuropsychology and Neuroscience
- Outcome Research
- Rehabilitation Engineering
- Spinal Cord Injury
- Stroke

The research is clinical and translational, not animal labs. There is a dedicated MRI machine for cognitive research. Currently there is about 35,000 square feet of research space and has about 80 employees, including 14 full-time PhD researchers, 2 full-time MD researchers, and 3 part-time MD researchers and three to ten post-doctoral students in training. Some generic research areas that need to be studied are: epidemiology of disability; clinical studies such as pharmacological and exercise interventions; social determinants of disability; outcome research with respect to various interventions, instruments, and techniques to evaluate function; and specific type, dose, and durations of therapies. One of the keys to research is collaboration and partnerships, and also to develop metrics to evaluate the research program. I hope this integrated model of clinical care (inpatient, outpatient, community) as well as the education and training of future health care providers and the emphasis on research to improve the outcomes and quality of life of individuals with disabilities is helpful as China builds its rehabilitation care models.

SY18-311B-10

REHABILITATION NET-WORKING (MANAGEMENT, FINANCE, OUTCOMES): DEVELOPING TASKS FOR PRM DOCTORS

Alessandro Giustini

Rehabilitation Hospital SanPancrazio – Arco di Trento, Kos Santo Stefano Group, Italy

Many international documents in recent years, UN Convention 2007,WHO -ICF and recently WRD, described how rehabilitation, and its scientific developments, are focuses on Disabled People Rights. The WRD underlines evidences in Rehabilitation (social, health, educational, work and cultural fields in any Country). WRD strongly acknowledges role of medical rehabilitation in the implementation of these indications and PRM role for person's functioning and participation. This vision call upon multiple actors from national to local Governents, health, education and cultural services, working authorities, professional associations, Disabled People, NGO'S to create a real Health Net-Work. It calls financial aspects too. PRM role is foundamental in this wide net-working to show how can be realized a global rehabilitation system renovating many aspects of health and social services. Offering different cares timely, in continuity and coherence, guiding a team involving many different professionals, maintaining the center on the Person. PRM Doctor have (as unique among Medical Specialists) the holistic approach to people (disabled or at risk) for this Network-management. The PRM specialists responsibility is to activate the continuous and comprehensive (patient's participation too) process "Individualised Rehabilitation Plan" that symbolizes continuity and complexity of this net-working. So many, often new and not only clinical but also regading the management in many fields, in different places, in different times, are the tasks for PRM doctors: modifying deeply the "traditional" role and relationship between Health Services and Rehabilitation.

SY18-311B-11

IMPLEMENTATION OF ICF FOR DISABILITY ASSESSMENT AND SOCIAL WELFARE SERVICE IN TAIWAN

Tsan-Hon Liou[1]*, Kwang-Hwa Chang[2], Shih-Ching Chen[3], Yen-Ho Wang[4]

[1]Department of Physical Medicine and Rehabilitation of Shuang Ho Hospital, [2]Wan Fang Hospital, [3]Taipei Medical University Hospital, Taipei Medical University, [4]Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Taiwan,Chinese Taipei

Background: People with disability represent the biggest definable disadvantaged group on earth, people with disabilities make up 15% of the global population worldwide. Taiwan reported that the number of people with disabilities was 1, 100, 436 in 2011. This study investigated a proposed system to assess patients' eligibility for disability based on the International Classification of Functioning, Disability and Health (ICF). *Methods*: *Phase I (2007.1-2009.12)*: To build an implementation team for this reform, develop evaluation tools, make an inventory of resources and do a small scale of field trial. *Phase II (2010.1-2012.6)*: To refine evaluation tools, ensure the application process and do a national population study. *Phase III (2012.7-2013.3)*: To implement the new disability system and monitor the condition periodically. *Results:* A total of 110,667 persons with disability got their disability service through the new system. Among them, 85,276 persons got social welfare supports, 51,885 persons were issued a parking priority card, 98,928 persons got their financial supports, 26,211 persons gained their assistive device allowance, 8,171 persons received family care supports, and 8,691 persons got their nursing care and rehabilitation service at home. Welfare services and social supports were carried out to people with disability according to their results of disability assessment and needs assessment. This is a pioneer model established to link between the medical assessment and social welfare policy for people with disability worldwide. *Conclusions*: We successfully implemented a new system to assess patients' eligibility for disability. However, the proposed assessment protocol and tools require further validation.

SY18-311B-12

USE OF PATIENT REPORTED OUTCOMES IN PHYSICAL AND REHABILITATION MEDICINE: CURRENT PRACTICE AND FUTURE DIRECTIONS

Ayse Kucukdeveci

Ankara University, Turkey

Patient-reported outcomes (PROs), defined as outcomes that are directly reported or completed by patients, are increasingly being used for the assessment and follow-up of patients. PROs reflect the impact of disease and its consequences from the patient's perspective and can measure the trade-off between the efficacy of the treatment/care and what the patient is willing to tolerate. PROs are especially significant when symptoms (impairments such as pain or fatigue), functioning (activities and participation) and well-being (quality of life/ health-related quality of life) are important areas of concern. PROs are regarded as essential components of outcome assessment in the field of physical and rehabilitation medicine, especially in musculoskeletal disorders and pain medicine. Domains most frequently assessed in PROs include physical, emotional and social

functioning. Certain psychometric standards, primarily reliability, validity and responsiveness, are required of any PRO measure. As PROs reflect the patient's perspective, they have the potential to facilitate patient involvement in treatment decision-making and provide guidance for clinical and health care decisions. Although the use of PROs in research is quite common, they remain underutilized in routine clinical care as most clinicians find lengthy questionnaires time-consuming for both the patient and the staff. PROs suitable for use in clinical care should be feasible with minimum respondent and administrative burden. New approaches based upon item response theory, including Rasch analysis, and computer adaptive testing are promising to reduce the respondent burden of the lengthy PROs as well as to develop cross-culturally valid PROs to be used internationally.

SY19-301AB-01

LOW BACK PAIN IN THE ATHLETE

Joanne Borg-Stein
Spaulding Wellesley, Harvard Univ. School of Med, United States

Low back pain is a common cause of pain and lost time from sports participation in the athlete. The etiology varies with age, sport and mechanism of injury. Training faults and musculoskeletal imbalance needs to be considered. In the adolescent athlete, posterior element overuse, stress fracture, congenital stenosis and apophysitis are the most common disorders. In the young adult athlete, lumbar disc disease becomes more prevalent. In the mature adult and masters athlete, lumbar stenosis and facet arthrosis develops. Often, there are associated hip and pelvis issues to consider as well. This lecture will present a state of the art overview of evaluation and management; including patient assessment, exercise, bracing, medication, injection, sports specific training and return to play criteria.

SY19-301AB-02

MYOFASCIAL TRIGGER POINT RESEARCH AND ACUPUNCTURE

Chang-Zern Hong
[1]Department of Physical Medicine and Rehabilitation, University of California Irvine, Irvine, California, USA, [2]Department of Physical Therapy, Hung-Kuang University, Sha-Lu, Tai-Chung, Taiwan

Objective: To report current research on myofascial trigger point (MTrP) and its correlation with acupuncture (AcP). *Method*: MTrP is a hyperirritable spot in a taut band of almost every human skeletal muscle. It is painful when activated as a consequence of other soft tissue lesion. The pathogenesis of MTrP has been further clarified based on recent human and animal studies. *Results:* There are multiple sensitive loci (sensitized nociceptors) in an MTrP region. Stimulation on a sensitive locus can elicit pain, referred pain (if stronger stimulus given), or even local twitch response (when very strong stimulus given). Recent research suggested that MTrP injection with multiple insertion technique is very effective for pain control. Acupuncture (AcP) to the MTrP with multiple insertion technique can provide similar effects as MTrP injection. Many local twitch responses (LTRs) can usually be elicited during multiple needle insertion. Based on the objective assessment of endplate noise in animal studies on the myofascial trigger spot (MTrS, equivalent to human MTrP), both direct and remote effects of needling have been demonstrated if multiple insertion technique is used. This effectiveness can be completely suppressed if the corresponding spinal cord or peripheral nerve is destroyed completely. *Implications/Impact on Rehabilitation*: It is suggested that the spinal cord integration is most important in the pathogenesis of MTrP and related to the effectiveness of needling therapy. Either MTrP injection or AcP can provide very effective pain control if multiple insertion technique is applied appropriately.

SY19-301AB-03

GENDER CONSIDERATIONS IN MUSCULOSKELETAL PAIN: A 2013 INTERNATIONAL UPDATE

Mark Young*, Steven A. Stiens, Alessandra Hirsch, Yehuda Mond, Michael J. Young
United States

Internationally, it is known that pain affects both sexes, yet there is increasing scientific evidence to suggest that each gender will encounter pain in a distinctly different way. The proliferation of evidence-based research (both experimental and clinical) has led to an enhanced understanding of the notion that "women are simply NOT small men" in regards to pain. Biological differences of men and women including anatomical, hormonal, genetic and psychosocial factors often underlie gender related pain nuances. Variances in pain sensation, drug metabolism, injury mechanism, hormonal attributes and healing process among the genders exist. Newly evolving concepts of pain pathogenesis such as the important role of Central Sensitization is now recognized to be linked to gender related hormonal and neuroendocrine alterations in select disease states. This presentation will profile several gender-influenced pain conditions. A systematic review of sex related factors followed by a consideration of specific putative mechanisms supported by scientific inquiry will be presented. Additional goals of this talk will be: to explore the relationship between faulty foot biomechanics and musculoskeletal pain pathogenesis in men and women; to review common gender-specific complementary medical remedies (acupuncture, music, meditation, et al.) and to elaborate on contemporary technologic and pharmacologic solutions in the management of gender-focused pain management. The overarching goal of this presentation is to offer guidance to PM&R clinicians worldwide in their recognition, understanding and practice of gender-based musculoskeletal pain evaluation and treatment.

SY19-301AB-04

NEEDLE ELECTRICAL INTRA-MUSCULAR STIMULATION (NEIMS) FOR MYOFASCIAL PAIN SYNDROME

Rai-Chi Chan
[1]National Yang Ming University, [2]Taipei Veterans General Hospital, Chinese Taipei

Myofascial pain syndrome (MPS) is a wide-spread, non-life-threatening yet annoying disorder. There is no golden rule of treatment, but most clinicians agree that treating the characteristic taut band is essential in managing MPS. A novel procedure – Needle Electrical Intra-Muscular Stimulation (NEIMS) – was developed specifically for relieving the pain and tightness of MPS patient(s). The key components of NEIMS are 1. Insert the monopolar needle into muscle and set the tip as the cathode; 2. Two-hertz square wave electric current delivered to the taut band through the needle. 3. Twitch-induced electrical stimulation for 3 min to each treating muscle at the taut band region. Through clinical and laboratory observations, the NEIMS is found to affect both local muscle as well as pain modulation center in the brain. Series reports on the clinical VAS effect, electrophysiologic evaluation in human and rabbit, muscle tissue biopsy in rabbit, laser Doppler blood flow change, functional MRI response of brain will be presented. The possible mechanisms of NEIMS will also be discussed. Besides MPS, the NEIMS can be applied to treat other soft tissue or neuropathic pain such as muscle strain, shoulder girdle pain and cervical or lumbar radicular pain. The NEIMS is found to be highly effective for both pain and muscle tightness relief, rapid onset with long lasting effect, easy to apply, time saving, and rather save. In clinical management of myofascial and other neuromuscular pain, the NEIMS treatment deserves a higher priority of consideration.

SY19-301AB-05

PAIN MANAGEMENT OR PAIN REHABILITATION

Bengt H Sjolund
University of Southern Denmark

Chronic pain, notably in the musculoskeletal system, is a complex phenomenon. According to several national and international epidemiological studies, it is so prevalent in the population (19 – 35%) that it may be denoted 'a variant of normal'. So, are all these people reporting pain from the musculoskeletal apparatus our patients? For long-term non-malignant, especially musculoskeletal pain, the situation is very uncertain. There is usually little or no specific tissue destruction or inflammation present, as has been demonstrated repeatedly. The often speculative hypotheses for chronic myalgia have not been substantiated. What dominates the clinical picture are the functional consequences of chronic pain, i e activity limitations and participation restrictions. A number of cognitive and behavioural concepts have been defined, such as pain behaviours, catastrophizing and kinesiofobia. Furthermore, there is considerable evidence that the consequences of pain, wherever the pain is located, are treatable with interdisciplinary pain rehabilitation group programs, based on cognitive-behavioural strategies for month-long periods, with effects on pain, activity (including return to work) and participation. Why then, do so many of us still focus on trying to manage chronic pain per se with methods developed for acute pain relief but unsuitable for long-term use, e g blocks or pharmacotherapy? Has someone scientifically demonstrated that there is a strong link between pain relief and functional improvement? Or is it because we think so? I propose that we limit our efforts to those functionally impaired by chronic pain and then by using only evidence-based interdisciplinary programs or variants thereof.

SY19-301AB-06

MANAGEMENT OF PATIENTS WITH PAIN AFTER STROKE. CHRONIC PAIN SYNDROME POST CVA: EVALUATION AND TREATMENT

Martin Grabois
Physical Medicine and Rehabilitation; Professor, Anesthesiology, Baylor College of Medicine, Houston, Texas, United States

Stroke is one of the major causes of long-term disability. Although stroke is generally considered a neurologic disorder, it is associated with a variety of musculoskeletal complications and multitude of pain problems. Pain following stroke is very common, especially in the upper extremities, and may be a major contributor to long-term disability. Pain can impact substantially on a patient's sense of well being. For many stroke patients, chronic pain is underestimated as a factor that significantly contributes to the overall quality of life and disability. Pain in stroke patients may originate centrally (thalamic pain syndrome), but in most patients, the pain is caused by a peripheral mechanism. Pain is generally associated with spastic hemiplegia accompanies ith contractures. Because stroke is common in the elderly, pain from concomitant chronic conditions such as arthritis and other musculoskeletal conditions must be considered as well. Furthermore, there are many associated medical conditions, such as venous thrombosis and peripheral neuropathies, which may contribute to post stroke pain. This lecture describes the common pain problems seen in stroke patients. The diagnosis, management, and impact of pain on rehabilitation outcomes will be described.

SY19-301AB-07

PAIN MANAGEMENT IN REHABILITATION MEDICINE

Masazumi Mizuma
Department of Rehabilitation Medicine, Japan

Pain is commonly seen in rehabilitation clinics. We have been managing common pain syndromes, such as myofascial pain, low back pain, peripheral neuropathy, complex regional pain syndrome and cancer pain through rehabilitation medicine by cooperating with several medical departments. Disabled persons sometimes complain about a pain due to nerve damage, paralysis, deformities of limbs, overuse, inappropriate posture and motions. Those ongoing difficulties are categorized as secondary pain conditions. Phantom limb pain, post-stroke pain, post-polio syndrome, pain after spinal cord injury etc. are included. For example, paralytic limbs in a patient with poliomyelitis can easily develop inappropriate gait patterns. It can be caused by the pain in lower limb and back. The paralytic limbs in hemiplegic patient with stroke also sometimes become a cause of pain on the non-affected side. These conditions will disturb their daily living activities. One of the purposes of the rehabilitation medicine is supporting their life. We must reduce their pain in these conditions and prevent secondary pain conditions. Very common treatments used are: medication or nerve block in the pain management, but we also provide a combination of physical therapy with various other therapies. Psychological treatment, electrical stimulations and surgical treatment are performed. Recently we added a new acupuncture technique. It uses very soft stimulations using minimum/non-needle acupuncture. The prevention of pain in the disabled person is a very beneficial approach. So I will focus on the prevention of a recurrence of the pain, introducing practical examples.

SY19-302AB-01

SPACE MEDICINE AND REHABILITATION

Shin Yamada
Kyorin University School of Medicine, Department of Rehabilitation Medicine, Japan

Astronauts work and live in the extreme environment that poses microgravity, cosmic radiation, confinement, and isolation. Space medicine plays a vital role in evaluating health risks to astronauts and in developing countermeasures against these problems related to space flight. The International Space Station (ISS), manned since November 2000, is a joint project between five participating space agencies: NASA, the Russian Federal Space Agency, JAXA, ESA, and CSA. Up to six astronauts stay onboard the ISS at once, and duration of each expeditions are about 6 months. Crew members have to spend much time for physical exercise to maintain their health conditions during space flight. A space specific ergometer, treadmills, and a special device for muscle strengthening exercise are equipped on the ISS, however, effectiveness of those trainings is not fully sufficient. Therefore astronauts need intensive rehabilitation against muscle weakness, bone loss, and some disabilities in activities of daily living after they return to earth. In addition to restoring muscle strength and cardiopulmonary function, readaptation to earth gravity needs to be carefully considered. One of the next destinations of manned space exploration is Mars, where it takes more than one year to reach and return. More effective and efficient protocols for onboard exercise or post-flight rehabilitation, and more compact and durable devices are needed for future missions.

SY19-301AB-02

Abstract is missing.

SY19-302AB-03

NONINVASIVE VENTILATION IN PULMONARY REHABILITATION

Seong Woong Kang
Yonsei University Gangnam Severance Hospital, Korea

The usage of mechanical ventilator has been an issue in advanced stage of most neuromuscular diseases (NMD). The patients experience hypoventilation symptoms and usually die from pulmonary

complications at last. The fundamental respiratory problems NMD patients experience are decreased alveolar ventilation and coughing ability. If any kind of respiratory complications occur in these patients, the respiratory work load increases, which can induce decompensation of respiratory muscles. In such cases, supportive ventilation should be provided to avoid respiratory muscle fatigue. If support is not provided, acute respiratory failure can be induced due to the abrupt fall in pH. Management of respiratory muscle fatigue is the key factor in the respiratory care of NMD. Weaning from ventilatory support after resolution of respiratory complications can be frustrating for a patient with advanced respiratory muscle weakness because of recurring respiratory muscle fatigue. In this situation, a patient may need reintubation andsupportive ventilation repeatedlyand may eventually receive a tracheostomy tube for long term support. In such patients, instead of totally weaning them, it would be better to provide noninvasive ventilatory (NIV) support via nasal mask or mouthpiece after removal of the intubation tube. By providing ventilatory aid through noninvasive means, we can prevent respiratory muscle decompensation. NIV support can be used safely and effectively as an alternative method of ventilatory support for the patients with advanced NMD who show ventilatory failure. It would relieve symptoms and signs of hypoventilation and prevent the acute respiratory muscle decompensation, if applied before overt ventilatory failure.

SY19-302AB-05

NON-INVASIVE BRAIN STIMULATION FOR MOTOR RECOVERY AFTER STROKE: MECHANISMS AND FUTURE VIEWS

Shin-Ichi Izumi
Tohoku University Graduate School of Biomedical Engineering, Japan

Repetitive transcranial magnetic stimulation and transcranial direct current stimulation are noninvasive brain stimulation (NIBS) techniques that can alter excitability of the human cortex. Considering the interhemispheric competition occurring after stroke, improvement in motor deficits can be achieved by increasing the excitability of the affected hemisphere or decreasing the excitability of the unaffected hemisphere. Many reports have shown that NIBS application improves motor function in stroke patients by using their physiological peculiarity. For continuous motor improvement, it is important to impart additional motor training while NIBS modulates the neural network between both hemispheres and remodels the disturbed network in the affected hemisphere. NIBS can be an adjuvant therapy for developed neurorehabilitation strategies for stroke patients. Moreover, recent studies have reported that bilateral NIBS can more effectively facilitate neural plasticity and induce motor recovery after stroke. However, the best NIBS pattern has not been established, and clinicians should select the type of NIBS by considering the NIBS mechanism. Here, we review the underlying mechanisms and future views of NIBS therapy and propose rehabilitation approaches for appropriate cortical reorganization.

SY19-302AB-06

Abstract is missing.

SY19-303AB-01

ORGAN TRANSPLANTATION REHABILITATION

Jeffrey Cohen
Rusk Inst. of Rehab Medicine, NYU School of Med, United States

Life-saving treatment of disease by organ transplantation has become a standard part of medical practice. The past 25 years have seen considerable advances in the field of organ transplantation with significantly reduced morbidity and mortality. This has been accomplished through new surgical techniques, technological improvements and the use of potent immunosuppressive drugs. There are more than 19 transplantable organ systems. This lecture will focus on two of the most common solid organ transplants seen in rehabilitation medicine: liver and renal. The key role of rehabilitation in improving the function and quality of life of these patients will be emphasized. For each organ system presented, discussion will focus on indications for and contraindications to transplantation, types of transplantation and both peri-operative and long term complications. The rehabilitation program, both pre and post organ transplantation will be discussed in detail. The important role of nutrition and psychological interventions will be addressed. Outcome studies focusing on Functional Independence Measures (FIM) and Health Related Quality of Life (HRQL) will be presented. Success in organ transplantation can no longer be measured by the number of years after transplantation but by the quality of those years. Rehabilitation has never played a more important role in maximizing the potential of these patients. Transplant rehabilitation can add "life to years" serving as a vital complement to transplant surgery which adds "years to life".

SY19-303AB-02

MUSCULOSKELETAL COMPLICATIONS AND REHABILITATION IN PATIENTS WITH CHRONIC GRAFT VERSUS HOST DISEASE

Li Li
Physical Medicine and Rehabilitation Department, United States

Chronic graft versus host disease (cGVHD) is a common complication following allogeneic hematopoietic-cell transplantation and is the leading cause of late non-relapse mortality in transplant survivors. It may lead to multiple organ system abnormalities, including the skin as well musculoskeletal and pulmonary systems, which could have a significant impact upon their functional status and quality of life. The problems related to treatment such as steroid myopathy and chemotherapy-related neuropathy can impair their function as well. The involvement of the musculoskeletal system can be quite extensive and frequently involves the skin, fascia, muscle, tendon, joint capsule, and bone. Symptoms of myalgia, cramps, weakness, fatigue, balance impairment, and tremor are often reported. The most frequent musculoskeletal abnormalities are soft tissue contractures and limitation in range of motion (ROM), fasciitis, steroid –induced myopathy, and osteoporosis. Further, both central and peripheral nervous systems are at risk for dysfunction following bone marrow transplantation, although direct neurological manifestations of cGVHD are uncommon. Rehabilitation interventions are frequently used for the symptoms, impairments, functional loss associated with cGVHD. A multidisciplinary approach to evaluate and manage patients with cGVHD is essential to adequately address its effects on both physical and psychological functioning.

SY19-303AB-03

RENAL REHABILITATION IN JAPAN

Masahiro Kohzuki*, Osamu Ito
The Japanese Association Of Renal Rehabilitation, Tohoku Univeristy Graduate School of Medicine, Japan

Objective: Chronic kidney disease (CKD) is a worldwide public health problem. Levels of physical activity and exercise tolerance among CKD patients with hemodialysis are low. Increased physical activity in this population has been associated with improved ability and capacity to perform activities in everyday life, occupational tasks, health-related quality of life and survival. Therefore regular exercise is recommended to this population. In contrast, the effect of regular exercise in predialysis CKD patients has not been fully

elucidated. *Methods:* We have been tried to demonstrate that renal protective effects of regular exercise in various animal models of predialysis CKD such as 5/6 nephrectomized spontaneously hypertensive rats and Wistar-Kyoto rats. Moreover, we have been tried to establish a new scientific society to study and to urge broad dissemination of Renal Rehabilitation (RR). *Results:* In our laboratory, we have been demonstrated that renal protective effects of regular exercise in various animal models of predialysis CKD. Moreover, we have established the Japanese Association of Renal Rehabilitation in 2011 to evaluate and promote RR. We define RR as, "RR is coordinated, multifaceted interventions designed to optimize a renal patient's physical, psychological, and social functioning, in addition to stabilizing, slowing, or even reversing the progression of renal deterioration, thereby reducing morbidity and mortality. RR includes five major components: such as exercise training, diet & fluid management, medication & medical surveillance, education, psychological & vocational counseling". *Implication:* RR is a feasible, effective and safe secondary prevention strategy following CKD, and offers a promising model for new field of rehabilitation. Future randomized controlled trials should focus more on the effects of exercise training and rehabilitation programs as these subjects and exercise types have not been studied as much as cardiovascular exercise.

SY19-303AB-04

INPATIENT AND OUTPATIENT REHABILITATION FOR CANCER PATIENTS

Ying Guo
The University of Texas MD Anderson Cancer Center, United States

Since the formal evaluation of rehabilitation needs of cancer patients in 1978 by Lehmann, cancer rehabilitation interventions have been shown to be successful in various settings. In the recent year, rehabilitation principles have been applied in cancer population in inpatient, consult, and outpatient setting. Cancer rehabilitation is also an intricate part of survivorship care. Although similar to general rehabilitation in many ways, cancer rehabilitation has its unique characteristics. Complicated medical problem, oncological treatment related complications, multiple and severe symptom burdens are few of the unique features. A successful cancer rehabilitation program can have positive impacts, not only in function but also in multiple domains of quality of life including positive affect, decreased distress, and enhanced feeling of well-being. However, rehabilitation assessments and interventions are still under- utilized with oncology patients. We will discuss current limitations with providing cancer rehabilitation and propose ideas to improve function and quality of life issues in future by addressing innovations in practice, improving educational models, financial barriers and research challenges.

SY19-303AB-05

NEURAL MECHANISMS OF TACTILE MOTION INTEGRATION IN SOMATOSENSORY CORTEX

Yu-Cheng Pei[1,2,3], S.S. Hsiao[1,2,3], J.C. Craig[4], S.J Bensmaia[2,3,5]
[1]Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital and Chang Gung University, Taiwan, [2]Department of Neuroscience, Johns Hopkins University School of Medicine, [3]Krieger Mind/Brain Institute, Johns Hopkins University, [4]Department of Psychological and Brain Sciences, Indiana University, [5]Department of Organismal Biology and Anatomy, University of Chicago, Chicago, United States

How are local motion signals integrated to form a global motion percept? We investigate the neural mechanisms of tactile motion integration by presenting tactile gratings and plaids, using the tactile analogue of a visual monitor, while recording the responses evoked in somatosensory cortical neurons in macaque monkeys. In parallel human psychophysical experiments, we measure the perceived direction of the gratings and plaids. We identify a population of somatosensory neurons that exhibit integration properties analogous to those observed in visual area middle temporal (MT) cortex. We find that the responses of these neurons can account for the perceived direction of the stimuli across all stimulus conditions tested. We show that the preferred direction of the neurons and the perceived direction of the stimuli can be predicted from the weighted average of the directions of the individual stimulus features (edges and intersections).

SY19-303AB-06

NEURAL MECHANISM UNDERLYING VISUAL WORD FORM PROCESSING: EVIDENCE FROM STUDIES ON CHINESE PURE ALEXIA

Chunlei Shan, Wenli Chen, Qian Ye, Fang Cong, Qiumin Zhou, Juan Jin, Meixia Yu
First Affiliated Hospital of Nanjing Medical University, China

Objective: To explore the critical cerebral cortex and neural pathway which are necessary for visual word form processing. *Methods:* Three patients, JXD, KY and CYH with similar cerebral infarction lesions in left ventral occipitotemporal cortex (LVOTC), were included in this study. Cognitive neuropsychological tests (read Chinese characters presented in central or left/right visual fields), functional MRI (silently read characters presented in left or right visual field), diffusion tensor image (DTI, identify the neural pathway of splenium of callosum corpus) and high spatial resolution MRI (verify the precise lesion location) were adopted. *Results:* JXD showed pure alexia for characters in central, left and right visual fields and his lesion included the left lateral midfusiform cortex (LMFC). KY showed pure alexia just for characters in the left visual field and his LMFC was intact. However, he had an additional lesion in the splenium pathway confirmed by DTI. CYH showed no pure alexia and his LMFC and splenium were intact. FMRI results showed that for JXD, no activations by reading was found in his left LMFC. For KY, the left LMFC could be activated only by reading characters presented in the right visual field. For CYH, characters in both visual fields could induce activations in his LMFC. *Conclusions*: LMFC, which has been called visual word form area(VWFA), is a critical cortex for visual words processing. The splenium pathway is important for transferring visual word information in left visual field (projected initially to right occipital lobe) to left LMFC (i.e. VWFA) for further processing.

SY19-303AB-07

THE BEHAVIORAL, NEUROPHYSIOLOGICAL AND FUNCTIONAL NEUROIMAGING STUDIES ON VISUAL NEGLECT

Weiqun Song
Xuanwu Hospital, Capital Medical University, Beijing, China

Background and purpose: Unilateral visuo-spatial neglect is a well-recognized predictor of poor functional outcome following stroke, especially right hemisphere. The neural basis of both spatial neglect and its recovery is largely unknown. Further, over the past 60 years, many methods have been described and evaluated aimed at reducing the effects of this impairment. Although there are some grounds for optimism particularly in terms of short-term impairment-based effects, the range and degree of disability borne by many patients remain high. We perform the behavioral, neurophysiological and functional neuroimaging studies on visual neglect, in order to provide insights into the pathogenesis of spatial neglect, to find efficient therapeutic methods for neglect patients. *Methods:* In a large sample

of stroke patients with spatial neglect, we studied the neural basis of different types of neglect, applying the lesion overlap neuroimaging methods. We explored the mechanisms of neglect by the method of event-related potentials and transcranial magnetic stimulation, including theta burst magnetic stimulation. The functional magnetic resonance imaging was used to explore the mechanisms of pathogenesis and recovery of spatial neglect. *Results:* First, we find that acute allocentric neglect is only observed in cases where substantial egocentric neglect is also present. Second, we find that in neglect patients, both the severity of spatial biases and the inter-hemispheric functional connectivity of dorsal attentional network are related to the functional connectivity or integrity of ventral/pivot regions and to the integrity of white matter tracts that likely connect ventral and dorsal regions. Finally, we find repeated theta burst magnetic stimulation over the parietal and dorsal lateral prefrontal cortex, can significantly rebalance the activity of attentional networks. *Conclusions*: Our findings suggest a strong association between egocentric and allocentric neglect. Ventral-dorsal interactions link the ventral lesions that cause neglect to the egocentric spatial bias that is the hallmark of the neglect syndrome. Repeated theta burst magnetic stimulation over key nodes of attentional networks – the parietal and dorsal lateral prefrontal cortex, can significantly accelerate the recovery of spatial neglect.

SY19-303AB-08

THE MECHANISM OF THE VIRTUAL REALITY FOR AFFECTED UPPER EXTREMITIES AFTER SUBACUTE STROKE: ANTICIPATION AND COGNITION

Dongfeng Huang, QiangLin
First Affiliated Hospital of Sun Yat-sen University, Guangzhou 510080, China

Objective: The effect of using virtual reality (VR) for affected upper limb and cogition have received increased attention. The cognition and anticipation in motor control are grounded in the systems used to control movement. We choose ten normal subjects and four patients to explore the mechanism of anticipation and cognition for motor control of affected upper limb after the treatment of kinect. *Method*: This study is a single-blinded randomized controlled trial with twelve weeks follow-up. The ten normal subjects (age from 50 to 75) are used as a group to set up the standard brain via fMRI. Four subacute stroke patients received one hour therapy sessions for their affected arms, occurring 5 days/week for 3 weeks using the kinect program. Subjects performed fMRI and evaluation of hand motor function using the Fugl-Meyer Assessment (FM), the Wolf motor arm Test (WMAT) and MMSE pretraining and posttraining (after 3 weeks intervention). *Results:* The brain activation areas of ten-normal-subject with hand-clenching under fMRI focused on SM1 and SMA and PM. Four patients exhibited: 1) WMAT and FM score increases and function improve clinically. 2) fMRI revealed significant change of brain activation to hand clenching of the affected hand in the SM1 and PM compared to averaged ten-normal-subject. *Implications on Rehabilitation*: The mechanism of kinect system for physical rehabilitation of upper limb disfunction and cognition may be connected to the SM1 and PM reorganization.

SY19-303AB-09

CORTICAL PRIMING IN COGNITIVE REHABILITATION: THE CASE OF UNILATERAL SPATIAL NEGLECT

Nachun Soroker
Loewenstein Rehabilitation Hospital, Israel

Objective: In stroke patients with unilateral spatial neglect (USN) salient contra-lesional objects and events fail to attract attention and generate conscious perception. This major disabling condition will serve to demonstrate the place for novel approaches to cognitive rehabilitation based on the application of behavioral treatments in conjunction with adjuvant methods aimed to modulate cortical excitability and inter-hemispheric balance in order to facilitate adaptive plasticity. *Method*: Data obtained by us with the following experimental treatments for USN will be presented: a. ipsilesional eye-patching combined with visual search training; b. mesh-glove electrical stimulation of the contralesional hand; c. EEG biofeedback. *Results:* Results show that patients' responsiveness is considerably variant, probably reflecting the dynamics in brain physiology that occur with the passage of time from the date of stroke onset, as well as differences in the physiological mechanism underlying neglect manifestations in different patients. *Implication for rehabilitation*: At the present stage of our understanding of USN, the selection of a treatment strategy for a given USN patient is dictated essentially by trial and error. The multifactorial nature of the syndrome calls for application of assessment methods targeting the different underlying factors, in each individual case, with special emphasis on lesion characteristics, i.e., the specific part of the attentional network involved by the lesion in each case. Gathering such information is likely to provide in the future a data set guiding decision making concerning the selection of the appropriate treatment for a given patient, in accord with his/her specific pattern of deficits.

SY19-303AB-10

COGNITIVE NEUROSCIENCE IN NEUROREHABILITATION: ENHANCING LEARNING CAPACITY OF PATIENTS

Chetwyn Chan
The Hong Kong Polytechnic University, HongKong

People with disability have encountered challenges in participating in activities. Rehabilitation aims to facilitate the people with disability to maximize their functions and hence achieving the participation. The common interventions employed may include skill training, provision of gadgets, environment modification, lifestyle redesign etc. All these involve learning (or relearning) of new information, skills and performances. Understanding the mechanisms behind the learning is important to the design and application of appropriate strategies in intervention programs. More importantly, the appropriate strategies can maximize learning potentials of those who receive the treatment. In this presentation, the types of learning which are less familiar to clinicians are introduced. They are self-regulatory, generalization, and cross-modal learning. Studies conducted by C Chan and his colleagues in the Applied Cognitive Neuroscience Laboratory at The Hong Kong Polytechnic University and those undertaken in other laboratories are used to illustrate the concepts and principles underlying these learning strategies. Besides, their associated neural processes are introduced. The role of attention, working memory, executive control and response inhibition in mediating the learning processes are emphasized. Clinical applications and future agenda in rehabilitation science research are explored.

SY19-303AB-11

Abstract is missing.

SY19-303AB-12

COGNITIVE REHABILITATION FOLLOWING BRAIN DAMAGE: PAST, PRESENT, AND FUTURE

John Deluca
Kessler Foundation, United States

Thousands of rehabilitation specialists treat millions of people who suffer from devastating brain injuries and diseases each year throughout the world. Such damage to the brain typically results in

cognitive problems that compromise everyday life functional activity. Rehabilitation principles are based on 100 years of neuroscience research on "recovery of function." Despite this rich history, there is a relative paucity of consistent and replicable evidence regarding the effectiveness of cognitive rehabilitation. This presentation will provide a brief history of cognitive rehabilitation, discuss recent trends and findings, and outline directions for the future. Topics to be discussed include: evidence for effectiveness (e.g., evidence-based reviews); the changing tools utilized in cognitive rehabilitation (e.g., crosswords to computers); how does one measure improvement following treatment (e.g., neuropsychological scores, everyday life outcomes); the use of neuroimaging techniques in rehabilitation; and it will discuss the need for a "grand theory" of cognitive rehabilitation. In addition, the environmental impact on the expression of cognitive impairment following brain dysfunction (e.g., cognitive reserve) and its relation to cognitive rehabilitation will be discussed. Advances in tele-rehabilitation may pave the way for changes in structural delivery of cognitive rehabilitation services.

SY19-305-01

"LOCOMOTIVE ORGAN DYSFUNCTION" IN ELDERLY PEOPLE; AN IMPORTANT ASPECT OF GERIATRIC FRAILTY IN A "SUPER-AGED" SOCIETY

Masami Akai
National Rehabilitation Center, Japan

Objectives: The term "geriatric frailty" is widely used, and it includes locomotors dysfunction. The change to "super-aged society" is rapidly developing in Japan, and drastic increase of the number of elderly requiring help from other people, who are cared by Long-term care insurance, is an urgent matter from medical and socioeconomical points of view. Locomotive organ dysfunction due to musculoskeletal disorders is one of the main problems for elderly. The purpose of this study was to establish an operational definition of locomotive dysfunction and to verify its validity through a prospective cohort study. *Methods:* We recruited 314 cases (age range 65–93) from 5 out-patient service facilities and collected the following 42 items and 392 variables; Basic demographic data, living environment, past and drug history, Complaints, signs and symptoms, posture classification, X-ray findings of the spine and knee, and a few biochemical data, Pain area and Motor functions tests, Geriatric Locomotive Function Scale-25 (GLFS-25) questionnaire filled by participants, Grading assignment by attending doctors. *Results:* Highly significant relationship between GLFS-25 score and grading assignment was confirmed. Extracted data show that motor functional tests had high correlation. In the variables several factors were identified to detect the risk to be locomotive dysfunction with a certain cutoff value and those were able to use as diagnostic criteria as well. *Implications on Rehabilitation*: The severity of locomotive syndrome may be affected by multiple involvements of several orthopaedic diseases. It is important to clarify the mechanism of locomotor dysfunction and its progressing process.

SY19-305-02

THERAPEUTIC POTENTIALS OF POWER AND ECCENTRIC EXERCISE FOR AGE RELATED MUSCLE ATROPHY (SARCOPENIA)

Jae-Young Lim
Seoul National University College of Medicine, Seoul National University Bundang Hospital, Korea

Purpose: Recent studies have focused on the evidence based interventions to prevent mobility decline or to enhance physical performance in older adults. Several specific modalities other than traditional strengthening program have been designed to take control of age-related functional decline more effectively. Main purpose of the current session is to delineate the role of physical function to disability and falls in older adults and to look over therapeutic potentials of power and eccentric exercise for age related muscle atrophy (Sarcopenia). *Reviews*: Age-related change in human skeletal muscles and its relationship with physical performance are discussed from the results of the in-vitro physiologic studies to human biomechanics studies. Sarcopenia issues are overviewed through recent consensus about diagnosis and management of sarcopenia. Mobility decline in aging population is closely linked with the change of force-velocity relationship. Specific modality interventions based on increased velocity and eccentric strength can improve their functions more effectively than traditional strengthening program. Power and eccentric strengthening program will be introduced as a typical modality specific program to improve both force and velocity. *Conclusion:* Decreased gait speed is a major indicator of mobility decline or sarcopenia in older adults. The clinical application of power and eccentric exercise needs to be developed to improve both force and velocity.

SY19-305-03

REHABILITATION AND OLDER PEOPLE: USING FRAILTY AS A CONCEPTUAL BASIS

Ian D Cameron, Susan E Kurrle
Rehabilitation Studies Unit, Curran Ageing Research Unit, University of Sydney, Australia

Background: Frailty has now been clearly defined and there are several definitions that have established predictive validity. Many older people considered for rehabilitation meet these definitions. While few studies have applied interventions to treat or ameliorate frailty, the available definitions suggest potential targets for rehabilitation interventions. *Method:* A completed study (1) that established the feasibility of treatment of frailty is reviewed to establish the types and range of rehabilitation interventions that are applicable in the context of frailty. *Results:* Exercise and nutritional interventions are the most applicable components of rehabilitation for frail older people. However, using an approach based on the International Classification of Functioning, there are a very wide range of potentially applicable techniques. Application of the principles of Comprehensive Geriatric Assessment is suggested, together with goal identification and attention to factors likely to influence adherence with the rehabilitation program (2). *Conclusion:* Frailty is a useful concept to apply in the rehabilitation of older people, particularly older people who have impaired functioning without a clear precipitating health condition.

SY19-305-04

FALL PREVENTION IN ELDERLY PEOPLE

Yohei Otaka
Department of Rehabilitation Medicine, Keio University School of Medicine, Japan

The falls and fall-related injuries have become major social issues, along with longevity. One-third of elderly people experience at least one fall a year. The numbers of fall-related death and fall-related fractures exponentially increase in persons aged 60 years and over. Hence, the development of effective fall prevention programs for the growing elderly population in realistic settings is crucial in rapidly aging societies like Japan. Many risk factors of falls in the community-dwelling elderly have been explored. The basic strategy to prevent falls is to modify these risk factors. Some approaches have been proven to be effective to reduce falls in randomized controlled trials, some of which have been confirmed in systematic reviews.

The representative approaches for community-dwelling elderly are exercise alone or multifactorial interventions that include exercises. Since 2002, we have conducted a fall prevention program for the community-dwelling elderly at senior citizens' salons in and around Tatebayashi, a city located approximately 60 km north of Tokyo. Total number of people who received our program has reached over 6000 so far. At each salon, about 10 to 30 persons gather weekly to enjoy recreational activities such as Karaoke, cherry-blossom viewing and so on. A multidisciplinary team visits each salon at least annually and provides a fall prevention program that includes home-based exercises, education of fall prevention, environmental modification and so on. In this presentation, I will outline our program, show its effectiveness to reduce falls, and discuss future perspectives.

SY19-305-05

REHABILITATION THERAPY AND PREVENTION OF FALLS IN ELDERLY

Hee Sang Kim
Kyung Hee University, Medical Center, Korea

Falls are associated with morbidity and mortality in the elderly. The risk of falls increases with age. The risk factors for falls in the elderly are muscle weakness of lower extremities, gait and balance problems, use of psychoactive medications and environmental hazards. The incidence of falls in the elderly is one third of elderly living in community annually. The rate of fall for elderly hospitalized patients is higher between community and nursing home residents. The reasons for a higher rate of falls for elderly are greater frailty of patients and increased reporting of fall events in hospitals and in nursing home than in community. Rehabilitation therapies and prevention of falls in the elderly are composed of 1) assessment & management of chronic conditions, visions, hearing, & untreated medical problems, 2) encourage health with exercises, & nutrition with hydration, 3) osteoporosis screening & treatment, 4) medication review (reduce if possible), 4) mental activity & focus training, 5) education to improve home environment, 6) confidence training for fear, 7) regular exercises: extremitic & abdominal strengthening, balance, Tai Chi, flexibility, gait, back extension, & aerobic exercises 8) improving transferring & ambulation with or without the use of aids, 9) footwear improvement (diabetic foot or painful arthritis), 10) postural back taping, hip protector, 11) patient & staff education about fall prevention, 12) post-fall assessments.

SY19-305-06

FALL PREVENTION IN THE ELDERLY: A TRANSDISCIPLINARY TEAM APPROACH

Ta-Sen Wei
Department of Physical Medicine and Rehabilitation & Fall prevention center, Changhua Christian Hospital, Chinese Taipei

Falls and related injuries are major health problems commonly occurred in the elderly, and they are characterized by high volume, high risk, multifactorial interaction, consequent adverse responses, and being modifiable. Assessments of fall risk include (1) history of previous falls, medical illness, medications, alcohol, and use of assistive devices, (2) functional evaluation: vision, balance, gait, etc., and (3) environmental hazards. Fall risk factors vary among different subjects, study designs, and assessment tools. To precisely recognize risk factors, well-selected assessment tools are needed for specific disease. The interactions between risk factors are often attributed to personal factors rather than environmental factors. To prevent falls and fall-related injury effectively, it relies on a comprehensive assessment and trans-disciplinary integrated team approach. The trans-disciplinary fall prevention team and fall prevention center was established since 2008, has dedicated to (1) develop policies and procedures of fall prevention, (2) manage fall-risk medication, (3) inspect safety of environment and facilities, (4) establish a fall-risk reduction education, and (5) perform case management and surveillance. Team members include physician, physiotherapist, occupational therapist, orthotist, nurses, pharmacist, information analyst, administrator of medical quality, engineering technician, administrator of environmental hygiene, and case managers. Based on the viewpoint of preventive medicine, subjects who fall or are at high risk referred from emergency room, outpatient department and community, a newly invented case management service model is given. This model provides a comprehensive and multidimensional evaluation for fall risk factors and also fall prevention programs.

SY19-306AB-01

THE USE OF COMPUTERS IN STROKE REHABILITATION OR VIRTUAL REALITY AS A MEAN FOR MOTOR TRAINING

Katharina Stibrant Sunnerhagen
Rehabilitation Medicine, University of Gothenburg, Sweden

Computers are used in stroke rehabilitation today, mainly for motor training but also for assessments and training of cognition and communication. A serious game is a computer-based game with the goal of education and/or training in any form. This stands in contrast to traditional computer games, whose main purpose is to entertain. There is an increasing interest in serious games as a possible tool in rehabilitation. Different types of computer games are available off the shelf from different suppliers. In rehabilitation settings these are being used for training purposes: Virtual reality where the person is more or less immersed in another world (created by the computer is another tool) as well as combining real life movies with motion. However, there is little research in the area. Depending on how the computers are used, effects can be expected on physical activity, heart frequency, energy consumption, balance or motor performance. We have tested several systems in rehabilitation with variable success. The persons with stroke have generally been interested in testing computer games as a way for achieving better function in the upper extremity. The staff has had a varied interest in testing computer games in rehabilitation, sometimes perhaps due to a feeling of insecurity when it comes to using computers. The effectiveness of computer games in rehabilitation is yet to be shown in a convincing way. Therefore, this type of intervention should be seen as projects and should be assessed as such.

SY19-306AB-02

NUTRITION THERAPY FOR STROKE PATIENTS DURING THE CONVALESCENT PHASE

Michiyuki Kawakami[1]*, Meigen Liu[1], Ayako Wada[2], Atsuko Horie[1], Tomoyoshi Otsuka[2]
[1]Department of Rehabilitation Medicine, Keio University School of Medicine, Tokyo, [2]Department of Rehabilitation Medicine, National Higashisaitama Hospital, Saitama, Japan

Little is known about the energy demand in stroke patients during the subacute phase, information essential to appropriate clinical and nutritional management. The aims of the study were to determine the resting energy expenditure (REE) of stroke patients in the subacute rehabilitation phase, and to evaluate whether estimation of REE from the Harris-Benedict equation (HBE) requires the addition of a "stress factor" to capture possible additional REE imposed by stroke. We measured REE with a portable calorimeter Metavine^{TR} and compared it with basal energy expenditure (BEE) calculated with HBE in 90 stroke patients admitted to a rehabilitation ward (50 males, mean age 68.5±12.1, mean days from stroke onset 54.5±16.6). Their REE was 5% higher than that predicted from HBE, and

their "stress factor" ranged from 1.0 to 1.1. We carried out another study to examine "activity factor", defined as the energy content of diet divided by REE, in 80 subacute stroke patients. As a result, the "activity factor" of those who were not obese ranged from 1.4 to 1.7. In conclusion, stroke patients in the subacute rehabilitation phase need more energy. This information would be useful to plan appropriate nutritional management.

SY19-306AB-03

MOTOR IMAGERY IN STROKE REHABILITATION

Qiang Wang
The Affiliated Hospital of Medical College, Qingdao University, Qingdao, China

Motor imagery (MI) is a process through which an individual repeatedly mentally rehearses an action or task without actually physically performing the action or task. Many brain imaging studies, primarily using functional magnetic resonance imaging (fMRI), have indicated increased neural activity in overlapping brain regions during both real motor execution and motor imagery practice. MI ability is usually assessed by individual responses to rating scales. Three of these instruments are commented on in detail. One of the challenges in applying MI to practice is the persistent question of how a clinician knows if the individual is engaged in MI. Monitoring of autonomic nervous system functions has provided physiological correlates to the practice of MI. Most studies have shown that MI training reduces impairments and improves functional recovery of the upper limb. Some studies also have showed the effect of MI on the lower extremities, such as in the sit-to-stand and stand-to-sit tasks, in stroke patients. Locomotor imagery training may be beneficial for patients who are unable to participate in physical gait training secondary to fatigue, severe paralysis or impaired balance. Regarding the activities of daily living, the MI intervention was useful for improving patients' ability on performing both the trained and the untrained (novel) tasks and in places different from the training environments. MI has also been used to combine with other therapies, such as CIMT, electromyogram-triggered electric stimulation, etc.

SY19-306AB-04

ENHANCING FUNCTIONAL RECOVERY AFTER STROKE

Ichiro Miyai
Morinomiya Hospital, Japan

Functional neuroimaging studies have shown that motor recovery of the upper limb after stroke depends on functional and structural reorganization of the neuronal network. We have also shown that the similar functional reorganization is associated with locomotor and balance recovery (Miyai I et al. Ann Neurol 2002:52;188-194, Miyai I et al. Stroke 2003;34:2866-2870, Mihara M et al. NeuroReport 2012;23:314–319) using functional near-infrared spectroscopy (fNIRS). To validate the efficacy of a certain rehabilitative intervention, it is ideal to monitor whether it induces the preferable activation patterns in the brain. Since fNIRS is portable and relatively robust to motion, it can monitor the immediate effect of the intervention and status of motor learning (Hatakenaka M et al. Neurorehabil. Neural Repair 2012;26:293-300). Furthermore, neuro-modulation enhancing adapted reorganization of the network is emerging as a potential intervention. Such attempts include brain-machine interface, magnetic or direct current stimulation and neuro-feedback to enhance a specific brain activity. We have developed a real-time fNIRS system as a tool for rehabilitative intervention (Mihara M et al. PLoS One 2012;7:e32234). This neuro-feedback system provides patients with knowledge of results regarding performance-related brain activities, which may enhance the efficacy of practice. We have found that mental practice with motor imagery combined with neuro-feedback using real-time fNIRS has a significant add-on effect on recovery of finger paresis in a randomized controlled trial in patients with subcortical stroke (Mihara M et al. Stroke 2013, in press).

SY19-306AB-05

ADL STRUCTURE IN STROKE PATIENTS

Shigeru Sonoda
Fujita Health University Nanakuri Sanatorium, Japan

In stroke rehabilitation, activities of daily living (ADL) scores are important not only for evaluation but in formulating treatment targets in rehabilitation. These ADL can be regarded as action tasks to be learned. It is reasonable to introduce the rule of motor learning when planning adequate rehabilitation to improve ADL. Since adjusting a task's difficulty level is a principal rule in motor learning, we must be cautious regarding the difficulty order of ADL items. The order of difficulty of ADL items has been expressed by independent ratios or the logit scores in Rasch analysis. This order is assumed to be the same whether the ADL score is high or low when these parameters are used. However, the difficulty order must differ between patients with low and high ADL levels, and the learning level of the activity would influence the order. To view the difficulty order of the FIM motor subscore (FIMM) multilaterally, I employed ranked logistic regression that predicted each item comprising the FIM score from the FIMM. Difficulty order of FIM items at any level of the FIMM score can be calculated by this method. From data on approximately 1000 stroke patients, transfer items became easier and sphincter control became more difficult at discharge than on admission in patients with lower FIMM scores. Since transfer exercises are common tasks in severely affected patients, it is natural to consider that exercise changes the difficulty order. Age and existence of hemispatial neglect also affect the difficulty order of ADL items.

SY19-306AB-06

NEW APPROACHES TO ENHANCE MOTOR RECOVERY AFTER STROKE

Joel Stein
NY Presbyterian Hospital, Columbia University, United States

There has been a broad recognition of the plasticity of the adult human brain over the past 15 years. Contemporary stroke rehabilitation encompasses both stimulation of brain plasticity to enhance neurological recovery and instruction in compensatory techniques, such as the use of braces, canes, and one-handed dressing. Instruction in compensatory strategies remains the foundation of rehabilitation practice, but is increasingly supplemented by efforts to enhance recovery. Several strategies are being employed to enhance the process of neurological recovery. First and foremost is activity-based treatment, such as the repetitive task practice, which has been shown to enhance recovery. Peripheral stimulation, using electrical stimulation or acupuncture to the peripheral nerves or muscles, is another approach whose efficacy remains uncertain. Direct electrical stimulation of the brain, most commonly performed non-invasively with transcranial magnetic stimulation (TMS) or transcranial direct current stimulation (tDCS), has been found to modulate brain plasticity and potentiate motor learning. Multiple small studies suggest that this approach may be useful to enhance the benefits of activity-based therapies. Medications, such as fluoxetine, have been studied as another treatment to enhance recovery post-stroke. Recent studies suggest that this medication may be useful to stimulate recovery, but definitive trials are needed to confirm these results. Growth Factors and Stem Cells remain confined to the laboratory at present, but are promising biological therapies for the future. As with other therapies proposed to enhance recovery post-stroke, these techniques will need to be combined with activity-based treatments to maximize their efficacy.

SY19-306AB-07

ADVANCED TECHNIQUE OF NEUROMODULATION IN PRM

Shih-Ching Chen[1,2]*, Chih-Wei Peng[1,2], Jiunng-Hung Kang[1,2], Chien-Hung Lai[1,2], Hsu-Hsien Lin[1,2], Song-Hwei Tseng[1,2]

[1]Department of Physical Medicine and Rehabilitation, Taipei Medical University Hospital, Taipei Medical University, [2]Department of Physical Medicine and Rehabilitation, School of Medicine, Medical College, Taipei Medical University, Taiwan, Chinese Taipei

The functioning of central, peripheral or autonomic nervous system is modulated by neurotransmitters or some chemical substances. Neuromodulation is defined as or refers to a variety of medical therapies that target the nervous system for restoration of functions, relief of pain, management of symptoms. There are three main types of neuromodulation, including chemical, electrical, and photoactive interventions. The functions of organs innervated by nerves hence can be modulated through these mechanisms. In the field of PRM, neuromodulation is a powerful technology to enhance the functions or to improve the conditions of individuals with disability or with certain symptoms. Functional electrical stimulation (FES), intrathecal baclofen (ITB) therapy and etc. are important for a rehabilitation team to promote the effectiveness of motion control therapy.

SY19-306AB-08

RECENT ADVANCES IN RECOVERY OF HAND FUNCTION POST STROKE

Preeti Raghavan

Rusk Inst. Of Rehab Medicine, NYU School of Med, United States

Hand function is critical to functional recovery. However, even when patients recover the ability to grasp objects after a stroke, grasping with control, flexibility and dexterity remains challenging. This is because dexterity requires the ability to scale fingertip forces according to the weight and texture of objects, modulate hand posture according to the shape and size of objects, and individuate finger movements, which are accomplished through integration between sensory and motor processes and coordination between proximal and distal muscle groups. Using 3-dimensional kinematic, force and EMG data obtained during functional movements, we show that: 1) sensory information can be transferred from the unaffected to the affected hand for sensorimotor integration and fine-tuned motor output in the affected hand post-stroke; and 2) scapular muscle activation can modulate muscle tone, coordination and spinal cord plasticity for control of finger movements. Novel rehabilitation strategies to restore dexterity in the affected hand post-stroke will be discussed.

SY19-306AB-09

RECENT ADVANCE IN SWALLOWING ASSESSMENT

Tyng-Guey Wang

National Taiwan University Hospital, Chinese Taipei

Dysphagia is a common problem in rehabilitation medicine. The traditional assessment of swallowing function includes history taking, physical examination, videofluoroscopic examination of swallowing (VFSS), fiberoptic endoscopic examination of swallowing (FEES), and manometry. Swallowing screening protocol for specific disease such as stroke patients has been developed recently based on clinic evaluation skill. Through the screening test, clinicians can early define the swallowing disorder and perform proper management. With swallowing screening, the incidence of aspiration in the specific subjects reduced significantly. Although VFSS is thought as a standard method in evaluating swallowing function for decades, it still lacks quantitative measurement of related swallowing parameters. Development of the software to analyze swallowing parameter quantitatively is a trend in VFSS. It makes the analysis of VFSS more objective and convincing. Surface electromyography and ultrasound are used to assess swallowing function in past 10 years. They have the advantages of non-invasive, can be applied in bed site setting, and using real food as the test materials rather than barium in VFSS. However, their applications are still under research although some primitive reports showed that they could be the potential methods for evaluation of swallowing function. Pulse oximeter is another studied tool in the evaluation of swallowing function. It is used in the detection the aspiration during meal. Some works showed that it can detect aspiration accurately especially in Pediatric subjects, but the others are not. More evidences are needed to be addressed before pulse oximeter is routinely used to detect aspiration during meal.

SY19-306AB-10

NEUROLOGICAL DYSPHAGIA AND ITS INTERVENTION STUDY-A SERIAL OF CLINICAL RESEARCH SUMMARY

Zulin Dou

Third Affiliated Hospital of Sun Yat-sen University, Guangzhou, China

Objectives: Using high-resolution solid-state manometry, we examined biomechanic changes of physiologic swallowing events in patients with dysphagia after brainstem stroke before and following completion of balloon dilation intervention, and compared their performance to control group. *Methods:* 30 brainstem stroke patients with dysphagia were involved in this study. 15 of them as dilatation treatment group completed 3 weeks of modified balloon dilatation treatment and traditional swallowing therapy. Another 15 of them as control group only completed 3 weeks of traditional swallowing therapy. Before, and following the dilatation we measured FOIS, pharyngeal manometric pressures peak and duration, the nadir of UES and its duration during swallows of thin liquid, thick liquid, and pasty material in 3 ml volumes. *Results:* Following dilatation treatment, 12 of 15 patients were removed feeding tube in dilatation group. Post-dilatation the relaxation of UES and propulsion of pharynx were both significantly better than Pre-dilatation in the group of dilatation treatment for three materials (p<0.05). UES resting pressure approximated to normal. Only 2 of 15 patients were removed feeding tube in control group following traditional swallowing therapy. Propulsion of pharynx was also improved after treatment in control group, especially for thin liquid (p<0.05). However, the magnitude change was not as good as dilatation group (p<0.05). Post-treatment the relaxation of UES in control group was not shown any significantly difference from pre-treatment (p<0.05) for all three materials. *Conclusions*: Failed UES relaxation and poor pharyngeal propulsion take great responsibility for dysphagia in brainstem stroke survivals. Dysphagia therapy with dilatation improves relaxation of UES and propulsion of pharynx during swallowing. Moreover, it is helpful for restoring UES resting pressure. Traditional swallowing therapies have certain effect on pharyngeal propulsion but do not have positive effect on UES.

SY19-306AB-11

DYSPHAGIA, A SWALLOWING DISORDER IN VARIOUS CLINICAL PROBLEMS IN ADULT REHABILITATION

Alberto Giattini

Ist. S. Stefano, Italy

Dysphagia is one of the most serious symptoms in the field of rehabilitation. It can have different origins. In the Rehabilitation of adults, the most frequent origin is neurological disorders. They

can be simplified according to the various levels of the nervous system. In upper motor neuron diseases we can include: cortical, sub-cortical and brainstem lesions. In lower motor neuron diseases we can include: cranial nerves, myoneuroal junction and muscular diseases. In sensory function disturbances we can include sensory nerves and sensory tracts (cerebellum and basal ganglia). Each level includes different diseases, which can have different degeneration characteristics, prognosis and outcomes. In the central nervous system, prognosis can be well influenced by cortical plasticity, which increases the utility of the intact hemisphere to control swallowing motor functions. Neglect, apraxia and aphasia can reduce deglutition activity after stroke. Parkinsons disease, is characterized by symptoms which can be related to dysphagia. The most important are sialorrhea, gastroparesis, tremors and rigidity. Brainstem functions, if recently compromised, can be characterized by serious dysphagia, with incomplete swallowing. Cerebellum disorders, even though their function in deglutition is not well understood, can show dysphagia probably due to the presence of ataxia, intention tremors and hypotonia. Problems relating to myopathies and myoneural junction are causes of swallowing disorders. Compromised Lower Motor Neuron functions can be seen in muscle and neuromuscular diseases. Idiopathic or iatrogenic swallowing disorders can sometimes resemble neurogenic dysphagia.

SY19-306AB-12

THE USE OF TRANSCRANICAL DIRECT CURRENT STIMULATION IN PATIENTS WITH STROKE AND DYSPHAGIA

Caterina Pistarini*, V. Pingue, M. Panourgia, S. Cremascoli

Department of the S.Maugeri Foundation Scientific Institute of Pavia, Italy

Objective: In this study we are trying to better define application of trans-cranial direct current stimulation (tDCS) during the subacute rehabilitation in post stroke dysphagic patients. The stimulation models are nowadays standardized, but it is still needed to define the effects oftrans-cranial direct current stimulation application on subacute stroke patients, the timing of application, the patients selection and the techniques of treatment. *Method:* We describe our study design with a protocol conducting on subacutestroke patients in a double-blind, sham-controlled study. The stimulation technique is provided. Our purposes are to enroll a large number of patients and use trans-cranial direct current stimulation during their standard swallowing therapy. We perform a wide assessment of dysphagiawith: Dysphagia Outcome and Severity Scale, Waxman scale, Penetration- aspiration scale and by video-fluoroscopy. We exanimated the patients before, immediately after, and 1 month after the last session of treatment. *Results:* Our first observations suggest that trans-cranial direct current stimulation can be considered as an adjuvant treatment tool combined with standardized techniques for the therapy of dysphagia in patients in an early phase of rehabilitation. *Impact on Rehabilitation*: The application of trans-cranial direct current stimulation can enhance the beneficial effects of swallowing therapy in the rehabilitation process in post stroke patients and improve their quality of life.

SY19-306B-01

Abstract is missing.

SY19-306B-02

CARDIAC REHABILITATION PROGRAM FOR HEART TRANSPLANTATION RECIPIENTS

Ssu-Yuan Chen

Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Taiwan

Heart transplantation is widely regarded as a viable alternative for individuals with end-stage heart disease. The number of heart transplant procedures reported to the transplant registry of the International Society for Heart and Lung Transplantation was about 3,700 per year in recent years. The first heart transplantation in Taiwan was performed in 1987. However, comparing with North America and Europe, the number of heart transplantation is far less in underdeveloped or developing countries such as South America, Africa and Asia. The transplanted heart exhibits unique physiological responses to exercise. Many factors are proposed to be responsible for the abnormal responses including a denervated heart, ischemia and reperfusion injuries to the donor heart, lack of an intact pericardium, and myocyte necrosis due to acute rejection. In addition, prolonged preoperative deconditioning and postoperative complications may also influence the cardiorespiratory function of heart transplantation recipients (HTR). In our previous study, the peak oxygen uptake of 17 HTR was only 49% of the healthy controls at 7 weeks after heart transplantation. Scarce studies have demonstrated the exercise benefits of cardiac rehabilitation program (CRP) among HTR in the early postoperative period. Among the 45 clinically stable HTR who started phase II CRP within 6 months after surgery in our hospital, they displayed significant increase in VO2peak, peak work rate, peak heart rate and body weight after supervised exercise training program. In addition, the HTR showed a significant increase of health-related quality of life scores (SF-36) in physical functioning, physical role, bodily pain, social functioning, emotional role, and mental health. We also found HTR who regularly participated in phase II CRP displayed significantly higher aerobic capacity than those who did not receive phase II CRP at one year after transplantation. Early postoperative CRP should be recommended for clinically stable HTR to enhance physical functional capacity, increase level of well-being, and improve health-related quality of life.

SY19-306B-03

CODE OF LIFE AND CARDIOPULMONARY EXERCISE TESTING: HOLISTIC INTEGRATIVE PHYSIOLOGY AND MEDICINE

Xingguo Sun

St. Johns Cardiovascular Research Center, Los Angeles Biomedical Research Institute at Harbor-UCLA Medical Center, United States

The cardiopulmonary exercise testing is one important clinical functional test method, which linked to whole functions of respiratory, circulatory, metabolic and neurohumoral etc systems. For clinical using of cardiopulmonary exercise testing, we need a theoretical system of physiology and medicine for the all systems in human body in whole. For life, as an organic whole, breathing is the characterization, blood circulation is basics, metabolism is premise, the oxidation energy material supply energy is the core of metabolism, under neurohumoral regulation, with assistance of digestion, absorption, excretion, urinary, skin and all other systems for homeostasis, in order to achieve a dynamic tends to be a balance, and never reach the true balance of a functional state. This paper described the respiration, blood circulation, metabolism and neurohumoral regulation etc functional integration of the complex process of self-regulation, and the basic architecture of the proposed new theoretical system of Holistic Integrative Physiology-Medicine.

SY19-306B-04

Abstract is missing.

SY19-307AB-01

GOAL SETTING IMPROVES OUTCOMES IN POST-STROKE SPASTICITY

Anthony B Ward
Univ. Hospital of North Staffordshire, United Kingdom

This presentation will discuss the lessons to be learnt from studies of real time management of post-stroke spasticity (PSS). The BOTOXEconomic Spasticity Trial (BEST) was a study of Onabotlulinum A and standard of care (SC) versus placebo and standard of care. It examined functional goal achievement in upper and lower limb spasticity in patients undergoing a rehabilitation programme following stroke. The underlying message was that goals can be achieved, even, four years post-stroke, if they are clear, objective and agreed between the patient and treating team. The BEST study is the largest study of post-stroke patients and used the goal attainment scale (GAS) as its primary outcome measure. Goal setting allows patients and clinicians to focus on the aims of treatment and functional attainment was seen for the first time in upper limb treatment with any botulinum toxin; on this occasion with Onabotulinumtoxin A. Agreement of goals between clinicians and patients their documentation is important. The experience has proved beneficial and many centres involved in BEST have now implemented this approach in their clinical practice, as recommend by the authors of the paper. Active patient participation in goal-setting is valuable. It may empower patients and lead them to greater motivation to achieve their goals. However, it is important that these goals should be specific; so that they can be easily measured and achieved. The benefit was seen in both the OnabotlulinumA and placebo groups, which showed that SC was an important intervention for PSS patients.

SY19-307AB-02

FUNCTIONAL RECOVERY IN POST-STROKE SPASTICITY

Min Ho Chun
Asian Medical Center, Korea

Spasticity is a common feature of the upper motor neuron syndrome that occurs after stroke. It can have disabling effects on the stroke survivor because it causes pain and reduces mobility. The onset of spasticity is highly variable. For some patients, overactivities of all muscles are generated initially after stroke. Spasticity that occurs later on will be determined by factors such as location, origin, and severity of the lesion. In addition to the reflex-induced neuronal component of passive stretch and over time, non neuronal components can also contribute to the resistance to passive stretch. According to most studies, spasticity after stroke occurs more commonly and is more severe in the upper limbs than the lower limbs. It has been known for a long time that spasticity may cause pain, affects movement function and activity performance negatively and may lead to secondary complications after stroke. Possible risk factors for post-stroke spasticity have been identified, which includes early arm and leg weakness, left sided weakness, early reduction in activities of daily living, and a history of smoking. Healthcare costs for patients with post-stroke spasticity are four times higher than the patients without post-stroke spasticity. Therefore, preventing spasticity and treating emerging spasticity in a timely manner are essential. Early interventions may prevent or can reduce the development of spasticity after stroke.

SY19-307AB-03

SPASTICITY MANAGEMENT IN CEREBRAL PALSY

Rochelle Dy
BCM/Texas Children Hospital, Houston, TX, United States

Cerebral palsy is the most common cause of motor disability affecting children, and its incidence has increased over time. It is a group of permanent disorders affecting development of movement and posture due to abnormal muscle tone and weakness. It is also often accompanied by disturbances of sensation, cognition, communication, behavior and secondary musculoskeletal problems. This talk aims to provide an overview of Cerebral palsy, its classification and associated clinical findings, with an emphasis on tone and spasticity management.

SY19-307AB-04

SPASTICITY MANAGEMENT IN TRAUMATIC BRAIN INJURY

Gerard Francisco
Department of Physical Medicine and Rehabilitation, University of Texas at Houston, TIRR Memorial Hermann Hospital, United States

Lesions that damage corticospinal integrity, such as a traumatic brain injury (TBI), result in a constellation of signs and symptoms collectively called the "upper motor neuron syndrome (UMNS)." UMNS is characterized by exaggerated behaviors, such as hypertonia, spasticity, and abnormal co-contraction of agonist and antagonist muscles (positive phenomena), and motor deficits, such as weakness and loss of dexterity (negative phenomena). Managing spasticity primarily addresses the positive phenomena and as a result unmasks the negative symptoms. In turn, this can significantly impair function. It is important, therefore, to identify treatment goals following a thorough history and examination. For some, the goal may focus on reducing spasms, while in others, improving function by reducing spasticity and hypertonia that are interfering with motor abilities. Oral medications are effective in reducing spasticity, but may aggravate weakness and lead to complications, such as sedation and drowsiness. This is critical in some persons with TBI, who have problems with alertness and attention. Because of this potential for adverse events, more targeted interventions are increasingly being favored as first-line treatment. These include chemoneurolysis using phenol or alcohol, botulinum toxins, and intrathecal therapies. In the last several years new botulinum toxin products have been introduced but the superiority of one product over another has yet to be proven. Intrathecal baclofen is becoming a popular not only for spasticity but for managing severe paroxysmal sympathetic hyperactivity post-TBI. Non-pharmacologic approaches, including physiotherapy, physical modalities, and surgery, should be employed whenever appropriate based on treatment goals, response to prior interventions, and severity of problem.

SY19-307AB-05

VALIDITY AND RELIABILITY OF A NEW SCALE FOR THE MEASUREMENT OF SPASTICITY IN STROKE PATIENTS

Fang Li[1], Yuedi Wu[2], Li Xiong[2]
[1]Huashan Hospital, Fudan University, Shanghai, [2]The First Rehabilitation Hospital of Shanghai, Shanghai, China

Objective: To evaluate the reliability and validity of a newly-designed scale named Triple Spasticity Scale (TSS) in the affected elbow flexors and ankle plantar flexors of hemiplegic patients with stroke. *Methods:* Fifty-one consecutive post-stroke hemiplegic inpatients were included. The TSS and Modified Ashworth Scale (MAS) were rated by one physiatrist and one physiotherapist. The TSS includes three Subsections which are muscle tone, clonus and dynamic muscle length. The assessments of TSS by two raters were used to determine the inter-rater reliability. The assessments by

one rater (the physiatrist) one day apart were used to determine the test-retest reliability. The construct validity was analyzed between the TSS and MAS. The single measures of intraclass correlation coefficient (ICC) were chosen as the test statistic of reliability, whereas the Spearman correlation coefficient was chosen as the test statistic of validity. *Results*: The test-retest reliability was good in the total score of TSS (ICC=0.772–0.890). The inter-rater reliability was also good in the total score of TSS (ICC=0.803–0.827). The Spearman Correlation Coefficient demonstrated significant relation between the TSS and MAS both in elbow flexors and plantar flexors (r=0.803–0.927, $p = 0.000$). *Implications:* The TSS provided good test-retest reliability and inter-rater reliability in the spasticity measurement. The construct validity of TSS was sufficient. This newly-designed scale offers an alternative measuring spasticity, and avoiding some shortcomings of previous measurements in the meanwhile.

SY19-307AB-06

TROUBLESHOOTING INTRATHECAL DELIVERY SYSTEMS

Michael Saulino
MossRehab, United States

Intrathecal delivery of therapeutic agents is an effective long-term treatment for chronic pain and severe spasticity. The overall complication rate has been reported to be between 10 and 31% with malfunctions in the catheter component of the system being reported much more commonly compared to the pump component. Interruptions in intrathecal delivery can results in serious, potentially life-threatening, complications. This presentation will review the typical methods for evaluating malfunction in intrathecal delivery systems including electronic interrogation of pump function, plain radiography, CSF aspiration via a catheter access port, fluoroscopic imaging with contrast injection, CT myelography including 3-D reconstruction and nuclear medicine cisternography. The procedural details of each approach will be described. The advantages, disadvantages and limitations of technique will be reviewed. Lastly, the feasibility of using CSF pressure signals to detect malfunction of intrathecal catheters will be presented.

SY19-307AB-07

Abstract is missing.

SY19-307AB-08

NEWLY DEVELOPED TECHNIQUES FOR EPIDURAL STEROID INJECTIONS IN RESPONSE TO HEIGHTENED SAFETY CONSIDERATIONS

Wenchun Qu*, William D Mauck, Mathew J. Pingree
Mayo Clinic, Rochester, MN, United States

Epidural steroid injections have been used for effective management of lower limb radicular pain. There are three basic approaches: interlaminar, transforaminal, and caudal. Selection of an approach is based on the distribution of the pain, neurologic examinations, and concordant imaging and electrophysiological findings. Transforaminal epidural steroid injection (TFESI) has been used for radicular pain with evidence of significant pain relief. The success has been attributed to the ventrolateral spread of the steroid, with a higher local steroid concentration due to the relative low volume directly instilled in close proximity to the nerve root. Serious adverse events have been reported. Although rare, those events were catastrophic with spinal cord injuries. It has been hypothesized that it is an ischemic event secondary to the occlusion of the anterior spinal artery. The thrombus has been suspected to be congregations of large particles from particulate steroid preparations, which were delivered via puncturing of the artery of Adamkiewicz (AKA). Recent angiogram studies have shown that AKA was overwhelmingly located in the cephalad aspect of the foramen. Cadaver studies further specified that the artery was only found ventral to the nerve roots. With better understanding of the anatomy of AKA and nature of steroid preparations, non-particulate steroid, infraneural and retroneural approaches have been recommended. Furthermore, DSA has been widely used for an extra layer of protection.

SY19-307AB-09

EUROREHABILITATION WITH EEG, EMG AND VIRTUAL REALITY

Xiaoli Li
Beijing Normal University, Beijing, China

Brain or spinal cord injury will greatly affect the quality of life of patients. Neurorehabilitation is to aid recovery from a nervous system injury, and to minimize and/or compensate for any functional alterations resulting from it. Obviously, neurorehabilitation is a complex medical process. In this talk, we will review the application of biofeedback with EEG/EMG and virtual reality in the neurorehabilitation. (1) The biofeedback can be used to evaluate the recovery states during the neurorehabilitation training. In this study, we propose a parameter estimation model and a feature fusion algorithm to process EEG and EMG signals under different movements, which can be applied to evaluate the movement states in rehabilitation training. The proposed method can improve the accuracy of movement pattern recognition and optimize the strategy of rehabilitation training. Furthermore, it can support to realize the rehabilitation robots with " individual adaptability". (2) We review the application and development of virtual reality in the field of neurorehabilitation, including advantages, limitations and challenges. Then, we will address our proposed system that is a nature, low cost and wireless interaction, which consists of a personal computer and a webcam/kinect. Three virtual tasks are designed in our system. The preliminary study demonstrates the feasibility of our developed system for the rehabilitation of ataxia patients and brachial plexus injury patients.

SY19-308-01

SEXUAL REHABILITATION PROGRAM FOR PERSONS WITH SPINAL CORD INJURY IN KOREA

Bum-Suk Lee
National Rehabilitation Center, Korea

The Korean National Rehabilitation Center has 300 beds for rehabilitation. SCI unit of our center has 60 beds. In 1996, we started the Sexual Rehabilitation Program for persons with disabilities. One full-time psychologist and one part time medical doctor worked for this program. During the 16 years since the beginning of the program, we have had about 28,000 cases of sexual counseling and education, and 1,700 cases of sex therapy (mainly for erectile dysfunction). 380 couples have used the 'sex practice room' in our hospital. We have conducted 21 researches, and published 3 books and 1 DVD about sexual rehabilitation for persons with disability. We studied the sexual function and satisfaction of 214 spinal corded injured male and 49 partners. The factors affect the sexual satisfaction were erectile function and couples partnership. We had developed new erection scale. The '100 Erection Scale' is a simple scale to describe the erectile function ('no erection'=0, 'as hard as before injury'=100). After the study of 177 males, we can conclude that this scale is a simple and good predictive scale for erectile function with in persons with SCI. The 15 couples who participated in '4 weeks small group counseling' showed higher sexual adjustment and satisfaction scores and less depressive than the control group who participated in simple sex education. We studied 71 spinal cord injured males and partners who used the sex practice room. Sex practice room in rehabilitation hospital is a new approach and a very helpful program.

SY19-308-02

CONTEMPORARY MANAGEMENT OF SEXUAL DYSFUNCTION IN THE SPINAL CORD INJURY MALE

Donald R. Bodner
Professor of Urology, Case Western Reserve University, Cleveland, Ohio, United States

Objective: To review the current diagnosis and treatment of sexual dysfunction in the Spinal Cord Injury male. *Methods:* A literature review was performed using PubMed and EMBASE to provide literature sources. Peer reviewed, evidence based journals were used as the basis of the analysis. We also relied on the recently published guideline on Sexuality and Reproductive Health in Adults with Spinal Cord Injury (1). The data was compiled and guidance is offered on best practices. *Results:* Spinal Cord Injury men suffer from erectile dysfunction, low testosterone and ejaculatory problems. The prevalence of these disorders is dependant on the level of injury and concomitant medications as most dominant factors. Treatment options for SCI male sexual dysfunction are safe and effective. PDE5 inhibitors remain first line therapy while secondary options include intracavernosal injection therapy, vacuum erection devices, intraurethral MUSE, and penile prostheses. There is a paucity of long-term data on PDE5 Inhibitors, but short-term data suggest these drugs are safe and effective. There is limited data on hypogonadism in SCI men, which provides guidance for further research. With respect to male factor infertility and ejaculatory dysfunction, standard therapies used in clinical practice for many years remain safe and effective. *Implications for Rehabilitation*: With advances in critical care and comprehensive rehabilitation, attention must remain focused on sexual rehabilitation. Standard treatment options for sexual dysfunction in the SCI male are safe and effective as in the non-SCI population. There is a need to bolster research efforts in hypogonadism in the SCI male.

SY19-308-03

SEXUAL AND URINARY REHABILITATION AFTER RADICAL PROSTATECTOMY

Hui Zhu
Chief, Urology Section, Louis Stokes Cleveland VA Medical Center, Cleveland, OH, United States

Prostate cancer is the most common cancer in many western nations such as the USA, and is become more prevalent in developing nations such as China. Radical prostatectomy, performed in various forms (i.e., open, laparoscopic, and robotic assisted prostatectomy) is the main stay treatment. While radical prostatectomy is an effective treatment for patients with localized prostate cancer, the most common associated long-term side effects are erectile dysfunction and urinary incontinence. Both conditions have significantly negative impact on the patient quality of life after the cancer treatment. These devastating conditions, developed right after the surgery, will nevertheless improve spontaneously postoperatively, even months or years after the initial operation. To facilitate the recovery of sexual and urinary function after radical prostatectomy, various rehabilitation approaches have been investigated and established. The currently most commonly adopted rehabilitation programs for sexual function include use of oral phosphodiesterase type 5 inhibitor (PDE-5 inhibitors), vacuum constriction device (VCD), transurethral alprostadil, and intracavernous injection of prostaglandin E1 or alprostadil. The most widely used rehabilitation strategies for urinary control include use of pelvic floor excise (e.g., Kegel exercise) and bio-feed back. In this presentation, the mechanisms of the rehabilitation strategies, the start-of-the-art clinical evidence behind each rehabilitation strategies, and their clinical efficacy for patients who have developed sexual and urinary dysfunction after radical prostatectomy will be examined. In addition, important clinical questions will also be raised as a guide for future research.

SY19-308-04

URODYNAMIC INVESTIGATION AFTER SPINAL CORD INJURY: ONE-CHANNEL CYSTOMETRY VS. MULTICHANNEL URODYNAMICS

Mouwang Zhou
Peking University Third Hospital, China

It is important to identify the type of neurogenic lower urinary tract dysfunction after spinal cord injury (SCI), It could not be predicted only by the location of injury and neurological examination. Regular multichannel urodynamic observation should be performed to assess the function of bladder and urethral. Unfortunately multichannel urodynamic system was not a standard equipment in every SCI rehabilitation center in China. In this situation, one channel device with transurethral catheter provide an alternative way. It is easy to get and perform, cheap and applicable. And one channel device has also revealed significant contribution in assessing lower urinary tract function, especially in measuring parameters during filling phase. We compared one-channel cystometry with multichannel urodynamics in 35 patients after SCI. The simple one-channel cystometry immediately followed by a regular multichannel urodynamics. It has shown good correlation between these 2 methods for the detection of neurogenic detrusor overactivity. We also found that the autonomic dysreflexia (AD) was not rare in the SCI patient above T6 while we used electrocardio and blood pressure monitoring during urodynamic investigation. It is recommended that blood pressure measurement during filling phase in urodynamic observation maybe a proper method to diagnosis potential AD after SCI.

SY19-308-05

THE APPLICATION OF THE ULTRASOUND FOR THE EVALUATION AND TREATMENT IN THE NEUROGENIC BLADDER

Weixin Yang
Department of Rehabilitation, the First Affiliated Hospital of Soochow University, China

Ultrasound is an effective method to visualize the lower urinary tract and evaluate the function of the bladder and urethra in patients with neurogenic bladder**.** Ultrasound examination of the lower urinary tract should include a study of the bladder morphology, detrusor wall thickness, the structures round the vesical neck and the external urethral sphincte. The examination technique may be transabdominal, transrectal, transvaginal or transurethral. Hypertrophy of detrusor muscle of the bladder wall has been described in association with many different disorders of the lower urinary tract, such as benign prostatic enlargement, urethral valves, dyssynergia of the rhabdosphincter, neurogenic bladder disorders and detrusor instability. The bladder pathology that can be studied by sonography includes cystitis, calculi, clots, diverticula, trauma etc. The sensitivity and the specificity of the method are high and sometimes superior to cystoscopy. Detrusor-sphincter dyssynergia (DESD) refers to the impaired coordination between detrusor muscle contraction and relaxation of the sphincter muscle during voiding, which can result in difficulty emptying the bladder. Botulinum toxin A injection into the external urethral sphincter for treating DESD can significantly reduce the static and dynamic urethral pressures. In order to localize the botulinum toxin A injection site more accurately in the external urethral sphincter and facilitate needle placement, the application of ultrasound-guided location is important.

SY19-308-06

BOWEL DYSFUNCTIONS FOLLOWING SPINAL CORD INJURY

Klaus Krogh
Aarhus University Hospital, Denmark

Objective: Bowel dysfunction is extremely common after spinal cord injury (SCI) and often termed Neurogenic Bowel Dysfunction (NBD). This presentation will provide a review of epidemiology, pathophysiology, clinical assessment and treatment of NBD. *Method*: Existing literature on NBD is reviewed with the main focus on clinical evaluation and new treatment modalities. *Results*: Approximately 80% of subjects with SCI have constipation and 20% have fecal incontinence at least once per month. Symptoms of NBD have severe consequences for quality of life and their prevalence increases significantly with time since injury. The pathophysiology of NBD depends on the level of SCI, but most subjects have prolonged colonic transit time and poor or absent anorectal sensation and anal sphincter control. In patients with high SCI autonomic dysreflexia caused by constipation or bowel emptying procedures is common. Assessment of NBD includes thorough patient history, anorectal examination and, in some cases, radiographically determined colonic transit time. A specific NBD score has been validated for assessment of symptoms and International Bowel Function Basic and Extended SCI Data Sets have been developed. In patients not responding to standard treatment with oral laxatives, digtal anorectal stimulation and mini enema, transanal colonic irrigation is recommended. In severe cases surgical treatment including Malone Antegrade Continence Enema or colostomy should be considered. Electrical nerve modulation and the surgically created somato-sensory reflex arch are still considered experimental in patients with NBD. *Implications on Rehabilitation*: Neurogenic bowel dysfunction is extremely common in subjects with SCI and should be assessed thoroughly as several treatment methods are available.

SY19-308-07

REHABILITATION PROGRAM EVALUATION

Mauro Zampolini
Regional Public Health Service - AUSL Umbria, Italy

Rehabilitation programs provide the base on which functional recovery is built. Rehabilitation goals can be defined after the assessment of clinical and functional problems. Functional problems in impairment, activity limitation and restriction of participation should be identified according to the international classification of functioning and disability (ICF). The ICF provides a common language in identifying the problems, allowing standardized data collection and benchmarking among different rehabilitation facilities. A new perspective is the evaluation of capacity and performance, in order to differentiate the capacity of a person without help and his/her performance in the "real world". In order to quantify improvement during the rehabilitation program functional scales should be used, since the ICF is a classification and not a measurement system. However, the classical score of functional scales should be related to the ICF framework in order to assess the severity of the problem. Another issue is that functional scales have psychometric problems due to a lack of linearity of the measurement. While Rasch Analysis is based on the item response theory (IRT) model that makes the scales that are usually used linear. In neurological rehabilitation the program should be differentiated according to the type of neurological damage: focal and diffuse damage diseases or degenerative diseases. The program changes depending on the time from the onset of disease and the intensity and the type of intervention should be accordingly defined more appropriately. Rehabilitation programs should guarantee the best functional recovery and the evaluation should be based on specific outcome indicators.

SY19-308-08

HIGH-INTENSITY TRAINING IN PERSONS WITH NEUROLOGICAL DISEASES

Jan Lexell,[1,2]
[1]Department of Health Sciences, Rehabilitation Medicine Research Group, Lund University, [2]Department of Rehabilitation Medicine, Skåne University Hospital, Lund, Sweden

Neurological diseases such as stroke, multiple sclerosis and Parkinson's disease are leading causes of life-long disability. High-intensity training has become an effective rehabilitation intervention to improve functioning and reduce disability in these persons. The most common forms of high-intensity training are Constraint Induced Movement Therapy (CIMT), Progressive Resistance Training (PRT) and Cardiorespiratory Fitness Training (CFT). Over the past decade scientific evidence supporting the use of high-intensity training in rehabilitation and as health promotion for people with neurological disorders has increased. In this presentation, there will be an up-to-date presentation of CIMT and PRT and current evidence for short- and long-term improvements in body functions, activities of daily living and participation in society following these interventions. There will also be a summary of recent published randomized controlled trials regarding the effects of cardiorespiratory fitness training in different neurological diseases on physical function, activity, participation, life satisfaction and mood. Finally, there will be a discussion about different barriers that can impede the use of high-intensity training and exercise, and the importance of reducing these barriers to augment the implementation of such programmes in order to increase functioning and physical fitness level after completion of in-patient or out-patient rehabilitation.

SY19-308-09

REHABILITATION IN PARKINSONS DISEASE: EVIDENCES AND EXPERIENCES

Areerat Suputtitada
Chulalongkorn University & King Chulalongkorn Memorial Hospital, Thailand

Parkinson's disease (PD) is a complex neurodegenerative disorder with far reaching implications for patients and their families. It is nowadays one of the most common neurological diseases. Although pharmacological treatment has changed its evolution, PD still leads to major disability that impairs the quality of life of patients. The characteristics of the disease, the long life span after diagnosis, the short duration of the effectiveness of drugs, and the frequent adverse effects related to drugs prompt the need for additional therapeutic interventions to improve motor performance. The positive effects of different rehabilitation treatments are established. A multidisciplinary intensive rehabilitation treatment in which combined treadmill with visual, auditory and somatosensory cues, and a stabilometric platform always improve gait and balance in PD patients. Progressive resistance strength training is an exercise therapy that can increase the ability of muscles to generate force, improve walking ability and enhance balance. Balance training improves postural stability and the level of confidence perceived while performing daily activities that require balance and reduces the frequency of falls. My session will cover evidences and experiences in rehabilitation for PD focusing on transfers, posture, upper limb function, balance (and falls), gait, and physical capacity and (in) activity. The cueing strategies, cognitive movement strategies, and exercise to maintain or increase independence, safety, and quality of life will be highlighted.

SY19-308-10

HYBRID ASSISTIVE NEUROMUSCULAR DYNAMIC STIMULATION (HANDS) THERAPY – NEW THERAPEUTIC STRATEGY FOR HEMIPARETIC UPPER EXTREMITY AFTER STROKE

Toshiyuki Fujiwara
Keio University School of Medicine, Japan

We devised a therapeutic approach to facilitate the use of the paretic upper extremity (UE) in daily life by combining integrated volitional control electrical stimulation (IVES) with a wrist splint, the hybrid assistive neuromuscular dynamic stimulation (HANDS) therapy. IVES can change its stimulation intensity in direct proportion to the changes in voluntary generated EMG amplitude recorded with surface electrodes placed on the target muscle. The stimulation was applied to the paretic finger extensors. Using this assistive stimulation combined with a splint, patients with moderate to severe hemiparesis, who cannot extend their paretic fingers voluntarily, could extend their fingers at their will. Patients wore a wrist-hand splint and carried a portable IVES in an arm-holder for 8 h during the daytime. The system was active for 8 h, patients were instructed to use their paretic hand as much as possible. HANDS therapy was conducted for 3weeks. The patients were also instructed to practice bi-manual activities in their daily lives. To examine the effects of the HANDS system, a randomized controlled trial conducted with stroke patients. Furthermore, we studied changes in selected markers of brain and spinal plasticity induced by HANDS therapy. The paretic upper extremity motor function improved after 3 weeks HANDS therapy. Neurophysiologically, the intervention induced restoration of presynaptic and long loop inhibitory connections as well as disynaptic reciprocal inhibition. Paired pulse TMS study indicated plastic change in the affected hemisphere. The HANDS therapy may offer a promising option for the management of the paretic UE in patients with stroke.

SY19-311A-01

MANAGEMENT OF ACL INJURY IN THE YOUNG ATHLETE

William Micheo
University of Puerto Rico School of Medicine Office, United States

The anterior cruciate ligament (ACL) is essential for both static and dynamic stability of the knee. It is commonly injured in the young athlete during sports activities by noncontact mechanisms that include landing with the knee in valgus and extension, sudden deceleration, change of direction, and rotation. Several modifiable and nonmodifiable risk factors predispose athletes to this injury, especially women. Early diagnosis, treatment directed to protect secondary knee structures, and rehabilitation play an important role in the management of ACL injury. Despite a lack of scientifically validated and published guidelines to help clinicians decide between conservative or surgical treatment, criteria such as patient's age, pain, recurrent instability, injury to secondary structures, and desired level of activity should be considered. Accelerated rehabilitation protocols for patients who have and have not undergone an operation are available and recommended with goals of reducing complications such as recurrent injury, loss of motion, residual weakness, and associated osteoarthritis. However, injury prevention protocols could be the next big step in management of ACL injury with emphasis on reducing modifiable risk factors in susceptible individuals who participate in sports.

SY19-311A-02

COMPREHENSIVE REHABILITATION OF SPORTS INJURIES

Nicolas Cristodoulou
President of PRM European Union, Cyprus

The lecture presents the basic principles of sports injuries rehabilitation, the stages of a tissue injury and the techniques used in rehabilitation of such problems. Since rehabilitation begins at the time of injury and continues even after the athlete's return to competition, the focus is on what is done at the field-side at the time of injury, in the rehabilitation departments and during the athlete's return to the field for training and competition. To design a rehabilitation plan which would maximize the restorative events, it is important to know the pathophysiology of the tissue-injuries and the three stages of their healing process: the inflammatory stage, the fibroblastic-repair stage, and the maturation-remodelling stage. Knowledge of the several physical modalities used during the acute, sub-acute and functional phase of rehabilitation is important as well. Improvement of neuromuscular control, correction of maladaptive behaviours, sport-specific and multi-plane activity, functional retraining, balance & proprioception re-education and athletic psychological approach are essential parts of the whole rehabilitation program. Examples for mobility exercises, strength exercises and stretching exercises are presented for several muscle groups and the relevant joints.

SY19-311A-03

THE ROLE OF EXERCISE IN THE TREATMENT OF OBESITY

Edward Laskowski

Mayo Clinic Sports Medicine Center, United States

The United States and the world are in the midst of a significant public health problem related to obesity and inactivity. This epidemic has far-ranging consequences for our workforce and our children and shows no signs of slowing in the near future. Significant research has been performed on the effects of exercise for the reduction of body weight; results of most studies indicate that exercise alone has a small effect on body-weight reduction independent of caloric restriction. However, when combined with dietary restriction, exercise has a synergistic effect and enhances weight loss beyond the effect of diet alone. In addition, exercise has been shown to have significant beneficial effects on cardiovascular and metabolic risk factors independent of actual weight loss, and losing just a small amount of weight can have a significant beneficial effect on these parameters. Genetic factors related to obesity have been found to be positively modified when persons incorporate physical activity into their lifestyle. Research has shown that too much sedentary time is an independent health risk. Thus, even some people who meet physical activity guidelines could benefit from sitting less. Exercise also is essential for the prevention of weight gain over a life span, although the amount required to prevent weight gain may be closer to twice the amount of exercise recommended by the current Physical Activity Guidelines. In many ways, the physiatrist is the most well prepared of all the specialists to address the complex, multidimensional problems of obesity and inactivity.

SY19-311A-04

EFFECT OF AEROBICS AND SUPERVISED PHYSIOTHERAPY IN PATIENTS WITH PAINFUL STIFF SHOULDER

Taslim Uddin
BSM Medical University, Dhaka, Bangladesh

Background: Compromised shoulder movement due to pain, stiffness, or weakness can cause substantial disability and affect a person's ability to carry out daily living activities (ADLs) (eating, dressing, personal hygiene) and work. *Introduction:* painful stiff

shoulder is a common condition in the physiatry OPD, pain clinics and rheumatology or musculoskeletal OPDs. Self reported prevalence of shoulder pain is estimated to be between 16% and 26%; it is the third most common cause of musculoskeletal consultation in primary care, and approximately 1% of adults consult a general practitioner with new shoulder pain annually. Most frequent cause is frozen shoulder and although the condition is said idiopathic yet, most of the cases are associated with minor trauma or diabetes mellitus. Pathologic basis of stiffness: The shoulder capsule is normally a very flexible elastic structure. Its looseness and elasticity allows the huge range of motion that the shoulder has. With a frozen shoulder this capsule (and its ligaments) becomes inflamed, swollen, red and contracted. The normal elasticity is lost and pain and stiffness set in. *Treatments*: the natural history of the disease indicates that it runs 03 stages and if nothing is done shoulders improve significantly over 2–4 years after onset. However the pain and limitations of the stiff shoulder generally require a treatment. Modalities include Physiotherapy, analgesic - anti-inflammatory agents, suprscapular nerv blocks, Injections of steroids and other agents, hydrodilatation procedure, arthroscopic capsular release or manipulation under anaesthesia (MUA) or acupuncture. The study: A study as carried out in the department of Physical medicine and rehabilitation BSM Medical University Dhaka during March 2008 to May 2009 to see the effects of aerobics and mobilizing exercise over thermotherapy modality with shoulder mobilizing exercise. 100 patients have been enrolled in to the study. Main outcome measure was active and passive range of motion (ROM) of the affected shoulder, pain, disability, and quality of life. Both groups experienced improvements in terms of pain, disability, and quality of life after the treatments; and when the groups were compared, significant effect of ROM, pain and disability index was found for aerobics preceding mobilizing exercise group. *Conclusions*: interventions that may shorten the clinical course should be highlighted. This topic describes the clinical and pathological features of painful stiff shoulder with an outline of the current treatment options, review the published results and present our own study.

SY19-311A-05

THE EFFECT OF LOAD AND EXERCISE ON BONE MASS AND STRUCTURAL GEOMETRY

Giovanni Iolascon*, Francesca Gimigliano, Raffaele Gimigliano

Second University of Naples, Italy

Mechanical strains, due to weight bearing or muscular loading forces, play a pivotal role in the triggering of the bone remodeling process all along the adult life. By means of remodeling, bones are able to adapt continuously to mechanical loads by adding bone tissue to improve resistance or by resorbing bone in response to a decreased use. The mechanical parameters locally influencing balance between formation and bone resorption are frequency, intensity, and duration of the mechanical stimulus. Bone strength and quality are improved if the mechanical stimulus is applied by short increments rather than over long periods. Osteocytes are able to respond to mechanical stimulation by modulating the expression and the secretion of many molecole. In particular, osteocytes are able to respond to mechanical stress via the Wnt/Lrp pathway, that is a negative regulator of sclerostin secretion, whereas the sclerostin itself is a negative regulator of the bone formation. Osteocytes can propagate their message to other connected cells by diffusion of produced molecules (paracrine effects), and by local transmission through gap junctions. Physical activity has a positive impact on bone quality. On the other hand, the reduction of mechanical loading, such as in a murine model mimicking weightlessness, increase osteocyte apoptosis, osteoclast recruitment and bone resorption. The global role of the osteocyte in mechano-sensing is generally accepted but the molecular pathways involved in the mechano-sensing phenomenon remains debate.

SY19-311A-06

CONSERVATIVE AND MINIMAL INVASIVE TREATMENTS FOR THE DISCOGENIC LBP

Sang-Heon Lee

Department of Physical Medicine and Rehabilitation, Korea University Medical Center, Seoul, South Korea

Intervertebral disc degeneration with discogenic nature is estimated to 39% of the chronic low back patients.There are no current consistent and highly effective treatment options for discogenic low back pain. However, the initial treatment for the discogenic pain is typically conservative and core stabilization exercise. Core stabilization exercise is the most important treatment for the discogenic LBP because the segmental instability of the spine is one of the main causes of discogenic LBP. Also, discogenic pain has an aptitude to aggravated or recur with aggravating causes such as spine segmental instability, frequent weight lifting and any kinds of the behavior increasing intradiscal pressure or shearing force. These are should be avoided. IF these conservative treatments are failed, the intradiscal injection and minimal invasive intradiscal treatments can be applied.Intradiscal injection of hypertonic dextrose showed the modest outcome. Overall, 43.4% of patients fell into the sustained improvement group with an average improvement in numeric pain scores of 71%, at 18 month measurements. Current heating methods include intradiscal electrothermal therapy, traditional radiofrequency and "cooled" radiofrequency heating. Coblation technology also has the potential of coagulating the outer annulus. A newly available in Korea, is a navigable pecutaneous decompression device named L'DISQ (U&I Co. Ltd.) that can reach the outer annulus. The pre-treatment and post-treatment VAS of these interventional treatments were 7.3, 6.8 & 6.9 to 3.7, 3.6 & 2.8 on the IDET, Coblation Nucleoplasty and L'DISQ, respectively.

SY19-311A-07

PLATELET RICH PLASMA THERAPY IN CHRONIC TENDINOPATHY: THAI EXPERIENCE

Sukajan Pongprapai

Thai Rehabilitation Medicine Association, The Royal College of Physiatrists of Thailand, Thailand

Platelet-rich plasma (PRP) is a kind of autologous blood with concentrations of platelets above normal level (PRP was defined as having at least 4-8 times above normal platelet concentration). Platelets play a role in normal healing response via local secretion of growth factors and recruitment of reparative cells. PRP was first utilization on maxillofacial and plastic surgery to improve bone healing in 1990. Later, there are growing evidence support the use of PRP injections for the treatment of muscle, tendon injuries and degeneration. Recent development of PRP preparation devices in outpatient and surgical settings has led to an increased use in sports medicine, orthopaedic, rheumatology, and rehabilitation medicine. Cell culture studies have provided evidence that PRP can stimulate processes of tendon healing. Several investigators have found increased collagen gene expression and increased production of vascular endothelial growth factor and hepatocyte growth factor in human tenocytes treated with PRP. In addition, recently reported that PRP stimulates the mobilization of circulation-derived cells to the area of injection and stimulates type I collagen production. In Thailand, PRP has been utilised in the field of maxillofacial surgery and esthetics for decade. But in the last few years, it has been using in musculoskeletal field. At Vichaiyut Medical Center, PRP has been used since early 2011. Four cases studies of chronic supraspinatus tendinitis injected with PRP.Three of them have shown good result of pain and functional scores within 3 months but one showed no improvement after 3 consecutive treatments. There were 2 cases of chronic medial epicondylitis and lateral epicondylitis reported

fair to good result of pain score within 6 months. In summary, PRP has been used safely in a variety of conditions such as acute and chronic muscle, ligament and tendon injuries. Most studies to date are involved in small sample sizes. However more clinical trials are certainly needed.

SY19-311A-08

FROM CLINICAL OBSERVATION TO INSTRUMENTAL GAIT ANALYSIS – HOW TO OPTIMIZE PM&R MANAGEMENT?

Luis Jorge Jacinto
Director do Serviço de Reabilitação de Adultos 3; Centro de Medicina de Reabilitação de Alcoitão, Portugal

Gait is the motor task most frequently performed by human beings during their lifetime. In PM&R daily practice, clinical observational and instrumental gait analysis, are key to identifying deficits and compensation strategies that are responsible for any impaired gait pattern observed. The naked-eye, in which observational analysis is based, has a number of limitations regarding the comprehensiveness, objectivity, repeatability, and availability of the data collected during every performance by the subject to study. All these limitations can be largely overcome, when using a tridimensional motion analysis system synchronized with force plates and dynamic telemetric EMG, such as in a Gait Laboratory. When used in clinical settings, gait laboratories allow clinicians, and therefore patients, to obtain better achievement rates for the treatment goals related to gait performance and safety. On the other hand, the scientific quality and objectivity of outcome measurement and monitoring are enhanced. The lecture will revisit the clinical evaluation tools and the instrumental methods available. Clinical application and utility will be illustrated with several case reports.

SY19-311A-09

IMPACT OF CLINICAL AND LABORATORY ASSESSMENT TO IMPROVE WALKING WITH ROBOTIC DEVICES

Marco Franceschini
Rehabilitation Department, IRCCS San Raffaele-Pisana, Rome, Italy

Stroke is one of the most important healthcare problems in Western Countries and one of the main causes of death and permanent activity limitations and participation restrictions. In future years this relevant role as cause of disability will increase. In Italian model the Physiatrist plays a central role respect to the main goals: to obtain an early rehabilitative management of patients, to coordinate and to conduct the rehabilitative process in every phase. In acute phase the team manager is Neurologist or Geriatric, but the involved Physiatrist is "Responsible" for the Rehabilitative project of the patient. Differently in sub acute phase the Physiatrist is the team manager. To obtain these objectives, a correct and homogeneous assessment of stroke patient is needed, so in 2008 SIMFER established a Project Group to propose a standardized minimal assessment for Stroke patients in Italy. A correct organizational model needs a strong correlation with the present clinical and basic research, so that providing some innovative clinical approaches to rehabilitation programs in stroke. At this time the strategies in stroke rehabilitation are changing: the paradigm of stroke rehabilitation approaches to improve motor function is focused on a training with high-intensity, repeatable and specific tasks. The current goal of clinical research in rehabilitation is the translation from basic research to the clinical field. In conclusion the Physiatrist in Italy has a central role in the assistance model of the persons with Stroke and plays an active role in obtaining an integration with basic and technological laboratories of research.

SY19-311A-10

THE USE OF MOTION ANALYSIS IN SPORTS MEDICINE

David Burke
Emory University School of Medicine, United States

As the science of sports medicine progresses, athletes naturally look to specific means by which they may enhance their performance. In addition, sports medicine physicians need means by which they may assist with the assessment of performance, and the risk of injury among their patients. Motion analysis, is a technique that has great applicability towards both missions. This talk will review specific capabilities of motion analysis, when reviewing sport specific behavior, and will illustrate different means by which these data may be captured. The initial presentation will review kinetics and kinematics capability in a typical motion analysis laboratory. Examples from motion analysis lab will illustrate the means by which this equipment can be used to analyze and enhance techniques using martial arts as an illustration. In addition, data will be reviewed in which a motion analysis lab was used to reduce stresses on the knee during training, resulting in the development of a new shoe. Finally, portable technologies for motion analysis will be reviewed, with an emphasis on capacity of individuals to use ubiquitous technology to facilitate training and evaluation.

SY19-311A-11

EVALUATION OF SPASTIC GAIT WITH BLOCKADES AND INFILTRATION

F. Molteni, H. Valduce

Villa Beretta Rehabilitation Centre, Costa Masnaga, Italy

Stability during human locomotion is continuously challenged, requiring mechanisms that integrate visual, vestibular and somatosensory inputs . In humans, the mass of the trunk corresponds to almost half of the total body mass. As a consequence, trunk position has an important impact on human motion. Trunk control is the ability of the trunk muscles to allow the body to remain upright, adjust weight shift, and performs selective movements of the trunk so as to maintain the center of mass within the base of support during static and dynamic postural adjustments.Despite evidence demonstrating the importance of trunk performance after stroke, studies evaluating therapy aimed at improving trunk function are limited. The sensory-motor impairment of trunk interferes with the functional performance after stroke, Parkinson Disease, Multiple Sclerosis, TBI, SCI. The emphasis of UMNS rehabilitation has been to restore independence in gait and arm function.To some extent, this focus may unintentionally bypass the develop- ment of good trunk stability in preparation for the performance of daily life skills. In addition, early hospital discharge can result in the use of atypical or compensatory strategies to compensate for trunk instability. Later in recovery, these compensatory patterns may be learned and difficult to reverse. Trunk position sense is an essential element of trunk postural control. Even a small impairment in trunk position sense may contribute to trunk instability. Clinical and Instrumental Motion Analysis and factorization analysis were used in order to understand the perturbation effects and suggest neural mechanisms related to the described postural responses. Especially, the main effects of trunk inclination on kinematics during walking are well identified, whether for able populations, elderly or people with trunk deformities. In addition, natural inclinations of the trunk with respect to the vertical, whether it be forward (FW) or backward (BW), have been highlighted during steady-state gait. Knowing the central nervous system (CNS) strategies elicited during perturbations to balance, based on experimental data directly related to the motor gesture, may be relevant to advance injury prevention and to promote specific rehabilitation training procedures.

SY19-311B-01

REHABILITATION DISASTER RELIEF - THEORY, SCIENCE AND PRACTICE

Jianan Li

Department of Rehabilitation Medicine, the 1st Affiliated Hospital of Nanjing Medical University, China, 210029. WHO-ISPRM sub-committee of Rehabilitation Disaster Relief

Objective: To review and summarize international experience in rehabilitation disaster relief. *Methods*: Literature review and on site investigation. *Results*: Natural disasters are frequently happened with massive casualty and damages. The major purpose of medical disaster relief is to save life (on-site rescue, emergency care, surgeries and intensive care for the severely injured) and to reduce disability by medical rehabilitation starting from acute stage in hospitals, recovery stage in rehabilitation facilities and returning to society. The key components in medical rehabilitation services for the victims are: local government support to provide social and medical resources for essential environment of medical rehabilitation, financial support from government and/or non-government organizations (NGO) and volunteers of rehabilitation professionals. A close cooperation among NGOs, international academic societies and United Nation/World Health Organization (WHO) is essential to overcome diplomatic barrier, to provide technical resources and to provide safety for the volunteers. The role of International Society of Physical and Rehabilitation Medicine (ISPRM) is to provide medical rehabilitation resources, including guidelines for various injuries and health conditions, database of rehabilitation professionals, co-ordination for the medical rehabilitation teams as well as financial support to the actions. More and more evidences are supporting that early rehabilitation intervention may significantly facilitate clinical efficacy at acute stage, reduce disabilities and improve quality of life for the disaster survivors in long term. *Conclusion*: Comprehensive rehabilitation disaster relief is essential for medical management of disaster victims. The infrastructure of medical rehabilitation needs further research with longitudinal prospective design.

SY19-311B-02

STAND TALL - AN ORTHOPAEDIC REHABILITATION PROGRAM – FROM THE 2008 EARTHQUAKE TO NATIONAL NETWORK AND IMPACT

Kai-Ming Chan

[1]The Chinese University of Hong Kong, China, [2]Prince of Wales Hospital,China, [3]Stand TALL, China

On May 12, 2008, a 7.9 earthquake in Wenchuan, Sichuan altered the lives of 350,000 people in the blink of an eye. The earthquake inflicted a devastating degree of injuries ranging from paralysis from spinal cord injuries to deformities resulting from post fracture infection. 10 days after the earthquake, the "Stand TALL" program was initiated by the Chinese Speaking Orthopaedic Society to aid the people of Wenchuan on their road to recovery from this heartbreaking disaster. The Chinese Speaking Orthopaedic Society understands that the road to recovery is not simple and will require an effective and sustainable approach. Stand TALL aims to unite experts from around the globe to efficiently utilize cutting-edge technology and knowledge to rebuild the lives of the victims. As a professional healthcare charity organization, Stand TALL has been continuously caring for patients as well as training rehabilitation medical staff within the Sichuan Province. Over the past years, Stand TALL has provided comprehensive treatment services to patients, including tailor custom treatment plans, adjustment or changing of prosthesis, or arrangement of orthopaedic surgeries in Hong Kong to avoid the development of stump deformation. We have been able to gain further understanding of the needs of the 457 patients through these projects. Stand TALL has been providing long-term rehabilitation treatment, prosthesis installation services, and has also trained rehabilitation medical staff within Sichuan Province to provide for victims who require life-long rehabilitation services. From September 2010, Stand TALL has been cooperating with units within the Sichuan Province to carry out rehabilitation medical training courses at various levels. As of December 2012, 1,909 students have been enrolled in our training courses. Throughout these years, Stand TALL has displayed that coordination between multidiscipline experts can improve the quality of patients' lives. The work of Stand TALL has been endorsed by the orthopaedic field and on 15 November 2012, on the opening of The Seventh International Congress of the Chinese Orthopaedic Association (COA 2012), Professor Chan Kai-Ming was awarded the COA 2012 Humanitarian Award. But as with any success, Stand TALL has not been without its challenges. In order to address obstacles, Stand TALL has organized two summit meetings at Chengdu in 2010 and 2012 where experts gathered and offered constructive input and engaged in fruitful discussions. In the future, Stand TALL will continue to improve training and patient care and also publish an Ortho-Rehab Book to summarize our working experience in Sichuan. We strongly believe that Stand TALL along with rehabilitation medicine will continue to flourish and aid patients in rebuilding their lives and health.

SY19-311B-03

LESSONS LEARNED FROM THE EXPERIENCE OF THE GREAT EAST JAPAN EARTHQUAKE AND DISASTER

Meigen Liu

Keio University School of Medicine, Japan

The 2011 Great East Japan Earthquake and Disaster (GEJED) was unprecedented, being geographically widespread and multifaceted (earthquake, tsunami and nuclear power plant failure). It was also characterized by a very low injuries to death ratio (0.372), and instead of injury management, huge needs existed in managing chronic illness and preventing immobilization and functional deterioration among elderly persons and persons with disabilities. This prompted rehabilitation professionals in Japan to establish the "10 Rehabilitation-Related Organizations of the GEJED Rehabilitation Support Service" (10-RRO). Its support activities included support for the management of secondary welfare shelters including rehabilitation services, support for the relocated victims, and transfers of those in need of inpatient rehabilitation to facilities in the non-disaster areas. Although our first collaborative endeavor was successful to some extent, we became keenly aware of the importance of better preparedness for more efficient and effective inter-organizational collaboration. We therefore published in 2012 a joint, multidisciplinary rehabilitation disaster relief manual aiming at enhancing preparedness during ordinary times and facilitating support activities in a coordinated manner at the time of disasters. In addition, we started training seminars for rehabilitation disaster coordinators in close collaboration with the already well-established Disaster Medical Assistance Team (DMAT). The coordinator candidates were recruited as a multidisciplinary team from each of the 46 prefectures in Japan based on the recommendation by each participating organization of the 10-RRO. The coordinators are expected to play a key role in enhancing disaster preparedness and disaster rehabilitation support coordination in each area and nationwide.

SY19-311B-04

EFFECTIVENESS AND EFFICIENCY OF REHABILITATION SERVICES DELIVERY FOR VICTIMS WITH DISABILITIES FROM THE 2008 SICHUAN EARTHQUAKE

Jan D. Reinhardt[1], Xia Zhang[1], James E. Gosney[1], Jianan Li[1]

[1]Committee on Rehabilitation Disaster Relief of the International Society of Physical and Rehabilitation Medicine, Geneva, [2]Swiss Paraplegic Research, Nottwil, [3]Department of Health Sciences and Health Policy, University of Lucerne, Lucerne, Switzerland, [4]Department of Rehabilitation Medicine, the First Affiliated Hospital of Nanjing Medical University, Nanjing, China

Background: The 2008 Sichuan earthquake caused a significant number of disabling injuries requiring physical rehabilitation. While

short term effectiveness of rehabilitation measures on physical function has been demonstrated, long term effectiveness of rehabilitation services on physical function and other outcomes yet needs to be determined. *Purpose:* To examine long term effectiveness of rehabilitation services on physical function, pain severeity, post traumatic stress disorder and life satisfaction of earthquake victims with disabling injuries. *Methods:* This is a prospective cohort study with three points of measurement, two intervention and one control group. 591 patients were orginally enrolled of which 403 had completed all three assessments. Physical function was measured with the Barthel Index and pain servereity with the Visual Analogue Scale. Postraumatic stress disorder was measured with the PCLC scale and Life Satisfaction-9 questionaire. Data were analysed with longitudinal regression models. *Results:* Physical function was significantly improved in the rehabilitation groups in 2010 as well as 2012 as compared to baseline while pain severeity decreased. In both cases a rehabilitation as well as time effect was observed. Post-traumatic stress disorder decreased and life satisfaction increased over time but could not specifically linked to rehabilitation measures. *Implications:* Long term effectiveness of rehabilitation of earthquake survivors with disabling injuries was demonstrated for physical function and pain. Effects of rehabilitation on psychological function and life satisfaction remain unclear. Future rehabilitation disaster relief services may specifically include components to improve the latter such as cognitive behavioural therapy.

SY19-311B-05

ROLE OF PM&R DOCTORS AND THERAPISTS INTERACTING WITH NGO'S IN DISASTER RELIEF AND CHALLENGING SETTINGS: PERSPECTIVE FROM FIELD EXPERIENCES WITHIN INTERNATIONAL HANDICAP

Eric Weerts[1] G. Jacquemin[2]

[1]Handicap International – Brussels – Belgium Vietnam, [2]Physical Medicine & Rehabilitation, University of Montreal, Montreal Gingras-Lindsay Institute of Rehabilitation

Background: The role of PMR in interventions after disaster is a topic of increasing interest. Their know how, specialty is of valuable help in the aftermath of emergency situations provided that preparation and roles within a team ([PT –OT – nurse - psychologist) approach can be clearly identified and maximized. *Methods*: The recommendations for PMR in the field of disaster intervention are based on the unique experience of Handicap International on several projects after natural disasters and conflicts. Through projects reports, short assignments to set up care and human resource management, this short communication gives a few perspectives on how the role of PMR is key in ensuring quality of services as well as necessary integrating the role of PMR in rehabilitation teams with the other team members in this specific setting. *Results and conclusion*: HI operates mainly on basic needs for severe trauma victim, this is preceded by the need to have supporting services available that can allow full use of the capacities of PMR, required personal skills and aptitudes beyond the core medical rehabilitation know how. These skills and know how should be placed within the available rehabilitation teams made up of PT, OT, psychologists and nurses.

SY19-311B-06

Abstract is missing.

SY19-311B-07

BUILDING THE ISPRM DISASTER ACUTE REHABILITATION TEAM PROGRAM

Josh Verson[1], Andrew Haig[1]*, Huacong Wen[2], Lars Johnson[1], Yih-Chieh Chen[1], Jianan Li[2]

[1]University of Michigan, United States, [2]Nanjing University, China

Introduction: Rehabilitation response following a natural disaster has been progressively documented as an essential strategy for recovery and relief. In order to respond quickly, rehabilitation professionals, policy makers, relief volunteers and health officials need adequate training. The International Society for Physical and Rehabilitation Medicine arranged a directive to improve rehabilitation after disasters. *Methods:* After putting together a preliminary online framework for the Disaster Acute Rehabilitation Team curriculum, interviews were conducted with disaster victims, doctors, health officials, nurses, volunteers and hospital administration to assess their personal post disaster rehabilitation experiences. Dozens of interviews were conducted and over 20 h of video and over 2,000 photographs were collected. The team consolidated this information and placed it into the framework for initial trials as a powerpoint document. *Results:* The framework for the core curriculum consists of 3 modules: a module for training rehabilitation professionals who will respond immediately to a natural disaster, another module for training rehabilitation professionals who will be team leaders and a third for rehabilitation professionals who will coordinate with national emergency planning organizations and NGO's. *Implications/Impact on Rehabilitation*: It is imperative that the rehabilitation response be rapid and efficient to improve survival rate following natural disaster. The DART curriculum provides a method for rehabilitation professionals who are involved in disaster work to plan and respond more effectively. The first-hand experience gained through interviews with rehabilitation professionals and tours of the disaster sites allowed for the production of a core curriculum and the preemptive planning for acute rehabilitation response during a natural disaster.

SY19-311B-08

DEVELOPING THE ISPRM REGISTRY OF REHABILITATION DISASTER RELIEF EXPERTS

Jan D. Reinhardt, James E. Gosney[1], Andrew J. Haig[1], Jianan Li[2]

Committee on Rehabilitation Disaster Relief of the International Society of Physical and Rehabilitation Medicine, Geneva, Switzerland, Department of Rehabilitation Medicine, the First Affiliated Hospital of Nanjing Medical University, Nanjing, China

Natural disasters cause a sudden onset of numerous new disabilities and aggravate existing disabilities. It is important to start rehabilitation of disaster victims with disabilities as soon as possible including pre-, peri- and post-operative consulting. Often natural disasters happen in low-resourced settings within which a rehabilitation perspective is absent or underdeveloped. A rehabilitation perspective in international disaster relief is thus urgently required. A pre-requisite for the deployment of international rehabilitation teams is a database of potential volunteer rehabilitation professionals including experts in Physical and Rehabilitation Medicine (PRM). Therefore, ISPRM and the WHO Disability and Rehabilitation (DAR) team included a respective item in the current WHO DAR-ISPRM collaboration plan: "ISPRM will, moreover, compile a database of international experts for PRM in disaster relief, which may provide a PRM professional volunteer team when it is needed in any region of the world. In that ISPRM will closely collaborate with relevant NGOs, other academic organizations and WHO offices". A starting point for the development of a comprehensive database of PRM volunteers is an online survey among ISPRM membership and national membership of ISPRM member societies including the below listed items. Further development of the database involves an advanced search function and links with other initiatives of professional rehabilitation societies. The lecture outlines the project plan and envisioned outline of the ISPRM disaster experts database.

SY19-311B-09

PROFESSIONALIZING HUMANITARIAN REHABILITATION DISASTER RELIEF: ROLE OF THE ISPRM CRDR

James Gosney
International Rehabilitation Forum – Emergency Rehabilitation Work Group, Ann Arbor, Michigan, United States

Background: International humanitarian assistance during disasters has undergone significant professional reform since the Haiti earthquake. This is especially true in the healthcare sector amidst concerns of highly variable quality of care and unregulated accountability of providers. *Purpose:* This presentation summarizes the current state of foreign medical team practice reform in disasters and highlights the role of medical rehabilitation of disabling injuries. Further, the response role of international rehabilitation professional societies is profiled with specific coverage of activities of the ISPRM WHO Liaison Committee (sub) on Rehabilitation Disaster Relief (CRDR). *Results:* Current ISPRM CRDR professionalization projects are outlined including the Disaster Acute Rehabilitation Team (DART) program, a registry of PRM volunteers, and coordination with external international disaster management agencies such as the UN and WHO. Additional projects include identification of PRM responder competencies, development of field data documentation forms, and publication of supporting academic papers. These activities aim to further professionalize the PRM response in disasters. *Conclusion*: ISPRM CRDR professionalization efforts will predictably result in a more standardized, higher quality medical rehabilitation response by accountable providers using appropriate documentation, resulting in decreased morbidity, mortality, and related consequences due to disabling injury sustained in disaster.

SY19-311B-10

INTERNATIONAL REHABILITATION EDUCATION. UPDATE AND TRENDS

Amparo Assucena[1]*, SSH Wu[3] Joaquin Pradas[2]
[1]Rehabilitation Department, Hospital Requena, Requena, [2]Union de Mutuas, Onda, Spain, [3]Department of Physical Medicine and Rehabilitation Medicine, UMDNJ-New Jersey Medical School

Objective: To highlighting common features and differences among Physical and Rehabilitation Medicine (PRM) Residency and Continuing Professional Development (CPD) in the three ISPRM areas; and to searching the different educational tools for educational purposes. *Methods:* A review of literature in scientific database, in international and national PRM societies' webpage and related links, other scientific and professional internet sources, and expert information on specific topics. *Results*: There is a different level of available formal sources of information on Residency and CPD, in the three ISPRM areas. The accessible national sources from some American countries, international and national sources from Europe, and Australasia have shown to be structured and comprehensive. The process, duration of the program, control procedures and accreditation of PRM Residency is not homogeneous among the countries of the three ISPRM areas. CPD is addressed to develop and/or improve knowledge up-to-date, clinical, non clinical and teaching skills and performance, research, management, and leadership with the ultimate goal to ensure quality and safety for patients. CPD regulation process including mandatory CPD, number of required credits, CPD provider and accreditation institutions, and certification are different along and within the three ISPRM areas. Referred educational tools include primarily conference-based model; practice activities; independent self-directed learning, including e-learning. Referred assessed performance tools include written examinations, assessments by supervising clinicians, direct observation or video review, clinical simulations, and multisource assessments. *Implications on Rehabilitation*: Accessible, standard and comprehensive information on education, and new educative trends may improve exchange and policies, and quality of education in Rehabilitation.

SY19-311B-11

EDUCATION AND TRAINING OF REHABILITATION PHYSICIANS WITH INTEGRATED SKILLS OF WESTERN AND ORIENTAL MEDICINE: AN INTERNATIONAL PERSPECTIVE

Dahong Zhuo
Sun Yat-sen University, Guangzhou, China

Objective: To introduce the existing programs in China on training rehabilitation physicians to acquire integrated skills of Western and Oriental medicine. *Methods:* The currently existing programs and prospective programs available in China for training the rehab physicians (physiatrists)to acquire integrated rehab skills of Western and Oriental medicine were summarized and categorized. Future direction for the improvement of these programs was proposed. *Results:* With the increasing evidence for the effectiveness and value of oriental medicine, especially TCM, in medical rehabilitation, there are also increasing learning needs for TCM from rehabilitation physicians, especially those in the Asian and Pacific region. The opportunity for such a kind of training is promising when TCM universities in China are now enthusiastic in offering programs on training of TCM Rehab skills. Such programs include different categories in formats, from Master postgraduate studies, clinical fellowship, clinical observership to short-term training courses. Study length varies from 1 or 2 years to several months or weeks. The most popular or frequently-sought courses are acupuncture/moxibustion, Chinese style manipulation and therapeutic massage, Chinese style exercise therapy (Kung Fu), Chinese style meditation and relaxation therapy, herbal medicine for physical rehabilitation. *Conclusions*: Emerging innovative educational programs are rising in China to train the international rehab physicians to acquire integrated skills of Western and Oriental rehab methods.

SY19-311B-12

VALUE AND IMPACT OF THE ISPRM INTERNATIONAL EXCHANGE PROGRAM

Bryan O'Young
Rusk Institute of Rehabilitation Medicine, United States

In responding to an increasing demand for international exchange for physical and rehabilitation medicine, the ISPRM International Exchange Committee (IEC) was established (2002). In this session, the history of the IEC will be discussed. The international exchanges among the different countries will be presented. The value and impact of the international exchange program on the visiting scholars will be highlighted.

SY19-311B-13

PM&R KNOWLEDGE NOW: AAPM&RS NEW LIFELONG LEARNING PM&R RESOURCE

Thomas Stautzenbach
AAPM&R Executive Director, United States

Objective: To be introduced to the new AAPM&R education and information resource "PM&R KnowledgeNow". Understand how PM&R KnowledgeNow is being utilized by AAPM&R members. PM&R KnowledgeNOW is an evolving, dynamic online resource that highlights the breadth and depth of clinical topics in the specialty of PM&R. Currently in the process of becoming the a primary resource for PM&R clinicians, PM&R KnowledgeNOW offers 100+ clinical topics and will expand to include over 300 topics. International physiatrists are invited to participate in the content development, maintenance and updating of new and expanding knowledge resources, and educational use of the on-line resource. Learn how to participate and utilize PM&R KnowledgeNow in your life-long learning commitment.

ORAL PRESENTATIONS (JUNE 16–20, 2013)

OR17-301AB-01

EVOLUTION OF SENSORY REWEIGHTING FOR BALANCE CONTROL AFTER STROKE

Alain Yelnik[1], Sophie Tasseel-Ponche[1], Eloise Szmatula[1], Pierre Paul Vidal[2], Isabelle Bonan[1,2,3]

[1]Lariboisière-F.Widal Hospital, Paris Diderot University, [2]CNRS - UMR 8194. Paris, [3]PRM Department, Medical school of Rennes 1 University, Rennes, France

Objectives: Continuous re-weighting of sensory information is required for a flexible control of upright stance. We recently showed that patients after recent stroke may be highly dependent on visual, proprioceptive and/or vestibular information. The aim of this study was to describe the evolution of these sensory comportments. *Methods:* 28 subjects with a first and unique hemispheric stroke (age=53.7±10.2, 18 men, right lesion=13) and 20 control subjects (age=51.7±13.95, 12 men) were studied. Postural control while standing at rest was probed with successively tendon vibration, visual optokinetic and vestibular galvanic stimulations. Patients were investigated mean 2 months after stroke, using a force platform (Technoconcept®). Patients as controls were retested 1 month later. Analysis was conducted from composite scores for each sensory stimulation as the mean of the absolute value of the displacement of the centre of pression in the different directions. *Results:* Both control and stroke patients showed large inter-individual variations. Patients were globally more sensitive than controls (mean global score=48.1, SD 17.9 versus 31.94, SD 12.7, p=0.001). They were excessively reliant on visual information (p=0.002) and to vestibular stimulation (p=0.04). While the scores were reproducible at one month in controls, patients displayed different kinds of evolution, sensory dependence remaining in most of them, but decreasing for some even increasing for a few. *Implication in rehabilitation:* Post stroke comportment regarding sensory reweighting is a complex and evolutive behavior. Better knowledge is needed to build personalized rehabilitation programmes.

OR17-301AB-02

THE EFFECT OF COMBINING MARSIELA CRENATA PRESL LEAF EXTRACT AND PHYSICAL EXERCISE ON ERβ EXPRESSION IN OSTEOBLAST CELLS MENOPAUSE MICE

Hening Laswati

Department of Physical Medicine and Rehabilitation, School of Medicine, Airlangga University, Dr Soetomo Hospital, Surabaya, Indonesia, Indonesia

Objective: Phytoestrogens are benefits for osteoporosis prevention in menopause women because be able to bind estrogen receptors (ER) to induce receptor dimerization and subsequently bind to estrogen response elements. Marsiela crenata Presl (Semanggi) is a quite concentrated phytoestrogen content, primarily found in Surabaya, east Java, Indonesia. The recent study already proved that Marsiela crenata Presl was bound ERα osteoblast cell in menopause mice, as a receptor to transcriptional activity in osteoblast cell function. The intervention combination Marsiela crenata Presl leaf extract administration and exercise has increased expression of the ERα significatly, but until now no study about the expression ERβ. The objective of the study was to analyzis the expression of ERβ osteoblast cells in menopause mice through combination intervention physical exercise and Marsiela crenata Presl leaves 96% ethanol extract administration. *Method:* Twenty-eight females of Mus musculus menopausal mice about one-year old were enrolled in the study using posttest only control group design. All subjects in the study were randomized into four experimental groups: (1) the control group; (2) the green clover leaves administration group; (3) the exercise on treadmill group and (4) the combination of green clover leaves administration and exercise on treadmill group. The experiment were conducted for 4 weeks and has recieved Ethical Clearance from Ethical Committee dr Soetomo General Hospital. The expression of ERβ in osteoblast cell from methaphysis of proximal femur, were measured using indirect immunohistochemistry technique. The result was evaluate with Kuroda method or semiquantitative grading. Descriptive data are presented by mean±SD. Before analysis all continuous variables were tested for normal distribution. *Results:* The expression score of ERβ in control group (group 1) was 1.51±0.77; phytoestrogen group (group 2) was 1.17±0.98; exercise group (group 3) was 1.00±0.56; combination group (group 4) was 2.00±0.1.77. There was seem in numeric the combination group have the highest expression of ERβ. There is no significant difference the expression of ERβ between the group 2 (p=0.88); the group 3 (p=0.70) and group 4 (p=0.75) with the control group. *Implications/Impact on Rehabilitation:* The osteogenic stimulus provided by load-bearing exercise can be used for prevention osteoporosis. Marsiella crenata Presl as a phytoestrogen have also affinity to ERβ in osteoblast cell but not significant. The two types receptor (ERα and ERβ) seem to counteract and balance to potentiate the osteogenic effects of physical exercise.

OR17-301AB-03

CATHODAL TDCS ENHANCES UPPER LIMB RECOVERY POTENTIAL IN ACUTE STROKE PATIENTS THROUGH REBALANCING MOTOR CORTEX EXCITABILITY

Maria Gabriella Ceravolo[1], Barbara Cicconi[1], Chiara Orni[1], Alessio Avenanti[2], Marianna Capecci[1]

[1]Politecnica delle Marche University, [2]University of Bologna, Italy

Objective: To assess the role of tDCS coupling with rehabilitation in promoting upper limb recovery after stroke. *Method:* A randomized controlled double blind investigation was performed enrolling 19 acute stroke patients, with moderate to severe upper limb paresis. Subjects were allocated into 2 groups receiving either 1.0 mA cathodal tDCS on contralateral M1 area (Exp. group: 9 cases), in 5 consecutive 20 min daily sessions, or sham stimulation (Control group: 10 cases). All subjects also performed one-hour daily sessions of task-oriented arm training. Motor function and Activity limitation were measured by Fugl-Meyer (FM) and Wolf Motor Function test (WMFT), respectively. Assessments were repeated at baseline (T0), after tDC /sham stimulation sessions (T1), and 1 (T2) and 3 months (T3) later. Inter-hemispheric asymmetry in cortical excitability threshold was followed-up, T0 values being compared to motor function recovery at T3. *Results:* A mild, though significant time x treatment interaction was found in FM T0-T3 change, showing a greater motor function increase in the Exp. group compared to Controls (p<0.05). No significant between-group differences were observed in WMFT. T0 inter-hemispheric asymmetry predicted FM recovery at T3 (R2=0.488). Inter-hemispheric asymmetry decrease, over time, was higher in Exp group than controls (p<0.01). *Implications/Impact on Rehabilitation:* Cathodal tDCS of controlateral motor cortex is a useful adjunct to upper limb rehabilitation in acute stroke. When coupled to task-oriented training, it possibly reduces inter-hemispheric inhibition, thus enhancing effective brain plasticity.

OR17-301AB-04

APPLICATION OF 320-ADCT IN EVALUATION OF SWALLOWING

Yoko Inamoto[1], Eiichi Saitoh[2], Kikuo Ota[1], Hitoshi Kagaya[2], Yoichiro Aoyagi[2], Seiko Shibata[2], Keiko Onogi[2], Naoko Fujii[3], Kazuhiro Katada[3], Jeffrey Palmer[4]

[1]Faculty of Rehabilitation, Fujita Health University, [2]Department of Rehabilitation Medicine, Fujita Health University, [3]Department of Radiology, Fujita Health University, [4]Department of Physical Rehabilitation Medicine, Johns Hopkins University, Japan

Objective: The 320-row area detector CT (320-ADCT) is a novel CT technology possessing superior space resolution (0.5 mm voxel) and satisfactory time resolution (10 frames/s), which allows a dynamic 3-dimensional swallowing evaluation. The purpose of this study is to evaluate how bolus size and consistency affect the temporal aspects of swallowing using 320-ADCT. *Methods:* Sixty-seven healthy subjects (24-77 years) and six subjects with dysphagic underwent 320-ADCT scans while swallowing liquids on command in 45° semi-reclining position. Two consistencies (honey thick and thin) and 3 bolus sizes (3, 10, 20 ml) of liquids were tested. The parameters measured were: (1) critical event timing, (2) hyoid and larynx displacement. *Results:* Event timing varied significantly with bolus consistency and size, and subject age. 1) With thin liquids, bolus propulsion was faster and true vocal cord (TVC) closure was both earlier and longer in duration ($n=10$). 2) With higher bolus volume, bolus propulsion was faster and upper esophageal sphincter (UES) opening was earlier ($n=26$). 3) In elderly subjects, velopharyngeal closure had earlier onset and longer duration, and laryngeal closure was prolonged ($n=67$). 4) The subjects with dysphagia showed dyscoordinated inter-event timing (such as delayed UES opening); also pharyngeal residue was observed after swallowing ($n=6$). *Implications:* The changes in TVC colure and UES opening appeared to promote swallow safety by preventing aspiration, and suggest that motor control of those structures is adaptable in response to afferents in the oral cavity. The three-dimensional visualization and quantitative measurements provided by 320-ADCT provide essential new benchmarks for understanding swallowing, both normal and abnormal.

OR17-301AB-05

THE EFFECT OF PULSED ELECTROMAGNETIC FIELDS ON THE EXPRESSION OF OPG AND RANKL IN OSTEOBLAST AND BONE TISSUE FROM OVX-INDUCED OSTEOPOROSIS RATS

Hongchen He[1], Yu-Jun Hu[2], Lin Yang[1], Ling Wang[1], Zhong-Jie Lei[1], Li Deng[3], Cheng-Qi He[1]

[1]Department of Rehabilitaion medicine, West China Hospital, [2]Department of Rehabilitation Medicine, Guangxi Zhuang Autonomous Region Peoples Hospital, [3]Tissue Engineering Lab, West China Hospital, Sichuan University, China

Objective: The purpose of this research was to observe the effect of PEMFs for the expression of OPG, RANKL mRNA on osteoblasts and the bone tissue from ovariectomized rats with osteoporosis and to explore the possible mechanism of PEMFS for osteoporosis patients. *Method:* 1) Experiment in vivo: 48 3-months-old female SD rats were randomly divided into SHAM control group, OVX experimental group, OVX estrogen group, OVX control group. After experimental model were made, exposed the OVX experimental group rats to pulsed electromagnetic fields (8 Hz, 3.8 mT), 40 min/day; OVX estrogenic group rats were given Premarin see conjugated estrogen lavage (0.065 mg/kg/day). After 30 days, use actual time fluorescent quantitation PCR instrument to detect the expression of OPG, RANKL mRNA on iliac bone tissue in each group rats. 2) Experiment in vitro: The osteoblast cells in SHAM group, OVX experimental group, and OVX control group were isolated from calvaria of ovariectomized rats with osteoporosis by sequential digestion. Exposed OVX experimental group to PEMFs (8 Hz, 3.8 mT), 40 min/day; after 5 days use actual time fluorescent quantitation PCR instrument to detect the expression of OPG, RANKL mRNA on iliac bone tissue in each group rats. *Results:* Experiment in vivo: Compare with OVX control group, OPG mRNA expression in OVX experimental group increased significantly, RANKL mRNA expression was no significant difference; Experiment in vitro: Compare with OVX control group, RANKL mRNA expression in OVX experimental group reduced significantly, OPG mRNA expression was no significant difference. *Conclusion:* PEMFs reduce the expression of RANKL mRNA on osteoblasts from OVX osteoporosis rats and increase the OPG mRNA expression. PEMFS affect the signal transmission of OPG-RANK-RANKL system in OVX osteoporosis rats that maybe one mechanism of PEMFS for osteoporosis treatment.

OR17-301AB-06

THE RESEARCH ON A COMMUNITY-BASED REHABILITATION TECHNOLOGY FOR STROKE

Hong Dai[1], Wenzhi Wang[2], Xianghong Meng[1], Bin Jiang[2], Shuang Shao[1], Shengping Wu[2]

[1]School of Public Health and Family Medicine, Capital Medical University, Beijing, [2]Department of Epidemiology, Beijing Institute of Neurosurgery, China

Objective: To observe the effect of a new community-based rehabilitation technology for Stroke named. *Method:* A group of Stroke patients living at four communities of Chongwen district in Beijing were selected, and trained for 3 months using a community-based rehabilitation technology for Stroke we called it as, which rooted in Conductive Education and had been revised and re-designed to adapt to the condition of chinese community patients by us. All patients were trained for at least one and half an h per day, 5 days per week (2 days trained in community health station, 3 days at home trained following our disk displayed the training method), for 3 months. The knowledge of stroke rehabilitation were propagandized. Their motion function, activities of daily living and social function were assessed by Fugl-Meyer Motor Assessment Scale (FMA), Barthel Index (BI) and Functional Activities Questionnaire (FAQ) before training and after 3 months' training. *Results:* 29 stroke patients had completed the training. So did the three assessments both pre-training and post-3 months' training. Their total scores of FMA, BI and FAQ post-3 months' training had been improved significantly comparing to pre-training ($p<0.01$–0.005). *Implications:* The CBR technology can improve the recovery level of stroke patients both in physical and social functions significantly, being feasible to be used and popularized in chinese community.

OR17-301AB-07

HDAC6 INCREASES CHAPERONE-MEDIATED AUTOPHAGY IN THE NEURONS OF ACUTE SPINAL CORD INJURY

Min Su, Liying Han, Chuandao Liu, Weixin Yang

Department of Rehabilitation, First Affiliated Hospital of Soochow University, China

Objective: In order to provide some clues to potential therapeutic targets for acute spinal cord injury, we studied the role of HDAC6 in the chaperone-mediated autophagy (CMA) of neurons in acute spinal cord injury. *Method:* Allens weight-drop method was used to establish a rat model of ASCI at T10. Corresponding time points after modeling the rats were sacrificed, each rat was taken about 2cm damage spinal cord tissue. The activation of CMA was measured by calculating the protein levels of LAMP-2a, HSC70 and HSP90. The roles of HDAC6 in this activation of CMA were investigated by using rt-PCR, WB and immunofluorescence. Furthermore, by EM observe damage and morphological changes of spinal neurons. *Results:* 1 h after the spinal cord injury, the protein expression levels of HSP90, HSC70 and LAMP-2A increased significantly. Simultaneously, the mRNA and protein expression levels of HDAC6 increased

dramatically and mainly concentrated on the damaged neurons. The results showed by immunofluorescencec that the HDAC6 cofocaled with LAMP-2A in the damaged spinal cord neurons concentrated Areas. Furthmore, the apoptosis of the spinal cord neurons have no significantly increased. *Implications:* We first provided evidences that HDAC6 mediates CMA of neurons in acute spinal cord injury. Study supported by the Major State Basic Research Development Program of China (973 Program) (No. 2011CB510003).

OR17-301AB-08

EFFECT OF ELECTRO-ACUPUNCTURE PRETREATMENT ON GLUTAMATE

Zhenzhen Guo

Department of Rehabilitation Medicine, Hua Shan Hospital, Fudan University, Shanghai, China

Objective: To study the effect of electro-acupuncture pretreatment on the glutamate (Glu) and γ-amino butyric acid (GABA) in rats following middle cerebral artery occlusion. *Methods:* SD rats were randomly divided into 3 groups: sham group, ischemic group and pretreatment group. The rats in the electro-acupuncture pretreatment group received electro-acupuncture at Baihui acupoint and Dazhui acupoint for 30 min a day, 5 days at the awake station. After electro-acupuncture pretreatment, middle artery was occluded for 120 min, then followed by reperfusion. Dialysate was collected from the striatum in vivo 40, 80, 120 min after occlusion as well as 40, 80, 120, 160, 200, 240 min after reperfusion. The changes of neurological deficit scores was evaluated 24 h after reperfusion, while the infarct volumes of brains was then measured with TTC staining immediately after the neurological outcome evaluation. *Result*: The Glu and GABA level in the ischemic group and the electro-acupuncture group increased significantly at 40, 80, 120 min after occlusion and 40, 80, 120, 160, 200, 240 min after reperfusion ($p<0.001$); The Glu level in the electro-acupuncture group was significantly lower than that in the ischemic group ($p<0.01$),while the GABA level in the electro-acupuncture group was significantly higher than that in the ischemic group ($p<0.01$).The neurological deficit scores in the electro-acupuncture group was significantly lower than those in the ischemic group ($p<0.01$). Meanwhile, infarct volume changes at ischemia-reperfusion 24 h in different groups also had a significant difference ($p<0.01$). *Implications*: Electro-acupuncture pretreatment can in a certain degree inhibit the excessive release of Glu and up-regulate the expression of GABA in striatum in the process of subsequent ischemic-reperfusion brain injury, which may be one of the protection mechanisms for the early ischemic brain injury.

OR17-301AB-09

A FMRI STUDY OF THE ORAL PHASE OF SWALLOWING IN HEALTHY VOLUNTEERS

Junfa Wu[1], Yongshan Hu[1], Yi Wu[1], Aiping Shi[2], Weibo Lu[2], Hanqiu Liu[3]

[1]Department of rehabilitation medicine, Huashan hospital, Fudan University, Shanghai, [2]Department of rehabilitation medicine, Shanghai No. 1 rehabilitation hospital, Shanghai, [3]Department of radiology, Huashan hospital, Fudan University, Shanghai, China

Objective: To explore the neurophysiology mechanism of swallowing in healthy humans. *Methods:* Four healthy volunteers knocking the tooth and moving tongue tip backwards along the palate, the activation pattern of cortex was showed with functional magnetic resonance imaging (fMRI). Image data were analysed by microsoft SPM5. *Results:* When subjects were knocking the tooth, bilateral precentral gyruses, adjacent ROs and supplementary motor areas (SMAs) are significantly acitvated. When subjects were moving tongue tip backwards along the palate, significant activations are observed in bilateral precentral gyruses, adjacent ROs, and SMAs, cerebellum tuber and cerebellum Inferior Semi-Lunar Lobule. The common activated areas during knocking the tooth and moving tongue tip backwards are located at bilateral precentral gyruses, ROs and SMAs. *Conclusions:* Bilateral precentral gyruses and adjacent ROs and SMAs should be parts of the neural network of swallowing, and knocking the tooth can be an alternative training of moving tongue tip to activate the neural network of moving tongue.

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STATIONARY GERIATRIC EARLY REHABILITATION IS WELL KNOWN AND WELL ORGANIZED IM MANY COUNTRIES. BUT IS IT SUFFICIENTLY IN OUTCOME FOR PATIENTS FROM ALL ASSIGNING SPECIALIST DEPARTEMENTS? A RANDOMISED OUTCOMETRAIL OF 1,295 PATIENTS

Christian Angleitner

Hospital of the Sisters of Charity Ried, Austria

Introduction and aims of the study: Stationary geriatric early rehabilitation is very well implemented and sufficiently standardized in many countries. But is stationary geriatric rehabilitation sufficiently in functional outcome for patients from all assigning specialist departments? *Purpose*: Is it possible to reach for all stationary geriatric early rehabilitation patients no matter from witch department they come from a sufficient therapeutic progress in functional outcome? *Methods:* The retrospective study includes all the patients from 2008 to 2011 witch our department took over from the neurologic, traumotologic, orthopaedic and internal departments. The development was measured with the FIM (functional independence measure). The take over FIM was taken inside 72 h after arriving and the discharge FIM was taken inside the last 48 h before leaving. *Results*: The study contains 1,295 patients, 396 orthopaedic patients with an average age of 74.83 years, a residence time from 15.95 days and a FIM development from 101 to 115 points; 375 traumatological patients with an average age of 81.44 years, a residence time from 18.77 days and a FIM development from 82 to 103 points; 363 neurological patients with an average age of 75.88 years, a residence time from 21.08 days and a FIM development from 73 to 91 points as well as 161 cardio logical/internal patients with an average age of 80.17 years a residence time from 17.54 days and a FIM development from 81 to 96 points. The FIM development of all patient groups is 1,24 (± 0.16 points) per therapeutic day. The recommended aim value of the American Rehabilitation Counselling Association (ARCA) amounts to1 FIM point per therapeutic day. *Conclusions:* It is possible to obtain a sufficient functional progress for all patientsin stationary early geriatric rehabilitation independently from witch specialist department they were overtaken from.

OR17-302AB-02

SYSTOLIC BLOOD PRESSURE RESERVE *METHOD:* A NEW WAY OF EXERCISE INTENSITY PRESCRIPTION FOR POST-MYOCARDIAL-INFARCTION PATIENTS WITH ATRIAL FIBRILLATION

DanielChiung-Jui Su[1], Willy Chou[1,3]*, Kuo-Shu Yuan[5], Chien-Liang Chen[4], Rong-Bin Hong[2], Yi-Ming Lo[2]

[1]Department of Physical Medicine and Rehabilitation, Chi Mei Medical Center, Tainan, [2]Department of Physical Medicine and Rehabilitation, Chi Mei Hospital, Liuying, Tainan, [3]Department of Recreation and Health-Care Management & Institute of recreation Industry Management, Chia Nan University of Pharmacy & Science, Tainan, [4]Department of Physical Therapy, I-Shou University, Kaohsiung, Taiwan, [5]Department of Business Management, National Sun Yat-sen University, Kaohsiung, Taiwan, Chinese Taipei

Objectives: Heart rate reserve (HRR) and rate of perceived exertion (RPE) are the most commonly used method for quantification of

exercise intensity. However, in patients with atrial fibrillation, there is no feasibly quantified method as HRR can be used. Our study is to investigate whether systolic blood pressure reserve (SBPR) method can be used in arrhythmic patients when prescribing exercise intensity. *Methods:* We retrospectively review 1,116 patients who went through maximal graded exercise testing after event of acute myocardial infarction in our medical center from 2003 January to 2012 September. Patients who concomitantly have atrial fibrillation were included in our study. SBP during the exercise is recorded with the corresponding VO2 value. Same as the VO2 reserve method, we then distribute the SBP into percentile rank, as maximal SBP becomes 100% and resting SBP as 0%. A regression model were established with SBPR as a dependent variable and VO2R as an independent variable. *Results:* The study population consisted of 119 post-myocardial-infarction (post-MI), atrial fibrillation patients with mean age of 60.6±10.00 years; height: 162.30±7.62 cm and weight: 63.77±11.12 kg. The results of the regression model showed that VO2R is predictive of SBPR (F=1003.469, $p<0.001$; B=0.804, $p<0.001$). Besides, VO2R was found to account for 68% of variance in SBPR (r^2=.680, $p<0.001$). *Implications/Impact on Rehabilitation:* When prescribing exercise intensity in post-MI patients with atrial fibrillation, SBPR has good correlation with VO2R and can serve as a better quantification method in practical use.

OR17-302AB-03

THE EFFECT OF FUNCTIONAL MAGNETIC STIMULATION IN STROKE PATIENTS WITH CHRONIC CONSTIPATION

Eun Sil Kim, Kwang Jae Lee*, Yong-Soon Yoon
Presbyterian Medical Center (Jesus Hospital), Korea

Objective: To evaluate the effect of functional magnetic stimulation (FMS) on Colon transit time (CTT) in stroke patients with chronic constipation. *Method:* 12 stroke patients with chronic constipation were participated in this study. We evaluated Modified Bathel Index (K-MBI), Bristol scale and CTT of each patient before and after FMS. The CTT was evaluated using radio-opaque markers (Kolomark®). The markers were given every morning at 9 am for three days. After four days, plain supine abdominal X-ray was taken. CTT was calculated by the number and location of radio-opaque markers. The location of markers in x-ray was analyzed by three divided segment: ascending, descending and rectosigmoid colons. We select the segment where the highest number of markers remained and applied the round coil magnetic stimulator (Biocon-1000 Pro®, Mcube Technology, Seoul, Korea) onto the corresponding abdomen for 20 min with 40Hz (3 second burst time and 6 second resting time), 1.5T (100%) of intesity for 5 times/week for 2 weeks. After FMS, CTT was recalculated by the same method and analyzed the statistical significance of the CTT between before and after the treatment. *Results:* The CTT was significantly decreased after FMS. The Bristol scale and Frequency of defecation were significantly increased after FMS application. However, there was no significant difference of MBI score after 2 weeks. *Conclusion:* This study suggestive that the Functional Magnetic stimulation can be an additional treatment method for stroke patients with chronic constipation.

OR17-302AB-04

EFFECTS OF EXERCISE THERAPY ON WALKING ABILITY AND HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH SEVERE PERIPHERAL ARTERIAL DISEASE

Osamu Ito
Tohoku Univesity Graduate School of Medicine, Japan

Objective: Exercise therapy improves the walking ability and health-related quality of life (HRQOL) in moderate peripheral arterial disease (PAD) patients with intermittent claudication. However, effects of exercise therapy in severe PAD patients have not been reported. Thus, the present study evaluated the effects of exercise therapy on walking ability and HRQOL in severe PAD patients. *Method:* Ten patients with severe PAD and without indication for revascularization were completed a 12-week supervised exercise program performed with treadmill and bicycle ergometer. The exercise program included 10 sessions per week for inpatients and 2 sessions per week for outpatients. Exercise tolerance and HRQOL assessed with the walking impairment questionnaire (WIQ) and 36-item Short-Form (SF-36) were evaluated before and after the exercise program. *Results:* Exercise therapy increased significantly the pain-free walking distance (PWD) from 46.6±46.3 m to 114.5±88.1 m and maximal walking distance (MWD) from 171.4±98.8 m to 465.4±199.7 m. Exercise therapy also improved significantly the scores of "Physical function" and "Vitality" of SF-36 and "Distance" and "Speed" of WIQ. The PWD correlated only with the scores of "Role physical" and "Body pain" of SF-36 after the exercise program. The PWD and MWD correlated with the scores of all four domains of WIQ before the exercise program, and the MWD correlated with the score of "Stair" after the exercise program. *Conclusion:* Exercise therapy improves the walking ability and HRQOL in severe PAD patients. However, the walking ability correlates with the scores of all four domains of WIQ only before exercise therapy.

OR17-302AB-05

OUR EXPERIENCE IN REHABILITATION TREATMENT IN EARLY POSTOPERATIVE PERIOD AT PATIENTS WITH BREAST CANCER

Tatyana Koleganova*, Natalia Krasnyakova, Elena Pintus, Tatyana Shapovalenko, Konstantin Lyadov
Medical and Rehabilitation Center, Russia

Background: Breast cancer is the most common malignancy in women worldwide. The main treatment for most of the breast cancer is mastectomy. Many cancer survivors suffer from postoperative trauma and treatment-related morbidities and 40% of patients complaints after primary treatment. This study aimed to explore the use of multidimensional rehabilitation in early postoperative period. *Methods:* Analysis was performed prospectively and retrospectively at study cohort (178 female, 30–72 years) and control cohort (150 female, 33–74 years), of surgically treatment breast cancer patients. Rehabilitation therapy was provided at study cohorts next day after surgery. It was included physical activities of patients, massage in the electrostatic field, common magnetotherapy. Effectiveness was analyzed by presence of the pain, edema and chylorrhea, which were evaluated by clinical evidence the last ones at early postoperative period and at follow-up visits at 6 months. *Result:* Quantity of patient days in hospital at study cohort received early rehabilitation therapy was less on 4–5 days than at patients among the control cohort. The presence of the pain, edema and chylorrhea were noted among the study cohort in 10%, 24%, and 18% and were lower compared with control group –12%, 29% and 24%, respectively. The follow-up comparison at 6 months demonstrated the pain and edema in 32% and 41% in study cohort whereas these markers significantly higher in control group –48% and 63%, respectively. *Conclusion:* Early postoperative multidimensional rehabilitation at surgically treated female breast cancer patients significantly decreased treatment-related morbidities after primary treatment.

OR17-302AB-06

EFFECTS OF 6-WEEK AEROBIC TRAINING ON VO_{2MAX} IN BREAST CANCER SURVIVORS (BCS)

Zorica Brdareski[1]*, Aleksandar Djurovic[1], Snezana Susnjar[2], Andjelka Ristic[1], Mirjana Zivotic-Vanovic[1], Ljubica Konstantinovic[3], Ljubica Nikcevic[4], Slavisa Djurdjevic[1]
[1]Military Medical Academy, [2]Institute for Oncology and Radiology of Serbia, [3]Clinic for Physical Medicine and Rehabilitation "dr M. Zotovic", [4]Special Hospital, Serbia

Objective: to investigate the effects of 6-week aerobic training performed only 2 times a week, on VO2max in BCS. *Method:* Prospective RCT, which included 47 BCS, divided into experimental (EG) and control group (CG). VO2max measurements were done by Astrand test, at baseline and after 6 weeks. Women in the E group had two trainings a week on a bicycle ergometer, moderate-intensity (45–65% VO2max) for 21 min. SPSS 17.0 was used for statistical analysis: paired *t*-test and analysis of covariance, statistical significance: $p \leq 0.05$. *Results:* There were 30 women included in the EG and 17 in the CG. At the beginning, VO2max did not significantly differ among the groups (E: 22.40 ± 4.67 ml/kg/min, C: 23.81 ± 6.67 ml/kg/min, p=0.40). After 6 weeks, we registered a statistically significant increase in VO2max in the experimental group (22.40 ± 4.67 ml/kg/min vs. 25.57 ± 4.53 ml/kg/min, p=0.00), but not in the control group (23.81 ± 6.67 ml/kg/min vs. 24.32 ± 6.54 ml/kg/min, p=0.36). The analysis of covariance showed a statistically significant difference in VO2max between groups after 6 weeks of training (F=11.26, p= 0.00). *Implication/Impact on Rehabilitation:* Results suggest that 6-week aerobic training of moderate intensity, for 21 min only two times a week, could lead to a significant increase in VO2max.

OR17-302AB-07

CLINICAL STUDY ON CHRONOTROPIC RESPONSE AND METABOLIC EQUIVALENTS IN PATIENTS WITH METABOLIC SYNDROME COMPLICATED WITH TYPE 2 DIABETES MELLITUS

Wei Chen, Min Gao, Zunke Gong, Liang Han, Jihong Wang

Department of Rehabilitation Medicine, Xuzhou Center Hospital, Jiangsu, China

Objective: To investigate chronotropic response and metabolic equivalents during treadmill exercise test in patients with metabolic syndrome complicated with type 2 diabetes mellitus. To provide theoretical foundations for the exercise prescription of those people. To observe the exercise electrocardiographic responses to metabolic syndrome patients complicated with type 2 diabetes mellitus, compare the CI index and maxMETs and the electrocardiographic change of ischemia. To explore their applicable values in assessing high risk of cardiovascular; To provide theoretical foundations for the early, objective diagnosis of Cardiovascular rehabilitation. *Methods:* A total of 120 patients with T2DM were grouped into MS group and non-MS group and all of them complete the electrocardiographic exercise testing, the indexes of CI: ratio of heart rate, heart rate reserve were measured and the maxMETs were measured. Coronary ischemia was measured by ST change of electrocardiogram (ECG). The exclusion criteria and the inclusion criteria for patient group and control group were defined. 64 cases of T2DM with MS patients fitting the patient group criteria were chosen. 56 cases of T2DM without MS fitting the criteria serving as control group. And the gender, age, level of education were matched in the two groups, the difference had no statistically significance. *Results:* Patients in MS group had a higher prevalence of CI indexes (rHR, HRR) and max METs than in the non-MS group. There were significantly correlation relationship between maxMETs and rHR (r=0.81, p<0.05), HRR (r=0.79, p<0.05). The percentage of ST change of ECG with coronary ischemia in MS group is 35.9%, the nonMS group is 19.6% (p<0.05). Patients with coronary ischemia had lower CI indexes and lower maxMETs (p< 0.05). *Conclusion:* 1. In the patients with metabolic syndrome complicated with type 2 diabetes mellitus, the CI indexes (rHR, HRR) and max METs are lower than those without metabolic syndrome. The possible mechanisms may be metabolic syndrome could reflect activity of autonomic nerve. 2. In the patients with metabolic syndrome complicated with type 2 diabetes mellitus had silent coronary ischemia, the CI indexes (rHR, HRR) and max METs are lower than those without metabolic syndrome. Metabolic syndrome complicated with type 2 diabetes mellitus had higher coronary ischemia occurred than those without metabolic syndrome. CI may reflect silent coronary ischemia or myocardial damage. 3. There were significantly correlation relationship between maxMETs and CI. Heart rate can't be used as monitoring index in patients with activity of autonomic nerve.METs and RPE can be used in those people as monitoring index. 4. The treadmill exercise test and risk stratification must be done before rehabilitation training in order to know the possibility of medical supervision. It has guiding significance in decressing risk of exercise test and increasing efficiency of exercise rehabilitation.

OR17-302AB-08

THE EFFECT OF 12-WEEK EXERCISE BASED CARDIAC REHABILITATION ON AEROBIC WORKING CAPACITY IN ELDERLY PATIENTS WITH CORONARY HEART DISEASE

Yanping Chen[1,2], Xun Liu[1,2]

[1]Baotou Yunlong Orthopaedic Hospital, [2]Tianjin University of Sport

Objective: To examine the effect of 12 weeks cardiac rehabilitation exercise on aerobic working capacity in elderly patients with coronary heart disease (CHD). *Methods:* 17 patients with coronary heart disease (aged 65.12±5.36 years) were selected to form the CHD group, and 14 non coronary heart disease people (aged 62.29± 7.08 years) were recruited to establish a control group. Before the cardiac rehabilitation starting, all subjects undertook a graded exercise test on the treadmill with modified Bruce protocol, from which their aerobic working capacity was obtained. Then, CHD patients attended an exercise training program during which time the exercise mode, intensity, duration and frequency were prescribed to hiking walk, 60%–80% peak heart rate (HRpk) of grade exercise test, 50 min of exercise and three times per week respectively. During exercise heart rate and ratings of perceived exertion (RPE) were used to control exercise intensity. The program lasted 12 weeks totally. *Results:* The quiet heart rate (HRrest) of coronary heart disease group was significant higher than the control group (p<0.05) before the rehabilitation program, and the peak oxygen uptake (VO2pk) and HRpk measured during the exercise test was significantly lower than the control group (p< 0.01 and p<0.05). After a 12 weeks of cardiac rehabilitation program, the VO2pk of CHD patients increased significantly (p<0.05), and the HRrest significant decreased (p<0.05), the HRpk no significant change. *Implications:*This study shows that VO2pk can be used as an important indicator to evaluation the effect of rehabilitation in patients with coronary heart disease during cardiac rehabilitation. And 12 weeks exercise based cardiac rehabilitation can improve the aerobic working capacity in elderly patients with coronary artery disease.

OR17-302AB-09

EFFECT OF CARDIAC REHABILITATION ON EXERCISE TOLERANCE, INSTRUMENTAL ACTIVITIES OF DAILY LIVING (IADL) AND QUALITY OF LIFE (QOL) IN SEVERE HEART FAILURE TREATED WITH IMPLANTABLE LEFT VENTRICULAR ASSIST DEVICE (LVAD)

Fumika Suzuki

Tohoku University Graduate School of Medicine, Japan

Introductions: Left ventricular assist devices (LVADs) provide effective bridge to transplant therapy for patients with end stage heart failure. Several types of implantable LVADs have approved from 2011 in Japan.This study evaluated the effect of cardiac rehabilitation (CR) on exercise tolerance, instrumental activities of daily living (IADL) and quality of life (QOL) in patients treated with implantable LVAD. *Methods:* Ten patients were treated with implantable LVAD between October 2008 and May 2012. Two patients underwent conversion from paracorporeal LVAD to implantable LVAD. After implantation, we underwent CR as soon as possible. Exercise toler-

ance was examined by using cardiopulmonary exercise testing,IADL and QOL were examined by using Frenchay Activities Index(FAI) and Minnesota Living with Heart Failure (MLHFQ), respsctively. *Results:* After LVAD implantation, CR significantly increased peak VO2 from 3.4±0.8 to 4.3±1.3 METs and anaerobic threshold (AT) from 2.5±0.6 to 2.8±0.9 METs. After conversion from a paracorporeal LVAD to implantable LVAD, peak VO2 increased from 3.3±0.6 to 4.4±0.6 METs and AT from 2.0±0.2 to 2.6±0.5 METs. After discharge from hospital, FAI score significantly increased from 2.1±1.7 to 22.9±10.1 and MLHFQ score significantly decreased from 61.9±12.0 to 39.1±7.7. *Conclusions:* CR improves exercise tolerance more effectively in severe heart failure treated with implantable LVAD, and IADL and QOL improve after discharge from hospital to home.

OR17-303AB-01

REDUCTION IN SIZE OF ENLARGED MOTOR UNITS AND CONCOMITANT LOSS OF QUADRICEPS STRENGTH OVER 10 YEARS IN POST-POLIO PATIENTS

Alice Bickerstaffe[1,2*], Anita Beelen[1], Hans Van Dijk[2], Machiel Zwarts[2], Frans Nollet[1]

[1]Academic Medical Center Amsterdam, [2]Radboud University Nijmegen Medical Centre, The Netherlands

Objective: To assess long-term changes in motor unit size (MUsize) and muscle strength of symptomatic quadriceps muscles of patients with post-polio syndrome (PPS-patients). *Methods*: Fifty of sixty-six adults with PPS and twelve of thirteen healthy controls who had undergone measurements of MUsize and quadriceps strength in 2000, agreed to retesting in 2010. All PPS-patients (mean age: 51.9 years, 64%female) had symptomatic quadriceps dysfunction with proven transmission defects on single-fibre EMG in 2000. Maximal isometric force was recorded on a chair dynamometer with knee and hip flexed at 90°. Mean motor unit size was calculated from the areas under the curve of single motor unit action potentials extracted from high-density surface EMG. *Results:* PPS-patients had significantly larger MUs and lower strength than controls, both at baseline (3.893 versus 1.593 mV*ms; 63.3 versus 120.8 Nm) and after 10 years (3.116 versus 1.430 mV*ms; 55.7 versus 85.6 Nm). The 37 PPS-patients with initially enlarged MU's (>2.52 mV*ms) exhibited a 23% loss of mean MUsize (4.529 to 3.4842 mV*ms) and 16% decrease in quadriceps strength (64.8 to 54.4 Nm), while those with normal MUsizes at the start had no change in either. Healthy controls had no significant changes in MUsize, but did lose 29% of their quadriceps strength, most likely due to atrophy, loss of muscle contractility and possibly a decrease in MU-number. *Implications for rehabilitation*: The loss of strength in this large symptomatic muscle of PPS-patients is slowly progressive and occurs in those patients with enlarged "unstable" motor-units and not those with normal sized units.

OR17-303AB-02

LOWER LIMB CORTICOMUSCULAR COHERENCE IN STROKE PATIENTS WITH DIFFERENT GAIT RECOVERY

I-Hsuan Chen[1], Ray-Yau Wang[1]*, Yea-Ru Yang[1], Men-Tzung Lo[2]

[1]Department of Physical Therapy and Assistive Technology, National Yang-Ming University, Taipei, Chinese Taipei, [2]Center for Dynamical Biomarkers and Translational Medicine, National Central University, Chungli, Taiwan, Chinese Taipei

Objective: Coherence between the electroencephalography (EEG) recorded on the scalp and electromyography (EMG) recorded on the limb reflect the corticospinal coupling between the cortex and muscle units. In this study, we recorded the EEG-EMG coherence in stroke patients with different gait recovery to examine the effects of corticospinal coupling on gait recovery after stroke. *Methods:* Twenty-six subjects with chronic stroke participated in this study. Gait speed at comfortable pace was recorded at the baseline assessment and 3-month follow-up assessment. Due to the changes of gait speed within 3 months indicating the degree of the gait recovery, subjects were thus divided into good recovery group (n=13, changes: 0.18±0.11 m/s) or poor recovery group (n=13, changes: -0.02±0.05 m/s). The EEG-EMG coherence examined at the baseline assessment indicated corticospinal coupling. The EEG of premotor (FC3, FC1, FCz, FC2, FC4) and sensorimotor areas (C3,C1, Cz, C2, C4) and EMG of the tibialis anterior of the affected leg were recorded during isometric contraction of the ankle dorsiflexion. *Results*: Subjects with good recovery in gait speed exhibited significantly higher beta-band corticospinal coupling over the midline and affected hemisphere (FCz, Cz, C1 or C2) in performing a foot movement as compared with poor recovery. *Implications/Impact on Rehabilitation*: This work provides the new tool to predict the gait recovery poststroke and may contribute to the important step to develop the promising treatment. This study was supported by the National Health Research Institutes of the Republic of China (grant no. NHRI-EX102-10039EI).

OR17-303AB-03

EFFECTS OF TRANSCRANIAL DIRECT CURRENT STIMULATION OVER BILATERAL FRONTAL GYRUS ON PICTURE NAMING IN APHASIA

Jie Wang, Dongyu Wu, Weiqun Song, Ying Yuan

Department of Rehabilitation Medicine, Xuanwu Hospital of Capital Medical University, China

Objectives: To investigate the effects of anodal transcranial direct current stimulation (tDCS) over the left Broca's area and cathodal tDCS over the right Broca's homologue on picture naming in aphasia. *Methods:* 29 aphasics with left frontal gyrus or basal ganglia lesion 2–12 months post-stroke were undertaken a picture-naming test with on-line anodal tDCS over the left Broca's area and on-line cathodal tDCS over the right Broca's homologue respectively. The test results of these two conditions were compared with that of sham stimulation respectively. The interval among the three conditions was 24 h. The left anodal and right cathodal tDCS over the bilateral inferior frontal gyrus were randomly administered. *Results:* The picture-naming score was improved significantly only in the condition of anodal tDCS over the left Broca's area compared with sham stimulation for the group (p<0.05), although some patients showed improvement during cathodal tDCS over the right Broca's homologue. *Conclusion:* Improvement of the picture naming in aphasia can be yielded by increasing the excitability of the left Broca's area. The left Broca's area and its peripheral areas play a very important role on the language recovery in aphasia with left frontal gyrus or basal ganglia lesion after stroke. Language tests with on-line tDCS is a convenient method to investigate the effect of anodal or cathodal tDCS on language function and the result of it can be used to guide the clinical treatment in individual with tDCS.

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RECOVERY OF LOCOMOTION AND MUSCLE CHANGES IN SPINAL CORD INJURED MICE FOLLOWING TREADMILL TRAINING

Mary Galea[1]*, Camila Battistuzzo[1], Lynda Hickey[2], Michelle Rank[2], Robert Callister[2]

[1]The University of Melbourne, [2]The University of Newcastle, Australia

Objective: The aim of this study was to examine recovery of locomotion and muscle changes with treadmill training for 3 or 6 weeks in mice after spinal cord injury (SCI). *Method*: Prior to surgery C57/B16 mice were familiarized with running on a treadmill. After a left hemisection at T12, mice were randomized to treadmill training (n = 6) or no training groups (n = 7). The trained

group recommenced training 1 week after SCI and continued for either 3 or 6 weeks. Gait kinematics were analysed before and after surgery using a high-speed camera and Peak Motus software. ATPase histochemistry was used to identify muscle fibre type in medial gastrocnemius (MG), soleus (SOL) and tibialis anterior (TA) muscles in both hindlimbs. Fibre area was measured from digital images using Image J software. *Results:* After 3 weeks of training, the locomotor pattern was uncoordinated and there was limited excursion of all hindlimb joints. After 6 weeks of training, hip and knee joint excursions recovered to pre-injury values, but not at the ankle joint. Fiber type and fibre area were unaltered in SOL and TA muscles in either limb regardless of training status. Fibre type was also unaltered in MG, however fibre area was larger in type IIB and hybrid fibres (type IIX) in MG in the affected limb in the trained group after 6 weeks of training. *Implications/ Impact on Rehabilitation*: A prolonged period of training has the potential to improve locomotor function and selectively reduce atrophy in MG after SCI.

OR17-303AB-05

EFFICACY OF ELECTROMAGNETIC FIELDS ON BONE MESENCHYMAL STEM CELLS DIFFERENTIATION TO NERVE CELLS AND TRANSPLANTATION FOR THE TREATMENT OF ACUTE SPINAL CORD INJURY IN RATS LINKED TO UPREGRATE BDNF EXPRESSIONS

Mingsheng Zhang, Wenfang Bai, Weicheng Xu, Yu Feng, Liming Bai, Xinping Li

Guangdong general hospital, Guangdong Academy of Medical Sciences, Institute of Geriatric Medicine, China

Objective: To observe the effects of 50 Hz electromagnetic fields (EMF) on bone mesenchymal stem cells (BMSC) differentiation to nerve cells and transplantation for the treatment of acute spinal cord injury (SCI) in rats. *Methods:* Rat BMSC were induced in a nerve cell culture environment in vitro or transplanted into incompletely injured spinal cord models in vivo with EMF exposure (frequency of 50 Hz, magnetic induction of 5 mT, 60 min per day for 12 d or 21 d). And then we observed cell phenotypes under a confocal microscope or inverted microscope, and analysed the pathological changes of SCI with hematoxylin-eosin and transmission electron microscope, assessed the motor functions by BBB scoring, and tested brain-derived neurotrophic factor (BDNF) gene expression using q-PCR in vitro or in vivo. *Results:* The results indicated that EMF could facilitate BMSC to differentiate into nerve cells, BMSC successfully transplanted to SCI rats participated in axon regeneration. Compared with control group, EMF exposure group' BBB scores were significantly difference ($p<0.05$), the expressions of BDNF gene were higher in vitro or in vivo ($p<0.05$), the anatomical structure in injured spinal cord was more similar as that of normal after day 21. *Implications:* Given the findings that 50 Hz EMF as a non-invasive treatment could significantly facilitate BMSC to differentiate into nerve cells, and improve motor function of SCI rats transplanted BMSC, EMF appears to be a promising clinical option for stem cell transplantation therapies in central nervous system diseases.

OR17-303AB-06

RESEARCH ON THE CORRELATION BETWEEN DIFFUSION TENSOR IMAGING AND MOTOR OUTCOME IN PATIENTS WITH BRAIN INJURY

Feng Feng, Hua Yuan

The fourth Military Medicine University, China

Objective: Diffusion tensor imaging (DTI) allows for the orientation and integrity of white matter tracts to be determined by virtue of its ability to visualize water diffusion characteristics. In the present research, we aimed to investigate the DTI findings of the corticospinal tract (CST) in the patients with intracerebral hemorrhage and cerebral infarction. Furthermore, we studied the correlation of the CST injury and the motor outcome using the combination of the fractional anisotropy of CST and the diffusion tensor tractography (DTT). *Methods:* 23 cases (3 cases are normal control) were performed by routine MRI and DTI. Treatment group were subjected to the rehabilitative management such as limbs exercises, repetitive transcranial magnetic stimulation, etc. NIHSS and Fugl-Meyer were used to assess the motor outcome. The apparent diffusion coefficient (ADC) and fractional anisotropy (FA) of the leision and the contralateral side were measured and compared. Pearson correlation analysis was performed to detect the correlation among FA, DTT classification and motor outcome. *Results:* FA value and NIHSS score of patients improved obviously, while DTT classification was negatively related to Fugl-Meyer assessment score. *Conclusion:* Brain molecule diffusion anisotropy characteristic of change. The change of brain molecular diffusion anisotropy characteristic can be used to evaluate the damage degree of white matter tract on brain damage area DTT classification is more accurate and intuitionistic for showing the damage degree of CST. DTI provides a good imaging for the rehabilitation of patients with brain damage and therefore is of great practical value.

OR17-303AB-07

50HZ ELECTROMAGNETICAL FIELDS FACILITATE THE INDUCTION OF RAT BONE MESENCHYMAL STEM CELLS TO DIFFERENTIATE INTO FUNCTIONAL NEURONS

Wenfang Bai[1], Mingsheng Zhang[1], Weicheng Xu[1], Yu Feng[2], Hong Huang[3], Xinping Li[1], Chunyu Deng[1]

[1]Guangdong general hospital, Guangzhou, China, [2]Southern Medical University, Guangzhou, China, [3]University of South Florida, Tampa, USA

Objective: Research results have shown that bone mesenchymal stem cells (BMSC) can different into neural cells. Electromagnetic fields (EMF) play the role of regulating cell proliferation and differentiation, but the mechanisms behind this are unknown. In this study we explored the efficacy of EMF on the induction of rat BMSC to differentiate into neurons in vitro. *Method:* BMSC were induced in a nerve cell culture environment and randomly divided into three groups: induction with EMF treatment (frequency of 50 Hz, magnetic induction of 5 mT, 60 min per day for 12 d), induction only, and control. Then we observed cell phenotypes in a confocal microscope, tested gene expression using RT-PCR, and detected post-synaptic currents via cell patch-clamp. We analyzed cell cycle and the portion of cells expressing neural cell markers with flow cytometry. *Results:* The results indicated that EMF can facilitate BMSC to differentiate into neu-ral cells, which expressed neuroal specific markers and genes, and formed synaptic junctions and pulsed excitatory postsynaptic currents. At the same time, the G0-G1 phase ratio recorded by flow cytometry gradually decreased under the EMF treatment with an increase of S phase ratio, and the portion of cells expressing neuroal specific markers (NES) increased. *Implications:* Given the findings that 50Hz EMF as a non-invasive treatment could significantly facilitate BMSC to differentiate into functional neurons, EMF appears to be a promising clinical option for stem cell transplantation therapies in central nervous system diseases.

OR17-303AB-08

THE EFFECT OF INTRAVESICAL BOTULINUM TOXIN A IN PATIENTS WITH NEUROGENIC DETRUSOR OVERACTIVITY

Koray Erten, Ümüt Güzelküçük, Bilge Yılmaz, Arif Kenan Tan

Tsk Rehabilitation Center Ankara, Turkey

Objective: To evaluate the effects of intravesical injection of 300 U of botulinum toxin A (BTX-A) on use of oral rescue medication,

bladder compliance, continence and subjective well-being in patients with neurogenic detrusor overactivity. *Study design*: Randomized, placebo-controlled, double-blind study. *Material and Methods:* A total of 30 patients with urinary incontinence due to spinal cord injury, were randomized to intravesical injections of either 300 U of BTX-A or placebo (saline solution% 0.9 NaCl) with 18 patients and 12 patients respectively. Intake of tolterodine and episodes of urinary leakage were noted daily. Cystometry was performed after 6, 12 and 24 weeks and quality of life was assessed. *Results:* Patients in the BTX-A group had a significantly lower intake of tolterodine throughout the study compared to those in the placebo group (p=0.003). Cystometric capacity was significantly higher at 6 (p<0.001) and 12 weeks (p=0.026) and maximum detrusor pressure and frequency of urinary leakage were significantly (p<0.01) lower during follow-up in the BTX-A group compared to the placebo group. In addition, subjective well-being parameters were significantly improved in the BTX-A group compared to the placebo group. *Conclusions:* Intravesical injections of 300 U of BTX-A was shown to be an effective treatment that reduce the need for oral medication, decrease high detrusor pressure and decrease the frequency of urinary leakages during the overall study period of 24 weeks. Quality of life was also significantly improved.

OR17-306AB-01

SUBSTITUTIVE TREATMENT EFFICACY FOR GH DEFICIT IN TRAUMATIC BRAIN INJURY PATIENTS

Odile Kozlowski, Christine Cortet-Rudelli, Edwige Yollin, Emilie Merlen, Walter Daveluy, Marc Rousseaux*

Centre Hospitalier Universitaire, Lille, France

Objective: In patients with severe traumatic brain injury (TBI), a growth hormone deficiency (GHD) is frequent and may contribute to the cognitive sequelae and poor quality of life (QoL). Recent studies have suggested that GH replacement therapy (GHRT) can improve processing speed and memory. Here, we analyzed the efficacy of GHRT on cognition, activities of daily living (ADL) and QoL and factors that predicted or contributed to these effects. *Method:* We included patients at least one year after their TBI and assessed pituitary functions (with stimulation tests), cognition (attention, memory and executive function), participation in ADL and QoL. GHD was treated for at least one year in 23 patients, who were compared with 27 non-treated patients. Other deficiencies were also treated. Measurements were performed at baseline and one year later. *Results:* The ANOVA of factors group and session ($p \leq 0.05$) showed that most cognitive parameters had improved at one year (evidencing a session effect). A stronger effect of GHRT (i.e. a group x session interaction) was found for the Rey Osterrieth complex figure recall and 2/6 domains in the QoL questionnaire ("personal" and "functional"). Trends ($p \leq 0.07$) were also found for spatial orientation and immediate recall in the verbal memory test. Greatest improvements were associated with lower performance before treatment. The magnitude of the improvements in ADL and QoL partially correlated with the improvement in cognition. *Implications/impact on rehabilitation*: Replacement therapy can improve the cognitive and QoL outcome in TBI patients with GHD, especially in those with severe difficulties.

OR17-306AB-02

VIRTUAL REALITY BASED TRAINING USING WII FIT IN SUBJECTS WITH PARKINSON'S DISEASE

Yingyi Liao[1,2], Yea-Ru Yang[1], Yih-Ru Wu[3], Ray-Yau Wang[1]*

[1]Department of Physical Therapy and Assistive Technology, National Yang-Ming University, Taipei, [2]Department of Rehabilitation, Jen-Teh Junior College of Medicine, Nursing and Management, Miaoli, Taiwan, [3]Department of Neuromuscular Disorder, Chang Guan Memorial Hospital, Linkou, Taiwan, Chinese Taipei

Objective: to investigate the effects of virtual reality (VR) based training using Wii fit on subjects with Parkinson disease (PD) *Method*: This study is a randomized controlled trial. Twenty-one subjects with PD (Hoehn and Yahr stage 1–3)were randomly assigned to the control group (n=7), exercise group (n=7) and VR based exercise group (n=7). Subjects in the exercise group received relaxation exercise, stretch exercise, strengthening exercise and balance training for 45 min following treadmill training for another 15 min. Subjects in the VR based exercise group received exercise training in VR using Wii Fit program including yoga, strengthening, aerobic and balance gaming for 45 min followed by treadmill training for another 15 min. The exercise was administered 2 to 3 times a week for a total of 12 times. Subjects in the control group received no structured exercise program. All subjects received pre- and post-training assessments including muscle strength of lower extremity, dynamic balance ability, sensory organization test, walking performance, timed up and go test (TUG), fall efficacy scale (FES-1) and the Parkinson's Disease Questionnaire (PDQ39). *Results:* Both exercise and VR based exercise groups showed significant more improvement in muscle strength, sensory organization test, PDQ39, FES-1 and TUG test after 12 times exercise training. However, the VR based group showed more improvement in forward and sideward movement velocity and walking speed as compared with exercise group or the control group. *Implications/Impact on Rehabilitation*: VR based training using Wii Fit can improve the dynamic balance, sensory organization ability, gait speed and confidence in fear of falling in subjects with PD. Due to its affordability and accessibility, Wii Fit is suggested as an effective training tool in rehabilitation.

OR17-306AB-03

REHABILITATION IN ADULT IMPLANT COCHLEAR: OUR EXPERIENCE

Renzo R Franco Ginocchio, C Rosario Vicente, V Ana Pinilla, G Ernesto Garcia

Phoniatrics and Logopedics Unit, Department of Rehabilitation Medicine, Miguel Servet Universitary Hospital, Zaragoza, Spain

Objective: To describe the rehabilitation process of a group of patients after cochlear implant and measure how many them gets understand complex spoken language. *Method:* Fifty patients with acquired deafness treated with a cochlear implant and then enrolled in speech therapy techniques. We use plan the rehabilitation in the order: Detection, discrimination, identification, reconnaissance and understanding We record, review and follow many variables as: Duration of treatment, score of understanding simple language (monosyllabic) and score of understanding complex language (Unknown content phrases). *Results:* In our hospital in the period of six years, we found fifty (n=50) patients treated with a cochlear implant. Of these 78% (n=39) got understand complex spoken language with a score test over 70%. The mean time of treatment for this group of patients was 4 months and 20 days. *Impact on Rehabilitation*: In our population there is a 78% of patients with a cochlear implant, who will insert ocupationally and socially without any limitation.

OR17-306AB-04

BEHAVIORAL CHARACTERISTICS AND SUBSTRATES OF SPATIAL ACALCULIA IN PATIENTS WITH RIGHT BRAIN DAMAGE

Pu Zhang, Xiaoping Yun

Department of Rehabilitation Evaluation, Beijing Charity Hospital, China Rehabilitation Research Center, Beijing, China

Objective: This study aims to summarize the behavioral characteristics of spatial acalculia (SA) patients; to explore the brain substrates underlying the spatial layout specific to complex written multipli-

cation in normal people; and to uncover the neural mechanisms underpinning the behavioral characteristics of spatial acalculia. *Method:* Six right brain-damaged patients with SA after stroke and 29 matched controls were included. All subjects' performances on a set of complex written calculation and on EC301 calculation and number processing battery were recorded. In the following fMRI session, the experimental tasks (control tasks, visuo-spatial memory tasks, simple multiplication tasks and complex multiplication tasks) were presented, the fMRI data of one SA patient and 10 normal controls were analyzed. *Results:* (1) The error of multi-digit multiplication was the main problem of complex calculation in the SA patients. The prominent error of multi-digit multiplication was misalignment of partial products. The error rate of EC301 tests in SA patients: estimation of the result of an operation (31%)>numerical transcoding (26%)>numerical comprehension (22%)>number sequences (20%)>mental calculation (11%)>arithmetical signs (0%). Arithmetical signs were intact, mental calculation was better preserved than estimation. (2) When visuo-spatial memory tasks compared to control tasks, the right precuneus, inferior parietal lobe, cuneus and the left lingual gyrus were activated in the normal controls; the bilateral occipital lobes, frontal lobes and the right posterior cingulate gyrus were activated in the SA patient. Compared to simple multiplication tasks, complex multiplication tasks elicited more activities in the right inferior parietal lobe, middle frontal gyrus, inferior frontal gyrus and the left lingual gyrus in the normal controls; the left precuneus, middle frontal gyrus and the bilateral occipital lobes of the SA patient were activated. Compared to complex multiplication tasks, the left angular gyrus and the right superior temporal gyrus were activated in the normal controls' simple multiplication tasks; for the SA patient, in addition to the left angular gyrus, the left superior frontal gyrus, middle frontal gyrus, inferior frontal gyrus, cingulate gyrus, precuneus and the right middle frontal gyrus were activated. *Impact on Rehabilitation:* There are dissociations in SA patients between misalignment of partial products in multi-digit multiplication and retrieval of arithmetic facts, between approximation and mental calculation. The misalignment of partial products stems from the deficit of the representation of spatial layout stored by visuo-spatial memory. A right parieto-frontal network is involved in the multi-digit multiplication, including the right inferior parietal lobe, middle frontal gyrus, inferior frontal gyrus which supports the containing of spatial layout information specific to complex multiplication. These findings may shed a light on the diagnosis and rehabilitation of spatial acalculia.

OR17-306AB-05

SENSORY QUANTITATIVE ASSESSMENT WITH ELECTRICAL PERCEPTION THRESHOLD IN SPINAL CORD INJURY

Yu Pan, Shuyan Qi, Qiaoxia Zhen, Xiaolei Liu, Lihua Zhang

Beijing Rehabilitaion Center, Beijing, China

Objectives: To observe the electrical perception threshold (EPT) at ASIA sensory point above, at, below the ASIA level in spinal cord injury (SCI) patient and to compare the level of SCI, according to EPT, with clinical sensory level derived according to ASIA classification. *Methods:* EPT to 5 Hz, 250 Hz, 2 kHz cutaneous electrical stimulation on both sides was measured in 9 patients with SCI (4 complete,5 incomplete) at American Spinal Injuries Association (ASIA) sensory key points above,at and below the ASIA level.The level of SCI according to EPT results was established as the lowest normal segment in which the patient EPT was within the EPT range of date base (mean ±2 standard deviation).The difference of the level of EPT and ASIA was compared. *Results:* In 4 cases with complete SCI the EPT level of all of them was higher than the clinical level. In 5 cases with incomplete SCI, the EPT level of 4 patients was higher than the clinical level. The EPT level and clinical level was the same for only one case with incomplete SCI. *Implications:* EPT is an objective, reproducible and quantifiable method of assessing sensation in patients with SCI.The results showed that EPT seems to detect and quantify subclinical changes at and near the ASIA level. Further study is required to observe the changes of ETP in SCI cases for long term and to assess the prognostic evaluation of EPT as a quantitative tool in clinic or rehabilitation.

OR17-306AB-06

HUMAN UMBILICAL CORD BLOOD-DERIVED MONONUCLEAR CELL TRANSPLANTATION: CASE SERIES OF 30 SUBJECTS WITH HEREDITARY ATAXIA

Wanzhang Yang[1], Yun Zhang[2], Fang Wu[1], Min Zhang[1], S. C Cho[3], Chun-Zhen Li[1], Shao-Hui Li[1], Guo-Jian Shu[1], You-Xiang Sheng[1], Ning Zhao[1], Ying Tang[1], Shu Jiang[2], Shan Jiang[2], Matthew Gandjian[4], Thomas E Ichim[4], Xiang Hu[2]

[1]Department of Rehabilitation Medicine, Nanshan Affiliated Hospital of Guangdong Medical College,Shenzhen, [2]Shenzhen Beike Cell Engineering Research Institution, Shenzhen, China, [3]Department of Neurology and Neurosurgery, Stanford University, Stanford, CA, [4]Medistem Inc, San Diego, CA, United States

Objective: The differential diagnosis for hereditary ataxia encompasses a variety of diseases characterized by both autosomal dominant and recessive inheritance. There are no curative treatments available for these neurodegenerative conditions. This open label treatment study used human umbilical cord blood-derived mononuclear cells (CBMC) combined with rehabilitation training as potential disease modulators. *Method:* 30 patients suffering from hereditary ataxia were treated with CBMCs administered systemically by intravenous infusion and intrathecally by either cervical or lumbar puncture. Primary endpoint measures were the Berg Balance Scale (BBS), serum markers of immunoglobulin and T-cell subsets, measured at baseline and pre-determined times ost-treatment. *Results:* A reduction of pathological symptoms and signs was shown following treatment. The BBS scores, IgG, IgA, total T cells and CD3+CD4 T cells all improved significantly compared to pre-treatment values (p<0.01–0.001). There were no adverse events. *Implications*: The combination of CBMC infusion and rehabilitation training may be a safe and effective treatment for ataxia, which dramatically improves patients' functional symptoms. These data support expanded double blind, placebo-controlled studies for these treatment modalities.

OR17-306AB-07

EXERCISE PRE-CONDITIONING AMELIORATES BRAIN EDEMA IN ISCHEMIC STROKE VIA DOWN-REGULATION OF AQP4 – AN MRI STUDY OF RATS

Xiaolou Wang, Zhijie He, Xiaojiao Yang, Jie Jia

Department of Rehabilitation, Huashan Hospital, Fudan University, China

Objective: Treadmill pre-training has been proved to ameliorate ischemia-reperfusion injury, yet its role on ischemic brain edema remains covered. *Method:* In present study, rats were randomly divided into 3 groups: Sham group, Treadmill pre-training (TT/Stroke) group and Stroke group. Animals in TT/Stroke group underwent two weeks of treadmill training, while animals in Stroke group and Sham group were allowed 2-week free movement. Middle cerebral artery occlusion (MCAO) was then performed in rats in Stroke group and TT/Stroke group. Rats in Sham group were performed the same surgical procedure without MCAO. Magnetic resonance imaging (MRI) was used to evaluate the impact of pre-training on dynamic process of cerebral edema after ischemia and reperfusion injury in vivo. During the process of ischemia and reperfusion, the development of cerebral edema was detected by Diffusion Weighted Magnetic Imaging (DWI) and T2 Weighted Resonance Imaging

(T2WI) while the change of blood brain barrier (BBB) permeability after ischemia was detected by contrast agent injection and post-T1 Weighted Resonance Imaging (T1WI). Simultaneously, brain water content measurement and Evans blue (EB) assay were performed to test the cerebral water content and BBB permeability after stroke. The expression of Aquaporin 4 (AQP4) was measured by Western Blot and immunofluorescence staining from 6 h to 3 days after stroke, to explore the relationship between treadmill pre-training and brain edema. Neurological deficits were evaluated through Garcia scoring system at 2 days post injury. *Results:* T2WI values of the ipsilateral cortex and striatum increased while the relative apparent diffusion coefficient (rADC) decreased through MRI, which reflects a formation of cerebral edema. In cortex, the rADC of TT/Stroke group increased compared with Stroke group at 1 h and 2.5 h after stroke, while the T2 values from 7.5 h to 2 days after stroke decreased as compared with Stroke group. In striatum, at 2.5 h after stroke, TT/Stroke group had increased rADC compared with Stroke group. T2 values at 2.5 h, 1 day, 2 days after stroke decreased compared with Stroke group. The brain water content of treadmill pre-training group decreased as compared with the Stroke group at 48 h after reperfusion ($p<0.05$). On the ipsilateral brain, the semi-quantitative amount of contrast agent leakage of TT/Stroke group significantly decreased when comparing with Stroke group at 7.5 h and 2 days after ischemia through MRI. The EB exudation in TT/Stroke group significantly increased when compared to Stroke group at 2 days after ischemia ($p<0.05$). Immunofluorescence staining of AQP4-positive cells significantly decreased in TT/stroke group in cortical region around ischemic lesions. Western blot results showed the expression of AQP4 after treadmill pre-training decreased at 1 h, 2.5 h,7.5 h, 2 days after ischemia. Significant difference was also observed in items of 1. spontaneous activity; 3. outstretching while held by tail; and 5. response to vibrissae touch of the Garcia score after treadmill pre-training. *Implications:* The result showed treadmill pre-training may reduce edema after cerebral ischemia via down-regulating the BBB damage and the expression of AQP4. *Acknowledgement*: The present study was supported by the National Natural Science Foundation of China (grant NO.81171855 and 81171854), Shanghai Municipal Science and Technology Commission Major Projects (grant NO.10DZ1950800), and 12th Five-year Plan supporting project of Ministry of Science and Technology of the People's Republic of China (NO: 2013BAI10B03).

OR17-306AB-08

MICROSTRUCTURAL BRAIN ABNORMALITIES IN PATIENTS WITH POST-BURN DEPRESSION USING HIGH-FIELD MR IMAGING

Jingming Hou[1], Hongliang Liu[1], Tiansheng Sun[2], Haitao Li[3]

[1]Department of Rehabilitation, Southwest Hospital, Third Military Medical University, Chongqing, [2]Department of Orthopaecdics, General Hospital of Beijing Military Area Command of Chinese PLA, Beijing, [3]Department of Radiology, Southwest Hospital, Third Military Medical University, Chongqing, China

Objective: Depression after serious injury is a very common clinical problem, but its neurobiology is still poorly understood. The purpose of this study was to use diffusion-tensor (DT) magnetic resonance (MR) imaging to explore the integrity and connectivity of brain white matter in patients with post-burn depression and to correlate DT parameters with clinical symptom severity. *Methods:* This study was approved by the local ethical committee, and written informed consent was obtained from all participants. DT imaging was performed by using a 3.0-T MR imager in 15 patients with post-burn depression and 20 healthy control subjects matched for age, sex, education level, and handedness. By using voxel-based analysis, fractional anisotropy (FA) and axial and radial diffusivities were compared between patients and control subjects with a two-sample *t*-test and were tested for correlation with symptom severity. *Results:* Compared with control subjects, the patients with post-burn depression demonstrated significantly increased FA in the genu and body of corpus callosum and middle occipital gyrus; and decreased FA mainly in inferior frontal gyrus and right temporal gyrus. The FA values in the white matter of right middle temporal gyrus in patients with post-burn depression correlated positively with HAMD scores ($r=0.536$, $p<0.01$). *Implications:* Our findings provide preliminary evidence that post-burn depression is associated with axonal microstructural abnormalities within the white matter. The positive correlation between DT abnormalities and symptom severity suggests that DT imaging might be useful in diagnosis and therapeutic planning in patients with post-burn depression.

OR17-306AB-09

FUNCTIONAL ELECTRICAL STIMULATION INCREASES NEURAL STEM/PROGENITOR CELL PROLIFERATION AND NEUROGENESIS IN THE SUBVENTRICULAR ZONE OF RATS WITH STROKE

Huihua Liu, Tiebin Yan

Department of Rehabilitation Medicine, Sun Yat-sen Memorial Hospital of Sun Yat-sen University, China

Objective: To explore the effect of FES on neurogenesis in rats after middle cerebral artery occlusion (MCAO). *Method:* The effect of FES on neurogenesis in rats after MCAO was investigated by applying two 10 minute sessions of FES daily beginning 48h after MCAO. Substantially improved functional performance was observed after treatment. Bromodeoxyuridine (BrdU) injections given twice daily were used to label proliferating cells. The outcome measures were the total number of BrdU-labeled cells in the SVZ, BrdU/glial fibrillary acidic protein (GFAP) double positive neural progenitor cells in the SVZ, BrdU/doublecortin (DCX) double labeled migrating neuroblast cells and BrdU/neuron-specific nuclear protein (NEUN) double labeled mature neuroblasts. All these were quantified at days 1, 3, 7 and 14 of the FES treatment. *Results*: FES significantly increased the number of bromodeoxyuridine (BrdU)-positive cells and BrdU/glial fibrillary acidic protein (GFAP) double positive neural progenitor cells in the subventricular zone (SVZ) on days 7 and 14 of the treatment. The number of BrdU/doublecortin (DCX) double positive migrating neuroblast cells in the ipsilateral SVZ on day 14 after treatment was significantly increased, and more DCX-positive cells migrated toward the injured striatum. But only a few BrdU/neuron-specific nuclear protein (NEUN)-positive cells were observed by day 14 of the treatment. *Implication*: These data indicate that FES when initiated 48h after stroke can enhance neurogenesis in the ischemic brain and improve functional outcomes. They show that FES augments the proliferation, differentiation, and migration of neural progenitor cells and thus promotes neurogenesis, which may be related to the improvement of neurological outcomes.

OR17-307AB-01

THE EFFECTIVENESS OF ROBOTIC WALKING IN THE EARLY RECOVERY PERIOD IN PATIENTS AFTER TOTAL KNEE AND HIP REPLACEMENT

Elizaveta Koneva*, Tatyana Shapovalenko, Konstantin Lyadov

Medical and Rehabilitation Center, Russia

Relevance: An advance in anesthesiology and intensive care, as well as improvement and development of new functional rehabilitation techniques enable high-tech rehabilitation at the earliest recovery period after total joint replacement. Target. Determine the effectiveness of training by distance robotic reconstruction (RRH) in patients after total joint (hip\knee) replacement (TJR, THR, TKR). *Materials*: The study included 210 patients after TJR, in 5 days-post operation-period, 162 – TKR, 48 – THR. The main group consisted of 130 patients received RRH+kinesiotherapy, the

control - 80 patients received kineziotherapy only. *Methods:* We started RRH on the second day after surgery and continued for 2–3 days, exercise duration – 20 min. All patients received kinesiotherapy. The effectiveness was estimated by podography and podometry in the beginning and in the end of treatment. Dynamics of mobility was assessed by the 10-meter-distance-test. *Results:* In the main group we checked considerable decrease of locomotion asymmetry, normalization of amortization of the operated leg by podography. Analysis of increasing of the trajectory of migration of center of pressure under the foot by podometry shows: in the main group 275.13+96.51 g\sm2 vs 64.74+51.72 g\sm2 in control group, p<0,05. Time of overcoming 10-meter-distance was 38.65+15.87sec in the main group vs 63.12+16.45 sec in the control group, p <0.05. *Conclusions:* RRH in the early recovery period after TJR of the lower limbs is highly effective method of recovery of walking.

OR17-307AB-02

IMMEDIATE EFFECTS OF MINIMAL/NON-NEEDLE ACUPUNCTURE TO LOWER LIMBS MUSCLE FUNCTION IN CHRONIC HEMIPREDIC PATIENTS WITH STROKE

Miyuki Matsumoto, Masazumi Mizuma
Showa University School of Medicine, Japan

Objective: It has been observed that minimal/non-needle acupuncture stimulations contribute for immediate positive effects to stumbling in hemipredic patients with stroke. Difficulty with walking is related to known signs like reciprocal inhibition causing contractures and pathological movement. By using the M-test, minimal stimulations supplied at antagonist and meridian result in decreasing difficulty of movement. This study is aimed to measure the influence of minimal acupuncture stimulation to lower limbs activity between agonist-antagonist patterns by surface electromyography (sEMG) in paresis walking. *Method:* 6 subjects were chronic (over 2 years) hemipredic and experiencing stumbling, with Brunnstrom stage II-VI, 4 males/2 females, 53.8 years ±19.2. The sEMG by both lower libs: biceps femoris, quadriceps femoris, tibial anterior (TA) and triceps surae (TS) were recorded during 3 min walking assessment. 6 steps iEMG between TA and TS were analyzed to provide a TA/TS ratio in swing phase. *Results:* The subjects showed significantly decreased VAS for difficulty in walking after stimulation. However, there were individual differences in the summed iEMG in a walking cycle during task tends to decrease muscle function. Furthermore there was a invest correlation with the number of steps. 67% subjects decreased TS iEMG in swing phase, giving the TA/TS ratio similar to characteristics found in healthy walking pattern. *Implications:* It was revealed that the minimal acupuncture stimulation using M-Test contributes to ADL by reducing TS hyperactivities. These results suggest that such stimulations may assist hypertonia by abnormal reciprocal inhibition and pathological co-contraction experienced by patients walking after a stroke.

OR17-307AB-03

THE MECHANISM OF THE VIRTUAL REALITY FOR AFFECTED UPPER LIMB AFTER SUBACUTE STROKE: A FUNCTIONAL MAGNETIC RESONANCE IMAGING STUDY

Qiang Lin, Dongfeng Huang, Xiao Bao, Yurong Mao, Le Li
The First Affiliated Hospital, SUN YAT-SEN University, Guangzhou, China

Objective: The effect of using virtual reality (VR) setups for affected upper limb has received increased attention. We choose eighteen normal subjects and two-patients case to explore the mechanism of cortical plasticity after the treatment of kinect. The objective was to compare the training effect on the affected upper limb after subacute stoke on pretraining, posttraining and twelve weeks follow-up using Kinect-based system, and explore the mechanism of brain reconstruction under functional Magnetic Resonance Imaging (fMRI). *Method:* This study is a single-blinded randomized controlled trial with twelve weeks follow-up. The eighteen normal subjects (55.56% women and 44.44% men; mean age: 59.17 years±5.04) are used as a group to set up the standard brain via fMRI. Two subacute stroke patients (2 males; age, 59 and 50 years) received one h therapy sessions for their affected arms, occurring 5 days/week for 3 weeks using the kinect program. Subjects performed fMRI and evaluation of hand motor function using the Fugl-Meyer Assessment (FM) and the Wolf motor arm Test (WMAT) pretraining, posttraining (after 3 weeks intervention) and 12 weeks follow-up. *Results:* The brain activation areas of 18-normal-subject with hand-clenching under fMRI focused on contralateral SM1 and bilateral SMA and ipsilateral cerebellum. Two patients exhibited: 1) WMAT and FM score increases (22 and 18; 2.3 and 1.7, respectively) and function improve clinically. 2) fMRI revealed significant change of brain activation to hand clenching of the affected hand in the contralateral SM1 postintervention compared to averaged 18-normal-subject. For SM1cluster size of three time-points, patient 1 presented gradually increased, while patient 2 was gradually decreased. *Implications on Rehabilitation*: Overall, our results indicate that: 1) The patients showed increased and decreased activation extent in the primary sensorimotor cortex, but they all expressed improvement of hand function. We suggest more similar to the average activation brain map of eighteen subjects the better recovery patients could get. 2) The mechanism of kinect system for physical rehabilitation of upper limb disfunction may be connected to the primary sensorimotor cortex reorganization.

OR17-307AB-04

THE EFFECTS OF ELEVATED INTRA-ABDOMINAL PRESSURE ON THE COMPRESSIVE LOADING OF SPINAL JOINTS AND ACTIVATION OF MUSCLE GROUPS

Mengjie Huang, Khatereh Hajizadeh, Ian Gibson, Taeyong Lee
National University of Singapore, Singapore

Objective: to investigate the effects of elevated intra-abdominal pressure (IAP) on the loading of spine and activation of muscle group through the approach of musculoskeletal modeling. *Method:* A validated musculoskeletal human-body model, with an equivalent bushing element which can mimic all the mechanical properties of IAP, was applied. The influence of different IAP from 5 mmHg to 30 mmHg in the increments of 5 mmHg on the loadings of lumbar spine joints and activation of muscle group of human body in the upright standing posture was studied. The musculoskeletal computational analysis was based on inverse and forward dynamic simulations. The spinal joint force and muscle activation were obtained after simulations. *Results:* It is found that elevated IAP without concurrent abdominal and back muscle contraction, reduce the compressive loading of lumbar intervertebral joints and the activities of abdominal and back muscle groups. *Implications/Impact on Rehabilitation:* The results of this study indicates that elevated IAP can relieve the loading condition of spine and muscle activation, which provide some suggestions for the rehabilitation of patients with back pain and other back problems.

OR17-307AB-05

PULSED ELECTROMAGNETIC FIELDS PREVENT OVARIECTOMY-INDUCED OSTEOPOROSIS IN RATS: A RANDOMIZED CONTROLLED TRIAL

Jun Zhou, Hongchen He, Lin Yang, Huifang Liu, Shiju Chen, Hua Guo, Lu Xia, Yuxi Qin, Chuan Liu, Xiaofei Wei, Chengqi He
Department of Rehabilitation, West China Hospital, Sichuan University, Chengdu, China

Objective: Receptor activator of nuclear factor κB ligand (RANKL) and osteoprotegerin (OPG) are cytokines predominantly secreted

by osteoblasts and play a central role in differentiation and functional activation of osteoclasts. This study aimed to systematically investigate the effects of pulsed electromagnetic fields (PEMFs) on bone mass and expressions of RANKL and OPG in ovariectomized rats. *Methods:* Thirty 3-month old female Sprague–Dawley rats were randomly divided into three groups: sham-operated control (Sham), ovariectomy (OVX), and ovariectomy with PEMFs treatment (PEMFs). One week following ovariectomy surgery, rats in the PEMFs group were exposed to PEMFs for 40 min/day, 5 days/week, for 12 weeks. *Results:* After 12-week interventions, serum 17β-estradiol increased ($p<0.05$) and tartrate-resistant acid phosphatase 5b decreased ($p<0.05$) in the PEMFs group. Bone mineral density of the proximal femoral metaphysis and the fifth lumbar (L5) vertebral body increased in the PEMFs group ($p<0.01$, $p<0.05$). Histomorphometrical studies showed that PEMFs increased trabecular bone area and trabecular number, and decreased the marrow cavity of the OVX rats after 12-week interventions. Biomechanical studies showed that PEMFs increased maximum load and energy to failure in L5 lumbar vertebral body ($p<0.01$, $p<0.01$). Quantitative real-time RT-PCR showed that PEMFs decreased mRNA expression of RANKL ($p<0.01$) and increased OPG expression ($p<0.05$) in ovariectomized rats. *Implications/Impact on Rehabilitation:* The results demonstrated that PEMFs can prevent ovariectomy-induced bone loss and deterioration of bone microarchitecture and strength, at least partly, through regulating the expressions of RANKL and OPG.

OR17-307AB-06

ULTRASONOGRAPHY IN THE DIAGNOSIS OF MYOFASCIAL NECK PAIN

Antonio Stecco[1]*, Marta Imamura[2], Andrea Meneghini[3], Carla Stecco[4]

[1]Department of PM&R, University of Padua, Italy [2]Department of PM&R, University of Sao Paulo, Brazil, [3]Department of PM&R, University of Padua, [4]Departmetn of Molecolar Medicine, University of Padua, Italy

Chronic neck pain is a highly prevalent clinical condition. However, a definitive diagnosis of its causes is sometime not possible. To understand if the deep fasciae of the neck could play a role in the chronic neck pain the morphometric and clinical data of 25 healthy subjects and 28 patients with chronic non-specific neck pain were compared. For all subjects, the active and passive cervical Range of Motion were analyzed with the goniometer and the Neck Pain Questionnaire was administered before treatment, after physiotherapy and at three and six months follow up. The fascia thickness of the sternal ending of sternocleidomastoid muscles and of medial scalene muscles was also analyzed with 10 Mhz ultrasonography. There were significant statistical different with the healthy subjects in the thickness of the upper side of the sternocleidomastoid cm fascia and of the lower and upper side of the right scalene fascia. At the end of the treatment and at three and six months follow up the patients refer a significant decrease of the pain and of the thickness of the fascia. The analysis of the thickness of the sub-layers of the fascia showed a statistical decrease of the loose connective tissue at the end of the treatment as well as at three months and a six months. The data support the hypothesis that the deep fascia of the neck, and in particular the loose connective tissue inside it, could play a significant role in the pathogenesis of the chronic neck pain.

OR17-307AB-07

EFFECTS OF ACUPOTOMY TREATMENT IN PATIENTS WITH CERVICAL VERTIGO

Duan Jun-Feng

Rehabilitation Medicine Department, General Hospital of Guangzhou Military Command of PLA, Guangzhou, China

Objective: To assess the influence of acupotomy treatment on the clinical function in patients with cervical vertigo. *Material*: 81 patients with cervical vertigo were randomly divided into manipulation group (control group, $n=40$) and assisted acupotomy group (experimental group, $n=40$). All the patients in two groups treated with Long spinal column bonesetting massage technique. While patients in experimental group additionally received a total of two acupotomy treatments, once a week. The effect was measured by the Evaluation Scale for Cervical Vertigo and color-coded duplex Doppler diagnostic ultrasound imaging on vertebral artery. *Results:* We found scores of the Evaluation Scale for Cervical Vertigo in the two groups of patients after treatment were significantly higher than those before treatment ($p<0.05$). After treatment, scores of the Evaluation Scale for Cervical Vertigo, cure rate and peak systolic velocity (PSV) measured by color-coded Doppler ultrasound imaging in experimental group were significantly superior to those in control group ($p<0.05$). *Implications:* Once potentially severe causes of the symptoms have been ruled out, application of acupotomy should be an appropriate strategy in patients with cervical vertigo.

OR17-307AB-08

THE EFFECT OF PHONOPHORESIS USING NIMESULIDE GEL ON MECHANICAL LOW BACK PAIN

Rodney Uy[1,2]*, Lohindren Adorable[1,2,3], Cris Cecil Abbu[1,2]

[1]Sacred Heart Hospital, [2]Southwestern University, [3]Vicente Sotto Memorial Medical Center, [4]Philippine Academy of Rehabilitation Medicine, Philippines

Objective: This study determined the effect of phonophoresis using Nimesulide gel on patients with mechanical low back pain. *Methods:* Ninety diagnosed mechanical low back pain patients were included in the study; divided into three groups of thirty. The initial numeric pain scale and Oswestry low back pain disability scale of the patients were obtained. All were treated every other day for ten sessions. The treatment comprised of Williams therapeutic exercise, ultrasound at 1.5 watts/cm^2 with 15 grams of ultrasonic gel, and phonophoresis using 3 grams of Nimesulide gel mixed with 15 grams of ultrasonic gel. Group 1 subjects were treated with therapeutic exercise alone, group 2 with combined therapeutic exercise and ultrasound and group 3 with combined therapeutic exercise and phonophoresis. After the tenth session, the numeric pain scale and Oswestry scale of the patients were obtained again. The data gathered pre-treatment and post-treatment in each group were analyzed using paired t-test and between groups using ANOVA. *Results:* There is significant difference in pain scale and Oswestry scale pre and post- treatment in each group; for pain - group 1: t=8.576, group 2: t=18.610, group 3: t=15.236, sig.000; for Oswestry - group 1: t=8.765, group 2: t=9.497, group 3: t=7.184, sig.000. Group 3 has the highest variance in pain (2.102299) and Oswestry scale (158.2586), and there is significant difference between groups in pain (F 24.10552, p 4.6809, Fcrit 3.101296) and Oswestry (F 4.554991, p 0.013142, Fcrit 3.101296). *Conclusion:* Phonophoresis using Nimesulide gel reduces pain and improves function faster.

OR17-307AB-09

BIOMECHANICAL PROPERTIES OF THE GLENOHUMERAL JOINT CAPSULE IN HEMIPLEGIC SHOULDER PAIN

Sun Gun Chung[1], Won Kim[1,2], Byung-Mo Oh[1,2], Youbin Yi[1,2,3]*

[1]Department of Rehabilitation Medicine, Seoul National University Hospital, Seoul, [2]Department of Rehabilitation Medicine, Seoul National University College of Medicine, Seoul, [3]Rheumatism Research Institute, Medical Research Center, Seoul National University, Seoul, South Korea

Objective: To investigate the biomechanical properties of the glenohumeral joint capsules in hemiplegic shoulder pain (HSP) with

multidirectional range of motion (ROM) limitation in comparison with those of control subjects without ROM limitation and adhesive capsulitis (AC) patients. *Design*: Retrospective reviews of intra-articular hydraulic distension pressure-volume monitoring data, medical records, and findings of sonographic studies. *Patients*: Fourteen patients with HSP were included; 10 subjects with full ROM and 42 AC patients of sex, age, and ROM matched with the HSP group served as the control and AC groups, respectively. *Methods:* Demographic variables, clinical parameters, sonographic findings and biomechanical parameters of the capsule - maximal volume (Vmax), pressure (p<sub>V_max) at Vmax and capsular stiffness (Kcap) - were compared among the three groups. *Results:* Demographic data, clinical variables were comparable among the three groups. Sonographic findings were comparable between the HSP and AC groups. Vmax was significantly larger in the control group than the AC group. The HSP and AC groups showed significantly higher Pv_max than the control group. Kcap of HSP was higher than that of control (13.86±8.36 vs 3.80±2.62, p=0.001 by Mann-Whitney U test) and lower than that of AC (13.86±8.36±16.86, p<0.0001 by Mann-Whitney U test). *Conclusion:* The glenohumeral joint capsules of HSP patients were stiffer than those of control subjects but not as much as those of AC patients with similar ROM limitations. It is suggested that HSP shares a common mechanism with AC but may have additional mechanisms contributing to its ROM limitations.

OR17-308-01

RELATIONSHIP BETWEEN SELF-REPORTED WALKING ABILITY AND OBJECTIVELY ASSESSED GAIT PERFORMANCE IN PERSONS WITH LATE EFFECTS OF POLIO

Christina Brogårdh[1,2]*, Ulla-Britt Flansbjer[1,2], Christina Espelund[2], Jan Lexell[1,2]

[1]Lund University, [2]Skåne University Hospital, Sweden

Objective: Muscle weakness in the lower limbs and impeded gait performance are common in persons with late effects of polio. The aim of this study was to assess self-reported walking ability in persons with late effects of polio and determine the relationship with objectively assessed gait performance. *Methods:* One-hundred and twenty-two individuals with prior polio (65 women and 57 men, mean age 65 years) participated in the study. The main outcome measures were: Walk-12 (Swedish version) to assess self-reported walking ability, and Timed "Up & Go", Comfortable Gait Speed, Fast Gait Speed and 6-Minute Walk Tests to assess gait performance objectively. *Results:* More than 50% of the participants reported limitations (moderately or quite a bit) related to standing or walking, climbing stairs, walking speed and distance, concentration and effort, and gait quality aspects. Half of the participants reported no need to use support when walking indoors or outdoors, but 58% reported that their ability to run was extremely limited. Significant correlations (p<0.01) were found between the Walk-12 and the four gait performance tests (rho -0.66 to 0.63). *Implications:* The strength of the relationship implies that Walk-12 reflects broader dimensions than the objective gait performance tests and can be a complement when the walking ability in persons with late effects of polio is evaluated.

OR17-308-02

EFFECT OF LATERAL WEDGING IN SHOES ON RADIOLOGICAL ANALYSIS AND FOOT PRESSURES IN PATIENTS OF OSTEOARTHRITIS KNEE

Somya Saxena, Upinderpal Singh, Sanjay Wadhwa, Shiv Lal Yadav, Gita Handa

All India Institute of Medical Sciences, New Delhi, India

Objective: Lateral wedging in shoes is advocated as a simple, inexpensive, self-administered intervention for knee osteoarthritis, yet there is currently limited evidence to support its use. Aim of this study was to assess the effect of lateral wedging quantitatively. *Material/Methods:* Zebris Gait Analysis System was used for foot pressure analysis. Scanogram bilateral Knee joints AP view was done to evaluate the joint space and angles. Design: Prospective Interventional Pre Post Study. *Case Selection*: 40 patients of either sex between 35–75 year age attending PMR OPD with Grade 2/3 osteoarthritis on Kellgren and Lawrence System affecting medial compartment of knee were included. Scanogram of bilateral knee joint standing and foot pressure force plate analysis was done at baseline and after ¼ inches lateral wedge was given in shoes of the patient. *Results and Implications*: We found significant decrease in joint space angles after lateral wedging which signifies that lateral wedging in shoes of the magnitude of ¼ inch does produce changes in the weight line at the knee joint. Peak plantar pressures showed a trend of shift towards lateral zone of foot after wearing lateral-wedged insoles in shoes, signifying the redistribution of pressure and change in the ground reaction forces in the patients of Osteoarthritis knee after shoe modification. All patients reported relief in pain score. Hence lateral wedging provides symptomatic benefits. Thus, footwear modification holds great potential as simple and inexpensive modality to treat OA knee in low income countries. Further our results suggest the importance of conservative management and its potential to delay the disease progression and may prove a boon for those who cannot afford surgical intervention.

OR17-308-03

CLINICAL CHANGE THRESHOLD AND DIAGNOSTIC VALIDITY OF THE UNIVERSITY OF ILLINOIS AT CHICAGO FEAR OF FALLING MEASURE TO IDENTIFY FALLERS IN COMMUNITY-DWELLING OLDER ADULTS IN THE US AND CHINA

Han Chen[1,2], Susan Smith[1]*, Elizabeth Wang-Hsu[1], Jan Meiers[1], Meifang Ji[2]

[1]Department of Physical Therapy & Rehabilitation Sciences, Drexel University, Philadelphia, PA , United States, [2]Department of Physical Medicine and Rehabilitation, Southwest Hospital, Third Military Medical University, Chongqing, China

Objective: Fear of falling is associated with falls and fall risk. The University of Illinois at Chicago Fear of Falling Measure (UIC FFM) is a self-report (optimal score=48) developed to investigate fear of falling (Velozo & Peterson, 2001). Our purpose was to estimate the clinical change threshold and diagnostic validity of the UIC FFM for *predicting* falls in community-dwelling older adults in the US and China. *Method*: From our research database of 95 US adults (aged 60–97, M=81.9 years.), a cohort of 12 (aged 60–80, M=69.8 years.) was selected to match the age and living environment of 24 Chinese volunteers (aged 60–82, M=67.5 years). Volunteers completed a demographic and fall history questionnaire (falls in past 12 months) and the UIC FFM in their native language. Clinical change threshold, sensitivity, specificity, likelihood ratios were calculated. *Results*: The US reported 5 fallers [41%], 7 non-fallers [58%] (Mean score=39.1/48) and the Chinese reported 13 fallers [56.5%], 10 non-fallers [43.5%] (Mean score=36.3/48). The clinical change threshold was 37/48 for both sites with sensitivity and specificity of 0.60 and 0.86, respectively for the US and 0.62 and 0.80, respectively for China. Positive likelihood ratios were 4.29 for the US and 3.01 for China. *Implications/Impact on Rehabilitation:* Result: are consistent with the literature that increased fear of falling is associated with increased fall risk. The UIC FFM is a simple, quick screen for fall risk in community-dwelling older adults in the US and China.

OR17-308-04

SAFETY REHABILITATION IN HYPERACUTE PERIOD OF STROKE

Irina Sidyakina*, Vadim Ivanov, Tatyana Shapovalenko, Konstantin Lyadov
Medical and Rehabilitation Center, Russia

Objective: Maximal realization of rehabilitation potential for patients after stroke is a primary purpose of neurorehabilitation. It is necessary to provide active rehabilitation procedures in first days after stroke for successful solution of this problem. The aim of this study is safety evaluation for complex rehabilitation program in hyperacute period of stroke. *Materials and Methods:* 239 patients after ischemic stroke that arrived into intensive care unit in first two days after event were included into this study. Main group counted 120 people (71 men), aged 65.4+13.8 years in average. Main group was subjected to extended rehabilitation program, that included standard rehabilitation program, stimulation methods, verticalization on tilt table, cyclic training, and surface and intra-gullet electromyostimulation in the case of bulbar disorders (level of conscience at least 14 points according to Glasgow Coma Scale). Control group counted 119 people (79 men), aged 68.2+12.2 years in average. Control group was subjected to standard rehabilitation program. When brain structures dislocated and patients had truncated conscience, intracranial pressure was monitored during procedures. In case of hemodynamic instability, invasive BP monitoring was done, respiration was monitored in case of respiratory compromise. *Results:* In 3 months after beginning of rehabilitation, Bartel and Rivermed scales measures in main group came to 47.3+2.6 and 4.2+0.2, respectively, in control group 39.0+1.2 and 2.1+0.1, respectively. Lethality in main group was 10.5%, in control 11.7%. *Conclusions:* Early and extended rehabilitation is safe for patients with severe cerebral stroke, if properly monitored, intensive therapy corrected in time, functional outcome improves in remote period.

OR17-308-05

THREE DIMENSIONAL MOTION ANALYSIS OF LUMBO-PELVIC RHYTHM DURING TRUNK EXTENSION

Michio Tojima[1]*, Naoshi Ogata[2], Yasuo Nakahara[2], Haruhi Inokuchi[1], Arito Yodu[1], Nobuhiko Haga[1,2]
[1]Department of Rehabilitation Medicine, Graduate School of Medicine, The University of Tokyo, [2]Department of Rehabilitation, The University of Tokyo Hospital, Japan

Objective: Coordination between hip and spine, known as lumbopelvic rhythm (LPR), is usually expressed as lumbar hip ratio (LHR). This study measured real-time LHR during trunk extension using three dimensional motion analysis system (VICON). *Methods*: The data of lumbar extension movement, categorized into backward and forward phase, were captured using Plug-in gait and original marker trajectories with VICON system in eight healthy males. The original markers were placed on both paravertebral muscles at T11 level, spinous processes of T10 and T12, and pelvis. We measured range of motion (ROM) of lumbar spine and hip, center of gravity (COG), and waist/hip moment. We calculated LHR as the ratio of real-time lumbar ROM to hip ROM. We divided each phase into ten partitions and analyzed the differences among all partitions using 1-way repeated measures ANOVA. *Results:* LHR significantly increased from 1.2 to 1.9 (mean 1.6) in backward phase, indicating significant movement of lumbar spine compared with hip movement at the later phase of extension. In forward phase, LHR decreased from 1.9 to 0.5 (mean 1.5) although there was no significant difference due to inter-individual variability. After the 70% of forward phase, LHR decreased to <1.0 and the COG remained postero-inferiorly compared with backward phase. Moreover, the flexion moment of waist was twice as large as that of the hip. *Implication/Impact on Rehabilitation*: Our novel method for measuring real-time LHR by VICON will be a useful tool for the analysis of the lumbar movement in patients with spinal/hip disorder such as hip-spine syndrome.

OR17-308-06

SEXUAL PRACTICES IN MALE PATIENTS SUFFERING FROM SPINAL CORD INJURY IN PAKISTAN; A CROSS-SECTIONAL SURVEY OF 34 PATIENTS

Saeed Bin Ayaz, Muhammad Ali Raza Qureshi*, Zaheer Ahmed Gill
AFIRM Rawalpindi, Pakistan

Aim and Objective: Spinal cord injury has major physiological and psychological consequences affecting a man's sexual desire, arousal, erectile function and fertility. The aim and objective of this study is to inquire about sexual practices in spinal cord injury patients. *Methods:* After approval of hospital ethics committee and verbal informed consent from patients, a total of 34 male patients (Age: 18–58 years) with established diagnosis of spinal cord injury were sampled by convenience sampling. Medical record was reviewed and face-to-face semistructured interviews were conducted. Patients with sexual problems prior to injury or cognitive deficits were excluded. *Results:* The mean age was 31 ± 9 years. Majority (23) was married and had education from 5th to 10th grade (18). Most were paraplegics (32) with a complete injury (26). Majority (82%) possessed sexual desire but was not sexually active following injury (91%). Tactile stimulation was the preferred mode (50%) for penile erection. Most of them failed to reach orgasm (68%) or ejaculate (91%) yet satisfied with their sexual life (62%). No one could have children following injury. Patients with incomplete lesions were better in terms of sexual desire (88 vs 81%) and activity (25 vs 4%), reaching orgasm (50 vs 27%), achieving ejaculation (38 vs 0%) and satisfaction in sexual life (75 vs 58%) when compared to those with complete lesions. *Discussion*: Following spinal cord injury most male patients in Pakistan possessed sexual desire but failed to reach orgasm and successfully ejaculate. None of them had been able to become father of a child. However they were satisfied with the way their sexual life was going on. The reason probably was the over whelming negative effect of their physical disability. Patients were so much concerned about their physical improvement that they could not pay attention to their sexual shortcomings. Physical ability was the only major desire they could wish for in their future life. This information also guided us to improve our efforts in providing education about sexual aspects of life following impairments to the physically disabled. *Potential Implications:* These findings were just a step forward in the research for sexual rehab in Pakistan which hopefully would break the ice and make people realize the importance of sexuality and the rehabilitation of sexuality in life of a common man.

OR17-308-07

THE SELF-REPORT FECAL INCONTINENCE AND CONSTIPATION QUESTIONNAIRE (FICQ) IN PATIENTS WITH PELVIC FLOOR DYSFUNCTION

Ying-Chih Wang[1,2,3]*, Daniel Deutscher[4], Sheng-Che Yen[5], Jerome Mioduski[2]
[1]University of Wisconsin-Milwaukee, [2]Focus On Therapeutic Outcomes, Inc, [3]Northwestern University, [4]Maccabi Healthcare Services, Israel, [5]Northeastern University, United States

Objective(s): Our purpose was to perform a psychometric analysis of the Fecal Incontinence and Constipation Questionnaire (FICQ) in patients seeking outpatient rehabilitation services due to pelvic floor dysfunction (PFD), and to develop an Item Response Theory (IRT)-based item bank suitable for computerized adaptive testing (CAT) application for this patient population. *Method:* We assessed a 20-item FICQ for unidimensionality and local independence,

differential item functioning (DIF), item fit, item hierarchical structure, and test precision using IRT partial credit model. Data were analyzed from 644 patients (mean age 52, SD 16, min 18, max 91) being treated for their PFD in 64 outpatient rehabilitation clinics in 20 states (USA). *Results:* Factor analyses supported the two-factor subscales as original defined: items related to either leakage or constipation severity. Removal of two items improved unidimensionality and local independence. Among remaining items, two items were suggestive of adjustment for DIF by age group and by number of PFD comorbid conditions. Item difficulties were suitable for patients with PFD with no ceiling or floor effect. Mean item difficulty parameters for each subscale ranged from 38.8 to 62.3, and 28.1 to 63.3 (0 to 100 scale), respectively. Endorsed leakage items representing highest difficulty levels were related to delay defecation, and confidence to control bowel leakage. Endorsed constipation items representing highest difficulty levels were related to the need to strain during a bowel movement and the frequency of bowel movements. *Implications/Impact on Rehabilitation*: To our knowledge, this is the first study designed to develop an IRT-based item bank suitable for CAT application for patients with PFD seeking outpatient rehabilitation therapy.

OR17-308-08

THE THERAPUTIC EFFECTS OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION OVER BLADDER DETRUSOR-SPINCTER DYSSYNERGIA AFTER SPINAL CORD INDURY

Huilin Mo, Hua Yuan, Xiang Mu, Rui-Xue Zhang

Department of Rehabilitation and Physiotherapy, Xi-jing Hospital, the Fourth Militay Medical University, China

Objective: We observed the effects of rTMS over detrusor-spincter dyssynergia patients to find out whether it is efficient for detrusor-spincter dyssynergia after SCI, which is yet not solved well enough. *Method:* 18 patients with SCI and detrusor-spincter dyssynergia were divided randomly into 2 groups: rTMS group and control group. The rTMS group was treated with 20 Hz rTMS over L2 spinous process given 20 pulses per group with interval of 10s for 7 min, once per day. Both groups received the same medicine and rehabilitation training. Urodynamic investigation and urinate diary were used to evaluate the effects before and after the treatment and 1 week after it. *Results:* rTMS group had a significant increase in Qmax and decrease in SLPP and PVR after the treatment,so as in mean urinary frequency and mean urine volume. CMG also increased but not significantly.The results even proceeded 1 week after treatment. Control group got no significant change in all the above. *Impact on Rehabilitation*: Patients with SCI always suffer from LUTS due to lesion of micturition center in spinal cord and related nerve tracts,in which detrusor-spincter dyssynergia the most common and a big influence factor on QOL among SCI patients as LUTS leads to susceptivity to urinary system infection,lesion of kidney and bladder and catheterization-reliance. There is yet no efficient way to solve it. The rTMS therapy shows an special effect on modulating excitability of nerve centers without lesion,which is thought to be useful as the dyssynergia seems to be caused by the imbalance of excitability of autonomic micturition centers in spinal cord.

OR17-308-09

CAN EARLY REHABILITATION AFTER TOTAL HIP ARTHROPLASTY REDUCE ITS MAJOR COMPLICATIONS AND MEDICAL EXPENSE? A RETROSPECTIVE LONGITUDINAL COHORT STUDY FROM 1997 TO 2009

Willy Chou[1,2], Pei-Chi Hsiao[1], Kuo-Shu Yuan[3], Hing-Man Wu[1], Daniel Chiung-Jui Su[1]

[1]Department of Physical Medicine and Rehabilitation, Chi Mei Medical Center, Tainan, [2]Department of Recreation and Health-Care Management & Institute of recreation Industry Management, Chia Nan University of Pharmacy & Science, Tainan, [3]Department of Business Management, National Sun Yat-sen University, Kaohsiung, Chinese Taipei

Objective: The purpose of the study is to investigate whether early rehabilitation can reduce the occurrence of post-total hip arthroplasty (THA) complications and medical expense within one year post-surgery. *Method:* Data from Taiwan's National Health Insurance Research Database from 1997 to 2009 were used in our retrospective longitudinal cohort study. A total of 1841 patients who received total hip arthroplasty (ICD-9-CM: 8151) were selected from 1998 to 2008 for our retrospective study. We then divided the patients into 3 groups based on the time they receive rehabilitation, namely, a group received rehabilitation within 1 week after discharge (within 1 week group), a group received rehabilitation 1 week after discharged (after 1 week group), and the group without rehabilitation (no rehabilitation group). A time frame of one year were set when depicting rehabilitation intervention, the occurrence of complication after the surgery and medical expense in this study. *Results:* We found that the rate of prosthetic infection and revision of hip replacement was higher in the after 1 week group when compared to within 1 week group (odds ratio=2.830, p=0.0403; odds ratio=3.02, p=0.0237). In addition, The results of exponential regression analysis showed that, compared with the within 1 week group, the after 1 week group had higher total medical expenses (exponential regression coefficient: Exp. (β)=1.78, p<0.0001), and the no-rehabilitation group had lower total medical expenses (Exp. (β)=0.80, p=0.0007). *Implications/impact on rehabilitation*: The results of our study revealed that early rehabilitation(within 1 week) after total hip arthroplasty can significantly reduce the rate of prosthetic infection, revision of hip replacement and the total medical expenses within 1 year after the surgery.

OR17-311A-01

THE IMPACT OF EXERCISE DURING PREGNANCY ON NEONATAL OUTCOMES – A RANDOMIZED CONTROLLED TRIAL

Ardiana Murtezani[1]*, Myrvete Pacarada[2], Zana Ibraimi[3], Arian Nevzati[4], Nerimane Abazi[1]

[1]University Clinical Center of Kosovo, Macedonia, [2]Gynecologic and Obstetric Clinic, University Clinical Center of Kosovo, [3]Department of Pharmacy, Faculty of Medicine, University of Kosovo, Macedonia, [4]Department of Physiotherapy and Occupational Therapy, University Hospital, Zurich, Switzerland

Background: The effect of exercise training during the course of pregnancy on the newborn's birth weight is unclear. This study examines the effect of aerobic and strength conditioning exercise performed during the second and the third trimester of pregnancy in nulliparous, previously inactive women on the newborn's outcome. *Methods:* Sixty-three nulliparous, previously sedentary, were randomly assigned to either an exercise (n=30) or a control (n=33) group. The subjects participated in the exercise group (EG) focused on aerobic and strength - conditioning exercise in three sessions for about 20 weeks. We registered the birth weight, birth length, gestational age at time of delivery, Apgar score and head circumference of the newborn. *Results:* There were no statistically significant differences between the two groups in mean birth weight, length, head circumference, and length of gestation. There was a significant difference between two groups in Apgar scores at 1 min (p=0.036) and 5 min (p=0.015) with newborns of the EG scoring higher than the CG. *Conclusions:* Supervised, aerobic and strength conditioning exercise performed over the second and third trimester of pregnancy does not have a negative impact on the newborn's body size and health.

OR17-311A-02

REDUCED COMPLEXITY LEVEL OF BRAIN WHITE MATTER STRUCTURE IN TRAUMATIC BRAIN INJURY

Venkateswaran Rajagopalan[1] Luduan Zhang[2], Glenn Wylie[3], Guang Yue[1]

[1]Human Performance and Engineering Laboratory, Kessler Foundation Research Center, West Orange, NJ, [2]LZ Biomedical LLC, Denver, CO, [3]Center for Neuroimaging Research, Kessler Foundation Research Center, West Orange, NJ,United States

Objective: Traumatic brain injury (TBI) is one of the leading causes of death and disability among young Americans. So far, no objective tools exist to accurately assess brain injury for making unbiased diagnosis and estimating injury progression and function recovery. Animal and recent human studies of TBI have consistently shown damage in brain white matter (WM). Therefore, WM parameters based on MRI data may potentially serve as a noninvasive biomarker for diagnosis, evaluation of injury progression and/or functional recovery of TBI. The purpose of this study was to explore the usage of fractal dimension (FD), a measure of brain WM structural complexity, as a potential biomarker for TBI. *Method*: High resolution 3D T1-weighted MR images were obtained using Siemens Allegra 3T scanner in controls ($n=13$) and TBI patients with moderate to severe injury ($n=17$). FD values were estimated for brain WM skeleton and found that they were significantly lower in TBI than controls. *Results:* Significant reductions in Brain WM skeleton FD values were observed in TBI patients when compared to controls, indicating reduced complexity of the WM structures. FD values were found to be reduced in both the right and left brain hemispheres irrespective of the side of the injury. *Implications/Impact on Rehabilitation*: TBI results in reduced brain WM structural complexity, and that FD is sensitive to WM changes in TBI. Correlation analysis between the FD measure and clinical evaluations of TBI and patients' cognitive/sensorimotor function, which is underway, may eventually reveal FD as a potential biomarker of TBI.

OR17-311A-03

EFFECT OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION ON RECOVERY OF SENSORIMOTOR FUNCTION AND ITS NEURAL STEM CELLS RELATED MECHANISM IN EXPERIMENTAL FOCAL CEREBRAL ISCHEMIA

Jinghui Zhang[1], Xiaohua Han[2], Xiaolin Huang[2]

[1]Department of Rehabilitation Medicine, The Third Affiliated Hospital, Sun Yat-sen University, Guangzhou, [2]Department of Rehabilitation Medicine, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China

Objective: To investigate the effect of repetetive transcranial magnetic stimulation (rTMS) on the recovery of sensorimotor function, the proliferation of neural stem cells (NSCs) and the expression of miR-106b family in the brain of rats subjected to focal cerebral ischemia. *Methods:* A rat model of acute focal cerebral ischemia was established using transient middle cerebral artery occlusion (tMCAO) technique. Rats were randomly assigned to control group, tMCAO group and rTMS group. rTMS treatments (30 pulses per train, 50-second break, 10 trains, 120% of resting motor threshold) were targeted to ipsilesional M1 cortex and performed once per day since the 1st day after tMCAO. Sensorimotor function was evaluated before treatment and on the 7th day of treatments. On 7th day of treatments, the proliferation of NSCs in ipsilesional subventricular zone was identified by double immunofluorescence staining (BrdU/nestin). The expressions of miR-106b family(miR-25, miR-93 and miR-106b) were evaluated using quantative PCR. *Results:* On the 7th day of treatments, the scores of postural signs and lateral resistance, the density of BrdU+/nestin+ cells and the expression of miR-106b family in rTMS group increased significantly compared with control group and tMCAO group. *Implications/impact on rehabilitation*: rTMS may enhance the recovery of motor function via the proliferation of NSCs by activation of miR-106b family. The finding provides evidence to support the clinical application of rTMS in stroke.

OR17-311A-04

PHYSIOLOGICAL ISCHEMIA TRAINING IMPROVES ENDOTHELIAL PROGENITOR CELLS' FUNCTION

Chunxiao Wan[1], Jianan Li[2]

[1]The Chinese PLA General Hospital, Beijing, [2]Nanjing Medical University, Nanjing, China

Objective: This study aims to investigate the effects of physiological ischemia training (PIT) on the function of endothelial progenitor cells (EPCs) in rabbits with intermittent myocardial ischemia. *Method:* Eighteen male adult New Zealand rabbits were randomly divided into three groups ($n=6$): sham-operated group (SO); only intermittent myocardial ischemia group (IMI); PIT together with IMI group (PT). PIT was induced by electrical stimulation (40% maximum current strength, 1 ms, 40 Hz) for 4 min a session, twice a day, 5 days a week, for 4 weeks. IMI was induced by left ventricular branch intermittent occlusion for 2 min a session, twice a day, also for 4 weeks. 20 mls blood was drawn from ear central artery before and post the 4-week experiment in all groups. The number of EPCs ($CD34^+/Flk\text{-}1^+$) in blood was counted by fluorescence-activated cell sorter. EPCs were isolated, culture and identified by double-positive staining with Dil-Ac-LDL and UEA-1. EPC migration and proliferation were detected with a modified Boyden chamber and the MTT assay, respectively. EPCs apoptosis was evaluated by flow cytometric analysis. *Results:* EPCs were characterized by Dil-Ac-LDL and UEA-1double staining. A increase of circulating EPCs in Group IMI and PT post 4 week training were observed. Group PT significently promoted EPCs migration to 196±22% ($p<0.05$), compared with Group MI and SO. However, there were no significant difference between EPCs proliferation and apoptosis founded in all groups. *Implications:* Our results indicate that PIT could enhance EPCs' numbers and functional activity, which will contribute to the angiogenesis process.

OR17-311A-05

ENDOCHONDRAL OSSIFICATION IS ASSOCIATED WITH CGRP INNERVATION IN RESPONSE TO LOW INTENSITY PULSED ULTRASOUND STIMULATION IN A BMP INDUCED ECTOPIC OSSIFICATION MODEL

Xiaoyun Wang[1,2], Xia Guo[1]

[1]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong, [2]Guangdong provincial work injury rehabilitation center, Guangzhou, [3]Guangdong provincial work injury rehabilitation center, Guangzhou, China

Objective: Although low intensity pulsed ultrasound (LIPU) promoting chondrocyte proliferation and matrix production has been well documented, the underlying mechanism is still unclear. Previous study indicated that sensory nerve fibers may influence chondrocytes via local release of neuropeptides. The present study aimed to investigate CGRP innervation in endochondral ossification in response to LIPU for clarifying the mechanism of effect of LIPU on chondrocytes. *Method*: Twenty-four New Zealand white rabbits were used. Bilateral transverse processes at L5–L6 were exposed and a PDLLA scaffold loaded with rhBMP-4 was implanted onto transverse processes of each side to establish an ectopic ossification model. Each rabbit received LIPU treatment at the surgical site unilaterally, and the other side served as control. Animals were sacrificed at 3 days, 1 week, 3 weeks, and 7 weeks postoperation for assessments. *Results:* On sham LIPU side, CGRP-positive

nerve fibers were found at the fibrous tissues which surrounded the cartilage tissue. However, on LIPU side, CGRP-positive nerve fibers were visible not only in fibrous tissues, but also in cartilage tissues. There were more cartilage tissues on LIPU side than sham LIPU side. Moreover, the density of CGRP-positive nerve fibers was significantly higher on LIPU side than sham LIPU side. At 1 week postoperation, chondrocyte proliferation rate, cell nuclear size, and the ratio of cell nuclear to whole cell were significantly higher on LIPU side than sham LIPU side. *Implications:* LIPU promotes CGRP ingrowth into endochondral ossification, which in turn may contribute to the promoting effects of LIPU on chondrocytes.

OR17-311A-06

STUDY ON OSTEOGENESIS PROMOTED BY LOW SOUND PRESSURE LEVEL INFRASOUND IN VIVO AND SOME UNDERLYING MECHANISMS

Hua Yuan[1], Xiang Mou[1], Hua Long[2]

[1]Department of Rehabilitation and Physiotherapy. Xijing Hospital, the Fourth Military Medical University, [2]Department of Orthopedics, Tangdu Hospital, the Fourth Military Medical University, China

Objective: To clarify the effects of low sound pressure level (LSPL) infrasound on local bone turnover and explore its underlying mechanisms. *Method:* Forty-six femoral defected rats were stabilized with a single-side external fixator and divided into infrasound group and sham group. Infrasound group rats were exposed to LSPL infrasound for 30 min twice everyday for 6 weeks. The pertinent features of bone healing were assessed by radiography, peripheral quantitative computerized tomography (pQCT), histology and immunofluorescence assay. *Results:* Infrasound group showed a more consecutive and smoother process of fracture healing and modeling in radiographs and histomorphology. It also showed that at 6 weeks after infrasound treatment, significantly higher average bone mineral content (BMC, 1.36±0.26 vs 1.01±0.18, $p<0.05$) and bone mineral density (BMD, 593.5±27.6 vs 437.1±47.5, $p<0.01$). Immunofluorescence showed increased expression of calcitonin gene related peptide (CGRP) –positive fibers in or around the fracture segment. While Neuropeptide Y (NPY) innervation presented a two-phase property: increased NPY-positive immunofluorescence in the first 2 weeks and decreased NPY-positive immunofluorescence after then. *Implications:* The results suggested the osteogenesis promotion effects of LSPL infrasound in vivo. Neuro-osteogenic network in local microenviroment was probably one target mediating infrasonic osteogensis effects, which might provide new strategy for accelerating bone healing and remodeling.

OR17-311A-07

THE ANALGESIC EFFECT OF ELETRO-ACUPUNCTURE ON PRIMARY AFFERENT TRANSMISSION MEDIATED BY P2X3 RECEPTOR IN CHRONIC NEUROPATHIC PAIN STATES

Wansheng Wang, Wenzhan Tu, Ruidong Cheng, Sai Wang, Fen Cao, Lihua Ruan, Li Zhang, Yinping Lai, Jie Hu, Song-He Jiang

The Second Affiliated Hospital of Wen zhou Medical College, China

P2X is a family of ligand-gated ion channels acting by adenosine 5'-triphosphate disodium (ATP), especially the subtype P2X3 in primary sensory neurons, plays a key role in the transmission of neuropathic pain at peripheral and spinal sites. Neuropathic pain is the most difficult type of chronic pain to treat, however, electroacupuncture (EA) has been accepted to effectively treat chronic pain in clinic widely. In order to determine the role of EA on neuropathic pain mediated by P2X3 receptors in dorsal root ganglion (DRG) neurons and spinal cord, Chronic constriction injury (CCI) model was used as neuropathic pain model, Male Sprague Dawley rats were used for the studies and were divided into 4 groups at random, including sham CCI group, CCI group, CCI plus contralateral EA group and CCI plus ipsilateral EA group. The mechanical withdrawal threshold (MWT) and the thermal withdrawal latency (TWL) were recorded respectively. At day 14 after operation the DRG neurons were quickly isolated from the CCI rats and the P2X3 receptors agonists ATP evoked currents in DRG neurons were examined by whole cell patch-clamp after application of A-317491, a selective non-nucleotide antagonist of P2X3 and P2X2/3 receptors. P2X3 receptor expression in the DRG neurons and spinal cord was evaluated by Western blotting and immunohistochemistry respectively. In this study, the MWT and TWL of CCI group are lower than other three groups ($p<0.01$) and the expression of P2X3 receptors of DRG and L4-L6 spinal cord were higher than other groups ($p<0.01$), while the MWT and TWL of EA groups were higher than the CCI group and the expression of P2X3 receptors of DRG and L4-L6 spinal cord were lower than CCI group ($p<0.01$), but no significant difference were found between the two EA groups ($p>0.05$). The amplitudes of the currents in EA groups were much smaller than those obtained in CCI group after application of 100 uM/L ATP ($p<0.01$), while the amplitudes of the currents were reduced gradually by application of A-317491 from low to high concention, but the inhibition to currents in EA groups were stronger than other groups. The results showed that EA may inhibit the primary afferent transmission of neuropathic pain induced by P2X3 receptor, further more, EA and A-317491 have a co-effect in inhabiting the currents mediated by P2X3 receptors in DRG neurons.

OR17-311A-08

π-TYPE TOPOLOGY BASED ON IMPLANTABLE WIRELESS POWER TRANSMISSION SYSTEM

Jian Chen, Yao Li, Jun Sun, Wei Zhang

Chongqing Institute of Green and Intelligent Technolosy, Chinese Academy of Sciences, China

Objective: In this study, we described a novel topologic structure for wireless power transmission from single external coils to multiple implantable micro devices inside the body tissue. *Method*: Wireless power transmitters are designed based on class π-type topologic structure, which greatly improved the impedance matching efficiency of Class-E power amplifier. Mathematical Models based on resonating chopper MOSFET and class π-type impedance matching network are used to optimize the system. By using high-flux, low-loss inductors, the new topologic structure enables an optimal wireless power transmission system with significant high-efficiency, low-loss energy transmission. *Results*: We have designed and developed the transmission system with the new topology structure. The efficiency of the system reaches 89.4%, and the power on the 50 ohm high-power RF load is 23.4W. *Implications*: This wireless power transmission system with new topologic technology provided an efficient solution for implantable micro device. It is possible to apply this new power supply scheme for multiple implantable functional electrical stimulation devices and chronicle neuromuscular disease which both needs multiple functioning units and long term treatment.

OR17-311A-09

TACTILE STIMULATION OF ACUPOINTS CAN INFLUENCE BRAIN MOTOR NETWORK

Pengxu Wei[1], Ruixue Bao[2]

[1]National Research Center for Rehabilitation Technical Aids, Beijing, [2]China Rehabilitation Research Center, Beijing, China

Objective: To explore effects and mechanisms of tactile acupoint-stimulation on brain motor network. *Method:* We recruited ten young healthy volunteers and collected T1 and T2* images with a 3T MRI scanner. The duration of fMRI scanning was 570 s, consisting of 9 rest-task cycles (30 s for each condition). During task periods,

subjects performed repeated right-foot dorsiflexion/relaxation. We applied tactile stimulation in six of the nine task blocks; each of the two acupoint (ST36 and SP6 of the right leg) was stimulated three times in a randomized order, respectively. Hence, the task condition had three variations: the task alone, and the task coupled with tactile stimulation of either acupoint. The data were analyzed with SPM8 and Conn1.2. *Results:* The motor task alone mainly activated bilateral area 6, area 4, S1, SPL and IPC at the threshold FDR-corrected $p<0.05$, with a strongleft-side predominance exceptarea 6 and IPC. The task combined with tactile stimulation evoked moreextensive activations. Conn analysis further demonstrated that concurrent tactile stimulation enhanced functional connectivity between left paracentral lobule and area 6, temporal lobe, occipital lobe, S2, cerebellum, etc ($p<0.001$ with extent threshold 10 voxels). The two acupoints induced different effects. *Implications/Impact on Rehabilitation*: Tactile acupoint stimulation can enhance cortical activity during movement; this effect may stem from strengthened functional connectivity between brain regions related to motor control. Acupoint-specific effects provide abundant targets for therapeutic intervention. Acupoint stimulation during movement may be a promising method for motor rehabilitation.

OR17-311B-01

KNOWLEDGE OF PAKISTANI HEALTHCARE PROFESSIONALS (HCPS) TOWARDS DISABILITY AND REHABILITATION MEDICINE

Nasir Mansoor Sahibzada[1]*, Farooq Azam Rathore[2], Hira Mubashir[3]

[1]CMH Kohat, Pakistan, [2]CMH Lahore, Pakistan, [3]Army Medical College, Nust, RawalpindI

Objective: To assess the knowledge of Pakistani HCPs towards disability and Rehabilitation Medicine using a structured questionnaire. *Methods:* A self-administered four item questionnaire was constructed and pilot tested before being distributed among 450 HCPs across Pakistan. The HCPs included physicians, nurses and allied health care professionals having a work experience of at least six months.Response rate was 90%. 381 forms were analyzed and descriptive statistics were performed. *Results:* The majority of the respondents were females (56.2%), physicians (80%), working in public/military hospitals (77%) and had a professional work experience between 1–10 years (68.5%). The majority of the respondents (94.2%) had contact with a person with disability (as a patient, colleague or a family member). One third (129) of the respondents correctly named two or more famous national/international disabled persons. Most (78.2%) of the respondents named "Rehabilitation Medicine Physician" as the most appropriate person to treat physical disabilities followed by physiotherapist (16%). When asked to describe Rehabilitation Medicine, most of the respondents answered, "multidisciplinary" (80.6%) followed by "physiotherapy" (9.1%) and "exercises" (3.7%). *Implications/impact on rehabilitation*: General knowledge and awareness regarding disability and PWD among Pakistani HCPs as assessed by this four item questionnaire is adequate in some domains and poor in others. Disability awareness should be part of the under and post graduate curriculum for all HCPs. The PWD support groups and organizations need to be more vocal and proactive in their efforts to fight mobility barriers and social stigmatization.

OR17-311B-02

A SWOT ANALYSIS OF POST GRADUATE PRM EDUCATION IN PAKISTAN

Farooq A Rathore[1], Sahibzada Nasir Mansoor[2], Zahid Rustam[3]

[1]Combined Military Hospital, Lahore Cantt, [2]Combined Military Hospital, Kohat Cantt, [3]Combined Military Hospital, Muzaffarabad Cantt, Pakistan

Objective: To present an overview of the Post Graduate PMR education and training system in Pakistan. To identify challenges and opportunities to improve PMR education in Pakistan.Recommend actions for the PMR faculty in Pakistan and South Asia to strengthen PMR education and training in South Asia. *Method*: An electronic literature search was carried out at Medline, OVID, Google scholar, Science direct, Springerlink etc. (1960–2012; English language only) with key words; medical education, Pakistan; residency; medical training; core curriculum; rehabilitation medicine; physiatry; health care; analysis.College of Physicians and Surgeons, Pakistan manual of training and course curriculum in PMR was reviewed. Informal discussions were held with PMR residents and consultants all around Pakistan to explore their experiences and perspectives on strengths and weaknesses of the current PMR education system in Pakistan. *Results: Strengths*: ·Diversity of patient·Exposure to a large number of patients with different minor and major physical disabilities. Early exposure to procedures and independent patient consultation. · Performing multiple roles to compensate for an absent member of the Rehab team. *Weaknesses:* · No exposure to PMR at under graduate level.· Lack of PRM residents. Outdated curriculum. · No mandatory program of CME, CPD in PMR. · No international recognition of the Pakistani PMR fellowship (in the USA, Europe and Australia). · No exposure to latest trends in the PMR education and management of complex neurological and orthopedic disabilities. · Concept of multidisciplinary team approach is missing in most of the training institutes. *Opportunities:* · Need for disability related research in Pakistan. · Opportunities for collaborative research nationally and internationally. · Availability of Clinical fellowships and academic observer ships in centers of excellence abroad. · Establishment of academic liaison and mentorship with international PRM faculty with faculty and resident exchange program. · Opportunity Distant learning program. *Implications/Impact on Rehabilitation*: PMR education in Pakistan has advanced in the last fifteen years, resulting in better training, research publications and international collaborations. But there is still lot of room for improvement. Collaboration and training is the key and can help to further strengthen PMR training in Pakistan.

OR17-311B-03

ACTIVITY- AND PARTICIPATION-RELATED ICF DISABILITY OF COMMUNITY-DWELLING DISABLED MEASURED BY WHODAS-II

Ja-Ho Leigh[1], Hyun Jeong Im[1], Youngsun Ro[2], Jeongmi Park[1], You Lim Yim[1], Wan Ho Kim[1]*

[1]Department of Rehabilitation Medicine, Korea National Rehabilitation Center, [2]Graduate School of Public Health, Seoul National University, Korea

Objectives: The purpose of this study was to identify ICF activity- and participation-related disabilities using the World Health Organization Disability Assessment Schedule II (WHO-DAS II) for community-dwelling people with disabilities (PWD). *Methods:* Data were collected by the questionnaire survey of 1088 home-dwelling disabled from 65 health care center involved in community-based rehabilitation program. Demographic profile, socioeconomic factors and subjective health perception were asked. To measure the physical impairment and participation, Modified Barthel Index (MBI), and WHODAS II were also surveyed. Calculated scores of 6 domains of WHODAS II were categorized in terms of percentage-span in ICF disability levels. We divided subjects into two groups; with severe/complete disability or not. Logistic regression was used to find out associations with personal and environmental factors. *Results:* The survey was completed by 967 participants. Association between disability and personal, environmental factors were analyzed. Female gender was associated with low disability for 'Getting along with people' domain. Lower economic state also was highly predictive of all domains except 'Understanding and Communication'. There was also a significant interaction effect between disability in 'Household activities' and the existence of

spouse. More rural residence is positively associated with disability in 'Getting around'(GA) and 'Participation in society' domains. Detached housing type is favorable in 'Self-care' domain, whereas apartment housing type is favorable in GA domain. *Implications:* This is the first Activity- and participation- related disability survey that performed in Korean PWD. Further stratified, sampled surveys are needed to assess unmet needs for social participation of PWD.

OR17-311B-04

EXPERIENCES OF PARTICIPATION IN A SWEDISH SOCIETY AMONG ADULTS WITH CEREBRAL PALSY OR SPINA BIFIDA: INVOLVEMENT AND CHALLANGES

Karin Törnbom
Gothenburg University, Sweden

Objective: Participation in the community is vital to mental health and is beneficial to individuals and society. Participation of all citizens means mutual advantages for individuals and for society. This article offers insight into the ways in which people with cerebral palsy (CP) and spina bifida (SB) reflect upon their experiences of social participation in a Swedish society. Italso provides a discussion of factors that can influence the possibilities for participation in this group. *Method:* Qualitative methodology was used to explore experiences of participation in adults with CP or SB by means of semi structured interviews. *Results*: Themes that appeared in the material were: Attitudes and treatment, Human rights, Equality, Possibilities for being influential and Being disabled in the media. Participants emphasized the importance of their human rights, to be accepted by others and to be treated equally. The participants also expressed a desire to make a contribution on the labor market, to have sustainable relationships and to be engaged in different projects. Participation was described as a process of interaction between a person and society, where there is mutual responsibility with respect to integration. Using the social model of disability, disabled persons are surrounded by barriers ofsocietal and judgmental attitudes. *Implication*: These results provide researchers, policymakers, and human services practitioners in the disability field essential knowledge of possible barriers for full social participation among adults with CP or SB specifically, but also among persons with visible disabilities more generally.

OR17-311B-05

BURNOUT SYNDROME AMONG PHYSICAL AND REHABILITATION MEDICINE DOCTORS

Laszlo Irsay*, Rodica Ungur, Monica Borda, Viorela Ciortea, Ioan Onac
University of Medicine and Pharmacy, Romania

Introduction: Burnout syndrome is a characteristic of workers in the health care and education system that occurs due to persistent stressors. For physicians, in practical terms, this phenomenon is very important because it affects professional efficiency, performance, and thus has an impact on medical decisions. This syndrome is associated with depersonalization, emotional exhaustion, depression, anxiety, cynicism towards patients, indifference and increased consumption of alcohol. *Methods:* Burnout syndrome can be quantified by the Maslach questionnaire. The authors have anonymously conducted this questionnaire electronically to physicians in the specialty of rehabilitation and physical medicine. *Results:* In the study, 73 subjects (61 women, 12 men) were included. The questioned doctors largely experienced emotional exhaustion (burnout rate of 64.38%), changing performance events, and causing workplace phenomena. Some of the personal data of the participants showed: Married people described a deeper state of professional incompleteness; Emotional resources were diminished in women; People working in a private system had less of an emotional consumption. *Conclusions:* Compared with other specialties (from other countries as well), exhaustion syndrome among rehab doctors is very severe, especially the feeling of emotional consumption and professional acomplishment.

OR17-311B-06

HOW CAN I FIND THE BEST QUALIFIED ORTHOPEDIC FOR MY PROBLEM NEARBY - A NEW REGIONAL ORTHOPEDIC SEARCH PORTAL ON WWW IN LOWER RHINE AREA - GERMANY

Stephan Gruener
Orthopaedic ambulance Dr. Gruener, Germany

Objective: Presentation of a regional orthopedic web search portal based on a database on about 115 orthopedic with about 140 data/person (complete>16.000 data). *Method*: In 2007 a local group of the professional association of German Orthopedics and Trauma Surgeons (BVOU) called "Competence Network Orthopedic and Trauma Surgery Lower Rhine Area" was founded in the lower Rhine area, a region with about 4 million inhabitants. Now it is a network of 115 members working in doctor's office or in hospital, being conservative and half of them also operative. We have complete data of each member, checked out and regularly updated in two questionnaires. First one consists of four groups: 16 special qualifications recognized by the medical state association (e.g. acupuncture or physical therapy), 13 other specials (e.g. infant hip ultrasound or osteology), 16 different kinds of membership in programs on special topics with various health insurance companies (e.g. concerning ambulant operations, endoprostheses, osteoporosis or rehabilitation) and 40 special topics on diagnosis and therapy not being payed by the general health insurances (e.g. bone densiometry or PMT). The Second one concerns the operative items, including ten groups (kind of organization and nine different body regions) with complete 67 items. All results can be easily found on www.rheinortho.de, searching in these groups or by BOOLE-search, results sorted by address and alphabetical impact. www.rheinortho.de is an easy-to-use and probably the most detailed search engine in web for orthopedic-rehabilitative medicine in Germany – a way to find the best regional expert.

OR17-311B-07

ANALYSIS OF PAIN, DEPRESSION AND COMMUNITY INTEGRATION IN EARTHQUAKE SURVIVORS WITH SPINAL CORD INJURY

Xiaorong Hu[1,2], Jianan Li[1,3], Xia Zhang[1,2], Chengjie Yan[1,2], Huacong Wen[1,2], Hong Jin[4]
[1]Department of Physical and Rehabilitation Medicine, First Affiliated Hospital of Nanjing Medical University, Nanjing, [2]Caring For Children Foundation, Hong Kong, China, [3]World Health Organization Liaison Sub-Committee on Rehabilitation Disaster Relief of the International Society of Physical and Rehabilitation Medicine, Assenede, Belgium, [4]Mianzhu People's Hospital, Deyang, China

Objective: This study compares pain, depression and community integration in 2008 Sichuan earthquake survivors with spinal cord injury (SCI) at hospital discharge and at 3-year follow-up in the community, and analyze the relationship of pain, depression and participation. *Methods:* Twenty-three subjects with spinal cord injury completed demographic and medical questionnaires and underwent medical examination at discharge from a hospital rehabilitation department. The visual analogue scale (VAS) was used for evaluating patients' pain degree, and the patient health questionaire-9 (PHQ-9) was used for depression status in community. The Craig handicap assessment and reporting technique (CHART) was utilized to evaluate social participation function. *Results:* The PHQ-9 score showed a significant decrease after 3 years in the community ($p < 0.05$), while the VAS score was reduced with no statistical significance ($p > 0.05$). The total score of the CHART results, as

well as the physical independence, mobility and occupation region showed a significant improvement ($p<0.05$). The degree of pain was related with the physical independence, occupation and social integration. However, there was no relationship between depression and the community integration. *Implications:* Overall depression status and community integration, including the physical independence, mobility and occupation were significantly improved when the SCI survivors returning to their daily life in the community. However, no significant difference in the pain degree, the cognitive independence and social integration at baseline and after three years was observed. Special attention should thus be paid to the chronic pain measurement in the community-based rehabilitation for the earthquake survivors with SCI.

OR17-311B-08

IMPLEMENTATION OF PRM TRAINING COURSE IN MEDICAL STUDENT EDUCATIONAL TRAINING CURRICULUM; IRANIAN EXPERIENCE

Seyed Mansoor Rayegani
Shahid Beheshti Medical University, Iran

History of introducing PRM in Iran medical practice goes back to late 1960s and early 1970s. From that dates a series of lectures were presented for medical students by academic physiatrists covering some of the most encountered rehabilitation topics. Expansion of medical colleges and increased numbers of medical students in addition to growing population, elderly, industrialization, and also occurrence of natural disasters necessitated medical students and related specialty residents to be more familiar with PRM. After 1979 revolution and subsequent battles such as Iraq-Iran war with resulted Veterans and their disability, rehabilitation was established as an obligation in medical practice. In spite of establishment of residency training programs there was no national and structured training course for medical students. Each medical college according to its local potentials and interests had some training programs. After preparing national curriculum for medical students training in 2007, the Iranian society of PMR with collaboration of Iranian board of PMR with assistance of Iranian CGME organized a committee for preparing PRM education materials for medical students. The result of this committee was a one months program with detailed task for medical students during internship period that will be discussed in the presentation.

OR17-311B-09

SINO FRENCH COOPERATION IN THE FIELD OF PRM

Francis Le Moine[1]*, Wei Guo[1], Patrick Nenert[1], Luc Maynard[1], Shilong Sun[1,2]
[1]UGECAM/CHM/FEDMER, France, [2]Popular Hospital ZENHGZHOU HENAN, China

A project of Sino French cooperation in the field of PRM has been formed with the French Federation of Physical Medicine and Rehabilitation (FEDMER) and one of the Zhengzhou hospital medical staff. Pooling the knowledge of two teams one another Chinese French oriented efficiency of the management of patients within our specialty. Together within a medical team and health care benefits of Traditional Chinese Medicine and Rehabilitation Medicine French for the benefit of patients. Bring up a new expanded vision of PRM in China and France, certe the outbreak of new technologies (robotics, home automation.) but also in the course and care programs as pathologies. Thus we initiated this cooperation by creating in a hospital, a structure of about 3000 m² on 3 levels in the city of Zhengzhou HENAN Province, which will include a technical rehabilitation upscale hospitalizations rooms as well as rooms for lessons. Exchange of medical and paramedical students will be organized between our two countries for both learning and teaching of the MPR. This virtuous model of cooperation will act in harmony despite different initial cultures but will harmonize around the patient's benefit. Beyond medical cooperation project is essentially built on the Sino-French friendship by reciprocal visits in China and France.

OR18-301AB-01

EXERCISE TRAINING REGULATES SKELETAL MUSCLE ATROPHY CAUSED BY CANCER CACHEXIA

Peijun Gui, Satoru Ebihara*, Naohiro Kashiwazaki, Kumiko Ito, Takae Ebihara, Masahiro Kohzuki
Tohoku University Graduate School of Medicine, Japan

Objective: Cachexia is known as a multifactorial wasting syndrome notably with skeletal muscle atrophy, which is responsible for death of nearly one-third of cancer patients. Exercise training has been suggested as a promising countermeasure to cachexia as well as cancers. However, how exercise counteracts cachexia-provoked muscle wasting is unclear. In this study, we evaluated the effect of exercise training on skeletal muscle wasting caused by cancer cachexia. *Method:* Male wild-type C57BL6/J mice were divided into sedentary (S), sedentary tumor-bearing (T), exercised (E) and exercised tumor-bearing (TE) groups. Anti-cachexia effects were assessed using the Lewis Lung Carcinoma (LLC) tumor model. Exercise training was performed on a treadmill at a speed of 12 m/min, 0 grade incline, for 60 min/day, 5 days/week. Body mass, food intake and tumor size were measured per day. Mice were sacrificed four weeks later. The tumor, skeletal muscles and white adipose tissue (WAT) were dissected and weighed. The intracellular MAFbx and MuRF-1 were quantified by Western blotting. *Results:* In sedentary tumor-bearing (T) group, the injection of LLC caused tumor growth, significant loss of WAT and skeletal muscles, and marked increases of both MAFbx and MuRF-1 expressions in gastrocnemius muscle (GA). Compared with T group, exercise induced partial rescue of both WAT and skeletal muscles. Moreover, exercise significantly reduced expression of MAFbx but not MuRF-1 in GA. *Implications:* Exercise training results in reduced MAFbx levels, suggesting that it blocks ubiquitin-proteasome system activation in LLC tumor model. These results may suggest a significance of exercise in cancer rehabilitation.

OR18-301AB-02

THE EFFECT OF PRE-TREADMILL TRAINING ON CEREBRAL BLOOD FLOW AFTER CEREBRAL ISCHEMIA/REPERFUSION IN RATS

Xiaojiao Yang[1], Hongyang Lu[2], Jie Jia[1]
[1]Department of Rehabilitation, Huashan Hospital, Fudan University, [2]Shanghai Jiao Tong University, Med-X Research Institute, China

Objectives: We described the influence of pre-treadmill training on ischemic stroke rats to investigate the differences of cerebral blood flow (CBF), which comprises cortex arteries, veins, and capillaries between rats with and without pre-ischemic treadmill training in this research. Furthermore, cerebral infarct volume and edema were detected for brain damage estimation. *Method*: Rats were randomly divided into three groups ($n=8$): sham, ischemic and pre-treadmill group. Rats in the sham and ischemic groups were not exposed to the treadmill before sham or middle cerebral artery occlusion (MCAO) surgery, but in the pre-treadmill group were subjected to two-week pre-treadmill training. All groups were detected CBF before, during and after surgery by using laser speckle imaging (LSI). Cerebral infarct volume was determined by TTC staining method. Edema was detected by diffusion-weighted imaging (DWI) of magnetic resonance imaging (MRI). *Results:* The results demonstrated that pre-treadmill training suppresses the change of cerebral blood flow at 1 h ($p<0.05$), 2 h ($p<0.01$) and 3 h ($p<0.05$) after ischemic/ reperfusion, compared with the no treadmill training subjects in artery and at 1 h ($p<0.05$), 2 h ($p<0.05$) and 3 h ($p<0.01$) in vein regions, while

the change of capillary CBF is inhibited the change at 1 h ($p<0.05$), 2 h ($p<0.05$) after ischemic injury. Meanwhile, pre-treadmill training reduces the relative apparent diffusion coefficient (rADC) at 6 h after ischemic injury ($p<0.05$), and decreases cerebral infarct volume at 24 h after ischemic injury ($p<0.05$). *Implications/Impact on Rehabilitation*: We inferred pre-treadmill training could play a role in neuroprotection about stroke through inhibiting the changes of CBF on very early stage after ischemic stroke.

OR18-301AB-03

ELECTRICAL STIMULATION INDUCED HSP70 RESPONSE AND REGULATION IN CELL GROWTH AND APOPTOSIS IN C2C12 CELL

Lei Wang[1], Yuefei Liu[1], Steinacker Jueden[2]

[1]Section of Sports and rehabilitation medicine, Nanjing University of Chinese Medicine, China, [2]Section of Sports and Rehabilitation Medicine, Department of Cardiology, University of Ulm, Ulm, Germany

Objective: To investigate 1) ES-induced Hsp70 response in C2/C12 cells and 2) association of Hsp70 response with cell growth process and apoptotic activity in cells undergoing ES. *Method:* Cultured C2C12 cells (by a confluence at 75%) were divided into different groups with regard to ES characteristics (at 13 voltages): A (ES: 12 Hz, 11 min), B (12 Hz, 90 min) and C (100 Hz, 11 min). Cells were harvested before ES, and 0, 1, 4, 8, 12h after ES. The gene expression of study parameters were estimated by quantitative real-time PCR with relation to an internal reference (ß2-microglobulin), and Hsp70 was additionally determined at protein level using quantitative western-Blot. *Results:* In group A, Hsp70 mRNA showed a biphosic increase at 1h and 8h after ES. In group B and C, Hsp70 mRNA level increased at 1 h, peaked at 4 h and kept elevated at 12 h after ES, where the peak level in group C was higher than that in group B. At protein level, Hsp70 ingroup B began to increase at 4 h after ES, and maintained elevated afterwards with its peak at 8 h. Hsp70 protein in group C showed depressed at 1h and augmented at 8h after ES. There was an increase of IGF-1 and Cyclin D1 mRNA in group A and B, whereas a depressed expression occurred in group C. P21 mRNA increased dramatically in group B and C, whereas no distinct change was shown in group A. In comparison with group A, where both Bax and Bcl-2 were up-regulated, Bcl-2 showed no change 1h after ES and decreased at 4 h after ES in group B and C, along with significant increase in Bax. Therefore, the apoptotic index (Bax/Bcl-2) was depressed in group A whereas clearly augmented in group B and C. *Implications:* The results of the study showed that ES can bring about distinct response with Hsp70 induction along with changes in the regulation of cell growth and apoptosis. It is likely that in response to ES, Hsp70 interacts with the regulation of cell growth and apoptosis.

OR18-301AB-04

PROTEOMICS ANALYSIS OF DIFFERENTIAL EXPRESSION PROTEINS IN CEREBROSPINAL FLUID BEFORE AND AFTER UMBILICAL CORD STEM CELL TRANSPLANTATION IN SPINAL CORD INJURY PATIENTS

Jibing Ou, Liqing Yao

Department of Rehabilitation, The Second Affiliated Hospital of Kunming Medical University, Kunming, China

Objective: This study aimed to analysis the differential expression proteins in cerebrospinal fluid (CSF) before and after umbilical cord stem transplantation.Meanwhile, to learn the mechanism of stem cells preliminary. *Methods:* 20 cases of thoracolumbar spinal cord injury (SCI) pateints were recruited,whose ASIA score were all A, they were assigned into match teams and test teams averagely. PT, OT, AT, FES and Rehabilitation Engineer routeinly treatment were used in all patinents. additionally, umbilical cord stem cell transplantation were intervened in the test team. Selecting 5 cases in each team respectively and taking their CSF before and after the 1 month's treatment. Then a gel-based proteomic approach using two-dimensional gel electrophoresis followed by quantification with specific software and subsequent identification of differentially expressed proteins by MS was applied. *Results*: Compared with the control team, the EMG, ADL, FIM, DTI in the test team were changed more obviously. Furthermore, in this study 28 up-regulated proteins differential expression proteins were successfully identified such as APOE, ALB, LRG, alpha-1B-glycoprotein, TTR, APOH Beta-2-glycoprotein, HP HP protein, HP Haptoglobin, Alpha-1-antitrypsin OS, A1BG Alpha-1B-glycoprotein, GSN Isoform 1 of Gelsolin,etc. *Conclusion:* The umbilical cord stem cell transplantation have a certain effect in the treatment of SCI of all the differential expression proteins, APOE, ALB, LRG, alpha-1B-glycoprotein, TTR are closely related to the nerve regeneration.These differential expression proteins may participate in the SCI repair process by mediated inflammatory reaction, apoptosis, axonal growth and nerve regeneration.

OR18-301AB-05

EFFECTS OF A2AR ON P-JNK EXPRESSION IN HIPPOCAMPUS CA1 OF NEWBORN MICE AFTER HYPOXIA-ISCHEMIA BRAIN DAMAGE

Hailing Fan, Xiang Chen

Yuying Children!s Hospital and the Second Aff iliated Hospital of Wenzhou Medical College, China

Aim: To investigate the effect of adenosine A_{2A} receptor deficiency on in hippocampus CA1 of newborn mice after hypoxia-ischemia brain damage and its potential mechanism. *Methods:* Cerebral ischemia was induced hypoxia-ischemia brain damage. Adenosine A_{2A} receptor knockout (A_{2A}RKO) mice ($n=32$) and their wildtype littermates (A_{2A}RWT) ($n=32$) were divided into Sham operation group, 1, 3 or 7day after hypoxia-ischemia brain damage. A HIBD model was developed with 7-day-old neonatal mice according classical Rice-Vannucci method. The expression of P-JNK and nerve cell apoptosis in hippocampus CA1 were deteced by HE staining, terminal deoxynucleotidyl transferase mediated dUTP-biotin nick-end labeling (TUNEL) staining and immunohistochemstry. *Results*: Adenosine A_{2A} receptor could obviously reduce the brain organization in mice degenerated and necrosised; TUNEL method showed the expressions of nerve cell apoptosis in M1dWT group fewer than those inM1dKO group ($p<0.01$); The little expression of P-JNK existed in normal brain, and P-JNK was enhanced immediately after ischemia and reached to peak at 1d after operation; Adenosine A_{2A} receptor could significantly decrease the expressions of P-JNK positive cells at every time point after HIBD ($p<0.05$); Positive correlation between the expressions of P-JNK and nerve cell apoptosis in hippocampus CA1 after HIBD in newborn mice ($r=0.802$, $p<0.05$). *Conclusion:* Adenosine A_{2A} receptor can attenuate the neuronal apoptosis caused by HIBD in hippocampus CA1 of newborn mice, which may exert the protection against inhabiting the continuous activation of P-JNK.

OR18-301AB-06

NEURAL SUBSTRATES OF MOTOR IMAGERY BASED BRAIN-COMPUTER INTERFACE TRAINING FOR STROKE PATIENTS WITH SEVERE UPPER LIMB PARALYSIS

Mingfen Li[1], Jie Jia[1], Ye Liu[2]

[1]Department of Rehabilitation, Huashan Hospital, Fudan University, [2]MOE-Microsoft Key Laboratory for Intelligent Computing and Intelligent Systems, Department of Computer Science and Engineering, Shanghai Jiao Tong University, China

Objective: We aimed to verify the effectiveness of MI-based BCI training for stroke patients with severe upper limb deficits and tried to explore the potential neurophysiological mechanism of

MI-based BCI training for stroke patients with upper limb motor function improvement. *Methods:* 15 stroke patients with severe upper limb paralysis were randomly divided into BCI group ($n=8$) and control group ($n=7$). Both two groups received the routine rehabilitation therapy and drug therapy while BCI group was treated with MI-based BCI rehabilitation training for 2 months. The BCI group conducted MI-based BCI training three times per week and it lasted for 1.5 h each time. A set of clinical measures including Fugl-Meyer motor assessment (FMA) and Action Research Arm Test (ARAT) were applied to assess the patients' motor function of upper limb. The Event-Related Desynchronization (ERD) changes were analyzed pre and post training. The relation between the rehabilitation outcome measures and the degree of ERD changes over different brain areas was also analyzed. *Results:* After training, positive improvements of outcome measures in BCI group than that in control group were observed. For most patients, significant ERD pattern over both hemispheres were observed and both sensorimotor areas (SMA) became more clearly. The activation of affected SMA and bilateral parietal lobes contribute to motor recovery of upper limb for stroke patients. Implications on Rehabilitation Better understanding the neurophysiological mechanism of MI-based BCI training contributes to the clinical application of the training as an innovative rehabilitation protocol to help stroke patients motor recovery. *Acknowledgments*: This study was supported by the National Natural Science Foundation of China (No. 81171854; 81171855) and Shanghai Municipal Science and Technology Commission major project (No. 10DZ1950800).

OR18-301AB-07

FUNCTIONAL TRAINING OF PATIENTS WITH CERVICAL SPINAL CORD INJURY USING ROBOTIC FEEDBACK DEVICES

Evgenia Tsvetkova*, Anna Albegova, Vadim Ivanov, Tatyana Shapovalenko, Konstantin Lyadov
Medical and Rehabilitation Center, Russia

Objective: The priority of the rehabilitation of patients with cervical spinal cord injury (CSCI) is to restore the manipulative function of the upper extremities. The purpose of this study was to evaluate the effectiveness of «Amadeo» and «MJS» devices in the rehabilitation of patients with CSCI. *Method*: Subjects ($n=8$) with CSCI were divided into basic and control groups. The basic group (5 men) – patients who got only a standard course of rehabilitation (physiotherapy, exercises on training devices, programmable electrical myostimulation) course of rehabilitation training on «Amadeo» and «MJS» (12 sessions, each 20–30 min). Control group (3 men) received just standard course of rehabilitation. Both groups were matched for age, sex, degree of neurological deficit. After 12 consecutive sessions, all patients were re-evaluated by FIM scale, Rivermead motor index. Range of motion and force of the distal muscles of the upper limbs were evaluated by «Pablo» and «Amadeo» devices. *Results:* There was a significant increase in active movements in the joints of the hand ($p<0.03$) after finishing the rehabilitation course in the basic group. Increasing the power of the distal muscles of the upper extremities was not statistically significant ($p<0.1$). Also, there was a significant increase in the amplitude of movements in different planes in shoulder and elbow joints. *Results:* by FIM scale, Rivermead motor index in the study group were higher than in controls. *Implications:* The introduction of robotic devices «Amadeo» and «MJS» in a rehabilitation program of patients with CSCI leads to significant improvement of motor function of the upper extremities.

OR18-301AB-08

OUTCOME COMPARISON OF SCAPULAR CONTROL EXERCISES WITH REGULAR CARE FOR ADULTS WITH SUBACROMIAL IMPINGEMENT SYNDROME

Bojhen Chen[1], Fukong Lieu[2], Wenyin Chen[1,2]
[1]National Yang-Ming University, Taipei, Taiwan, [2]Cheng Hsin General Hospital, Taipei, Taiwan, Chinese Taipei

Objective: To compare the effectiveness of exercise intervention with physical agents therapy for adults with subacromial impingement syndrome and scapular dyskinesis. *Method*: Sixteen adult patients admitted to this study. Participants were randomly allocated to either a scapular control training group (SCG, $n=10$) or a regular care group (RCG, $n=6$). The SCG performed stretching and strengthening exercises emphasized on scapular control. The RCG receivedtranscutaneous electrical neuromuscular stimulation and low-power laser therapy. The Scapula Assistance Test, Scapula Retraction Test, and Infraspinatus Retraction Test were adopted to detect scapular dyskinesis. Primary outcomes included pain and disability. Scapular muscles strength andsoft tissue flexibilitywere also measured. Mann-Whitney *U* test was performed to compare variables between groups at baseline and after 12-session interventions. Wilcoxon signed rank test was used to detect changes. *Results:* Good to excellent test-rest reliability has been established (ICC3,1= 0.878–0.997) prior. Both groups reported significant improvement in pain and function after treatment. Subjects identified with scapular dyskinesis in the SCG group ($n=6$) revealed greater glenohumeral external rotation and lower trapezius strength increase as compared to RCG ($n=3$). Other outcome measures yielded only subtle differences between the two groups. *Implication/Impact on Rehabilitation*: The findings must be interpreted carefully due to small sample size. A 12-session exercise intervention or modality therapy is beneficial for patients with scapular dyskinesis. Further investigation involving more subjects is needed.

OR18-301AB-09

VIRTUAL REALITY REHABILITATION THROUGH KINECT-BASED MOTION-SENSE SYSTEM FOR RECOVERING THE UPPER EXTREMITY FUNCTION OF STROKE PATIENTS

Si-Huei Lee[1], Shih-Ching Yeh[2], Shuya Chen[3], Jo-Lam Liu[1], Yu-Fang Huang[1], Jia-Chi Wang[1], Yi-Yun Yang[1], Juyi Lin[1], Rai-Chi Chan[1]*
[1]Department of Physical Medicine & Rehabilitation, Taipei Veterans General Hospital, Taiwan, [2]Department of Computer Science and Information Engineering, [3]Department of Physical Therapy, College of Health Care, China Medical University, Taiwan, Chinese Taipei

Objective: The purpose of this study was to develop Kinect-based motion-sense virtual reality rehabilitation system for recovering the upper extremity of stroke and test its efficacy by comparing with conventional rehabilitation. *Methods:* There were 24 patients recruited in this study, and randomly assigned to the kinect-based group (KB) and conventional therapy group (CT). Twelve to the KB group (male/female=7/5, age=59.17±12.21, onset months=8.33±5.85) and the other 12 to the CT group (male/ female =6/6, age=60.40±15.10, onset months= 7.81±5.55). Both groups received 24 hrs of intervention as total and the frequency was 1.5 h per session, twice to third times per week. The results of upper extremity function were assessed by Wolf Motor Function Test (WMFT), Upper Extremity Performance Evaluation Test for Elderly (TEMPA), and Box and Block Test (BBT). The Wilcoxon signed rank test was used to examine the results. *Results:* The results of WMFT, TEMPA and BBT were significantly increased in the two groups. However, dexterity of KB group were showed significantly improved than the CT group ($p<0.05$). *Implications/impact on rehabilitation*: The results revealed that the system could not only highly improve the upper extremity function of stroke patients but also let the patients gain multi sensory feedbacks which provide them the sense of enjoyment while participating in the program. The advantage of using this system is that no sensors are attached on stroke survivors. Thus, we believe that the system is a promising therapeutic intervention. Also to combine with telemedicine is expected.

OR18-302AB-01

UNUSUAL DELAYED FUNCTIONAL DECLINE OF A STROKE PATIENT IN AN ACUTE REHAB SETTING

Laurentiu Dinescu*, Lorena Giraldo, Mohammed Zaman, Marc Ross

Department of Physical Medicine and Rehabilitation, Kingsbrook Jewish Medical Center, Brooklyn, New York, United States

Objective: To increase awareness about unusual causes for delayed functional decline in a stroke patient undergoing rehabilitation. *Method:* A case study of a 75-year-old female with previous history of hypertension, COPD, admitted to the TBI unit two weeks after having a subarachnoid hemorrhage, treated with angiographic stent coiling of a cavernous carotid aneurysm. Upon admission to rehabilitation, her functional status was minimal assistance with mobility and activities of daily living. Two days later, the patient became lethargic, unable to follow commands, but arousable to pain stimuli. Her blood pressure was borderline low, brain imaging studies showed no acute changes, CXR, urine and blood cultures failed to indicate an infection, and her blood work was significant for mild hyponatremia and hypoglycemia. *Results:* After reviewing the brain imaging studies, based on the vicinity of the cavernous portion of the internal carotid artery to the pituitary gland, panhypopituitarism was suspected. Further endocrinological tests confirmed the diagnosis, showing low TSH, T3, T4, low cortisol level with a good adrenal response to cosyntropin stimulation, low prolactin, IGF-1, FSH and LH. Hormonal replacement therapy was initiated with excellent patient recovery. *Implications/Impact on Rehabilitation*: Panhypopituitarism can manifest clinically many days after an acute stroke in the vicinity of the pituitary gland, as the stored pituitary hormones are slowly depleted. Early recognition and treatment with hormonal replacement therapy can dramatically improve the rehabilitation outcome in such patient.

OR18-302AB-02

REHABILITATION OF VENOUS MALFORMATION OF THE UPPER LIMB

Andre Thevenon

Lille University Hospital, France

Objective: Venous malformations (VM) of the upper limb are an uncommon disease, which may involve skin, muscle and joints. Pain, thrombophlebitis, growth anomaly, are the most common symptoms. Joint stiffness may also be a problem. Treatment includes anti platelets or anticoagulant, compression garments, sclerotherapy, endovascular laser and surgery. Objective to assess the effect of physical therapy on joint stiffness due to veinous malformation of the upper limb. *Method:* Follow-up of all patients who consulted in our department from 2010 to 2012 for joint stiffness due to veinous malformation of the upper limb. Four patients were given a home programme with 1 to 3 posture exercises they had to perform at least once daily, 2 patients with extensive disease involving all the joints of the limb were admitted in our department as outpatients. *Results:* 6 patients (17 to 45 year old) were include. Movement limitation concerned: elbow extension (5 patients), pronosupination (2 patients), wrist (2 patients), shoulder (1 patient). Pain was a limiting factor in all the cases. An improvement of the range of motion occurred during the first months for all the joints but two. This improvement lasted till the end of follow-up (18 months). We failed to improve the limited extension of two elbows (–40° and –45°). One of these patients had a very large malformation extending to the thorax and was overprotecting her arm. In the other case, a deformation of the radius and the ulna largely contributed to the limitation of the elbow extension. *Implication*: Painful stiffness of the joints of an upper limb with veinous malformation can be improved with a very simple home based exercises programme.

OR18-302AB-03

THE PRESENT SITUATION OF PHASE II CARDIAC REHABILITATION FOR ACUTE MYOCARDIAL INFARCTION AT CLINICS IN NORTHERN JAPAN

Yoshiko Sakata[1], Osamu Ito[1]*, Hiroshi Watanabe[2], Masahiro Kohzuki[1]

[1]Department of Internal Medicine and Rehabilitation Science, Tohoku University graduate School of Medicine, [2]Department of Rehabilitation Medicine, Tohoku Kosei Nenkin Hospital, Japan

Objectives: We reported previously that the implementation of Phase II cardiac rehabilitation (CR) after acute myocardial infarction (AMI) in hospitals with Department of Cardiovascular Medicine was extremely poor in contrast to the broad dissemination of percutaneous coronary intervention for AMI in Miyagi prefecture, Japan. The purpose of the present study was to investigate the implementation of Phase II CR for AMI at clinics. *Method:* Questionnaires were sent in 2009 to 387 clinics with Department of Cardiovascular Medicine and/or Rehabilitation in Miyagi prefecture, Japan. *Results:* Effective replies were obtained from 161 clinics (41.6%). In total 161 clinics, 83 clinics had Department of Cardiovascular Medicine, and 68 clinics had Department of Rehabilitation, and 10 clinics had both department. Only 3 clinics carried out Phase II CR for AMI. The major reasons for non-implementation at clinics were lack of staff, especially rehabilitation staff, lack of system to support emergency and lack of patients participating CR for AMI. *Implications & Impact on Rehabilitation Medicine*: This survey revealed the present situation that Phase II CR for AMI was so poorly implemented at clinics with Department of Cardiovascular Medicine and/or Rehabilitation in Northern Japan. In addition, CR was not well-known in general practitioners. The benefits of CR, especially Phase II CR, in patients with AMI was established, so further efforts are needed to disseminate CR for AMI.

OR18-302AB-04

EFFECTS OF EXERCISE TRAINING ON COLLAGEN DEGRADATION AND DISCOIDIN DOMAIN RECEPTOR1 EXPRESSION IN THE HEART OF ANGIOTENSIN II-INDUCED HYPERTENSIVE RATS

Takahiro Nakamura*, Nobuyoshi Mori, Yuma Tamura, Seiko Yamakoshi, Bin Xu, Jongwoo Kim, Masahiro Kohzuki

Tohoku University Graduate School of Medicine, Japan

Objective: Exercise training is known to have antihypertensive effect and inhibit cardiac fibrosis. It has been reported that discoidin domain receptor 1 (DDR1) is tyrosine kinase receptor which binds to and gets activated by collagens. The present study examined the effects of exercise training on collagen degradation and DDR1 in the heart of Angiotensin II (Ang II)-induced hypertensive rats. *Method:* Male Sprague-Dawley rats were randomly divided into four groups: Saline-Sedentary (SS) group, Saline-Exercise (SE) group, Ang II-Sedentary (AS) group and Ang II-Exercise (AE) group. Saline or Ang II (200 ng/kg/min) was continuously infused into the animals by osmotic minipump, and the exercise with treadmill (30 m/min, 60 min/day, 5 times/weeks, 15% incline) were performed to the exercise group. After 4 weeks, protein expression of collagen type I, collagen type III, DDR1, matrix metalloproteinase (MMP)-1 and tissue inhibitors of metalloproteinase (TIMP)-1 in the heart were examined by Western blotting. *Results:* In the AS group, MMP-1 expression and MMP-1/TIMP-1 ratio were decreased, and collagen type I expression was increased. In the AE group, DDR1 expression was increased. Furthermore, collagen type I and TIMP-1 expression were lower in the AE group than the AS group. *Implications/impact on rehabilitation*: Exercise training inhibits collagen deposition in

the heart of Ang II-induced hypertensive rats. In the hypertensive condition, DDR1 and MMP-1/TIMP-1 balance may be involved in the antifibrotic effect of exercise training. The present study may give a clue to elucidating cardioprotective mechanism of cardiac rehabilitation.

OR18-302AB-05

BREAST CANCER WITH LUNG POST-BEAM INJURIES: BREATH BIOMECHANICS AND REHABILITATION

Fedor Mukharlyamov

Scientific and practice Center of medical rehabilitation, restorative and sport medicine of Moscow, Russia

Purpose: Assessment of medical rehabilitation of patients with breast cancer with post-beam injuries of lungs. *Material and Methods:* 92 patients with primary breast cancer, earlier transferred the combined treatment - surgery and remote beam therapy were observed: 36 patients with beam bronchitis (BB), 47 with beam pneumonitis (BP), 9 with beam fibrosis (BF). 25 patients with the magnetotherapy, 48 patients with magneto- and aerosoltherapy, 19 patients where drugs were carried out. *Results:* Magnetotherapy at patients with BB authentically increased indicators of VC, PEF, FEF75, approaching them to the normal; at patients with BP -authentically increased indicators of VC, FVC, PEF, FEF75, and MVV; at patients with BF the insignificant increase in indicators of VC, PEF, FEF75, 50, 25 was noted. As a result magneto-and aerosoltherapy at patients with BB also increased all main indicators, but only VC authentically increased at decrease in ERV; at patients with BP VC, FVC authentically increased; at patients with BF the increase in VC, FVC, PEF, FEF75 and MVV were noted. As a result of drug treatment all the indicators changed not authentically. *Conclusions:* Magnetotherapy authentically reduces restrictive violations, improvesindicators of passability of bronchial tubes as small and average (approachingthem to normal), and large (restoring them completely). The magnetotherapy incombination with an aerosoltherapy increases the vital capacity of lungs.

OR18-302AB-06

PHYSIOLOGICAL ISCHEMIC TRAINING INDUCES ENDOTHELIAL PROGENITOR CELL MOBILIZATION AND MYOCARDIAL ANGIOGENESIS VIA A VASCULAR ENDOTHELIAL GROWTH FACTOR/ENDOTHELIAL NITRIC OXIDE SYNTHASE-RELATED PATHWAY

Mingyue Xiao, Xiao Lu, Jianan Li

The First Affiliated Hospital of Nanjing Medical University, China

Objective: Angiogenesis is a promising new treatment strategy for revascularization which may result in development of collateral cardiac blood vessels. We therefore hypothesize that physiological ischemic training (PIT) of skeletal muscle contributes to myocardial angiogenesis and endothelial progenitor cell (EPC) mobilization in the established rabbit model of controllable myocardial ischemia. *Methods:* Rabbit subjects were grouped by sham operation, MI without PIT, PIT, PIT with pretreatment with the endothelial nitric oxide synthase (eNOS) inhibitor L-nitroarginine methyl ester (L-NAME), PIT with anti-vascular endothelial growth factor antibody (Anti-VEGF), and PIT pretreatment with both L-NAME and Anti-VEGF. PIT protocol included cyclic cuff inflation-deflation on rabbit hind limbs for 4 weeks. At the endpoint, capillary density, collateral blood flow, circulating EPCs, and left ventricular ejection fraction were evaluated. The mRNA and protein expression of VEGF and eNOS were also examined. *Results:* The PIT group had a higher EPC count ($p<0.001$) and an increase in capillary density ($p<0.01$) and collateral blood flow ($p<0.05$) in the ischemic myocardium compared with the Sham and MI groups. Capillary density and collateral blood flow were highly correlated with EPC increase ($r=0.893$ and $r=0.863$, respectively, $p=0.000$). VEGF blockade and eNOS inhibition blunted PIT-induced effects and resulted in decreased left ventricular ejection fraction ($p<0.05$). *Impact on Rehabilitation*: PIT improves EPC mobilization and myocardial angiogenesis in vivo through a VEGF/eNOS-related pathway. These findings may contribute to clinical application of a new therapeutic strategy for neovascularization in patients with ischemic diseases.

OR18-302AB-07

PHYSICAL REHABILTATION AT AN ARTERIAL HYPERTESION WITH SIMULTOR TRAINING

Ekaterina Ivanova[1], Fedor Mukharlyamov[2]*, Alexander Razumov[2]

[1]Medical Moscow Region Clinical Center of Restorative Medicine and Rehabilitation, [2]Scientific and practice Center of medical rehabilitation, restorative and sport medicine of Moscow, Russia

Objectivies:To investigate the effectiveness physical rehabilitation (PR) with simulator training (ST) in patients with arterial hypertension (AH). *Methods:* 108 patients with AH were included to programs of PR consisted from 10 sessions. 53 patients were obtained the employments on cyclic and power simulators with telemetry monitoring of cardiorespiratory system; 51 patient were carried out by standard techniques of PR at AH - control group, CG). All the patients were treated by basic drug therapy. *Results:* After 10 sessions downturn of initially increased BP on the average on 23% in ST, in CG - on 13% was marked. Since 6–7th session stabilization of BP at a target level in group ST, after 9–10th session - in group GE was marked. All the patients marked improvement of the common condition of health, increase of daily activity and tolerance to physical loading; dozes of supporting drug therapy have been decreased at 64% of patients of group ST and at 27% of patients of group GE. *Conclusions:* Using of ST with telemetric control in a mode of step-by-step growing physical loadings at an AH is more high effective method of PR than standart techniques allowing authentically to stabilize a level of BP, to reduce drug therapy and to increase quality of life of the patient.

OR18-302AB-08

THE EFFECT OF BOTULINUM TOXIN TYPE A ON REFRACTIVE OVERACTIVE BLADDER SYMPTOMS IN PATIENTS WITH MULTIPLE SCLEROSIS: A PILOT STUDY

Brigitte Schurch, U Mehnert, J Birzele, K Reuter

University Hospital Lausanne, Switzerland

Objective: Patients with multiple sclerosis often experience overactive bladder symptoms. High dose intradetrusor botulinum toxin A treatment is effective but often results in urinary retention and urinary diversion via a catheter. In this pilot study we evaluated whether only 100 U botulinum toxin A would significantly decrease overactive bladder symptoms in patients with multiple sclerosis without impairing pretreatment voluntary voiding. *Material and Methods:* Included in our study were 32 patients with multiple sclerosis who had overactive bladder symptoms such as urgency, frequency and/or urgency incontinence. The treatment effect was evaluated using data on 3 consecutive visits, that is before, and a mean ±SD of 46.2±11.9 and 101±21 days after intradetrusor injection of 100 U Botox, including the results of cystometry and uroflowmetry at visits 1 and 2, and uroflowmetry alone at visit 3. Patients completed a 3-day voiding diary for all 3 visits. *Results:* Maximum bladder capacity significantly increased and maximum detrusor pressure decreased. Daytime and nighttime frequency, urgency and pad use significantly decreased. Post-void residual volume significantly increased initially but decreased until 12 weeks. Median time to re-injection due to recurrent overactive bladder symptoms was 8 months. *Implications/ Impact on Rehabilitation*: Overactive bladder treatment in patients

with multiple sclerosis using 100 U Botox intradetrusor injections seems to be effective and safe. Despite slightly impaired detrusor contractility most patients still voided voluntarily without symptoms. Thus, 100 U Botox may be a reasonable treatment option for refractive overactive bladder symptoms in patients with multiple sclerosis who still void voluntarily.

OR18-302AB-09

PROTECTIVE EFFECT OF ISOMETRIC EXERCISE ON VASCULAR ENDOTHELIAL FUNCTION IN ATHEROSCLEROSIS

Aicui Lin

Department of Rehabilitation, Nanjing First Hospital, Nanjing Medical University, China

Background: The role of isometric exercise (IE) has been well documented in promoting the formation of collateral circulation in myocardial ischemic animals, but not in vascular endothelial function of atherosclerotic animals. *Objective*: The present study was designed to evaluate the effect of IE on vascular endothelial function in rabbits with atherosclerosis and the underlying mechanism. *Methods:* Twenty-four rabbits were randomly divided into 3 groups, each group of 8, respectively. The normal diet (ND) group and high-fat diet (HD) group were left inactive. The IE training (IT) group fed with high-fat diet underwent isometric training for 3 min each time, twice a day, five days a week. Vascular endothelial growth factor (VEGF) of peripheral blood was tested by ELISA method, and circulating endothelial progenitor cells (CEC) was analyzed by flow cytometry. At the end of the experiment, aortic cross-sectional area of atherosclerotic plaque was measured by frozen oil red O staining method. *Results:* At the beginning of the experiment, there were no differences of VEGF and CEC among the three groups ($p > 0.05$). However, at the end of the experiment, the VEGF and CEC of ND group and IT group decreased significantly ($p<0.05$), whereas the VEGF and CEC of HD group increased ($p<0.05$). The aortic atherosclerotic plaque of HD group was found to be significantly larger than that of IT group ($p<0.05$), while no atherosclerotic plaque was observed in ND group. *Conclusion:* In the process of atherosclerosis, IE can reduce plaque area. The mechanism may be related to inhibition of vascular injury leading to excessive proliferation of VEGF and CEC hyperplasia.

OR18-303AB-01

STRATEGIES OF TREATMENT AND REHABILITATION ON CHRONIC NORMAL PRESSURE HYDROCEPHALUS IN COMATOSE PATIENTS AFTER BRAIN INJURY

Zhen Chen[1]*, Weiqun Song[1], Ge Chen[2], Yanhui Yang[3], Yanming Zhang[1], Maobin Wang[1]

[1]Department of rehabilitation of Xuanwu Hospital, [2]Department of neurosurgery of Xuanwu Hospital, [3]Department of radiology of Xuanwu Hospital, Capital Medical University, Canada

Objective: To investigate the effects of chronic normal pressure hydrocephalus (CNPH) after brain injury on comatose patients' rehabilitation, to detect the clinical and radiologic characteristics of CNPH, and to assess the short-term and long-term outcome after ventriculoperitoneal shunt (VPS) and rehabilitation. *Method:* According to the clinical examination, assessment of rehabilitation, and imaging data (except for other diseases which can cause ventricular enlargement), 128 comatose patients following cerebral hemorrhage and traumatic brain injury were diagnosed as CNPH and received VPS. The neural rehabilitation treatments were used after operation, and the rehabilitative principle of prevention and active training were emphasized. *Result*: Fifty-five coma patients recovered gradually. There was a significant difference at Glasgow coma scale in pre-operation, 1 month, 3 months and 1 year follow-up after VPS treatment ($F=3.26$, $p<0.05$). The standard Barthel score of 1 year follow-up (85.88±15.24) is significantly higher than that of one month after VPS (47.66±8.15) ($p<0.05$). Similar improvements at Mini Mental Status Examination results were observed at 1 year follow-up ($p<0.05$). *Implications/Impact on Rehabilitation*: CNPH influence awareness, active daily living, and cognitive functional outcome in patients with cerebral hemorrhage and traumatic brain injury. It is very important that physiatrists find it as soon as possible and make patients had VPS operation. Preventive and active rehabilitation treatment is the necessary factors which improved patients' prognosis. Functional image may be helpful for differentiating ventricular enlargement due to cortical atrophy and hydrocephalus.

OR18-303AB-02

FOLLOW UP OF THE FUNCTION OF THE PATIENTS SUFFERED FROM CERVICAL SPINAL INJURY WITHOUT FRACTURE OR DISLOCATION

Yanyan Yang, Mouwang Zhou

Peking University 3rd Hospital, China

Objective: To summarize the function outcome of the patients who suffered from cervical spinal injury without fracture or dislocation, so that to reveal the emphasis of rehabilitative training for the high risk population before injury and the patients after operation. *Methods:* 92 patients were involved in the follow-up survey, who received operation in our hospital in 2008. Phoned follow up was made to get the JOA17, COA40, MBI and SF-36 score before the operation, 1 week after operation and just at the moment of following up. *Results:* 28.4% patients have history of cervical spondylosis, 43.5% felt uncomfort at the cervical area. Only 9.5% ever had rehabilitative training before injury. Most injuries were due to low energy traumas, the No. 1 reason was fall. All the JOA17, COA40, MBI and SF-36 scores increased significantly 1 week and 3 years after operation ($p < 0.01$). 83.3% showed no more functional development one year and a half after operation. Motor functional recovery was always better than sensory functional recovery. The mainly residual fine activities dysfunction involve holding, bathing, washing, dressing, feeding and mooring. The mainly residual lower extremities dysfunction is stepping. There were still 34.5–53.1% patients felt zonesthesia, pain, numbness and cervical stiff and heavy. 53.1% patients complained limitation of cervical rotation and flexion. Bladder dysfunction remained in 8.7% patients, bowel dysfunction in 18.5% and sexual dysfunction in 22.8% patients. 20.7% patients went back to their work, 0.04% changed their jobs. *Implications & Impact on Rehabilitation Medicine*: This follow up revealed the living and working condition of the patients who suffered from cervical spinal injury without fracture or dislocation-dination. The results shows that balance training is important to high risk population of cervical spinal injury. Fine function, balance training and sensory training is good to the long term life quality. Vocational training or advice should be given early after operation.

OR18-303AB-03

THE RELATIONSHIP WITH PAIN, FUNCTION, COMPLICATION, AGE AND ADL FOR SPINAL CORD INJURY PATIENTS: MULTIVARIATE STATISTICS ANALYSIS FROM JARM DATA BASE

Naohisa Kikuchi

Faculty of Medical Science, Yokohama City University, Japan

Objective: Recently pain in spinal cord injury patient has been a big problem. Pain causes QOL deterioration in these patients, sometimes it decrease opportunity of outside activities. And most of pain in these patients is intractable. Our association has database for spinal cord injury patients in all areas of Japan. In this paper, we tried to research of relationship with pain, injury level, ASIA impairment scale, complication and ADL for spinal cord injury patients from our database. *Methods:* The data were collected from the Japanese

Association of Rehabilitation Medicine Rehabilitation Database (JARM DB). The base data were collected from 3,453 spinal cord injury patients, then we extracted cases with deficit data ($n=186$). Mean age was 50.1±18.7 years old. The items for statistics were injury level, ASIA impairment scale, complication, spasticity, FIM total and each scale. We mainly used logistic regression analysis (IBM SPSS Statistics 20) as multivariate statistics analysis. *Results:* The statistically significant items ($p<0.01$) were age, spasticity, autonomic over reflection, paralytic ileus, bladder incontinence. There were no significant correlation with pain and injury level, ASIA impairment scale, FIM total and each items. From this analysis, pain may correlate old age and autonomic nerve injury. *Implication/ Impact on Rehabilitation:* We showed relationship with pain and other factors in spinal cord injury patients from JARM DB. Age and autonomic factors may correlate pain. From these results, proper physical medicine, rehabilitation, and autonomic reactive drugs might be effective for intractable pain in spinal cord injury patients.

OR18-303AB-04

MEASURING INTERCONNECTION OF THE RESIDUAL CORTICAL FUNCTIONAL ISLANDS IN PERSISTENT VEGETATIVE STATE AND MINIMAL CONSCIOUS STATE WITH CROSS APPROXIMATE ENTROPY

Dongyu Wu, Ying Yuan, Jie Wang
Department of Rehabilitation, Xuanwu Hospital of Capital Medical University, Beijing, China

Objectives: Recent advances in functional neuroimaging and neurophysiological methods showed that patients in persistent vegetative state (PVS) and minimal conscious state (MCS) might retain islands of preserved cognitive, sensory and auditory function. This study was undertaken to investigate the cortical response to painful and auditory stimuli for subjects in PVS and MCS, and measure interconnection of the residual cortical functional islands with electroencephalographic (EEG) nonlinear dynamic analysis (NDA). *Methods:* Thirty PVS subjects, 20 MCS subjects and 30 subjects in normal conscious state (NCS) were involved in the study. EEG was recorded under three conditions: eyes closed, auditory stimuli and painful stimuli. EEG nonlinear indices of approximate entropy (ApEn) and cross approximate entropy (C-ApEn) were calculated for all subjects. *Results:* Interconnection of local and distant cortical networks of patients in PVS was generally suppressed and painful or auditory stimulation could hardly cause any activation of associative cortices from neither local nor distant networks. Instead, interconnection of local cortical networks of patients in MCS improved significantly, to some extent, very close to the NCS; the only significant difference with the NCS existed in the distant unaffected cortical networks. *Implications:* Interconnection of local and distant cortical networks of the MCS is superior to the PVS. NDA could measure interconnection of the residual cortical functional islands with associative cortices in the unconscious patients. NDA can characterize the interconnection of cortical networks for the unconscious state and provide some information of unconsciousness at the awareness level.

OR18-303AB-05

THE OPTIMAL TIMING OF MYELOTOMY ON A RAT MODEL OF ACUTE SPINAL CORD INJURY

Degang Yang, Jianjun Li, Rui Gu, Anming Hu, Feng Gao, Xin Zhang, Mingliang Yang, Liangjie Du, Wei Sun, Yingying Wu, Jiangen He, Yutong Feng, Hongyu Chu
China rehabilitation research center, School of Rehabilitation Medicine of Capital Medical University, China

Objective: Hematoma and edema play an important role in the pathophysiological mechanism of spinal cord injury (SCI). Myelotomy seems to be a promising intervention. However, the timing of myelotomy has not been explored in an animal model of SCI. Here we aimed to determine the timing of microsurgical myelotomy in SCI. *Methods:* 55 adult female rats were randomly assigned to either a sham-operated group, model group, 8 h (h)-myelotomy group (8 h-MTG), 24 h-myelotomy group (24 h-MTG) or 48 h-myelotomy group (48 h-MTG). SCI at T10 was induced with a NYU impactor. Myelotomy was performed at 8, 24 or 48 h after SCI, respectively. Functional recovery was evaluated via the open-field test and the inclined plane test. The percentage of spared white matter area and ultrastructure characteristics of the injured dorsolateral spinal cord was determined on the 42nd day after SCI. *Results:* Myelotomy groups showed better locomotor function, ultrastructural preservation and higher percentages of spared white matter area than the model group ($p<0.05$). Rats in 24 h-MTG demonstrated a higher BBB score than 48h-MTG at 35 and 42 days post-injury ($p<0.05$). Rats in the 24 h-MTG showed a higher intra-axonal fraction and myelin fraction than those in 48 h-myelotomy group ($p<0.05$). Rats in the 24h-MTG showed a little better outcome than those in the 8 h-MTG. *Impact on rehabilitation*: Early myelotomy after SCI significantly improves the locomotor function of rats. The optimal timing of myelotomy in SCI rats is 24 h after SCI, not 48 h. This study offered some evidence for the earlier microsurgery of spinal cord injury, and earlier surgery could provide some convenience for the earlier rehabilitation.

OR18-303AB-06

COMBINATION OF EARLY CONSTRAINT-INDUCED MOVEMENT THERAPY AND FASUDIL ENHANCES MOTOR RECOVERY AFTER ISCHEMIC STROKE IN RATS

Baoqiong Liu, Yan Zhao
Department of Rehabilitation, Xiangya Hospital, Central South University, China

Objective: Constraint-induced movement therapy (CIMT) is one of the most promising techniques for the recovery of upper extremity movement in chronic stroke patient. However, its effects on acute stroke has not been confirmed. Some experimental studies in animal models suggest that very early CIMT may not be helpful. Myelin-associated inhibitors, which have upregulated in the acute focal infarction brain, limit axonal regeneration by activating Rho-ROCK pathway. The present study examined whether early CIMT combined with a Rho-ROCK inhibitor fasudil promotes motor recovery after acute ischemic stroke. *Methods:* Adult rats were trained to perform the skilled forelimb reaching test, followed by permanent middle cerebral artery occlusion to impair the preferred forelimb. Rats were assigned to one of 3 treatment groups ($n=6$ each) (fasudil+CIMT), fasudil only, CIMT only) and control group (no treatment). Therapeutic treatments were initiated 1 day postinfarct and included intraperitoneal infusion of fasudil and CIMT. Behavioral assessments on skilled reach and foot fault were conducted before the infarct and for 4 weeks postinfarct. *Results:* All rats showed similar forelimb impairment before treatment. Fasudil alone and in either combination with CIMT facilitated recovery after 2 weeks of treatment, whereas CIMT alone failed to enhance recovery. Rats in fasudil+CIMT group demonstrated better forelimb function on skilled reach and foot fault tests than fasudil group at Weeks 2 and 4. Infarct sizes and remaining cortical tissue did not differ in the various treatment groups. *Conclusions:* These results indicate that early CIMT combined with Fasudil, but not CIMT alone promotes motor recovery after acute ischemic stroke.

OR18-303AB-07

ADAPTED LOW INTENSITY ERGOMETER AEROBIC TRAINING FOR EARLY AND SEVERELY IMPAIRED STROKE SURVIORS: A PILOT RANDOMIZED CONTROLLED TRIAL TO EXAMINE ITS FEASIBILITY AND EFFICACY

Zun Wang[1], Hongjuan Fan[2], Yihuang Gu[1], Lixia Zhang[3], Xiao Lu[3], Lei Wang[1], Tong Wang[3]

[1]Nanjing Medical University of Traditional Chinese Medicine, Nanjing, [2]Affiliated Hospital of Jiangsu University, Zhenjiang, [3]The First Affiliated Hospital of Nanjing Medical University, Nanjing, China

Objective: The role of aerobic training in stroke rehabilitation has been established,yet,it is unclear whether very early and weak stroke patients could also benefit. Our preliminary study aim to evaluate the feasibility and efficacy of adapted low intensity ergometer aerobic training among early and severely impaired stroke surviors. *Methods:* Forty-two severely impaired patients withen six weeks post stroke were recruited and randomly assigned to experimental group and control group. Both groups participated in routine rehabilitation with low intensity aerobic training added to the experimental group three times per week for six weeks. Fugl-Meyer motor score, Barthel index,exercise test time and peak heart rate, blood glucose levels and serum lipid profiles will be evaluated before and after intervention.The actual number of aerobic training sessions subjects finished will be collected and any adverse events or unpleasant syptoms will also be recorded. *Results:* Aerobic training significantly improved Barthel index (from 40±21 to 79.2±14.2), Fugl-Meyer motor score (from 26.4±19.4 to 45.4±12.7), exercise test time (from 12.2±3.62 min to 13.9±3.6 min), 2 h glucose level (from 9.12±1.16 mmol/L to 7.21±1.36 mmol/L) and total triglycerides (from 1.43±0.06 mmol/L to 1.16±0.21 mmol/L) when compared with the control group ($p<0.05$). Patients in the experimental group finished 291 (85.1%) sessions of the total 342 aerobic training prescribed and no adverse event occurred. *Impact on Rehabilitation*: 1) Adapted low intensity aerobic training may be feasible for early and extremely weak stroke survivors.2) Low intensity aerobic training may increase motor functional recovery and reduce cardiovascular risk factors amongearly and very weak stroke patients.

OR18-303AB-08

RECIPROCAL INHIBITION TECHNIQUE ON CONNECTIVITY CHANGES IN THE BRAIN AND MOTOR FUNCTION AFTER STROKE

Qiang Duan, Hua Yuan, Xiang Mu

Xijing Hospital, Xi'an, China

Objective: To investigate the effects of reciprocal inhibition technique on the motor functional connectivity in the brains of stroke patients. *Methods:* 30 patients with stroke were randomly divided into a treatment group ($n = 15$) and a control group ($n = 15$). The control group underwent normal limb position, intermediate frequency electric therapy, circulated compression to limbs, etc. While the treatment group were applied reciprocal inhibition technique beside conventional rehabilitation treatment, 20 min each time, once everyday, 6 times a week. All the treatment last for 4 weeks. All patients were assessed with the Canadian neurological scale (CNS), the Frenchay activities index (FAI), the Motricity index (MI), the Motion evoked potential (MEP) and the motor functional connectivity in resting-state function magnetic resonance imaging (rs-fMRI) before and after treatment. *Results:* Both groups average scores on the CNS, FAI, MI and SEP were improved ($p<0.05$). Compared with the control group, the change of FAI in treatment group improved significantly ($p<0.05$).The coefficient of functional connectivity of the bilateral motor cortex had decreased significantly after treatment in both groups ($p<0.05$). In the treatment group the changes were significantly correlated with the improvements in FAI scores. *Implications:* Reciprocal inhibition technique can improve the extremity motor function and ability in the activities significantly in stroke patients, and reduce the coefficient of functional connectivity of the bilateral motor cortex. Also the connectivity were significantly correlated with the improvements in the motor function.

OR18-303AB-09

MAGNETOENCEPHALOGRAPHY STUDY ON LANGUAGE PROCESSING CHARACTERISTICS IN CHRONIC NON-FLUENT APHASIA

Zhongli Jiang[1], Shaoqiang Chen[1], Feng Lin[1], Ting Wu[1]

[1]the First Affiliated Hospital of Nanjing Medical University, Nanjing, [2]Affiliated Nanjing brain Hospital of Nanjing Medical University, Nanjing, China

Objective: The purpose of this study was to o explore brain neural network activities during picture naming and the relations of them to impaired language abilities in patients with chronic non-fluent aphasia. *Method:* Five patients with chronic non-fluent aphasia and 5 age-, gender-and education-matched healthy controls were recruited in this study. All behavioral performance was assessed with western aphasia battery (WAB) and brain language processing during picture naming was detected with magnetoencephalography (MEG). *Result*: The magnitudes of Broca's area activation were significantly lower in patient group than in control group ($p<0.05$) during 400 ms-600 ms of picture naming by comparison of picture naming-related regions of interest (ROIs), while the magnitudes of activation in Broca-homologue area, Wernicke-homologue area and inferior parietal lobule of right hemisphere were significantly higher in patient group than in control group ($p<0.05$). There were significantly correlations between aphasia quotient (AQ) and brain activation in Broca-homologue area in aphasia patients ($r=0.886$, $n=5$, $p<0.05$). *Conlusion*: Neural network activities of right hemisphere during speech put-out preparation are widely activated in patients with chronic non-fluent aphasia, which is suggestively related to low levels of compensatory effect on language function.

OR18-306AB-01

TRADITIONAL THAI MASSAGE IN MEDICAL STUDENTS WITH BURNOUT SYNDROME: A QUASI-EXPERIMENTAL TRIAL

Yury Rosales Ricardo

Universidad Ciencias Medicas Holguin, Cuba

Background: Actually, Burnout Syndrome in medicine students is a problem to resolve, and it is very important to find an effective treatment. Objective To determine the efectivity of Traditional Thai Massage in the treatment of Burnout Syndrome in medical students. *Methods:* A quasi-experimental study was conducted consisted in the application of Traditional Thai Massage medical students diagnosed with moderate Burnout Syndrome University of Medical Sciences of Holguin, between February and June 2011. They formed two groups of equal number and composition. The control group (CG) was not applied to any experimental treatment while (EG) was applied to Traditional Thai Massage (TTM). *Results*: In the initial test both groups had their 5 members with moderate Burnout (GC=54.1; GE=54.2), in the final test of the experimental group students significantly improved in general: GE=35.4; compared with the control group: GC=52.6. *Impact of rehabilitation*: The results suggest that Traditional Thai massage is effective in the treatment of burnout syndrome in medical students.

OR18-306AB-02

EFFECTS OF MECHANICAL LUMBAR SPINE TRACTION IN TREATMENT OF NONSPECIFIC ACUTE AND SUBACUTE LOW BACK PAIN

Gordana Devecerski, Slobodan Pantelinac*

University of Novi Sad, Faculty of Medicine Novi Sad, Clinic for Medical Rehabilitation Clinical Ce, Serbia

Background: There are different recommendations for the treatment of patients with nonspecific acute and subacute low back pain (LBP). One of the recommendations is the use of mechanical spine traction. The aim The aim of this study was testing the therapeutic efficacy of mechanical spinal traction as an additional form of therapy for patients with nonspecific acute and subacute LBP. *Material and Methods:* The study included 60 patients (30 men and 30 women) average age 47.57 ± 9.42 years, with nonspecific acute and subacute LBP. The average duration of pain was 5.3 ± 2.4 weeks. The examined patients were divided into two groups of 30 patients (15 men and 15 women). First group of patients ("standard group") received standard physical therapy (kinesitherapy, low level magnetotherapy and laser therapy). Second group received mentioned standard treatment plus mechanical lumbar spine traction („traction group"). The average age and duration of pain between the groups were not significantly different. Static traction was applied for 12 min total (10 min at the desired intensity, plus 1 minute for increase and 1 min to decrease the intensity). The intensity of the pull was 40–60% of the subject's body weight, adjusted on the subject's tolerance and symptom response. All patients received 12 physical therapy sessions over 6 weeks. The pain and its features as well as degree of disability and the effectiveness of therapeutic procedures were estimated by visual analog scale, pain detect test, Oswestry Low Back Pain Disability Questionnaire, and Thomayer and Schober test. The assessments were made before treatment, at the end of treatment (6th week) and after 3 months. *Results:* After 6 weeks of treatment all of the above mentioned tests showed a significant improvement. "Traction group" had all the results significantly better than the "standard group". However, this difference between the groups disappeared after three months, because the results were practically equal, but the overall results in both groups were still significantly better than results before treatment. *Conclusions:* Mechanical spinal traction, added to standard therapeutic procedures, may contribute to a faster recovery of the patients during the treatment of nonspecific acute and subacute low back pain.

OR18-306AB-03

CHALLENGES IN OSTEOARTHRITIS MANAGEMENT IN INDIA

Rajesh Pramanik

Indian association Of Physical Medicine & Rehabilitation, India

Introduction: It is a real challenge to rehabilitate the patients of OA in South East Asia specifically in India. The myth in the mind of common people of India is that arthritis is not treatable by modern medicine. This is a humble presentation to highlight the grey areas of OA rehabilitation in India. *Methods:* This is a presentation based on the observations of data in OA clinic of Department of PMR in IPGMER, Kolkata from July 2009 to October 2012. The collected data of more than 2000 OA population showed an interesting pattern of presention of OA and management policies practiced in India. *Results:* According to our experiences in one of the apical hospital in a big state of India knee OA is predominating over hip OA in this region of the world possibly due to squatting habit of the people. The medical fraternity is also little bit ignorant or apathetic to the patella femoral joint pain syndrome leading to patella femoral OA over the years. The clever business policy of the big pharmaceutical house, lack of uniform protocol, availability of the over the counter medications, improper policies are the contributing factors of the inappropriate use of DMOAD in India. On the top of these factors squatting habit during prayer, cooking, dining, toileting etc. are creating a real challenge for the physiatrists to rehabilitate knee OA in this part of this world. *Discussion*: In reality the patients of India are getting minimal support from the rehab world due to less number of physiatrists, lack of available therapy facilities everywhere and upgraded orthotic appliances. Our patients are fighting and earning their breads against these odds in their life in the mud houses, firm houses, inaccessible or partially accessible villages with poor transport system. Above all there is a prejudice or negative idea regarding the success of replacement surgery in commons people mind. *Potential Implications:* These data are pointing towards real lack of understanding about the disease in patients mind, lack of uniform protocol,lack of accessible rehabilitation services in every corner of country. Next steps: To arrange awareness program, more physiatric input, more resources in OA management may help to improve the scenario of OA rehabilitation.

OR18-306AB-04

BURDEN & ETIOLOGY OF LOW BACK PAIN IN WEST BENGAL: BRIEF REPORT OF A COMMUNITY SURVEY

Rathindranath Haldar[1,2]*, Rajesh Pramanik[1,2]

[1]Indian Association of PMR, [2]International Rehabilitation Forum, India

Objective: To study the burden and aetiology of low back pain in West Bengal, India. *Method:* This community based cross sectional study was conducted by dividing the whole state into four strata: north, south, east, and west. Estimated sample size was 3,600 taking prevalence of LBP as 10% (Spine 2006; 31:E968-72) with 10% allowable error and 95% CL. 450 individual were screened from a district (2 from each strata). Out of 450 persons, 360 were rural population (180 each from two villages of two different block) and 90 were urban population (45 each from two wards of different municipality). A team of doctors including rheumatologist conducted the survey based on clinical diagnoses. *Results:* Total 3549 (1394 male and 2155 female) were surveyed. 79.9% were married with mean age of 40.7±16.1 years and family size of 5.6±2.5. interestingly 770 (21.7%) with 223 male (29%) and 547 female (71%) were suffering from LBP. Lumber strain were the commonest (73.2%) cause followed by degenerative disease (12.7%), facet joint arthritis (3.6%), osteoporotic fracture (2.5%), spondylolisthesis (1%), herniated disc (0.8%), spinal canal stenosis (0.1%), psychological (0.8%), pelvic cause (0.2%) and others (4.9%). *Implication in rehabilitation*: LBP is huge burden in developing country like India and biomechanical cause and nutritional deficiency are the major contributors of the LBP. Simple rehabilitation intervention with postural correction and nutritional care may help our patient to be free from disability.

OR18-306AB-05

EFFECTIVENESS OF RADIAL EXTRACORPOREAL SHOCK WAVE THERAPY FOR CALCIFIED ROTATOR CUFF TENDINOPATHY

Merce Avellanet*, Laura Tutte, Blanca Zeballos

Hospital N. Sra. Meritxell, Andorra

Calcified rotator cuff tendinopathy is a common cause of shoulder pain and its diagnosis is confirmed by imaging techniques. Extracorporeal Shock wave therapy (ESWT) is an indication for this pathology although there is moderate evidence of its effectiveness. There is also a lack of consensus of application protocol. The aim of this study was to evaluate the effectiveness of radial ESWT for the treatment of calcified rotator cuff tendinopathy in terms of pain and calcification deposit changes. *Methods:* Prospective observational study of 42 patients with calcified rotator cuff tendinopathy. Calcification was localized by ultrasonography. Treatment protocol was as follows: 5 interventions of radial ESWT were applied at

2–3.5 bars as tolerated, 2000 impulses, once per week, at 7-10Hz frequency. Main outcome pain measure was the visual analog scale (VAS) at rest, night and activity before and after the treatment. Patients under litigation were excluded. *Results:* At diagnosis, 70% had a subcentimetric calcification and 30% bigger than 1 cm. 50% underwent an ultrasonography 4 months after the treatment with 25% complete disappearance and 65% calcification diminution. Mean improvement in pain was 4 points in VAS at rest, 5 inactivity VAS and 3.48 innocturnal VAS. All these results were statistically significant ($p<0.05$). 14 patients (31%) underwent physiotherapy as adjunct therapy but with no significant differences in outcome. *Conclusion:* Our radial ESWT protocol has shown to be effective in terms of pain and calcification deposit reduction for patients with calcified rotator cuff tendinopathy.

OR18-306AB-06

INSPIRATORY MUSCLE TRAINING AND EFFORT CAPACITY IN CYSTIC FIBROSIS PATIENTS

Alexandra Mihaela Rusu[1], Bogdan Almajan-Guta[2], Claudiu Avram[1], Mihaela Oravitan[1], Adrian Nagel[1]

[1]West University of Timisoara, [2]University "Politehnica" Timisoara, Romania

Objective: This study aimed to establish the benefit of inspiratory muscle training on effort capacity in young patients with cystic fibrosis. *Method*: Twelve cystic fibrosis patients (age between 6 and 12 years), with moderately or severe respiratory function limitation, were evaluated trough spirometry and 6 minute walk test, before and after a 4 weeks inspiratory muscle training programme (3 sessions a week, the training intensity was set at 80% of maximum inspiratory pressure, each session last from 10 to 30 min until exhaustion). Cystic Fibrosis Quality of Life questionnaire (CFQoL) was also used in order to evaluate the fatigue perceived by the patient during daily living activities. *Results:* After 4 weeks of inspiratory muscle training, the respiratory functional capacity significantly improved (FEV1 from 60.5±37.92% to 64.17±35.65%; PEF from 3.19±1.4 L to 3.26±1.4 L and PIF from 2.93±1.54 L to 3.04±1.55 L), patients reported lower fatigue scores for daily living activities and the walk distance performed during 6 minute walk test increased from 531±120.5 m to 545.4±120.8 m. In conclusion, inspiratory muscle training can improve the respiratory function and has a positive effect on exercises tolerance in cystic fibrosis patients. *Implications on Rehabilitation*: Respiratory function plays an important role in improving quality of life and prognostic of cystic fibrosis patients. Inspiratory muscle training can be performed by the patients that refuse or are unable to perform other form of exercise training or physical therapy. *Funding*: This paper work was supported by a research grant from UEFISCDI Romania, code TE_36, Contract No. 13/09.08.2010.

OR18-306AB-07

A NEW METHOD FOR SUSTAINABLE RELIEF OF FROZEN SHOULDER (SUPRASPINATUS TENDINITIS) IMMEDIATELY AFTER ONE SESSION LOW LEVEL LASER ACUPUNCTURE THERAPY

Dhiya Houssien*, Asmaa Houssien

Dr Dhiya Centre for Rheumatism, Physiotherapy and Acupuncture, Saudi Arabia

Background and Objectives: Low-level Laser therapy (LLLT) is widely used in treating musculoskeletal pain. A saying of Prophet Mohammad (Peace be upon Him) "He whoever visits a sick person and says upon him: "I ask Allah the Grand, the Lord of the Magnificent Throne to cure your illness" (7 times), God will restore him to health. The purpose of this study was to determine whether the use of this prayer during a single LLLT session for supraspinatus tendinitis would result in better outcome. *Patients and Method:* 40 patients with Frozen shoulder were assigned to two groups (20 each): G1 (laser alone) and G2 (prayers and laser). No patients realized the therapist's recitation of prayer. All patients received LLLT once. Pain intensity was assessed on 100 mm visual analogue scale (VAS). The ranges of motion were measured using goniometry. All measures were recorded at initial visit, immediately after 4, 12, and 24 weeks. *Results:* After 6 months of a single session, the VAS dropped from 78 to 76 mm in G1. In contrast, VAS decreased from 80 to 60 mm in G2. Abduction increased from 72° to 74° in G1, while increased in G2 from 72° to 116°. The external rotation increased from 18° to 26° in G1 compared to an increase from 18° to 46°in G2. There were also increases in internal rotation from 40° to 54° in G1 but it increased from 38° to 57° in G2. *Conclusion:* Using prayers during LLLT results in better supraspinatus tendinitis therapy outcome and reduces treatment period down to one session.

OR18-306AB-08

COMPARISON OF FUNCTIONAL IMPROVEMENT AND QUALITY OF LIFE IN KNEE OSTEOARTHRITIS BEFORE AND AFTER TREATMENT OF PRP (PLATELET RICH PLASMA)

Seyed Ahmad Raeissadat, Sm Rayegani, Mh Bahrami, D Elyaspour, M Babaee

Physical Medicine and Rehabilitation Research Center, Shahid Beheshti Medical University, Faculty of Medicine, Modarres Hospital, Iran

Objective: Knee OA is a highly prevalent, chronic condition. Unfortunately repairing of cartilage is limited and alternative or co-adjuvant therapies don't prevent and improve this process. PRP (platelet rich plasma) is a new treatment which is used in repairing of musculoskeletal disorder. This study designed to evaluate effectiveness of PRP on functional and quality of life changes in knee OA patients. *Method:* A total of 62 patients with knee OA (Outer bridge grades I–IV) and symptoms of >3 months duration met the inclusion criteria (age). *Result*: There were no adverse effects reported at 6 months follow up. Mean age of patients is 56.96 yrs.This study demonstrated significant improvement in WOMAC Index and SF36 questionnaire between pre-treatment and follow up values ($p<0.0001$). *Implications/Impact on Rehabilitation*: PRP has been showing promise result in function and QOL after 6 months follow up. These favorable results point to consider PRP as therapy for knee OA.

OR18-306AB-09

CARPAL TUNNEL SYNDROME IN PATIENTS WITH PARKINSON'S DISEASE: ELECTRO-DIAGNOSTIC AND ULTRASONOGRAPHIC STUDY

Seungnam Yang, Bumjun Park, Hyojung Kang, Joonshik Yoon, Seijoo Kim

Korea University Guro Hospital, Korea

Introduction: Tremor is one of cardinal symptoms of Parkinson's disease (PD) and may cause cumulative traumatic injury on nerves of hands. Carpal tunnel syndrome is related with trauma of hands. The aim of study is to analyze the electrodiagnostic and ultrasonographic studies of patients with PD and to verify the effect of movement of hands in PD on median nerve. *Methods:* We recruited 31 hands of healthy controls (60.25+14.67 years) and 81 hands of patients with PD (64.95+11.13 years). The patients with PD were divided by Hoehn and Yahr (H&Y) clinical stage and divided into two groups of mild and advanced degree. Clinical symptoms of patients with PD by Unified Parkinson's Disease Rating Scale (UPDRS) and quality of life by Parkinson's Disease Questionnaire were measured. Median nerve conduction study and cross sectional area of median nerve by ultrasonography were evaluated. *Results:* Eighteen patients were classified by mild group and 23 were advanced group by H&Y

stage. Cross sectional area of median nerve of patients with PD was significantly larger than that of control group. Electrophysiologic findings of median nerve between patients with PD and control group had no significant difference. Total UPDRS score was not significantly correlated with Cross sectional area findings of median nerve, but the severity of tremor was significant correlated with cross sectional area of median nerve. *Conclusions:* Carpal tunnel syndrome diagnosed by ultrasound was frequent in PD, tremor might be a risk factor for the development of median nerve pathology.

OR18-307AB-01

PELVIC FLOOR ELECTROPHYSIOLOGY PATTERNS ASSOCIATED WITH FAECAL INCONTINENCE

Hussein Sultan
Faculty of medicine, Alexandria, Egypt

Introduction: Pelvic floor electrophysiological tests are essential for assessment of patients with faecal incontinence. *Aim*: The present study was conducted to determine the patterns of pelvic floor electrophysiology that are associated with faecal incontinence. Subjects The present study included 40 patients with faecal incontinence and 20 apparently healthy subjects as a control group. *Methods:* All patients were subjected to history taking, clinical examination, proctosigmoidoscopy, anal manometry and electrophysiological studies. Electrophysiological studies included pudendal nerve motor conduction study, pudendo-anal reflex, needle electromyography of external anal sphincter and puborectalis muscles, pudendal somatosensory evoked potential and tibial somatosensory evoked potential The control group was subjected to electrophysiological studies which include pudendal nerve motor conduction study, pudendo-anal reflex, pudendal somatosensory evoked potential and tibial somatosensory evoked potential. *Results:* The most common pelvic floor electrodiagnostic pattern characteristic of faecal incontinence was pudendal neuropathy, abnormal pudendo-anal reflex, denervation of external anal sphincter and puborectalis at rest, incomplete interference pattern of external anal sphincter and puborectalis at squeezing and cough and localized defect in external anal sphincter. *Conclusions:* There were characteristic pelvic floor electrodiagnostic patterns for faecal incontinence.

OR18-307AB-02

THE CHARACTERISTICS OF GAIT DISTURBANCE IN PATIENTS WITH KNEE OSTEOARTHRITIS

Jung Hwan Lee, Sang-Ho Lee
Wooridul spine hospital, Korea

Objective: Knee osteoarthritis (OA) is a major source of pain and disability in elderly persons. This study was to investigate the gait characteristics of knee OA compared with normal persons and to assess the change of gait abnormalities after total knee arthroplasty (TKA) by three dimensional gait analysis. *Method:* Medical records of 15 patients with knee OA was reviewed retrospectively who had underwent TKA and performed three dimensional gait analysis before (preTKA) and 2 months after surgery. *Results:* PreTKA showed decreased gait velocity, stride length, and single limb support time compared with control. Maximal anterior pelvic tilt, internal and external pelvic rotation was larger than control. Maximal hip flexion and extension was larger and smaller than control respectively. Knee flexion of preTKA were larger than control throughout gait cycle. Maximal knee extension and flexion moment in preTKA was significantly larger and smaller than control respectively. Maximal knee varus of preTKA was larger than control but was significantly decreased after TKA. Maximal knee valgus of preTKA was smaller than control but was significantly increased after TKA. Maximal knee valgus moment of preTKA was lower than control but significantly increased after TKA. Maximal knee external rotation moment of preTKA were lesser than control. *Implications/Impact on Rehabilitation*: Gait deviation of knee OA was observed throughout pelvis, hip and knee joints. TKA resulted in improvement only in knee varus angle and valgus moment. This suggested post operative rehabilitation program including hip and knee flexor stretching be needed.

OR18-307AB-03

NEUTRAL WRIST SPLINTING IN CARPAL TUNNEL SYNDROME: A COMPARISON OF CUSTOM-MOLDED THERMOPLASTIC SPLINT VERSUS PREFABRICATED NEOPRENE SPLINT

Phongphitch Saensri*, Yupadee Fusakul, Thanyaporn Aranyavalai
Department of Physical medicine and Rehabilitation, Faculty of Medicine Vajira Hospital, University of Bangkok Metropolis, Thailand

Objectives: To compare the efficacy of custom-molded thermoplastic wrist splint and prefabricated neoprene wrist splint on symptoms in mild to moderate degree carpal tunnel syndrome (CTS). *Methods*: A total of 40 patients were randomly assigned into two groups. Group I ($n = 20$) received custom-molded thermoplastic wrist splints which were custom-made by occupational therapist. Group II ($n = 20$) received prefabricated neoprene wrist splints. The patients were evaluated with visual analogue scale (VAS), grip strength baseline with 5-week follow-up. Side effects from splint wearing were also recorded. *Results:* Statistically significant improvement was seen in VAS ($p < 0.001$) in custom-molded thermoplastic splint group at 5-week follow-up when compared with subjects receiving prefabricated neoprene wrist splints. Side effects of wrist splints were found in 23 patients in custom-molded splint group and in 4 patients in prefabricated neoprene splint group such as discomfort, stiffness and pain at some contact areas. However, the custom-molded wrist splint could be adjusted and corrected by occupational therapist at 5-week follow-up to conform to wrist-hand configuration and facilitate long-term compliance of wrist splint wearing. *Conclusion:* Custom-molded thermoplastic splint was superior to prefabricated neoprene wrist splint in treatment of mild to moderate CTS in terms of pain relief and adjustability of wrist splint to achieve goal of treatment.

OR18-307AB-04

PHYSICAL FITNESS IS CORRELATED TO HEALTH-RELATED QUALITY OF LIFE AMONG HEART TRANSPLANTATION RECIPIENTS

Chen-Jung Hsu[1,2], Ssu-Yuan Chen[1], Shoei-Shen Wang[3], Ching Lan[1], Nai-Kuan Chou[3], Yih-Sharng Chen[3], Jin-Shin Lai[1]
[1]Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital and National Taiwan University College of Medicine, Taiwan, [2]Department of Physical Medicine and Rehabilitation, Keelung Hospital, Department of Health, Keelung City, Taiwan, [3]Department of Surgery, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Chinese Taipei

Objective: Health-related quality of life (HRQoL) represents an important outcome measure to assess heart transplantation recipients (HTR). This study aimed to evaluate the correlations of HRQoL with health-related physical fitness among HTR. *Method:* The study included 44 clinically stable HTR (age: 49±15 years; 38 men, 6 women) at 5.0±3.3 years after transplantation. The HRQoL of subjects was evaluated by the Medical Outcomes Trust 36-item health survey (SF-36). Each subject underwent: 1) a symptom-limited cardiopulmonary exercise testing to evaluate cardiorespiratory fitness; 2) an isokinetic test (Cybex Norm dynamometer) to measure muscular strength of knee extensors at 0 degree per second; 3) Grip

strength measured with a hand-held hydraulic dynamometer; 4) anthropometric measurements and bioelectrical impendence analysis for body composition analysis. *Results:* The peak oxygen uptake was significantly positively correlated with physical functioning and social functioning ($p < 0.05$). The concentric isometric muscle strength of knee extensors was significantly positively correlated with physical functioning and mental health. The handgrip strength was significantly positively correlated with social functioning and mental health. The body fat percentage was significantly negatively correlated with bodily pain. *Implications:* Our results provided the evidences of correlations between HRQoL and health-related physical fitness among HTR. The rehabilitation program designed for improvement of the health-related physical fitness might have a benefit effect on HRQoL among HTR.

OR18-307AB-05

REVISED SCORING SYSTEM OF PEABODY MOTOR DEVELOPMENTAL SCALES IN CHILDREN WITH DISABILITY

Gai Zhao, Yang Bian, Ming Li
The first affiliated hospital of Beijing university, Beijing, China

Purpose: In children with disability, it is commom to have a scattered distribution of passing items in the gross motor subtest of Peabody development motor scales (PDMS-2). The aim of our study is to analyze the impact of two scoring system with or without these passing items on gross motor quotient (GMQ) and age equivalents. *Methods:* 124 children between 1.2 and 71 months were administered gross motor subtest of PDMS-2. The mean of GMQ is 81.49. Those items which need the same posture and stimulus were administered at the same time. The age equivalents or quotients of the two scoring methods were compared using paired-samples *t*-test. *Results:* there is only one child can pass the items above the ceiling on stationary subtest, 19 children on locomotion subtest, There is a significant difference between those two methods about GMQ or age equivalents on the specific subtest (p=0.000–0.042). However, when the scores of these passing items were included into the raw scores, the range of the increased value of children' GMQ is 0–2, and the range of the increased value of gross motor age equivalents is 0–1 month. *Conclusion:* The phenomenon of the passing items above the ceiling is usually taken place on the locomotion subtests. Including these passing items into scoring system will make the evaluation of gross motor level more accurate, while the impact on the GMQ and age equivalents is minor, especially in normal children.

OR18-307AB-06

TCM REHABILITATION FOR TREATING DYSPHAGIC PATIENTS WITH STROKE

Yang Tian[1], Xiaodong Jiang[2], Ming Gao[3], Kewei Zhao1, Jiaqi Lu[1], Hongying Wang[1]
[1]Department of Rehabilitation, Jilin Academy of Traditional Chinese Medicine, [2]Department of Rehabilitation, Ji An City Hospital, [3]Department of Rehabilitation, Song Yuan Chinese Medicine Hospital, China

Objective: To explore the TCM rehabilitation impact and efficacy in patients with swallowing dysfunction after stroke. *Method:* 80 cases of post-stroke patients with swallowing dysfunction were divided into two groups: Treatment group (n=40) were treated with acupuncture, swallowing training and massage.Acupncture was given at Fengchi (GB20), Lianquan (RN23), Jingjin (EX-HN12) and Yuye (ex-hn13). Control group (n=40) were treated with swallowing training only,included thermal tactile stimulation, deglutition organ exercises and food swallowing training. 40 min/day. After treatment of swallowing, assess the function once a week.and evaluated and analyzed curative effect of the two groups. *Results*: After a month of treatment, all groups showed improvement in Water-Swallow Test, Swallow Function Score, among them the treatment group total efficient(93.33%) was higher than those in the control group (80%), x^2=6.05,0.01<p<0.05. Differences between the two groups were significant. *Implications:* TCM rehabilitation can effectively improve the swallowing function. *Key words:* Acupuncture/Massage/Stroke/Swallowing dysfunction.

OR18-307AB-07

RELIABILITY OF A TRUNK MOUNTED DEVICE BASED ON A VIRTUAL REALITY SYSTEM ON EVALUATING THE SITTING BALANCE IN HEALTHY ADULTS

Xijun Wei[1], Huihua Liu[1], Wujian Lin[1,2], Yingmin Lang[1,3]
[1]Department of Rehabilitation Medicine, Sun Yat-sen Memorial Hospital, Sun Yat-sen University, [2]Department of Sports and Health, Guangzhou Institute Of Physical Education, [3]2nd Department of Clinical Medicine, Changzhi Medical College, China

Objective: To investigate the reliability of the trunk mounted device on assessing the sitting balance in healthy adults, and explore the posibility of that device using in subjects with sitting problem. *Method:* sessor B) were employed to evaluate the participants' balance based on the device which was mounted on the surface of 7th thoracic vetebrae between scapulas for testing the moving angles of trunk three dimentionally. The participants were required to tilt on left, right, and backward extremly, and tilted angles in the three directions were recorded in this device. The angles were measured three times on each direction for every participant at beginning and one week after. Intraclass correlation coefficient (ICC) was used to test the iner-rater and intra-rater reliabilities. *Results:* High repeated measure reliabilities were showed in the data at begining collected by assessor A and assesor B, 0.843 and 0.72 on left, 0.827 and 0.819 on right, 0.940 and 0.848 on back, respectively. High intra-rater reliabilities were revealed on right and back, ICC values were 0.864 and 0.848, and relative lower intra-rater reliability was presented on left with value at 0.653. High inter-rater reliabilities were illustrated, and the correlation values were 0.820 on left, 0.939 on right, and 0.889 on back. *Implications:* This trunk mounted device is reliable in measuring the changed tiled trunk angles in sitting balance evaluation, and testing the reliability in subjects with sitting balance problem is required.

OR18-307AB-08

EEG ANALYSES OF CHRONIC CENTRAL PAIN AFTER SPINAL CORD INJURY*

Xu Zhang, Lili Yan, Zhaohui Ren, Hong Dai
Capital Medical University, Beijing, China

Objective: To study the character of EEG signals of the patients suffering from chronic central pain (CCP) after Spinal Cord Injury (SCI), in order to acquire effective auxiliary diagnosis method. *Methods:* EEG signal of CCP after SCI were analysed through three methods by us: the analyses of singular value (SVD); wavelet transform; bispectrum transform. *Results:* (1) The mean value of SVD in every lead is different in the various pains: this is the biggest when voilent pain(spontaneous pain) occurs, and that is weeny while CCP does not occur. (2) In low frequency, the dithering of indolent pain curve is smooth, voilent pain curve's dithering is increased, numbing pain curve's dithering is the most exquisite one. (3) Through the bispectrum method to analyses the EEG signal, the 3-D pattern shows it's otherness: pattern cusp of the indolent pain is silences, it's peak is between 2,000–3,000; pattern cusp of the voilent pain is increased distinctly, its peak is between 4,000–5,000; pattern cusp of the numbing pain have several levels, most of them are concentrate in low value area, it's peak is about 1,000. *Implications:* Accounting the EEG signal in the different pain status, we can draw the conclusion that it existed a prominent difference among the different pains.

OR18-307AB-09

EPIDEMIOLOGY OF MUSCULOSKELETAL CONDITIONS IN INDIA

Ajay Gupta[1], Rajendra Sharma[1,2], Shiv Lal Yadav[3], J Mahanta[4], Kr Haldiya[5]

[1]VM Medical College & Safdarjang Hospital, New Delhi, [2]All India Institute of Physical Medicine & Rehabilitation, Mumbai, [3] All India Institute of Medical Sciences, New Delhi, [4] Regional Medicine Research Center, Dibrugarh, [5]Desert Medicine Research Center, Jodhpur, India

Objectives: To study the magnitude and impact assessment of select musculoskeletal disorders in adults (aged over 18 years) in the community with a focus on Osteoarthritis, Rheumatoid Arthritis and Spinal Disorders. *Methodology*: It was estimated that a sample size of 5,000 persons will enable estimation of the prevalence rate of Rheumatoid Arthritis of 0.55% in the range of 0.49% to 0.71%. This implies that about 5,000 individuals were covered from each type of area (urban, rural) at each of the three centres in the study. We used point prevalence of diagnosed MSDs using a Family Screening Schedule by home visits in the community and follow up at a tertiary level care centre. In cases which were assigned a diagnosis for musculoskeletal conditions, Assessment of Health Status, Functional Status, and Disability was carried out by the use of study instruments i.e. HAQ, WOMAC Index, OSWESTRY Disability Questionnaire. For the screening schedule sensitivity of 92.50% and specificity of 99.05% was established and the calculated Kappa for the investigated cases was observed agreement 0.9375, Chance agreement 0.656 and Kappa Co-efficient 0.817 during the field based reliability exercises. *Results:* Total of above 32,000 persons were screened in the Delhi, Dibrugarh and Jodhpur centres (these are three different cities in India with different demographics, geography, culture and economics). The prevalence of MSDs in the current study at 95% CI is tabulated as under and the results will be further analysed in the paper.

Center	Delhi	Dibrugarh	Jodhpur
Sample size	11015	10032	11036
MSD Prevalence	7.08 (6.6, 7.56)	11.52 (10.90, 12.14)	9.53 (8.98, 10.08)
Rheumatoid Arthritis	0.17 (0.10, 0.24)	0.19 (0.11, 0.27)	0.62 (0.47, 0.77)
Osteoarthritis	3.28 (2.97, 3.63)	5.81 (5.35, 6.27)	6.52 (6.40, 6.64)
Spinal Disorders	4.80 (4.40, 5.20)	5.76 (5.53, 5.59)	5.42 (5.00, 5.84)
Inflammatory Arthritis - Undifferentiated	0.05 (0.01, 0.09)	0	0
Soft Tissue Rhematism	0.85 (0.68, 1.02)	0.77 (0.73, 0.81)	0.14 (0.7,021)
Non specific body aches & pains	0.59 (0.45, 0.73)	1.61 (1.36, 1.86)	1.84 (1.59, 2.09)
Gout and other mono-articular inflammatory arthritis	0.13 (0.063, 0.197)	0.10 (0.04, 0.16)	0.027 (0.023, 0.030)

OR18-308-01

CHARACTERIZATION OF MOTOR LEARNING FOLLOWING TRAUMATIC BRAIN INJURY USING RAPID FINGER SEQUENCE MOVEMENT

Keren Cismariu[1], Sharon Shaklai[1]*, Carmit Gal[2], Maria Korman[3], Avi Karni[2,4], Ofer Keren4, Yaron Sacher[1]

[1]Loewenstein rehbilitation hospital, Sackler School of Medicine, Tel Aviv University, [2]Sagol Dept of Neurobiology, University of Haifa, [3]Dept of Occupational Therapy, University of Haifa, [4]Sheba Medical Center, Tel Hashomer, Israel

Objective: Traumatic brain injury (TBI) is a major health problem in modern societies. Understanding the principles of motor (procedural skill) learning is vital to our ability to devise theory bound practice methods to maximize motor skill gain during rehabilitation. Learning to perform rapid finger opposition movement sequences (FOS) has been well studied in healthy individuals, providing significant knowledge about the neural mechanism of motor learning. No such data exists in TBI patients. The aim of this research was to study the principles of motor learning in TBI patients using the FOS paradigm. *Methods:* Ten sub-acute TBI patients with moderate - severe injury were trained to perform a 5-element FOS. The sequence was practiced in a single session in the first week of the study and on a daily basis during the second week. Each structured practice session consisted of 100 task repetitions at a comfortable rate. Performance (speed and accuracy) was tested before, immediately after and 24 hrs after training. *Results:* 7/10 subjects showed early within session and delayed, overnight gains with no speed accuracy trade-off. Subsequent daily practice yielded further, though smaller, improvement in 6 patients. 7 showed preservation of acquired skill after a month. *Implications:* Majority of severe TBI patients can efficiently learn new motor skills. Gains in performance evolving both concurrently with practice and between sessions indicate procedural memory consolidation, reflecting phases previously described in healthy adults.

OR18-308-02

ASTROGLIAL CX43 HEMICHANNEL IS NECESSARY FOR ENVIRONMENTAL ENRICHMENT-MEDIATED LEARNING AND MEMORY IMPROVEMENT AFTER EXPERIMENTAL TRAUMATIC BRAIN INJURY IN RATS

Shan Jiang, Ling Li, Ya-Na Li, Hui-Hui Wang, Hong-Ping Xie

The First Affiliated Hospital, Chinese PLA General Hospital, China

Background: Environmental enrichment (EE) enhances learning and memory performance after traumatic brain injury (TBI). However, the mechanism remains unclear. Cx43 is a member of the connexin family and appears to be the most prevalent protein in astrocytes. Recent evidence indicates that hippocampal Cx43 hemichannel contributes to higher brain function, particularly for learning and memory. It suggests that Cx43 is likely to participate in the EE-mediated learning and memory improvement after TBI. *Objective*: To investigate the role of Cx43 hemichannel in the EE-mediated learning and memory recovery after TBI. *Methods:* Anesthetized adult male rats received either a cortical impact or sham injury and were then received EE or normal housing with 2 weeks of exposure. We microinfused into the rat hippocampus TAT-Cx43L2 (a peptide that selectively inhibits Cx43-hemichannel opening while maintaining synaptic transmission), Gap 27 (specific Cx43-hemichannel blocker) or Cx43-specific antisense oligonucleotides (Cx43-ASODN) (effective in knocking down Cx43 expression). Learning and memory capacity was assessed with Morris water maze at 1 day and 14 days post-injury. *Results:* 1) Learning and memory capacity significantly decreased after TBI. 2) Learning and memory capacity was enhanced in the TBI groups that received EE vs. standard housing. 3) TAT-Cx43L2, Gap27 or Cx43-ASODN can effectively suppress the EE-mediated learning and memory improvement. *Implication*: These data support that Cx43 hemichannel is necessary for EE-mediated learning and memory improvement after TBI. Thus, the present study is the first to demonstrate a physiological role of astroglial Cx43 hemichannels in neurobehavioral recovery after TBI, making these channels a novel target for the treatment of cognitive disorders after brain injury.

OR18-308-03

THE CONSTRUCTION OF COMPUTER-ASSISTED HIGHER-LEVEL BRAIN FUNCTION RECOVERY

Zhuoming Chen

The First Affiliated Hospital Of Jinan University, China

Objective: This study aims to construct computer-assisted equipments for the recovery of higher-level brain function. *Method:* The

present research is carried out to construct an effective computer-assisted higher-level brain function recovery machine by developing a series of computer-assisted equipments, including auditory functional detection and recovery, language functional detection and recovery, speaking functional detection and recovery, multisensory functional detection and recovery, cognitive functional detection and recovery, aged intelligence functional detection and recovery as well as psychological functional detection and recovery. *Results:* The research results suggested that the seven computer-assisted equipments were identical with the development regularity of individual cognition. *Implications:* The application of computer-assisted higher-level brain function recovery would play an important role in clinical, which helps to improve the curative effect of relative patients as well as achieve better recovery effects. National 863 Science and Technology Program (No.2007AA02Z482), Guangzhou Science and Technology Program, Major Livelihood and Technological Special (No.2012Y2-00023).

OR18-308-04

REHABILITATION OUTCOME TWO YEARS AFTER TRAUMATIC BRAIN INJURY

Marcela Lippert-Grüner[1,2,3], A M Tomanov[4]

[1]Medical Faculty, University of Cologne, [2]University of West Bohemia Plzen, Germany, [3]Charles University in Prague, The First Faculty of Medicine and General Teaching Hospital, Prague, [4]Rehabilitacni ustav Brandys nad Orlici, Czech Republic

Introduction: The aim of the study was to evaluate the outcome of patients with severe traumatic brain injury (STBI) after 12 and 24 months (Glasgow Coma Scale GCS 24 h). *Methods and Subjects*: A total of 51 patients underwent a multidisciplinary early rehabilitation treatment until they were discharged from hospital and local ambulatory care was deemed sufficient. The follow-up examination took place 12 and 24 months after the STBI. *Results:* Data revealed a high level of independence in activities of daily living (mean Barthel Index after one year 92.7 points, after two years 93.7 points). After one and two years, 74.5% and 80.4% of the patients, respectively, were completely independent of need for care. Nevertheless, more than half of the patients had sensorimotor, behavioural, speech, visual and/or auditory disturbances. Return to work rates improved between one and two years after trauma, as evidenced by the rate of patients being back to full time work at one year (n= 14, 28%) and two years (n=20, 40%) post-STBI. Return to work rates improved between one and two years after trauma, as evidenced by the rate of patients being back to full time work at one year (n= 14, 28%) and two years (n=20, 40%) post-STBI; although, none of these changes reached statistical significance. *Discussion:* In summary, there are still changes in both impairment and disability related areas between one and two years post-STBI, but the degree of improvement is variable depending on the area being considered. Clinicians should remain aware of the fact that modulation of impairment and disability appear to continue well beyond one year post-STBI which may impact on decisions regarding the provision and intensity of further rehabilitation efforts.

OR18-308-05

THEORY OF MIND (TOM) AND LINGUISTIC ABILITIES IN PATIENTS AFTER TRAUMATIC BRAIN INJURY

Yaron Sacher[1,2], Michal Biran[1,3], Noga Balaban[2], Ilil Dayan[1], Mali Gil[1]

[1]Loewenstein hospital, Israel, [2]Tel aviv University, [3]Haifa University, Israel

Objective: Theory of mind (ToM) is the cognitive ability to see the world through the eyes of another. It underlies efficient social interactions and is vital to the understanding of discourse. ToM impairment might be expressed in a speakers disability to understand that her addressee holds a perspective that is different from hers. Accordingly, it can be expected that ToM impairment will affect linguistic abilities that depend on the interlocutors need to monitor others knowledge regarding discourse information mentioned in the discourse. Restriction of participation in social activities and disturbances in ToM is a frequent consequence of traumatic brain injury (TBI). Therefore, the aim of this study was to assess the relationship between ToM abilities in TBI patients and their TOM related linguistic abilities. *Methods:* Nine TBI patients with normal syntactic and lexical abilities were included. A battery of tests assessing different aspects of ToM was administered, followed by tests of linguistics aspects related to ToM. Namely, the ability to appropriately use definiteness when introducing referents in discourse and the ability to appropriately use and choose between referring expressions according to discourse context. *Results*: Five patients had ToM impairment according to the aToMic battery. Four of these patients scored low on one or more of the linguistic tests, whereas only one of the patients with normal ToM scored low. *Implications*: The findings contribute to the understanding of the relation between linguistic and cognitive impairments in ToM and open a door to possible intervention to improve ToM abilities of TBI patients.

OR18-308-06

REHABILITATIVE OUTCOME OF TBI AND POLYTRAUMA

Marcela Lippert-Grüner[1,2,3]

[1]Medical Faculty, University of Cologne, [2]University of West Bohemia Plzen, Germany, [3]Charles University Prague, The First Faculty of Medicine, Czech Republic

Introduction: Brain injury, whether isolated or accompanied by polytrauma, is one of the most common forms of injury sustained in road accidents, accidents at work or during leisure time. About 70% of polytrauma patients have also sustained some form of brain injury. Immediate and systematic application of an adequate rehabilitation programme is the most important factor in the restitution of functions impaired by severe trauma. The aim of the study was to evaluate influence of additional presence of polytrauma for the independence in the activities of daily living, need of care and social outcome of patients with severe brain injury after inpatient rehabilitation. *Method and Subjects:* 62 survivors (age 34. 8, range 16–65 years, m:f= 4 :1) of severe brain injury (GCS <= 8 for at least 24 h) with or without polytrauma were investigated. The outcome after 6 and 12 months with essentially similar therapies, and draws a comparison between 38 patients with isolated severe brain injury and 24 patients with severe brain injury and additional polytrauma. *Results*: After six months the majority of both groups independent in ADL (Barthel-index >80 points, FIM-Score >110 points). There were also no significant differences between the groups in need of care. Clear differences could be found in the return to work. After six months, 22.9% of the patients with isolated severe brain injury were able to return to their jobs and only 15% of patients with additional polytrauma. After 12 months, this difference has disappeared. *Discussion:* These results suggest that - contrary to what is frequently asserted in the relevant literature - one year after the accident the presence of additional polytrauma no longer exerts any significant influence on the outcome of the severe-brain-injury patients discussed in this paper. If the patients survive the acute phase and are given continuous rehabilitative care from as early a period as the acute phase of the illness up to their professional reintegration, then their prospects are no worse than those of patients with an isolated form of severe brain damage. *Conclusion:* For the outcome of patients with polytrauma is an early continous rehabilitation crucial important.

OR18-308-08

REGIONAL REGISTRY FOR ACQUIRED BRAIN INJURY IN EMILIA ROMAGNA, ITALY

Paolo Boldrini
Azienda ULSS9 Treviso, Italy

Background: Severe Acquired Brain Injury (SABI) is among the most common disabling neurological disorders, and may have lifelong effects. To facilitate the management of the rehabilitation process of SABI patients through the network of services a comprehensive data source is needed. In this paper we report the development and the results of a regional population-web-based registry containing records for all the SABI patients receiving rehabilitation services in a regional dedicated network (GRACER Network) in Emilia Romagna, a 4-million inhabitant Region in Northern Italy. *Methods:* The registry has been developed from 2003 to 2005, and the systematic data collection started in 2006. Patients enrolled had a brain damage of traumatic and/or vascular and/or hypoxic-anoxic and/or infectious aetiology, leading to a coma (GCS>or=8) of at least 24 h. Demographic, clinical and use-of-services data are collected during the acute, post-acute rehabilitation and social reinsertion phase. *Results*: In the period 2006–10, 1701 patients admitted to the ICUs of the regional network have been enrolled in the registry. 69,8% were males; the mean age was 43.1 (SD 15.3). 49.8% of cases were traumatic; the median GCS score at onset was 5. The mean length of stay (LOS) in intensive/neurosurgical unit was 26.3 days (SD 36.5). DRS median scores on admission/disharge were 27 and 23, respectively. 54.4% of patients were discharged to a rehabilitation unit. As for the rehabilitation phase, in the same period 844 patients were enrolled; 68,5% were males; the mean age was 42.2, (SD 15.2); 52.1% were traumatic. The mean rehabilitation LOS was 97.4 days (SD 101.9). The median DRS scores on admission/discharge were 20 and 10, respectively. 70,2% of patients were discharged to home. 202 patients were followed up after discharge; mean age 43.6 (SD 15), 47.1% were traumatic; the median DRS score was 6. *Conclusions and implications for rehabilitation*: The GRACER registry is a useful support in monitoring clinical pathways and outcomes of patients, promoting uniformity in levels of care. It helps clinicians in managing patients, facilitating communication between the different centers of the GRACER network. It also provides health care administrators with a flow of data useful in improving rehabilitation services.

OR18-308-09

EFFICACY OF REHABILITATION ON ACALCULIA AFTER ACQUIRED BRAIN INJURY

Xin Zhang, Xiaoping Yun, Mingming Gao
Department of Rehabilitive Evaluation of China Rehabilitation Research Center, China

Objective: To compare the efficacy of different rehabilitation models on acalculia after acquired brain injury. *Methods:* 113 cases were randomly assigned to 3 groups: control group (n=37), computer-assisted training group (n=38) and face-to-face training group(n=38). The control group just received cognitive dysfunction evaluation. The training groups received cognitive rehabilitation training 5 days a week and 30 min a day which sustained for 6 weeks. And 33 patients were selected to prolong for 12 weeks. They were evaluated with Revised EC301 Calculation and Number Processing Battery in Chinese version (EC301-CR) at the beginning, the 6th week point and the12th week point respectively. *Results*: 6-week after treatment, The performance of both the computer-assisted training group and face-to-face training group significantly improved (p<0.001); It showed that computer-assisted group > face-to-face group > control group (p<0.001) both 6 weeks and 12 weeks latter. Significant negative correlation was found between age and performance of EC301-CR (p<0.05). *Conclusion:* The effect of computer-assisted training on acalculia is superior to face-to-face training; The first 6 weeks of training is the best period for rehabilitation; The younger the patient is, the better results are.

OR18-311A-01

ACUPUNCTURE WITH TONGUE THREE NEEDLES TREATMENT ON 52 CASES WITH SUPRANUCLEAR PARALYSIS AFTER STROKE

Xiaohua Tu
The Department of Rehabilitation, Third People's Hospital of Chongqing, China

Objective: To observe the curative effect and the swallowing effect of acupuncture with tongue three needles treatment to supranuclear paralysis cases. *Methods:* 110 cases were randomly divided into the acupuncture treatment group and the control group, each of them has 55 cases, respectively. The treatment group was treated with tongue three needles treatment, while the control group was treated with low frequency electrical stimulation; the two groups were treated with swallowing exercise in addition. The swallowing effect was assessed with Fujishima's swallowing evaluation, and the curative effect was assessed with Depression Tian drinking water test. *Results*: The effective rate of the acupuncture treatment group and the control group was 98.18% and 80.0%, respectively, there was statistical significant (p<0.05). The data of pre- treatment of thetwo groups was not statistical significant (p>0.05). The swallowing evaluation showed that, after-treatment, swallowing effect improved obviously in both groups, the acupuncture treatment group increased significantly, and the difference between the two groups was statistical significant (p<0.05). *Conclusion:* Acupuncture with tongue three needles treatment has significant effect in patients with supranuclear paralysis.

OR18-311A-02

REHABILITATION PROGRAMME FOCUSSED ON BALANCE AND STABILITY EXERCISES IMPROVES BALANCE AND STABILITY IN STROKE PATIENTS COMPARED TO REGULAR PROGRAMME IN A RESOURCE POOR SETTING

Threethambal Puckree*, Pooveshni Uthum
Faculty of Heal Sciences, Durban University of Technology and University of KwaZulu Natal, Durban,. South Africa

Objective: This study compared the effects of an outpatient community rehabilitation programme with one focussed on balance and stability training on stability and balance in stroke patients. *Methods:* Fifty stroke patients participated in a randomised controlled trial. The Postural Assessment Scale for Stroke patients (PASS) and the Berg Balance Scale (BBS) were administered to all fifty participants on the weeks prior to and after the twelve week intervention or control programmes. The raw data (PASS and BBS) was normalized by calculating percentage changes for each item for each participant and subjected to Mann-Whitney U tests (p were used to compare control with experimental means. PASS and BBS scores were correlated using Pearsons correlation coefficients. *Results*: For the PASS, for 12 items in 25 participants, a total of 50 improvements were noted in the control group compared to 182 in the experimental group. Normalized mean increases from pre to post-test increased significantly (p<0,05) in the experimental group compared to the control in all items except for sitting without support and rolling to unaffected side. For the BBS, for 14 items in 25 patients, a total of 51 improvements were noted in the control group compared to 225 in the experimental group. The Berg balance scale showed a similar significant increase except for the item sitting unsupported. PASS scores correlated with BBS scores (r=0, 84, p=0.000). *Implication*: Focussed outpatient based rehabilitation programmes are more effective in rehabilitation of stroke patients in resource poor settings.

OR18-311A-03

SOCIODEMOGRAPHIC AND NERVE CONDUCTION FINDINGS IN PATIENTS WITH SUSPECTED PRIMARY NEURAL LEPROSY

Maria Leonor Rengifo-Varona, Catalina Gomez-Guevara, Ivonne Escobar-Urrego, Jazmin Pinzon-Suarez

Clinica Universidad de La Sabana, Colombia, Colombia

Objective: To establish electrodiagnostic features in patients with suspected primary neural leprosy. *Methods:* All patients referred from a specific Colombian endemic leprosy area between September 2008 and May 2009 and submitted to Clinica Universidad de La Sabana complaining of sensitive symptoms underwent nerve-conduction study that included the four extremities. 37 patients were evaluated, 17 women and 20 men, between 25 and 79 years old (48 SD of ±13,55), living in a leprosy endemic area. Patients were mainly original from three eastern–central Colombian departments: Cundinamarca (26), Santander (3), Boyacá (3). Their occupational activities: housework 9/37, casual work 6/37, butcher-assistant 2, construction 3, and agriculture 2. In reference to the nerve conduction. *Results:* 97.02% found to have abnormal pattern, from these patients, 19% did not have neuropathy (significance level 0.013), 12 patients presented upper limbs compromise and 16 patients had all four extremities compromised. Also from the previous mentioned 97.02%, 19% of patients had axonal neuropathy, 69% demyelinating neuropathy, and 8% mixed neuropathy. From the 37 patients, 10 patients did not refer sensitive alteration, and 5 of them had polyneuropathy; and from the 26 patients with sensitive alteration, 23 had peripheral nervous system compromise. *Implication/impact of rehabilitation:* A correlation between nerve-conduction studies and sociodemographic characteristics of patients suspected to have neural. Hansen disease has had poor diffusion in Colombia, therefore it is important to correlate patients symptoms with these findings and biopsy, to have an accurate diagnosis.

OR18-311A-04

REHABILITATION INTERVENTIONS FOR UNILATERAL NEGLECT AFTER STROKE: A SYSTEMATIC REVIEW FROM 1997 TO 2012

Yonghong Yang[1,2], Raymond C.K Chung[1], Cecilia W.P Li-Tsang[1], Kenneth N. K Fong[1*]

[1]The Hong Kong Polytechnic University, [2]West China Hospital, China

Objective: To review the effectiveness of rehabilitation interventions for persons with unilateral neglect after stroke from 1997 to 2012. *Methods:* A systematic review included articles of randomized controlled trials about neglect strategies among stroke patients that addressed the BIT as primary outcomes in the interventions. *Results*: Twelve RCTs were identified according the inclusion and exclusion criteria. The qualities of the studies were good with mean PEDro score of 6.08±0.81. Different interventions have been studied in RCTs; Prism Adaptation (PA) appeared to be the most common, with 5 out of 12. The meta-analysis showed that for immediate effects of neglect interventions, the BIT conventional subtests has a statistically significant mean effect size of 0.76 (95% CI, 0.28–1.23; p=0.002) whereas the BIT Behavorial subtest showed no statistically significant mean effect size of 0.37 (95% CI, –0.19–0.91; p=0.17), and the BIT (Total) showed a modest statistically significant mean effect size of 0.55 (95% CI, 0.16–0.94; p=0.006). However, the meta-analysis showed that there was no statistically significant mean effect size on long-lasting effects for all BIT outcomes. *Implications on Rehabilitation*: Prism Adaptation (PA) appeared to be the most common and effective strategy among interventions on unilateral neglect and rTMS maybe is a promising approach for treatment of unilateral neglect. Rehabilitation interventions have positive immediate effects on unilateral neglect as measured by the BIT conventional subtest than that on the behavioural subtest. Effects of rehabilitation interventions are often transient and often cannot be generalized across time to daily functioning.

OR18-311A-05

CLOSED LOOP MYOELECTRICALLY CONTROLLED NEUROMUSCULAR ELECTRICAL STIMULATION COMBINED WITH A SPLINT IMPROVES UPPER EXTREMITY MOTOR FUNCTION AND MODULATES SPINAL AND CORTICAL INTERNEURONS AMONG PATIENTS WITH STROKE

Toshiyuki Fujiwara*, Kaoru Honaga, Michiyuki Kawakami, Atsuko Nishimoto, Kaoru Abe, Yohei Otaka, Tetsuya Tsuji, Akio Kimura, Meigen Liu

Keio University School of Medicine, Japan

Objective: Hybrid Assistive Neuromuscular Dynamic Stimulation (HANDS) therapy was developed as a new therapeutic approach to facilitate the use of the affected upper extremity in daily living and improve the motor function by combining closed loop myoelectrically controlled neuromuscular electrical stimulation (IVES) with a hand-wrist splint for patients with hemiparesis. We applied HANDS therapy to patients with moderate and severe hemiparesis and studied the functional recovery and physiological changes. *Methods:* Participants were 61 patients with chronic hemiparetic stroke (their mean time from onset was 28.4 months). Participants used IVES combined with a hand-wrist splint for 8 h a day for 3 weeks. We assessed Fugl-Meyer upper extremity motor score (FM), modified Ashworth scale (MAS) at baseline, post HANDS therapy and 3 months after the end of HANDS therapy (3-month follow-up). We assessed short intracortical inhibition (SICI) with transcranial magnetic stimulation and spinal reciprocal inhibition (RI) with conditioned –test H reflex paradigm. *Results*: HANDS therapy improved FM score and decreased MAS significantly. Three month follow-up assessment showed that these improvements were maintained for 3 months. HANDS therapy induced disinhibition of affected hemisphere SICI and modulation of RI in the paretic forearm. The improvement of FM was correlated with the change of affected SICI. The change of MAS was correlated with the change of affected RI at interstimulus interval of 100 ms. *Implications*: The effectiveness of HANDS therapy was confirmed with both clinical and electrophysiological studies. HANDS therapy induced functional recovery of the paretic upper extremity motor function based on cortical and spinal plastic changes.

OR18-311A-06

CORTICAL REORGANIZATION AFTER MOTOR IMAGERY TRAINING IN CHRONIC STROKE PATIENTS WITH SEVERE MOTOR IMPAIRMENT: A FMRI STUDY

Limin Sun[1], Yongshan Hu[1], Dazhi Yin[2], Mingxia Fan[2], Lili Zang[2]

[1]Department of Rehabilitation, Huashan Hospital, Fudan University, Shanghai, [2]State Key Laboratory of Medical Neurobiology, Fudan University, Shanghai, China

Objective: To measure the efficacy of motor imagery training (MIT) on chronic stroke patients and to find the possible cortical reorganization patterns in fMRI response. *Method*: Eighteen chronic stroke patients randomly assigned to the MIT group and CRT group. Patents of the two groups all received standard CRT. Nine subjects in the MIT group also received 30-minute MIT sessions, occurring 5 days/week for 4 weeks. The upper extremity of Fugl-Meyer Assessment (FM-UL) was blindly evaluated before and after the interventions. fMRI was also administered to assess cortical activation changes of the regions of

interest (ROIs) while the patients executed a passive fist clutch task. *Results:* After interventions, the changes of FM-UL scores in MIT group were dramatically greater than that in CRT group (p=0.004). We found two kinds of cortical reorganization patterns existed in MIT and CRT group. One is the persistent growth of activation in cSMC (contralateral sensorimotor cortex) for most patients and the other is the focusing of activation in cSMC with increasing of LI-SMC (Lateral Index of SMC) for a small portion of patients. For the former pattern,the relative change of activation in cSMC in MIT group was greater than that in CRT one, but the difference was not statistically significant. *Implications*: This study indicates that for the chronic stroke patients with severe upper-extremity impairment, a 4-week regimen of CRT plus MIT resulted in functional improvement of upper limbs. We describe how these interventions may elicit "plastic" changes, the possible cortical reorganization patterns in the brain.

OR18-311A-07

INTRODUCTION OF THE JAPANESE VERSION OF THE STROKE DRIVERS SCREENING ASSESSMENT

Takashi Kato[1,2], Megumi Shiino[1], Naofumi Kubota[1], Jun-Ichi Inobe[1], Syutaro Nakaaki[3], Masaru Mimura[3]

[1]Inobe Hospital, Japan, [2]Graduate School of Oita University of Nursing and Health Science, Japan, [3]Department of Neuropsychiatry, Keio University School of Medicine, Japan

Introduction: Driving is a major concern for patients who have experienced a stroke. Traditionally, a battery of tests have been considered more effective than a single test for the evaluation of driving ability, as driving involves diverse cognitive functions. The Stroke Drivers Screening Assessment (SDSA), developed by Nouri and Lincoln, is a specific battery of tests used to predict post-stroke driving ability and has been adapted for use in countries such as Norway and theUnited States. This preliminary study was conducted to assess the effectiveness of the Japanese version of the SDSA. *Methods:* Three male and 2 female post-stroke patients (mean age 66.4±9.7 years) participated in this study. They received an on-road evaluation in a dual controlled vehicle accompanied by an experienced driving instructor. Adjustments to the original SDSA included altering driving circumstances to be commensurate with Japanese driving situations and road signs. All participants were evaluated through the adjusted SDSA and comparisons were made between SDSA results and on-road driving abilities. *Results*: According to the SDSA results, 4 participants were classified as fit to drive and 1 participant was classified as unfit. These SDSA classifications predicted driving ability with 100% accuracy, as confirmed by on-road assessments. *Discussion*: The meta-analysis conducted by Devos et al (2011, Neurology) revealed the effectiveness of the SDSA in predicting driving ability in patients post stroke. Further studies with increased numbers of the patients will be required to establish the effectiveness of the Japanese version.

OR18-311A-08

GAIT BIOMECHANICS: AN APPROPRIATE TARGET FOR POST-STROKE REHABILITATION?

Olga Dobrushina*, Pavel Snopkov, Irina Sidyakina, Tatyana Shapovalenko, Konstantin Lyadov

Medical and Rehabilitation Center, Russia

Objective: To determine the role of gait biomechanics in post-stroke mobility. *Method*: We evaluated 18 patients with post-stroke hemiparesis (16 male, 2 female aged 57.5±13.6 years) that were able to walk without assistance. Examination was performed for muscle strength (6-grade scale, mean 4.0±1.5), spasticity (Modified Ashworth Scale, mean 1.1±1.3) and Rivermead Mobility Index (mean 12±3). We evaluated gait biomechanics by TRUST-M system with five sensors (sacrum, both hips, both chins) providing information on angles and accelerations. *Results*: Coxofemoral joint and/or knee goniogram deformation was observed at the paretic side in 17 patients and at the intact side in 8 patients. The most common were the following abnormalities: walk cycle asymmetry caused by a decrease in paretic leg stance – 10 patients, a decrease in paretic knee range of motions (PNR) – 11 patients (mean 36.1±16.7°), a decrease in intact knee range of motions (INR) – 5 patients (mean 51.8±10.9°). These values correlated with muscle strength and Modified Ashworth Scale, but, apart from PNR (r=0.73, p=0.001), the correlation was weak or very weak. Biomechanical abnormalities were found to be significant predictors of a decrease in Rivermead Mobility Index below 14 with optimal cut-off for PNR at 42° (sensitivity 91%, specificity 92%, AUC=0.95), for INR – at 56° (sensitivity 80%, specificity 73%, AUC=0.75), for the beginning of the second double support – at 48% (sensitivity 80%, specificity 61.5%, AUC=0.75). *Implications*: Biomechanical gait abnormalities are a rather autonomous cause of post-stroke immobility and thus pose a feasible target for rehabilitation.

OR18-311A-09

THE FACE OF LEPROSY REHABILITATION TODAY: A DESCRIPTIVE STUDY OF NEW LEPROSY CASES CONSULTED TO PHYSICAL AND REHABILITATION MEDICINE DEPARTMENT IN DR. SOETOMO GENERAL HOSPITAL, SURABAYA, INDONESIA

Husnul Mubarak[1,2], Patricia Maria[1,2], Hening Laswati[1,2]*

[1]Physical and Rehabilitation Medicine Dr. Soetomo General Hospital, Surabaya, [2]School of Medicine Airlangga University, Indonesia

Objective: Impairments arising from leprosy along with its stigmatizing effect able to destruct patients' quality of life. Therefore, rehabilitation has inevitably become part of comprehensive management of leprosy. We aimed to examine most recent new cases of leprosy being consulted to P&RM Department Dr. Soetomo General Hospital Surabaya and to identify the characteristics of patients related to age, sex, occupation, types of leprosy, impairments, and P&RM approaches. *Method*: A descriptive study was performed. We reviewed new leprosy patients' databases whom being consulted to P&RM Installation Dr.Soetomo General Hospital during period of January 1st, 2010 to January 31st, 2013. *Results*: During the period, 45 new leprosy cases were registered. The mean age is 36.7±16,6 years old. Most patients (22%) are 21–30 years old. Men are more affected than woman with ratio 2.2:1. Dominant occupation is student (15%) and the rest are categorized as low income jobs. Most cases (40%) are BB type leprosy. BL type has the most impairments with mean 10.3±3.7 impairments. Ulnar nerve lesion was mostly suffered by the patients (73%). Strengthening exercises is P&MR approach that is mostly (60%) used to overcome disability. *Implications on Rehabilitation*: These data have provided us a picture of most recent characteristics of leprosy patients in endemic country like Indonesia. The fact that men in productive ages are mostly affected escalates the importance of rehabilitation. Comprehensive leprosy rehabilitation program is expected to reduce impairments, disabilities, and eventually to improve patients' quality of life.

OR18-311B-01

THE PREVALENCE OF LANGUAGE IMPAIRMENT, AND THE CORRELATION BETWEEN LANGUAGE AND INTELLIGENCE DEVELOPMENT IN KINDERGARTEN-AGE CHILDREN WITH DEVELOPMENTAL DELAY

Su-Fen Liao[1], Jui-Ching Liu[2], Chun-Ling Hsu[3], Ming-Yuh Chang[4], Tung-Ming Chang[4], Helen Cheng[3,5]

[1]Department of Physical Medicine and Rehabilitation, Changhua Christian Hospital, [2]Division of Speech-Language Pathology, Department of Physical Medicine and Rehabilitation, [3]Child Development Center, [4]Division of pediatric neurology, Department

of Pediatrics, [5]Department of Psychiatry, Changhua Christian Hospital, Chinese Taipei

Objective: This study was designed to assess the prevalence of Developmental language disorder (DLD) and Specific language impairment (SLI), and the correlation between language and intelligence development in kindergarten-age children with Developmental delay (DD). *Method*: We performed a retrospective review of kindergarten-age children with DD who were referred for cognitive and language evaluation between September 2011 and May 2012. *Results*: Sixty-five children (45 males and 20 females) who completed the WPPSI-R and Revised Preschool or Primary School Language Assessment participated in this study. The male-to-female ratio was 2.25 to 1, and the mean age was 5 years 10 months (SD 4 months); PIQ was 94.8 (SD 13.5), VIQ was 83 (SD 12.3), and FSIQ was 87.4 (SD 11.9). Twenty-three (35%) children had normal language development, 13 (20%) had below average language development, and 29 (45%) had DLD. PIQ was significantly better than VIQ in all children ($p<0.001$), and there was no difference within the 3-language groups. The PIQ ($p=0.007$) and VIQ ($p=0.002$) of children with DLD and SLI were significantly lower than children with normal language development. *Implications/impact on rehabilitation*: The children with DLD and SLI were associated with a delay in mental ability. The discrepancy in PIQ and VIQ between children with DLD or SLI and children with normal language development did not differ.

OR18-311B-03

COMPARISON BETWEEN HEAD-BODY TILT 45 DEGREES ELEVATION AND MASSAGE THERAPY ON OXYGEN SATURATION AND HEART RATE IN PREMATURE INFANT

Rima Natasha Hartanto, Amendi Nasution*, Rini Sekartini, Arya Kekalih
Medical Rehabilitation Department Cipto Mangunkusumo Hospital, Indonesia

Background: Premature definition from World Health Organization is a baby born before gestational age 37 weeks. Prematurity results in high mortality incidence and longer stay in hospital. Nowadays, intensive care in neonatology is to provide physiological needs of premature baby, especially the impact of environment in intensive care to physiological parameters. To achieve optimal physiological growth and developmental, it is necessary to give physical therapy and medical therapy altogether. *Objective*: This study is to compare effects of positioning and massage therapy. *Methods:* The study is performed in Perinatology inpatient ward at RSCM Jakarta. Study design is randomized clinical trial. Subjects are premature baby in Perinatology ward during September 2010–April 2011 that already fulfilled inclusion and exclusion criteria. *Results*: Mean pulse rate in control group day one-day five intervention is (159–159) beat per minute, massage group is (158–152) beat per minute, and elevation group is (165–148) beat per minute. Mean oxygen saturation is (93–92)% in control group, massage group (94–98)%, and elevation group is (93–96)%. *Implication/Impact on Rehabilitation*: Pulse rate significantly decreased in elevation group, compared with massage and control group; oxygen saturation increase significantly in massage and elevation group.

OR18-311B-04

RELIABILITY AND VALIDITY STUDY OF THE CHINESE VERSION OF ALBERTA INFANT MOTOR SCALE IN HIGH RISK INFANTS IN CHINA

Cui Wang, Wei Wang, Yucheng Xi, Zhuo Li, Zhen Huang
Peking Univrsity First Hospital, Beijing, China

Objective: To examine the intrarater and interrater reliability of the Chinese version of Alberta Infant Motor Scale (AIMS-CN) and the concurrent validity with Peabody Developmental Gross Motor Scale (PDGMS) when it was used in high risk infants in China. *Methods:* Forty-four high risk infants were admitted to the reliability study. In the interrater reliability study, an investigator administered the AIMS-CN to the infants and videotaped their performance, then two other investigators scored the performance in the videos independently. The scores from three of them were used to examine interrater reliability. At least one month later, two investigators rescored the performance with the videos again to examine the intrarater reliability. Fifty-six high risk infants were admitted to the validity study. Two investigators used the AIMS-CN and the Peabody Developmental Gross Motor Scale (PDGMS) to exam a infant within one week, the raw scores from the two scales were used to examine the concurrent validity. Intraclass correlation coefficient (ICC) was calculated to examine the reliability and Pearson's correlation coefficient was calculated to examine the concurrent validity. *Results*: In the interraterreliability study, total ICC was 0.994, any two of the investigators ICCs were 0.986-0.995.In the intrarater reliability study, total ICCs were 0.993-0.999. In the concurrent validity study, the Pearson's correlation coefficient between the two scales' raw scores was 0.965, $p<0.01$. *Conclusion:* The results suggest that AIMS-CN is a very reliable and efficient instrument to evaluate the gross motor development of the high risk infants.

OR18-311B-05

HIP SUBLUXATION/DISLOCATION IN PATIENTS WITH CEREBRAL PALSY – DOES STANDING HELP?

Ohnmar Htwe[1]*, Fadzilah Ismail[2], Leonard Joseph[3], Amaramalar Selvi Naicker[1]
[1]Department of Orthopaedic and Traumatology, Universiti Kebangsaan Malaysia Medical Centre, Kuala Lumpur, [2]Hospital Sultanah Bahiyah, Alor Star, Kedah, [3]Physiotherapy Program, School of Rehabilitation Sciences, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

Hip subluxation/dislocation is common in children with cerebral palsy (CP) and is directly related to Gross Motor Function Classification System (GMFCS). *Objective*: To investigate the association between GMFCS level, h of passive standing and hip Subluxation/dislocation. *Method*: It was a cross sectional study done at a tertiary centre in Malaysia. Information such as demographic data, mode of standing, duration of standing (h/day), compliance to physiotherapy session were collected with the proforma. Hip migration percentage (MP) was measured with radiograph of the pelvis. *Results:* Total of 54 CP patients were included in this study. Male gender with spastic quadriplegic type constituted the highest number. The subjects were between 2–12 years. Most of the patients' GMFS were 3-5. There was statistically significant association between GMFCS level and severity of MP ($p=0.001$). A positive correlation was noted between GMFCS levels and degree of Acetabular Index (AI) ($p=0.018$). Those who maintained a therapeutic standing of more than 3 h a day were shown to have a lesser MP ($p=0.001$). *Implications/Impact on Rehabilitation*: Standing delayed the hip subluxation by maintaining a lowered MP and improved AI in patients with cerebral palsy. Parents should be advised to stand their children for a minimum of 3 h/day.

OR18-311B-06

TRUNK STABILITY CONTROL ASSESSMENT IN CHILDREN WITH SPASTIC CEREBRAL PALSY

Jianxian Wu
The Second Hospital of Anhui Medical University, China

Objective: To study the trunk stability control,visual compensatory, the anterior-posterior (AP) and medial-lateral symmetry in spastic

cerebral palsy patients. *Method:* Trunk stability and symmetry parameters of 20 spastic cerebral palsy patients and 20 health control subjects were assessed by PK 254P rehabilitation system in standard silent sitting for 30s in eyes open and eyes closed. The variables of AP standard deviation of center of pressure (COP), medial-lateral (ML) standard deviation of COP, average AP speed of COP, average ML speed of COP, perimeter of COP, and ellipse area of COP were used in determining the trunk stability. Also the average position of COP in X axis and Y axis represented the symmetry of weight distribution. *Results*: In both eyes open and eyes closed spastic cerebral palsy patients' postural sways AP standard deviation of center of pressure (COP), medial-lateral (ML) standard deviation of COP, average AP speed of COP, average ML speed of COP, perimeter of COP, and elipse area of COP) were lager than health subjects ($p<0.05$).Also the difference in eyes open and eyes closed of the trunk stability control parameters was bigger than control subjects ($p<0.05$).The offset of medial-lateral in spastic cerebral palsy patients is nearly symmetrical (average position of COP in X axis close to zero), but the offset of anterior-posterior tend to the anterior (average position of COP in Y axis significantly greater than zero). The offset of medial-lateral and anterior-posterior in health subjects are nearly symmetrical (average position of COP in X axis and Y axis close to zero). *Conclusion:* The spastic cerebral palsy patients' trunk stability control are worse than health subjects. The role of visual compensatory in trunk control stability are bigger than control subjects. The offset of medial-lateral is nearly symmetrical, but the offset of AP tend to the anterior.

OR18-311B-07

GROUP SAND PLAY FOR CEREBRAL PALSY CHILDREN WITH BEHAVIORAL PROBLEMS

Wenyu Yu, Tao Wang, Bang-Hui LI, Nong Xiao
Department of Rehabilitation, Children's Hospital of Chongqing University of Medical Science, China

Objective: To explore the effects of group sand play on the behavior of cerebral palsy (CP) children with behavioral problems. *Methods:* Ninety children with CP aged 3-5 with behavioral problems were selected, after those with mental retardation had been excluded through the Peabodypicture vocabulary test (PPVL). Their behavioral problems were diagnosed using Achenbach's child behavior check list (CBCL). The children were randomly divided into an experimental group and a control group with 45 cases in each. The experimental group received 10 weeks of sand play treatment in addition to routine rehabilitation. The controls received only routine rehabilitation. *Results*: After treatment, the social withdrawal, depression, aggression and disruptive behavior scores of the 3-years olds in the experimental group were significantly lower than before treatment and significantly lower than those of the controls. For the 4 and 5 year-old boys the results were similar in terms of social withdrawal, depression, immaturity, sexual behavior, aggression and delinquent behavior. For the 4- and 5-year-old girls the scores for depression, somatic complaints, social withdrawal, compulsion, aggression, and hyperactivity showed similar significant improvements. *Conclusion:* Group sand play can improve the behavior and promote the mental health of CP children.

OR18-311B-08

LOWER EXTREMITY KINEMATICS OF CROUCH GAIT IN CEREBRAL PALSY: A PILOT STUDY

Yi Zhu, Tong Wang, Sheng Wang, Dianhuai Meng
The First Affiliated Hospital with Nanjng Medical University, China

Objective: Crouch gait is a severe pathological gait pattern in cerebral palsy children. We aimed to investigate the kinematics in sagittal and coronal plane of crouch gait. *Method*: Seven cases of cerebral palsy with crouch gait pattern participated in this study. The age was 10.7±7.5 years, height was 132.1±27.4 cm and weight was 35±18.1 kg. An optoelectronic motion capture system was used to track the movements of body segments. The lower limb kinematics and the temporal and spatial parameters were calculated according to Helen Hays gait model. *Results*: As for the temporal and spatial parameters, the stride length was 57.3±29.4 cm, the cadence was 94.1±31.2 step/min, the velocity was 48.4±28.5 cm/s and the stance phase was 69.7±11.2%. As for the kinematics, during mid-stance, the mean hip adduction was 2.4±7.6 degree, mean hip flexion was 18.7±10.0 degree, mean knee flexion was 29.3±9.4 degree, mean knee valgus was 6.4±17.0 degree, mean ankle dorsiflexion was 19.4±5.5 degree and mean foot pronation was 1.8±3.5 degree. During early swing, mean hip abduction was 2.4±7.6 degree, mean hip flexion was 48.6±7.4 degree, mean knee flexion was 64.6±9.1 degree, mean ankle dorsiflexion was 3.2 ±7.7 degree and mean foot pronation was 0.2±2.4 degree. *Implications*: The increased hip and knee flexion with excessive ankle dorsiflexion was found in crouch gait. Further studies are needed to prove the decreased hip adduction during mid-stance, decreased hip abduction during early swing and increased knee valgus during mid-stance.

OR18-311B-09

PREVALENCE OF INTELECTUAL DISABILITY WITH OBESITY AMONG STUDENTS OF SPECIAL SCHOOL FOR DISABLED C AND CI IN JAKARTA

Tirza Ediva Tamin, Ferial Hadipoetro Idris*, Muchtaruddin Mansyur, Damayanti Rusli Syarif
Cipto Mangunkusumo Hospital, Indonesia

Objective: Intellectual disability (ID) individuals with obesity have double problems, ID which will limit their daily life and obesity with its complications. Therefore prevalence data are needed to make management plan to cope with obese ID individuals. The prevalence of ID with obesity in foreign countries range between 16–29%. In Indonesia, the prevalence of ID with obesity was 5.2% in Bali and 3.4% in young adults of the Indonesian Special Olympics athletes in Bandung. Since the prevalence data in Jakarta is not available, the researcher was encouraged to do a research to know the prevalence of obesity in Special School for disabled C/C1 in Jakarta. *Method*: This research is a cross-sectional study. Subjects were the students of Special School for disabled C/C1 in Jakarta between 10–30 years old. The criteria of obesity for the age of 10–20 years old is using BMI $\geq 95^{th}$ percentile for the respective age and sex. The criteria of obesity for the age of 21–30 years old is using the BMI>25.0 according to WHO for Asia Pacific. *Results*: Based on the classification, Special School for disabled C1 is 50.30%, and the Special School for disabled C is 49.70%. *Implications/impact on rehabilitation*: The prevalence of ID with obesity among students of Special School for disabled C and C1 in Jakarta is 282 people or 16% of the total 1.760 subjects.

OR19-301AB-01

A PILOT STUDY: DOES SYMPTOMS OF HYPERVENTILATION IN SEVERE ASTHMA PATIENTS RELATED TO DIFFERENCES IN BREATHING PATTERN?

Wai Leung Ambrose Lo
Faculty of Health Sciences, University of Southampton, Southampton, United Kingdom

Objective: To investigate if symptoms of hyperventilation (SH) in severe asthma (SA) patients are related to differences in breathing pattern parameters (BPP). *Method:* Five SA patients with SH and five SA patients without SH were recruited. SH was diagnosed by Nijmegen questionnaire. BPP were monitored over a 30 min period of rest by respiratory inductive plethysmography. The recorded BPP were: 1. Tidal volume (Vt); 2. Variability in tidal volume (VVt); 3. Expiration time (Te); 4. End-tidal carbon dioxide levels ($ETCO_2$); 5.

Respiratory rate and 6. Sigh rate. VVt was assessed by coefficient of variation (CV). $ETCO_2$ was monitored by capnography. Relationship between BPP and SH were assessed by correlation analysis. Differences in BPP between groups were assessed by Mann-Whitney U test. *Results*: Strong positive correlation between SH and sigh rate (r=0.8, $p>0.05$) and between SH and VVt (r=0.7, $p>0.05$) were observed in patients with SH but not in SA patients without SH. Mann-Whitney U test revealed no statistical significant difference in all BPP between the two groups. *Conclusion:* Sigh rate and VVt were strongly associated with SH in SA patients. These findings suggest that sigh breaths and VVt may play a role in symptoms of hyperventilation experienced in SA patients. Breathing interventions that aim to reduce sigh rate and VVt may help SA patients to control symptoms of SH. Further research is required to substantiate the findings of this study.

OR19-301AB-02

WHOLE BODY MUSCULOSKELETAL 3D/4D MEASUREMENT METHODS, STATUS OF RESEARCH & DEVELOPMENT

Helmut Diers
DIERS International GmbHA, Germany

The monitoring of the whole musculoskeletal system and axis from cervical spine to feet, under static and dynamic conditions, is the requirement of clinical user and a challenge for engineering and R&D. The aim of the development was to find a solution for this demand. The analysis of the whole human body requires specific measurement technologies related to three different regions of the body: 1. 3D/4D spine and posture analysis covers the trunk from cervical spine to pelvis. 2. Video-Gait analysis measures the legs and leg axis in standing and walking. 3. Foot-Pressure analysis is monitoring the foot positions and pressure distribution. All 3 measurement methods are integrated and synchronized the first time into one system solution. Both methods of static and dynamic measurement of the whole skeletal system of the body are now possible. Thereby the dynamic 4D analysis of the spine has a leading function. The measurements of the trunk show all movements of the body, spine and pelvis as well as deviations and rotations. The monitoring of leg axis is the bridge between the pelvis and the feet. The foot pressure measurement presents the rolling motion and the positions of the feet und document the intensity of pressure. The possibility of dynamic whole body measurement and objective documentation of the skeletal system will generate new options for clinical use like: Monitoring of real body movements, motion deficits and asymmetries. Creation of new adapted therapy concepts, based on objective measurements Pre & Post operative analysis, Follow ups etc. The total system solution needs space of about 8 m^2 and the examination time per patient is, depending on the type of investigation, approx. 15–30 min. Compared with other existing devices, like a standard gait lab, the compact solution of the "DIERS 4D motion Lab" enables the user for the first time to integrate the system directly into the workflow of a clinical environment.

OR19-301AB-03

COMBINED THERAPEUTIC APPLICATION OF BOTULINUM TOXIN TYPE A AND LOW FREQUENCY RTMS FOR POST-STROKE SPASTIC UPPER LIMB HEMIPARESIS

Hong Wang, Hua Yuan, Wei Liu
The fourth military medicine university, China

Aim: To detect the curative effect and safety of combined therapeutic application of botulinum toxin type A (BTX-A) and low frequency rTMS for post-stroke spastic upper limb hemiparesis. *Methods:* The study subjects were 60 post-stroke patients with spastic upper limb hemiparesis, who were admitted to Xijing Hospital from 2010.07 to 2012.9. The patients were divided into three groups randomly: the routine rehabilitation group, BTX-A group, BTX-A+rTMS group (n=20). In the routine rehabilitation group, patients were given routine rehabilitation. In the BTX-A group, BTX-A was injected into spastic muscles of the affected upper limb. In the BTX-A+rTMS group, 4 weeks after BTX-A injection, the patients received 20min LF-rTMS daily over 1 month. The severity of spasticity was measured with modified Ashworth Scale (MAS), and motor function of the affected upper limb was evaluated mainly using Fugl-Meyer Assessment (FMA) and modified Barthel Index (MBI) before treatment, at 4 weeks, 8 weeks and 12 weeks post-treatment. *Results*: All patients completed the protocol without any adverse effects. The MAS score of all examined muscles decreased significantly at 4weeks post-treatment. At 8 weeks, the MAS score decreased futher both in the BTX-A group and BTX-A+rTMS group. However, at 8 weeks, the MAS score increased in the BTX-A group, while no change in the BTX-A+rTMS group. The FMA score and MBI score improved significantly for BTX-A group and BTX-A+rTMS group at 4 weeks and 8 weeks post-treatment. At 12 weeks, The FMA score and MBI score were keeping increase in the BTX-A+rTMS group, while no change in the BTX-A group. *Implications:* The protocol has approving long-term curative effect for post-stroke spastic upper limb hemiparesis.

OR19-301AB-04

DRY NEEDLE IN CHRONIC UPPER BACK PAIN OF LAO PATIENTS

Bouathep Phoumindr
University of Health Sciences, Laos

Objectives: To compare benefits of treatment between Medication and Dry Needle Technique in Chronic Upper Back pain. *Methodology*: Four hundred chronic upper back pains aged 30- 50 with same criteria and diagnosis in Chronic Myofascial Pain Syndrome. They were registered from January to December 2007 at Sethathirath Hospital. Two hundred male and 200 female were selected. Half of each gender was farmer and officer. They were separated into group A and B equally in gender and profession. Group A was handled by NSAIDs 7.5 mg once a day and muscle relaxants 500 mg three times a day. Dry Needle Technique was used in group B. The treatment session was performed completely for 7 days. The follow up and reevaluation were done once daily. *Results*: The average age of male and female was 41 years old. They were high school 67% and primary 33%. Group A obtained pain relief on second day 52%, third day 37%, the rest on fourth day with dizziness and fatigue 89% and 67%. Group B pain released immediately 68% after first Dry Needle and the rest on second day without any side effects. No significant different between farmers and officers in two groups. Pain location was higher in female. *Implications/ Impact on Rehabilitation*: Dry Needle Technique was an excellent method of treatment in Chronic Upper Back pain which cured pain dramatically and immediately without side effects, pay less and safe for social economic of pain patients.

OR19-301AB-05

CAN FUNCTIONAL ELECTRICAL STIMULATION IMPROVE THE NESTIN EXPRESSION AROUND THE INFRACTED AREA OF ACUTE CEREBRAL RATS AND ITS NEURAL FUNCTION RECOVERY?

Xiuyuan Zheng, Sheng-Huo Li, Tie-Bin Yan, Hui-Hua Liu
Department of Rehabilitation Medicine, Sun Yat-sen Memorial Hospital of Sun Yat-sen University, China

Objective: To investigate the effectiveness of functional electrical stimulation (FES) on nestin expression around the cerebral infracted area of rats and its neural functionrecovery. *Methods:* The Model of middle cerebral artery occlusion (MCAO) of male adult SD rats was established with the method of intraluminal filament occlusion. Sixty

rats of successfully established model were randomly allocated into one of the following groups, FES, placebo and control one with 20 in each group. They were further assigned into 4 subgroups according to teatment duration: 1 day, 3d ays,7 days and 14 days (5/subgroup). Three days after the MCAO's surgery, rats in FES group were treated with FES while those in placebo group with the same device but without electrical input.Rats in control group had no treatment. The mNSS was adopted to evaluate functional recovery after different treatment duration. Meanwhile, the nestin expression at four diffrent treatment duration was detected by immunohistochemistry stain in distant area of ipsilateral cortex of infarction. *Results*: The mNSS scors in FES group is lower than placebo and control group after7 and 14 day treatment duration ($p<0.05$); the expression of nestin-positive cells in distant area of ipsilateralcortex of infarction in FES group is higher than placebo and control group after 3, 7 and 14day duration ($p<0.05$). *Conclusions:* The FES improves neural function recovery after 7 day and 14 day treatment; it increases the nestin expression,which illustrates that FES promote situ-proliferation of the nestion positive cells and reorganize the brain function. This study was supported by The National Natural Science Foundation of China, no.81171863.

OR19-301AB-06

FUNCTIONAL ELECTRICAL STIMULATION ENHANCES NEUROLOGIC FUNCTION BY PROMOTING NEURAL STEM CELL PROLIFERATION IN RATS WITH CEREBRAL INFARCTION

Yun Xiang, Wei Wang, Wanzhang Yang, Zhicheng He
Department of Rehabilitation Medicine, Nanshan Affiliated Hospital of Guangdong Medical College, Shenzhen, China

Objective: To investigate the effects of functional electrical stimulation (FES) on neurologic function and proliferation of neural stem cells (NSC) in the ischemic subventricular zone (SVZ) of rats with acute cerebral infarction, and to explore possible mechanism. *Method*: Acute cerebral infarction was made by means of middle cerebral artery occlusion (MCAO). Rats were randomly allocated into FES group, placebo stimulation group and sham-operation group. FEStreatment was carried out 2 days after operation. The modified neurological severity score (mNSS) was adopted to evaluate neurologic function. Bromodeoxyuridine (BrdU), BrdU /nestin and BrdU/glial fibrillary acid protein (GFAP) positive cells in the ischemic SVZ were detected by immunofluorescence techniques. *Results*: The mNSS score in FESgroup was lower than that in placebo stimulation group and sham-operation group ($p<0.05$). Compared with other two groups, the expression levels of BrdU+ cells in the ischemic SVZ in the FES group were significantly higher ($p<0.05$). The ratio of BrdU-Nestin double-positive cells among BrdU-positive cells was not significantly different among three groups ($p>0.05$). *Implications*: FEStreatment can improve the recovery of neurologic function of rats. One of the important mechanisms was through promoting NSC proliferation in ischemic SVZ.

OR19-301AB-07

THE EFFECT OF TRANSCRANIAL DIRECT CURRENT STIMULATION ON MOTOR ACTIVATION IN CHRONIC STROKE: AN FMRI STUDY

Lydia Abdul Latif[1], Azhari Nordin[1], Nor Atikah Mustapha[1], Tze Yang Chung[1], Anwar Suhaimi[1], Li Kuo Tan[2], Norlisah Ramli[3]
[1]Dept of Rehabilitation Medicine, Faculty of Medicine, University of Malaya, [2]Dept of Biomedical Engineering, Faculty of Medicine, University of Malaya, [3]Dept of Biomedical imaging, Faculty of Medicine,University of Malaya, Malaysia

Background: Non invasive brain stimulation has been shown to be effective in inducing cortical changes both excitatory and inhibitory depending on the current flow. This has been shown in behavior effect such as upper limb function and very limited imaging study using functional MRI (fMRI). *Objective*: to assess whether tDCS using anodal stimulation over lesion hemisphere combine with intensive constraint-induced movement therapy (CIMT) will induced changes to blood-oxygen level dependent (BOLD) signal using fMRI in chronic stroke. *Methods:* This is an exploratory study involving ten patients with chronic stroke entered a double-blind sham-controlled study. Patients received 5 days of either anodal or sham stimulation combined with intensive CIMT. fMRI was done before and after intervention and patient performed grasp released hand movement during imaging. Behavior effects were also measured using Fugl-Meyer Assessment score and hand grip stregth. *Results*: Changes were noted in the fMRI using bold in the group that received tDCS compare to sham tDCS before and after intervention. The changes were noted in the activation area of the anodal stimulation. Patient also demonstrated gains in behavioral effects. *Conclusions:* These findings demonstrate that anodal stimulation has potential for cortical modulation as shown by activation of bold fMRI.

OR19-301AB-08

EFFECTIVENESS OF NAVIGATED TRANSCRANIAL MAGNETIC STIMULATION FOR REHABILITATION MOVEMENT IMPAIRMENTS AFTER STROKE

Tatyana Baydova*, Daniil Degterev, Irina Sidyakina, Tatyana Shapovalenko, Konstantin Lyadov
Medical and Rehabilitation Center, Russia

Navigation transcranial magnetic stimulation (TMS) of the brain in stroke patients affects the cortical motor area of the limbs. Therapeutic effect of TMS is achieved by activation of motor neurons affected hemisphere and inhibition of motor neurons of the unaffected hemisphere. *Methods:* The study included 33 patients (24 men, 9 women). Patients have been divided into main and control groups. Control group was included in 14 patients who received basic treatment. 19 patients of the main group were received a course of rhythmic navigation TMS of the brain except basic treatment. Depth of hemiparesis in the main group was 2.4±1.1, in the control group 2.8±1.4. NIHSS score in the main group was 19.1± 6.7, in the control 17.7±5.3. The Barthel index in the main group was 15.0±5, in the control group 20±5. All of the patients have had mapping of motor cortical areas by navigation TMS. *Results*: All patients have undergone treatment satisfactorily. Strength of muscle in main group increased to 3.4±1.5, in the control group to 3.0±0.9, stroke severity by NIHSS score in main group decreased to 14.6±3.7, in the control group 15.2±5.3 points, Barthel's Index of activities of daily living in main group increased to 40 ± 10 points, in the control group to 35±5 points. *Conclusions:* Rhythmic navigation TMS accelerates recovery of locomotor activity patients after stroke.

OR19-301AB-09

THE EFFECTS OF INFRASOUND ON THE GROWTH OF BONE MARROWS STEM CELLS

Renhong He, Jianzhong Fan, Dejie Li, Xia Liu
Department of Rehabilitation Medicine, Nanfang Hospital, Southern Medical University, China

Objective: In this study, we want to elucidate the effects of the infrasound on the proliferation, apoptosis and differentiation of the bone marrow stromal stem cells (BMSCs), in the meanwhile the preliminary mechanism was discussed. *Method:* The primary BMSCs were derived from the Sprague-Dawley rats. The cells of passage 3 were divided into infrasound groups with infrasound for 10 min, 30 min and 60 min and control groups which were not treated with infrasound but exposed to air for the same durations.

We found the infrasound could promote the proliferation and inhibit the apoptosis of BMSCs. The results indicated the 60min is the suitable duration, when we applied the infrasound to the BMSCs. Then we examined the expression of survivin and glial fibrillary acidic protein (GFAP) of BMSCs from the two groups with 60 min. The morphological changes of the two groups with 60 min were observed under the scanning electron microscope (SEM) and transmission electron microscope (TEM). *Result*: We found there existed significantly differences between the two groups in terms of the BMSCs expressing the survivin, but no difference in the positive rate of GFAP cells. The results of SEM and TEM showed deteriorations in the control group compared with infrasound group. We conclude that the infrasound can promote the proliferation and inhibit the apoptosis of BMSCs; one of the mechanisms response to the beneficial effect may be the improvement of suviving expression after the BMSCs treated by infrasound; the result of positive rate of GFAP indicates the infrasound will not restrain the differentiation of BMSCs. *Impact on Rehabilitation*: To explore a new physical agent to promote the recover of the stroke patients.

OR19-302AB-01

RESPONSIVENESS OF THE FUNCTION IN SITTING TEST (FIST) IN ADULTS IN INPATIENT REHABILITATION: PRELIMINARY RESULTS

Sharon Gorman
Samuel Merritt University, United States

Objective: Compare change in Function In Sitting Test (FIST) scores during inpatient rehabilitation to other measures of balance and function and determine the FIST's responsiveness to change. *Methods:* In a prospective, non-blinded, criterion standard comparison study at 3 accredited inpatient rehabilitation units in the US, 61 adults with sitting balance dysfunction were compared using admission and discharge scores of the FIST, Functional Independence Measure, and Berg Balance Scale by trained physical therapist raters. Therapists and participants also provided Global Rating of Change (GRC) ratings for balance and function upon inpatient rehabilitation discharge. *Results*: Concurrent validity of all measures at admission and discharge was good to excellent (Spearman's rho r=0.684 to 0.787) with significant improvement (p<0.05) in FIST scores from admission (mean = 37.24, standard deviation = 14.55) to discharge (mean = 48.78, standard deviation = 7.08). FIST admission scores showed good to moderate correlations (Spearman's rho r=0.645 to 0.693) with all measures at discharge supporting predictive validity of the FIST. In participants with meaningful balance changes at time of inpatient rehabilitation discharge (GRC score ≥2; 68% of participants), the mean change in FIST scores was 13.34 points (standard deviation = ±14.06), and the FIST showed a large effect size (0.95) and standardized response mean (0.94), indicating responsiveness of the FIST. *Implications on Rehabilitation*: With a lack of activity-based outcome measures for lower functioning patients, this preliminary analysis shows strong psychometric values and supports the FIST's responsiveness during inpatient rehabilitation.

OR19-302AB-02

CONCURRENT VALIDITY OF PPPSQ WITH PSOC

Zhe-Min Lin[1], Shih-Heng Sun[1]*, Yi-Yun Huang[1], Fang-Yu Lin[2]
[1]China Medical University, [2]The University of Texas at Austin, Chinese Taipei

Objective: Currently, family centered approach becomes the mainstream of early intervention. Early intervention services focus not only on the development of the child, but also on the family that take care of the child. "Early Intervention Parents' Perceived Parenting Skills Questionnaire" (PPPSQ) was a newly developed tool that evaluates parenting skills in early intervention. Parenting Sense of Competence Scale (PSOC) is a widely used parenting scale that measures parental self-efficacy. In this study, PSOC was used as a gold standard to validate the concurrent validity of PPPSQ. *Method*: Two hundred and fifty-three parents recruited from local Early Intervention Notification and Referral Centers (EINRC) and Early Intervention Case Management Centers (EICMC) filled out the two questionnaires after they signed the inform consent. *Results*: The results showed moderate correlation, the Pearson' correlation coefficient between PSOC total score and PPPSQ two dimensions: "Ability to obtain early intervention services" (r=0.365, p<0.01), and "Confidence of being parents" (r=0.389, p<0.01), and PPPSQ total score (r=0.360, p<0.01). Mothers scored significantly higher than fathers in PSOC total score. Respondents who were in later stage of EI service delivery had higher total scores of PSOC than those who were in early stage. *Implications/impact on rehabilitation*: Early intervention need to focus more on the outcome of family services. This study provided evidence that PPPSQ was a valid tool that could be used to evaluate parenting skills. When service providers in early intervention face family, they would understand more of the relationship between parenting skills and parental self-efficacy.

OR19-302AB-03

DELPHI-BASED ASSESSMENT OF FALL-RELATED RISK FACTORS IN ACUTE REHABILITATION SETTINGS ACCORDING TO THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY, AND HEALTH

Tze-Hsun Yen, Hong-Chou Chen*, Tsan-Hon Liou
Taipei Medical University Shuang-Ho Hospital, Chinese Taipei

Objective: To apply the International Classification of Functioning, Disability, and Health (ICF) model to fall prevention through the development of an ICF core set for fall risks in acute rehabilitation settings. *Method*: Design: Fall risk factors were identified through a systematic review of the literature, and linked to ICF categories. A consensus process was conducted using a Delphi-based evaluation technique. Setting: University-based hospital. Participants: Twenty multidisciplinary participants from different institutions. Interventions: Not applicable. Main Outcome Measure(s): A 5-point Likert-type scale was used to weigh the impact of each risk category. The level of agreement for each consensus was assessed based on the Spearman rho and semi-interquartile range indices. Categories with a mean score of 4.0 or greater in the third round of evaluation were included in this ICF core set. *Results*: The core set contained 34 fall risk categories that were distributed as follows: 18 categories in body functions, 2 inbody structures, 8 inactivities and participation, and 4 in the environmental factors, and two categories were deemed personal factors. *Implications/impact on rehabilitation*: This is the first ICF core set for falls in acute rehabilitation settings. Further validation is required.

OR19-302AB-04

IMPLEMENTATION OF COMBINED ADVANCED TECHNOLOGIES TO ASSESS MULTIPLE AND DIFFERENT QUALITIES OF A HYDRAULIC PROSTHETIC FOOT

Itzhak Siev-Ner[1], Anat Kristal[1], Sigal Portnoy[2]
[1]Sheba Medical Center, department of Orthopedic Surgery, [2]Tel Aviv University, department of Bioengeeniring, Israel

Objective: The mechanism of a prosthetic foot influences the stability, gait symmetry and comfort of the transtibial amputee (TTA). We evaluated the efficiency of the hydraulic foot in TTA prosthesis-users. *Method*: 10 active unilateral traumatic TTA males, were examined with their existing stored energy foot, after which it was replaced to the Hydraulic Foot and after a month they went through the same exams. We used: the CAREN® virtual reality motion analysis system, the CODA Motion Analysis laboratory

and an internal stress monitor (FlexiForce, Tekscan). *Results*: The Hydraulic foot enabled approximately 4º DF more than the subjects' own prosthetic feet, resulting in a decrease in sagittal knee angle fluctuations in both legs. The COP was more centered A greater ankle plantar- flexor moment and power was measured while ambulating with the hydraulic foot. Peak internal stresses at the distal tibial end decreased significantly ($p<0.01$). *Implication in Rehabilitation*: The hydraulic prosthetic foot had an effect on the posture of the subjects, it may assist the TTA prosthetic-user while ambulating on uneven terrain and contribute to the stabilization in standing. It enables a motion at the ankle which results in less compensation at the hip and knee and enables a smooth and natural transition from backward to forward acceleration. Internal stresses under the truncated bones decreased while using the Echelon foot, thereby lowering the risk for internal injury to the soft tissues of the residuum.

OR19-302AB-05

THE USE OF THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) FOR EVALUATING FUNCTIONAL PROPERTIES IN A GERIATRIC POPULATION SAMPLE

Aydan Oral, Sina Esmaeilzadeh*, Bahar Dernek
Department of Physical Medicine and Rehabilitation, Istanbul University Istanbul Faculty of Medicine, Istanbul, Turkey

Objective: The aim of this study was to investigate functioning properties in persons who were 65 years and older using the ICF checklist and the WHODAS-II. *Materials and Methods:* In this population-based, cross-sectional, and descriptive study, data on the ICF checklist and the WHODAS-II were collected from 200 randomly selected participants who lived in a small town in Istanbul through a face-to-face interview at home visits. The ICF categories were rated as no, mild, moderate, severe, and complete impairment/ difficulty. Any degree of a problem was considered in calculating the percentage of subjects with a difficulty. *Results:* The mean age of the participants, of whom 53.5% were women and 46.5% were men, was 72.3±5.3 years. In the ICF body functions, mental and sensory functions were the two top categories having been impaired equally in more than three fourths of the participants. The prevalence of limitations in the activities and participation was the highest in the first category (d1) followed by those in mobility (d4) and in domestic life in around half of the sample. The prevalence of self-reported restrictions was almost the lowest in the 'community life' category. The WHODAS-II revealed difficulties in relevant domains in similar percentage of the subjects except for the first item of the participation domain where almost half reported restrictions in joining specified community activities. *Conclusions:* In this selected sample of persons ≥65 years, the discrepancy in community life/ participation domains identified using the ICF checklist and the WHODAS-II stresses the importance of the use of an ICF based measurement tool with specific questions for complementing the information obtained in a community setting using the ICF checklist. Furthermore, other factors such as how the individuals perceive community life as well as cultural and personal factors may play a role that need to be clarified.

OR19-302AB-06

APPLICATION OF CLASSIFICATION AND FRAMEWORK OF ICF TO REHABILITATION EVALUATION AND FOLLOW-UP PRACTICE OF CHILDREN WITH TRAUMATIC BRAIN INJURY

Hua Yang, Kai-Yi Zhao, Quan Jin
The 2nd Affiliated Hospital of Wenzhou Medical College, China

Objective: The study explored to the use of ICF to Rehabilitation evaluation and follow-up practice of children with traumatic brain injury. *Methods:* Setting file for the traumatic brain injury children hospitalized at the rehabili-tation set of The 2nd Affiliated Hospital of Wenzhou Medical College from January 2007 to August 2011,and their diseases were diagnosised by ICD-10, when they discharged, rehabilitation physician follow them up by regular telephone inquiries and outpatient service. Follow-up content: (1) Select some of the ICF body function and activity and participation categories to evaluation the outcome of patients followed up. (2) Application of the ICF as a conceptual model, common rehabilitation measurement was used to evaluation the health staus. *Results*: 1. Of 60 chilren, 32 were followed up,1 was dealth. Follow-up time range from 6 month to 4 years. The mean age when followed up at last was 7.2±4.4 years. Among the 32 follwed-up children the main Classification of Diseases were brain contusion (S06.201), subarachnoid hemorrhage (S06.5051) and skull fracture (S02.902). In addition to the educationcategory, the disorder degree of the remaining categories are mainly no and mild problem. More than half of the children (60.7%) have disorder in education and 9 (28.1%) had complete problem. A certain proportion of the chliren had a disorder of memory and intelligence function. There were 4 getting complete problem in gait and getting on and off toilet respectively. 2. Two children were illustrated to show how to use the common measurement to assess under the guidance of ICF theory. Their consciousness return to normal within 2 weeks and they got a significant improvement in muscle strength and muscular tone. Their activity of daily life were normal 5 month after injury. However,their social adaptability were at Boundary level. *Conclusion:* 1. ICF can comprehensively assess the health staus in the follow-up study of traumatic brain injury children, but shortcomings exist, for example, some categories do not apply to children and inconvertible of clinical operations. 2. ICD-10 and ICF are complementary classifications. 3. Application of these common rehabilitation measurement contribute to the overall outcome research when the ICF was used as a conceptual model.

OR19-302AB-07

FUNCTIONAL ELECTRICAL STIMULATION BASED ON NORMAL WALKING PATTERN IMPROVES WALKING ABILITY OF PATIENTS WITH CHRONIC STROKE: A RANDOMIZED CONTROLLED STUDY

Wenwen Jiang, Zhimei Tan, Tiebin Yan
Department of Rehabilitation Medicine, Sun Yat-sen Memorial Hospital, Sun Yat-sen University, Guangzhou, China

Background and Purpose: Functional electrical stimulation (FES) has been used to improve the motor function of stroke subjects for decades. However, the effectiveness between multi-channels of FES and single channel one is still not clear. This study was to investigate whether four channels FES that mimics to normal gait pattern is more effective than single channel FES induced ankle dorsiflexion only, in improving the chronic stroke's motor function. *Methods:* Fifty-six patients after 3 month post-stroke were recruited and randomly allocated into one of the 3 groups at the rate of 2:1:1, respectively receiving four channel FES (n=27), single-channel FES (n=15) or placebo FES (n=14) with sham stimulation. All received standardized rehabilitation program. FES treatment lasted for 30min one session, once a day with 5 days weekly for 3 weeks. Primary outcomes were measured with muscle co-activation index (CI) during walk and gait speed during a 10-meter walking test. Secondary outcomes were evaluated with Fugle-Meyer motor assessment (FMA), the Berg balance scale, and Barthel index. Participants were assessed before training, weekly during the 3 week of treatment. *Results*: No significant differences were found among 3 groups at baseline. However, repeated measure ANOVA revealed a significant increase in CI, gait speed, FMA, Berg index after 2 and 3 week treatment within groups of four channel and one single channel FES as well as between group of four channel FES and the other 2 groups ($p<0.05$). No significant improvements were demonstrated within the placebo group. *Conclusions:* In subjects with chronic

stroke, 15 sessions of four channel FES are more effective than one channel FES and placebo FES in improving gait velocity, muscle coordination when walking, and also balancing ability.

OR19-302AB-08

MOTOR FUNCTION REBUILDING OF PARALYZED LIMBS BASED ON TECHNIQUES OF SENSING, NETWORKING, AND FUNCTIONAL ELECTRICAL STIMULATING

Zhigong Wang[1], Xiaoying Lü[2], Yang Xia[3], Wenyuan Li[1], Zonghao Huang[1], Yuxuan Zhou[2], Suyang Wang[2], Jingdong Yang[2], Xintai Zhao[1], Ming Ma[3], Bilei Wang[3]

[1]Institute of RF- & OE-ICs Southeast University, Nanjing, [2]State Key Lab of Bioelectronics, Southeast University, Nanjing, China, [3]Rehabilitation Center of Zhongda Hospital, Southeast University, Nanjing, China

Objective: The motor function rebuilding of paralyzed limbs of hemiplegic patients after stroke and the tetraplegic/paraplegic patients caused by spinal cord injury is concerned. A novel concept called MENB (micro-electronic neural bridge) for neural/muscular signal regeneration and motor function rebuilding of paralyzed limbs is presented and the experiments are demonstrated. *Method*: Based on the techniques of signal sensing and processing, neural and electrical mixed networking, and FES (functional electrical stimulating), a MENB consists of one microelectronic system and two electrode arrays that interconnect two nervous systems that can be the upper and lower parts of an injured spinal cord, the nerve fascicles of the intact and paralyzed limbs of a hemiplegic, or the nervous systems of two bodies. *Results*: Using the technique, we have made experiments including: 1) One hand of a hemiplegic volunteer was controlled by one hand of a healthy person where two arms were connected by a MENB with surface electrodes; 2) One finger of a hemiplegic volunteer was controlled by one finger of a healthy person where related surface electrodes were connected by a MENB; 3) a hemiplegic volunteer used his healthy hand to control his paralyzed hand. *Implications/impact on rehabilitation*: The method is developed directly for the motor function rehabilitation of paralyzed limbs. The advantage is that the stimulating signals of the paralyzed limb are detected from the healthy limb of the paralyzed patient himself or from a healthy person. The system is therefore simple and the effect is better than traditional FES technique.

OR19-302AB-09

THE EFFECT OF FUNCTIONAL ELECTRICAL STIMULATION FOR FOOT DROP BY USING 3 DIMENSIONAL TREADMILL GAIT ANALYSIS

Ken Ishihara[1], Hitoshi Kagaya[1], Eiichi Saitoh[1], Koji Mizutani[2], Kazuya Usami[2], Masaru Ando[2]

[1]Department of Rehabilitation, Medicine, School of Medicine, Fujita Health University, [2]Department of Rehabilitation, Fujita Health University Hospital, Japan

Purpose: Correction of foot drop by functional electrical stimulation (FES) has been used widely. However, few reports showed the changes in motion by using 3 dimensional gait analysis system. The purpose of this study is to evaluate gait on the treadmill with and without FES. *Objects and Methods:* Ten stroke patients who could walk using a cane or ankle foot orthosis who gave written informed consent participated in this study. Tibialis anterior muscle and common peroneal nerve were stimulated during the swing phase of gait by NESS L300 system (Bioness Neuromodulation Ltd., Ra'anana, Israel). This system has pulse width of 100–300 microsecond, pulse amplitude of 0-80 mA and frequency of 20–45 Hz. The patients walked on the treadmill with their comfortable walking speed. The color markers were attached to both sides of acromion, greater trochanter, lateral epicondyle of the femur, lateral malleolus, and the head of fifth metatarsal bone. We evaluated 20 seconds at a rate of 60 Hz with and without FES by 3D gait analysis system (KinemaTracer, Kissei Comtec, Matsumoto, Japan). *Results*: Ankle dorsiflexion and knee flexion angle increased between the swing phase and early stance phase of gait in the affected side with FES. The improvements in step length and foot clearance were also observed in Lissaous Overview Picture. *Conclusion:* 3 dimensional treadmill gait analysis revealed the effect of FES for foot drop.

OR19-302AB-10

DUAL EFFECTS WITH POWER-ASSISTED FUNCTIONAL ELECTRICAL STIMULATION AND T-DCS ON THE BRAIN CORTICAL PERFUSION AMONG STROKES

Yukihiro Hara*, Shigeru Oobayashi, Kazuto Tujiuchi, Hiroshi Fuseya

Nippon Medical School Chiba Hokusoh Hospital, Japan

The aim of this study was to investigate the dual effects with power-assisted functional electrical stimulation (FES) and transcranial direct current stimulation (t-DCS) on upper extremity function and brain perfusion among stroke patients. The subjects were 6 chronic stroke patients with moderate impaired hemiparesis. They had anodal or cathodal t-DCS to C3 or C4 in international 10–20 system for 20 min. Because cathodal t-DCS to unaffected hemisphere resulted in the immediate upper extremity dysfunction in three moderate impaired hemiparetic patients, cathodal t-DCS experiment was no more adopted for others. The sides to which hemisphere anodal t-DCS can directly modify corticomotor excitability or prime the effects of motor function were examined. Clinical evaluation and Near Infrared Spectroscopy (NIRS) were examined and they had upper extremity FES followed with t-DCS. Immediate functional improvement showed in five patients after anodal t-DCS to unaffected hemisphere and in one patient with mild hemiparesis after anodal t-DCS to affected hemisphere. Anodal t-DCS and FES induced the functional improvement and increase of the brain perfusion in NIRS in all patients. The extent of functional improvement and laterality of sensory motor cortex (SMC) perfusion in NIRS, however, revealed the variability among individual stroke patients. It was hypothesized that there should be functional effect variability of the adequate side of anodal t-DCS among moderate impaired hemiparetic patients. The sensory motor integration due to FES and global brain activation of t-DCS might facilitate the perfusion of SMC and resulted in the functional improvement of hemiparetic upper extremity.

OR19-302AB-11

TRANSCRANIAL DIRECT CURRENT STIMULATION OF THE PREMOTOR CORTEX AIMED TO IMPROVE FINE MOTOR CONTROL IN THE HAND

Elena Pavlova[1], Michael A. Nitsche[2], Jörgen Borg[1]

[1]Karolinska Institute, Sweden, [2]Göttingen Universität, Germany

Objective: Transcranial direct current stimulation (tDCS) is a non-invasive method for modulation of brain activity and excitability. Anodal stimulation leads to an increase of excitability under the electrode, whereas cathodal tDCS decreases it. In this study we investigated the influence of tDCS of the dorsal premotor cortex (PMd) on dexterity, assessed in the spring compression task. *Methods:* 12 healthy persons received anodal tDCS to the primary motor cortex (M1) contralateral to the performing hand and sham stimulation. Another group of 12 healthy persons participated in five sessions of stimulation comprising anodal and cathodal tDCS of the left and the right PMd and sham stimulation. During the motor task an unstable spring should be compressed as much as possible without buckling. The force in the fingers serves as a measure of dexterity. *Results*: tDCS over M1 in the experiment 1 as well as over the

left, but not the right PMd in experiment 2 resulted in significant improvement of motor performance. The effects of premotor tDCS were heterogeneous: Some participants benefitted from cathodal premotor stimulation (group 1), some from anodal (group 2) and others did not have a considerable effect (group 3). The effect of stimulation polarity correlated with force during task performance and subjective task difficulty: participants of the group 2 had lower force and higher subjective task difficulty than group 1. *Implications*: The improvement of fine motor control duringtDCS of the left dorsal premotor cortex makes this area a promising candidate for future investigations in the field.

OR19-302AB-12

EFFECT OF ANODAL TRANSCRANIAL DIRECT CURRENT STIMULATION (A-TDCS) ON NAMING PERFORMANCE IN NON-FLUENT POST-STROKE APHASIA

Lydia Abdul Latif*, Hanita Mohamad, June Wai Kuan Ng, Bee Leng Ooi

Dept of Rehabilitation Medicine, Faculty of Medicine, University of Malaya, Malaysia

Background: Non invasive brain stimulation has been shown to influence speech production in patients with stroke. The main objective of this study is to compare the picture naming accuracy in expressive aphasia using anodal transcranial direct current stimulation (TDCS) combined with intensive behavior language therapy. *Methodology*: In this randomized control double-blind exploratory study, ten participants with expressive aphasia were included. One group received either anodal TDCS or sham TDCS. Stimulation was given over left broca region. Both group received intensive behavior language therapy during the 5 days stimulation period. Subjects received 40 min of therapy a day which included 20 min of stimulation. The behavioral approach was mainly concentrating on word retrieval and accuracy in pronunciation. *Outcome assessment*: Picture naming with 30 commonly used picture and were divided into 2 groups; trained items and generalized items. Measurements were done D1, D5 and D30 after stimulation. *Result*: Anodal TDCS was not found to have any adverse effects. Both group showed improvement in picture naming. Picture naming of treated item were better in the anodal TDCS compare to sham TDCS. Picture naming of generalize item were slightly better in the sham group. Greater effect was noted during D5 compare to D30 for both groups. *Conclusion:* Behavioral language therapy when done intensively will improve picture naming. When combine with anodal TDCS, it may enhance recall for treated but not generalize items for picture naming. The results of this study also show that patient requires more intensive therapy whenever possible.

OR19-303AB-01

LOWER LIMB CORTICOMUSCULAR COHERENCE IN STROKE PATIENTS WITH DIFFERENT GAIT RECOVERY

I-Hsuan Chen[1], Ray-Yau Wang[1], Yea-Ru Yang[1], Men-Tzung Lo[2]

[1]Department of Physical Therapy and Assistive Technology, National Yang-Ming University, Taipei, [2]Center for Dynamical Biomarkers and Translational Medicine, National Central University, Chungli, Taiwan

Objective: Coherence between the electroencephalography (EEG) recorded on the scalp and electromyography (EMG) recorded on the limb reflect the corticospinal coupling between the cortex and muscle units. In this study, we recorded the EEG-EMG coherence in stroke patients with different gait recovery to examine the effects of corticospinal coupling on gait recovery after stroke. *Methods:* Twenty-six subjects with chronic stroke participated in this study. Gait speed at comfortable pace was recorded at the baseline assessment and 3-month follow-up assessment. Due to the changes of gait speed within 3 months indicating the degree of the gait recovery, subjects were thus divided into good recovery group (n=13, changes: 0.18±0.11 m/s) or poor recovery group (n=13, changes: –0.02±0.05 m/s). The EEG-EMG coherence examined at the baseline assessment indicated corticospinal coupling. The EEG of premotor (FC3, FC1, FCz, FC2, FC4) and sensorimotor areas (C3, C1, Cz, C2, C4) and EMG of the tibialis anterior of the affected leg were recorded during isometric contraction of the ankle dorsiflexion. *Results:* Subjects with good recovery in gait speed exhibited significantly higher beta-band corticospinal coupling over the midline and affected hemisphere (FCz, Cz, C1 or C2) in performing a foot movement as compared with poor recovery. *Implications/Impact on Rehabilitation*: This work provides the new tool to predict the gait recovery poststroke and may contribute to the important step to develop the promising treatment. This study was supported by the National Health Research Institutes of the Republic of China (grant no. NHRI-EX102-10039EI).

OR19-303AB-02

TREADMILL EXERCISE ENHANCES HIPPOCAMPAL SYNAPTIC PLASTICITY AND IMPROVES SPATIAL MEMORY IN CEREBRAL ISCHEMIC RATS

Pei-Cheng Shih, Ray-Yau Wang*, Yea-Ru Yang

National Yang-Ming University, Chinese Taipei

Objective: The objectives of this study were to examine the effect of treadmill exercise on spatial memory in cerebral ischemic rats, and to investigate the possible mechanisms underlying this effect. *Method*: The middle cerebral artery occlusion (MCAO) procedure was used to induce cerebral ischemia in this study. After the MCAO, 32 rats were randomly assigned to the control group or exercise group. For rats in the exercise group, treadmill training began from the second day post MCAO, at the speed of 8 m/min, 30 min/day for 14 consecutive days. Rats in the control group remained relatively inactive in their cage. Morris water maze test was used for spatial memory assessment. Western blotting was used for measurement of synaptic plasticity markers, including BDNF, synapsin-I and PSD-95. Golgi stain was used for quantifying hippocampal dendritic structure. *Results*: Rats in the exercise group demonstrated better spatial memory performance as compared with the control group (p<0.01).The level of PSD-95 was significantly higher in both hemispheres (p<0.01) and the levels of BDNF and synapsin-I were higher only in contralesional hemisphere (p<0.05) in exercise group comparing with the control group. For synaptic structure, a trend of increasing dendritic complexity was noted in the contralesional hemisphere in exercise group. *Implications/impact on rehabilitation*: Treadmill exercise has been widely used for motor improvement in rehabilitation especially for subjects with cerebral vascular disease. Our study demonstrated that treadmill training can also improve memory performance after cerebral ischemia, possibly by enhancing hippocampal synaptic plasticity.

OR19-303AB-03

TEMPORAL-SPATIAL PARAMETERS OF GAIT: REFERENCE DATA FROM HEALTHY CHINESE ADULTS

Bin Shu, Xiangping Li, Qing Duan, Haoyue Deng, Xiangqin Fang, Wanling Jiang

Institute of Field Surgery, Daping Hospital, Third Military Medical University, Chongqing, China

Objective: We evaluated the gait characteristics of healthy Chinese adults to providereference data for clinical gait analysis in this population. *Method*: For this purpose, a total of 2562 healthy adults were

divided into 5 age groups as follows: 20–29, 30–39, 40–49, 50–59, and >60 years for each gender. DZBD-I GaitMat system was used to measure the temporal-spatial parameters of gait during walking at the speed of their choice. The parameters included walking velocity, step length, stride length (stride width), step time, swing time, total support time, single-support time and double-support time. The height and weight of subjects were also measured. *Results*: The data show that men walked faster than women, except for the third and above sixth decades of age ($p<0.05$). The velocity decreased with age in both genders, starting from the 5th decade in both men and women ($p<0.01$). The step length of men was longer than that of women ($p<0.05$), and it started to decrease during the 5th decade for women and the 6th decade for men ($p<0.01$). *Implications*: These results of gait analysis using DZBD-I GaitMat system provide, for the first time, the reference data of gait, that is, the characteristics of temporal-spatial parameters of gait in healthy adult Chinese population.

OR19-303AB-04

PHYSICAL EXERCISE ENHANCES ENDOGENOUS NEURAL STEM CELLS' MIGRATION VIA SDF-1A/CXCR4 PATHWAY AFTER ISCHEMIC STROKE IN RATS

Jing Luo[1], Xiquan Hu[1], Liying Zhang[1], Lili Li[1], Menglin Li[1], Ruxun Huang[2], Zhong Pei[2]

[1]Department of Rehabilitation Medicine, the Third Affiliated Hospital, Sun Yat-sen University, [2]Department of Neurology, the First Affiliated Hospital, Sun Yat-Sen University, China

Objective: The aim of this study is to investigate whether physical exercise enhances neural stem cells' migration through SDF1α/CXCR4 pathway in rats with ischemic stroke. *Methods:* A total of 90 adult wistar rats after MCAO (middle cerebral artery occlusion) were randomly divided into five groups (n=9, each group): the physical exercise group (E), the physical exercise group injected with AMD3100, a blocker of SDF1α/CXCR4 signal pathway (E+A), the control group (C), the control group injected with AMD3100 (C+A) and sham-operated group (S). The rats were sacrificed on the 7, 14 and 21 days after evaluating the neurological function by mNSS (modified neurological severity score) scale. The specific marker BrdU, DCX, SDF-1α and CXCR4 were checked in the peri-infarct region. Results mNSS scale in E+A group was much higher than that in E group ($p<0.05$), but a little lower than that in C and C+A group at 14 days and 21 days after MCAO ($p>0.05$), suggesting that blocking of SDF1 α/CXCR4 pathway by AMD3100 prevented neurological function from recovery, while physical exercise facilitated neurological function. Immunofluorescence analysis showed BrdU and DCX displayed a significantly higher colocalization in E than that in other groups at at each time points ($p<0.05$). In addition, physical exercise significantly increased the number of SDF-1α and CXCR4 positive cells. *Implications*: Physical exercise enhances neurological function possibly by mediating endogenous neural stem cells' migration to the peri-infarct region via SDF-1α/CXCR4 pathway after ischemic stroke in rats.

OR19-303AB-05

EVALUATION OF THE EFFECT OF ISOKINETIC TRAINING IN DIFFERENT RANGE OF MOTION ON KNEE STABILITY IN STOKE PATIENTS

Ying Zhang, Jing-Gang Du

Tianjin Union Medicine Centre, China

Objective: To evaluate the effect of isokinetic quadriceps and hamstring training in different range of motion in stroke patients. *Methods:* Isokinetic quadriceps and hamstring training of affected side were performed in 51 stroke cases, which were categorized in three groups of isokinetic training with 0–30°, 30–60°or 60–90° range of motion of knee, using ISOMED2000. The quadriceps spastity, the ratio of flexor on extensor (F/E) the lower limb function of Fugl-Meyer scale and Barthal Index (BI) were compared before and after the training. *Results*: The F/E score, the Fugl-Meyer scale and the BI in the 0–30° training group were statistically different before and after training ($p<0.05$). Whereas there were no statistical differences for the Fugl-Meyer scale and the BI in the 30-60°and 60-90° training groups ($p>0.05$), though there was statistical difference for F/E in the 30–60° training group. *Implications*: The isokinetic quadriceps and hamstring training in knee range of motion 0-30°in stroke patients could increase the knee stability, improve lower limb function of the affected side and improve the capability of daily activity in stroke patients.

OR19-303AB-06

INFLUENCE OF EXERCISE TRAINING ON THE STRUCTURE AND FUNCTION OF SKELETAL MUSCLES OF RATS WITH CHRONIC EXCESSIVE DRINKING

Qinfeng Wu, Xin Zhou, Ping Si

Department of Rehabilitation Medicine, The F Affiliated Hospital of Nan Tong University, Nantong, China

Objective: To study influence of exercise training on the structure and function of skeletal muscles of rats with chronic excessive drinking. *Methods:* Totally 30 male Wistar rats (200-220 g) were selected and randomly divided into 3 groups, control group, alcohol group and exercise group. The ethanol group and exercise group was administered ethanol (50%) 10 g/kg/day in 10 weeks. The control group was lavaged isovolume normal saline. Meanwhile, from 7th week the rats of the exercise group was begun to be administered with swimming training. Measurements of weight of each rat were performed every week. After 10 weeks the experiment made use of RM6240 system, observe construction function of gastrocnemius by suscitation of ischiadic nerve in vivo. The experiment observed morphous and distribution of skeletal muscles fiber, and measured cross section area of the fibers. A quantitative analysis was carried out for total protein skeletal muscles. *Results*: 1. The construction function of skeletal muscle of mice: the latency of single twitch of gastrocnemius of the alcohol group was prolonged compared with control group, and contraction extent was significantly decreased, 1/2 relaxation time of single twitch also prolonged ($p<0.05$). 2. The cross section area of the fibers of skeletal muscle of mice: The cross section area of the fibers II a and II b of gastrocnemius of the alcohol group was diminished compared with control group ($p<0.05$). 3. Quantitative of total protein of skeletal muscles: Quantitative of total protein of gastrocnemius reduced significantly with control group ($p<0.05$). *Implications*: Chronic excessive drinking can damage the structure and function of gastrocnemius of rats, and regular exercise training can lighten it.

OR19-303AB-07

SHORT-TERM AND LONG-TERM EFFECTS BY THE EXERCISE USING LOWER BODY POSITIVE PRESSURE-BEARING WALKING MACHINE FOR LATE-STAGE ELDERLY PATIENTS

Misa Miura[1], Makoto Nagasaka[1], Osamu Ito[1], Yasuaki Kawai[2], Masahiro Kohzuki[1]

[1]Tohoku University Graduate School of Medicine, [2]Tottori University, Faculty of Medicine, Division of Adaptation Physiology, Japan

Objective: The effect of walking on a lower body positive pressure (LBPP)-bearing treadmills for late-stage aged patients has not been elucidated. In this study, we report the short-term and long-term effects of exercise with the LBPP for late-stage elderly patients. *Methods:* Twelve elderly patients admitted in a Nursing Care Home (86.3±5.1 years old) were divided into an intervention

group (LBPP group, n=7) and a control group (n=5). In addition to an ordinary rehabilitation program, the patients in the intervention group performed a walk-training from 11/20 to 13/20 in Borg Scale for six min with LBPP once a week. Strength of quadriceps femoris muscle, visual analog scale (VAS of gonalgia), and six minute walking distance were evaluated in all subjects before and after the first and the final intervention. *Results*: After the first intervention, the patients in LBPP group had significant improvement in quadriceps femoris muscle strength and VAS (p<0.05), but not in upper muscle strength. However, the improvement of muscle strength and VAS did not last for one month. Conversely, one month after the intervention, walking speed and six minute walking distance have been improved significantly in the LBPP group (p<0.05). Considerations The LBPP might provide a safe and effective tool for walk-training in late-stage elderly patients. Further, LBPP might bring about pain improvements within the short-term and improvements of motor performance for a long-term. The results suggest that walking with LBPP may have different effects along the time course.

OR19-303AB-08

PRE-ISCHEMIC ENVIRONMENTAL ENRICHMENT PROMOTED NEUROBEHAVIORAL OUTCOMES WITHOUT REDUCING INFARCT VOLUME; THE POSSIBLE ROLE OF ENRICHMENT-RELATED PHYSICAL EXERCISE

Yi Wu, Hongyu Xie

Department of Rehabilitation Medicine, Hua Shan Hospital, Fudan University, Shanghai, China

Objective: To explore whether pre-ischemic environmental enrichment (PIEE) provides protection to rats with subsequent, transient focal cerebral ischemia (tFCI), whether PIEE increased levels of voluntary exercise and whether an exercise-related factor was involved in the protective effect. *Method*: After tracking and recording exercise level of rats in each group, we tested neurobehavioral and morphological recovery of rats following transient focal cerebral ischemia. Motor function was evaluated by neurologic deficits scores, foot fault test, cylinder test and rota-rod test. The function of spatial learning and memory was determined using a water maze task. Brain infarct volume was analyzed using the triphenyltetrazolium chloride (TTC) staining method. The correlation between the changes in voluntary exercise and neuroprotective outcomes was assessed by using Spearman's correlation coefficient. *Results*: Our study showed that PIEE improved recovery of motor function, spatial learning and memory without reduction in brain infarct volume. We also found that PIEE robustly increased the level of physical exercise of the rats which positively correlated with the extent of neurobehavioral recovery. *Implications*: Our results suggest that PIEE may induce brain ischemic tolerance through, at least partially, increasing physical exercise. Namely, enriched environment promoted the involvement and adherence of rats to physical exercise. Clinically, we doctors might manipulate the environmental factors to deal with the problem of noncompliance of exercise in population and especially patients suffered in stroke. *Acknowledgements*: The study was supported by the Natural Science Foundation of China (NSFC, NO. 81171856, 81171855) and the Key projects of Shanghai Science and Technology on Biomedicine (NO.10DZ1950800).

OR19-303AB-09

EFFECTS OF A GREEN AQUATIC EXERCISE ON NEONATAL SEIZURE-INDUCED BEHAVIORAL

Hong Ni[1], Jieying Wang[1], Baoliang Sun[2]

[1]Neurology Laboratory, Soochow University Affiliated Children's Hospital, [2]Key Laboratory of Cerebral Microcirculation at the Universities of Shandong, Department of Neurology, Affiliated Hospital of Taishan Medical College, Taian, Shandong, China

For the purpose of investigating the intervention effect and the underlying molecular mechanism of a green aquatic programme (bubble bath hydrotherapy) on behavioral damage of neonatal rat with prolonged seizures, a seizure was induced by inhalant flurothyl daily in neonatal Sprague-Dawley rats from postnatal day 6 (P6). The authors assigned fifteen rats each randomly into the control group (CONT1), the control plus hydrotherapy group (CONT2), the seizure group (EXP1) and the seizure plus hydrotherapy group (EXP2). Behavioral parameters of brain damage (swimming development, overhanging test, negative geotaxis response, and open-field test) were observed from P12 to P40, respectively. Mossy fiber sprouting was determined by Timm staining at P42. Morris water maze test was performed during P43–P49. Plasticity related gene 1 (PRG-1) and bcl-2 inhippocampus and cerebral cortex were detected by western blot method at P50. In regard to behavioral parameters of brain damage, EXP2 rats performed better than EXP1 rats. Hydrotherapy in EXP2 remarkably reduced the aberrant mossy fiber sprouting in the CA3 subfield of hippocampus compared with that in EXP1. The amount of PRG-1 and bcl-2 proteins in hippocampus and cerebral cortex of EXP1 increased significantly compared with that of the other three groups. There was no significant difference of PRG-1 and bcl-2 proteins between EXP2 and CON groups. These results indicate that green aquatic exercise may positively impact the neurobehavioral deficits by modulating hippocampal regenerative sprouting and PRG-1, bcl-2 expression in a neonatal rat model of flurothyl-induced recurrent seizures.

OR19-306AB-01

INTENSITY OF DEPRESSION AND CD3+CD56+NATURAL KILLER T CELLS IN FIBROMYALGIA SYNDROME

Boya Nugraha[1,2]*, Christoph Korallus[1], Susanne Kuhlmann[3], Heike Kielstein[3,4], Christoph Gutenbrunner[1]

[1]Dept. rehabilitation Medicine, Hannover Medical School, Germany [2]Dept. Chemistry, University of Indonesia, Indonesia, [3]Institute for Functional and Applied Anatomy, Hannover Medical School, [4]Dept. Anatomy and Cell Biology, Martin Luther UniversityHalle-Wittenberg, Halle (Saale), Germany

Objective: Fibromyalgia syndrome (FMS) patients have multiple symptoms, including mental symptoms. Natural killer T (NKT) cells have been shown to have correlation with depression. This study aimed to observe the role of CD3+CD56+NKT cells level in FMS patients in relation to the intensity of depression. *Methods:* Ninety six-female patient who matched the definition of FMS were divided into subgroups of depression according to Hospital Anxiety and Depression Scale (HADS) score (HADS-Depression <8; 8-10; and >10). CD3+CD56+NKT cells from peripheral blood were measured by fluorescence-activated cell sorting methods. *Results*: CD3+CD56+NKT cells in the subgroup of depression of FMS patient showed significant differences (ANOVA; p=0.02). The difference was observed in HADS-D <8 and="">10 (post-hoc: Bonferroni test, p=0.018). The use of antidepressant significantly altered the level of CD3+CD56+NKT cells (p=0.041). A blocking variable ANCOVA with antidepressant as covariate showed main effect in subgroup of depression (p= 0.029), however, the interaction of antidepressant and subgroup of depression did not influence the level of CD3+CD56+NKT cells (p=0.376). *Implications/impact on rehabilitation*: These results suggest that CD3+CD56+NKT cells could play a role as a mediator in mental symptoms, such as depression in FMS patients. Symptoms of mood may be part of patho-physiological mechanisms of FMS and subgrouping of FMS patients based on the intensity of mental symptoms may help to optimize the treatments, including for their rehabilitation program. However, to evaluate clinical relevance of these findings further studies are needed.

OR19-306AB-02

CHRONIC PAIN AND PAIN CATASTROPHIZING IN THE REHABILITATION OF LUMBAR DISC HERNIATION

Ioana Onac[1], Marian Vintu[1], Ioan Onac[2], Adela Moldovan[3], Daniel David[3]

[1]Princes Royal Hospital, United Kingdom, [2]Iuliu Hatieganu University of Medicine and Pharmacy Cluj-Napoca, Romania, [3]Babes Bolyai University Cluj-Napoca, Romania

Objective: Analyse the mechanisms responsible for the treatment outcome (pain intensity, disability, emotional distress, quality of life) following multidisciplinary treatment (medication, physiotherapy and cognitive-behaviour therapy) for chronic pain secondary to lumbar disc herniation and identify important factors for ethiopathogenetic treatments. The medical and surgical approach is not enough to prevent or treat chronic pain. Multidisciplinary treatment based on biopsychosocial model will be the choice for some of our patients. The question is for whom? *Methods:* Seventy-five patients with chronic pain following an acute episode of sciatica due to lumbar disc herniation were randomised in three treatment groups, followed for two weeks: medication (Med-20 patients); medication and physiotherapy (Med-Phy-26 patients) and medication, physiotherapy and cognitive-behaviour therapy (MED-PHY-CBT- 29 patients). Patients were assessed on day one, 14 and 1, 6, 12 month. Patients were evaluated by: Pain Catastrophizing Scale, visual analogue scale to assess expectation and hopes, Schober and Tomayer Test, General Attitudes and Beliefs Scale and Automatic Thoughts Questionnaire. Data were collected in a SPSS data base and were analysed with ANOVA test. Post hoc analyses of the treatment outcomes between patients with clinical and subclinical level of pain catastrophising were also performed. *Results:* Pain catastrophizing at a clinically significant level is an important mechanism for management and it implies multidisciplinary treatment. Irrational thinking and decreased mobility didn't influence quality of life. *Impact on Rehabilitation*: We are proposing an assessment and treatment algorithm, which includes evaluation of pain catastrophizing, that could decrease chronic low back pain incidence and treatment cost.

OR19-306AB-03

EVALUTION OF SERUM LEPTIN, BASAL CORTISOL, BASAL DEHYDROEPİANDROSTERONE SULFATE LEVELS IN PRIMARY FIBROMYALGIA AND THEIR ASSOCIATION WITH PSYCHOLOGICAL STATUS AND QUALITY OF LIFE

Mustafa Calis[1]*, Ozlem Tufan[1], Ozgur Akgul[1], Havva Talay Calis[2], Nimet Bahadir[1]

[1]Erciyes University School of Medicine, [2]Kayseri Education and Research Hospital, Turkey

Background: Fibromyalgia is a common disease characterized by chronic widespread musculoskeletal pain. Several hypotheses have been developed to explain the etiopathogenesis of fibromyalgia, but the cause of fibromyalgia is currently unknown. *Objectives*: To analyze and compare leptin, basal cortisol, basal dehydroepiandrosterone sulfate (DHEAS) levels among female fibromyalgia patients and healthy controls for investigating the possible etiopathogenetic role in fibromyalgia. The other goal of this study was evaluate these hormones' association with psychological status and quality of life. *Methods:* Forty nine patients with primary fibromyalgia and thirty five healthy controls aged 20 to 55 years were included in the study. Serum leptin, basal cortisol and basal DHEAS levels were compared between patient and control group. Hamilton Depression and Anxiety Rating Scale, SCL90-R, Fibromyalgia Impact Questionnaire, Modified Fatigue Impact Scale, Nottingham Health Profile and Ten-point visual analog scale (VAS) were used thus assessing the major areas affected by FM - quality of life, mood, function and pain. The relationship of these scales with leptin, cortisol and DHEAS levels were investigated. *Results*: Leptin levels were significantly higher in patients with primary fibromyalgia compared with healthy controls ($p<0.05$). However there were no significant differences in mean levels of basal cortisol and DHEAS between the fibromyalgia and control groups ($p>0.05$). Leptin levels were positively associated with HAM-A scores in fibromyalgia group ($p<0.05$). There was no relationship between leptin and other symptoms of psychological or quality of life. DHEAS levels were significantly lower in fibromyalgia patients with fatigue and sleep disturbance. *Conclusions:* It has been shown that leptin levels were increased in fibromyalgia patients and there was a significant relationship between leptin levels and anxiety. *Key words:* Cortisol, DHEAS, fibromyalgia, leptin, psycological status, quality of life.

OR19-306AB-04

PAIN IN PHYSICAL REHABILITATION MEDICINE AND NEUROACUPUNCTURE, CASES REPORT

Patrick Sautreuil[1], P Thoumie[1], S Bendaya[1], B Missaoui[1], M Piquemal[2]

[1]Rehabilitation department, Rothschild Hospital, Santerre street, Paris, France, [2]Asuncion, Paraguay

Introduction: Pain is often an obstacle for patients in rehabilitation programs that physical therapies and chemicals can't releave. Neuro-acupuncture, traditional techniques like deqi and intradermal needles can be alternative treatments. *Purpose of study*: Chemicals may be inefficient or have side effects at efficient dose. Physical therapies like TENS may be inefficient too. Acupuncture needles, used in a western way, are proposed to most of the patients suffering from severe pains. Study samples amputation painfull neuromas, muscular dystrophy and multiple sclerosis spastic pains, low back pains, neuropathic pains after stroke. *Methodology*: Neuro-acupuncture uses needles on ashi points (ashi xue) or triggers points and for their referred pains. Needles are set as deep as necessary and twisted depending to deqi technique: the needle "looks for" the exact pain felt by the patient. Intradermal needles are very thin. Inserted parallely to the skin, they are kept in place (covered by a plastic film) for a few days to one week. *Synthesis*: For amputation, we showed how the needle works as an electrical conductor through the painfull neuroma. Needles work as well for dystrophy and spastic muscles. Intradermal needles, as a foreign body, can moderate the sensitization of neuro receptors. *Conclusion:* Neuro-acupuncture brings a new answer and enriches the treatment to severe pains in rehabilitation. It can be a complementary and an integrative technique, easy to use. It completes chemical treatments or limits their utilisation in case of side effects.

OR19-306AB-05

CLINICAL STUDY OF NEEDLE WARMING MOXIBUSTION TREATMENT MYOFASCIAL PAIN SYNDROME

Caixia Su[1], Zhongli Jiang[1], Feng Lin[1], Junjie Yang[1], Qianqian Wang[1], Jiayan Yang[1]

[1]Department of Rehabilitation Medicine, Sheng Ze Hospital of Jiangsu Province, , [2]Department of Rehabilitation Medicine, First Affiliated Hospital of Nanjing medical university, China

Objective: To observe the clinical effects of warm needling on myofascial pain syndrome (MPS), expecting to confirm the high efficiency of this therapy, and to objectively evaluate the clinical efficacies of MPS of using physion MD's pain spot test. *Methods:* 30 cases accorded with the diagnostic standard of MPS adopting own randomized controlled, including warm needling group, electro-acupuncture group using acupuncture drawing can and TDP, and MTZ-M group. Simplified McGill pain questionnaire and pain spot (red dots) quantity of physion MD's muscle resistance meas-

uring instrument from Japan were adopted as observation indexes. Therapeutic effect was assessed with PRI and VAS and PPI and the change of red dots quantity before and after treatment respectively. *Results:* After treatment, there was significant difference in the total integral of PRI and VAS and PPI and red dots quantity with those prior to treatment ($p<0.05$). *Conclusions:* It is suggested that the warm acupuncture therapy is a highly effective method with MPS. Total symptom integral and pain spot tests resulted in improved accuracy for evaluation of clinical curative effect.

OR19-306AB-06

ACTIVITIES OF SUPRAHYOID AND INFRAHYOID MUSCLES DURING SWALLOWING – ANALYSIS USING 320-ROW AREA DETECTOR COMPUTED TOMOGRAPHY (ADCT)

Yoichiro Aoyagi
Fujita Health University, Japan

Backgroud: Research on muscle activation patterns during pharyngeal swallowing has been limited in human. Newly developed 320-row area detector computed tomography (ADCT) has excellent spatial and temporal resolution, which facilitates quantitative kinematic analysis of pharyngeal swallowing by identifying laryngopharyngeal structures. In this study, we investigated muscle activity patterns by observing changes in swallowing-related muscles length. *Methods:* Twenty-six healthy males were evaluated using a 320-row ADCT while swallowing 10 ml liquid. The following parameters during swallowing were analyzed: (1) origins and insertions of five suprahyoid, one infrahyoid muscles; and (2) movement of the hyoid bone. *Results*: Stylohyoid, posterior digastric, and mylohyoid muscles began to shorten initially and almost simultaneously. The shortening of these muscles occurred during the upward movement of the hyoid bone. Subsequently, geniohyoid, thyrohyoid, and anterior digastric muscles began to shorten, synchronizing with the forward movement of the hyoid bone. The shortened lengths of the stylohyoid, posterior digastric, and mylohyoid muscles significantly correlated with the upward movement of the hyoid bone (r=0.45–0.65). The shortened lengths of geniohyoid muscle significantly correlated with the forward movement (r=0.61). *Discussion & Conclusion:* It was newly found that serial shortenings of hyoid muscles influence the trajectory of the hyoid bone. Stylohyoid, posterior digastric, and mylohyoid muscles initiate the swallowing reflex and contribute to the hyoid upward movement. Geniohyoid is a key muscle that pulls the hyoid bone anteriorly. Rehabilitation strategies such as electrical stimulation or muscle strengthening exercise should be potential and rational methods for pharyngeal dysphagia with limited movement of hyoid bone.

OR19-306AB-07

THE INFLUENCE OF BOULS VOLUMES AND CONSISTENCY ON OROPHARYGEAL SWALLOWING: A STUDY OF HEALTH SUBJECTS USING HIGH-RESOLUTION SOLID-STATE MANOMETRY

Yue Lan[1], Guangqing Xu[2], Zulin Dou[1], Guifang Wan[1], Tuo Lin[1], Fan Yu[1]
[1]The Department of Rehabilitation Medicine, [2]The Department of Rehabilitation Medicine, China

Objective: To determine the effect of bolus volume and consistency on pharyngeal and upper esophageal sphincter pressures, durations using high-resolution manometry (HRM). *Methods:* Twenty-four health subjects swallowed three bolus volumes (3 mL; 5 mL; 10 mL) and three bolus consistencies (water; thick; pasty) in the neutral head position. Pressure and durations measurements were acquired using a high-resolution solid-state manometer, with emphasis placed on the hypopharynx and upper esophageal sphincter (UES). Variables include UES nadir pressure, UES relaxtation duration, maximum hypopharygeal pressure and hypopharyngeal duration were analyzed across bolus volumes and consistencies using threeway repeated measures analysis of variance (ANOVA) investigating the effect of bolus volume and consistencies. *Results:* UES nadir pressure, UES relaxtation duration, maximum hypopharygeal pressure and hypopharyngeal duration varied significantly across bolus volume and consistencies. UES relaxtation duration, UES nadir pressure and maximum hypopharyngeal pressure, had a direct positive relationship with bolus volume, whereas all of these four parameters had an positive relationship with bolus consistency. *Implications:* Differences in hypopharyngeal pressure and duration, UES nadir pressure and duration were detected across varying bolus volumes and consistencies. Consideration of these variables is paramount in understanding normal and pathological swallowing.

OR19-306AB-08

THE EFFECT OF DRY NEEDLING AT UPPER TRAPEZIUS MYOFASCIAL TRIGGER POINTS IN THE TREATMENT OF MYOFASCIAL PAIN SYNDROME - A PREELIMINARY STUDY

Nuniek Nugraheni Sulistiawaty, H Reni*
Department of Physical Medicine and Rehabilitation School of Medicine Airlangga University, Dr. Soetomo Hospital Surabaya, Indonesia

Background: The most myofascial pain syndrome was suffered upper trapezius muscle. This not fatal condition but can caused decreasing quality of life. Dry needling is thought to mechanically disrupt the shortened contractile element of the muscle so doing break the feedback loop responsible for sustaining the myofascial trigger point. *Objective*: The purpose of this study was to investigate the effect of dry needling at upper trapezius myofascial trigger points in the treatment of Myofascial Pain Syndrome. *Method:* The study was a pre and post study. Eight patients, between the ages of 22–40, from the out patient medical rehabilitation in Soetomo general hospital participated in the study. They underwent a case history, relevant physical examination and a cervical spine examination. The eight subjects received dry needling therapy using acupunture needle, after being diagnosed systematically as suffering from myofascial trigger points of the upper trapezius muscle. Each patient received three treatments weekly with a one-week follow-up. Subjective measures was taken at all four visits. Subjective data was obtained from the Visual Analog Scale. This data was used to perform statistical analysis using paired t-tests to compare mean VAS score pre and post intervention respectively, at a 95% level of confidence. *Result:* Mean VAS analysis revealed significant statistical both VAS I to VAS II (p=0.002) and VAS II to VAS III (p=0.005), while mean VAS III to VAS IV not significant (p=0.285). *Conclusion:* It can thus be concluded that twice treatments dry needling weekly were enough to clinical management of myofascial trigger points and three times dry needling is not needed.

OR19-306AB-09

POWER-ASSISTED FUNCTIONAL ELECTRICAL STIMULATION FOR PHARYNGEAL DYSPHAGIA

Hitoshi Kagaya[1]*, Takahiro Momota[2], Shigeo Tanabe[2], Tomokazu Sutoh[3], Yoichiro Aoyagi[1], Yoko Inamoto[2], Seiko Shibata[1], Kikuo Ota[2], Keiko Onogi[1], Eiichi Saitoh[1]
[1]Department of Rehabilitation Medicine I, School of Medicine, Fujita Health University, [2]Faculty of Rehabilitation, School of Health Sciences, Fujita Health University, [3]Department of Rehabilitation, Fujita Health University Hospital, Japan

Objective: Dysphagia causes pneumonia and decreases quality of life. Many patients with pharyngeal dysphagia have reduced laryngeal elevation, but only a few functional training are advocated so far. The objective of this study is to evaluate the laryngeal elevation with and without power-assisted functional electrical stimulation (FES) in normal subjects and in patients with reduced laryngeal elevation. *Methods:* This study was approved by the Institutional Review Board

and a written informed consent was obtained from all subjects. The surface electrodes were put on the suprahyoid muscles in 12 healthy subjects and 3 patients with pharyngeal dysphagia. All patients showed reduced laryngeal elevation by videofluoroscopic examination of swallowing (VF). Normal subjects swallowed 3 ml and 10 ml of water with and without the power-assisted FES (PAS system®: OG Giken Co., Ltd, Japan). The colored marker was put on the surface of the thyroid cartilage and the laryngeal elevation was measured by using the 3-dimensional motion analysis system (KinemaTracer®: KISSEI COMTEC, Japan). The hyoid elevation with and without the power-assisted FES in patients were evaluated by VF. *Results*: The laryngeal or hyoid elevation increased with power-assisted FES both in normal subjects and in patients with reduced laryngeal elevation. The stimulation amplitude changed in accordance with the changes in the electromyography of the suprahyoid muscles. *Implications/impact on rehabilitation*: The power-assisted FES may be useful to treat patients with reduced laryngeal elevation.

OR19-307AB-01

FUNCTIONAL MAGNETIC RESONANCE IMAGING STUDY OF THE SEMANTIC IDENTIFY TASK DIFFERENCE IN CHINESE AND UYGHUR LANGUAGES

Yanling Xi, Jian Wang, XiaoNing Zhang, Tuerhong Tuerxun, Kuerbannaimu Kaheman, Chun Hui Jiang, Bao Lan Wang, Hai Xia Huang

The First Affiliation Hospital of Xinjiang Medical University, Urumqi, China

Purpose: To observe the activated region of the brain cortices as a pattern of semantic identify of both Uyghur and Chinese languages in which the healthy volunteers were in examination condition using the blood oxygenation level dependent functional magnetic resonance imaging (BOLD-fMRI), then the cortical networks of Uyghur or Chinese semantic processing in the cerebral cortices were elucidated. *Method*: In the present study, a total of thirty right handed volunteers (fifteen are native speakers of Han Chinese, and fifteen are native speakers of Uyghur) were recruited and compared when they were assessed semantic identify task in the studies. *Results*: The different activation regions during the semantic identify in Uyghur and Han Chinese groups were the left anterior cingulate gyrus (BA23) and the midline mesophyllwedge,which were markedly seen a positive activation in Uyghur group compared to those of Han Chinese, and it was significant differences ($p<0.05$). *Implications*: We observed that the brain activated region of semantic processing in Uyghur group was differences to those of Han Chinese, and the cingulate gyrus and the praecuneus might have a language function in Uyghur language semantic processing, espatially the left anterior cingulate gyrus.

OR19-307AB-02

ALTERNATIVE COMMUNICATION INTERVENTIONS IN CHINESE CHILDREN WITH AUTISM

Szu-Han Kay Chen[1], Katya Hill[1,2], Chunjing Su[3], Kexing Sun[2]

[1]University of Pittsburgh, Pittsburgh, United States, [2]Shanghai University of Traditional Chinese Medicine, Shanghai, [3]Quyang Sub-district Community Health Service Center, Shanghai, China

Objective: Approximately 740,000 people with autism in China face challenges to language performance, verbal and non-verbal communication, and social interaction in daily living activities. Augmentative and Alternative Communication (AAC) is a field of endeavor that provides solutions for people with autism faced with expressive communication challenges. The purpose of this study was to investigate the treatment effectiveness of intervention using a language-based AAC device with children with autism. *Method*: Ten children with autism were recruited in a single-subject multiple baseline study using a mixed model analysis to evaluate the effectiveness of AAC intervention that manipulated both the treatment strategies and AAC system components as dependent variables. The outcome variables included communicative intention, number of total words used for communication, mean length of utterance, and use of meaningful spontaneous speech. *Results*: The results showed all children had improved use of intentional communication, increased engagement during treatment and gains in the number of words they used. Discussion includes AAC design variables manipulated to support language, the specific treatment strategies, the treatment protocol, and family values and preferences influencing clinical decisions. *Implications/impact on rehabilitation*: The proposed presentation aims to describe the importance of the AAC system display. Consequently, the vocabulary selection and organization becomes critical in providing access to words for effective communication. Evidence-based language approaches that build linguistic and communication skills are discussed for applying AAC interventions in Chinese people with autism. A demonstration of the AAC system and treatment protocol can be implemented as future practice guidelines.

OR19-307AB-03

THE ANALYSIS OF SPATIAL PERCEPTION PROCESS OF HEMINEGLECT COMBINED WITH PUSHER SYNDROME

Chunlei Shan, Runhong Zhang, Chao Chen, Enhui Li, Wenli Chen, Qian Ye

First Affiliated Hospital of Nanjing Medical University, China

Objective: To reveal and analyze the feature of spatial perception process of hemineglect combined with pusher syndrome. *Method*: Patient WMZ, a 49 years old female patient with cerebral infarctions in right parietal, frontal, occipital and temporal lobe, was evaluated by common tests for determining hemineglect and a series of special designed neuropsychological assessments of spatial perception process, such as subjective visual vertical (SVV), subjective visual straight ahead (SVA), subjective tactile straight ahead (STA), subjective postural vertical (SPV) tests with eyes open or closed. *Results*: WMZ showed left hemineglect and completed SVV test normally. This result was different from the performance of heminegelct patients without pusher syndrome, who were reported to recognize the counterclockwise line as vertical. Both SVA and STA tests indicated clockwise deviation, which were similar to the performance of hemineglect without pusher syndrome. The result of SPV showed clockwise leaning of body when her eyes closed and counterclockwise leaning when her eyes open. This result was consistent with pusher syndrome but not hemineglect, who showed no body leaning. From above finding we draw a conclusion that SVV and SPV will be modified when hemineglect is combined with pusher syndrome, but SVA and STA will not be influenced by inclusion of pusher syndrome. This study provides further evidence supporting the critical perceptual disorder of pusher syndrome is limited to coronal plane dimension. *Implications*: Reveal and analyze the specific manifest of spatial perceptual process is helpful for selecting more reasonable and effective rehabilitation approaches for spatial perceptual process disorders.

OR19-307AB-04

ENHANCING MEMORY RECOVERY WITH REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION AND ITS UNDERLYING NEURAL MECHANISMS

Hua Yuan

Department of Rehabilitation and Physiotherapy. Xijing Hospital, the Fourth Military Medical University, China

Objective: To study the effects of repetitive transcranial magnetic stimulation (rTMS) treatment on the spatial memory functional

recovery of subacute cerebral ischemic rats and its underlying neural mechanisms. *Method*: Twenty-four Sprague-Dawley rats with subacute cerebral ischemia were randomly divided into three groups: the sham group, the low-frequency rTMS group and the high-frequency rTMS group. Low-frequency rTMS group rats were treated with 1 Hz rTMS for 4 weeks. High-frequency rTMS group rats were treated with 10 Hz rTMS for 4 weeks. Morris water maze was carried out to determine the ability of spatial learning and memory. Real-time PCR, Western blot and immunohistochemistry were used to detect the expression of brain-derived neurotrophic factor (BDNF), N-methyl-D-aspartate (NMDA), NMDAR1, MAP-2 and synaptophysin mRNA and proteins in the rats hippocampus. *Results*: At 4 weeks after rTMS treatment, the average escaping latent period and swimming distance of the low-frequency rTMS and high-frequcy rTMS group were shorter than that of sham group ($p<0.05$). The mRNA and protein content of BDNF, NMDAR1, MAP-2 and synaptophysin in the low-frequency rTMS and high-frequency group were higher than that in sham group ($p<0.05$). No obvious difference was found between low-and high-frequency group. *Implications*: Both low- and high-frequency rTMS take a beneficial role in spatial memory function recovery after subacute cerebral ischemia. It may be related to its roles to increase the expression of BDNF, NMDA, NMDAR1, MAP-2 and synaptophysin expression in hippocampus.

OR19-307AB-05

ACUTE CHANGES IN VISUOSPATIAL ATTENTIONAL FUNCTION AFTER LOW-FREQUENCY REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION INDUCED LOCAL BRAIN "VIRTUAL LESION"

Guangqing Xu[1], Yue Lan[2]

[1]Department of Rehabilitation Medicine, The First Affiliated Hospital of Sun Yat-sen University, [2]Department of Rehabilitation Medicine, The Third Affiliated Hospital of Sun Yat-sen University, China

Objective: The aim of this study was to seek more direct evidence for the role of FPN in controlling visuospatial attention using low-frequency repetitive TMS-induced local "virtual lesion" to explore the potential mechanisms of the visual spatial neglect. *Methods:* Fourty healthy, right-handed volunteers (20 males and 20 females) were recruited. They were divided into two groups as frontal group and parietal group in accordance with sex for the DLPFC and the posterior parietal cortex stimuli studies, respectively. Subjects received Attention Network Test following a single, 30 min, 1 Hz rTMS train (1800 pulses) over the left or right DLPFC and PPC, respectively, or received sham stimulation (counterbalanced over the left and right DLPFC and PPC, respectively). *Results*: All subjects performed the task well, completing all trials in ~30 min regardless of low-frequency rTMS condition. During the ANT task, subjects responded significant slower on none and spatial cue conditions after real 1 Hz rTMS over PPC than sham, but not DLPFC. The efficiencies of alerting and resolving conflict were deficits in participants after right DLPFC rTMS, however, increased after left DLPFC. In addition, Participants after right PPC rTMS showed deficits in the alerting and orienting networks, but not left PPC. *Implication*: These findings suggested that the right DLPFC played a crucial role in the executive control processes, and right PPC associated with orienting attentional function. Furthermore, the results of our studies supported a theory of inter-hemispheric competition in the visuospatial attention network.

OR19-307AB-06

AN INVESTIGATION ON THE BILATERAL EFFECT OF EIGHT WEEKS UNILATERAL ELECTROACUPUNCTURE ON MUSCLE STRENGTH AND VOLUNTARY ACTIVATION

Liping Huang[1], Meiling Zhao[1], Shi Zhou[1,2], Ming Ao[1], Longjun Cao[1], Jun Liang[1]

[1]Tianjin University of Sport, China, [2]South Cross University, Australia

Objective: An investigation on the bilateral effect of eight weeks unilateral electroacupuncture at the acupoints on muscle strength and voluntary activation. *Methods:* Thirty participants were enrolled and randomly allocated into three groups according to the enrolled and exclusive criterion: electroacupuncture on acupoints group (E-ACUP, n=10), electroacupuncture on sham point group (SHAM, n=10) and control group (CON, n=10). The right leg was the target of interventions. Acupoint ST36 and ST39 were pricked in the E-ACUP group. The SHAM group was applied to the anterior tibialis muscle belly nearby ST36 and ST39, away from the meridian and acupoints in traditional Chinese medicine. Participants in both two groups were given 3 sessions of electroacupuncture a week for eight weeks, 30 min for each session. The parameters of electroacupuncture applied to the points were constant current, discontinuous wave, cycles of 7 second on and 7 second off, pulse width of 0.5 ms, frequency of 50 Hz, participants' tolerance intensity. Bilateral muscle strength and muscle activation of anterior tibialis muscle were tested pre- and post-experiment and after detraining. *Results:* Bilateral maximum voluntary contractions of anterior tibialis muscle were increased by both electrostimulation on the right leg acupoints [23.1% (left), 15.75% (right), $p<0.01$] and nonacupoints [17.5% (left), 13.62% (right), $p<0.01$] 8 weeks later compared to control group. Bilateral voluntary activation of anterior tibialis muscle was improved by E-ACU[7.36% (left), 6.92% (right), $p<0.05$] and SHAM [7.79% (right), $p<0.05$] compared to control group, respectively. Bilateral muscle strength increment in E-ACU lasted longer after detraining than other groups. It implied that acupoints' cross effect of strength increment may be specific for rehabilitation.

OR19-307AB-07

THE INFLUENCE OF VISION ON POSTURAL CONTROL DURING CLIMBING STAIRS IN OLDER ADULTS WITH AND WITHOUT CHRONIC LOW BACK PAIN

Shi Hong Ching[1], Sang-I Lin[1], Kuo-Yuan Huang[2], Yi-Ju Tsai[1]

[1]Department of Physical Therapy, National Cheng Kung University, Tainan, Chinese Taipei, [2]Department of Orthopedics, National Cheng Kung University Hospital, Tainan, Chinese Taipei

Objective: To investigate the influence of different visual conditions on postural sway while walking onto a stair in older adults with and without chronic low back pain (CLBP). *Method:* Older adults aged over sixty years participated in this preliminary study including six patients with CLBP and six as healthy controls. Older adults were instructed to walk on a five-meters walkway and then climbing onto a stair with 18-cm height that mimic activities during daily life. Older adults were required to walk under two visual conditions: normal vision and blurred vision while wearing a blurred goggle. Postural control indicated as center of pressure (COP) was measured using a portable force platform fixed on the stair. Only the COP data during the single limb support phase was analyzed. *Results*: Older patients with CLBP had significantly greater COP medolateral displacement (p=0.007), and path ellipse area (p=0.031) than healthy controls. Moreover, a trend of interaction effect was observed in the path ellipse area (p=0.060). Older patients with CLBP tended to have greater COP ellipse area in the blurred vision condition compared to the normal vision condition (p=0.009), while the healthy older adults did not differ significantly between the two vision conditions (p=0.917). *Implications on Rehabilitation*: Greater postural sway while climbing onto a stair when the vision was deprived was only observed in older patients with CLBP but not in healthy older controls suggests that older patients with CLBP may rely more on the vision input for maintaining balance than healthy controls. The results may also imply the possible deficits of proprioception or somatosensory in older patients with CLBP.

OR19-307AB-08

EARLY MEMORY INTERVENTION FOR AMNESIC MILD COGNITIVE IMPAIRMENT: A RANDOMIZED CONTROLLED TRIAL

Wanzhen Wu[1,2], Yinhua Zhu[2], Bozhong Wang[2], Aihua Ren[2], Enyan Yu[3], Liyue Zhu[2], Jianmei Zhou[2]

[1]Department of the psychiatry, Zhejiang Hospital, Hangzhou, [2]Department of Rehabilitation, Zhejiang Hospital, Hangzhou, [3]Department of the psychiatry, Zhejiang Provincial Peoples Hospital, Zhejiang Hospital, Hangzhou, Zhejiang province, China

Background: Cognitive intervention could improve cognition for healthy older adults, Alzheimer's disease and other dementia, yet there is limited information about the benefit of memory training for older adults with amnesic mild cognitive impairment. *Objective*: To investigate the usefulness of an early memory intervention for the memory difficulties experienced by people with amnesic mild cognitive impairment. *Methods:* Using a randomized control design, 78 participants with amnesic mild cognitive impairment were randomly assigned to a memory rehabilitation group or control group. Participants were assessed on primary measures of everyday memory (prospective memory) and memory strategies at 6 weeks' and 6 months' follow-up. Memory techniques included errorless learning, mind mapping, visual imagery and face-name association's strategy. Briefly, errorless learning consists in reducing or eliminating errors during learning. *Results*: Everyday memory was measured by performance on objective immediate/delayed memory tasks, and significantly improved following intervention. There was a strong trend towards improvement in self-appraisal of everyday memory. Knowledge and management of memory strategies also significantly increased following intervention. The time about memory intervention was longer, and the effects were more significant. *Implications*: Memory training is likely to be effective for managing memory difficulties. Early memory intervention could help minimizing everyday memory failures for memory in amnestic mild cognitive impairment. The research was supported by grants from Zhejiang Provincial Natural Sciences foundation (NO. Y2091289).

OR19-307AB-09

CLINICAL CONTRAST STUDY OF COGNITIVE FUNCTION EXERCISE OR TAKING ARICEPT ORALLY IN TREATMENT OF PARKINSON'S DISEASE DEMENTIA

Bing Chen, Jian-Ping Huang, Jian-Fei Chen, Yuan Zhang, Kun Yang, Deng-Chong Wu, Mei Yu, Guo-Wei Zhang

The Traditional Chinese Medicine hospital of WenZhou, China

Objective: To study the efficacy of Cognitive Function Exercise or Taking Aricept Orally in Treatment of Parkinson's Disease Dementia. *Methods:* Fifty PDD patients were randomly administered with cognitive function exercise (experimental group n=24) or taking ARICEPT Orally (control group n=26). To evaluate the clinical effect in 0\4\8\12 weeks with Chinese version of Montreal Cognitive Assessmen (MoCA) and Unified Parkinson's Disease Rating Scale (UPDRS). *Results*: After 4 weeks the score of MoCA of experimental group was higher significantly than that of control group (p<0.05), but after 8 weeks, this difference was disappear. 1) After 4 weeks the score of UPDRS part-I of experimental group was lower significantly than that of control group (p<0.05), but after 8 weeks, this difference was disappear. 2) The scores of UPDRS part-II was no significantly differences both intra-group and group comparison. 3) When 4–8 weeks the scores of UPDRS part-III of control group was higher significantly than that of experimental group, then this difference was disappear after 12 weeks. *Conclusions:* The efficacy of Cognitive Function Exercise or Taking Aricept Orally in Treatment of Parkinson's Disease Dementia were similar but the former play effect faster than the latter, and has less adverse reactions.

OR19-308-01

CHARACTERISTICS OF LOCALIZATION AND DISPERSION OF ALCOHOL INJECTION ALONG NERVE STEM

Shouguo Liu[1], Jianan Li[1], Jackson Kurt[1], Jie Zhu[1], Xiao Lu[1], Bing Li[1]

[1]Department of Rehabilitation Medicine, the First Affiliated Hospital of Nanjing Medical University, China, [2]Department of Health and Sports Science, University of Dayton, Dayton, OH, United States, [3]Jiangsu Jiankang Vocational college, Nanjing, [4]Wuxi Tongren Rehabiliation Hospital, Wuxi, China

Objective: To explore the relationship between the amount of electrical current required and the nerve-needle distance for the localization of nerve block injection sites. Additionally, to evaluate the effects of different injection speeds, concentrations and injectate volumes on tissue dispersion in the alcohol nerve block procedure. *Methods:* 14 tibial nerves of 7 rabbits were selected for nerve localization component of the study. The nerve-needle distance was located by 3-dimensional manipulator. The minimum current eliciting motor response was recorded at the nerve-needle distances of 0 mm, 1 mm, 2 mm, 3 mm, 4 mm and 5 mm. 54 tibial nerves of 27 rabbits were used for the dispersion study and randomly assigned to a speed group (SG, n=18, including 3 subgroups: Ia, 0.004 ml/s; Ib, 0.01 ml/s; Ic, 0.1 ml/s), concentration group (CG, n=12, including 2 subgroups: IIa, 50%; IIb, 100%) and volume group (VG, n=24, including 4 subgroups: IIIa, 0.1 ml; IIIb, 0.3 ml; IIIc, 0.5 ml; IIId, 1ml). All tibial nerves were successfully located with a nerve stimulator and neurolyzed with a mixed solution of alcohol and contrast medium. 10 min following the injection, helical CT scanning was performed to measure the volume and dispersion pattern of the injectate using three-dimensional reconstruction. *Results*: In the localization study, linear regression analysis showed linear relationship between nerve-needle distance (X) and the minimal current (Y), and the regression equation is $Y=0.13X+0.22$ ($r^2=0.974$, $p<0.05$). In the dispersion study, in SG the volume of alcohol spread of subgroup Ic was more than that in subgroup Ia and Ib ($p<0.05$). In CG there was no statistically difference between the two subgroups ($p>0.05$). In VG all subgroups demonstrated significant differences between each other ($p<0.05$). *Conclusion:* A positive-linear relationship of the nerve-needle distance and electrical current exists in nerve block procedure. Alcohol spreads longitudinally along the tibial nerve. The speed and volume of injectate can significantly influence the volume of alcohol spread while concentration has no effect.

OR19-308-02

EARLY OUTPATIENT REHABILITATION FOLLOWING LUNG TRANSPLANTATION

Gerold Ebenbichler[1], U Maier[1], V. Augustin[1], J. Gibley[1], S. Doblhammer[1], C. Molderings[1], P. Jaksch[1], G. Muraközy[1], K. Kerschan-Schindl[1]

[1]Department of PMR, [2]Department of Thoracic Surgery, Vienna Medical University, Vienna, Austria

Objective: Set up an early outpatient rehabilitation program following lung transplantation (LuTX); follow the effects of rehabilitation. *Methods:* This prospective observation included 20 patients who had undergone single or double LuTX (n=18) at the department of thoracic surgery, and participated - independently from postoperative complications - in a 2 months' outpatient rehabilitation program at the department of PMR, Vienna Medical University. Interventions comprised of regularly supervised therapeutic and breathing exercises, neuromuscular electrostimulation, psychological and dietic consultations, and regular encouragement to perform daily muscle and breathing exercises themselves. Main outcome measures were vital capacity (VC%), forced expiratory volume in 1 second (FEV1%), 6 min walking test (6MWT), fatigue at the end of the 6MWT (VAS), handgrip strength, number of repetitions of a free chair rise test.

Results: Subjects (mean age: 39±13 years, BMI: 20.6±1.8 kg/m²) started rehabilitation 33±32 days after LuTX. The program lasted for 64.7±14 days. VC% improved by 16.5% (95% CI: 10–23) and FEV% by 18% (95% CI: 11–25). The 6MWT (baseline: 402±113 m) was improved by 172 m (95% CI: 134–211) at the end of the program. Both the hand grip strength and the number of repetitions of the chair rise test were also found significantly improved at the end of the intervention. *Conclusions:* LuTX recipients undergoing early outpatient rehabilitation benefit from such intervention. Perceived gains in exercise performance seem comparable to those observed in early inpatient programs. Regular encouragement to optimize patients' adherence with unsupervised training is assumed to be of utmost importance for the success of the program.

OR19-308-03

A RANDOMISED CONTROLLED TRIAL IN TWO EARLY INTERVENTIONS FOR ROAD TRAUMA – EARLY REHABILITATION VERSES AN EDUCATION INTERVENTION

Steven Faux, Roslyn Mozer, John Estell, Freibert Kohler, Scott D'amours, Jenny Chapman, Ian Harris

Objective: To assess the impact on persisstent pain at 3 months for mild-to-moderate road trauma injury and 6 months for severe grade road trauma injury from baseline following one of two interventions an early consultation with a rehabilitation physician or a posted letter with information and advice to see the local doctor. *Method*: a multi-site single-blinded stratified randomized controlled trial. 184 subjects – 92 in early rehabilitation intervention arm and 92 in education intervention. Recruitment over 18 months 2010–2012. Subjects with mild to moderate injury followed for 3 months, those with severe injury for 6 months. Pain was measured using the pain index (0–100) from the orebro musculoskeltal screening questionnaire. *Results*: Over 89% of injuries were mild in this cohort and 70.2% had returned to work or usual activities by 3 months following road trauma. There were no significant differences in either group with respect to mean pain undex at 3 months (rehab group 24.6 Vs information group 26.9). Qualitative data indicated that over 20% had ongoing treatment despite returning to work. Those suffered adverse events related to the injury (11.8%) (missed injuries, further hospitalisation or surgery) had them resolved within 26 days in the intervention group and 86 days in the control group. *Implications/ impact on rehabilitation*: In this cohort of largely mild injuries following road trauma, a simple targeted education strategy referring people to existing health infrastructure resulted in equivalent prevention of persistent pain as a targeted early rehabilitation intervention involving a hospital based consultation.

OR19-308-04

PROSTHETIC MANAGEMENT FOLLOWING ROTATIONPLASTY

Noel So*, Karen Andrews, Thomas Shives, Peter Rose, William Shaughnessy, Franklin Sim
Mayo Clinic, Rochester, United States

Objective: To explain the rehabilitation course and determine the typical time for prosthetic fitting following rotationplasty. This study evaluated the disease status, prosthetic rehabilitation, and function of 12 patients who underwent rotationplasty from 1985–2011. *Methods:* We conducted a retrospective, observational study of 12 patients who underwent rotationplasty at a tertiary care, outpatient, multidisciplinary practice that follows patients with amputations through the continuum of their care. Data collection included patient demographics, type of cancer, location of cancer, adjunctive chemotherapy, need for additional surgical procedures, use of a provisional prosthesis, time to fit for first prosthesis, total number of prosthesis obtained, presence of neuropathic pain or phantom sensation, and return to sports. Descriptive analysis was performed. *Results:* Median age at amputation was 10 years. The mortality was 8.3% (1 out of the 12 patients had aggressive metastasis that lead to demise three years following rotationplasty). 100% of the population was successfully fitted. 25% (3 out of 12 patients) received a definitive prosthesis in less than 90 days. 50% of patients had received a bypass temporary prosthesis. 58.3% of the patients had documentation supporting a return to sport/premorbid physical recreational activities. 7 patients (58%) had phantom sensation/ pain postoperatively, with only 1 patient (8.3%) reporting continued symptoms at 6 months follow-up (8.3%). None of the patients have requested conversion to a transfemoral amputation. *Impact on Rehabilitation*: Knowing the factors that may affect prosthetic rehabilitation following rotationplasty is important for perioperative counseling and decision making.

OR19-308-05

FEATURES OF EARLY REHABILITATION OF THE PATIENTS WITH THE CARDIOEMBOLIC STROKE (CES) AND CHRONIC HEART FAILURE (CHF)

Tatyana Isaeva*, Irina Sidyakina, Tatyana Shapovalenko, Konstantin Lyadov
Medical and Rehabilitation Center, Russia

Relevance: One of the most important tasks of rehabilitation of patients with CES is the optimization and development of safe rehabilitation programs considering the presence of CHF. *Purpose*: To estimate effectiveness and safety of rehabilitation programs, including various methods of verticalization in the acute period of CES in patients with varying degrees of CHF. *Material and methods:* 88 patients were involved in this study, the main group consisted of 47 patients (31 of them with CHF2-3), the control - 41 patients (26 with CHF2-3) (retrospective). Duration of disease was on average of 10.1 [5;14] days, the severity of the stroke on average was 15.7 [10,0;21,0] points on a scale NIHSS Rehabilitation programs included the passive and active measures, including verticalisation. Patients of the main group were verticailised by "Erigo" device, in the control group a tilt-table was used. Rehabilitation programs were strictly individual. The average length of hospital stay was 45 days. *Results:* In the main group verticalisation of patients by «Erigo» was significantly less often accompanied by orthostatic reactions (12,5%\4 patients) vs 46%\12 patients in the control group. In the control group we checked thrombosis of the veins of legs in 16.67% of patients, and 8.3% of patients had a stagnant pneumonia. In the main group there were no such complications. *Conclusion:* Robotic verticalisation by "Erigo" device is a safe method of rehabilitation of patients with a severe stroke associated with CHF, as well as the prevention of pneumonia and thrombosis of the lower extremities.

OR19-308-06

THE EFFICACY OF BOTULINUM TOXIN A INJECTION FOR PES VARUS DURING GAIT USING THREE-DIMENSIONAL GAIT ANALYSIS SYSTEM

Hiroki Tanikawa[1,2], Hitoshi Kagaya[2], Eiichi Saitoh[2], Kenichi Ozaki[3], Norihide Itoh[4], Junya Yamada[1], Ieyasu Watanabe[1], Takemitsu Aoki[5]
[1]Department of Rehabilitation, Fujita Health University Hospital, [2]Department of Rehabilitation Medicine I, School of Medicine, Fujita Health University, [3]Department of Rehabilitation Medicine, National Hospital for Geriatrics Medicine, [4] Faculty of Rehabilitation, School of Health Sciences, Fujita Health University, [5]KISSEI COMTEC Co., Ltd, Japan

Objective: Many studies showed the efficacy of the botulinum toxin A (BoNTA) injections for lower limb spasticity in hemiplegic patients. However, they evaluated only muscle tone at rest. Few

reports evaluated the spasticity during motion. The purpose of this study was to investigate the efficacy of BoNTA injections for the treatment of pes varus during gait by 3D motion analysis system. *Methods:* Subjects were 12 hemiplegic patients with an average age of 53 years. The time after onset was 2,178 days on average. All patients showed pes varus especially during the swing phase of gait. They underwent the injections of BoNTA to their tibialis posterior (12 patients), gastrocnemius (7 patients), flexor digitorum longus (7 patients), and flexor hallucis longs muscles (2 patients). The Modified Ashworth Scale (MAS) and the varus angle during treadmill gait by 3D motion analysis system (KinemaTracer®: KISSEI COMTEC) were measured before, 2, 6, and 12 weeks after the injections. *Results*: The median MAS in all patients decreased 2 weeks after the injections, and it remained until 12 weeks after the injections. The varus angle decreased significantly 2 and 6 weeks after the injections in 10 patients. The angle became worse in the remaining 2 patients, and they had pain in the affected foot by 6 weeks after the injections. *Implications*: The BoNTA injections were effective for the treatment of pes varus during gait. Not only changes in muscle tone at rest, but those in motion as well are important to evaluate the efficacy of injections.

OR19-308-07

NUTRITIONAL STATUS OF HOSPITALIZED REHABILITATION PATIENTS IN SINGAPORE

Jie Yang[1]*, Yet Hua Loh[1], Lee Boo Tan[1], Yee Sien Ng[2]

[1]Department of Dietetics, and [2]Department of Rehabilitation Medicine, Singapore General Hospital, Singapore

Objective: Malnutrition is a significant condition that can negatively affect hospitalized patients. Yet, little attention is given to nutrition and its effects on rehabilitation outcomes. This study aims to investigate the nutritional status of hospitalized rehabilitation patients and the effect of nutritional status on overall functional outcomes and length of hospital stay (LOS). *Method*: A cross-sectional study of patients hospitalized in rehabilitation wards was conducted over a six-month period (June-November 2012). Within 72 h of admission/transfer to rehabilitation wards, demographics, anthropometrics and Functional Independence Measure (FIM) score were obtained. FIM was repeated weekly. Using Subjective Global Assessment (SGA), a Dietitian assessed and categorised patient's nutritional status into: well-nourished, mild-to-moderately malnourished or severely-malnourished. Additionally, Mini Nutritional Assessment (MNA) was performed for patients aged ≥65 years. *Results*: In this study, 109 patients (59% male) were included. Ethnic distribution was 86% Chinese, 7% Malay and 7% Indian; mean age was 68.8±14.2 years. Approximately 45% patients (n=49) were mild-to-moderately malnourished and 11% (n=12) severely-malnourished. In the elderly (n=71), MNA revealed 31% were malnourished and 37% at risk of malnutrition. There was a significant difference in FIM score improvement (mean difference) in the well-nourished compared with severely-malnourished ones (60.3 vs. 33.5) (p=0.03). Severely-malnourished patients had longer LOS (mean = 51±31 days) when compared with well-nourished (31±18 days) and mild-to-moderately malnourished (34±20 days) groups (p<0.02). *Implication/Impact on Rehabilitation*: More than half of rehabilitation patients were malnourished. Nutritional status appears to influence functional outcomes and LOS. These findings emphasise the need for early nutritional status assessment/identification in rehabilitation patients to ensure timely nutrition intervention for better outcomes.

OR19-308-08

POSSIBILITY OF ADVANCED HAND ACTIVITY REHABILITATION WITH THE USE OF SENSOR GLOVES

Elena Mozheyko*, Semyon Prokopenko, Grigory Alexeyevich

Krasnoyarsk state medical university named after professor V.F. Voino-Yassenetsky, Russia

Introduction: Paralysis is one of the most common disabilities resulting from stroke. Loss of arm-hand performance due to a hemiparesis as a result of stroke or cerebral palsy, leads to large problems in daily life. *Methods:* Of neurorehabilitation based on computer games are gaining more and more attention. Objectives of the study was to assess the effectiveness of sensor gloves for hand activity rehabilitation. *Methods*: The treatment group consisted of 27 persons suffered an ischemic stroke 1 to 6 months before the experiment, the control group was made of 23 stroke survivors. Scales used to assess motor deficit: NIHSS, Ashwort scale, Fugl-Meyer Motor Test (FMA), Motor Assessment Scale (MAS), 9 Peg Hole test; a questionnaire of Disabilities of the Arm, Shoulder and Hand (DASH). Cognitive examination was performed with the use of MMSE, FAB. Intervention group patients received two courses of exercises with the use of sensor gloves lasted 28–30 days, duration of training sessions – 30–40 min. *Results*: MAS and FMA results demonstrated a statistically significant improvement of upper extremity functions in treatment group (p=0.03 and p=0.001, respectively). Results of DASH did not show significant improvement by the end of the first treatment course, but there was a tendency for improvement after the second course. Use of sensor gloves did not provoke an increase in spasticity according to Ashwort scale. *Conclusion:* The first experience of use of sensor gloves for correction of advanced hand activity after the stroke has shown high effectiveness.

OR19-308-09

A DESIGN OF DATA GLOVE FOR THE REHABILITATION AND QUANTITATIVE ASSESSMENT OF HAND FUNCTION

Jue Wang[1,2], Yang Zheng[1], Mingming Zhang[1,2], Yonghui Qin[1], Xiaofeng Guo[1]

[1]The Key Laboratory of Biomedical Information Engineering of Ministry of Education, Institute of Biomedical Engineering, School of Life Science and Technology, Xi'an Jiaotong University, [2]International Research Center of Health and Rehabilitation Sciences, Suzhou Research Institute, Xian Jiaotong University, China

Objective: Rehabilitation for hemiplegia caused by brain injuries is an international problem. There is no effective means for quantitative assessment of the effect of rehabilitation. A data glove was designed for the rehabilitation training and quantitative assessment of hand function. *Method*: Flex sensors and flexible force sensing resistors were encapsulated inside the glove and located in the dorsal side and the palm side respectively. The former was used to measure the bending angles of the joints of each finger as indicators of motion range of fingers and the latter was utilized to detect the force on the palm side as a measure of exercise capacity of hands with resistance. According to the manual muscle test (MMT), virtual reality environment was built based on the two kinds of information described above for immersion training of patients with different muscle strength. The virtual reality environment could lead patients to grab with or without resistance, to grab with a given speed and to maintain a certain posture of hands, etc. Meanwhile, information recorded by sensors was used to give a quantitative assessment of motion range, speed and exercise capacity with resistance. *Implications/impact on rehabilitation*: The design of the data glove provides means and methods for objective and quantitative assessment of rehabilitation effect of hand function for stroke patients. It can be used as an auxiliary instrument for hospital rehabilitation equipment and alone as rehabilitation equipment into the home or community-based rehabilitation.

OR19-311B-01

COMMUNITY BASED REHABILITATION (CBR) SERVICES IN RURAL BANGLADESH, CONCEPTS OF A MODEL PROJECT

Shahidur Rahman*, Akm Salek
BSM Medical University, Bangladesh

Objectives: The overall aim of community based rehabilitation (CBR) is to achieve community-based inclusive development where people with disabilities and their family members are part of the all developmental initiatives like millennium development goals with equal rights and opportunities like others. Bangladesh with 150 million populations has about 10 million disabled lives in rural area. The concept of this model project if implemented can reduce the sufferings of rural disabled at large and bring them into mainstream of development. *Methods*: The project will be implemented at sub-district level where about 3000000 peoples reside. A CBR committee will be formed comprising of a rehab personnel, local administrative head, government health officer, social welfare officer, political leaders, Imam of mosque and representatives from disabled. A data information base of all disabled of the sub-district identifying and quantifying their needs will be made. Healthcare, microcredit facilities, vocational training, and workshop for manufacturing low cost devices will be arranged to meet the needs of disabled. *Results*: If these rural poor disabled can be addressed in realistic and humanistic way, an optimistic positive impact will flourish our social harmony as well as our national economy. Successful implementation of this model project in a small area of Bangladesh can be example to others in developing countries. *Implications*: Funding is the main obstacle to start and continue this project. Reach communities of other parts of world, WHO and societies working with disabled should come forward to meet the need of rural disabled in low resource region.

OR19-311B-02

IMPLEMENTATION OF THE ACTIVE AGING PROGRAMME FOR OLDER ADULTS WITH BIOPSYCHOSOCIAL RISK IN UNIT OF PHYSICAL MEDICINE AND REHABILITATION NO. 1 AND SEGURITY CENTER IMSS-MEXICO

Lucia Allen*, Isabel Aguilar
Mexican Social Security Institute, Mexico

Background: The implementation of program of multiple activities for active aging of older adults, including risk factors modify dysfunctional, provides greater independence and quality of life. *Objective*: To determine the benefit of implementing active aging program in biopsychosocial conditions of the elderly. *Material and Methods:* A quasi-experimental, prospective, analytic in 19 people over 60 years, both sexes, Unit of Physical Medicine and Rehabilitation No.1 and Social Security Center IMSS Monterrey Mexico, during October-November 2012 applying Active Ageing program with: Tai Chi Chuan, Dance Therapy, Nutrition Counseling and Water Activities, performing initial and final evaluations of Yesavage depression Scale, Barthel functional scale, flexibility assessment, dietary habits questionnaire and Endurance assessment with heart rate. Descriptive statistics and Student t test for quantitative variables. *Results*: The Barthel Scale found no alteration prior to the program, no statistical significance ($p > 0.099$), the scale of Yesavage, eating habits questionnaire, flexibility and endurance benefit was statistically significant. *Impact*: The implementation of active aging program generates optimal benefit in reducing complications affecting functional independence and quality of life of elderly people and reduce institutional cost.

OR19-311B-03

EFFICACY OF HOME VISIT SURVEY AFTER DISCHARGE TO ASSESS INPATIENT REHABILITATION PROGRAM – THE END POINT OF REHABILITATION IS NOT DISCHARGE BUT GOOD QUALITY LIFE AT HOME

Giichiro Ohno, Aiko Muramatsu, Eri Kitamura, Naomi Tokura, Miki Kanno, Miyuki Ito*
Tokatsu Hospital, Japan

Objective: To investigate the effect of home visit survey after discharge (HVS) to assess the inpatient rehabilitation program. *Method*: The goal of rehabilitation is decided based upon patient`s medical information and also the family background and home environment From April 2009 to November 2012, 3771 patients discharged our hospital after rehabilitation therapy. The hospital rehabilitation staffs visited to forty five patients of them after discharge. The activities of daily living (ADL) were compared between at discharge and home. A questionnaire on HVS was conducted on 40 hospital rehabilitation staffs. *Results*: There were 45 patients with age range 32–88 (mean 72.6) years and a male-to female ration of 29:16. Twenty one of them were admitted for rehabilitation after stroke and other neurologic diseases, 5 were orthopedic conditions and 16 were disuse muscular atrophy. HVS were performed between 3 weeks and 14 months. Compared with at discharge, ADL at visit improved in 24 patients (53.5%), preserved in 19 (42%) and worsened in 2 (4.4%). Those group which improve ADL were 70`s and 80`s in age, disuse muscular atrophy and orthopedic problems in diseases, between 2 and 12 months in visit period and those who continue rehabilitation after discharge. A questionnaire on hospital rehabilitation staffs shows that three forth of them have experience of HVS and that they estimate ADL after discharge keep well more than their forecast and assess HVS very useful in rehabilitation planning. *Conclusion:* HVS is effective on estimating and making inpatient rehabilitation program.

OR19-311B-04

MOBILE UNIT REHABILITATION: EXPANDING THE ROLE OF OCCUPATIONAL THERAPY IN THE STATE OF SÃO PAULO

Tatiana Domingues Pedroso
Fundação Faculdade de Medicina, Brazil

Objective: The Mobile Unit Rehabilitation has been designed mainly for delivery of equipment such as orthotics, prosthetics and wheelchair in the State of São Paulo attendances conducts multidisciplinary character of IMREA HC FMUSP - Lucy Montoro. The aim of this study was to present the work of the Occupational Therapy Service in Mobile Rehabilitation Unit from January 2009 to April 2011 and analyze data such as clinical diagnoses, demographic data and access to treatment and rehabilitation equipment. *Methodology*: Primary care occupational therapy had focused on indication and orthotics upper limb (UL) and assistive technology devices, evaluation and adjustment of the sitting position in a wheelchair, assessment and guidelines for the use of upper limb prosthesis, guidance for performance in activities of daily living. *Results*: We collected patient data and we observed that most of the population served was comprised of individuals with disabilities resulting from Cerebral Palsy and Stroke and Brain Injury, aged 03-20 years followed by 41 to 50 years, with the largest number of individuals of gender male. *Implications/Impact on Rehabilitation*: After initial treatment, some patients underwent return between 2–3 months to review on the use of equipment and adherence to guidelines. It was found that much of the population served had no access to treatment or

the basic guidelines of an occupational therapist for the prevention of disabilities as well as for functional performance and participation in everyday activities, thus reinforcing the importance of the participation of this professional in the Mobile Unit.

OR19-311B-05

THE IMPORTANCE OF HEALTH EDUCATION FOR THE COMMUNITY-BASED PULMONARY REHABILITATION OF PATIENTS WITH STABLE COPD

Wen Zhang, Fei He, Wen-Hua Chen, Xian-Qiao Jin
Department of Rehablitation, Shanghai First People's Hospital, China

Objective: To investigate the impact of health education for the pulmonary rehabilitation of patients with the chronic obstructive pulmonary disease (COPD) in community *Methods:* 46 patients were divided into 2 groups by place of residence, 25 patients in intervention group, 21 patients in control group. The intervention group accepted exercise prescription (exercise prescription of Traditional Chinese Medicine) and a 10-month rehabilitation health education (A total of 10 collective lectures). The control group only got a random education and some promotional materials about disease. The Bristol COPD Knowledge Questionnaire (BCKQ) test was taken by two groups before and after the 10-months health education. *Results*: After the 10-month health education, the BCKQ score of intervention group improved significantly ($p<0.01$), and there was a significant difference ($p<0.01$) of BCKQ score between two groups. *Implications on Rehabilitation*: Health education may be able to effectively improve the mastery of the disease-related knowledge for COPD patients in the community. It is imperative to carry out health education in the community, in order to help patients control symptoms, avoid the acute attack, reduce the psychological pressure, and maintain a stable state, so as to play an active role in the rehabilitation of disease.

OR19-311B-06

A NINE-INSTITUTION (SEVEN COUNTRIES)-MULTI-CENTER STUDY ON SPECIALIZED STROKE REHABILITATION

Birgitta Langhammer[1,2], Johan Kvalvik Stanghelle[2,3], Susanne Sällström[2], Frank Becker[2,3], Tong Zhang[4], Tamara Bushnik[5], Maria Panchenko[6], Ofer Keren[7], Samir Banura[8], Elessi Khamis[9], Åsa Lundgren-Nilsson[10], Li Xie[11]
[1]Oslo and Akershus University College, [2]Sunnaas Rehabilitation Hospital, Norway, [3]University of Oslo, Norway, [4]China Rehabilitation Research Center, Beijing, China, [5]Rusk Institute of rehabilitation, New York, United States, [6]Policlinic no2, Petrozavodsk, [7]Sheba Medical center, Tel Aviv, [8]Betlehem Arab Society for Rehabilitation, Betlehem, [9]El Wafa hospital, Gaza, Israel, [10]Sahlgrenska University hospital, Gothenburg, Sweden, [11]Sichuan 81 rehabilitation Center, Chengdu, China

Background: Stroke rehabilitation can successfully be administered in the general hospital, in specialized rehabilitation hospitals, in nursing facilities or at home. Some persons with stroke have severe complications and are in need of specialized rehabilitation. However, services provided in specialized rehabilitation centers are not standardized or described as services in an acute stroke unit. In-patient stroke rehabilitation services may differ widely from clinic to clinic, and from country to country. The present study aims to get an overview of the specialized stroke rehabilitation services in nine different institutions in seven countries, and to study the outcomes of stroke patients served in these institutions. *Purpose and aim*: 1. A descriptive study of the stroke rehabilitation content in specialized clinics in seven countries: procedures for admission to rehabilitation, services available and provided to patients, as well as length of stay and discharge routines. 2. An observational study of changes in regard to physical function, quality of life and psycho-social factors in stroke patients before and after specialized rehabilitation. *Material*: Patients with a primary diagnosis of stroke as defined by the World Health Organization and irrespective of age are invited to be consecutively enrolled in the study. Inclusion criteria are stroke patients in need of specialized rehabilitation and voluntary participation. Exclusion criteria are sub-arachnoid hemorrhage, tumor, or other severe medical conditions in combination with stroke. Participation in the study is voluntary, and subjects must be able to cooperate for performing the planned measurements. *Methods/Outcome measures:* A general description of centers participating in the study, and particular description of the content of "specialized rehabilitation" is presented, as well as priorities for admission, time delay between stroke debut and admission, waiting lists, determinants for and length of stay, follow up procedures etc. National Institutes of health stroke Scale (NIHSS), a quantitative measure of stroke-related neurologic deficit, Modified Rankin Scale (MRS) measuring the degree of disability or dependence, Barthel Index (BI) alternatively Functional Independence Measure (FIM), measurement of activities of daily living, Life Satisfaction Scale (LISAT-11), and a semi-structured interview with focus on the social situation are registered before and after rehabilitation and six months post rehabilitation.

OR19-311B-07

CHALLENGES AND OPPORTUNITIES OF REHABILITATION DEVELOPMENT IN CHINA

Jianjun Li
[1]China Rehabilitation Research Center, [2]Faculty of Rehabilitation Medicine, Capital Medical University, China

Objective: This study is to summarize the current situation and characteristics of rehabilitation in China, and to explore the direction and strategies of the further development of rehabilitation. *Method*: The history and experiences of rehabilitation development at home and abroad was studied by literature, and the current situation of rehabilitation in China was investigated by the questionnaire survey. *Results*: With the rapid development in the past 30 years, the rehabilitation in China has made great achievements and improvements. However, there is still a large gap with the developed countries, as well as Hong Kong area, and Taiwan area. In addition, there are a variety of problems to be resolved in future. *Implications on rehabilitation*: Experienced the period of rapid development with the initiating, accelerating, and catching up the world's advanced level, how to further improve the welfare system and service system highly related to the rehabilitation development, which is to be able to enter a new stage with coordinated and sustainable development, and accumulate strong power for long-term development. The reselection of the development strategies are not only new challenges, also new opportunities for further development, for example, how to make adjustments of the new rehabilitation philosophy and thinking, how to innovate the policies, standards and regulations, and how to form a multidisciplinary rehabilitation personnel training network and model.

OR19-311B-08

NATIONAL INSTITUTES OF HEALTH REHABILITATION RESEARCH FUNDING TRENDS: UNITED STATES AND BEYOND

Jiaxin Tran, Radhika Bapineedu
UMDNJ-New Jersey Medical School, United States

Objective: The National Institutes of Health (NIH) in United States invested $1.89 billion supporting research in rehabilitation in the past years. We aim to characterize projects that received the funds, and predict their effects on rehabilitation medicine by analyzing the

record of previous NIH-led research. *Method*: Data for NIH-funded projects between 2008 and 2011 were obtained from Research Portfolio Online Reporting Tools. Trends related to grant type, filing year, unique sponsoring institution and principal investigator, related categorization, and researcher-selected keywords were identified and compared between projects led by international and U.S. organizations. Lastly, MEDline and Scopus were used to assess the publication impact of previous NIH-funded rehabilitation projects. *Results*: Neurorehabilitaton/bioengineering and neurorehabilitation/behavioral science made up the primary research focus within the U.S and internationally, respectively. There is greater diversity among international sponsoring institutions than within the U.S. Organizations based in Americas, Europe, and Asia received $6.5 million from NIH; Canada and Sweden were the top two recipients. Less than 10% of the rehabilitation publications on MEDline receive NIH funds, but approximately 25% of the most cited articles are funded in part by NIH. Despite this success, NIH is not without flaws. Only 23% of the projects granted were new applications, and the "rehabilitation" category is occasionally applied liberally. *Implications/impact on rehabilitation*: Neurorehabilitation has the potential to grow significantly in the years ahead with NIH support. NIH may benefit from more new rehabilitation projects. All researchers can improve the impact of their projects by reviewing NIH grant scoring rubric.

OR19-311B-09

THE GLOBAL REHABILITATION CERTIFICATE PROGRAM OF THE INTERNATIONAL REHABILITATION FORUM

Andrew Haig[1,4], Olubisi Ajetunmobi[2], Sean Smith[1], Asare Christian[3], Meeta Peer[4]

[1]University of Michigan Department of Physical Medicine & Rehabilitation, [2]University of Michigan College of Literature, Science, and Arts, [3]Johns Hopkins University Department of Physical Medicine & Rehabilitation, [4]International Rehabilitation Forum, United States

Introduction: Rehabilitation medicine can be strengthened around the world by exchange of trainees and experienced clinicians. However there are important barriers to participation, including educational requirements of the home institution, identification of willing overseas programs, preparation for meaningful experience, and burden on the host. The Global Rehabilitation Certificate Program is designed for trainees in Physical and Rehabilitation Medicine. The program will award a certificate for participation and is designed to be integrated into their training curriculum. *Methods:* A conceptual framework was developed by the International Rehabilitation Forum board. Subsequently the first author, an undergraduate with international interest, and resident physicians from two programs flushed out the details of the certificate process. *Results*: The program is ready for beta testing. The modules are divided into pre-visit (knowledge about global rehabilitation, the country, rehabilitation systems in the country, and the unique issues for the site they are visiting, and goals for the visit. In the country certificate candidates will do whatever work brought them to the country. They will also be required to visit a disabled persons organization, perform an epidemiology exercise with the Language Independent Functional Evaluation, and record information useful for their portfolio. After returning home candidates will submit a 2 min video on their experience, submit their L.I.F.E. data to the student database and compare it with other student data, and provide feedback to the program about their educational experience. IRF member physicians will review the portfolio and confer a certificate if adequate. *Discussion*: This program can facilitate meaningful exchange of clinicians and trainees across borders. Substantial challenges still exist: There is no clear precedent for this approach, the interests and reactions of candidates and hosts need to be gauged. The framework or repository for information and the processes of approval require more study. Nevertheless, a first 2 trainees are scheduled to try the program in February 2012.

POSTER PRESENTATIONS (JUNE 16–20, 2013)

PO-0001

BDNF EXPRESSION SECONDARY TO TREADMILL TRAINING CONTRIBUTES TO THE LONG-TERM SUPPRESSION OF ALLODINIA AND SPASTICITY THROUGH FUNCTIONAL KCC2 INCREASE IN LUMBAR ENLARGEMENT AFTER THORACIC CORD INJURY

Syoichi Tashiro[1], Munehisa Shinozaki[2], Masahiko Mukaino[4,1], Francois Renault-Mihara[2], Liang Zhang[1], Hideyuki Okano[2], Masaya Nakamura[3], Meigen Liu[1]

[1]Dep. of Rehabilitation Medicine, KEIO univ. school of Medicine, Japan, [2]Dep. of Physiology, KEIO univ. school of Medicine, Japan, [3]Dep. of Orthopedics surgery, KEIO univ. school of Medicine, Japan, [4]Dep. of Rehabilitation Medicine, Asahikawa Medical university, Japan

Background: Spasticity and allodinia are major sequelae after spinal cord injury (SCI). Although several studies have shown that treadmill training (TT) improves them, the mechanism still remains unclear. So far, there have been studies reporting that BDNF was induced by training, that KCC2, Kaliume-Chloride cotrainsporter 2, was induced by BDNF administration after SCI, and that allodinia and spasticity were exacerbated by KCC2 down-regulation, separately. Here, we investigated how TT affects post SCI spasticity and allodinia, focusing on BDNF and KCC2 using rat contusive SCI model. *Material and Method:* In 50 adult rats, moderate contusive SCI was induced at Th10 level using an IH impactor (200 Kdynes). The animals were divided into 2 groups at random. In the training group, TT was performed using a robotic device from 7 to 21 post-operative days. In the control group, no exercise was performed. Spasticity, allodinia and locomotor function were assessed up to 7 weeks after SCI. Changes in BDNF and KCC2 expression of lumbar enlargement were assayed by western blotting. *Result:* Spasticity and sensory function were significantly improved in the training group. Interestingly, this trend continued at least following 4 weeks. In biological assaies, changes in phospho-KCC2 expression were closely associated with the improvement of spasticity and allodinia. Increase in BDNF expression was observed prior to that in KCC2. *Conclusion:* Present data indicate that TT would contribute to suppression of spasticity and allodinia through inducing BDNF expression and consequently functional KCC2 expression.

PO-0002

EFFECT OF RED PHOTON ON CASPASE-8 AND CASPASE-3 IN HYPOXIC-ISCHEMIC BRAIN DAMAGE ON ACUTE PHASE IN NEONATAL RATS

Long Chen, Wei Jiang, Xiao-Jian Zhang, Jie Chen, Nong Xiao

Childrens Hospital of Chongqing Medical University, Chongqing 400014, China

Objective: To investigate the effect of Red Photon on caspase-8 and caspase-3 inhypoxic-ischemic brain damage on acute phase in neonatal rats. *Methods:* 45 seven-day-old Sprague Dawley rats were randomly divided into Sham group, HIBD group, Photon group. HIBD group were induced using Rice-Vannueci model. Photon rats were irradiated on scalp by red photon immediately, 30min per day, lasted 3 days. 1) Random 10 rats of each group were sacrificed by cervical dislocation and the left hippocampus was rapidly isolated and snap-frozen in liquid nitrogen for use in mRNA and protein examination, on the 3 day. 2) Random 5 rats was used for immunofluorescence to evaluate the expression of caspase-8 and caspase-3 in the localization and semi quantitative. *Results:* The mRNA and protein of caspase-8 and caspase-3 in left hippocampus of rats were respectively higher expression of HIBD group than Sham group on 3 day ($p<0.05$). After irradiated by red light, the mRNA and protein expression of caspase-8 and caspase-3 were significantly decreased of Photon group than HIBD group. In the CA1 field, the caspase-8 and caspase-3 staining in Photon group were evident lower level than HIBD group. And the florescent light of was higher than HIBD rat. *Conclusion:* Photon can decrease the expression of apoptosis factor caspase-8 and caspase-3 of hypoxic ischemic brain damage in acute phase, and decrease the neural cells apoptosis, to achieve the purpose of treatment of hypoxic-ischemic brain damage.

PO-0003

ELECTROACUPUNCTURE AT BAIHUI AND SHENTING IMPROVES THE COGNITIVE IMPAIRMENT AFTER CEREBRAL ISCHEMIA-REPERFUSION INJURED RATS VIA NF-KB SIGNALING PATHWAY

Xiaodong Feng[1], Shanli Yang[2,3], Jiao Liu[5], Jia Huang[1], Jun Peng[4], Jiumao Lin[4], Jing Tao[1,2,3], Lidian Chen[1,2,3]

[1]College of Rehabilitation Medicine, China, [2]MOE Key Laboratory of Traditional Chinese Medicine on Osteology & Traumatology and Exercise Rehabilitation, China, [3]Fujian Key Laboratory of Exercise Rehabilitation, China, [4]Academy of Integrative Medicine, Fujian University of Traditional Chinese Medicine, China, [5]Henan Collage of Traditional Chinese Medicine, China

The Cognitive Impairment is a serious mental deficit after stroke especially in the Cerebral Ischemia-Reperfusion. Acupuncture at Baihui (DU20) and Shenting (DU24) acupoints has been used to treat the Cognitive impairment for a long time in the traditional Chinese medicine and has a unique curative effect. However, the mechanism has not been clarified. NF-κB-mediated neuronal cell apoptosis is involved in the development of post-stroke cognitive impairment; therefore it has become a promising target for treatment of impaired cognition. Using a rat model with focal cerebral ischemia/reperfusion (I/R) injury, in the present study we evaluated the therapeutic efficacy of electroacupuncture against post-stroke cognitive impairment and explored the molecular mechanisms. We found that the cerebral infarction, the behavior score in the neurological deficits, the Morris water maze can be improved obviously after electroacupuncture 10 ten days. Furthermore, electroacupuncture profoundly suppressed I/R-induced activation of NF-kB signaling in ischemic cerebral tissues. Consequently, the inhibitory effect of electroacupuncture on NF-kB activation led to the inhibition of cerebral cell apoptosis. Finally, electroacupuncture remarkably down-regulated the expression of pro-apoptotic Bax and Fas, two critical downstream target genes of NF-kB pathway. Collectively, our findings suggest that inhibition of NF-kB-mediated neuronal cell apoptosis might be one of the mechanisms whereby electroacupuncture at Baihui and Shenting exerts therapeutic effect on post-stroke cognitive impairment.

PO-0004

EFFECTS OF EXERCISE TRAINING AND STATIN ON TRIGLYCERIDE CONTENT AND XANTHINE OXIDOREDUCTASE IN THE LIVER OF OBESE ZUCKER RATS

Akihiro Sakuyama*, Osamu Ito, Liping Tan, Yoshiko Sakata, Rong Rong, Daisuke Ito, Masahiro Kohzuki

Department of Internal Medicine and Rehabilitation Science, Tohoku University Graduate School of Medicine, Sendai, Japan

Objective: It has been reported that exercise training (Ex) or statins, potent blockers of cholesterol biosynthesis, have an impact on fatty

liver or serum uric acid levels. In this study, we investigated the effects of Ex and atorvastatin (ATV) on triglyceride content and xanthine oxidoreductase (XOR), which involves in uric acid production and oxidative stress in the liver of obese Zucker rats (OZR). *Method:* Five-week-old male OZR and lean Zucker rats (LZR) were used for this study. OZR were divided into four groups according to the following treatment: 1) control (OZR-Con); 2) Ex (OZR-Ex); 3) ATV (OZR-ATV); and 4) Ex + ATV (OZR-Ex+ATV). Ex was performed by treadmill running (7 days/week; 60 min/day at 18 m/min, 0% grade) and ATV (20 mg/kg) was administered by gavage. After treatment for 10 weeks, triglyceride content or XOR activity in the liver were evaluated by biochemical methods. *Results:* Liver triglyceride content was significantly higher in OZR-Con than in LZR and significantly lower in OZR-Ex and OZR-Ex+ATV than in OZR-Con, whereas, there was no significant difference between OZR-Con and OZR-ATV. Liver XOR activity was significantly higher in OZR-Con than in LZR. Compared to OZR-Con, liver XOR activity was not significantly different in OZR-Ex or OZR-ATV, meanwhile, was significantly lower in OZR-Ex+ATV. *Implications/Impact on Rehabilitation*: Combination of Ex and statin decreases triglyceride content and XOR activity in the liver of OZR.

PO-0005

COMPARISON OF POSTURAL CONTROL BETWEEN HEALTHY CONTROLS AND INDIVIDUALS WITH NON-SPECIFIC LOW BACK PAIN DURING EXPOSURE TO THE DIFFERENT VISUAL STIMULUS

Rui Li[1,2], Ninghua Wang[1], Xiang Yan[3], Kunlin Wei[3]
[1]The First Hospital of Peking University, Beijing, China, [2]Sun Yan-Sen Memorial Hospital of Sun Yan-Sen University, Guangzhou, China, [3]Peking University. Beijing, China

Objective: The Optokinetic Stimulation (OKS) has widely applied, but not been applied to the Low back pain (LBP). Our study was to investigate the effect of the different OKS on the kinematics of postural control in Chronic Nonspecific LBP disorders. *Method:* Fifteen individuals with CNLBP (age range 25-40 years) and fifteen matched controls were recruited. Every subject was exposed to random-dot patterns projected on a screen. The dots' moving direction were expansion (+) and contraction (-), and velocity included 80°/s, 40°/s and 20°/s. The stimulus used "stimuli--interval" pattern. The peak velocity, different phases' standard deviation of the Anterior-Posterior (S.D) and total length of the Medial-Lateral of COP displacements in the stable and soft surface were recorded. *Results:* Main effects of surface for all parameters were significant. Group and OKS for all parameters were no significance with exception of peak velocity (F (3,95)=3.6, p=0.01) and S.D2 (F (5,140)=9.34, p<0.01) of OKS. The interactions of group by OKS on S.D2 (p<0.01), group by surface by OKS (p<0.01), and surface by OKS on S.D1 and S.D3 (p<0.05) were significant. Compared to the healthy individuals, significant more S.D2 of amplitude was seen in CNLBP persons when confronting the + 40 stimuli in the soft surface (p<0.05). *Impact on Rehabilitation*: The LBP patients decreased the efficiency of postural adjustment when OKS in the expansion direction. It's suggested that the treatment to the abnormal motor pattern in the LBP should take the properties of virtual environment and effect of vision into account.

PO-0006

NEUROMUSCULAR MAGNETIC STIMULATION OF QUADRICEPS MUSCLES IN HEALTHY SUBJECTS

Byeong Cheon Seo, Sun-Yul Hwang, Min Kyun Sohn*
Department of Rehabilitation Medicine, Chungnam National University Hospital, Daejeon, South Korea, Korea

Objective: The purpose of this study was to investigate the effect of neuromuscular magnetic stimulation (NMMS) on the quadriceps muscle to the muscular strength and muscle thickness in healthy subjects. *Methods:* The 40 healthy volunteers were randomly divided into two independent groups. One group (n=20) served as controls; and the other group (n=20) underwent 3 sessions in each week of 15 min NMMS on the quadriceps muscle for total of 5 weeks. The intensity of magnetic stimulation was determined to the maximally tolerated intensity indicated by each subject. The isokinetic peak torque per body weight, average power at 60°/s and 120°/s, isometric peak torque, and average peak torque at 60° of knee flexion of quadriceps were measured using a Biodex System 4® (Biodex, NewYork, USA). Cross sectional area and thickness of rectus femoris and vastus intermedius were measured by Mylab70XVG (Esaote S.p.A, Genova, Italy) in each group before and after magnetic stimulation. *Results:* There were no significant differences between two groups in quadriceps strength and thickness before NMMS. The isokinetic peak torque per body weight, average power, isometric peak torque, and average peak torque of knee extensor were significantly increased (p<0.05) after NMMS with no changes in control group. However, there were no significant changes in cross sectional area of rectus femoris and vastus intermedius and thickness of vastus intermedius in both groups. *Conclusion:* The strength improvement of NMMS group might be explained by early finding of neural adaptation of quadriceps muscle. Our results supported the use of NMMS as an appropriate method for strengthening the skeletal muscle and can replace neuromuscular electrical stimulation in strengthening of large muscles such as quadriceps muscle.

PO-0007

ROLE OF GABA TRANSMISSION IN DEVELOPMENT OF VESTIBULAR-RELATED BEHAVIOR

Huijing Hu
Department of TBI Rehabilitation, Guangdong Provincial Work Injury Rehabilitation Center, China

Background: The vestibular system is one of the sensory systems, which is essential for providing sensory cues for visual stabilization, motor coordination, spatial orientation, and perception of self-movement. Inhibitory synaptic transmission within the vestibular circuits plays an essential regulatory role in coordinating vestibular functions. The role of GABA synapses in the development of vestibular system remains unknown. *Objective:* To examine if GABAergic transmission within the vestibular nucleus is crucial for establishment of vestibular-related behavior, an intervention approach was adopted to perturb GABAergic transmission within the postnatal vestibular nucleus. *Method:* A slice of Elvax loaded with either GABAA receptor antagonist bicuculline was inserted into the fourth ventricle and covered the bilateral vestibular nuclei at different ages. Vestibular-related behavior tests were performed. *Results:* The acquisition of negative geotaxis, an otolith-related orientation reflex, was delayed in postnatal rats pretreated with bicuculline. Furthermore, the acquisition of motor learning, evaluated by rotarod test, was impaired in adult rats treated with bicuculline at postnatal day 1 (P1). However, no change was observed in adult rats that were pretreated with bicuculline at P14 or P21. *Implications*: These results indicate that GABAA receptors play an important role in postnatal establishment of the spatial coding ability.

PO-0008

LOCAL STABILITY OF REPETITIVE TRUNK MOVEMENTS

Arnaud Dupeyron[1,2], Sietse Rispens[3], Jacques Pelissier[1,2], Christophe Demattei[4], Jaap H Van Dieen[3]

[1]Federation of PMR. Academic Hospital Montpellier-Nîmes, France, [2]Movement to Health, EuroMov, Montpellier-1 University, Montpellier, France, [3]Move Research Institute, Amsterdam, Faculty of Human Movement Sciences. VU University Amsterdam, 1081 BT Amsterdam Nederlands, [4] Bespim. Academic Hospital Carémeau. 30029 Nîmes Cedex, France

Purpose: The maximum Lyapunov exponent ($lambda_{max}$) quantifies the local dynamic stability of trunk movements and can provide information on trunk motor control in healthy subject or in low-back pain patients. However, the number of repetitions needed to obtain an accurate $lambda_{max}$ and the effect of fatigue on local stability are not known. *Method:* Ten healthy subjects performed 100 repetitions of trunk movements in flexion, of trunk rotation and of a task combining these movement directions. $Lambda_{max}$ was calculated from thorax, pelvis and trunk (thorax relative to pelvis) kinematics. A bootstrap procedure was used to analyse the data. ICC and coefficient of variation were used to quantify precision as a function of the number of cycles analysed. ANOVA was used to compare movement tasks and to test for effects of time. *Results:* To obtain accurate $lambda_{max}$ for trunk local stability, only 30 repetitions are necessary. Flexion was less stable than rotation or combined movement ($lambda_{max}$ was higher). Fatigue did not affect local stability. Trunk movement was more stable than thorax and pelvis movements taken alone. *Discussion:* These results can help for the choice of the number of repetitions in assessing local dynamic stability of trunk movements during simple or complex tasks. Higher stability during asymmetric movement may be explained by higher co-activation of trunk muscles. It would be interesting to control in low back pain patients whether stability is similarly affected by task asymmetry and if co-contraction is correlated to local dynamic stability.

PO-0009

GUA LOU GUI ZHI DECOCTION TREATS SPASTICITY AFTER CEREBRAL ISCHEMIA AND ITS POSSIBLE MECHANISM WITH AMPA RECEPTORS

Jia Huang, Jing Tao, Lidian Chen
Fujian University of Traditional Chinese Medicine, China

Objective: This study was carried out to observe the mechanism of a Traditional Chinese Medicine formula - Gua Lou Gui Zhi Decoction (in brief "GLGZD") on spasticity in adult rats after cerebral ischemia with glutamate level and AMPA receptors. *Method:* A rat model of Middle cerebral artery occlusion (MCAO) was established and interfered with GLGZD. 7 days after ischemic, Glutamate level in cerebrospinal fluid (CSF) was tested by HPLC. Western blot analyses of AMPA (GluR1/2/3/4) of brain tissue from spastic animals were tested. Confocal and electron microscopic analyses of AMPA (GluR1/2/3/4) in brain sections were tested by fluorescent immunohistochemistry. *Results:* Using HPLC analysis, we found that cerebral I/R injury significantly enhanced glutamate concentration in cerebrospinal fluid (sham control group,201.16±3.69 mM; Ischemic Control group, 855.05±13.20 mM, $p<0.05$). However, administration of GLGZD remarkablyreduced the level of glutamate to 222.97±16.93 mM ($p<0.05$, versus IC group). Western Blotting and Immunofluorescence analyses showed that, as compared with SC group, the protein expression of GluR1, GluR3, GluR4 was increased, whereas that of GluR2 was reduced in rats of IC group. However, cerebral ischemia induced alteration in the expression of AMPA receptor subunits was neutralized by GLGZD treatment. *Implications/Impact on rehabilitation:* Spasticity is a serious post-stroke physical disability. Glutamate and AMPA receptors have been shown to play an important role in spasticity after cerebral ischemia. We reported for the first time that GLGZD exerts therapeutic efficacy against spasticity in ischemic stroke via inhibition of glutamate/AMPA receptor-mediated excitotoxicity. These results suggest that GLGZD may be a potential therapeutic agent for cerebral ischemia and spasticity.

PO-0010

EFFECT OF GUA LOU GUI ZHI DECOCTION TREATS POST-STROKE SPASTICITY

Jing Tao, Jia Huang, Lidian Chen
Fujian University of Traditional Chinese Medicine, China

Objective: This study was carried out to observe the effect of a Traditional Chinese Medicine formula - Gua Lou Gui Zhi Decoction (in brief "GLGZD") on spasticity in adult rats with cerebral ischemia. *Method:* A rat model of Middle cerebral artery occlusion (MCAO) was established and interfered with GLGZD. 7 days after ischemic, neurological deficits, the screen test were scored and tested. The infarct volume was detected by TTC staining. the infarct volume was quantified with Motic Med 6.0 System. Hoffman reflex (H reflex) was recorded, The threshold for both the M waves and H waves was determined, and the Hmax/Mmax ratio was calculated. *Results:* In the present study we demonstrated that GLGZD displayed neuroprotective effect by improving neurological deficits scores and reducing cerebral infarct volume. And also, GLGZD displayed anti-spasticity effect by improving the screen test and H-reflex. The screen test showed that GLGZD can promote the motor function after cerebral ischemia via reducing the muscle tone and releasing the spasticity. Moreover, To confirm above observations we determined the effect of GLGZD on H-reflex that represents monosynaptic reflex and thus indicates the degree of excitability of motor neuron. Cerebral I/R injury resulted in an obvious increase in the amplitude and decrease in the latency of H-reflex wave, as well as a significant increase of Hmax/Mmax ratio, demonstrating the occurrence of spasticity. *Implications/Impacton Rehabilitation:* Spasticity is a common feature of the upper motor neuron syndrome (UMNS) following stroke. We reported for the first time that GLGZDexerts neuroprotective function and displays therapeutic efficacy against spasticity in ischemic stroke.

PO-0011

COMPARSION OF THE EFFECTS OF LASER THERAPY AND GALVANIC STIMULATION IN PERIPHERAL NERVE REGENERATION PROCESS HISTOPATHOLOGICAL ANALYSIS IN SCIATIC NERVE OF RABBITS

Irene Rodriguez Ramírez, Nidia Yazmin Herrera Hernandez*, Jesus Maria Rangel, Miguel De La Parra, Manuel Torres
Mexican Institute of Social Services, Monterrey, Nuevo León, Mexico

Introduction: The peripheral nerve injury, resulting in functional difficulties for the patient, and high cost to society. Physical therapy used different treatments to promote nerve regeneration is important to distinguish the effects of these treatment modalities in nerve regeneration. *Objective:* compare histopathological effects after application laser therapy and galvanic electrostimulation in acute peripheral nerve regeneration. *Methods:* Experimental not blind, cross-sectional, prospective, analytical study made in Physical Medicine Rehabilitation Unit No. 1 and Orthopaedics Hospital 21. In Monterrey México. 9 rabbits underwent sciatic neurorraphy including them randomly into group A (control), group B (laser) and group C (electro-galvanic) treated for six weeks. We realize histological and statistical analysis. *Results:* The histopathological analysis showed similar degree of nerve regeneration in groups A and B but with delayed nerve regeneration for group C. (p 0.05). *Impact:* Use of laser InGaAs/GaAs (905 nm) not affect nerve regeneration compared with no intervention, but the use of galvanic electrostimulation at frequency 0- 1.5 mA delayed peripheral nerve regeneration.

PO-0012

BODY WEIGHT SUPPORT TREADMILL TRAINING DECREASES GLIAL FIBRILLARY ACIDIC PROTEIN EXPRESSION IN THE SPINAL CORD INJURY AND POSITIVELY MODULATES NEURONAL GROWTH

Xiaojing Ding
Tianjin Peoples Hospital, China

Objective: We studied the effects of body weight support treadmill training on glial fibrillary acidic protein expression in rats after spinal cord injury (SCI). *Method:* 30 female adult Sprague-Dawley rats were included in our study. An animal model of experimental incomplete spinal cord injury was established by using a modification of Allen's weight-drop method at T9 spinal cord. Ten uninjured rats were included as the normal group, and the other 20 injured rats were randomly divided into 2 equal groups. One injured group without training was the control group, and the other one injured group was trained by body weight support treadmill training (BWSTT). The rats in training group started their training 8 days after SCI and were trained for 4 weeks. Every training session lasted 30 min per time and twice per day. We observed the changes of glial fibrillary acidic protein (GFAP) expression in T9 spinal cord post-SCI day 35 by immunohistochemistry, Western Blot and RT-PCR. *Results:* BWSTT decreases glial fibrillary acidic protein expression in the spinal cord and then positively modulates neuronal growth. *Impact on rehabilitation:* BWSTT not only promotes axonal sprouting and synapse formation by stimulating the expression of some positive growth factors such as Brain-derived neurotrophic factor (BDNF),as we know, but also decreases the expression of some negative factors like glial fibrillary acidic protein, which can make a balance of permissiveness and inhibition, creating a suitable regenerating environment for the injured spinal cord,thus promotes nerve fibers growth and improves motor recovery.

PO-0013

EFFECT OF THE DIFFERENT TIME COURSE OF PHYSIOLOGICAL ISCHEMIC TRAINING ON THE FUNCTION OF SKELETAL MUSCLE

Yan Zhao[1,2,3], Jianan Li[1,2,3], Aicui Lin[1,2,3], Mingyue Xiao[1,2,3]
[1]Department of Rehabilitation Medicine, First Affiliated Hospital of Nanjing Medical University, China, [2]Department of Sports and Health Science, Nanjing Sports Institute, China, [3]Rehabilitation Department of Nanjing First Hospital (AL) Nanjing, China

Objective: This study aimed to test effect of the different time course of physiological ischemic training on the function of skeletal. *Design*: Forty-eight New Zealand White rabbits were randomly groups: (*i*) ischemia with cuff inflation training for 0 week (PITC-0), 2 weeks (PITC-2), 4 weeks (PITC-4) and 6 weeks (PITC-6). Six animals of every group received right femoral artery ligation and occlusion of blood flow in the left limb by cuff inflation for 3 min, followed by 5 min of deflation, repeated for three times; (*ii*) ischemia with isometric exercise training for 0 week (PITE-0), 2 weeks (PITE-2), 4 weeks (PITE-4) and 6 weeks (PITE-6). Six animals of every group received right femoral artery ligation and the left limb for isometric contraction exercise ischemic training for 4 min, followed by 10 min of rest, repeated twice. Zero, two, four and six weeks later, muscle endurance, muscle strength, the collateral circulation and succinate dehydrogenas (SDH) were evaluated. *Results*: 1.The ischemic limb. (*i*) Skeletal muscle endurance in the group PITC-4 and the group PITC-6 was significantly higher ($p<0.05$) compared with the group PITC-0. The group PITC-6 is higher than the group PITC-4 ($p<0.05$). There was a significant difference ($p<0.05$) among the PITE groups. (*ii*) The maximum muscle contraction strength of the group PITC-6 was significantly higher compared with the PITC-0 group (p<0.05). That of the PITE-6 groups significantly increased ($p<0.05$) compared to the PITE-0 group. (*iii*) The collateral circulation in the group PITC-6 and the group PITE-6 were significantly high ($p<0.05$). (*iv*) SDH activity and the content in the group PITC-6 were significantly higher than that in the group PITC-0 ($p<0.05$). *Implications*: PIT improved the performance of the pathological skeletal muscle requires at least 4 weeks by promoting remote angiogenesis in pathological ischemic skeletal muscle.

PO-0014

THE EFFECTS OF FUNCTIONAL ELECTRICAL STIMULATION ON NEUROGENESIS AFTER STROKE: A PRELIMINARY STUDY

Yun Xiang[1,2], Tiebin Yan[1], Zhiqiang Zhuang[1], Dongmei Jin[1], Yuan Peng[3]
[1]Department of Rehabilitation Medicine, Sun Yat-sen Memorial Hospital of Sun Yat-sen University, Guangzhou, China, [2]Department of Rehabilitation Medicine, Nanshan Affiliated Hospital of Guangdong Medical College, Shenzhen, China, [3]Department of Rehabilitation Medicine, The First People's Hospital of Guangzhou, Guangzhou, China

Objective: The therapeutic effect of functional electrical stimulation (FES) after stroke was explored in terms of its ability to promote the expression of basic fibroblast growth factor (bFGF), epidermal growth factor (EGF) and endogenous neural stem cells (NSC) in the subgranular and subventricular zones of the brain. *Method:* Rats were randomly allocated into FES, placebo stimulation and sham-operated groups, and a stroke model was induced in the members of the FES and placebo groups. FES group members received daily FES treatment for two weeks. The rats' behavior was evaluated and bFGF and EGF protein expression and gene transcription were measured. Nestin-positive cells were counted. *Results:* The rats in the FES group exhibited significantly improved behavioral performance at day 14 which was also significantly better than that in the placebo group. Nestin positive cells and bFGF and EGF expression were all up-regulated significantly. *Implications:* These data suggest that FES can facilitate the behavioral recovery of paralyzed limbs by increasing bFGF and EGF expression and promoting the proliferation of endogenous NSCs. This may be one of the mechanisms by which FES initiates neuronal plasticity after stroke.

PO-0015

EFFECTS OF EXERCISE TRAINING ON THE MOTOR FUNCTIONAL AND EXPRESSION OF NOGO-A/NGR/RHO-A PROTEIN FOLLOWING CEREBRAL ISCHEMIA IN RATS

Chao Li[1], Hongmei Wen[1], Zulin Dou[1], Chanjuan Zhang[1], Jinsheng Zeng[2]
[1]The third affiliated hospital of sun yat-sen university rehabilitation, China, [2]The first affiliated hospital of sun yat-sen university neurologist, China

Objective: To study the effects of exercise training on recovery of motor function and neurons following cerebral ischemia, and to explore the involvement of Nogo-A/NgR1/Rho-A pathway. *Method:* Right middle cerebral artery occlusion (MCAO) model was replicated by Electric coagulation on stroke-prone renovascular hypertension Sprague-Dawley rats. The rats were randomly divided into three groups: sham group, exercise training group and control group. Each group at 7d, 14d, 28d, and 52 days was assessed forelimb grip strength and observed the morphological changes by Nissl staining, Western blot analysed Nogo-A, NgR,Rho-A protein expression. *Result:* Infarction after 7d, 14d, 28d and 52d four time points, the training group rats' grip strength were more improved than the control group. ($p<0.05$). *Conclusion:* Exercise training can promote the recovery of limb function after cerebral infarction., and has a protective effect on the damaged nervous system,

Down-regulation of the Nogo-A/NgR/Rho-A protein levels may reduce inhibition on axons.

PO-0016

LOW-MAGNITUDE VERTICAL VIBRATION ENHANCES TRANSFORMING GROWTH FACTOR BETA 1 AND TYPE I COLLAGEN EXPRESSION IN TENOCYTES

Chia-Hsin Chen[1,2,3], Yi-Jen Chen[1,3], Chau-Zen Wang[1]

[1]Kaohsiung Medical University, Kaohsiung, Chinese Taipei, [2]Kaohsiung Municipal Ta-Tung Hospital, Kaohsiung, Chinese Taipei, [3]Kaohsiung Medical University, Hospital Kaohsiung, Chinese Taipei

Objective: Whole-body vibrations can act as an anabolic stimulus for muscles and tendons. Low-magnitude vertical vibration (VV) could increase the myogenesis and myotube formation of myoblasts. However, the effects of low-magnitude VV on tenocytes and the molecular mechanisms of these effects remain undefined. VV may act as an anabolic stimulus of tenocytes to enhance the expression of transforming growth factor beta 1 (TGF-β1) and extracellular matrix (ECM) proteins, which have the potential to improve tendon properties, which is critical for accelerating tendon healing. *Method:* Primary tenocytes were isolated from porcine Achilles tendons. Cell viability was evaluated using the MTT assay. The cell cycle profile was determined using flow cytometry. Using real-time PCR, ELISA, and immunofluorescence studies, we examined the effect of VV treatment with frequencies of 5, 8 or 10 Hz on the expression of TGF-β1 and the ECM protein type I collagen in tenocytes. *Result:* We showed that VV stimulation, from 5-10 Hz, is safe and effective at upregulating the gene expression of TGF-β1 and type I collagen in primary tenocytes. The levels of expression of both TGF-β1 and type I collagen were the highest after VV treatment at frequencies of 10 Hz, and the expression levels correlated with the treatment frequency in a dose-dependent manner. *Implications on Rehabilitation:* Low-magnitude VV treatment, from 5-10 Hz, act as an anabolic stimulus of tenocytes to stimulate the expression of TGF-β1 and type I collagen. *Clinical Relevance:* Low-magnitude VV can provide a promising way to regulate TGF-b1 and collagen expression in tenocytes, which may have the potential to improve tendon properties and accelerate tendon healing.

PO-0017

DANCE THERAPY IS EFFECTIVE ON GAIT AND BALANCE IMPAIRMENT IN ADVANCED PARKINSON'S DISEASE

Maria Gabriella Ceravolo, Andrenelli Elisa, Sordoni Elisa, Di Biagio Laura, Monsù Anna Maria, Capecci Marianna

Department of Clinical and Experimental Medicine – Politecnica delle Marche University, Ancona, Italy

Objective: To assess the short- and medium-term effects of dance therapy as compared to task-oriented training of balance and gait in Parkinson's disease (PD) people. *Method:* A randomized controlled study with single blind assessment and one month follow-up was performed enrolling 43 PD subjects (mean age: 67.0 years; median Hoehn & Yahr stage: 3; mean disease duration 9.9 years). Subjects were allocated to 3 groups receiving either dance therapy with Latino and Tango music (consisting of one-hour sessions, 3days/week x 4 weeks), or balance training on a balance platform (30-min sessions 5days/week x 4 weeks) or treadmill training (30-min sessions 5 days/week x 4 weeks). Gait and balance parameters were measured by 10-meter walking time (10MWT), 6-min walking test (6MWT), Timed Up and Go (TUG), Berg Balance scale (BBS) and Freezing of Questionnaire (FOG). Assessments were repeated at baseline (T0), after treatment (T1), and 1 month later (T2). *Results:* All strategies proved effective at improving endurance (6-MWT) and balance (TUG, BBS) in the short term (T1-T0 change: $p<0.001$). Treadmill, though not balance, training allowed for persistent endurance increase at T2, whereas balance, though not treadmill, training was associated to persistent benefit in TUG and BBS at T2. Dance gave a lower, though persistent, gain in all measures, as compared to the other two approaches. *Implications/Impact on Rehabilitation:* Dance therapy is as effective as task-oriented approaches for improving both gait and balance and may be regarded as a global multimodal treatment of severely disabling axial symptoms in PD.

PO-0018

TLR4 EXPRESSION INTERVENE IN BRAIN OF INFECTED INTRAUTERINE FETAL RAT BY IVIG

Xiaojie Li[1,2,3], Mengying Dai[1,2,3], Qifeng Sun[1,2,3], Shiling Zhang[1,2,3]

[1]Third Affiliated Hospital of Jiamusi University; Jiamusi, Heilongjiang, China, [2] Children Neural Rehabilitation Laboratory of Jiamusi University, Jiamusi, Heilongjiang, China, [3]Rehabilitation College of Jiamusi University, Jiamusi, Heilongjiang, China

Objective: To observe effect of intravenous immunoglobulin (IVIG) in intrauterine infection pregnant SD rats to expression of TLR4 infetal rat brain. *Methods:* 40 pregnant SD rats were randomly divided into 3 groups: Intervention group (LPS+IVIG): 16 pregnant rats, 350μg/kg LPS enterocoelia injection for pregnant 17th days rats,2g/kg immune globulin injection from the pregnant rats tail vein after LPS injection 3 h. Experimental group (LPS): 16 rats, the same way to make intrauterine infection as above group. Control group (NS): 8 rats, the same amount saline enterocoelia injection for pregnant 17th day rats. At pregnant 18th day, 19th days, 21th day and 1day newborn rats to observe the placentas and the fetal brain's pathology by HE stain, compare the weight of fetal rats, PCR to measure TLR4-mRNA of fetal brain, immune staining to observe TLR4 expression in every group, at every time point. *Results:* Experimental group, placenta and uterine wall were congestion and edema, leukocyte infiltration, white matter of fetal rats were water-neutralization with juvenile cells, punctate hemorrhage. Experimental group and intervention group's offspring weight were lose in varying degree, there is significant differences between each group ($p<0.01$). The TLR4-mRNA and TLR4 expression were both increased in fetal brain in experimental group and the intervention group. *Implications:* Intrauterine the LPS infection could lead to fetal brain inflammation. Giving IVIG timely to pregnant rats could reduce the sustained activation of microglia, inhibit fetal brain inflammation, reduced the extent of brain damage and protected fetal brain.

PO-0019

COMBINING A SELECTIVE SEMAPHORIN3A INHIBITOR TREATMENT WITH TREADMILL TRAINING ENHANCES MOTOR FUNCTIONAL RECOVERY IN ADULT SPINAL CORD-TRANSECTED RATS

Liang Zhang[1,2,3], Shinjiro Kaneko[3], Yoshiaki Toyama[3], Meigen Liu[1], Hideyuki Okano[2], Masaya Nakamura[3]

[1]Department of Rehabilitation Medicine, Keio University School of Medicine, Japan, [2] Department of Physiology, Keio University School of Medicine, Japan, [3]Department of Orthopaedic Surgery, Keio University School of Medicine, Japan

Objective/Method: Rats exhibit extremely limited motor function recovery after total transection of the spinal cord (SCT). We previously reported that SM-216289, a Semaphorin3A inhibitor, enhanced axon regeneration and motor function recovery in SCT adult rats. However, the effects were limited, presumably because most of the regenerated axons did not connect to the right targets. Thus, rebuilding appropriate connections of regenerated axons may

enhance recovery. To this end, combining Semaphorin3A inhibitor treatment with extensive treadmill training may further enhance the "rewiring" of regenerated axons. In this study, aiming for clinical use, we administered newly-developed potent Semaphorin3A inhibitor, SM-345431, by a novel and our original drug delivery system using silicone sheet which enables continuous drug delivery during the period of the experiment. *Results:* Treatment with SM-345431 using this delivery system enhanced axon regeneration with significant but limited hind limb motor function recovery as reported previously. Although extensive treadmill training with SM-345431 administration did not further enhance axon regeneration, hind limb motor performance was improved, as evidenced by the significant improvement in the execution of plantar steps on a treadmill. Control SCT rats could not execute plantar steps, even by the end of the experimental period. Further analyses suggested that this strategy reinforced the wiring of central pattern generators in lumbar spinal circuits, which in turn led to enhanced motor function recovery (especially in extensors). *Implications/Impact on rehabilitation:* This study highlights the importance of combining treatments that yield axon regeneration with specific and appropriate rehabilitations, aiming for rewiring, for the treatment of spinal cord injury.

PO-0020

COMPARE CHARACTERISTICS OF GROWTH AND SECRETION OF PRIMARILY CULTURED HUMAN PHEOCHROMOCYTOMA CELLS IN TWO DIFFERENT CULTURE MEDIA

Xiao Li, Wu Shaoling, Zhou Ruijun, Lin Caina, Ma Chao

Department of Rehabilitation Medicine, Sun Yat-sen Memorial Hospital, Sun Yat-sen University, Guangzhou, Guangdong, China

Aims: The objective of the study was to observe and compare characteristics of growth and secretion of primarily cultured human pheochromocytoma cells between in artificial cerebrospinal fluid (aCSF) and in Dulbecco's Modified Eagle's Medium/Ham's F-12 (DF)-based medium. Main methods The human pheochromocytoma tissues were digested successively and the tumor cells were cultured in aCSF and in (DF)-based medium separately. The cell morphology was observed with inverted phase contrast microscope, and the levels of catecholamine and enkephalin in cell culture medium were detected by enzyme-labeled immunosorbent assay (ELISA). The cells were identified by expression of Chromogranin A (CgA) with immunohistochemical method. We use cell counting kit-8 (CCK-8) colorimetric assay to obtain the growth curve of primary culture human pheochromocytoma cell in aCSF and in (DF)-based medium respectively. Key findings: We successfully established the method to primarily culture the human pheochromocytoma cells. Similar morphological changes in the cultured human pheochromocytoma cells were observed in the two cell culture mediums. We also observed that the neurite-like processes in (DF)-based medium was longer than that in aCSF, indicating that cells in aCSF differentiated slowly. By the cell growth curve, the largest number of cell proliferation was the initial cells number of 2 times or so. No statistically significant changes in the curve points were observed between aCSF and (DF)-based medium using the same methods ($p>0.05$). It was found that human pheochromocytoma cells could secrete enkephalin and catecholamine in aCSF. There were no significant differences between aCSF and (DF)-based medium on the level of enkephalin (ENK) and catecholamine (CA) synthesized and secreted by the cells from the same sample ($p>0.05$). Significance: We demonstrated in this study that human pheochromocytoma cells could survive and had secretion function in aCSF, which suggests that human pheochromocytoma cells was a good alternative cell candidate for transplantation to alleviate terminal cancer-related pain. The findings provide the basis for the further experiment.

PO-0021

SURVEY OF FUNCTION AND PERFORMANCE OF REGISTERED PEOPLE WITH DISABILITY BY USING 9 ICF-ICD CORSETS: THAILAND DISABILITY FOLDER

Daranee Suvapan[1], Chompunut Pongakkasira[1]*, Ubonwon Watthanadilokul[1], Donruedee Srisuppaphon[1], Maliwan Yeunyongsuwan[2]

[1]Sirindhorn National Medical Rehabilitation Centre Thailand, [2]Bureau of Policy and strategy, Ministry of Public Health, Thailand

Objective: To evaluate performance and difficulty in activity and participation in each type of registered people with disability in Thailand by using ICF and linked to ICD 10 and to evaluate of its feasibility. *Method*: There are 6 categories of registered people with disability in Thailand, which are vision, hearing/communication, mobility/body image, mental/autistic, intellectual and learning disability. Expert committees defined 9 ICF corsets for each categories and subcategories. Each corset consists of 5 to 10 of b and d codes and linked to ICD 10, which would indicate the cause of disability. The common codes in most corsets are d870: economic self-sufficiency and d920: recreation and leisure. Physicians or healthcare personnels were trained before using specific ICF corsets related to disability categories. Pilot study was conducted at 5 center and 4 community hospitals between 1 July and 30 August 2012. *Results*: The number of participants is 1605. Most are in mobility, hearing and intellectual categories. Most ICD 10 diagnosis are Mental retardation, stroke and hearing loss. Performance and difficulty in activity and participation were evaluated and shown good feasibility. *Implications/Impact on rehabilitation*: We will advocate government hospitals to use joint ICF-ICD to reflect overall outcome of medical rehabilitation in Thailand after the implementation of the Act of Empowerment of people with disability. This is also providing executive information system for Ministry of Public health, Thailand.

PO-0022

THE PRELIMINARY STUDY OF THE BRIEF ICF CORE SETS FOR CHINESE PRIMARY OSTEOPOROTIC PATIENTS

Jie Liu, Zhongli Jiang

The First Affiliated Hospital of Nanjing Medical University, Nanjing, China

Objective: The purpose of this study was to explore the brief international classification of functioning (ICF), disability and health core sets for Chinese primary osteoporotic patients. Methods: According to the ICF checklist and the ICF core sets for osteoporosis, we formulated a case report form for clinicians and a patient with primary osteoporosis record form, respectively. The information of the patients with primary osteoporosis was recorded by using both forms. The frequency of each item in the comprehensive ICF core sets was calculated by using descriptive statistics. The items whose frequency was equal or greater than 30% were chosen as the first-phase brief ICF items. *Results*: Thirty-five items of second–level of ICF categories were created in the brief ICF core sets in Chinese osteoporotic population, with 8 items in the body function, 2 items in the body structure, 12 items in activity and participation, and 13 items in the environmental factors. *Conclusions*: The first-phase brief ICF core sets for patients with primary osteoporosis in China can be identified through the two questionnaires. But the results still need to be integrated with the results of expert questionnaires and to be validated and verified by multicenter study.

PO-0023

PHYSIATRIC APPROACH TO OSTEOPOROSIS (PATO): A NATIONAL SURVEY USING THE BRIEF ICF CORE SET FOR OSTEOPOROSIS

Francesca Gimigliano, Giovanni Iolascon, Ilaria Riccio, Raffaele Gimigliano
Second University of Naples, Italy

Objective: To classify the Italian osteoporotic population with or without fragility fractures, using the Brief ICF Core Set for Osteoporosis. To calculate the fracture risk with the WHO FRAX algorithm of our cohort. *Method:* We carried out a National survey on behalf of SIMFER involving 80 Italian Rehabilitation Services distributed throughout Italy. Each unit was asked to enroll, in a 6-month period (February-July 2010), 100 osteoporotic patients (50 with a fragility fracture and 50 without). The inclusion criteria were age over 50 y.o and the diagnosis of Osteoporosis. Data collection included the record of demographic data (area of residence, age, sex, weight and height), presence of a fragility fracture, risk factors related to the FRAX Assessment Tool, ICF categories as they are listed in the Brief ICF Core Set for Osteoporosis, and treatment data. *Results:* We received data on 5,238 patients, we excluded 650 patients because they didn't meet the inclusion criteria and therefore we analyzed data on 4,588 patients. More than the 90% of the population were females. The 57.61% had already had a fragility fracture. The mean FRAX MAJ was 17.24, the mean FRAX HIP was 8.5. the most commonly impaired ICF categories were b280, s760, and d430. *Implications/Impact on rehabilitation:* Osteoporosis is a disabling disease therefore a physiatric approach should be always recommended. The FRAX Assessment tool is useful to identify people at high risk of fracture and the brief ICF Core Set can be used to identify the rehabilitative needs of osteoprotic patients.

PO-0024

FUNCTIONAL RECOVERY OF ACUTE CEREBRAL INFARCTION WITH FUNCTIONAL ORAL INTAKE SCALE (FOIS)

Tsunemi Kitagawa[1,2], Aiko Osawa[2]*, Shinichiro Maeshima[2]
[1]International University of Health and Welfare, Japan, [2] Saitama Medical University International Medical Center, Japan

Objectives: In acute cerebral infarction, it is seen in a high rate of eating and swallowing disorders. And these findings become the important point to select the right or wrong of the at-home return as. We examined Functional Oral Intake Scale (FOIS) at the time of the discharge and activities of daily living (ADL), relations with the discharge for the cerebral infarction patient in acute phase hospital. *Method:* Subjects were 306 acute cerebral infarction patients. Their age was 18-98 years old, and the mean length of stay was 28.5±16.6 days. As the first evaluation, we checked neurologic symptoms and a cognitive function less than bedside swallowing assessment (BSA). Furthermore, we investigated ADL and the place to come back when discharge and history of pneumonia while admission. Lastly, we examined relationships between these evaluations and FOIS at the time of the discharge. *Results*: 120 home, 173 other hospital and 13 death out of 306 discharged patients. 98% of home discharged patients were FOIS Level 5 or more and 80% of patients who moved to the other hospital were less than Level 4. FOIS at discharge was related to age, types of Cerebral infarctions, lesions, BSA, place to discharges, length of stay, history of pneumonia and FIM at discharge. *Implications*: FOIS is a deglutition function rating score used well in many foreign countries. It was thought that it could become the useful index to decide at-home return.

PO-0025

RELIABILITY AND VALIDITY OF THE CHINESE VERSION OF GENERAL ICF CORE SETS

Yong Bao[1], Qing Xie[2], Li-Jun Cui[2], Yi-Ting Tang[1], Ling Gu[1], Ya Zong[2], Ying-Qi Zhang[2]
[1]Department of Rehabilitation, Lu Wan branch of Ruijin Hospital Affiliated to Shanghai Jiao Tong University Medicine School, China, [2]Department of Rehabilitation, Ruijin Hospital The Shanghai Jiao Tong University Medical School Shanghai, China

Objective: To test the reliability and validity of the Chinese version of general ICF Core Sets. *Methods:* 80 inpatients were measured with the Chinese version of general ICF Core Sets, Modified Barthel Index (MBI) and Functional Comprehensive Assessment (FCA). Validity of construct validity, and criterion validity, reliability evaluation interrater reliability and internal consistency analysis methods. Reliability test evaluation by Kendall's W; the consistency test Cronbach α value analysis; criterion validity using Pearson correlation to determine the Chinese version of general ICF Core Sets and MBI and FCA correlation of the rating table. *Results*: The Chinese version of general ICF Core Sets 27 entries Cronbach α coefficient of 0.957, entry through standardized after reliability 0.954; which the body functions Cronbach α coefficient 0.892, activities and participation Cronbach α coefficient of 0.960, were compared with high internal consistency. The Kappa coefficients of environment factor were 0.373.Kendall's W value reached 0.887, and p=0.000, in good agreement between the results of the evaluation by. Pearson coefficient between the Chinese version of general ICF Core Sets and the MBI and FCA were 0.597 and 0.603 (p<0. 01) has a certain correlation. *Conclusion:* The Chinese version of general ICF Core Sets has good reliability and validity. It is necessary to carry out the further research to test the validity. While some assessed entries needed further modification, determined and perfect.

PO-0026

ICF CORE SETS FOR VOCATIONAL REHABILITATION VALIDATION IN PATIENTS WITH SPINAL CORD INJURY: RESULTS FROM THE ITALIAN PROJECT

Sonia Cremascoli*, Beatrice Aiachini, Caterina Pistarini, Gabriella Fizzotti
Salvatore Maugeri Foundation, Italy

Objective: Recently, through the project "Developing a Core Set to describe Functioning in Vocational Rehabilitation", the categories to be included in the first version of the International Classification of Functioning (ICF) Core Sets for vocational rehabilitation were produced. This study is part of the validation phase and takes into account the problems of re-employment for patients with spinal cord injury (SCI). The project was designed in collaboration with the ICF Research Branch, WHO - DIMDI at Swiss Paraplegic Research (SPF) Notwill, Switzerland. *Method:* we interviewed SCI patients according to the methodology of the Focus Group (FG). In this study we used six questions about their health condition, with reference to work, exploring the various components of the ICF. We included SCI patients one year after their discharge from our Spinal Unit. Seven FG were conducted since has been reached "saturation" of the data. The processing data provided the full transcript of the debate and the "linking" with ICF categories of the content expressed by all members of the group. *Results:* a list of ICF categories that identify the most frequent issues for inclusion in the work reported by SCI patients will be presented and, through a study about the overlapping, i.e. the percentage of these categories and/or absent,

the validation of the ICF Core Set for vocational rehabilitation in SCI will be evaluated. *Implications/Impact on rehabilitation:* The development of specific Core Sets allows to facilitate the use of the ICF in clinical practice.

PO-0027

THE EFFECT OF ADL GRADING MANAGEMENT IN PATIENTS WITH STROKE

Guofang Bai, Dan Guo, Lihong Li, Suju Chen, Lixia Zhao, Ting Liu
Shijiazhuang Central Hospital, China

Objective: To study rehabilitation management mode which improve the effect of stroke rehabilitation. *Methods:* (1) The degree of disabilities was distinguished by the scores of ADL in patients with stroke. 2) Different levels of stroke rehabilitation management content were made: including different levels stroke rehabilitation process, different ADL levels rehabilitation nursing contents, rehabilitation nursing training to caregivers, It was determined by the ADL level where they could go after discharged from the hospital and the follow-up plan management measares. (3) The average hospitalization days, change of patients with ADL scores, scores of patients' and caregivers' quality of life were compared between 78 cases who came form before management and 101 patients who were from after treatment. *Results:* There were significant differences of the average hospitalization time and average hospitalization cost between before and after the implementation of the ADL grading management. there were significant differences changes in patients of ADL ability and life quality. Caregivers' life quality was significantly improved. *Conclusion:* The implementation of the ADL grading management can effectively improved the effect of the stroke patients' rehabilitation and the quality of life, at the same time improved the Caregivers' quality of life, reduced the cost of rehabilitation, Improved the recovery efficiency.

PO-0028

EFFECTS OF COMBINATION TREATMENT WITH PULSED ELECTROMAGNETIC FIELDS AND ELECTROACUPUNCTURE ON BONE MASS AND STRENGTH IN OVARIECTOMIZED RATS

Jun Zhou[1], Hongchen He[1], Lin Yang[1], Huifang Liu[1], Shiju Chen[1], Hua Guo[1], Lu Xia[1], Yuxi Qin[1], Chuan Liu[1], Xiaofei Wei[1], Chengqi He[1]
Department of Rehabilitation, Rehabilitation Key Laboratory of Sichuan Province, West China Hospital, Sichuan University, China

Objective: The aim of this study was to examine the individual and combined effects of pulsed electromagnetic fields (PEMFs) and electroacupuncture (EA) on bone mass and strength in ovariectomized (OVX) rats. *Methods:* Fifty 3-month old female Sprague–Dawley rats were assigned to one of five groups: sham-operated control (Sham), ovariectomy (OVX), ovariectomy with PEMFs treatment (PEMFs), ovariectomy with EA treatment (EA), and ovariectomy with PEMFs+EA treatment (PEMFs+EA). The treatments were started 1 week after ovariectomy and continued for 12 weeks. After 12-week treatments, serum 17β-estradiol, bone mineral density (BMD), and bone biomechanical properties, were examined. *Results:* PEMFs, EA and combination treatment significantly increased serum 17β-estradiol ($p<0.01$, $p<0.05$, $p<0.01$) and femur BMD ($p<0.01$, $p<0.05$, $p<0.01$) compared to OVX group. Both PEMFs and EA significantly increased BMD of the fifth lumbar (L5) vertebral body ($p<0.01$, $p<0.01$), what's more, combination treatment was more effective than PEMFs or EA alone for improving BMD in L5 vertebral body. Biomechanical studies showed that PEMFs or electroacupuncture alone increased maximum load ($p<0.01$, $p<0.01$) and energy to failure ($p<0.05$, $p<0.01$) in L5 vertebral body. The combined treatment further improved the extent of maximum load ($p<0.05$, $p<0.01$) and energy to failure ($p<0.01$, $p<0.01$) over PEMFs or EA alone. *Implications/Impact on Rehabilitation*: PEMFs and EA had additive benefits on BMD and bone strength in L5 vertebral body. These data suggest that a comprehensive program of PEMFs and EA may be an effective method for preventing and treating osteoporosis in post-menopausal women.

PO-0029

THE ROLE OF REHABILITATION IN TAIWANESE NATURAL DISASTERS: AN EXTERNAL PERSPECTIVE

Yih-Chieh Chen, Andrew Haig, Josh Verson, Lars Johnson, Wen Huacong
University of Michigan, United States

Introduction: Post-natural disaster rehabilitation has been the focus of recent papers and an ISPRM committee. Most published work has focused on low-resource regions or external aid, with less attention to response in higher resource regions with a strong local rehabilitation system. Taiwan is a country prone to natural disasters; study of its post-disaster rehabilitation may reveal a pattern appropriate to many high-and middle-income countries. We therefore explored the role of rehabilitation medicine following Taiwan's natural disasters. *Methods:* An American medical student, fluent in Mandarin, traveled throughout Taiwan, including the site of the 1999 Nantou County earthquake, to conduct interviews with government disaster response officials, physiatrists, emergency medicine doctors, nurses, and victims with experience working in disaster relief and/or PRM. *Results:* Physiatrists and techniques following a natural disaster in Taiwan are highly utilized even though PRM is not yet a formal part of the national disaster response. Physiatrists who have worked on-site following major earthquakes have found that their skills were frequently in greater demand than the skills of other responders. Victims could be properly triaged to a rehabilitation ward. Despite the overwhelming post-disaster need for medical attention, the Taiwanese system is full of resilience, due in part to the presence of rehabilitation practices on-site and in receiving hospitals. *Conclusion:* A strong rehabilitation infrastructure promotes successful disaster relief and recovery. Development of rehabilitation medicine should be a priority in disaster prone areas to help buffer the acute increase in PRM related conditions post-natural disaster and to prevent unnecessary deaths and disabilities.

PO-0030

OBSERVE AND CORRELATION STUDY OF THE EFFECT OF CAMERON MODEL ON IMPROVING THE HEALTH OF STROKE FAMILY CAREGIVERS AND THE PATIENTS

Kai Wang[1], Yaoliang Wu[2], Peiyong Jing[1], Zhaoyang Wu[1], Weng He[1]
[1]Shanghai Jinan Geriatric Hospital. Shanghai, China, [2] Disabled Persons Federation of Shanghai Jingan District, Shanghai, China

Objective: Observed the effect of improving the knowledge and skills of family caregivers, reducing their adverse psychological conditions, and further improving the function of stroke patients through Cameron education mode, and analysis their correlation. *Method*: Hospitalized stroke patients, 38 in the intervention group,36 in the control group, were evaluated the EES, MMSE, Fugl-Meyer, MBI, corresponded caregivers were evaluated the GHQ-12 before intervention. Both groups conducted rehabilitation training in hospital. To the family caregivers of intervention group, we adapted Cameron mode, provided them with targeted education and skills training, To the family caregivers of control group, we adapted regular health education. After 3 months both groups were re-evaluated. *Results:* After rehabilitation, the scores of EES, Fugl-Meyer, MBI of the intervention group patients were higher than that of the control group (all $p<0.05$). The scores of GHQ-12 and some of its projects of the intervention group family caregivers were lower than that of the control group ($p<0.01$-0.05 respectively). Multiple linear regression analysis found that the scores of GHQ-12, attention of

the intervention group family caregivers were negative correlation to the scores of MBI ($p<0.05$, 0.01 respectively) of patients after rehabilitation. The scores of tension of these caregivers were negative correlation to the scores of EES of the patients ($p<0.05$). *Conclusion:* Cameron education model can effectively improve the skills of family caregivers, reduce their unhealthy mental state, and then further improve the effect of patient's rehabilitation. Health status and attention of the caregivers was correspondent to the ADL of the patients, tension of the caregivers was correspondent to the neurological deficit of the patients.

PO-0031

MANAGEMENT OF SELF-CARE ACTIVITIES DURING THE FLOOD: AN EXPLORATORY STUDY ON PEOPLE WITH SPINAL CORD INJURY

Mohiuddin Araf, Khademul Hoque*

Department of Physical Medicine and Rehabilitation, Apollo Hospitals Dhaka, Bangladesh

Introduction: Bangladeshis a country where natural disasters are almost a regular phenomenon specially the flood. Disasters of different types affect almost the entire country in every year. The consequence of disaster makes peoples life challenging, where the impact is much more to the people with physically challenged. It needs to be mentioned that there are lots of government and non government organizations working for the rehabilitation of the people with physically challenges, but very few organization consider the needs and basic care of physically challenged during flood disaster. That is why the researcher was undertaken this study to explore the performance of self-care activities for the people with spinal cord injury (SCI) during the time of flood. *Objectives:* To identify changes and mange their self-care activities during flood and to know how the rehabilitation program for the people with spinal cord injury to be improved for the better preparedness during flood. *Method:* Qualitative research design was selected to conduct the study and the data was collected through semi-structured face to face interview. The data was analyzed through content analysis. *Result and Discussion:* Seven in-depth interviews were conducted among the people with tetra and paraplegia who were using assistive devices, wheel chair and living in flood affected area. It was found that before flood most of the participants were independent to manage their self-care activities. But due to the flood, various limitations had aroused which affect an individual's ability to maintain their self-care activities. Thus, they became dependent on their family member in all aspects of their daily livings. Not only they were dependent but also they had to face several other associated problems, which seriously impact their life. Some participants had faced some physical problems like as developed bed sores, urinary complications, skin diseases, diarrhea and other water borne diseases. At the same time it also causes some psychosocial problems, which made them depressed and lonely, and sometimes they thought that there was no value of their life while others were active and they were dependent during flood. *Implications:* Natural disaster cannot be avoided but people especially, physically challenged need to have the capacities to cope with it. Thus, the health professional should design rehabilitation program in such way that it helps people with spinal cord injury to regain required skills thus they can best cope with disaster. Access to appropriate facilities-housing, beds, toilets, and other necessities must be monitored and made available to individuals with disabilities before, during and after flood.

PO-0032

ANALYSIS OF PRACTICAL NURSING INTERVENTIONS FOR STROKE PATIENTS WITH DYSPHAGIA FOR EVIDENCE BASED PRACTICE: SYSTEMATIC LITERATURE REVIEW

Mi Hyun Ahn[1], Eun Seok Lee[1]*, Kyun Hee Moon[1], Jeong In Jeong[1], Hyun Sook Son[1], Eun Joo Kang[1], Yoon Ah Oh[1], Mo Na Choi[3], Deog Young Kim[2]

[1]Severance Rehabilitation hospital, Yonsei University Health System, Korea, [2] Department and Research Institute of Rehabilitation Medicine, Yonsei University College of Medicine, Korea, [3]College of Nursing, Yonsei University, Korea

The purpose of this study is to devise a systematic basis that can be applied in practical nursing interventions for stroke patients with dysphagia. The specific purpose of the research is as follows: (1) The number of subjects was organized, the level of evidence was analyzed, and intervention effects were analyzed. (2) Practical interventions that could be used in hospitals were selected and evidences were provided. *Methods:* This research studies on the effect of dysphagia intervention using the analysis of qualitative and quantitative research through descriptive studies. Also using a systematic review through literature survey, random controlled trial, cohort studies, case studies and research studies, the effects were verified. Practical research methods used to analyze the possibility of practical recommendations were the clinical practical guidelines proposed by the Classification of Recommendations and level of evidence. The process used to analyze this study was discussed by professionals. *Result:* A total of 19 researches were arranged by author, year of publication, number of sample, interventions, and methods. Through the analyzed results, recommended interventions were included in the size of treatment effects. Olfactory stimulation by black pepper oil, oropharyngeal stimulation and swallowing exercise, swallowing training program were included in the upper class in the level of evidence. *Conclusion:* Through a systematic literature review, behavioral changes were occurred through educational aspects and the nurse's guidance. To make this possible, swallowing training program was recommended and using this basis a developed clinical practical guideline would be a good model for a evidence based practice.

PO-0033

PILOT STUDY: ELEMENTS FOR SUCCESSFUL SELF-MANAGEMENT PROGRAM IN MAINLAND OF CHINA

M Cao, S.K Choi, S.C Leung, S.L Tse

Hong Kong Society for Rehabilitation, China

Background: The Chronic Disease Self-management Program (CDSMP), developed by Stanford University, is one generic self-management program with international and Chinese studies, demonstrating its effectiveness to improve health status among people with chronic disease. *Objectives:* To use the six week CDSMP to stimulate the exploration of appropriate self-management programs for use in China. *Methods:* A multi-centred pilot study was designed using CDSMP in Lanzhou, Shijiazhuang, Kunming, Haikou, Dujiangyan, Beichuan and Pengzhou. Pre and post questionnaires, focus groups, diaries and interviews provided feedback from 176 participants and 14 trained leaders. *Results:* Participants and leaders agreed they enjoyed the group sessions. However, many changes to structure and content were suggested, including shorter sessions, reading material and expert teachers. They requested more relevant Chinese examples and description. Most topics were deemed useful, but there was little interest in topics on "differences between acute and chronic illnesses", "planning for the future (advance directives)", and "making informed treatment decisions". New topics on "dealing with sleeping problems", "fall prevention", "energy conservation", and "specific chronic disease knowledge" were suggested; and notably, major changes for rural population are required. *Conclusion:* This pilot study provides valuable feedback for developing self-management programs relevant for urban and rural communities in in-land China. The study results will be reviewed by an expert panel, to support a new program design for

trial, followed by general dissemination to community health staff and community-based rehabilitation programs in China.

PO-0034

THE TRANSPORTATION OF WENCHUAN EARTHQUAKE AND THE BUILDING REGIONAL LARGE REHABILITATION INSTITUTION NET

Zengchun Sun, Youping Yang, Jin Qin, Zengchun Luo
Sichuan Province BaYi Rehabilitation Centre, Sichuan, China

Objective: To analyze the injured transportation through the nation after the Wenchuan earthquake, so as to provide reference for the establishment of regional rehabilitation centers net of disaster. *Methods:* We retrospectively analyzed the available data including government policies, reports and primary and secondary literatures. *Results:* According to incomplete statistics datum, after 72 h, there were 30,620 injured and 22% of the total inpatient injured. Three days later, there were 68,700 patients, out of which 14,400 had serious injuries. Five days later, A large-scale transportation was initiated from 1st hospital, 441 patients were transported and transferred to 2nd and 3rd hospitals. One week after the quake, a total of 10,015 wounded victims was transferred to 20 provinces. At the 3rd hospital, patients were admitted within the first 2 weeks after the quake (82.4%), and its peak on Day 8 after the quake (976 cases), and inpatients were discharged on Day 9 to Day 18 after the quake (60.2%). There were 283 wounded carried out by helicopters. Totally, 1037 patients were transferred by railway and airline. *Impact on rehabilitation:* A massive transportation and concentrated rehabilitation are necessary for medical relief after a natural disaster, while there is a large space to fulfill as a large regional rehabilitation net is valuable for disaster rehabilitation relief and can reduce the scale of rescue and transportation in addition to offering a powerful platform for early, medium and long-term recovery. Establish a regional large, well-networked rehabilitation institution's net would cost effective.

PO-0035

USE OF A SHARED MEDICAL APPOINTMENT IN THE TREATMENT OF AMPUTEE PATIENTS

Jonah Green
NYU/Woodhull Medical Center, United States

Objective: To increase appointment compliance and patient satisfaction in a population of amputee patients from a public hospital in New York City. *Methods*: The Department of Rehabilitation Medicine at Woodhull Medical Center implemented the Shared Medical Appointment (SMA) model in the management of patients with amputations. This best practices approach is being discussed in the National Quality Improvement in Health Care Forums and is currently being used in the assessment and treatment of patients with diabetes and other chronic illness. In an SMA, a group of patients with similar needs are seen as a group. Screening and assessments are completed, a medical history taken, and medical decision making is provided in the group. This allows for patients to learn from each other and provide care in a context and to create an agenda for ongoing care (e.g., nutritionist, mental health, etc.). In Rehab, we are applying the model to the assessment and treatment of patients with amputations. *Results:* Patient satisfaction surveys were completed and attendance data was monitored showing significant improvements in both categories. *Implications/Impact on rehabilitation:* We have now developed a more efficiently run clinic with improved patient satisfaction and quality of care; reduced costs and increased revenues; and provided care in a "continuous model" resulting in a stronger provider-patient bond, better adherence, and stronger support networks for the patient.

PO-0036

THE INFLUENCE OF HEALTH EDUCATION ON REHABILITATION THRAPY COMPLIANCE OF PATIENTS WITH SPINAL CORD INJURY

Caie Zheng, Yuan-Jiao Wang, Ya-Li Wang
Zhejiang Province Hospital, HangZhou, China

Object: To explore the influence of health education on rehabilitation therapy compliance of patients with spinal cord injury (SCI). *Methods:* 57 patients with SCI were randomly divided into study group (29 cases) and control group (27 cases). Health education was carried out in study group in admission, during routine rehabilitation and in discharge. But the control group was only routine rehabilitation. *Results:* The patients of the study group in the knowledge of rehabilitation and preventing complication was better than the control group ($p<0.01$), the difference was significant. *Conclusion:* Health education can improve rehabilitation therapy compliance of patients with SCI. Health education is extremely important in promotion of rehabilitation in patients with SCI.

PO-0037

THE EFFECT OF NURSING INTERVENTION ON PREVENTION ON BEDRIDDEN PATIENTS WITH DEEP VEIN THROMBOSIS OF LOWER EXTREMITY

Feng Ying Wang, Guo Sheng Xie, Xue Ling Wang, Lu Yin Zhong, Ling Liu
West China Hospital of Sichuan University, Department of rehabilitation medicine, China

Objective: Explore the purpose of nursing intervention on prevention effect of bedridden patients with deep venous thrombosis of lower extremities. *Method:* We divide 80 cases of bedridden patients randomly into two groups, including 40 cases of control group and 40 cases of intervention group, and we take active and systematic measures of prevention nursing intervention, on bedridden patients in intervention group, focusing the prevention, determine the high-risk crowd, take predictive measures prevention nursing intervention from patients' diet, posture, positive movement, passive movement, functional exercise and drug application, etc, through the integrated assessment of bedridden patients. *Results:* Through the comparison of the DVT incidence between the intervention group and the control group, we discover that the DVT incidence in the intervention group is significantly lower than the control group. *Conclusion:* The active and systematic methods of prevention nursing intervention are effective in reducing the DVT incidence in bedridden patients.

PO-0038

GREATER AND LONGER-LASTING IMPROVEMENTS IN UPPER LIMB MOVEMENT SPEED THAN EITHER TREATMENT IN CHRONIC STROKE

Sheng Bi, Christina W.Y. Hui Chan
Chinese PLA General Hospital, China

Objective: Our previous study showed that combining transcutaneous electrical stimulation (TES) with task-related training (TRT) improved lower limb motor function in patients with chronic stroke better than either treatment alone. This study set out to investigate whether combining TES with TRT would produce greater and longer lasting motor improvements in the upper limb of these patients than either treatment also. *Methods:* 77 subjects with chronic stroke were randomly assigned to 4 groups: TENS alone, p-TES+TRT,

TES+TRT, and control. (1) Maximum isometric voluntary contraction (MIVC) force of elbow flexors and extensors, and hand grip, (2) reaction time (RTs) of wrist flexion and extension, and (3) Wolf Motor Function Test (WMFT) were recorded before, at week 4, 8 and 12 follow-up. *Results:* After 8 weeks of treatment, the TES+TRT group showed significantly faster wrist flexion compared with the TES and control groups, manifested by a greater percentage decrease in its RT. The p-TES+TRT group presented a significantly faster wrist extension compared with the TES group, and the 2 TRT groups showed a significant percentage decrease of the WMFT time compared with the control. At follow-up 4 weeks after treatment, only the TES+TRT group presented a significantly shorter wrist flexion RT compared with the control group, and shorter wrist extension RT compared with the TES group. *Conclusions:* While the 2 TRT groups showed significant improvements in UL movement speed right after intervention, only the combined TES+TRT group showed significantly shorter RT 4 weeks after treatment ended.

PO-0039

THE APPLICATION OF THREE EVALUATE AND TREATMENT THERAPY TO THE STROKE PATIENTS IN ADL EVALUMENT

Ying Cui
Hebei Afiliation University, Tangshan, China

Objective: To compare the effect of the stroke patients' Activity daily living ability evaluated and treated by Barthelindex (BI), FIM and Activity daily living Task analysis scale. *Methods:* 360 stroke patients were selected into control group with 90 cases, BI evaluate rehabilitation group A with 90 cases, FIM evaluate rehabilitation group B with 90 cases and Activity daily living Task analysis scale evaluate rehabilitation group C with 90 cases. 1 month before and after therapy score of Activity daily living (ADL) ability evaluate by BI, FIM and Activity daily living Task analysis scale and not rehabilitation treatment. Group A was evaluated and treated by BI. Group B was evaluated and treated by FIM. Group C was evaluated and treated by Activity daily living Task analysis scale. *Results:* After one month's treatment, compared to control group Scores on the Activity daily living ability of Group A, B and C had significant meaning ($p<0.05$). ($p<0.05$). Compared to Group A, Group B had a better outcome in ADL. Compared to Group B, Group C had a better outcome in ADL. *Impact on rehabilitation:* Compared to BI and FIM, Activity daily living Task analysis scale can more comprehensively reflect stroke patients' Activity daily living ability.

PO-0040

THE IMMEDIATE CORTICAL EXCITABILITY CHANGE OF NOXIOUS THERMAL STIMULATION ON THE ARM VERSUS THE FOREARM IN HEALTHY PERSONS

Chuan-Li Lin[1], Miao-Ju Hsu[1,2], Chien-Chih Chen[1], Mao-Hsiung Huang[3], Ruey-Tay Lin[2,4], Jau-Hong Lin[1,2]
[1]Kaohsiung Medical University, Physical Therapy, Chinese Taipeim, [2] Department and Graduate Institute of Neurology, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan, Chinese Taipei, [3]Department of Physical Medicine and Rehabilitation, Kaohsiung Medical University Chung-Ho Memorial Hospital, Kaohsiung, Taiwan,Chinese Taipei, [4] Department of Neurology, Kaohsiung Medical University Chung-Ho Hospital, Kaohsiung, Taiwan,Chinese Taipei

Objective: Effects of noxious thermal stimulation (NTS) on functional recovery in upper limbs of stroke patients are evident, but the difference of cortical excitability between different parts of NTS intervention is still known. This study aimed to investigate the immediate effect of NTS on the arm versus the forearm in healthy individuals. *Methods:* Twenty-two apparently healthy adults (age: 21.6±1.4 years) received a 30-min NTS intervention (hot-pain: 46-47°; cold-pain 2-3°) on dominant arms or forearms with randomized sequences. Transcranial magnetic stimulation parameters (abductor pollicis brevis as the target muscle) including motor threshold (MT), motor evoked potential (MEP), and size of cortical motor output map (map size) from the dominant hemisphere were assessed before and after the two separate stimulations. *Results:* One way repeated measures ANOVA showed that after NTS on the dominant forearm, the MT decreased from 0.58±0.12 to 0.53±0.09 significantly ($p<0.01$) while the MEP and map size both increased significantly from 0.31±0.45 to 0.68±0.89 ($p<0.01$) and 4.78±3.80 to 11.05±7.91 ($p<0.01$), respectively. *Implications on Rehabilitation:* This result indicates that the 30-min NTS applied on the forearm may result in more cortical excitability than that on the arm, which provides the neurophysilogical basis of NTS in clinical practice for stroke patients.

PO-0041

EFFECTS OF TASK ANALYSIS APPROACH AND CONSTRAINT-INDUCED MOVEMENT THERAPY IN STROKE REHABILITATION

Ying Cui
Hebei Afiliation University, Tangshan, China

Objective: To study how to train by task analysis approach and constraint-induced Movement Therapy to recover the motor function and Activity daily living ability mostly after stroke. *Methods:* 225 stroke patients were selected into task analysis group with 75 cases, united treatment group with 75 cases and control group with 75 cases. Three groups were given conventional rehabilitation training. Task analysis group underwent 1 month task analysis approach on the basis of control group. united treatment group underwent 1 month constraint-induced Movement Therapy on the basis of task analysis group.1 month before and after therapy score of Fugl-Meyer assessments (FMA) was used to evaluate motor function, the table of task analysis and the BI (Barthelindex) were used to evaluate Activity daily living (ADL) ability. *Results:* After one month's treatment, Scores on the motor function and Activity daily living ability of united treatment group with (68.24±5.67), (59.24±1.08), (77.37±8.96) scores and task analysis group with (57.46±6.51), (50.00±5.01), (67.13±8.02) had significant meaning between each group ($p<0.05$). Compared to control group with (45.24±7.80), (41.71±4.17), (59.58±9.14) scores, united treatment group had a better outcome in all scores. *Impact on rehabilitation:* Choosing and using the task analysis and constraint induced Movement Therapy that fits for hemiplegic patients and pointedly making therapeutic project is more propitious to the recovery of the motor function and Activity daily living ability in hemiplegic patients.

PO-0042

IMPLEMENTATION OF THE GERMAN GUIDELINE FOR WORK-RELATED MEDICAL REHABILITATION

Matthias Bethge[1]*, Stefan Löffler[2], Betje Schwarz[1], Heiner Vogel[2], Monika Schwarze[1], Silke Neuderth[2]
[1]Hannover Medical School, Germany, [2] University of Wuerzburg, Germany

Objective: To investigate how German inpatient rehabilitation centres are implementing the newly developed guideline for work-related medical rehabilitation (WMR) that describes additional therapies and diagnostic tests that should be performed in patients with poor work ability. *Methods:* Implementation of the WMR guideline was evaluated in chronic back pain patients (ICD-10: M50, M51, M53, M54) at seven inpatient rehabilitation centres. Patients completed questionnaires at beginning of rehabilitation, at discharge and three months after discharge. Details regarding the

treatments provided were extracted from the standardised discharge report. *Results:* Of the 375 patients (mean age: 50.0 years, 55.5 % female) surveyed at baseline, 327 (87.2 %) completed the questionnaires at discharge and 267 (71.2 %) three months after discharge. Rehabilitation programmes comprised an average 82.9 h of therapy, 11.2 h (13.5 %) of which were additional therapies in line with the WMR guideline. The recommended frequency and duration of social counseling and work-related psychosocial therapy measures were appropriate. However, there were discrepancies regarding the recommended duration and frequency of functional capacity training and the diagnostic tests performed. The standardised mean difference (SMD) between baseline and follow-up sick leave duration indicated an almost medium-sized effect (SMD=0.47; 95 % CI: 0.28 to 0.66). Linear regression showed that an additional 5 h of work-related therapy was associated with a 1.2-week decrease in sick leave duration (95 % CI: -2.38 to -0.03). *Implications/Impact on rehabilitation:* The WMR guidelines were for the most part successfully implemented. This seems to improve rehabilitation outcomes.

PO-0043

NEW METHODOLOGY FOR GAIT ANALYSIS IN A PATIENT WEARING AN ANKLE-FOOT ORTHOSIS

Filipe Carvalho[1]*, Ana Rita Almeida[1], Cláudio Pessoa[2], Iuri Fonseca[2], Filipe Martins[2], Luís Roseiro[2], Jorge Laíns [1]

[1]Centro de Medicina de Reabilitação da Região Centro - Rovisco Pais, Tocha, Portugal, [2] Instituto Superior de Engenharia de Coimbra, Portugal

Objectives: To present an instrumented ankle-foot orthosis (AFO) that allows the evaluation of temporospatial and cinesiologic parameters of gait in different phases and environments, such as irregular pavements and stairs. Application of the instrumented AFO in a stroke patient with spastic hemiplegia and evaluation of different gait parameters before and after Botulinum Toxin application. *Method:* Utilization of an AFO, instrumented with a resistance wire extensometer, calibrated in a laboratory. Tests were performed on a patient with left hemiplegia due to ischemic stroke. Gait parameters were evaluated during three different protocols: corridor, stair and outdoor, and at two different periods: before and after Botulinum toxin application on selected muscles of the lower limb. *Results:* Data analysis showed that there was a beneficial effect of the Botulinum Toxin in our patient gait patterns with a better weight distribution during the stance phase, an increase in cadence, a drastic reduction of the co-contraction peak detected in the beginning of the swing phase and a shortening of the stance phase during climbing and descending stairs. *Implications/Impact on rehabilitation:* This methodology is inexpensive and was successful in evaluating different gait parameters in a patient with spastic hemiplegia using an AFO. By allowing the evaluation of gait parameters outside the gait laboratory, such as in rough terrains and stairs, it holds an unmatched versatility compared with others mentioned in the literature.

PO-0044

EARLY INTENSIVE BEHAVIOURAL INTERVENTION FOR AUTISM SPECTRUM DISORDERS IN CHINA

Chongying Wang

Center for Behavioural Science, School of Medicine, Nankai University, Tianjin, China

Objectives: More children are diagnosed with an autism spectrum disorders (ASD) than AIDS, diabetes and paediatric cancer combined. The most promising avenue to avert this disease burden is Early Intensive Behavioural Intervention (EIBI), which research has demonstrated can alter the course of behavioral development for children with an ASD (Dawson, 2008; Howlin et al, 2009; Rogers & Vismara, 2008). This study aims to investigate how EIBI works in China. *Methods:* 20 Children aged 12 - 60 months are enrolled for this program to provide structured, hands-on strategies with specific curriculum and teaching practices. Therapists and parents are trained with necessary skills to engage, communicate with, and teach their very young children with or at risk for ASD. Principals of Applied Behavior Analysis and Pivotal Response Training/teaching (PRT) are used in a naturalistic teaching approach - designed for implementation in everyday settings – home, individual, groups, centres, etc. *Results:* During the six months observation, children have been brought back into the social loop on their imitation, emotions, communication, sharing experiences, social and symbolic play, language etc., according to the curriculum checklist used to gather information on the child's developmental abilities on the basis of these. *Implications on Rehabilitation:* By providing intervention early in development, it appears possible to mitigate the severity of autism symptoms and alter the trajectory of the disease at both the level of behavior and the brain.

PO-0045

REHABILITATION PROGRAM EVALUATION FOR CHILDREN WITH AUTISM SPECTRUM DISORDERS

Chongying Wang

Center for Behavioural Science, School of Medicine, Nankai University, Tianjin, 300071, China

Objectives: This study aims to evaluate the rehabilitation programs for children with autism spectrum disorders (ASD) in Tianjin, China. *Methods:* 50 Children aged 3-6 years are enrolled for this program. They are selected from rehabilitation centers and special schools in Tianjin where they received at least 20 h per week comprehensive behavioral intervention based on the principals of applied behavior analysis and pivotal response training/teaching in a naturalistic teaching approach - designed for implementation in everyday settings – home, individual, groups, centres, etc. Their developmental abilities are mastered and evaluated for a period of twelve months. The evaluation form consists 8 parts and 493 items, including perception, language and communication, cognition, joint attention and social interaction, emotion and behaviors, fine and gross motor, personal independence. *Results:* Children in different rehabilitation centers and special schools showed different development in twelve months. Some children showed significant changes on language and adaptive behavior, but others do not. *Implications on Rehabilitation:* The findings demonstrate a great need for comprehensive rehabilitation programs for children with ASD based on professional assessment.

PO-0046

COMPREHENSIVE REHABILITATION PROGRAM FOR PATIENTS WITH DYSFUNCTIONS AFTER WENCHUAN EARTHQUAKE

Jing He, Hongchen He, Yonghong Yang, Chengqi He

Rehabilitation Department, West China Hospital of Sichuan University, Chengdu, Sichuan, China

Background and Objectives: There were huge amounts of patients with various dysfunctions after Wenchuan Earthquake and the rehabilitation needs was enormous. Emergency rehabilitation program Comprehensive Rehabilitation Program (CPR) was formed in this case. The study aimed to invest the effect of CPR on patients with various dysfunctions after Wenchuan Earthquake. *Methods*: From January 2008 to May 2010, the medical records of 15656 patients with dysfunctions were reviewed and we gathered the results of functional evaluation such as motor score, sensory score and ADL score before and after CRP. CRP includes PT, OT, PO, Acupuncture, Emergency Rehabilitation and Community-based Rehabilitation. *Result*: The motor function, sensory function and ADL of the patients have been improved through CRP. *Conclusion:* The Comprehensive

Rehabilitation Program provides appropriate and effective treatment for patients with dysfunction after the Wenchuan earthquake.

PO-0047

POST-EARTHQUAKE QUALITY OF LIFE AMONG INPATINETS SURVIVORS 4.5 YEARS AFTER THE EARTHQUAKE IN 2008 WENCHUAN, CHINA

Zengchun Sun, Tingyan Yang, Jin Qin, Zengyong Luo
Sichuan Province Rehabilitation Hospital, Sichuan, China

Objective: To investigate quality of life of in-patient survivors after 4.5 years in a great earthquake Wenchuan, China and to examine the relationships. Provide dates for further intervention and recovery policy. *Method:* Survey time was determined between January 1-12, 2013, a cross-sectional descriptive survey in an Earthquake Patients Rehabilitation Hospital which was specially build for Wenchuan Earthquake by nation. Reasons for hospitalization without earthquake-related injury were excluded. Participant's gender, age, injury condition, family supports were assessed. Rehabilitation professional evaluated the Word Health Organizations' quality of life instrument (WHOQOL-BREF, Chinese version) and the ability of Activities of Daily Living (ADL) Barthel Index. Results were compared with the general population. *Results:* The results reveal that the hospitalized patients survivors were adversely affected on physical capacity and psychological dimensions of QOL even 4.5 years after the earthquake, and had seriously dependency in ADL. Results paradoxically in better social relationships and significantly higher in environmental domains. Poor QOL associated with their gender, age, types and degree of injury, times of admission, poor family support. *Impact on rehabilitation:* Even 4.5 years have passed, 10 earthquake-related inpatients still live in the hospital. They have low quality of life and serious influence on physical capacity and activities of daily living. Good social relationships and environmental domains may have relationships with hospitalized. Lower QOL associated with female gender, higher age, injured types and degree, poor family support, increased dependency in activities of daily living. It challenges for recovery experts and societies to institute efforts shorten the recovery phase and maintain a high level of the longitudinal inpatients by focus on long-term therapy when making rehabilitation strategy after disaster.

PO-0048

THE EFFECT ON IMPROVEMENT OF THE ACTIVITIES OF PATIENTS WITH STROKE BY THE PRIVATE HOME-BASED TRAINING PROGRAM

Nobuyuki Kawate[1], Mssazumi Mizuma[2]
[1]Showa University school of nursing and rehabilitation, Japan, [2] Showa University School of Medicine, Japan

We programed the private home-based training for patients with stroke at home. This program was as follows: 1) we make training menu depending on the ability of the patients, 2) we make the patients learn it, 3) we make it perform in the patients at home, 4) and we confirm the enforcement situation and make modifications every two weeks. We examined an effect on improvement of the activity level of daily living by this program. *Subject*: Subjects of this study included 16 patients with ambulatory stroke that lived at home (average age 61.6 years old, men: 8, women: 8). *Method:* We randomized the patients to two groups of the training group:8 (average age 62.5 years old) and the non-training group: 8 (average age 60.8 years old).We measured the activities level (a value that is average activity level divided with activity time) of daily living patients by Life Corder®. Life Corder® was a portable equipment which applied the acceleration measurement. In addition to regular pedometer measurement, activities intensity was categorized into 10 levels by measuring amplitude and frequency (pitch) of vibration using the accelerometer. We compared the change one year later between both groups. *Results*: In the non-training group, 0.2% decreased, whereas in the training group, 28.7% increased ($p<0.05$) than the activitie sLife Corder®. Life Corder®. level one year ago. *Discussion*: We were suggested that the activities of daily living of patients with stroke at home were increased by the private home-based training program.

PO-0049

AN IMPORTANT ACTIVITY AS A PHYSICAL THERAPIST AT THE RADIATION DISASTER AREA OF MINAMISOMA CITY IN FUKUSHIMA PREFECTURE

Nobuaki Moriyama, Yukio Urabe, Noriaki Maeda
Department of Sports Rehabilitation,Graduate School of Biomedical and Health Sciences, Hiroshima University, Hiroshima, Japan

Objective: Minamisoma City in Fukushima prefecture was greatly affected by the radiation disaster due to the Great East Japan Earthquake on March 11, 2011. As for Minamisoma City General Hospital, inpatients did not have sufficient medical and rehabilitation service due to the shortage of therapists. A project team by twenty-eight volunteers was formed. The participants were therapists with a national qualification. The objective of this team activity was to provide the patient in the radiation disaster area with medical treatment. *Method:* The volunteer activity was performed in Minamisoma City General Hospital. The time frame was 7 months, from October 2011 to April 2012. Each participant provided physical therapy to each patient. *Results:* On April 2011, the early phase of the disaster, the hospital could not afford to provide any rehabilitation service. A year later on April 2012, a total of 2000 patients had received rehabilitation service. After volunteer intervention, about 10% of the patients took project member's rehabilitation. *Implications/Impact on rehabilitation:* The activity resulted in increase of patients taken rehabilitation service after the acute phase of the disaster when the hospitals functions had recovered. Although the medical recovery from the disaster placed great emphasis on the immediate result after the disaster, it has been suggested that continuous response to victim's health even after the early phase of the disaster is important.

PO-0050

A STUDY ON VALIDITY OF ACTIVITY DAILY LIVING TASK ANALYSIS SCALE

Ying Cui
Hebei Afiliation University, Tangshan, China

Objective: To investigate the validity of the Activity daily living Task analysis scale. *Method:* 90 hemiplegic patients were measured by Activity daily living Task analysis scale. The interrelationships among Activity daily living Task analysis scale, Function Independent Measurement (FIM), Barthel index (BI), Fugl-Meyer assessment (FMA) and Hamilton Depression Scale (HAMD) were analyzed. Result ctivity daily living Task analysis scale had positive correlations with FIM, BI (rs=0.5750~0.7604, $p<0.001$) respectively. Activity daily living Task analysis scale had positive correlations with FIM-A, FMA (rs=0.4292~ 0.8260, $p<0.001$~ 0.02). *Impact on rehabilitation:* Activity daily living Task analysis scale is combined by measurement and treatment with good validity. It can be applied to ADL evaluation among hemiplegia patients, and it fits very well into the routine assessment and treatment scheme.

PO-0051

A SNAPSHOT OF FU'S SUBCUTANEOUS NEEDLING

Zhong-Hua Fu, Hong-Ru Zhang, Yi-Huang Gu
FSN Institute, Nanjing University of Chinese Medicine, China

Fu's Subcutaneous Needling (FSN), a therapeutic approach, originated from conventional acupuncture and developed since 1996,

mainly acts safely at the subcutaneous layer around the afflicted spot using a kind of special trocar needle as its tool. For the majority of the focal painful or tender problems, FSN could provide significant and immediate relief sometimes works faster than anesthesia. This brief FSN introduction highlights its indications, tool, process, and the method of how to test the effect, in order to provide a brief but valuable resource for those clinicians and researchers in the field of pain management.

PO-0052

EXPERIENCES OF EDUCATION ABOUT REHABILITATION IN LOW RESOURCHES COUNTRIES

Germano Pestelli[1], Paola Maltoni[2], Corinne Rellstab[3], Alessandro Accili[4]

[1]Italian Society of Physical and Rehabilitation Medicine (SIMFER), Italy, [2]Rehabilitation Dep. Public health service FORLI, Italy, [3]Zurich social service, Switzerland, [4] Fatebenefratelli Hospital, Genzano di ROma, Italy

We would like to share our experience about education in low resources countries all over the world. We start to do something about this in Albania, town of Shkoder, in 1999 doing education for rehabilitation to a group of 20 young Albanian people living in the northern region near Shkoder and Puke. The teachers were Italian medical doctors in rehabilitation expert in adults' and in children rehabilitation and a group of 5 Italian physiotherapists and 1 Swiss occupational therapist. We start to work with the collaboration of NGO Madonnina del Grappa of Florence who had, and have now too, a mission in Northern Albania. ALL the young Albanian people had have a basis education as nurses. The organization was for 3 weeks of education four times every year for 3 years. After the first educational training, in according with the dramatic situation of Albania in that period, we start to do something for poor and disable people of the region, in according with the rules of CBR. In 2007 the University of Shkodra and the University of Florence decided to do a regular three years course of rehabilitation in which some of us are teaching metodology of rehabilitation and rehabilitation after bones' fractures. After this experience we did other similar jobs in Etiopia (2004-2008), in Ghana (2010-2012), in Moldova (2009-2013) and in Guatemala (2012-2013). The aim is to improve the knowledge about rehabilitation of the volunteers and of the caregivers to obtain a better assistance for disable and poor people. And also to create opportunity of job in low resources countries. Our job, in all these countries, is always as volunteers and with the cooperation of NGO, of Italian Society of Rehabilitation (SIMFER) and other health and social organizations.

PO-0053

BETTER OUTCOMES THROUGH INTERACTIVE PATIENT EDUCATION; A MECHANISM FOR INCREASED EFFICIENCIES IN THE CLINICAL SETTING

Robert Willison, Lao Yanrong, Dai Hong-Se*

PDi Communication Systems, United States

Objective: Examination of patient's understanding and subsequent outcomes through the use of coupled hardware and patient education. General comparison to other patient education delivery methods from a clinical standpoint. *Method:* Sampling of several departments using control and experimental population. Investigation was done using a bedside patient education system in order to educate patients on their diseases, outcomes, rehabilitation expectations, and medications. The control was through conventional methods - nursing staff answering questions, reading, and other general knowledge sources. *Results:* Three areas of results were generalized. The impact on the hospital from the time efficiency for the nursing/care staff in reducing workload, the impact on the patient from increased knowledge and understanding about the course of disease/ treatment, and the impact of using consistent education methods. In each case, there was a positive impact from the use of the system on the overall healthcare experience. *Implications/Impact on rehabilitation:* Generalized results suggest that implementation of a consistent patient education system accessible by the patient and their family allows for the best possible post-treatment outcomes - reduced interrogatory workload on the staff allowed more time to focus on core healing tasks. Avoiding re-injury and rapid healing are optimum when patients follow caregiver's orders - and comprehension of the orders are supported through consistent patient education.

PO-0054

EVIDENCES ON THE REHABILITATION OF PATIENTS WITH DYSTONIAS

Tatiana Domingues Pedroso

Fundação Faculdade de Medicina, Brazil

Objective: The dystonias are movement disorders characterized by muscle contractions that cause repetitive torsion movements with variable speed, leading to an abnormal stance. They can be classified according to the age of the diagnosis, etiology and anatomical distribution; and may be focal, segmental, multi-focal or generalized. The present study aims to present the results and scientific evidences with regard to the strategies and interventions of rehabilitation for people with dystonias (except in the cases of Parkinson). *Methodology:* In order to do this, 10 questions have been elaborated regarding the proposed themes in the context of the multi-professional actuation and have been structured in the P.I.C.O. configuration (initials for "Patient", "Intervention", "Control", "Outcome"). The study used descriptors like dystonia, botulinum toxin, anticholinergic, transcranial magnetic stimulation (TMS), deep brain stimulation, activities daily living, among others to perform the search and review of articles in the databases of MEDLINE (PubMed) and other sources of research, without time limit. Studies that could contribute in the elaboration of answers and recommendations related to drug interventions, of brain stimulation, use of botulinum toxin, and therapeutic exercises were included after discerning selection. *Results:* This way, after analyses of the researched material (21 articles included) recommendations were elaborated to the rehabilitation of patients with dystonias and it was verified the need for more studies with this objective, which became indispensable to the inclusion of considerations and impressions of the clinical practice. *Implications:* More studies are needed especially about the occupational performance and participation in the daily life activities.

PO-0055

THE DESIGN OF WIRELESS SURFACE EMG ACQUISITION SYSTEM

Jianting Fu, Yao Li, Lei Ma, Jian Chen

Chongqing Institute of Green Intelligent Technology, Chinese Academy of Sciences, China

Surface electromyography (sEMG) signal is a kind of biological electrical signals generated when the neuromuscular system is activated, which contains accurate motion information, thus it would be effective to extract the limb motion information through the collection and analysis of surface signal. This design of wireless Surface EMG acquisition system contains three parts: surface EMG sensor, signal acquisition module (via Bluetooth) and the analytic and display module on PC server. Surface EMG sensors work as analog signal amplifiers and filters. In this part of design, we introduce AD8428, a new integrated signal conditioning block, This block has several advanced characteristics, such as 130 dB min CMRR, Low input voltage noise, low Offset drift. The main functions of the signal acquisition module (via Bluetooth) include AD conversion, parameters configuration, data storage (SD) and basic user interface (UI). As for PC server, it con-

tains much more complicated UI and takes charge of monitoring and configuring lower machine, as long as analyzing surface EMG signal data. All in one, this brand new system has achieved the function of 8-channel of surface EMG acquisition, of which resolution rises up to uV level, and effective wireless communication distance would be able to reach 15m. In general speaking, we introduce a noninvasive, convenient, effective way to extract EMG from human body to address the key technologies for human-computer interaction. Besides, with the EMG signals obtained, we are able to take advantages of it in prosthetic control, rehabilitation, medical and many other fields, which would be a significant achievement in the field of biological-computer interdisciplinary integration.

PO-0056

FUNCTIONAL ELECTRICAL STIMULATION IMPROVES MOTOR FUNCTION AND ABILITIES OF DAILY LIVING OF THE LOWER LIMB IN PATIENTS WITH EARLY STROKE: A RANDOMIZED CONTROLLED TRIAL

Guoqing You[1,2], Tiebin Yan[1], Huiying Liang[2]

[1]Department of Rehabilitation Medicine, Sun Yat-sen Memorial Hospital, Sun Yat-sen University, Guangzhou, China, [2] Department of Rehabilitation Medicine, the Zhongshan City Peoples Hospital, Zhong Shan, China

Objective: To investigate the effectiveness of functional electrical stimulation (FES) in improving the motor function of the lower paretic limb, balance and abilities of daily living in stroke patients. *Methods:* Thirty-seven patients suffered from first stroke were stratified and then randomly allocated into FES group (n=19) and the controlled group (n=18). FES group was treated with functional electrical stimulation and standard rehabilitation, and the controlled group with standard rehabilitation only. For the FESg roup, surface electrode plates were placed over the motor points of the tibialis anterior, medial and lateral grastrocnemius of the affected lower limb.FES was delivered at 30Hz with 200μs and the intensity strong enough to induce foot dorsal extension and eversion. The treatment lasted for 30min, once per day, 5 days per week for 3 weeks. Measurements included composite spasticity scale (CSS), lower limb domain of Fugl-Meyer assessment of motor recovery, postural assessment scale for stroke patients (PASS), Berg Balance Scale (BSS) and modified Barthel Index (MBI). They were evaluated before, at two and three weeks of treatment. *Results:* Before treatment, no significant differences were found between the two groups for the baseline. After 2 and 3 week treatment, the percentage of CSS score in the FES group (8.9%±23.2%and 10.4%±18.3%) was significantly lower than that in the controlled group (36.3%±47.3% and 47.7%±56.4%). The percentage of FMA score in the FES group (105.5%±75.7% and 127.1%±89.4%) was significantly higher than that in the controlled group (51.4%±47.3% and 64.3%±51.8%). The percentage of MBI scores in the FES group (96.1%±58.0% and 112%±74.2%) was obviously higher than that in the controlled group (48.2%±25.4% and 64.7%±41.3%). *Conclusion:* Three weeks of FES on the paretic lower limb of early stroke patients improves motor function and activities of daily living.

PO-0057

REPORT ABOUT THE EARTHQUAKE IN EMILIA, ITALY

Germano Pestelli

SIMFER, Italian Society of Physical and Rehabilitation Medicine, Italy

On 20 May 2012 at 4.03, a violent earthquake struck the province of Modena, in particular the area of the towns of Carpi, Mirandola, Concordia and San Possidonio, damage more 'serious were mainly in urban centers and the countryside. Rescuers managed by the Region of Emilia Romagna and the Civil Defence immediately began their activities through the channels of historical experience and consolidated in the Italian territory. On May 28, at 9:00 in the morning two aftershocks over 6 on the Richter scale shook the area again aggravating an already serious situation. 400 people injured 30 people dead 20,000 displaced Construction fields 45 Prepared meals every day about 50,000 for the first 2 months Then follow one another every day for about 15 days to about 100 days of shocks of adaptation, to September 19 have been counted more than 2000 shocks. Aid to people affected by the earthquake began immediately after the first shock with the joint effort of the National Civil Protection and Emilia Romagna region. Was created a Committee of aids' coordination at the headquarters of the Regional Council in Bologna. Were immediately erected tents for immediate assistance to those who had their homes destroyed, the wounded were immediately taken to hospitals in the area and, if necessary, also in Bologna, Reggio Emilia and Parma. The civil protection sent volunteers for the daily management of the camps.

PO-0058

EFFECTS OF THE COGNITIVE BEHAVIOURAL THERAPY (CBT) ON FEAR OF FALLING WITH STROKE PATIENTS: A PILOT RANDOMIZED CONTROLLED TRIAL

Tai Wa Liu[1]*, Shamay S.Y. Ng[2], Gabriel Y.F. Ng[2]

[1]Nursing, School of Science and Technology, The Open University of Hong Kong, Hong Kong, China, [2] Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong, China

Objective: To investigate the effects of cognitive behavioural therapy (CBT) on fear of fallings in patients with chronic stroke. *Method:* This study was a pilot randomized controlled clinical trial. Thirteen seniors with stroke were randomly assigned into either: (1) cognitive behavioural therapy (CBT) plus conventional training (CT) group, and (2) conventional training (CT) group. All subjects underwent 1 session of assigned treatment per week, for 8 weeks. For the he primary outcomes, subjective balance confidence and balance performance were measured by the Activities-Specific Balance Confidence (ABC) Scale and the Berg Balance Scale (BBS), respectively. For the secondary outcomes, fear-related avoidance of activities and ability of living independently in the community were measured by The Survey of Activities and Fear of Falling in the Elderly (SAFFE) scale and the Lawton Instrumental Activities of Daily Living (IADL) scale, respectively. *Results:* When compared with the CT group, CBT+CT group had significantly better IADL scores but not ABC, BBS and SAFFE scores, after 8-week intervention. *Implications/Impact on rehabilitation:* Results of this pilot study have demonstrated that CBT is feasible treatment for patients with chronic stroke. The 8-week CBT program in supplement to conventional training could improve the activities of daily living in patients with stroke.

PO-0059

AN INTERVENTION TO PREVENT CHILDREN FROM PERMANENT DISABILITIES: USING ACTIVE CASE FINDINGS TO IDENTIFY AND REHABILITATE CHILDREN WITH UNDIAGNOSED CEREBRAL PALSY IN DIOXIN-AFFECTED AREAS

Ja-Ho Leigh[1], Inpyo Jeon[2], Chang Hoon Hong[3], Nahee Shin[4], Allison Alley[5], Juhwan Oh[5]*

[1]Department of Rehabilitation Medicine, Korea National Rehabilitation Center, Korea, [2] Department of Rural Health, Korea Health Promotion Foundation, Korea, [3]Medipeace, Korea, Korea, [4] Graduate School of Public Health, Seoul National University, Korea, [5] JW LEE Center for Global medicine, Seoul National University College of Medicine, Korea

Objective: Based on a known causal relationship between dioxin and development disabilities such as cerebral palsy (CP), this intervention study aimed to prevent permanent disability by providing rehabilitation services to children before brain maturation. The study was funded by a developmental grant and was conducted in middle Vietnam, a heavily dioxin-affected area. *Method:* In 2012, children under age 16 residing in Gio Hai Commune, one of 19 villages in Gio Linh District of Quang Tri Province, were screened through face-to-face interviews using a structured questionnaire. Identified cases were then diagnosed by a physiatrist using developmental diagnostic tools and were referred to a physical therapist for rehabilitation services and continuing support. Results The study response rate was 95% (631 out of a possible 661). Ninety-five children (15.1%) showed developmental delays, 51 (8.1%) children had movement disabilities and 9 (14.3 per 1,000) had CP (5 cases were previously diagnosed and 4 cases were newly diagnosed [mean age 16 months with development age 9 months])). As part of the intervention, 33 children received rehabilitation, 21 children attained special wheelchairs tailored for their deformed body curvature, and 25 parents received an in-home therapy information booklet with relevant education. *Implications:* This study identified children previously undiagnosed with development disorders and confirmed a higher prevalence of CP in this region compared to other areas such as Korea (2.6 per 1,000). The results support scaling-up the intervention research package to the whole province to prevent an estimated 741 undiagnosed children with CP from avoidable permanent disabilities.

PO-0060

REHABILITATION IN DISABLING OBESITY

Paolo Capodaglio
Istituto Auxologico Italiano, Italy

Obesity is a clinical condition characterised by significant clinical implications, such as co-morbidities and somatic fragility, which seriously affect independence, psychological well-being and overall quality of life. Given the figures of obesity worldwide, there is a need to develop a proper rehabilitative approach originating from the functional limitation, disability and clinical needs of obese patients. Excess weight per se imposes abnormal mechanics on body movements, which could account for the high incidence of musculoskeletal disorders in these subjects. Pain and osteoarthritis, both known determinants of disability, are often correlates of obesity, in particular at knee, hip and spine level, which shows a limited flexibility and increased dorsal stiffness. Despite greater muscle mass, when normalized to body weight, strength appears 10% lower in obese subjects as compared to their lean counterparts. Obesity appears to be linked to an increased risk of falling. As for cardiovascular response, obese subjects show a lower oxygen consumption in relation to body mass and perform early anaerobic work during exercise. Obese subjects basically adapt their gait and select lower walking speed so as to reduce the load at knee level and the metabolic expenditure. Disability associated with obesity may be predominantly due to a combination of motor or cardio-respiratory complications according to the coexistence of a range of related conditions. The lecture will also discuss feasible care models for disabling obesity, illustrating current protocols in musculoskeletal, cardio-respiratory and psychological rehabilitation. This will explain what can be done rehabilitation wise based on the latest scientific evidences.

PO-0061

A TRACKING ANALYSIS OF HSL REHABILITATION EDUCATION PROGRAM'S EFFECT

Weifeng Zhang[1], Lei Zhang[2]
[1]Department of rehabilitation science, Nanjing college of special education, Nanjing, China, [2] Key Laboratory of Speech and Hearing Sciences, Ministry of Education, East China Normal University, Shanghai, China

Objective: To research the development and changes of hearing-impaired children's hearing, speech and language ability in the HSL rehabilitation education program, by a tracking analysis of language rehabilitation effect of 320 cases. *Methods:* Use the standards and methods of hearing, speech and language assessment, and analyze the three assessment data by tracking data analysis methods. And use repeat measured experimental design to choose the gender, age at implantation and recovery time as independent variables, speech, language assessment results as the dependent variable. *Results:* The hearing-impaired children's ability of hearing, speech, language increase significantly with the recovery time ($p<0.01$); the small age group's rise of speech and language ability is larger than the older age group ($p<0.01$); the variation coefficient of the speech and language proficiency assessment results is getting smaller and smaller with the rehabilitation process ($p>0.05$). The assessment results between hearing-impaired boy and hearing-impaired girl is no significant difference ($p > 0.05$). *Conclusion:* the younger are hearing impaired children, the more significant is the effect of rehabilitation of hearing, speech, language ability; the differentiation of speech, language ability of hearing impaired children in the same age group is getting smaller and smaller after 1 year of rehabilitation. This shows the effectiveness of the program of the HSL rehabilitation education.

PO-0062

THE EFFECT OF ACUPUNCTURE COMBINED WITH REHABILITATION THERAPY ON MOTOR FUNCTIONAL AND ADL OF STROKE PATIENTS

Min Chen
Acupuncture and rehabilitation department in Huangshi Hospital of Traditional Chinese Medicine, Hubei province, China

Objective: To study effects of acupuncture combined with rehabilitation therapy on the motor functions and activities of daily living in patients with stroke. *Method*: 60 patients were randomly divided into two groups, observation group and control group. There were 30 patients each group. Patients in the two groups were treated with conventional drugs and acupuncture conventional treatment. while those in the observation group were received early limb function rehabilitation training. All patients were assessed after treating for 3 months. *Results:* Comparing to the patients of the control group, there were significant improvements of motor functions and activities of daily living of patients in the observation group ($p<0.01$). *Implications:* The acupuncture combined with rehabilitation therapy can effectively promote the recover of the motor functions and activities of daily living in patients with stroke and reduce the disability rate.

PO-0063

EVALUATION OF A THERAPEUTIC EDUCATION PROGRAM BEFORE A TOTAL KNEE ARTHROPLASTY

Jean-François Flez, Philippe Couette*, Louis Antoine Liguori
Clinique Saint Paul, Martinique, France

Objective: Evaluation of the advantages of a therapeutic education program before the installation of a three-compartments knee prosthesis with rotational plateau (TCKP), as well as the impact of this program on anxiety level and postoperative pain. *Method:* All patients about to receive the installation of a TCKP were studied over a 6 months period: 57 patients and 24 accompanying relatives accepted to follow the program, whereas 36 other patients did not follow it. The same surgeon operated on the 2 groups of patients, which then had to follow the same rehabilitation protocol. The program consists in an individual comprehensive assessment, and in the participation to a collective education session informing patients on anesthesia, surgery and rehabilitation. A doctor of physical medecine and rehabilitation and a medical staff lead these meetings that lasted 2 h. Patients and his relatives who followed the program had to fill in

a questionnaire before and after this information session. The study measured the anxiety level before the surgery, and the postoperative pain at day 5 and day 21 after the surgery (measured by the VAS) among the 2 groups. *Results*: This study shows that a therapeutic education program before a TCKP allows a better pain management 5 days after the surgery, and contributes to reduce the patient and the accompanying relatives anxiety level before and after the surgery. *Implications:* Setting up a therapeutic education program seems to positively affect the quality of the rehabilitation of the patient and could be applied to other surgeries requiring rehabilitation.

PO-0064

THE ORIGIN AND DEVELOPMENT OF HANG BY THE FEET MASSAGE THERAPY

Jin Lin Yang
Traditional Chinese Medicine Hospital of Huangshi City in Hubei Province, Huangshi, China

Hang by the feet massage therapy is growing up on the basis of the Traditional Chinese Medicine bone-setting and massage therapy, and is a kind of method of Traditional Chinese Medicine treatment on spinal fractures and pain in waist and leg. The passage cited in the origin of hang by the feet massage therapy from the ancient books, and discussed its development from modern clinical practice.

PO-0065

MEDICAL REHABILITATION AFTER DISASTERS FROM 1991 TO 2011: A BIBLIOMETRIC STUDY

Seyad Ahmad Raeissadat[1], Parviz Mojgani[2]*
[1]Physical Medicine and Rehabilitation Research Center, Shahid Beheshti Medical University, Faculty of Medicine, Modarres Hospital, Iran, [2]Iran Helal Higher Educational Institute of Applied Sciences, Iran

Introduction: Over the last decades absolute numbers of injuries as well as injury to death ratios in natural disasters have increased significantly and technological disasters have affected more people. This underlines the increasing need for medical rehabilitation after disasters. A systematic analysis of the literature growth in medical rehabilitation after disasters is, however, not available. In this bibliometric study the papers related to medical rehabilitation after disasters published during 1991 to 2011 were analyzed and the research trends were assessed. Research activities in different countries were also determined quantitatively. *Methods:* For this study, 279 papers related to medical rehabilitation after disasters published from 1991 to 2011 were considered. Searches of Science Citation Index Expanded (SCI-EXPANDED), Social Science Citation Index (SSCI), Conference Proceedings Citation Index - Science (CPCI-SSH) & Conference Proceedings Citation Index- Social Science & Humanities (CPCI-SSH) available by Thomson Reuters for Scientific information (ISI) were conducted to obtain the characteristics of the published articles. *Results:* This report reflects citations to source items indexed within Web of Science. From 1991 to 2011, 279 papers have been cited 1011 times, of which 968 cases were without self-citations. Articles constituted the highest percentage of the published papers. USA, IndiaandChinahad the greatest number of published papers. The number of publications increased between the years 1991 and 2011. *Conclusion:* This study showed the growing trend of the literature concerning medical rehabilitation after disasters over the last two decades. USA, ChinaandIndiahave had major role in this regard.

PO-0066

CONSTRUCTION OF THE THREE-LEVEL REGIONAL REHABILITATION SERVICE MANAGEMENT SYSTEM IN CEREBRAL STROKE TREATMENT BASED ON CLOUD COMPUTING

Guozhi Huang
Dept. Rehabilitation of Zhujiang Hospital, Southern Medical University, China

Objective: Through the Three-level regional rehabilitation service management system (TRRSM System), clarify the clinical pathway for diagnosis and treatment of Cerebral Stroke within the three-level regional rehabilitation unit. Through standardization, digitalization and cloudization, we further standardize the assessment and treatment of cerebral stroke; furthermore, implement the stratified, staged regional rehabilitation service system for cerebral stroke. *Methodology*: 1) Through literature review on local and international progress, development and existing issues for construction of "Cerebral Stroke regional rehabilitation system", to figure out the feasibility and workability of TRRSM System. 2) Collecting the current service functional ability of different level of rehabilitation unit in Guangdong Province. 3) By expert grading method (Delphi method), analyze and define the functional role and service can be provided by different level of rehabilitation unit in the Cerebral Stroke clinical pathway. *Result*: 1) With the experimental TRRSM system model to stimulate the information flow and clinical pathway connection within three-level regional unit in the digital laboratory, demonstrated that it provides the economics of scale of resource on the rehabilitation processing. 2) Implementation of the Standardize Cerebral Stroke clinical pathway through TRRSM System within Three-level of rehabilitation unit. *Implications:* With the TRRSM System, implement the cerebral stroke regional rehabilitation system structure, as a basis for the regional rehabilitation system construction concept and model development This article further confirmed the feasibility of the TRRSM system in cerebral stroke based on cloud computing. Through cloud technology, we provided basis for the utilization decision support on diagnosis, rehabilitation and health management on cerebral stroke.

PO-0067

EXPERIENCE OF NURSE ENGAGE BEDSIDE REHABILITATION OF THE EARLY REHABILITATION PATIENTS

Wenjun Lyu
Provincial hospital authority of Jiangsu, Jiangsu, China

With the idea of rehabilitation go deep into and increased of patient's rehabilitation needing, more and more kinds of patients change over to rehabilitation unit, nurse join into early bedside rehabilitation physiotherapy has been increasing, early rehabilitation nursing is not only involved with basic physiotherapy, also need nurse to familiar and grasp with the clinical application of the advanced rehabilitation apparatus.

PO-0068

WHAT AMOUNT OF RESISTANCE IS APPROPRIATE FOR THE LUMBAR MUSCLES' COORDINATION TEST IN YOUNG MALE ADULTS?

Yanmei Guo, Wei Chen, Chang-Shui Weng
Department of Rehabilitation Medicine of Nan Lou, The Chinese PLA General Hospital, China

Objective: To determine what amount of resistance is appropriate for the lumbar muscles' coordination test in young male adults so that the test results are applicable for clinical practice. *Methods*: Thirty young male adults (aged from 18 to 26 years old, mean age 20.60±2.20 years) carried out the lumbar muscles' coordination test for two times within one week by one consistent tester. In each test, the examinee took the 5, 10 and 15 kilogram of resistance tests consecutively. Four test results were obtained; namely, the concentric mean, the concentric deviation, the eccentric mean and the eccentric deviation. Intra-class correlation coefficients (ICCs)

for these four test results were applied to evaluate the reliability of those tests. *Results*: The intra-class correlation coefficients (ICCs) of the four test results of the 5kg of resistance group were 0.303, 0.500, 0.358 and 0.360 respectively; and 0.449, 0.382, 0.365 and 0.272 respectively for the 10 kg of resistance group: and 0.453, 0.442, 0.614 and 0.411 respectively for the 15 kg of resistance group. *Conclusion*: The four test results show that those in the 15kg of resistance group have good test-retest reliability. We should choose 15 kg as the minimum resistance when young male adults are being tested of the lumbar muscles'coordination ability.

PO-0069

EXPLORATION OF RELATIONSHIP ON COPM AND ADL FOR STROKE PATIENTS

Yonghui Hou[1], Ying Liu[1], Guorong Wei[2], Xiuming Chen[1], Xiang He[1], Yongbo Jiao[1], Junjing Yang[1], Xiaoyan Li[1]

[1]The Department One Of Rehabilitation medicine;Shi Jia Zhuang Central Hospital, China, [2]The Hongkong Society for Rehabilitation, China

Objectives: To explore the relationship of the Canadian Occupational Performance Measure (COPM) and stroke patients' Activities of Daily Living (ADL); *Methods:* 86 patients after stroke who's Bathel Index /ADL scores was no statistic difference and then was randomly divided into two groups: Group A (n = 44) and group B (n=42). All subjects had same rehabilitation treatment, but COPM was applied to group A as well. After two months, all subjects were assessed by Bathel Index again to determine their ADL scores; The changes of the two groups on ADL scores and the correlation between COPM scores and ADL scores in group A were analyzed. *Result:* There was significantly difference of changes on ADL scores between two groups, Group A is more than group B in bathel Index (p<0.05). Therefore,COPM and ADL have positive relationship in stroke patients in this sample. *Implications:* It is suggested by this study to Apply COPM to stroke patients and to facilitate their ADL gains.

PO-0070

ADHERENCE CHARCTERISTICS OF CHINESE POST-STROKE REHABILITATION PATIENTS

Lu Wang[1]*, Wenke Fan[2,3], Yugang Jia[4]

[1]Philips Research Europe, Netherlands, [2]Huashan Hospital, China, [3]Fudan University, China, [4]Philips Research, China

Introduction: Due to extremely low supply-demand between rehabilitation professionals and stroke patients in China, patients do not receive the desired attention. Post-stroke rehabilitation is a laborious process. Promoting effective rehabilitation adherence requires user-tailored techniques. *Objective:* The objective of the study is to summarize and group patients' characteristics pertaining to enabling or inhibiting rehabilitation adherence. *Methods*: The study consisted of interviewing 18 stroke rehabilitation in-patients in Shanghai, China. Both open questions and self-report questionnaires, aimed at exploring the psychological determinants of behaviour adherence were employed. Consequently, the results were qualitatively analyzed. *Results*: All participants acknowledged the importance of rehabilitation training. Three profile groups were extracted based on the stage of rehabilitation, which included patients engaging in rehabilitation for less than three months (early patients), less than six months (mid-term patients) and more than six months (long-term patients). Early patients are the most motivated, confident and impatient group. They tend to overdo exercises without being aware of side effects. Mid-term patients are eager to evaluate themselves and balance the eagerness to recover. Long-term patients are dissatisfied and tend to doubt on the effectiveness of the training exercises. Participants are emotional, insecure and obedient. In particular, they see themselves as a burden for their family. Participants' level of motivation, perceived competence and belief in effectiveness tend to decline after three months. Family plays an important role on their attitude. *Implication/Impact on rehabilitation*: Technology mediated training is a solution to alleviate shortage of professionals. The grouped profiles provide important characteristics that facilitate rehabilitation adherence.

PO-0071

THE EFFECTIVENESS OF FUNCTIONAL ELECTRICAL STIMULATION BASED ON A NORMAL GAIT PATTERN ON SUBJECTS WITH EARLY STROKE: A RANDOMIZED CONTROLLED TRIAL

Zhimei Tan[1,2], Huihua Liu[1], Yuegui Chen[1], Shuwei Xu[1], Tiebin Yan[1]

[1]Sun yat-sen memorial hospital, sun Yat-sen University, China, [2]The first affiliated hospital of zhengzhou university, China

Objective: This study investigated the effectiveness of four-channel FES based on a normal gait pattern on improving functional ability in subjects early after ischemic stroke, and compared it with conventional FES stimulating ankle dorsiflexion only. *Methods:* Forty-five subjects were randomly assigned into a four-channel FES group, a four-channel placebo group or a dual-channel group. Stimulation lasted for 30 min in each session with 1 session/day, 5 days a week for 3 weeks. All subjects were assessed at baseline, then once a week during the 3 weeks of treatment and at a follow-up 3 months after the treatment had finished. The assessments included Fugl-Meyer Assessment (FMA), the Postural Assessment Scale for Stroke Patients (PASS), Berg Balance Scale (BBS), Functional Ambulation Category (FAC), and the Modified Barthel index (MBI). *Results:* All 3 groups demonstrated significant improvements in all outcome measurements from pre- to post-treatment,and a further gains at follow-up. Comparison between groups revealed the score of FMA, and MBI in the four-channel group were significantly higher than those of the dual-channel group (p<0.05) at the end of the 3 weeks of training. The score of PASS, BBS, MBI and FAC in the four-channel group were significantly higher than those of the placebo group (p< 0.05). *Implications:* Four-channel FES and dual-channel FES can both improve motor function, balance, walking ability and performance of activities of daily living in subjects with early ischemic stroke. In comparison with dual-channel FES stimulating ankle dorsiflexion only, four-channel FES demonstrated greater effectiveness.

PO-0072

RETROSPECTIVE ANALYSIS OF FUNCTIONAL OUTCOME AFTER INPATIENT REHABILITATION HEMIPLEGIC STROKE PATIENTS DISCHARGED FROM HOSPITAL

Qi Wu[1], Tong Wang[1], Haiyun Mai[1], Lixia Zhang[1]

[1]The first affiliated hospital of nanjing medical university rehabilitation medicine department, China, [2]Guangdong province first disabled soldier hospital rehabilitation department, China

Objective: to explore the necessity of cerebral apoplexy third grade recovery, by means of retrospectively analyzing the discharged stroke inpatients' destination and functional outcome. *Methods:* From the stroke hemiplegia patients who had accepted a period of time for rehabilitation in our department, and now had been discharged, we chose 121 patients who met the standards, as the family team.The 47 patients, who had left our department and accepted rehabilitation in another rehabilitation facility, are rehabilitation team. Two teams were compared in general and functional evaluation when they were leaving our department and getting back. *Results:* the rehabilitation team's functional progress is much more than the family team, but the complications are much less. The family team 's D-value of the Barthel index is negative correlation to the age of onset, course of disease, and is positive correlation to the discharging Barthel index and Holden classification. To regression

analyze the readmission Barthel index with the discharging Barthel index and Holden classification, we found the patients' Barthel index will not decline, only when the discharging Barthel index is more than 45 points and the discharging Holden classification is equal or greater than 2, but the D-value is more relevant to the Holden classification. *Conclusion:* when the stroke hemiplegic inpatients' function reaches a certain level, it is necessary to refer to secondary rehabilitation institutions or return to the family function to maintain their function.

PO-0073

INVOLVEMENT OF STUDENTS IN REHABILITATION PLANNING: THE MICHIGAN CENTER FOR GLOBAL HEALTH AND THE ISRPM DISASTER ACUTE REHABILITATION TEAM

Josh Verson[1], Andrew Haig[1]*, Huacong Wen[2], Lars Johnson[1], Yih-Chieh Chen[1], Jianan Li[2]

[1]University of Michigan, United States, [2]Nanjing University, United States

Objective: Foreign travel is a common experience for university students. However, their role is often that of observing or following, rather than leading. While senior academics may have factual knowledge, students might provide a unique holistic perspective. With the university's Center for Global Health funding and guidance, the ability of students to lead a global effort in rehabilitation disaster relief was examined. *Methods:* An American undergraduate student and a professor spent a semester planning and forming a team of students to travel to China, Chile and Taiwan to assess the rehabilitation response during natural disasters. Students were responsible for arranging and conducting interviews with government disaster response officials, victims, doctors, nurses, health officials, hospital administration, and non-government organizations with a goal of building the ISPRM's Disaster Acute Rehabilitation Program. *Results:* Students reported that the project was a life-changing growth experience. They became competent at completing a job; developing plans with goals, time frames, and metrics for success. They learned to work as a team; to brainstorm creatively and understand the different leadership styles. They built confidence as they interacted with prominent leaders in PRM and government. Subjectively interviewees may have been more open and pragmatic with students than senior experts. *Impact on rehabilitation:* The involvement of students in leading this major international research project demonstrates that students are capable at leading, teaching and gaining necessary organizational skills. This project provided the students with the ability to explore rehabilitation internationally and introduce it as a career choice.

PO-0074

CLASSROOM DESIGN AND EFFECT OF "NURSING REHABILITATION" BASED ON THE WORKING PROCESS

Yi Ping Li, Ying Zhang, Fuchun Hao

Tianjin Medical college, China

Objective: To explore the effect of the drive-oriented teaching method in "nursing rehabilitation" teaching. *Method:* Two classes were randomized sampled into 2 groups. The drive-oriented teaching method was applied in the experimental group while traditional teaching method in the control group. *Results:* 61.7%-91.5% students of the experimental group thought that the drive-oriented teaching method can improve the composite abilities. Compared with the control group, the students' performance of theory and skills examination were higher in the experimental group ($p<0.01$). *Implications:* The application of drive-oriented teaching method can improve the composite abilities, stimulate the study interesting and enhance the teaching effect.

PO-0075

SURVEY OF MEDICAL RESIEDNTS ATTITUDES TOWARD PHYSICAL MEDICINE AND REHABILITATION

Seyed Ahmad Raeissadat[1,4], Behnoud Samadi[2,4], Seyed Mansour Rayegani[3], Mohammad Hasan Bahrami[3]

[1]Physical Medicine and Rehabilitation Research Center, Shahid Beheshti Medical University, Faculty of Medicine, Modarres Hospital, Iran, [2]Physical medicine and rehabilitation department, Vaseei hospital, Sabzavar medical university, Iran, [3]Physical medicine and rehabilitation research center, Shohada-e-Tajrish hospital, Shahid Beheshti medical university, Iran, [4]Clinical research development center, Modarres hospital, Shahid Beheshti medical university, Iran

Objective: Assessing attitudes toward physical medicine and rehabilitation (PMR) (fields of activities, advantages and shortcomings) among different medical residents will enhance services provided by physiatrists, as residents represent a considerable proportion among different medical staffs. *Methods:* In this 2-month descriptive cross-sectional study, medical residents in 19 selected academic hospitals from 4 major medical universities in Iran were assessed. Data were collected by using a questionnaire including research variables and 12 questions about residents' attitude toward PMR. *Results:* About 54 percent of participants had history of referral to/consultation with physiatrists. The most common related specialties were neurosurgery (96%), neurology (92%) and orthopedics (83%) and the least common ones were anesthesiology (8%), ophthalmology (13%) and gynecology and obstetrics (16%). Gender and specialty variables had significant effects on rate of consultation with physiatrists. The most known PMR fields were rehabilitation of central nervous system disorders, electrodiagnostic studies and prescription of physical modalities. The least known fields were geriatric rehabilitation, pain management and cardiopulmonary rehabilitation. The most beneficial fields were therapeutic exercise prescription, prevention, diagnosis and treatment of musculoskeletal and rheumatic disorders, and geriatric rehabilitation. The least beneficial fields were therapeutic manipulation, cardiopulmonary rehabilitation and diagnosis and rehabilitation of myopathies-neuropathies. *Implications:* Considering the less familiarity with fields such as geriatric rehabilitation, pain management and cardiopulmonary rehabilitation, more effort should be made to introduce those less known PMR fields. Furthermore, more activity should be taken by physiatrists to describe such fields as manipulation and cardiopulmonary rehabilitation more clearly to elucidate their indications, applications and benefits.

PO-0076

THE EFFECT OF HYDROTHERAPY ON COGNITIVE FUNCTION OF AUTISTIC CHILDREN

Bing Liang[1], Jie Bao[2], Yuanyuan Zhou[1]

[1]The Boai School of Soochow Industrial Park District, Soochow, China, [2]Sport and Physical Education School of Soochow University, Soochow, China

Objective: Researching the effect of hydrotherapy on cognitive function improvement of autistic children in order to provide the scientific practice base for hydrotherapy with the comprehensive rehabilitation education project of the autistic children. *Method:* According to study design, 16 children with autistic randomly divided into control group and hydrotherapy group. C group of 8 children only choose the comprehensive rehabilitation education method of autistic children,and H group of 8 children choose the hydrotherapy of music, games, group interactive teaching methods with the comprehensive rehabilitation education method for 8 weeks. Evaluating the effect of each group therapy method with the autism behavior children scale (ABC scale). *Results:* There were significant improvement of the Cognitive ability and social communication ability in H group,their behavior focus on not mind to be close to others, Stereotyped behavior significantly

reduced, active. Cognitive significantly stimulated, but the independent living ability has no obvious improvement. *Conclusions:* Hydrotherapy can significantly improve the Cognitive development, reduce its sensory perception threshold, promote movement coordination, increase social communication of autistic children with its unique thermal conduction and mechanical effect.

PO-0077

EVALUATION OF A PROBLEM-BASED LEARNING EXPERIENCE IN REHABILITATIVE CURRICULUM

Juan Ni, Yuming Hu, Qi Gu Qi, Jingying Ju, Fangang Zhang, Guangyu Shen

Department of Rehabilitation, The Affiliated Hospital of Nantong University, China

Objective: Evaluate the adapted approach of a 'problem-based' learning (PBL) in rehabilitative curriculum. *Design:* The adaptation of PBL required students to write and select the material based on their placement experiences for the cohort's learning. Placement PBL was evaluated using both questions and focus groups. The students discussed actively of acquired knowledge and modes of thought changes took place in all groups. *Findings:* Although students' views of PBL were generally positive, they also had some difficulties in adjustment to a new style of learning. Small group learning and independent skills in conveying information were valued of the new approach. PBL was seen to help students to move from a theoretical understanding to application of theory in the complexity of actual service situations. *Implications for practice:* The findings show that a paradigm shift from teacher-centred to student-centred learning and from theory-based to practice-based learning occurred among the students. Longer-term research is needed to assess the effectiveness of PBL in helping students to become confident rehabilitative therapy clinicians.

PO-0078

RESIDENT AS EDUCATOR: PHYSICAL MEDICINE AND REHABILITATION RESIDENT CURRICULUM

Paras Shah

Albert Einstein College of Medicne, United States

Objectives: To evaluate the usefulness of incorporating Resident as Educator curriculum (RAE) into Physical Medicine and Rehabilitation residency program. To provide an opportunity within the curriculum for resident-to-resident as well as medical student teaching. Needs Assessment A needs assessment was conducted to determine and grade PMR residents' confidence to teach musculoskeletal procedures to peers. MSKE being a major component of the Physiatry training, confirmed the need for a teaching skills curriculum. Curriculum Development Buy in was obtained from the Program Director and the curriculum committee of the PMR residency program. A curriculum was developed to run parallel with core curriculum incorporating the existing opportunities for practical training. 3 hr didactic sessions on principles of education, developing teaching style, the adult learner, secrets of effective presentations, use of PowerPoint for presentations, and methods of clinical teaching including one min preceptor, bedside-teaching techniques, and the art of giving feedback. To provide practical experience, residents were given mentor-guided specific teaching assignments throughout the year. *Results:* Confidence levels for all residents increased post-musculoskeletal course, both performing and teaching the MSKE. Teaching skills of the senior residents were rated high on both self (4.05) and peer (4.25) evaluations. The residents reported increase in their job satisfaction with the inclusion of teaching responsibilities.100% of residents felt that teaching MSKE improved their knowledge in the subject *Conclusion:* Confidence levels of all residents with regard to performing and teaching the MSKE were effectively increased by completion of a course that integrated cadaveric anatomy review with hands-on musculoskeletal exam practice.

PO-0079

REHABILITATION NURSES' PROFESSIONAL IMAGE BEAUTY SHAPING

Ying Chen, Ling Meng

Tong Ji medical college of Hua Zhong University of science and technology, wuhan, China

Nursing occupation figure beauty is an important part of nursing aesthetics, reflecting the nurses of internal and external beauty of the perfect combination. Around the rehabilitation nurse occupation image characteristic, elaborated the shaping of rehabilitation nurses occupation image significance, methods and techniques, only by constantly improving the rehabilitation nurse moral consciousness and the occupation quality, in order to create a good nursing occupation image beauty. Rehabilitation nurses good nursing occupation image beauty can make rehabilitation patients mental solace, emotional illness get pleasure, speedy recovery and improve disability after adaptation to life and work ability, improve the quality of life, a better return to families and society.

PO-0080

EFFECTIVENESS OF EDUCATIONAL INTERVENTION TO LEARNING-BASED COUNSELLING PRACTICIES AMONG THERAPY PERSONNEL

Essi Xiong[1,2]*, Heidi Ruokolainen[1,2]

[1]Oulu University Hospital, Finland, [2]University of Oulu, Finland

Objective: Rapid discharge from acute care is increasingly forcing patients to be more independent and reduces time for counselling. The purpose of this study was to describe the effects of an educational intervention for therapy personnel on learning-based counselling practices in hospital. *Method*: A design was quasi-experimental before-after. The data was gathered from therapy personnel including physio-, occupational therapists and a podiatrist (at baseline n=30, at post-test n=20) from two Physical Medicine and Rehabilitation units of university hospital in Finland. Data was collected by learning-based counselling instrument (©Kääriäinen 2012) in February and May 2012. Data was analysed by descriptive statistics, Fisher's test and paired t-test. *Results*: The therapists focused more on the patients' ability to learn and understand the given instructions and information after intervention (p=0.020). They activated patients' previous knowledge at beginning in the counselling and highlighted the patients' importance of awareness of their own situation. They paid attention to contents of counselling as a whole and avoided handling only details. The therapists also asked patients to show or tell how they have understood the issues. The therapists with over 13 years of work experience utilised the different methods of counselling versatilely. *Implications on rehabilitation*: This study offered knowledge that supports the importance of education in optimizing the patients' counselling. The challenge for future patients' counselling process is the development of more active role of the patient himself in treatment goal setting and care of his own condition. Also further testing of instrument for measuring learning-based counselling is needed.

PO-0081

THE ORGANIZATION AND IMPLEMENTATION OF REHABILITATION THERAPY TEACHING WARD DURING THE PERIOD OF CLINICAL PLACEMENT AND INTERN FOR STUDENTS OF DEPARTMENT OF REHABILITATION THERAPY ACCREDITED BY WCPT

Wangxiang Li
Dept.of rehab.therapy of The 2nd affiliated hospital of Kunming medical university, Kunming, Yunnan, China

The author investigated the current situation in rehabilitation therapy teaching ward during the period of clinical placement and intern for students of department of rehabilitation therapy and found that: there is no rational reference model existed for rehabilitation therapy teaching ward, the model that most hospitals followed is actually for the clinical students. As a department accredited by WCPT, its teaching concept and teaching pattern should meet the international standards so that the students could have the ability of independent thinking, independent assessing and independent implementing therapy after graduation. However, much difference exists between current rehabilitation medical care model and international model, which potentially will have some disadvantages for the students' work and study in the future. Therefore, the author suggested that: 1st. We should make the protocol of rehabilitation therapy teaching ward of our country's; 2nd. Improve the teaching ability of clinical therapists at all level; 3rd. Make the National Standard Guidelines and Textbooks for clinical placement and intern of department of rehabilitation therapy.

PO-0082

HFMD WITH PARALYSIS OF LIMBS REHABILITATION THERAPY

Xuebing Tang, Gaogui Huang, Bo Zao, Yun Liu
The childrens Hospital of Kunming, Department of rehabilitation medicine, Yunnan Province, China

Objective: Explore HFMD with paralysis of limbs rehabilitation method and effect. *Methods:* l36 cases of HFMD with paralysis of limbs rehabilitation therapy, to evaluate the rehabilitation treatment. *Results:* 136 cases of HFMD with paralysis of limbs rate of 98.5% of total recovery, the rehabilitation of mild recovery speed and better than the severe cases the differences was statistically significant. *Conclusion:* 136 cases of HFMD with paralysis of limbs should do early rehabilitation. Very few children will be left sequelae.

PO-0083

THE EXPERIENCE OF NATIONAL CONGREGATION OF THE BRAZILIAN ACADEMIC LEAGUES FOR STUDIES IN PAIN-CONALID

Herison Harrider S. Vaz[1], João Paulo Oliveira[2], Fernanda Albernaz Valente[3], Lucas Garcia S. Godoy[3], Kátia Crys M. Ogliari[3], Alessandra Vasconcelos S. Paiva[3], João Paulo M. Ribeiro[1], Fabrício Castro Borba[4], Juares A. Cividini Júnior[5], Gustavo M. Peixoto[6], Matheus Gomes S. Paz[7], Murillo S. Catito[8]
[1]Potiguar University, Natal, [2]University of Sao Paulo, Sao Paulo, [3]Superior School of Health Sciences, Brasilia, [4]Faculty of Medicine of Marilia, Marilia, Sao Paulo, [5]Federal University of Mato Grosso, Cuiaba, [6]Federal University of Paraiba, Joao Pessoa, [7]Federal University of Bahia, Salvador, [8]Federal University Of Maranhao, Sao Luis, Brazil

Objective: The CONALID has an objective to work in the fields of teaching, research and extension among the leagues of pain, what means a continuous encouragement for study. Thus, training future professionals to be able to evaluate and to care for patients suffering impairment caused by acute or chronic pain in all aspects: biological, psychological, social and spiritual. *Method:* Report the experience of formation, structuring and results of a national congregation of pain leagues by medical students. *Results:* Through the initial partnership among leagues, extra-curricular rotations were possible across academic institutions, students learned new techniques for pain management, they could improve their knowledge about outpatient care and formed research groups that are submitting articles encompassed by the field to international congresses. In 2012, the students performed the first scientific meeting linked to X Brazilian Congress of Pain with nearly 100 medical students from several regions of the country. What are the changes caused by creation of CONALID: The CONALID has shown academic and social impact, considerable potential to research knowledge production and education enhancement, but respecting ethical and humanistic principles in all activities improving the quality of life of patients. Due to this rich dynamic environment, pain leagues has played an important role in the medical formation: help students to be active, offer opportunities of search, share experiences, acquire practical knowledge in the pain field and its rehabilitation as well intellectual potential and interpersonal relationship abilities.

PO-0084

PRESENT STATUS OF PRM EDUCATION SYSTEM IN MONGOLIA

Baljinnyam Avirmed, Batchimeg Shirmen, Batgerel Oidov
Health Sciences University of Mongolia, Mongolia

Health Sciences University of Mongolia (HSUM) started the first program for the resident training in the department of PRM in 2000 and duration of the training was 1 year and became 1,5 year from 2012. Each year approximately 8-12 medical doctors are training to be as a rehabilitation doctors in Mongolia. Rehabilitation Medicine is the newest and worst developed field if compare with other medical fields in Mongolia. Basically physical modality treatment is much more developed than Rehabilitation Medicine. Almost all main state hospitals have very old, out of dated equipment of physical modality which absolutely does not meet to present requirement and we don't work by team because we don't have PT, OT and ST. Quality of the residential training and rehabilitation treatment is not so good because of many reasons. The biggest problem is the human resource. Last 5 years only 5 doctors studied in a Korea and Thailand for the short period. This is not enough to develop RM in Mongolia. By supporting Gunma University, physical therapists education system was started and last year the first 15 students finished their bachelor degree and we need to increase quality of education on rehabilitation doctors and PTs. The biggest problem is the human resource in this field also. This time we don't have occupational and speech therapist's education system in Mongolia. The another biggest problem is that we do not have any modern equipped inpatient rehabilitation centre. We don't use electrodiagnostic, gait analysis laboratory and ultrasound apparatus and no specialists who can work on it. Because of that we don't teach to our doctors about mentioned skills. Our big problem is also scientific and research work in our field. We have almost nothing on rehabilitation research at the moment except 1-2 works. We need international cooperation and support to develop rehabilitation medicine and to send our young doctors to the abroad to study Rehabilitation medicine and EMG, ultrasonography etc.

PO-0085

CURRENT STATUS AND COUNTERMEASURE ON REHABILITATION MEDICINE EDUCATION OF HENAN PROVINCE

Xinchun Dong[1], Jiayan Zhao[2], Chunsheng Yang[2]
[1]Wuxi Tongren International Rehabilitaion Hospital, China, [2]Xinxiang medical university, China

Objective: To probe into current status and development mode of rehabilitation medicine education of Henan province. *Method:* Through literatures retrieving of Henan province universities students recruitment of 2010 and 2011, to get the number of recruit students in the rehabilitation and relevant majors. To comprehend the current status of rehabilitation medicine education of Henan province universities. *Results:* At present stage, only a few universi-

ties set up the rehabilitation and relevant majors. *Conclusion:* The rehabilitation medicine education development is slow in Henan province and has not been paid enough attention. Suggest to set up rehabilitation major at universities with good conditions and training center or practice base at complex hospitals with good background of rehabilitation medicine and strengthen the person in service training.

PO-0086

THERAPEUTIC EDUCATION PROGRAM (TEP) FOR HEMIPLEGIC PATIENTS AFTER STROKE

Le Moine Francis, Dominik Lee, Philippe Moysolier, Christiane Abbyad*, Camille Cortez
UGECAM/CHM/FEDMER, France

The UGECAM/CHM have created a Therapeutic Education Program (TEP) in collaboration with patients for an annual list of approximately 50 stroke adult patients. The team leader is a PMR physician program coordinator. The coordination is provided by review meetings of the TEP team of this program including the patients representatives. The program coordinator conducts this type of meetings 4 times per year. The objective is to improve practices and adapt the education's proposition to the patients needs by working on the content of education sessions and materials used: -Meetings for preparation of the sessions and synthesis -Staff at the beginning and during hospitalization -Transmissions between team members For each hemiplegic patient, the educational diagnosis, the individual objectives, the reports of the educational sessions and of the delayed evaluation consultation are registered in an education file which is then sent to the referred physician of the patient. Confidentiality and professional ethics require the patient's consent. The Program is evaluated by means of a self-assessment based on data from a dashboard of the educational activity and on the educational files of the patients. The educational program aims self-sufficiency and improvement of the quality of life of the hemiplegic patient: knowledge in self-care, adjustment and psychosocial skills.

PO-0087

DISCUSSION ON THE REFORM IN TEACHING METHODS OF REHABILITATION MEDICINE INTRODUCTION

Ying Chen, Na Qiao
The Affiliated Hospital Hainan Medical University, China

It is necessary condition of rehabilitation medicine development to train the rehabilitation therapeutic students. It could have the effect of understanding rehabilitation medicine on students and inspiring their interest in studying rehabilitation therapeutics through teaching of rehabilitation medicine Introduction. It should pay attention to the reform in teaching method of rehabilitation medicine Introduction and to improve students' Quality and ability.

PO-0088

A CASE ANALYSIS OF A PROFESSIONAL VOLLEYBALL PLAYER'S REHABILITATION USING ISOKINETIC TECHNOLOGY

Xue Ren, Peng Zhang, Zhizhong Tan
Shanghai Reserarch Institute of Sports Science, China

Objective: The purpose of this study is to show the importance of Isokinetic's used in a professtional volleyball player's rehabilitation. Recently, Isokinnetic muscle testing and training is the most advanced and practical technique in the evaluation of muscle function and training muscle strength in the world. It is playing an important role in training, sport science research and rehabilitation. *Method:* A professional volleyball free man whose left medial meniscus tear and ACL partial tear surgeryed for 2 mounthes.Knee laxity is normal,but decreased strength and stability. Using the Isomed 2000 Isokinetic muscle testing both knee's muscle strength on the 60°/s and 300°/s.Then according the results make a rehabilitation program.Every one mounth we test both knee's muscle strength and make a new rehabilitation grogram. *Results:* 1. The difference of flexion's pesk torque of two knees narrowed from13.7% to 6.3% and extension's peak torque of two knees narrowed frow 52.3% to 2.7% 2.The left knee's flexion peak torque increases form 124 Nm to 184 Nm and the extension's peak torque increases from 103 Nm to 252 Nm. *Impact on rehabilitation:* The strength and stability of left knee is increased obviously.And now he is return to the sports competition.

PO-0089

THERAPEUTIC EDUCATION PROGRAM FOR ADULTS AMPUTATED WITH A DIABETIC ARTERIOPATHY

Tourret Bertrand, Francis Le Moine, Michelle Carzon, Philippe Moysoulier*
BTC Orthopedie, France

This educational program aims at improving the diabetic amputee patient autonomy, quality of life, control of risk factors and management of the disease itself. It aims to contribute to a better acceptance of the deficiency and prevent complications and repeated hospitalizations. It helps the patient and/or his entourage to acquire or enhance the skills they need to meet the educational objectives prioritized and negotiated with him. For that we must develop skills that must be 3 types: "Knowledge": Understand, analyze, interpret arteritic disease and its evolution. Understand the value and purpose of treatment, and manage independently. Know the rules and dietary, and risk toxic and addictive habits. Skills "self-care" Know monitor and take care of the lower limb contralateral side of the stump for signs of deterioration. Master transfers, footwear, wearing and maintenance of the prosthesis. Understand the importance of physical activity suitable regular Understand and use existing institutions Skills "adaptation" or "psychosocial" Manage the process of mourning, emotions, restore self-image. Being able to face a risky situation (injuries, falls). The patient must be an actor's autonomy This program provides tools, indicators, and is reviewed annually.

PO-0090

NURSING CARE OF GERONTAL FEMORAL NECK FRACTURE PATIENTS AFTER UNDERWENT ARTIFICIAL FEMORAL HEAD REPLACEMENT

Qin Jia
Department of Orthopaedics, Zhejiang provincial people's hospital, Hangzhou, China

Objective: To summarize the nursing care effect of gerontal femoral neck fracture patients after underwent artificial femoral head replacement. *Methods:* To investigate the nursing care effect of 64 gerontal femoral neck fracture patients after underwent artificial femoral head replacement, by evaluating perioperative situation watching the pathogenetic condition, reducing complications,doing early mobilization. *Results:* Early mobilization after the operation elevates the quality of life. According to the Harris standardization in 6-36 months,the results was as follows: excellent: 45 examples, good: 16 examples, middle: 3 xamples,95.3% (61/64) were excellent or good. 23.4% (15/64) of them feel pain in the hip. 64 of them can walk in 1-3 weeks after the operation,self-care was achieved, and none was die. *Conclusion:* artificial femoral head replacement was effective for gerontal femoral neck fracture patients, the quality of life was raised because of the perioperative nursing care.

PO-0091

AN INVESTIGATION OF REHABILITATION THERAPY STUDENTS' LEARNING STYLE OF TRADITIONAL CHINESE MEDICINE UNIVERSITY BASED ON VARK SURVEY ANALYSIS

Xiaodan Liu[1], Weibing Wu[1]
[1]Shanghai University of Traditional Chinese Medicine, China, [2]Shanghai University of Sport, China

Objective: To find out the learning styles of Rehabilitation Therapy students, providing a theoretical basis for Undergraduate Teaching of Rehabilitation Therapy. *Method:* The VARK Questionnaire (version 7.0) was performed among 263 students from four grades of Shanghai University of Traditional Chinese Medicine. *Results:* We obtained the learning style characteristics of Rehabilitation Therapy students from four aspects' statistics and analysis: the maximum value of the distribution from the VARK value, learning styles intensity distribution, the tendency of the multiplicity distribution, tend to four aspects of the VARK in the single learning styles. *Implications:* In the rehabilitation education process, we should pay attention to four points: emphasis on practice teaching, using a variety of teaching methods, using different teaching methods for different grade levels, concerning about the students with a tendency dominant.

PO-0092

SECONDARY OCCUPATION EDUCATION TEACHING OVERALL SOLUTION RESEARCH (REHABILITATION TECHNOLOGY)

Yu Jing[1,2], Li Ling[1,2], Li Yan[1,2], C Xiao Ping[1,2]
[1]Tianjin Medical College, China, [2]Tianjin Red Star in secondary vocational school, China

Objective: Development of rehabilitation medicine service object is first pension institution in the elderly, rehabilitation, health care and other services to the extension, followed by services will also be extended to the city community and social groups of sub-health groups, however serve these populations in the rehabilitation of severe scarcity of talent has become the main problem, also become the bottleneck of the development of rehabilitation medicine, this rehabilitation technical talents be imperative. *Method:* Is a research method mainly, supplemented by literature methods and experiment research. Result. Clear occupation school rehabilitation technology professional occupation post as the primary old-age care and assistant rehabilitation health care division, according to the national occupation qualification examination standard for determining the professional occupation areas of activity, occupation mission, occupation activity and occupation ability, the occupation ability into the task of learning, knowledge courses, technical courses and occupation activity curriculum the establishment, the personnel training objectives and modes of operation for the same kind of school personnel training provides a paradigm.

PO-0093

PROBLEM-BASED LEARNING METHOD (PBL) THROUGH THE PRACTICAL COURSES ON REHABILITATION SCIENCE MAJORS

Jie Fang, Weikun Li, Cuihuan Pan
The Second Affiliated Hospital of Guangzhou Medical University, China

Objective: To investigate the application effect of Problem-based Learning Method (PBL) through the practical courses on rehabilitation science majors, and cultivate the students' clinical thinking and practical ability in rehabilitation science. *Methods:* 48 students majoring in rehabilitation science from Grade 2008 to Grade 2011 were randomly divided into the experimental groups and the control group by using through PBL and the traditional teaching approach respectively.Comparing students' performance from different groups,and design questionnaires to conduct a survey on students' attitudes towards PBL to check the feasibility of PBL teaching approach in the practical courses *Results:* Students' performance in the experimental group is significantly better than that of the control group both in theory test and operation test. *Conclusion:* PBL can strengthen students' memory about knowledge, and improve their clinical thinking and independent analytical capability. As a result, worthing of spreading in practice course of rehabilitation science.

PO-0094

THE RESEARCH AND DEVELOPMENT ON TRAINING OF COMMUNITY REHABILITATION PROFESSIONALS

Xiaohui Xu
Department of Rehabilitation - Chongqing City Management College, China

Objective: Cultivation of rehabilitation professionals with strong practical community rehabilitation skills and ability to coordinate with Bureau of Civil Affairs, Chinese Disabled Persons' Federation and Department of Education, in order to accommodate the high demand of such professioinals for the elderly, disabled and those with chronic illness in communities. Thorough evolution of training method was needed for educating habilitation professionals Method 1.Substantial change of curriculum system to meet the changing demand for habilitation professionals, new courses include: community practical habilitation techniques (OT, PT, ST, Psychiatric Rehabilitation, Rehabilitation Engineering Technology, Rehabilitation Nursing and Traditional Chinese Medicine Rehabilitation), community common disease rehabilitation, disability and community rehabilitation, social work and rehabilitation, ethics in community rehabilitation and introductory of community rehabilitation 2.Execution of 3 steps progressive training *Method:* Stage one: Preparation of the investigation report while completing the rehabilitation course, to define the specific rehabilitation needs of patients. Stage two: the application of 4+1 method using local communities as platforms (4 weeks in house theoretic training in college rehabilitation training Centre, 1 week's internship in local councils, community medical centres and rehabilitation centres respectively, and so forth. Stage three: Internship in rehabilitation institutions, community medical centres, local councils and the disabled persons' federation, to provide comprehensive training on students' practical skills *Results:* Qualified rehabilitation professionals with strong practical skills and ability to liaise with relevant government departments - the students are widely popular with employers *Implications/ Impact on rehabilitation:* The training of outstanding rehabilitation professionals that is relieving the pressing demand for rehabilitation services in local communities, and helping to realise the object of 'easy access of community rehabilitation services for all the disabled people by 2015'; as the shortage of such professionals is currently the key obstacle to the development of community rehabilitation.

PO-0096

A SURVEY OF ELECTRODIAGNOSTIC MEDICINE SKILLS COMPETENCY TRAINING FOR REHABILITATION MEDICINE RESIDENTS IN SHANGHAI

Yun Miao, Yini Pan, Yanyan Yu, Bo Yu, Wen Zhang, Wenhua Chen
Shanghai First Peoples Hospital, Shanghai Jiaotong University, China

Objective: To understand the demands of Rehabilitation Medicine Residents in Shanghai to Electrodiagnostic Medicine skills competency training. *Method:* Questionnaire surveys were undertaken

among the trainees who participated standard training of Rehabilitation Medicine for Residents from 2010-2012 in Shanghai. *Results:* For these residents (64), 89.1% of the trainees held that it was necessary for Rehabilitation Medicine Residents to participate Electrodiagnostic Medicine skills competency training, and Electrodiagnostic Medicine education play an important role in developing clinical evaluation skills for patients with neuromuscular problems.The trainees showed low score (23.59±14.07) in theoretical knowledge in electrodiagnostics. 87.5% of them no practical experience in electrodiagnostics, and for Electrodiagnostic Medicine study, The biggest obstacle is lack of basic knowledge and equipment (52%,48%). *Implications:* Electrodiagnostic Medicine skills competency training should be implemented as soon as possible to the Rehabilitation Medicine Residents standardized training system which will improve and refine standardized the current Rehabilitation Medicine Residents training model in Shanghai.

PO-0097

QUALITY OF LIFE ASSESSMENT ON THE STUDENTS OF THE REHABILITATION MEDICINE SPECIALTY

Liping Tan, Shiling Zhang, Wei Pang, Zhihai Lv, Zhimei Jiang, Xiaojie Li
College of Rehabilitation medicine of Jiamusi University, Jiamusi city, China

Objective: To assess the quality of life (QOL) and its influence factors, and offer feasible guidelines for further improving physical and mental health of the rehabilitation medicine college students in Jiamusi University. *Methods:* 82 undergraduate college students were conducted a questionnaire with Short-Form health questiormaire (SF-36) survey scale (Chinese version). *Results:* The total QOL score is 119.80±10.46 points (83.19%, scores ranging from 36 to144), including physical component summary (PCS) scored with 66.28±5.39 (89.57%, scores ranging from 21 to74) and Mental component summary (MCS) scored with 53.52±6.54 (76.46%, scores ranging from 14 to70). The scores of four PCS domains equivalent to physical functioning (PF), role-physical (RP), bodily pain (BP) and general health (GH) were 29.39±0.87, 7.28±1.19, 9.29±1.50 and 20.31±3.57, respectively. The scores of four MCS domains equivalent to role-emotional (RE), vitality (VT), social functioning (SF) and mental health (MH) were 4.73±1.21, 17.83±2.47, 8.70±1.12 and 22.27±3.43, respectively. There was not significantly difference in the eleven domains of the QOL between the male and female college students. *Conclusion:* The overall QOL was favorable. The MCS score was lower than the score of the PCS. We should take targeted interventions to further improve the quality of life of the rehabilitation medicine college students' mental health.

PO-0098

REHABILITATION OF CONTINUING MEDICAL EDUCATION AND CONTINUING PROFESSIONAL DEVELOPMENT OF GLOBAL STANDARDS AND LOCALIZATION

DongFeng Huang
Department of Rehabilitation Medicine, First Affiliated Hospital, Sun Yat-sen University, China

The World Federation for Medical Education held an international conference called "Global Standards in Medical Education for Better Health Care" in 2003, in which the concept of "Continuing Professional Development (CPD)" was proposed. CPD is the process by which health professionals keep updated to meet the needs of patients, the health service, and their own professional development. Recently, CPD has replaced the term of CMD due to its wider ranging competences and the multidisciplinary context of patient care. Because global standards in CPD must be certainly modified in accordance with regional, national and institutional needs, we analyzed the problems of implementing CPD in rehabilitation and put forward a series of countermeasures to enhance and construct the Chinese CPD standards in rehabilitation. Based on the growing demand for the highest quality of rehabilitation healthcare and the severe shortage of trained rehabilitation personnel in China, the content of CPD in rehabilitation must focus on approving competencies (both basic clinical skills and specialized knowledge in rehabilitation), team work building, teaching, and researching. Moreover the process of CPD should strengthen professionalism of rehabilitation personnel (including doctor, nurses, therapists and social workers) and enable them to act autonomously in the best interests of their patients. in the terms of providers of CPD, medical schools should providing CPD activities in cooperation with other stakeholders. In addition, they must undertake leadership in improving the quality of CPD.

PO-0099

HOW TO USE EVIDENCE-BASED GUIDELINES IN PHYSICAL AND REHABILITATION MEDICINE

Roberto Rached
Physical and Rehabilitation Medicine, Clinics Hospital of University of Sao Paulo, Sao Paulo, Sao Paulo, Brazil

Objective: to present how evidence-based guidelines can beused in daily medical practice in Physical and Rehabilitation Medicine. *Method:* This is a descriptive study reflecting on the meaning of the guidelines in the framework of medicine. Its assumptions an understanding of methodologies such as knowledge of the critical paths of the scientific process and good clinical practice that make questions and investigates the possibilities and limits, seeking the recognition that all clinical practice should be guided by the best scientific evidence. *Results:* Implementation of guidelines used into daily clinical practice is a challenge and a lot of efforts should take place in order to promote and to allow dissemination: distribution of educational materials; educational meetings; local consensus processes. *Implications/Impacton Rehabilitation:* It is possible to conclude that is a big challenge for the field of Physical and Rehabilitation Medicine make and implement the guidelines. For a better implementation, it requires to be adaptable, ie, there are several versions for different purposes and users. Clinical applicability in context or additional information must be provided for better interpretation and application of recommendations. Must be identified in advance housing costs and resources, competencies and formations, technical specifications and impacts for the better use of the guidelines.

PO-0100

RESIDENT ATTITUDES ON THEIR ROLE AS "NEAR-PEER" TEACHERS

Casandra Rosenberg*, Michael Baria, Karen Newcomer
Mayo Clinic, United States

Objective: At our institution, Physical Medicine and Rehabilitation (PM&R) residents play a key role in medical student musculoskeletal physical exam training (MSKPET). The term "near-peer" teaching describes more advanced physicians-in-training who teach and mentor their junior colleagues. We believe the role of PM&R residents as teachers is of great benefit to residents as well as students.Our primary objective was to investigate the attitudes of our PM&R residents regarding their role in medical student MSKPET, including preparedness, education, and clinical confidence. *Methods:* The resident teacher training model was assessed. All PM&R residents were asked to complete an anonymous questionnaire. The majority of attitudes were graded on a 5-point Likert scale. *Results:* Twelve of 13 potential respondents replied. All had participated in teaching the medical students. All respondents felt "somewhat" or "very prepared" to teach. The preferred method of preparation was "email outlining the resident/teacher role." Attitudes towards participation were overwhelmingly positive. For example, 67%

felt participation was "very helpful to their MSK knowledge," and 83% became "somewhat" or "much more confident" in their clinical exam skills. More teaching experiences were requested by 67%. I*mplications/Impact on Rehabilitation:* Earlier research suggests that hands-on teaching improves exam scores, self-confidence, and outlook towards future teaching responsibilities. Our study confirms multiple educational benefits to resident near-peer teachers in our MSKPET program. We recommend all PM&R residents have opportunities to participate in formal near-peer education. Our presentation will outline our successful model.

PO-0101

"TRAIN-THE-TRAINER": AN EFFECTIVE AND SUCCESSFUL TRAINING MODEL TO ACCELERATE TRAINING AND IMPROVE PHYSIOTHERAPY SERVICES FOR PERSONS WITH HEMOPHILIA IN CHINA

Lixia Chen[1], Jing Sun[2], Pamela Hilliard[3], Nichan Zourikian[4], Marissa Hang[4], Victor Blanchette[3], Man-Chiu Poon[6], Koon Hung Luke[7]

[1]Peking Union Medical College Hospital, Beijing, China, [2]Nanfang Hospital, Guangzhou, China, [3]Hospital for Sick Children, Toronto, Canada, [4]CHU Sainte-Justine, Montreal, Canada, [5]University of Toronto, Toronto, Canada, [6]University of Calgary Foothills Medical Centre, Calgary, Canada, [7]Children's Hospital of Eastern Ontario, Ottawa, Canada

Objectives: To teach a small group of Chinese physiatrists and physiotherapists (1) to become trainers and leaders in Hemophilia physiotherapy care in China; (2) to acquire rapid proficiency in using the reliable and validated Hemophilia Joint Health Score (HJHS) for evaluating musculoskeletal health in boys with hemophilia. *Methods:* Two experienced Canadian physiotherapists and co-developers of the HJHS moderated a 4-day physiotherapy training workshop with 6 Chinese participants. Upon workshop completion, the 6 trainees demonstrated improved hemophilia-specific physiotherapy knowledge and were fully familiar with the HJHS and in its administration. *Conclusion:* "Train the Trainer is a very effective education program designed to speed up training in hemophilia physiotherapy to meet the rapidly increasing need for service in a developing country such as China. It is anticipated that physiotherapists at newly established Chinese hemophilia treatment centers will receive training in hemophilia care as a result of this unique program in the immediate future.

PO-0103

THE COMPILATION OF A JOB SATISFACTION AND TEACHING SATISFACTION QUESTIONNAIRE OF REHABILITATION THERAPY MAJOR AND ITS VALIDITY AND RELIABILITY

Jingjing Xue[1], Lingjun Xiao[1], Tiebin Yan[1], Shuo Luan[2], Meihuan Huang[2], Pingzhong Tu[2], Yahan Hu[3], Xiang Zheng[4]

[1]The Rehabilitation department of the Sun Yat-sen Memorial Hospital of Sun Yat-sen University, China, [2]The Rehabilitation Science of Sun Yat-sen University, China, [3]The sports health and rehabilitation specialty of Guangzhou Sports University, China, [4]The Rehabilitation Therapy Science of Gannan Medical College, China

Objective: To work out a job satisfaction and teaching satisfaction questionnaire of Chinese rehabilitation graduates, and make a comprehensive evaluation of the questionnaire results, thus providing a reliable basis for its application. *Method:* Based on Minnesota Satisfaction Scale using "Likert 5 Score", the questionnaire in question was designed via collecting relevant data by consulting experts and doing literature review. The job satisfaction questionnaire contains 18 items, including 3 dimensions: satisfaction of the graduates as to internal and external work environment, satisfaction as to career advancement and competitiveness. The teaching satisfaction questionnaire includes 11 items, also consisting of 3 dimensions: theory teaching satisfaction, practice teaching satisfaction and the comprehensive ability training satisfaction. *Result:* The test-retest reliability coefficient of job satisfaction questionnaire is 0.854, and of the teaching satisfaction questionnaire is 0.758. The test-retest reliability coefficient of each dimension ranges from 0.664-0.954. In internal reliability analysis, the Chronbach's α coefficient of job satisfaction questionnaire is 0.913, and of the teaching satisfaction questionnaire is 0.909, Common factors extracted by factor analysis are expected to reflect the content, indicating good construct validity of the questionnaire. In content validity analysis, the correlation coefficient of entry 5 and entry 12 with the total score of their dimension are greater than 0.5;the correlation coefficients between the rest items and their dimension are greater than 0.7, and statistically significant, indicating the contents validity of the questionnaire is preferably. *Conclusion:* Empirical results show that this questionnaire has a good reliability and validity, and can apply to job satisfaction and teaching satisfaction survey of rehabilitation therapy graduates. *Keywords:* rehabilitation; satisfaction; survey; questionnaire

PO-0104

THE STUDY OF THE POSTOPERATIVE SAFETY AND REHABILITATION EFFECT OF THE PREOPERATIVE EDUCATION AND FUNCTIONAL TRAINING IN THE KNEE REPLACEMENT

Xiaolong Yang

Tianjin medical university, China

Objectives: To discuss the influence of the Preoperative Education and Functional Training to the patients of TKR on postoperative safety and rehabilitation effect. *Methods:* 100 replaced knees joined the experiment. Before the experiment, both group need to carry out the HSS scale and the ROM test of each sample. Experimental group was taken preoperative education and functional training, as well as the early-stage rehabilitation after the surgeries. Control group was only taken part into the early-stage rehabilitation after the surgeries. After the procedure, aforementioned tests were taken to the two group sample again. *Results:* To the HSS Scale, the score of both group were increasing; the score of experimental group is much higher than the control group with a statistic difference ($p<0.05$); to the ROM of the knees, both group were increasing, the experimental group is higher than the control group with a statistic difference ($p<0.05$). There was no DVT happened in all samples of each group. *Conclusions:* Preoperative education and functional training improved the procedure the rehabilitation after the surgeries, increased the score of the HSS scale and the ROM; enhance the effect of the rehabilitation, facilitate the proceeding for back to the normal life; no conclusion of the relationship of the preoperative education and functional training and the DVT event.

PO-0105

PROMOTE PROFESSIONAL OCCUPATIONAL THERAPY EDUCATION WITH WFOT MINIMAL STANDARDS IN CHINA MAINLAND

Guohui Lin[1], Mengan Cao[2], Kit Sinclair[3], Sheila Purves[2], Hongxing Wang[4]

[1]Department of Rehabilitation Medicine, Guangzhou Rehabilitation Center for People with Disability, China, [2]International & China Division, The Hong Kong Society for Rehabilitation, China, [3]Dept of Rehab Sciences, Hong Kong Polytechnic University, China, [4]Department of Rehabilitation Medicine, Jiang Su Provincial Hospital, China

Objective: To facilitate change from the present rehabilitation therapy education for OT in mainland China to an international level based on the minimal education standards of World Federation of Occupational Therapy (WFOT). *Method:* Based on findings from a survey of fourteen rehabilitation therapy education programs and the review of a typical rehabilitation therapy education program, a 14-week hybrid program of online and face-to-face learning for OT educators was run in 2011 and 2012. *Results:* Ninety OT educators country-wide successfully completed the course and reported significant increase in use of leant OT concepts and teaching-learning methods within the Chinese context. An online OT forum was initiated by OT educators from 2011 cohort with more than 500 present registrants. Publication of "National OT Practice Standards" in May 2012. and "National OT Teaching Guidelines" in 2013 with three OT educational programs currently using these new guidelines, are indicators of change. *Implications:* Change of a national curriculum requires time, resources and local and international input. The lead was taken by Chinese professionals with strong and active support from Hong Kong and international experts. The direction and growth is sustained by local pioneer OTs who are steering Occupational Therapy towards a relevant, highly creditable and sustainable profession that is gaining recognition by hospitals and clients, and international OT colleagues. This case study illustrates the significance of partnerships.

PO-0106

TO INVESTIGATE THE EFFECT OF NEW MODE IN HOME-BASED REHABILITATION TRAINING OF CHILDREN WITH CEREBRAL PALSY

Qianqian Kang
Xiangya Boai Rehabilitashion Hosipitle, Changsha, China

Objective: To explore the effects of the new model of family rehabilitation training for parent with cerebral palsy children. *Methods*: Children with cerebral palsy are divided into 4-5 groups with functional, in the form of a therapist taught and another to guide targeted family rehabilitation theory and technology training. The training of exercise therapy as the main line integrating of occupational therapy, speech therapy, Chinese massage, Conductive Education ect.120 parents are randomly selected to observe the training effect by questionnaire survey after a month. *Results:* After training the families' awareness to learn rehabilitation knowledge enhance 53.33%. Family rehabilitation for children to help enhance 50.83%, the illness to understand the degree to enhance 39.17%, active with the therapist to explore children problem of consciousness 44.17% increase, to carry out family therapy at home 37.5% increase. *Conclusion:* The group of home rehabilitation training mode, multifaceted integration, targeted training effect, is one of the vast number of medical rehabilitation agencies to promote in majority of medical institutions.

PO-0107

COMPUTER AIDED ATTENTION TRAINING SOFTWARE COMPILING AND THE CLINICAL EXPERIMENT RESEARCH

Zhen Zeng[1], Lijuan Ao[2]
[1]Chengdu Sports University, Chendu, Sichuang Province, China, [2]Department of Rehabilitation and Physiotherapy, Kun Ming Medical College, Kunming, Yunnan Province, China

Objective: To study the effects of computer assisted attention training on cognitive and ADL in patients with brain injury by the attention training software; prepare the ground for further improvement of the software (designing and operation) and for promotion of its clinical application. *Methods:* 1. Thirty nine brain injury patients with attention dysfunction assessed by MMSE and MoCA were randomly divided into two groups: attention software training group and control group.2. Both groups received the same medical therapy, hyperbaric oxygen, physical therapy and traditional therapy, with the attention intervention group received four-week computer assisted training. 3. Based on attention test part of MMSE, MoCA, NCSE and LOTCA, and Bathel were evaluated at the beginning, at the 4th week and the 8thweek respetively. 4. To make the statistical analysis such as the mean ± standard deviation, variance analysis, chi-square test and t- test to deal with clinical research data. *Results:* The MMSE attention scores, the LOTCA attention scores the MoCA attention scores, the NCSE attention scores and Bathel scores shown, between the two groups, there was significant difference in training 4th week and the 8th week ($p<0.05$), and the scores of training group higher than the control group. *Implications:* 1. This software can improve the overall level of cognitive and ADL function in patients with brain injury.2. The therapeutic efficacy can be maintained within a short term after ceasing of the cognitive training. This study shows that this software can be widely utilized in clinical intervention.

PO-0108

APPLY "INTERNATIONALIZATION" MODEL OF EDUCATION TO PROSTHETICS AND ORTHOTICS SPECIALISM TEACHING IN SICHUAN UNIVERSITY

Wei Liu
West China Hospital, Sichuan University, China

In recent years, prosthetics and orthotics industry has been developed with high speed in our country. The education of prosthetics and orthotics has gradually formed an emerging discipline. But how to establish a prosthetics and orthotics training system according to international standards as soon as possible and cultivate complex talent with medicine and engineering knowledge merging is an important issue for the prosthetics and orthotics education. Sichuan University, take advantage of its multi-disciplinary resource (its teaching programs involving multiple areas of electrical, mechanical, and medical), Cooperating with the Hong Kong Polytechnic University and reference to the guidelines of the International Society For Prosthetics and Orthotics. Its transplants "internationalization" of the mode of teaching, cultivation of complex talents conforming to International Society For Prosthetics and Orthotics certificate standards gradually begin.

PO-0109

THINKING ABOUT STRATEGY OF TALENT TRAINING OF EXERCISE REHABILITATION MAJOR

Jun Zhou, Xiangjiang Rong
Capital university of physical education and sports, China

Objective: To explore the characteristic of Target, specifications and location in Exercise rehabilitation Talent Training. *Method:* Based on the analysis of our experience in running a school, the condition of social demand for talents, talent training characteristics etc. *Result:* 1, Students are admitted only with sport basic (test of sports), the ability to catch the action essentials of common sports, this will be the foundation of later learn.2,Basic medical courses is one of the important basic medicines, it differ from the medical colleges and Universities, master this courses should outstanding sports feature, such as sport anatomy, physiology, biochemistry, biomechanics, sports injury and rehabilitation,sports medical supervision, exercise prescription etc.3,Rehabilitation courses should focus on physical treatment, at the same time to increase the traditional medical rehabilitation method, traditional health care sports content proportion.4,Strengthening practice teaching -- Practice proportion to 1.5-2 years, partial rehabilitation skills can be put in practice.5, To determine what skills the rehabilitation exercise students should possess, and take Unified examination when they graduate.6,The graduates areas of employment cover ranges with sports injury rehabilitation, community rehabilitation, sanatorium, rehabilita-

tion center and hospital rehabilitation therapists etc. *Conclusion:* Talent Training of Exercise rehabilitation professional should have its own characteristics.

PO-0110

REHABILITATION MEDICINE EDUCATION FOR JUNIOR DOCTORS DURING HOUSEOFFICER TRAINING IN JOHORBAHRU, MALAYSIA

Sharon Khor[1], Mohana Vale[1], Thanalactchumy Chandra Bose[2]
[1]hospital sultan ismail johor bahru, Malaysia, [2]hospital sultanah aminah johor bahru, Malaysia

Objective: to ascertain the usefulness of a rehabilitation medicine posting at houseofficer level in JohorBahru Malaysia, determine the appropriate posting order (first or subsequent), ideal duration and the association between level of exposure to specialized rehabilitation services and knowledge after posting. *Method:* Over a period of one year, 41 houseofficers underwent a 2-week posting in Rehabilitation Medicine at 2 tertiary referral hospitals in JohorBahru. Their logbooks were reviewed. *Results:* Twelve (29%) doctors were in their first posting after graduation while the rest had done postings in other specialties. All reported an increase in their level of knowledge after posting. Sixty-eight percent of doctors reported high knowledge after the posting. There was no association between order of posting and knowledge acquired (p=0.235). Amongst doctors who acquired higher increase in knowledge, 71% preferred to keep the posting duration at 2 weeks. *Implications/Impact on rehabilitation:* A brief exposure to rehabilitation medicine is beneficial for junior doctors during their early training prior to service in rural districts as knowledge about rehabilitation will enable better care and appropriate referrals to rehabilitation medicine services in tertiary hospitals.

PO-0111

EFFECT OF REHABILITATION TRAINING FOR OPTIMIZING MOTOR SKILLS ON UPPER LIMB FUNCTION RECOVERY AFTER STROKE

Lin Zhu, Weiqun Song, Ran Zhang, Lin Liu
Department of Rehabilitation Medicine, Xuan Wu Hospital, Capital Medical University, China

Objective: To observe optimize motor skills rehabilitation recovery of upper limb function after stroke. *Methods:* 40 cases of stroke (hemorrhagic or ischemic) patients (both upper limb dysfunction), patients were divided into even and odd number of hospitalized cases optimization group (20 cases) and control group (20 cases). All patients underwent traditional stroke rehabilitation and drug treatment, given to optimize patients optimize the rehabilitation of motor skills, 40 min/2 times/d, 5 times/week training. The time now is six weeks. Respectively upper extremity FMA score before treatment and after six weeks, clinical neurological deficit scores, simple upper limb functional tests (STEF) score. *Results:* 1) After treatment, six weeks, two groups of the FMA score increased, but the difference between the optimized group scores before and after treatment is higher than that in the control group, respectively (12.6 ± 6.0) and (3.6 ± 2.6), the difference was statistically significant (p <0.01). (2) degree of neurological deficit scores table amount, shoulder and arm movement score and hand motor function score after treatment optimization group than the control group difference was statistically significant (p<0.01). 3) two sets of the easy upper limb function tests STEF score after treatment were improved, the difference between before and after treatment score optimization group was higher (14.8 ± 5.3) and (9.5 ± 2.7), the difference was statistically significant (p<0.01). *Conclusion:* optimize the rehabilitation of motor skills can help to improve the use and control of the upper limb after stroke.

PO-0112

THE AFFECT OF SELF SURFACE OF MUSCLE TRAINING ON THE PROGNOSIS OF PATIENTS WITH PERIPHERAL FACIAL PARALYSIS

Bo Cheng, Fang Yuan, Fei Cheng
Chongqing sanxia center hospital, China

Objective: To investigate the affect of self surface of muscle training on the prognosis of patients with peripheral facial paralysis. *Methods:* outpatient treatment of 68 cases of acute peripheral facial paralysis patients for the study, control group 31 cases, 37 cases of the observation group.The statistical analysis of the efficiency of healing time, treatment compliance, satisfaction of two groups. *Results:* House-Brackmann HB facial nerve function were evaluated after treatment comparison (P *Conclusion:* Self-facial muscle training can improve the cure rate of patients with the acute stage of peripheral facial paralysis, shorten the course, improve treatment compliance and satisfaction.

PO-0113

WHAT DO SPINAL CORD INJURED PATIENTS THINK ABOUT INFORMATION ON NEUROGENIC BLADDER AND ITS TREATMENT OPTIONS? AN EXPLORATORY STUDY

Julia Patrick Engkasan*, Jenn Ng Chirk, Yun Low Wah
University Malaya, Malaysia

Objective: To explore the views and experiences of spinal cord injured patients with respect to information they received about neurogenic bladder and its treatment options. *Methods:* We used purposive sampling to select 15 patients who had spinal cord injury (tetraplegia and paraplegia) from both the in-patient and out-patient settings. All patients had neurogenic bladder and were using either indwelling catheterization (transurethral or suprapubic), intermittent catheterization and spontaneous voiding. One to one semi structured interview was conducted and the interviews were audio-recorded, transcribed verbatim, checked and analysed using a thematic approach. *Results:* The three main themes emerged were: sufficiency of information; ease of understanding; and credibility of information. Newly injured patients who were still hospitalized were more satisfied with the amount of information they received compared to those who have been discharged and living in the community. The knowledge gap was apparent once patients experienced life outside the hospital. Some patients were unable to understand verbal information and preferred different modes of information delivery, particularly media using visual aids showing the treatment procedures. There were mixed views on which source of information was more credible. Whilst doctors are considered knowledgeable in this subject, fellow patients who had undergone the procedure were in a better position to describe the treatment options. *Implications:* This study showed there is a need to improve both the quantity and quality of information given to these patients.

PO-0114

POST-POLIO SYNDROME- CLINICAL, DEMOGRAPHIC AND SEVERITY EVALUATION AMONG POLIO SURVIVORS IN JERUSALEM

Zeev Meiner[1]*, Irina Gartsman[1], Hagai Levine[2], Yechiel Friedlander[2], Orly Manor[2], Isabella Schwartz[1]
[1]Hadassah Medical center, Jerusalem Israel, Israel, [2]The Hebrew University-Hadassah, Braun School of Public Health, Jerusalem Israel, Israel

Objective: To determine the medical, demographic and socioeconomic parameters associated with the development of post-polio

syndrome (PPS) among polio survivors in Jerusalem. Materials and methods A prospective cohort study of polio patients attending the post-polio clinic in Hadassah Medical center in Jerusalem. Demographic, medical, social, and functional data were recorded using a particular questioner adjusted to the polio population. The existence of PPS was diagnosed according to the March and Dimes criteria, the severity of PPS had been determined using the index of PPS score (IPPS) *Results:* Among 194 polio patients screened, 154 (79 %) were diagnosed as suffering from PPS among them 78 (51 %) were men. Polio patients with PPS have significantly more difficulties in walking outdoor and in ADL functions (p=0.042 and p=0.007, respectively). Demographic and clinical parameters were identical between polio patients with or without PPS and the only significant risk factors to develop PPS were lower education and higher BMI. The total IPPS score was significantly correlated with health, ADL and mobility parameters. Polio survivors with lower education or women suffer from more severe polio sequelae. Polio survivors who still work suffered less significant polio sequelae. *Implications/impact on rehabilitation:* The prevalence of PPS in our population was among the highest reported. Polio survivors with PPS show significant difficulties in ambulation and in ADL functions in comparison with polio survivors without PPS and the general population. These findings promote the need for specific rehabilitation programs for polio survivors in order to maintain their function and to prevent further deterioration due to PPS.

PO-0115

THE QUALITY OF LIFE AMONG LOWER LIMB AMPUTEES TREATED AT THE TERTIARY HOSPITAL, MALAYSIA

Ohnmar Htwe[1]*, Suganthini Salvanayagam[1], Kelvin Lee Zhi Xing[1], Siti Maryam Abdul Hadi[1], Hadi Fadhil Mat Said[1], Ai Ai Tan[2], Leonard Joseph[3], Amaramalar Selvi Naicker[1]

[1]University Kebangsaan Malaysia Medical Centre, Malaysia, [2]Medical Rehabilitation Services Department, Universiti Kebangsaan Malaysia Medical Centre, Kuala Lumpur, Malaysia, [3]Physiotherapy Program, School Of Rehabilitation Sciences, Faculty Of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

Lower limb amputation is a devastating event which causes a dramatic change in the quality of life (QoL) of amputees. *Objective:* To evaluate the QoL of lower limb amputees and its association with epidemiological factors. *Method*: This was a cross-sectional study, conducted at the tertiary hospital from January to April 2012. Pro forma and 36-item Health Survey form (SF-36) were used to collect the data from 65 lower limb amputees. Data analysis was done by using SPSS version 19 and Quality Metric Health Outcome Scoring Software 4.5. *Results*: The mean age of the respondents was 56.28 ± 14.53 years. Most of them were males (81.5%) and the rest were female. Over 60% were below knee and the rest were above knee amputees. Unilateral lower limb amputees constituted the highest number (89.2%). It was observed that younger age (r: -0.443, p<0.000), being employed (mean rank: 42.05, p<0.008) and prosthesis users (mean rank: 38.83, p<0.001) had a significantly higher physical component score (PCS) of SF-36 while the mental component score (MCS) had no significant changes. *Implications/ Impact on Rehabilitation*: Age, employment, prosthetic usage played a role in determining the QoL of lower limb amputees in terms of the physical functioning. Physicians must thus encourage all amputees to undergo a well-structured rehabilitation programme so as to improve physical functioning and QoL of the amputees.

PO-0116

EXPLORATION OF 'DISABILITY LEVELS' WITH WHODAS II AMONG PERSONS WITH DISABILITY AND CHRONIC DISEASES IN HONG KONG

Peter Poon*, Anchor Hung, Mike Cheung, Leonard Li, Eddie Chow

Centre on Research and Advocacy, The Hong Kong Society for Rehabilitation, Hong Kong, China

Objective: The present study aims to explore the disability levels among the persons with disability and chronic diseases in Hong Kong with the World Health Organization Disability Assessment Schedule - Second Version (WHODAS II) based on the International Classification of Functioning, Disability and Health (ICF). *Method:* A cross-sectional study was conducted in Hong Kong through mail and web surveys, from January to March 2013. The study targeted on seven types of disability and seven types of chronic diseases. The 36-item WHODAS II was used to measure respondents' disability level in activity and participation. *Results:* A total of 1010 adults participated in the survey. Respondents showed high level of disability in activity and participation (Mean 36.3, SD 23.7). They had the most difficulties in household activities (Mean 47.3, SD 33.3), participation in society (Mean 42.6, SD 26.1), and getting around (Mean 38.2, SD 30.2). Higher level of disability in activity and participation was associated with higher self-reported disease severity and lower quality of life among all types of disability and chronic diseases. *Implications:* The present study was the first study assessing the disability level in activity and participation among persons with disability and chronic diseases in Hong Kong population. Respondents' high level of disability in activity and participation indicated that the rehabilitation service and policy should not only focus on patients' medical dysfunction but also their daily living and social aspects of disability. A newer definition of disability based on with the WHODAS II and ICF framework should further be explored in Hong Kong.

PO-0118

FUTSAL INJURIES IN THE ASIAN CUP 2010

Mohammad Rahimi[1]*, Mohammad Hosaine Alizadeh[1], Reza Rajabi[1], Hashem Piri[1], Hamed Arghavani[2]

[1]Tehran university, Iran, [2]Esfehan university, Iran

Objective: Futsal is an attractive sport which has a lot of fans all around the world and also it is one of the favorite sports among men. The aim of this study was to investigate the incidence rate, area of injury, time of onset and incidence of injury zone in the male futsalists participant in the first indoor soccer Championship Asian Cup 2010. *Method:* The data was collected by the report form and the medical report by the physician of the matches. Chi-Square test was used to analyses the data. *Results:* Overall 53 injuries were recorded in the 20 matches the prevalence of 397.5 injuries per 1000 match h or 2.65 was happened in each competition. 43.4% of injuries occurred in the lower extremities, mostly in the knee (20.8%) and ankle (20.8%), respectively (x2=44.47, p=0.001). Moderate injuries were significantly higher than severe injuries (x2=31.71, p=0.001). No significant difference in injury incidence was found among four 10-min periods of time. Most injuries occurred in the last 10-min of the match (30.2%). Also, injuries occurred in the region 2 (Penalty area) was significantly higher than other regions (x2 =88.13, p=0.001). *Implications/Impact on rehabilitation:* According to the results futsal showed more injuries in the knee and ankle. Factors such as different regions of the playground and the time of the match can effect in injury rates of players. Therefore, for avoiding of injury in futsal attention should go toward these factors.

PO-0119

A MULTIFACTORIAL INTERDISCIPLINARY INTERVENTION REDUCES FRAILTY AND IMPROVES FUNCTIONING IN COMMUNITY-DWELLING FRAIL OLDER PEOPLE: RANDOMIZED CONTROLLED TRIAL

Lan Cameron[1]*, Nicola Fairhall[1], Catherine Sherrington[1], Stephen Lord[2], Keri Lockwood[1], Noeline Monaghan[1], Christina Aggar[1], Colleen Langron[3], Susan Kurrle[1]

[1]University of Sydney, Australia, [2]University of New South Wales, Australia, [3]Hornsby Ku-ring-gai Health Service, Australia

Objective: We aimed to evaluate whether a multifactorial intervention could reduce frailty and improve functioning in frail older people. *Method:* A randomized controlled trial with 241 frail community-dwelling older adults in Sydney, Australia. Participants met the Cardiovascular Health Study criteria of frailty and had no severe cognitive impairment. The experimental group received a 12-month multifactorial, interdisciplinary intervention targeting identified characteristics of frailty, functional limitations, and management of health conditions. The control group received usual healthcare. Blinded assessors measured outcomes at three and 12 months after study entry. Primary outcomes were frailty and mobility (using the Short Physical Performance Battery (SPPB)). Secondary outcomes included measures of functioning. *Results:* The mean age of participants was 83.3 years (SD: 5.9 years); 68% were women. 216 participants (90%) were followed-up at 12 months. In the intention-to-treat analysis at 12 months, the between group difference in frailty was 14.7% (95% CI 2.4 to 27.0%, p=0.02), and the intervention group scored significantly better on the SPPB (mean difference between groups 1.44 (95% CI 0.80 to 2.07, p<0.001)). The intervention group walked 0.05 m/s faster over 4 m (95% CI 0.0004 to 0.1, p=0.048) than the control group, and had significantly better scores on the Goal Attainment Scale (odds ratio 2.1; 95% confidence interval (CI) 1.3 to 3.3, p=0.004) at 12 months. Exercise-associated musculoskeletal symptoms constituted adverse events in two participants. *Implications:* A multifactorial intervention reduced frailty and increased functioning in frail older adults. This study shows that a rehabilitation approach to frailty is effective.

PO-0120

GAIT MODIFICATIONS PRIOR TO STEP ASCENT IN OLDER ADULTS

L-Wen Chen[1], L-Ting Lee[1], Yi-Ju Tsai[1], Yi-Ching Yang[2], Sang-I Lin[1]*

[1]Department of Physical Therapy, National Cheng Kung University, Tainan, Chinese Taipei, [2]Department of Family Medicine, National Cheng Kung University Hospital, Tainan, Chinese Taipei

Objective: Ascending to an elevated surface is a common daily activity but poorly understood. The purposes of this study were to investigate gait modifications prior to ascending a step of two heights and determine the effects of different visual conditions in older adults. *Method:* Eleven older adults walked at their natural pace on a pressure sensor walkway before ascending a 9 (LOW) or 18 (HIGH) cm surface under normal (N) and blurred (B) visual conditions. The stride characteristics of the last four steps prior to step ascent were compared between pairs of two consecutive steps. *Results:* There were no significant differences in the overall gait velocity or the step time of the last four steps between the four conditions. There were no significant changes in the step length of the last four steps in N-LOW. In B-LOW, the second last step was significantly shorter than the third last step (p=0.006). Increasing step height led to significant reductions in the step length of the last two steps in N-HIGH (p=0.047), and in the last and third last steps in B-HIGH (p=0.015). *Implications/Impact on rehabilitation:* Modifications of the step length of the last step prior to ascent could help to ensure proper foot placement and was the strategy adopted by older adults encountering a higher step. When visual inputs were insufficient, gait modifications began earlier, possibly to compensate for uncertainty in the judgment of foot-step distance. These modifications are likely to be adaptations to increased task demands and may benefit patients with physiological constraints.

PO-0121

DOES PAUSING PRIOR TO ASCENDING A STEP LEAD TO BETTER POSTURAL STABILITY IN OLDER ADULTS WITH DIABETES?

L-Ting Lee[1], L-Wen Chen[1], Yi-Ju Tsai[1], Yi-Ching Yang[2], Sang-L Lin[1]*

[1]Department of Physical Therapy, National Cheng Kung University, Tainan, Chinese Taipei, [2]Department of Family Medicine, National Cheng Kung University Hospital, Tainan, Chinese Taipei

Objective: Ascending to an elevated surface is often needed while walking in the community and may pose a greater threat to balance for individuals with physiological constraints. This study sought to determine if pausing before ascending a step during walking would lead to better postural stability in older patients with diabetes. *Method:* Fourteen older patients with diabetes walked6 mand then directly (no-PAUSE) or having a brief pause (PAUSE) before ascended a 9 (LOW) or 18 (HIGH) cm step at their natural pace. Footswitches were used to determine the gait events. A forceplate was mounted on the step to measure the anteroposterior and mediolateral displacement and acceleration of the center of pressure (COP) during two phases of the step ascent: leading limb single support (LLSS) and initial (25 ms) double support (IDS). *Results:* In LLSS, the peak COP backward acceleration was significantly higher in PAUSE than no-PAUSE regardless of step height (both p<0.001), and in HIGH than LOW (p<0.05) in no-PAUSE. In IDS, the peak backward acceleration was significantly lower in PAUSE than no-PAUSE despite step height (both p<0.05). The differences in the displacement or mediolateral acceleration were nonsignificant. *Implications/Impact on rehabilitation:* Pausing before step ascent requires additional forward torque to overcome the inertia and was found to lead to greater COP backward acceleration in the leading limb single support phase. Although pausing also led to better postural stability in the initial double support phase, this strategy appeared to be more destabilizing and might increase the risk of falling backward during step ascent.

PO-0122

ANDROGENS: ACTION MECHANISM AT SKELETAL MUSCLE, EFFECT ON MUSCLE MASS, MUSCLE STRENGTH AND PHYSICAL FUNCTION IN THE ELDERLY

Famke Vanderhauwaert[1]*, Louise Deldicque[2]

[1]UZ leuven, Belgium, [2]KU Leuven, Belgium

Objective: To elucidate the working mechanisms of the androgens testosterone and its precursor dehydroepiandrosterone (DHEA) on skeletal muscle in people aged 65 and older, and to determine whether androgen therapy has an effect on muscle mass, muscle strength and physical function in the elderly. *Method:* Literature search in PubMed, with terms androgens and/or testosterone and/or DHEA, sarcopenia, aging, skeletal muscle. *Results:* Androgens have a direct genomic action at skeletal muscle and regulate proliferation and protein metabolism, but they also have crosstalk with other signaling pathways in skeletal muscle. Androgens, especially testosterone, inhibit myostatin, a negative regulator of muscle growth, and augment growth hormone secretion. Administration of testosterone in older men gives a significant increase in muscle mass and a milder effect on muscle strength. The effect of testosterone on physical function remains uncertain, probably due to methodological issues. Administration of testosterone in older women has not been well studied. Evidence for the effect of DHEA administration on muscle mass, muscle strength and physical function is not consistently found. *Implications/Impact on rehabilitation:* Muscle mass and muscle strength decline with aging, called sarcopenia, which causes decreased functionality, increased risk on morbidity and

mortality, and decreased quality of life. Administration of androgens, especially testosterone, can possibly be used in the prevention or treatment of loss of muscle mass in the elderly, to improve health and quality of life.

PO-0123

THE EFFECT OF INTENSIVE BASIC MOVEMENT TRAINING ON ADL IN AGED STROKE PATIENTS

Shasha Fan, Zishan Jia
Hebei Provincial Peoples Hospital, China

Objective: To study the effect of intensive basic movement training on ADL in aged stroke patients. *Method:* Thirty-six aged stroke patients were randomly assigned to two groups, the experimental group (23 cases) were given intensive basic movement training, the control group (22 cases) were given traditional rehabilitation therapy, in each group include 10 patients whose age > 70 years. Both the two groups trained once a day, five days a week. Motor function was assessed using Fugl-Meyer assessment (FMA) and ability in the activities of daily living (ADL) was assessed using Barthel-index (BI). Ability of basic movement was assessed using the ability for basic movement scale (ABMS) pre-treatment and after 4 weeks of treatment. Result Before treatment there were no significantly different between the two groups in FMA, BI and ABMS. At the 4th week evaluations, the FMA, BI and ABMS scores in both groups had all significantly increased compared with pre-treatment, and the improvement in experimental group is bigger than the control group, but the difference was not statistically significant. However, at the 4th week evaluations, for the patients whose age > 70 years, the FMA (lower limbs), BI and ABMS scores in the experimental group increased significantly more than the control group. *Implications:* Intensive basic movement training can improve the ability of ADL of patients after stroke. It is a simple but effective therapy for aged stroke patients especially for very old patients.

PO-0124

COMPARISON OF BODY COMPOSITION, OBESITY, AND SARCOPENIC STATUS IN ELDERLY LEPROSY SURVIVORS WITH NO OR MILD PHYSICAL IMPAIRMENT TO THAT IN THE GENERAL POPULATION

Won Kim[1], Hee Won Park[2], Byung Kwan Hwang[3], Soon Ook Bae[3], In Kwon Kim[4], Sun G. Chung[3]*
[1]Department of Rehabilitation Medicine, Asan Medical Center, University of Ulsan College of Medicine, Korea, [2]Department of Rehabilitation, Kangwon National University Hospital, Korea, [3]Department of Rehabilitation Medicine, College of Medicine, Seoul National University, Korea, [4]Wilson Leprosy Center and Rehabilitation Hospital, Korea

Objective: To investigate whether body composition and the prevalence of obesity and sarcopenia among leprosy survivors with no or mild physical impairment differ from those of the general population. *Method:* A total of 36 leprosy survivors aged 65–90 years with no or mild physical impairment were recruited. Individuals matched for sex, age, and height were selected as a control group from the Fourth Korea National Health and Nutrition Examination Survey (KNHANES IV-3). Anthropometric characteristics, body composition, appendicular skeletal muscle mass (ASM), modified skeletal muscle mass index (SMI), and the prevalence of obesity and sarcopenia were compared between the leprosy survivors and the control group. *Results:* Compared to the control group, the leprosy survivors had higher body weight, BMI, total fat mass, and total fat percentage. The leprosy survivor group also had lower ASM (p=0.035) and SMI (p<0.001) values. Comparison of the composition of regional body parts showed that the lean body mass of the legs was lower in the leprosy survivor group even though this group had higher body weight. The leprosy survivor group also had a significantly higher prevalence of sarcopenia than the control group (38.7% vs. 5.6%; p=0.002). *Implications/Impact on rehabilitation:* These findings may suggest that the socioeconomic barriers faced by leprosy survivors retard their social participation, which may result in physical inactivity causing fat accumulation and sarcopenia.

PO-0125

ALEXITHYMIA AND SLEEP QUALITY IN THE ELDER PATIENTS WITH OSTEOARTHRITIS

Erkan Kaya[1], Selahattin Özyürek[2], Cengiz Kaplan[3], Alparslan Bayram Çarli[1], Mehmet Zeki Kiralp[4]
[1]Deparment of Physical Medicine and Rahabilitation, Military Hospital, Bursa, Turkey, Turkey, [2]Deparment of Orthopedics, Military Hospital, Aksaz, Turkey, Turkey, [3]Deparment of Norology, Military Hospital, Bursa, Turkey, Turkey, [4]Department of Physical Medicine and Rehabilitation, Gülhane Military Medical Academy, Haydarpaşa Training Hospital, İstanbul, Turkey, Turkey

Objective: Osteoarthritis (OA) affects more than half of all older adults, many of whom experience co-morbid sleep disturbance. The current study examined the relationship of sleep chracteristics with scores on alexithymia in the elder patients with osteoarthritis. *Methods:* Consecutive OA patients were invited to participate in a self-administered questionnaire study which included the validated multi-domain Pittsburg Sleep Quality Index (PSQI), Toronto Alexithyimia Scale (TAS) and Visual Analog Scale (VAS). *Results:* The study population included 305 OA patients. PSQI global scores were > 5 in %50 OA patients. Abnormalities in subjective sleep assessment, sleep latency, sleep duration, sleep efficiency, daytime dysfunction and increased sleep-aid medication use observed in OA patients. The most common abnormality reported by OA patients was increased sleep fragmentation. Mean scores on the TAS were > 11 in %45 OA patients. It was determined that the OA patients with sleep disturbances had displayed much more alexithymic characteristics. *Implications/ Impact On Rehabilitation* The results of this study indicate that sleep disturbance was highly prevalent among OA patients and was associated with the alexithymic personality trait. Personality may be important while evaluating sleep and health quality in patients with OA.

PO-0126

RELATIONSHIPS BETWEEN MUSCLE STRENGTH OF LUMBAR BACK AND STATIC BALANCE ABILITY OF MIDDLE AND OLD AGED WOMEN

Wenrong Wang, Zhaodong Yu, Xiangjiang Rong
Capital university of Physical Education, Beijing, China

Objective: With the growth of age, the Middle and Old Aged Women appeared a series of body function decline, inevitable cause balance ability reduced. This article aims to explore the relations between back muscle strength and static equilibrium of Middle and Old Aged Women. *Method:* Choose 30 cases. Divided into three groups according to age.40-50years old age group, 50-60 years old age group, 60-70 years old age group, they are people with no serious cardiovascular disease and joint diseases and vestibular function disorder. Measurements of balance ability were performed through the Italian Postural Equal balance analysis system. Measurements of balance ability were performed through FuZiLi sports training device (Japan) GT - 350 waist abdomen strength test. *Results:* 40-50years old age group (46.55+1.214), Lumbar back biggest contraction force (453.00+93.841), Lumbar back Maximum Stretch strength (489.27+139.981); 50-60 years old age group (52.8+1.932), back Biggest contraction force (430.90+176.856), Lumbar back Maximum Stretch strength (445.9+169.286);60-70years old age group (64.00+4.595),back Biggest contraction force (351+156.761), Lumbar back Maximum Stretch strength (360+144.665), spss17.0

statistic analysis. *Implications:* As the growth of the age of the middle-aged and old women, back muscle strength and static balance function will gradually decline; Drop of back muscle strength and static balance function decline has certain relevance: Compared to back contraction force,the effect for static balance function the back Stretch strength is more apparent: Lumbar back muscle strength training as part of the core strength training may be one of the new method of the middle-aged and old women to improve the static equilibrium, should be take seriously.

PO-0127

TO STUDY THE CORRELATION BETWEEN LOWER-EXTREMITY MUSCLE STRENGTH AND FALLS IN COMMUNITY-DWELLING ELDERLY

Nan Peng, Ming Zhou, Rongguang Shi, Jihong Fang, Lingchen Li, Hongwei Li, Jiayu Li, Zhanfan Guo, Qiuhua Wang, Xiaoying Li, Yanmei Guo, Wei Chen
Chinese Gneneral Hospital of P.L.A, China

Objective: To investigate the correlation between lower limb muscle strength and falls in community elderly. *Method:* According to the inclusion and exclusion criteria,4376 residents were screened with the random cluster sampling method in four communities in Beijing.412 subjects enrolled, aged 50 to 93 years (average age 75.59 ± 9.46). Fall group 81 cases, 331 cases of non-fall group. All subjects received maximal isometric muscle strength testing on bilateral iliopsoas, quadriceps femoris, biceps femoris, and tibialis anterior by using handheld dynamometer. *Results:* The fall rate of over 65 years was 25.31%. The fall rate of 4 age groups: 50-64, 65-74, 75-84, and ≥85 was 0%,7.47%, 29.78%, 28.99% separately. Anterior tibialis muscle strength in aged 75-85 group decreased 15.02% than that of 65-75 years, that may be relevant with significantly higher fall rates in this age. Four groups of lower extremity muscle strength between the fall group and non-fall group, there were significant differences ($p \leq 0.002$). The strength difference of both sides tibialis anterior was not statistically significant (p=0.836) in the falls and non-falls group. Weight with muscle strength of each area had positive correlation (p<0.001), Except quadriceps, the three groups of lower extremity muscle strength was correlated with BMI (p<0.05). Implication Body weight and BMI was positively correlated with fall. Age, lower extremity weakness will increase the risk of falls.

PO-0128

MOBILITY PROBLEMS IN OLDER ADULTS WITH DIABETIC NEUROPATHY

Sang-I Lin, Yi-Ju Tsai, Yi-Ching Yang, I-Ting Lee, I-Wen Chen
National Cheng Kung University, Chinese Taipei

Objective: Diabetes mellitus (DM) is a condition common to the elderly and may lead to complications such as peripheral neuropathy (NP). Patients with DM-NP have been shown to have impaired balance and locomotion control. These problems are believed to be caused by sensorimotor deficits related to NP, not DM per se. This study sought to determine if the ability to perform basic mobility tasks in older adults would be affected by DM or NP. *Method:* Three groups of age-matched older adults, including healthy control (CON), diabetes without NP (DM-nonNP) and diabetes with NP (DM-NP) participated in this study. Subjects first went through a series of sensorimotor function tests, including grip and leg muscle strength, visual contrast sensitivity, plantar cutaneous sensitivity and vibration threshold perception. The mobility tasks included forward reach (FR), alternate stepping, timed up-and-go, 360o turn and 5 times chair rise. The reach distance was measured for FR, while the time taken to complete the task was recorded for the other tasks. *Results:* The results of multivariate ANOVA showed that NP was associated with visual and plantar cutaneous sensitivity impairments. The performance in all mobility tasks except 360o turn was also significantly poorer in NP, compared to the other two groups. DM-nonNP did not differ from CON in sensorimotor function or mobility task performance. *Implications on Rehabilitation:* The ability to perform basic mobility tasks in older adults was affected by NP, but not DM per se, and that sensory impairments were likely to contribute to such functional limitation.

PO-0129

AN INVESTIGATION OF DYSPHAGIA IMAGING: PATIENTS OVER 80 YEARS OLD

Jihai Peng, Mingsheng Zhang, Wenfang Bai
Department of rehabilitation, Guangdong General Hospital, China

Objective: To investigate the dysphagia imaging features of elderly patients (over 80 years). *Method*: 85 patients including 45 elderly patients over eighty years old and 40 patients under seventy years old, were diagnosed as swallowing disorders with speech pathology assessment and modified barium swallow examination (MBS). All patients were tested by penetration aspiration scale, and we analyzed the various indicators on aspiration by MBS. These indicators include the ability to control the bolus, bolus transit time, drain time and amount in advance, the soft palate movement, laryngeal elevation speed, vallecula residue, pyriform sinus residue, laryngeal penetration, aspiration and upper esophageal sphincter (UES) open. *Results:* The grades of FOIS (food oral intake scale) in two groups were no significant difference (p>0.05). For the elderly patients over eighty years old, the bolus leakage in advance, laryngeal mention slowed, pharyngeal constrictor muscle weakness were the major risk factors for aspiration as indicated by the results of longest regression analysis. The bolus leakage in advance attributed to velopharyngeal insufficiency was more common in elderly patients than in the patients under eighty years old. *Conclusion*: The particularity of dysphagia Imaging in the patients over eighty-year-olds is specific, and this is useful to guide the clinical assessment and the specific treatment.

PO-0130

BALNEOTHERAPY FOR OSTEOARTHRITIS IMPROVES SLEEP QUALITY IN OLDER ADULTS

Erkan Kaya[1], Cengiz Kaplan[3], Selahattin Ozyürek[2], Alparslan Bayram Çarli[1], Mehmet Zeki Kiralp[4]
[1]Deparment of Physical Medicine and Rahabilitation, Military Hospital, Bursa, Turkey, [2]Deparment of Orthopedics, Military Hospital, Aksaz, Turkey, [3]Deparment of Neurology, Military Hospital, Bursa, Turkey, [4]Department of Physical Medicine and Rehabilitation, Gülhane Military Medical Academy, Haydarpaşa Training Hospital, İstanbul, Turkey

Objective: Osteoarthritis affects more than half of all older adults, many of whom experience co-morbid sleep disturbance. Pain initiates and exacerbates sleep disturbance, whereas disturbed sleep maintains and exacerbates pain, which implies that reducing the pain of patients with osteoarthritis may also improve their sleep quality. *Methods:* A total of 200 patients suffering for more than 6 months with Kellgren 2-3 knee osteoarthritis were selected to the study. Sleep and functional status were assessed at baseline and after 19 session balneotherapy by using Western Ontario and McMaster Universities Osteoarthritis (WOMAC) Index. and Pittsburgh Sleep Quality Index (PSQI). *Results:* A high prevalence of abnormal sleep quality in patients with knee osteoarthritis was observed. The most common abnormality was sleep fragmentation, with an increased sleep disturbance score. Patients reported significantly improved sleep and functional status after balneotherapy. *Implication:* Balneotherapy, without directly addressing pain control, improved self reported sleep and functional status in older patients with knee osteoarthritis.

PO-0131

EFFECTS OF EXERCISE THERAPY ON CARDIAC HEALTH IN AGING FROM CLINICAL TO BENCH EVIDENCE

Shin-Da Lee
China Medical University, Chinese Taipei

Objectives: Effects of exercise therapy on cardiac health and cardiac apoptosis in aging were unknown. *Methods:* Thirty elderly men were randomized to study group (n=15) and controlled group (n=15). The intervention group enrolled regular aerobic exercise (50-60% VO2max, 30 min, 3 times/week) for six months. Sixteen young rats (YOUNG) and sixteen aging rats (OLD) at 20 months of age were served as negative control. Sixteen aging rats underwent treadmill running exercise 1 h daily for 12 weeks (OLD-EX). After exercise training or sedentary status, blood sampling were analyzed in all elderly men as well as the excised hearts in all rats were measured by heart index, hematoxylin-eosin staining, Western Blotting and positive TUNEL assays. *Results:* Body fat%, BP, HR, interleukin-6, high-sensitivity C-reactive protein, free IGF-1, and homeostasis model assessment-insulin resistance were significantly decreased in elderly men after intervention. Abnormal myocardial architecture and more cardiac TUNEL-positive apoptotic cells were observed in OLD, but not in YOUNG. Cardiac Fas ligand, Fas death receptors, Fas-associated death domain (FADD), t-Bid, Bad, Bak, Bax, activated caspase-8, activated caspase-9, and activated caspase-3 in OLD were significantly increased, compared to YOUNG. Aging-induced protein levels of TNF-alpha, Fas ligand, Fas death receptors, FADD, activated caspase-8, and activated caspase-3 (Fas pathways) became lower in OLD-EX. Aging-induced protein levels of t-Bid, Bad, Bax, Bak, activated caspase-9, and activated caspase-3 (mitochondria pathway) became lower in OLD-EX. *Conclusions:* Exercise training prevented inflammation in aging and suppressed aging-induced cardiac Fas and mitochondria dependent apoptotic pathways in rat models.

PO-0132

THE ALTERED EXPRESSION OF 5-HT3 RECEPTOR IN MEDIAL PREFRONTAL CORTEX OF RAT WITH PARKINSON'S DISEASE

Yue Xi
The Second Affiliated Hospital, Medical School of Xi'an Jiaotong University, Xian, China

Objectives: To investigate the altered expression of 5-HT3 receptor in medial prefrontal cortex (mPFC) of Parkinson's disease (PD) model rat and explore the role of 5-HT3 receptor in the pathogenesy of non-motor symptoms in PD. *Methods:* The altered expression of 5HT3 receptor in mPFC and its subregions of PD rats was analysed by immunocytochemical SP technique, then it was comparded to the normal rats. *Results:* The counting of 5-HT3 receptor positive cells in mPFC and its subregions (PrCm, ACd, PL, IL) of PD rats showed a significant decrease when compared to the normal rats, respectively (p<0.05). *Conclusion:* The result suggest that 5-HT3 receptor dysfunction in the mPFC and its subregions of PD.

PO-0133

EFFECTS OF LOWER BODY POSITIVE PRESSURE TREADMILL TRAINING ON BALANCE, MOBILITY AND LOWER EXTREMITY STRENGTH OF COMMUNITY-DWELLING OLDER ADULTS

Rolando Lazaro
Samuel Merritt University, United States

Purpose/Hypothesis: There is growing evidence that confirms the benefits of partially supporting a person's body weight during exercise. Lower body positive pressure (LBPP) unweighting is a new method of providing partial body weight support. This is achieved by using the AlterGTM, a treadmill device with a pressurized chamber that unloads the lower extremities while a person exercises. Currently there are no published studies detailing the benefits of LBPP treadmill training in the geriatric population. This study aims to investigate the effect of LBPP treadmill training on balance, mobility and lower extremity strength in community- dwelling older adults. Subjects: Ten community-dwelling individuals (ages 60-85 years) with no neurological conditions or musculoskeletal injuries within the past year participated. *Methods and Materials:* The subjects participated in twice weekly treadmill training sessions using LBPP at 80% of body weight. They exercised using their self-selected speed and incline for twenty min each session for eight weeks. Blood pressure and heart rate were taken before, after 10 min and at the conclusion of each training session. Pre- and post-test measures included Performance Oriented Mobility Assessment (POMA), 10 meter walk test (10MW), Computerized Dynamic Posturography (CDP), modified Timed Up and Go (mTUG) and lower extremity dynamometry. *Results:* All 10 participants were female. Wilcoxon signed ranks test results showed statistically significant improvement in POMA (p=0.024), composite score of the CDP (p=0.025), the sit-to-stand split of the mTUG (p=0.005), and lower extremity strength (p=0.008 to.015). Average self-selected speed more than doubled from 1.92 to 3.90 mph (mean=2.44). All subjects exercised within their safe limits, with no unsafe increases in blood pressure or heart rate, and no complaints of extremity pain or muscle soreness throughout the entire training period. *Conclusions:* In a sample of community-dwelling older adults, an eight-week regimen of treadmill exercise with LBPP unweighing resulted in improvements in balance, mobility and lower extremity strength. All participants exercised within safe limits, and reported no adverse effects from the training. Clinical Relevance: The study provides preliminary support for safe and effective use of LBPP treadmill training in community-dwelling older adults. The positive effects of LBPP in minimizing biomechanical risks, decreasing pain while weight-bearing and facilitating mobility are of benefit in geriatric populations.

PO-0134

AGE-RELATED DIFFERENCES IN LOWER LIMB PROPRIOCEPTIVE ACUITY

Chaomin Ni, Ke Zhang, Jianxia Song
Dept. of Rehabilitation Medicine, The Affiliated Provincial Hospital of Anhui Medical University, hefei, China

Objective: To compare the difference of lower limb proprioception between the young and middle-aged and elder people, and analyze its correlation. *Method:* Age-related changes with 60 participants (30 of young people and 30 of middle-aged and elder people) were assessed by PK254p rehabilitation system of multiaxial proprioceptive assessment. The variables of Average Trace Error (ATE),time and ATE+time,were used in determining the proprioceptive acuity. *Results:* In middle-aged and elder people of lower limbs proprioceptive tests,all parameter values (ATE, time, ATE + time,) were more than young people group (p<0.05), and there was significant positive correlation between the proprioception and age in the elder people instead of young people. *Conclusions:* The old people in the proprioceptive acuity of lower limbs is less than young people. There is significant correlation between the proprioception and age in the elder people,suggesting that along with the age growth, proprioception sensitivity of lower limbs is declining.

PO-0135

FACTORS AFFECT THE HEALTH RELATED QUALITY OF LIFE OF RESIDENTS WITH CHRONIC STROKE LIVING IN LONG TERM CARE FACILITIES: A PRELIMINARILY CROSS-SECTIONAL STUDY

Tsai Ren Jei[1,2], Lin Kwan-Hwa[3]*

[1]Cardinal Tien Hospital, Chinese Taipei, [2]Graduate Institute of Physical Therapy, College of Medicine, Chinese Taipei, [3]Department of Physical therapy, Tzu Chi University, Chinese Taipei

Objective: Stroke survivors are usually disable and often institutionalized. Health related quality of life (HRQOL) is usually used as an outcome of medical intervention. However, the factor affects the HRQOL of stroke survivors living in long term care facility (LTCF) is still unknown. *Methods:* A cross-sectional study was conducted to investigate the contributing factors for HRQOL of 24 stroke-survivors recruited from LTCF. All demographic data were recorded. Severity, balance, physical performance and HRQOL were evaluated with simplified STREAM (upper, lower limbs and mobility function), Berg Balance Scale (BBS), Barthel Index (BI), and Stroke Impact Scale version 3 (SIS), respectively. The average score of eight domains of SIS represented as the satisfaction of HQOL. The level of association between HRQOL and clinical variables were first examined with Spearman's correlation coefficients and, then, with multiple stepwise linear regression. *Results:* The results of our study revealed that the severity of stroke, score of BBS and BI were significant related to HRQOL (ρ=0.754, 0.706, 0.693, 0.726, 0.779 respectively; p<0.01). The regression analysis selected upper-limb function (one aspect of S-STREAM), BI, and gender as the significant variable (R^2=0.786). *Implications/Impact on rehabilitation:* The present results suggest gender, upper-limb function and ability to archive activity of daily life determine the satisfaction of HRQOL of stroke survivors living in long term care facilities. Clinically, Health-related professionals face the issue of HQOL should take gender into account and the treatment program should emphasize on the upper limbs function and ADL training. Further study with a larger sample size is needed to draw concrete conclusions of contributing factors of HRQOL.

PO-0136

POTENTIAL EFFECT OF VISUAL AND AUDITORY CUES ON MOTOR FUNCTION OF PARKINSON DISEASE PATIENTS

Shuo Luan[1], Xiao Xia Zhu[2], Wei Ming Wang[1], Hong Yu Gao[1], Yu Rong Mao[2], Liu Jie Su[1], Xiao Dan Ma[1], Xi Chen[2]

[1]Faculty of Rehabilitation Sciences, Zhongshan School of Medicine, Sun Yat-Sen University, Guangzhou, China, [2]Rehabilitation department, 1st affiliated hospital of Sun Yat-sen University, Guangzhou, China

Objective: To explore the potential effect and long-lasting improvement of visual and auditory cues on motor function of Parkinson disease patients *Method:* 6 Parkinson disease patients were enrolled in a one-week rehabilitation program based on external visual and auditory cues by wearing walking glasses called GaitAid Virtual Walker for forty min each day. Before, after the training and 3 months later, the following evaluation were taken for statistical analysis: Berg Balance Scale (BBS), timed up-and-go test (TUGT), Unified Parkinson Disease Rating Scale (UPDRS II, III), 6- min walking test (6MWT), walking speed, stride and cadence. *Results:* By using the glasses, patients (n=6) achieved a significant improvement in walking speed, stride length, the score of BBS and UPDRS II, III (p<0.05) after one-week treatment, and there were promising long-lasting (3 months' follow-up) improvement in the former parameters. *Implications/Impact on rehabilitation:* Parkinson disease is a relatively common progressive neurodegenerative disorder. Gait problems are characterized by a decreased stride length and increased cadence. The walking glasses plus external visual and auditory cues together, can improve the motor function especially gait and balance ability, which will benefit more patients in near future.

PO-0137

EARLY MEMORY INTERVENTION COMBINED WITH ACUPUNCTURE TREATMENT FOR AMNESIC MILD COGNITIVE IMPAIRMENT: A PILOT TRIAL

Wanzhen Wu[1,2], Yinhua Zhu[2], Bozhong Wang[2], Aihua Ren[2], Enyan Yu[3], Liyue Zhu[2], Jianmei Zhou[2]

[1]Department of the psychiatry, Zhejiang Hospital, China, [2]Department of Rehabilitation, Zhejiang Hospital, China, [3]Department of the psychiatry, Zhejiang Provincial Peoples Hospital, Zhejiang Hospital, Hangzhou, Zhejiang province, China

Background: Cognitive intervention could improve cognition for healthy older adults, Alzheimer's disease and other dementia, yet there is limited information about the benefit of memory training combined with acupuncture treatment for older adults with amnesic mild cognitive impairment. *Objective:* To investigate the usefulness of an early memory intervention combined with acupuncture treatment for the memory difficulties experienced by people with amnesic mild cognitive impairment. *Methods:* Using a randomized control design, 48 participants with amnesic mild cognitive impairment were randomly assigned to a memory rehabilitation group or memory intervention combined with acupuncture treatment group. Participants were assessed on primary measures of everyday memory (prospective memory) and memory strategies at 6 weeks' and 6 months' follow-up. Memory techniques included errorless learning, mind mapping, visual imagery and face-name association's strategy. Acupuncture treatment included plexus puncture with the needle in the district of the left frontal temporal area, lefting pin 6 h. *Results:* There was difference in memory improvement between memory rehabilitation group and memory intervention combined with acupuncture treatment group. Everyday memory was measured by performance on objective immediate/delayed memory tasks, and significantly improved following intervention. There was a strong trend towards improvement in self-appraisal of everyday memory. Knowledge and management of memory strategies also significantly increased following intervention. The time about memory intervention was longer, and the effects were more significant. *Implications:* Memory training combined with acupuncture treatment is likely to be effective for managing memory difficulties. Early interventions could help minimizing everyday memory failures for memory in amnesic mild cognitive impairment. Funding: The research was supported by grants from Zhejiang Provincial Natural Sciences foundation (NO. Y2091289)

PO-0138

NEW APPROACHES TO THE APPLICATION OF PHYSICAL REHABILITATION IN PATIENTS WITH OSTEOARTHRITIS OF THE KNEE JOINTS IN THE ELDERLY PERSONS IN CONDITIONS OF SANATORIUMS

Tatyana Bakalyuk, Igor Mysula*, Igor Salayda

Ternopil medical university, Ukraine

Objective: Study the use on the sanatorium stage of rehabilitation in elderly patients with OA medical complex with the inclusion of Nordic Walking classes and exercises with elastic bands. *Method:* The study included 62 people (middle age 74.2 + 3.2) with osteoarthritis of the knee joint and second stage without synovitis with reduced bone density, which was on the sanatorium stage of rehabilitation. Radiological stage of OA is determined by classification of Kellgren J.N. and Lawrence J.S. (I grade - 22 patients, the second grade - 40). Patients were divided into 2 groups. Within 21 days 30 patients receiving a spa treatment which included the using of traditional classes in physical therapy. In the second group of 32

patients over the duration on the sanatorium stage of rehabilitation were involved in a day Nordic walking with a gradual increasing in walking distance to 2 miles a day and every other day doing the exercises for the knee joint with an elastic band daily for 20 min. To assess the severity of joint pain, we applied a visual analogue scale and to characterize the functional disorders - application for determination of alhofunctional Lequesne index and WOMAC questionnaire. *Results:* After analyzing the research material obtained the following results*:* positive trend registered in 83% of patients in the group which engaged in Nordic walking and doing the exercises for the knee joint with elastic bands, whereas in the control group only 48%. *Implications/Impact on rehabilitation:* Nordic walking reduces static and dynamic loadings on knee joints and improves body balance, prevents malnutrition and progression of muscle dysfunctions of joints. Exercises with elastic bands improves sense of balance, increases muscle strength. Thus in patients with osteoarthritis of the knee joint in the elderly persons spa treatment with the inclusion of Nordic Walking and exercises for the knee joint with elastic bands during 3 weeks leads to a probable reduction in severity of pain in the knee joints and improves the quality of life of patients.

PO-0139

TRUNK SWAY DURING WALKING IN OLDER ADULTS: NORMATIVE VALUES AND ASSOCIATION WITH FALLS

Mooyeon Oh-Park[1,2]*, Sewon Lee[2], Roee Holtzer[2], Jeannette Mahoney[2], Joe Verghese[2]

[1]Kessler Foundation Research Center, United States, [2]Albert Einstein College of Medicine, United States

Objectives: Trunk sway is a key component of dynamic balance control, however, there were no reported norms of trunk sway among older adults. The objective of this study is to establish the norms for trunk sway during walking by age and gender among community-dwelling older adults, and to assess the association between trunk sway and static balance measures and falls. *Methods:* Cross-sectional study of non-disabled community-dwelling older adults (age≥65). Trunk sway in antero-posterior (pitch) and medio-lateral (roll) direction was measured by angular velocity sensors (Swaystar) during walking of self-selected speed. *Results:* Of 196 older adults (mean age 76.1, 57.1% women), women showed larger roll (7.1±2.5 versus 6.5±2.8, p=0.011) and pitch angle (6.2±2.0 versus 5.5±2.0, p=0.042) than men. The roll angles in men were 5.3±1.1, 5.3±1.4, 5.4±1.81, and 4.8±1.3 degrees for the age group 65-70, 71-75, 76-80, and ≥81. The roll angles in women were 6.7±2.4, 6.1±1.5, 5.8±2.0, and 6.3±1.9 degrees for each age group. There was no significant age effect on the roll or pitch angle in both genders. No correlation was shown between trunk sway and static balance measure of unipedal stance time. However, the roll angle was larger among 33 (16.8%) fallers compared to 163 non-fallers (6.6±2.3 versus 5.7±2.0, p=0. 020). The pitch angle was similar between fallers and non-fallers (7.3±2.9 versus 6.7±2.6, p=0.170). *Conclusion:* Trunk sway during walking appears to be stable with aging among non-disabled elderly and capturing distinct aspect of balance separated from static measures. Increased medio-lateral sway may discriminate fallers from non-fallers among older adults.

PO-0140

IMPROVED FALL PREDICTION FOR COMMUNITY-DWELLING OLDER ADULTS: COMBINING THE UNIVERSITY OF ILLINOIS AT CHICAGO FEAR OF FALLING MEASURE WITH THE BERG BALANCE SCALE

Han Chen, Elizabeth Wang-Hsu, Jan Meiers, Susan Smith*

Department of Physical Therapy & Rehabilitation Sciences, Drexel University, Philadelphia, PA 19102 USA, United States

Objective: One in 3 adults, 60 and older, fall annually. Over 20% sustain injuries affecting functional independence. The Berg Balance Scale (BBS; optimal score=56) has been widely used to measure fall risk. However, a systematic review (Neuls et al., 2011) suggested that the BBS used alone is not useful in predicting falls. Our purpose was to improve fall prediction by combining the BBS with a psychological measure of fear of falling. *Method:* 77 community-dwelling adults (15 men/62 women; aged 60-97, M=81.9 years.) completed a demographic and fall history questionnaire and a self-report questionnaire, the University of Illinois at Chicago Fear of Falling Measure (UIC FFM; optimal score=48) (Velozo & Peterson, 2001). Physical therapists and students (n=7) administered the BBS. Logistic regression was used to predict the probability of falling based on fall history. *Results:* BBS scores ranged from 18-56 (M=43.6 ± 10.2, 95%CI=41.3-45.8). UIC FFM scores ranged from 17-48 (M=34.4 ± 8.9, 95%CI=32.6-36.3). The overall model using the BBS and UIC FFM scores significantly predicted fall history ($\chi2$=10.67, df=2, p=0.005) with a diagnostic accuracy of 72% versus 62% accuracy obtained using the BBS score alone. *Implications/Impact on rehabilitation:* Addition of a psychological fear of falling measure (UIC FFM) improves the predictability of the BBS to identify fallers in community-dwelling older adults. Further studies combining the BBS and UIC FFM with other measures are suggested to enhance fall prediction.

PO-0141

EFFICACY OF TREADMILL WALKING TRAINING ON GAIT PERFORMANCE AND BALANCE IN THAI ELDERLY

Thitiporn Phakdepiboon

Rehabilitation Medicine Department, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Thailand

Objectives: To evaluate the effect of a 4-week treadmill walking on balance and gait performance in Thai elderly. *Methods:* Thai elderly aged 60 or older were recruited in this study. The design program included 30-min treadmill walking at each individual comfortable speed was set as 2 times per week for 4 weeks. At baseline and 4 weeks, participants were tested in their static balance by Single-Leg Stance Test with eyes open and close (SLST-EO and SLST-EC), dynamic balance by Expanded Timed Up and Go Test (ETUG) and gait velocity were measured. *Results:* The SLST-EO [median (interquartile range, IQR)] of right, left leg for pre and post training were [20.70 (15.60-63.00)], [20.36 (10.80-67.27)] and [38.00 (20.17-74.19)], [26.52 (14.61-72.39)] sec, respectively. The SLST-EC [median (interquartile range, IQR)] of right, left leg for pre and post training were [4.20 (3.42-9.29)], [4.00 (2.89-7.91)] and [6.85 (2.70-13.62)], [4.96 (3.91-12.59)] sec, respectively. ETUG, gait velocity [mean (standard deviation)] of pre training were [22.37 (3.15)] sec, [1.08 (0.15)] m/s and post training were [20.54 (2.12)] sec, [1.14 (0.15)] m/s, respectively. All parameters in post training were statistically improved. (p<0.05). *Implications/Impact on rehabilitation:* A 4 week, twice weekly, treadmill-walking training is able to improved balance, both dynamic and static and gait velocity in Thai elderly.

PO-0142

THE EFFECT OF BALNEOTHERAPY ON BLOOD PRESSURE

Ali Hikmet Kayar[1], Erkan Kaya[2]*, Alparslan Bayram Çarli[2], Cengiz Kaplan[3]

[1]Department of Hydroclimatology, Military Hospital, Bursa, Turkey, [2]Department of Physical Medicine and Rehabilitation, Military Hospital. Bursa. Turkey, [3]Department of Neurology, Military Hospital, Bursa, Turkey

Objective: Exposure to heat is widely used traditional therapy in many cultures. In this poster we will present the effect of the bal-

neothreapy cure on blood pressure. *Methods:* A total of 214 patients suffering for more than 6 months with Kellgren 2-3 knee osteoarthritis were selected to the study. All of patients were admitted 19 days balneotherapy and physiiical medicine and rehabilitation cure program. Patients blood pressure were measured every morning by the same nurses. We analyzed results by using SPSS ver 15.0. *Results:* We found that systolic blood pressure decrease while balneotherapy session but we didn't find any change in diastolic blood pressure. *Implications:* Systemic thermal therapy, such as taking a warm-water bath and sauna, induces systemic vasodilation. Balneotherapy may be helpful as an adjunctive non-pharmacological treatment for hypertension.

PO-0143

EFFECTS OF COGNITIVE DUAL TASK TRAINING ON BALANCE FUNCTION IN ELDERLY PEOPLE

Jiejiao Zheng[1], Xueqiang Wang[1], Yueying Xu[1], Yin Yang[1], Liyan Shen[1], Zhenwen Liang[1]

[1]Huadong Hospital affiliated to Fudan University, Shanghai, China, [2]Shanghai University of Sport, Shanghai, China

Objective: To evaluate the effectiveness of cognitive dual-task training on balance function in elderly people. *Methods:* One hundred elderly people were randomly allocated into training group and control group. Control group received conventional balance program, training group received cognitive dual-task training (conventional balance program + cognitive training). Subjects were asked to exercise 3 times a week (40 min/time) for 8 weeks. In the pre- and post-training sessions, all participants performed tests of static postural control. Static postural control was assessed via measurement of center of pressure sway under eyes open (EO) and eyes closed (EC) conditions. *Results:* Ninety–two of the 100 participants (training group, n=47; control group, n=45) completed the 8 weeks program. Control group had significantly greater maximum displacement in the medial-lateral direction with eyes open and closed condition, compared with training group ($p < 0.05$). And anteroposterior balance indices of subjects in the dual task group were significantly better than those in the control group with eyes open after 8 weeks (p=0.000). *Implications:* Our results demonstrate that an integration of a cognitive training and balance program (cognitive dual task) could produce more beneficial effects on balance function than balance exercise alone (single task) in elderly people.

PO-0144

THE INFLUENCE OF BACKGROUND DISEASES OF THE PATIENT ON HIS WALKING ABILITY DURING GERIATRIC REHABILITATION

Yael Horvitz[1], Haim Barel[1], Alexei Oboukhov[1], Ayala Younger[1], Heidi Sugarman[2]

[1]Bait Balev, Israel, Israel, [2]Ono Academic College, Israel, Israel

Background: The ability of a patient older than 60 years, to rehabilitate from damage to his walking ability, might be influenced by his background diseases. The current research examined the influence of common background diseases on the potential of walking rehabilitation in adult patients who were hospitalized for rehabilitation, and who were independent in their walking before the hospitalization. Research Purposes 1. Improving the physiotherapists' ability to assess the potential of walking rehabilitation of the adult patient. 2. Finding specific background diseases which might reduce the potential of walking rehabilitation. *Methods and Data:* The research was retrospective. The data was gathered from medical files of all the patients who were hospitalized in 5 rehabilitation institutes. Background diseases examined: dementia, depression, CVA in the past, heart diseases, former fractures, cancer and Parkinson. The data included 893 patients: 470 for orthopedic rehabilitation, 242 for neurological rehabilitation, and 181 for general rehabilitation. The average age of the patients was 78 years. *Results:* At the end of hospitalization the average FIM scale of walking for patients with the checked background diseases was 4.8, except of patients with parkinson – 4.59, dementia – 3.65 and parkinson + other disease – 3.7. *Conclusions:* Dementia is a negative factor in walking rehabilitation. Parkinson together with another background disease reduces rehabilitation ability significantly. Other background diseases were not found to be negative factors in walking rehabilitation. Clinical Application When assessing the goals in walking rehabilitation of adult patients, it is recommended to take into account - among other factors - the background diseases of the patient, especially dementia and Parkinson.

PO-0145

FINDINGS REGARDING RELATIONSHIPS BETWEEN SOCIO-DEMOGRAPHIC, PSYCHOLOGICAL AND CO-MORBIDITY FACTORS, WITH THE FUNCTIONAL STATUS, IN GERIATRIC INPATIENTS

Ana Capisizu[1], Sorina Aurelian[2], Andreea Zamfirescu[3], Ioana Omer[3], Monica Haras[1], Camelia Ciobotaru[4], Liliana Onose[5], Tiberiu Spircu[1], Gelu Onose[1]

[1]The University of Medicine and Pharmacy Carol Davila, Bucharest, Romania, [2]The Titu Maiorescu University, Bucharest, Romania, [3]The St.Lucas Hospital, Bucharest, Romania, [4]The University Ovidius, Constanța, Romania, [5]The Medical Service of Metrorex, Bucharest, Romania

Objective: To assess the impact of socio-demographic andco-morbidity factors, and quantified depressive symptoms on disability in inpatients. *Method:* Observational cross-sectional study including a number of 80 elderly (16 males, 64 females; mean age 72.48 years; standard deviation 9.95 years) admitted in the Geriatrics Division between May-July, 2012. We used the: Functional Independence Measure, Geriatric Depression Scale and an array ofsocio-demographic and polipathology parameters, respectively. Statistical analysis included Somers'D for ordinal variables, linear bivariatecorrelations, general linear model analysis, ANOVA and Kruskal-Wallis, tests. *Results:* FIM scores were negatively correlated with age (R=-0.301; 95% c.i.-0.439?-0.163 p=0.007); GDS score had a weak negative impact on FIM (D=-0.188; 95% c.i.-0.324?-0.052 p=0.006). A general linear model, including other variables (education, living conditions, provenance, gender, matrimonialstate) as factors, found living conditions (p=0.027) and the combination of matrimonial state and gender (p=0.004) to significantly influencing the FIM score. ANOVA showed significant differences in FIM scores stratified by the number of chronic diseases (p=0.035). *Implications/Impact on Rehabilitation:* Our study objectifies the negative impact of depression on functional status; interestingly, education had no influence on FIM scores; living conditions and combination of matrimonial state and gender had an important related impact: patients with living spouses showed significant better functional scores than divorced/ widowers; the number of chronic diseases also affected FIM scores: lower in patients with significant polipathology. These findings must be considered when designing geriatric rehabilitationprograms within home skilled cares.

PO-0146

EFFECTS OF OLFACTORY STIMULATION ON GAIT PERFORMANCE IN FRAIL OLDER ADULTS

Satoru Ebihara, Masahiro Kohzuki

Tohoku University Graduate School of Medicine, Japan

Objective: The purpose of this preliminary study was to examine the effect of essential oil olfactory stimulations on gait performance in older adults. *Method:* Fourteen subjects in stable condition were recruited from inpatients who introduced to rehabilitation ward for the purpose of general rehabilitation de-conditioning. In each sub-

ject, the gait performances were measured before and after olfactory stimulation. Olfactory stimulation was applied by distilled water (sham), lavender and grapefruit essential oils in the different days. For the stimulation, a paper stick, previously dipped in the oils or distilled water, was placed within a few centimeters of the right side of the subject's nose for 2 min. The order of the stimulations was randomly selected for each subject. Gait performance was estimated by the timed-up-and-go test, gait speed and steps for 10-meter walk. The change of gait performances before and after the stimulations was estimated with a paired Student *t*-test. *Results:* Olfactory stimulation with either lavender or grapefruit oil significantly improved the timed-up-and-go test. By contrast, little effect was observed in gait speed and steps for 10-meter walk. *Implications/Impact on rehabilitation:* The study suggests that olfactory stimulation may improve gait performance presumably due to improvement of posture stability in frail older adults.

PO-0147

THE VARIOUS ASPECTS OF POSTURAL BALANCE IN OLDER ADULTS TREATED WITH PROXIMAL FEMORAL NAIL ANTIROTATION OR HIP ARTHROPLASTY

Bo Wu, Lei Zhang, Mingsheng Zhang

Guangdong Academy of Medical Sciences and Guangdong General Hospital, Guangdong Geriatric Institute, China

Objective: This study examined various aspects in the eyes open or eyes close condition of postural balance comprised 7 older adults treated with proximal femoral nail antirotation and 7 older adults of the same age treated with hip arthroplasty. *Method:* We randomized chose seven patients in each group, who had a history of proximal femoral nail antirotation or hip arthroplasty, respectively. Persons participated in static balance tests using a balancing apparatus in the eyes open or eyes close condition. *Results:* Significantly higher scores in the Before and After Standard Deviation were found among the proximal femora nail antirotation subjects compared to the hip arthroplasty ones in the eyes open condition ($p<0.05$). There was no significant difference in other parameters. *Conclusions:* The patients with a history of hip arthroplasty may fall down easier than the patients treated with PFNA.

PO-0148

ISOKINETIC KNEE STRENGTH IN AMBULATORY GERIATRIC PATIENTS

Ssu-Yuan Chen[1]*, Ching-L Chang[2], Ming-Hsia Hu[3,1], Tsai-Chun Chen[3], Jin-Shin Lai[1], Ching-Yu Chen[4,2]

[1]Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Chinese Taipei, [2]Division of Geriatrics and Gerontology, Institute of Population Health Sciences, National Health Research Institutes, Taipei, Chinese Taipei, [3]School and Graduate Institute of Physical Therapy, National Taiwan University College of Medicine, Taipei, Chinese Taipei, [4]Department of Family Medicine, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Chinese Taipei

Objective: The measurement of muscle strength is critical for sarcopenia screening. The geriatric patients with weak muscle strength in the lower limbs are liable to poor physical performance and frailty. The purpose of this study is to evaluate the isokinetic knee strength of ambulatory geriatric patients and to examine its associations with thigh mass and physical performance. *Method:* One hundred forty-five ambulatory geriatric patients with a mean age of 77.2±5.9 year were included in this study. They were recruited from family medicine or geriatric clinics in the districts surrounding Taipei City of Taiwan for a multidimensional, interdisciplinary comprehensive geriatric assessment. Each subject underwent an isokinetic test (Cybex Norm dynamometer) to measure muscular strength of knee extensors and flexors at 0, 60, and 180 degrees per second. The anthropometric measurements (including weight and thigh circumference), appendicular skeletal muscle mass by bioelectrical impendence analysis, and physical performance (including timed up & go test, 5-meter walking time, and handgrip strength) were examined. *Results:* Concentric isokinetic muscle strength of knee extensors/flexors was significantly positively correlated with thigh muscle mass, appendicular skeletal muscle mass index, and better physical function including gait speed, and timed up & go test ($p<0.05$); but it was significantly negatively correlated with age and gender. The concentric isokinetic muscle strength of knee extensors/flexors at 60 degrees per second has the highest correlation coefficient with other physical function measurements. *Implications:* Our results provide support that knee strength is associated with sarcopenia and physical function among geriatric ambulatory patients.

PO-0149

GAIT CHARACTERISTICS AND FUNCTIONAL BALANCE PEROFRMANCE IN OLDER PATIENTS WITH CHRONIC LOW BACK PAIN

Yi-Ju Tsai[1]*, Pei-Tzu Chiang[1], Kuo-Yuan Huang[2]

[1]National Cheng Kung University, Tainan, Chinese Taipei, [2]National Cheng Kung University Hospital, Tainan, Chinese Taipei

Objective: to investigate the differences of stride characteristics during level walking and functional balance performance in older adults with and without Chronic Low Back Pain (CLBP). The influence of CLBP on gait and balance specifically in older adults who may lead to higher risks of falls or disability is thus understood. *Method:* Fifteen older patients with CLBP and sixteen healthy controls participated. Stride characteristics was measured using a motion analysis system and force platform. Functional balance performance was measured using three tests including forward reach (FR), 5 timed sit-to-stand (STS), and timed up and go (TUG). Strengths of lower extremity major muscle groups were also recorded. Group differences were tested using independent *t*-tests. *Results:* Older patients with CLBP had slower walking velocity ($p=0.017$) and longer stride length ($p=0.028$) than the controls although no differences were found in cadence, stride duration, and width. Older patients with CLBP had longer performance time during TUG ($p=0.009$) and STS ($p=0.008$) and shorter reach distance during FR ($p=0.008$) than the controls indicating poorer balance. All the low extremity muscle strengths in older adults with CLBP were significantly weaker than the controls. *Implications on Rehabilitation:* Older patients with CLBP had slower walking speed, poor balance and lower limb weakness implying with higher risks of falls. The results highlight the importance of fall risks identification and prevention in older patients with CLBP. A therapeutic program for older patients with CLBP should include not only pain relief but also balance training.

PO-0150

EFFESTS OF TAI CHI ON POSITION SENSE OF THE KNEE JOINT IN THE ELDERLY

Yuanbiao Liu

Hangzhou First Peoples Hospital, China

Prupose: The objective of the prospective randomized control study was to examine the effect of Tai Chi exercise on knee joint position sense (JPS) in older subjects. *Material and Methods:* Sixty-three male physically inactive volunteers aged ≥ 65 years were randomly assigned to one of the two groups: Tai Chi ($n=32$) and a wait-list control ($n=31$). The Tai Chi exercise was scheduled for 1 h per day, 5 days per week for 6 months. JPS was evaluated by passive reproduction of pre-determined angles on a dynamometer (Biodex 3 system) prior to the Tai Chi exercise and immediately after 6 months exercise program. The JPS was reported with absolute (AE),

relative (RE) and variable angular errors (VE). *Results:* There were 2 and 4 participants withdrew from the Tai Chi and control group respectively during the follow-up. Therefore, the measurements from the 30 and 27 participants were finally analyzed, respectively. There were no differences between the 2 groups with respect to the AE, RE and VE. After the exercise, the absolute angular of the Tai Chi group were reduced from 6.7° to 4.21°, in contrast, there was no significant difference of that of the control group. Similarly, the relative angular error was significantly reduced from 5.95 ° to 4.01° in Tai Chi group. Whilst, there was no significant changes of the variable angular error between the 2 testing sessions. *Implications:* 6 months' Tai Chi exercise might be adopted as a useful program for improvement of JPS of the knee in the elderly.

PO-0151

PREVALENCE OF ROTATOR CUFF TEARS IN ELDERLY PATIENTS WITH SHOULDER PAIN

Hsin-Shui Chen[1,2], Li-Wei Chou[3,4], Mu-Jung Kao[5,6], Yueh-Ling Hsieh[7], Chang-Zern Hong[8]

[1]China Medical University Beigang Hospital, Chinese Taipei, [2]Department of Rehabilitation Medicine, School of Medicine, College of Medicine, China Medical University, Chinese Taipei, [3]School of Chinese Medicine, College of Chinese Medicine, China Medical University, Chinese Taipei, [4]Department of Physical Medicine and Rehabilitation, China Medical University Hospital, Chinese Taipei, [5]Department of Physical Medicine and Rehabilitation, Yangming Branch, Taipei City Hospital, Chinese Taipei, [6]Department of Physical Therapy and Assistive Technology, National Yang-Ming University, Chinese Taipei, [7]Department of Physical Therapy and Graduate Institute of Rehabilitation Science, China Medical University, Chinese Taipei, [8]Department of Physical Therapy, Hungkuang University, Chinese Taipei

Objective: To estimate the prevalence of rotator cuff tear in elderly patients with shoulder pain in Taiwan (rural area). *Methods:* We reviewed the medical records of 1077 patients (400 male and 677 female) since 2007 to 2012 who visited our hospital because of shoulder pain for over 3 months. Inclusion criteria included age over 65 y/o, no trauma history of shoulder, and no shoulder operation history. All patients received arthrogram evaluation for shoulder condition. *Results:* Among the 472 enrolled patients, 300 patients had shoulder pain in the right side, 170 in the left side and 2 patients in both sides. Age ranged from 65 to 96 y/o (mean 80±15). Totally 474 shoulders were assessed, and 41 % (193/474, including 75 males and 118 females) had evidence of rotator cuff tear in arthrographic findings including 92.2% of full thickness tear (178) and 7.7% of partial tear (15). Arthrographic findings in other 44 % (208/474) of patients revealed adhesive capsulitis. Only 15% (73/474) patients revealed the normal shoulders. There were 69.6% (138/193) of patients with rotator cuff tear in right shoulder and 23.3% (45/193) in left shoulder. *Implications/Impact on rehabilitation:* The results indicated that rotator cuff tear is an important cause of shoulder pain in elderly patients. Early accurate diagnosis and treatment can improve later socio-economic problems and disability.

PO-0152

GERIATRIC REHABILITATION IN ELDERLY PEOPLE: RELATIONSHIP BETWEEN DEPRESSION AND ATTITUDE /HABITUATION TO MUSIC

Hiromi Sakai[1], Naoto Kamide[2], Masahiro Kohzuki[1]*, Tiantian Jia[1], Setsuko Monma[1], Toshiko Yoshida[3], Masayoshi Ichie[4]

[1]Department of Internal Medicine & Rehabilitation Science, Tohoku University Graduate School of Medicine, Japan, [2]Graduate School of Medical Sciences, Kitasato University, Japan, [3]Department of Nursing, Miyagi University, Japan, [4]Department of Music & Acoustical Medicine, Disability Science, Tohoku University Graduate School of Medicine, Japan

Objective: Music therapy is now used in many disparate areas-from coronary care units to rehabilitation after a stroke. Music therapy may promote movement from isolation to community in community-dwelling elderly. Depression is a common psychiatric disorder in older adults, and its impact on music therapy has not been elucidated. This study aimed to clarify the relationship between depression and attitude to music, and depression and habituation to music in community-dwelling elderly. *Methods:* Two-hundred thirty community-dwelling elderly living in either Kasukabe city in Saitama prefecture or Sendai City in Miyagi prefecture in Japan were participated in this study. The residents background information, the amount of pleasure for various activities, and the instrument activities of daily living (I-ADL) were surveyed. All the participants were asked by the questionnaire including depression, attitude to music and habituation to music. Depression was assessed using Five-Item Version of the Geriatric Depression Scale (GDS5). Interest in music, frequency of listening to music and mood changing by singing were investigated for attitude and habituation to music. *Results*: Interest in music and frequency of listening to music in subjects with depression was significantly less than that in subjects without depression. Furthermore, mood changing by singing in subjects with depression was significantly smaller than subjects without depression. *Implications/Impact on rehabilitation:* These results suggest that depression may be related to attitude and habituation to music in community-dwelling elderly. Although music therapy may help older people to reduce their depression level, not standardized but specific music therapy protocols may need to improve life quality in community-dwelling older people with depression.

PO-0153

THE RELATIONSHIP BETWEEN THE SIZE OF THE ANTERIOR – POSTERIOR CURVATURE OF THE SPINE AND POSTURAL STABILITY IN WOMAN OVER 60 YEARS OF AGE

Katarzyna Walicka-Cuprys, Justyna Drzal-Grabiec, Justyna Podgórska, Justyna Rykała, Joanna Grzegorczyk, Agnieszka Brzozowska-Magon*, Maciej Rachwal

Faculty of Medicine, University of Rzeszow, Poland

Objective: Impaired postural stability and disturbances in the development of physiological curvature of the spine increases with age, this may cause an increased risk of falling. The aim of this study is to evaluate the relationship between the size of curvature of the spine and the postural stability parameters. *Material and Method:* The study included 90 women aged 60-92 years (mean 70 years ± 8.01). Non-invasive photogrammetric method based on projection Moire phenomenon was used to assess posture. To assess the balance in a relaxed standing position with eyes open and closed stabliographic method was used. Compliance with the normal distribution was verified Shapiro-Wilk test. The results were statistically analyzed using Spearmans rank correlation test. *Results:* In the study with eyes open, there was no correlation between the parameters defining posture and balance. In the study with eyes closed between depth of thoracic kyphosis (DTK) and average deflection of the center of pressure (MA-EC) r= -51, average deflection in the sagittal plane (MAAP-nd EC) r=- 44, the surface area of the center of pressure (SA-EC) r=- 47, average deflection in the frontal plane (MAML-EC) r=40 and between depth of lumbar lordosis (DLL) and average deflection in the sagittal plane (MAAP-EC), r=0,40 significant correlation was found. *Conclusions:* During the standing position with eyes closed, the shape of curvature of the spine affects the postural stability. In the prevention of disorders in seniors postural stability should be considered exercises which reduce lumbar lordosis and balance exercises in the frontal plane.

PO-0154

THE COMPARATIVE VALIDITY OF THREE FUNCTIONAL MOBILITY TESTS FOR PREDICTING FALLS IN OLDER PEOPLE

Changshui Weng, Na Wan, Li Ming Liu, Cai Xing Zhu, Wei Guo Jiao, Zhong Shi Chen

Dept. of Rehabilitation Medicine of Nan Lou, The General Hospital of PLA, Beijing, China

Objective: The Purpose of this study was to examine the comparative validity of threefunctional mobility tests for predicting falls in older people. *Methods:* 116 volunteers (mean age of 74.4±6.5 years) were recruited and divided into two groups: fall group and no-fall group. All subjects were tested by Five times sit to stand test (FTSST), Timed up and go test (TUGT) and Timed 10-meter walk test (TWT). The data is analyzed by using the statistic descriptive, spearman correlation coefficient, logistic regression analysis and receiver operating characteristic (ROC) curve analysis. *Results:* The fall group showed higher FTSST time (seconds), TUGT time (seconds) and TWT time (seconds) than the no-fall group (p<0.001). There were significantly correlation of the FTSST time), TUGT time and TWT time with history of falls (p<0.001). The logistic regression analysis revealed that the FTSST, TUGT and TWT were significantly related to falling (OR:1.1643-1.2503).The area under the ROC curve for the FTSST, TUGT and TWT show an indicator of discriminatory power was 0.68-0.73, and compared the area under the ROC curves of these tests was no difference (p>0.05). *Implications:* The FTSST, TUGT and TWT as a quick, easily functional testing tool that is useful for for predicting falls in older people.

PO-0155

DUAL TASK GAIT TEST AND GAIT REHABILITATION IN THE ELDERLY

Bernard Auvinet[1]*, Claude Touzard[1,2], Anne-Helene Olivier[1,3], Eric Barrey[1,4]

[1]Polyclinique du Maine F-53010 Laval, France, [2]Hôpital du Haut Rocher F-53024 Laval, France, [3]INRIA Rennes F-35040 Rennes, France, [4]Université d'Evry INSERM-U902 F-91025 Evry, France

Objective: Gait rehabilitation in the elderly is usually focused on motor function. Recently complex motor-cognitive training has been reported more efficient to improve gait rehabilitation. The rational is based on the interrelationship between cognition and motor function, which can be assessed by the dual-task (DT) paradigm. The aim of this study was to investigate the implication of a dual task gait test (DTGT) in gait rehabilitation. *Method:* Data were collected from outpatient's consultations including DTGT. Fifty six patients were tested (age: 75±7 y, F: 27, M: 29). Patients performed a reference single walking and an attention demanding task while walking. DT consists in walking and backward counting one by one from fifty. Gait analysis was provided by a three-axis accelerometer (Locometrix™). We computed the evolution of walking speed (WS) and stride regularity index (SR) between the single and the dual walking tasks. *Results:* According to the evolution of WS and SR with an interval of ± 15%, two major different sub-groups were identified (p<0.0001): subgroup 1: (21 patients) WS and SR remained constant; subgroup 2: (33 patients), 19 decreased both WS and SR, 14 decreased SR but no change of WS. Two patients were out of these two subgroups, there was an increase of SR (magnet effect) but no change of WS. *Implications/Impact on rehabilitation:* Gait rehabilitation programs can be tailored according to the results of a DTGT thanks to information about changes in velocity and regularity, which can be linked to the balance between motor and cognitive therapies.

PO-0156

MUSCLE ATTENUATION CHARACTERISTICS OF THE COMMUNITY-DWELLING OLDER MEN

Ming Zhou[1], Nan Peng[1], Rongguang Shi[1,2], Jihong Fang[1,2], Lingchen Li[12], Hongwei Li[1,3], Jiayu Li[1,3], Zhanfang Guo[1,3]

[1]chinese general hospital of PLA,Beijing, China, [2]Cadre Recuperation Office, General Staff of PLA,Beijing, China, [3]Department of Outpatient Clinic, Department of General Political, PLA, China

Objective: To study the characteristics of muscle attenuation of the community-dwelling older men in China,for targeting of interventions to prevent falls in this group. *Method:* Using random cluster sampling method among four communities in Beijing. According to the inclusion and exclusion criteria, 276 subjects aged ≥ 50 years enrolled. Maximal isometric strength were tested by handheld dynamometer meter in iliopsoas bilateral, quadriceps, tibialis anterior, biceps femoris. *Results:* After 50 years old, lower extremity muscle strength of men was progressively delined.The speed of muscle attenuation in various ages was different. Lower extremity muscle strength declines fastest during the period of 75-84 years age as 13.58%,17.98%,14.88%,16.04% (p<0.01). Quadriceps muscle strength is themost obvious decrement. Strength decline rate of Lliopsoas was faseter than that of quadriceps, tibialis anterior, biceps femoris as 10.28% and 11.78% (p<0.01) between 65 to 74 and ≥85 year-old male. *Conclusion:* With growth of the age, lower extremity muscle strength of men showed a declining trend. Strength decline rate is the fastest after 75 years old. The man over 75 years old should prevent the decline of their Lower extremity muscle strength.

PO-0157

THE ANALYSIS OF TRANSCRANIAL DOPPLER IN ELDERLY PATIENTS WITH VERTIGO

Yuting Zhang

Jiangsu Provincial People's Hospital, Zhongshan rehabilitation branch, China

Objective: To observe the cerebral vascular hemodynamic situation and to explore the clinical value of TCD in elderly with vertigo. *Method:* Testing for patients with vertigo symptoms in our hospital examination of 300 cases, 200 cases of men and 100 cases of women aged 60 to 80 years, an average of 72.51 ± 4.40.Use the Israeli RIMED- Digi-Lite™ transcranial Doppler (TCD) detector,use the 2mHz probe detects MCA, ACA, PCA and BA, VA, PINCA.Analysis of blood flow velocity spectrum shape,plasticity index and other indicators. *Results:* The reference to the TCD normal (Nanjing Brain Hospital) Vs beyond ± 25 abnormal blood flow velocity as abnormal. The decreased Blood flow velocity has 120 cases, which the VA-BA decreased blood flow velocity decrease has 90 cases (55 males and 35 females), accounting for 75% and the ICA decreased blood flow has 30 cases (20 males and 30 females), accounting for 25 %. Compared to ICA, VA-BA flow rate of descent rate was significantly higher than the ICA (X^2 =30.66, p<0.005). And male' VA-BA flow velocity drop rate significantly increased than women' (X^2=20.47, p<0.005).The change of blood flow velocity spectrum shape mainly extended contraction Tiara blunt or Peak time delayed. The above results show that, the senile vertigo patients with vertebral - basilar artery blood flow velocity significantly change may be due to the elderly cervical degenerative changes and cerebral arteriosclerosis and other factors, men may be related to smoking, alcohol consumption and other factors. *Conclusion:* TCD may provide some objective basis in the diagnosis of the senile vertigo patients with brain blood supply, disease observation, and guidance and treatment.TCD is a very valuable detection method.

PO-0158

REHABILITATION AFTER HIP FRACTURE IN CONVALESCENT REHABILITATION WARDS

Aiko Osawa[1], Shinichiro Maeshima[1], Daisuke Nishio[2], Yoshitake Hirano[2], Hiroshi Kigawa[2], Kenichi Ozaki[3], Izumi Kondo[3]

[1]Saitama Medical University International Medical Center, Japan, [2]Hanno Seiwa Hospital, Japan, [3]National Center for Geriatrics and Gerontology, Japan

Objective: In recent years, hip fractures among the elderly are increasing. However, there is little reporting regarding the amounts of rehabilitation training for and functional prognoses of hip fractures. We have considered the factors which influence activities of daily living (ADL) and discharge destination of patients hospitalized in convalescent rehabilitation wards from the viewpoints of the amount of time spent training and the hospitalization periods. *Method:* The target is a group of 50 patients suffering hip fracture, and we evaluated their condition before injury, their cognitive function, their uninjured side leg extensor muscle strength, and their activities of daily living (ADL). The discharge destinations were generally divided into a home group and a facility/hospital transfer group, and comparative examination was carried out regarding the relationship between the overall number of units of rehabilitation conducted, including physiotherapy and occupational therapy, and the daily number of units. *Results:* The FIM efficiency declined greatly from 0.32 for the 4th through 6th weeks after hospitalization to 0.11 for the 6th to 8th weeks, and in a post hoc test, a significant difference was observed in the FIM efficiency between weeks 2-4 and weeks 6-8. *Implications:* This suggests that for hip fracture, about 6 weeks after being admitted to a convalescent rehabilitation ward, post-discharge guidance including nursing service and family coaching is necessary.

PO-0159

REHABILITATION OF UPPER LIMB FUNCTION IN HEMIPLEGIC PATIENTS AFTER STROKE

Wen He, Kai Wang
Department of Rehabilitation the geriatric Hospital of JING'AN, shanghai, China

The incidence of upper limb dysfunction of stroke patients was high, and the recovery was difficult, which has serious impact on their activities of daily living and quality of life. This article reviewed the new techniques and methods for hemiplegic patients after stroke. The main methods for hemiplegic patients after stroke have the following several aspects: bilateral isokine-matic training, mirror neuron system, gymnastics rods training, music therapy, motor imagery, Upper limb rehabilitation robot, Virtual Reality, constraint induced movement therapy, functional electrostimulation, electromyographic biofeedback therapy and Transcranial Magnetic Stimulation and so on.

PO-0160

THE APPLICATION OF FALL RISK EVALUATION SYSTEM IN OLD PEOPLE

Liancheng Wang, Shibo Xu, Liqin Zhang
Department of Rehabilitation, Tianjin TEDA Hospital, China

Objective: This research is discussing the incidence of old people fall risk, analyzing related factors and preventing fall. *Methods:* Research randomly chose 100 model works in BinHai area. The fall risk evaluation system includes balance, gait and lower limb strength (dominated side) tests. 75 candidates completed tests. All parameters of fall group were compared with non- fall group. Besides that, balancing score and gait data needs to compare with normal data. *Results:* 47 cases balancing score were above normal data. There is no significant difference in fall and non-fall group; 62 cases show abnormal gait. Step length variation of fall group is above non- fall group; there are 13 people whose lower limb strength was decreasing. Significant difference was observed by comparing with young adult strength. Plantar flexors strength of fall group is significant lower than non- fall group. *Conclusion:* Fall risk evaluation system can be applied to old people fall risk protocol.

PO-0161

A STUDY OF AGE-RELATED CHANGE AFFECTS THE EQUILIBRIUM FUNCTION SHORT-TERM POSTOPERATIVE IMPROVEMENT IN CERVICAL MYELOPATHY

Yuntao Zhou[1], Hironori Hosoe[2]*, Koji Sato[2]
[1]Fujita Healthy University,Japan, [2]Nagoya Daini Red Cross Hospital, Japan

Objective: The present study aimed to clarify whether age-related change could affect the postoperative recovery of equilibrium function, one month later after Laminoplaty surgery for patients with Cervical Myelopathy. *Method:* 12 patients with Cervical Myelopathy who underwent decompression (65.5±10.1 years; 10 men, 2 women) were enrolled in this study. The following items were assessed before, one week, and one month after surgery; 3 basic characteristics (symptom duration, comorbidity, Cognition disability HDS-R), five equilibrium evaluations (Unilateral Stance, Timed Up and Go, Function Reach Test, Stepping Test, STEF, and Stabilometry). The subjects were divided into the elderly group (≥65 years) and the non-elderly group (<65 years). The basic characteristics, and the equilibrium function were compared between the two groups. *Results:* The elderly group included 7 cases (71.9.±5.3years; 6 men, 1 woman) and the non-elderly group contained 5 cases (56.6±8.3 years; 4 men, 1 woman). In the 3 basic characteristics, the rate of having comorbidity in the elderly group (71.4%) was significantly greater than in the non-elderly group (40%). Although the equilibrium function was significantly impaired in the elderly group, their improvement rates were equal to or significantly greater than the non-elderly group in one week and a month short-term postoperative. *Conclusion:* Age-related change is a directly negative factor for equilibrium function postoperative recovery for one month after surgery with Cervical Myelopathy.

PO-0162

LONG-TERM CARE INSURANCE SYSTEM IN JAPAN AND OUR HOME CARE SERVICES IN TOKYO GENERAL HOSPITAL

Harumi Sugiyama
Tokyo General Hospital, Japan

Introduction: Long-term Care Insurance System (LCIS) in Japan was adopted to cope with advanced age problems in 2000. The purpose of LCIS is to help people who need care for their family member at home. LCIS includes Home care and Institution services. *Methods and Materials:* Subjects were 189 patients who had Day Care services and 35 person who had Home visit Rehabilitation services at our hospital. This is retrospective study with Barthel index, 10-meter ambulation speed, and timed up and go test. *Results:* 1. Twenty three percent of population in Japan became over 65 years old in 2012 and 18% of over 65 yo person was certified as disabled or requiring support in August, 2012. 2. We started our Day Care program in November 2010 and Home-visit rehabilitation program in April 2012. Users of Day Care center were 189 patients (Mean age; 76 yo) in June 2012 and 35 patients (mean age; 79, 2 yo) in April 2012. Eighty percent of patients were due to stroke and locomotor diseases. Many of them could keep their functions by their Home care services. 3. Nakano-Ku, one district of Tokyo, where our hospital is located, has 300,000 population with only 4 Day Care centers and 13 Home visit rehabilitation centers. We feel at least 120 Home care centers in Nakano-Ku are needed to care disabled and/or requiring support person. *Conclusion:* This system was now well accepted so far in Japan, However we should examine further about how many locations of center we need, and what kind of services and cost efficiency of this system.

PO-0163

EFFECT OF WHOLE-BODY VIBRATION EXERCISE ON BALANCE CONTROL, LOWER-EXTREMITY MUSCLE STRENGTH AND GENERAL HEALTH STATUS IN FRAIL ELDERLY PATIENTS

Li Zhang, Changshui Weng

Department of Rehabilitation Medicine, Nan Lou of Chinese PLA General Hospital, China

Objective: To evaluate the effects of whole-body vibration (WBV) exercise on the balance control, lower-extremity muscle strength and general health status in frail older patients and discuss the feasibility of WBV as an intervention for frailty in older adults. *Method:* A single centre randomized controlled trial will be conducted. 40 frail older persons were included and assigned randomly to the WBV group or control group. WBV exercise was performed on a Galileo machine at a frequency of 6~24 Hz, 4 bouts (30-60 seconds each bout) for a training duration, three times every week, for 8 weeks. The control intervention was involved the usual care, physical therapy and routine exercises for 8 weeks. The frail status, balance function and confidence, lower extremity muscle function and strength, and the general health status (SF-12) of each subject were assessed at baseline, after 4 weeks and 8 weeks of WBV or control training. *Results:* 17 subjects in WBV group and 16 subjects in control group completed all of the measurements and interventions procedure. There are marked improvements in the TUG and FTSS test, lower extremity muscle strength, balance function and balance confidence, and SF-12 scores of the frail elderly in both groups during the intervention period of 4 weeks and 8 weeks (ps <0.05). The improvements in the WBV exercise group were more obvious than those in the control group though there were no significant differences between the two groups (ps >0.05). *Implication:* WBV exercise is a safe, convenient, and efficacious training method that can improve the mobility, balance and muscle strength of the lower extremity in the frail elderly.

PO-0164

TRENDS AND CHARACTERISTICS OF AGE-ASSOCIATED LOSS IN LOWER-EXTREMITY STRENGTH AMONG COMMUNITY-DWELLING OLDER ADULTS

Nan Peng, Ming Zhou, Chunhua Li, Rongguang Shi, Jihong Fang, Lingchen Li, Hongwei Li, Jiayu Li, Zhanfang Guo

Chinese General Hospital of P.L.A, China

Objective: To identify the trends and characteristics of age-related muscle condition among community-dwelling adults in urban China. *Method:* This study was conducted in four communities in Beijing Metropolitan area where 4,376 subjects attended information meetings and were screened with selectioncriteria. Four hundreds and sixty-eight subjects were qualified including 412 subjects aged 50 to 93 and 46 between 20-30 years old. All subjects received maximal isometric muscle strength testing on bilateral iliopsoas, quadriceps femoris, biceps femoris, and tibialis anterior by using handheld dynamometer. The results were compared based on subjects' 5 age groups: <30, 50-64, 65-74, 75-84, and ≥85. *Results:* The strength on tested muscles declines as the age increases in both men and women (p<0.001). The rate of muscle strength decline is different between men and women. For men, iliopsoas muscle strength is the most obvious decrement as 5.5kg (31.61%) (p<0.01), while tibialis anterior muscle strength is the fastest decline in women, as 5.67kg (44.02%) (p<0.01). Quadriceps muscle strength in 65-74 age male group was 12.90 ± 3.95kg (left), and 12.97 ± 3.94kg (right), while in the same age female group it was 9.37 ± 3.09kg (left), and 10.11 ± 3.03kg (right). *Implications:* With age increment, muscle strength in both men and women declines,but older men decreased faster than women in iliopoas, while older women did faster than men in tibilalis anterior, and quadriceps. These results indicate that different muscles should be emphasized based on age and gender when providing muscle strengthening exercise for older adults.

PO-0165

THE VALUE OF PHYSICAL FUNCTION TESTS TO PREDICT FALLS IN COMMUNITY-DWELLING OLDER ADULTS

Ming Zhou[1], Nan Peng[1], Jihong Fang[2,2], Rongguang Shi[2,2], Lingchen Li[2,2], Hongwei Li[3,3], Jiayu Li[3,3], Zhanfang Guo[3,3]

[1]Chinese PLA General Hospital, Beijing, China, [2]Cadre Recuperation Office, General Staff of PLA, Beijing, China, [3]Department of Outpatient Clinic, Department of General Political, PLA, Beijing, China

Objective: We expect that fall-risk can be predicted by a predictive model in healthy community-dwelling elderly and quantify the relationship between physical function and fall. *Method:* This study was conducted in four communities in Beijing. One hundred and forty- four subjects aged ≥65 year (80.35±5.48), 50 fallers and 94 non-fallers, were evaluated in this study. Data were analyzed for differences between fallers and non-fallers and significant variables entered into logistic regression analysis. *Results:* Results indicate that non-fallers have significant shorter walking time and higher scores on the Functional gait assessment (FGA), Berg balance scale (BBS), Function reach test (FRT), Modified clinical test of sensory integration on balance (CISIB), one-leg stance when compared to fallers ($p \leq 0.05$). Logistic regression was used to determine which useful items from commonly used tests were predictive of falls and the results show that total FGA score and Standing on a foam surface with eyes open condition of the Modified CTSIB contribute significantly to the prediction of falls with 80% sensitivity and 74.2% specificity, the sensitivity and specificity of FGA and FOEO is separately 76%,74.2% and 56%,81.6%.According to the Receiver Operating Characteristic (ROC) Curve, the area under the curve was 0.845 for logistic model. *Conclusions:* This model can be used to predict fall-risk in healthy community-dwelling elderly population. It is more i sensitive and similarly specific than FGA and FOEO for predicting the fall in community- dwelling older adults.

PO-0166

SEXUALITY AND AGING WITH DEPENDENCE: A QUESTION OF RIGHTS

Arlete Salimene, Marta Imamura*, Linamara Rizzo Battistella

Clinical Research Center, Institue of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation, Hospital das Clínicas, University of São Paulo School of Medicine, Brazil

Objectives: To detect the expression of sexuality in men undertaken by cerebrovascular accident (CVA), they age physically dependent on their relationship with the sexual partner, caregiver, known as rehabilitation services are attentive to issues of sexuality of these patients. Reflection brings social, cultural, political and economic issues such as human rights and recognition for health policy in the public sphere. *Materials and Methods:* Interviewed 27 patients and sexual partners of a universe of 76 subjects, designed for health care and rehabilitation. Inclusion criteria: ACV with three to six months of last discharge patients, 50 years or older, presence of hemiplegia and other neuromotor sequelae, family caregiver, sexual partner. Study conducted in 2004, revised in 2008, descriptive, prospective, quantitative and qualitative; application instrument validity, Golombok Rust Inventory of Sexual Satisfaction (GRISS); taped interviews with couples, fully transcribed, socioculturally contextualizing their sexual reality. *Results:* Mean age, 61 years, maximum 76 years. The average monthly household income, after a stroke, is the $ 1,228.64 to $ 2,457.28. Women In GRISS Scale, 72%

reported sexual activity between couples carers, despite that, 40% lack of sexual desire submit, claiming lack of erection companion and nonorganic psychogenic dyspareunia. Among men, the average index for the absence of sexual dysfunction was 58%, 65% had premature ejaculation, 60% had genital response failure and 70% were not sexually active. *Conclusions:* physical impairment does not preclude the expectation of couples keep sexually active, with restrictions and accommodations. Health services and rehabilitation, sexuality should consider in their therapeutic processes.

PO-0167

EFFECT OF ELECTROACUPUNCTURING ON ACTH AND TNF-A IN SERUM AFTER ACUTE EXERCISES OF RATS

Minghua Zhao, Yunhong Wang
Capital University of Physical Education, China

Introduction: The purpose of the study is to observe the change of ACTH and TNF-α in rat serum after acute exercise and the effect of electroacupuncturing Zusanli. The researches are helpful to understand the mechanism of the prevention and cure of exercise-induced fatigue. *Method:* 90 Sprague-dawlay male rats were randomly divided into 9 groups, control group (C), exercise group (E 0 min, E 60 min, E 90 min, E 5 hr), exercise + 2/15 Hz electro-acupuncture group (E+2/15 Hz 0 min, E+2/15 Hz 30 min, E+2/15 Hz 4 hr).Exercise rats run on treadmill with incremental intensity untill exhaustion (Bedford, 1978). The electro-acupuncture group rats were submitted to electro-acupuncture for 30 mins. After finishing exercise, the rats were sacrificed at the different time point and the blood were moved, then adopting radioimmunoassay method to evaluate ACTH and TNF-α in the rats serum. *Results:* Results from experiment indicated that a higher level of ACTH was found from exercise group (E60 min group is 53.88±12.59 pg/ml) than that from control (C group is 37.70±10.05 pg/ml) (p<0.01). The level of TNF-α from exercise group (E 60 min group is 1.01±0.33 pg/ml)is higher than that from control (C group is 0.57±0.14 pg/ml) (p<0.05). The ACTH (E+2/15Hz0min is 36.21±2.06 pg/ml) and TNF-α (E+2/15 Hz 0 min is 0.47±0.13 pg/ml) in exercise+2/15 Hz electro-acupuncture showed a significant decrease than that from exercise 60 min group (p<0.01). Compared with the exercise group, TNF-α concent of rats in each time point are declined. *Conclusions:* Exercise can increase the content of ACTH and TNF-α in the rat serum. while acupuncturing rat's Zusanli may relieve the increase in ACTH and TNF-α. It is indicated that the treatment of acupuncturing at Zusanli may play a role in preventing exercise-induced fatigue by regulating neuroendocrine system.

PO-0168

DISABILITY IN ACUTE INTERNAL MEDICINE PATIENTS: PREVALENCE, FACTORS AND POTENTIAL FOR EARLY REHABILITATION

Yee Sien Ng[1]*, Shenzhen Tan[2], Jing Chen[1], Chek Wai Bok[1], Gerald Choon Huat Koh[3], Effie Chew[4]
[1]Singapore General Hospital, Singapore, [2]Duke-NUS Graduate Medical School, Singapore, [3]Saw Swee Hock School of Public Health, NUS, Singapore, [4]National University Health System, NUS, Singapore

Objective: Internal Medicine (IM) patients form the largest inpatient cohort in many hospitals. Despite recognized impact of disability on outcomes, evaluation of disability is largely overshadowed by acute diagnosis-based disease management. We aim to determine the prevalence of disability and identify associated factors. *Methods:* Patients admitted to the IM Department of an academic tertiary hospital under a single medical team were recruited prospectively. Demographic data, admitting diagnosis, biochemical markers, socioeconomic data, comorbidities and functional outcomes were obtained. Functional Independence Measure was assessed at discharge (FIMd), and retrospectively reported 1-month prior to admission (FIMp). Comorbidities were assessed using the Charlson Comorbidity Index (CCI). Multiple regression analysis was conducted. *Results:* Of 372 patients (age 67.9 ±17.9, male 54.8%), length of stay (LOS) was 11.0±27.8 days (median 5.0 days). The most common primary diagnoses were cellulitis (17.7%), pneumonia (16.4%) and heart failure (11.6%). FIMd was 85.3±38.1 (motor 59.2±29.1, cognitive 26.1±10.3). Unadjusted and adjusted CCI was 2.61±2.54 and 4.76±3.68 respectively. 117 (31.5%) patients had socioeconomic difficulties (financial and caregiver issues), 73.7% were discharged home. Increased age (p<0.001), longer LOS (p=0.007), higher haemoglobin (p=0.04), lower albumin (p<0.001), socioeconomic difficulties (p<0.001) and lower FIMp were associated with lower FIMd. Pre-admission FIMp was 98.2±34.7, average decline (FIMp-FIMd) was 12.8±19.0. A FIMd drop of ≥10 occurred in 36.4%. *Implications/Impact:* Disability is prevalent in IM patients. Demographic, social, medical and premorbid factors correlate with functional outcomes. Decline in function was common on admission. Comprehensive care of IM patients must include assessment of function and triaging for early rehabilitation.

PO-0169

FACTORS ASSOCIATED WITH LONG-TERM FUNCTIONAL OUTCOMES, PSYCHOLOGICAL SEQUELAE AND QUALITY OF LIFE IN PERSONS AFTER PRIMARY BRAIN TUMOUR

Bhasker Amatya*, Fary Khan
Royal Melbourne Hospital, Melbourne Health, Australia

Objectives: To examine factors impacting long-term functional outcomes and psychological sequelae in persons with primary brain tumours in an Australian community cohort. *Methods:* Participants (n=106) following primary brain tumours in the community were assessed for impact on participants' current activity and restriction in participation, using validated questionnaires: Functional Independence Measure (FIM), Perceived Impact Problem Profile (PIPP), Depression Anxiety Stress Scale, Cancer Rehabilitation Evaluation System–Short Form and Cancer Survivor Unmet Needs Measure. *Results:* Mean age of the participants was 51 years (range 21-77 years), majority were female (56%) with median time since brain tumour diagnosis 2.1 years and a third (39%) had high grade tumours. Majority showed good functional recovery (median motor FIM score 75). 56% reported pain, ataxia (44%), seizures (43%); paresis (37%), cognitive dysfunction (36%) and visual impairment (35%). About 20% reported high levels of depression (13% in Australian normative sample). Two-third participants reported highest impact on the PIPP subscales for psychological wellbeing and participation (45%). Factors significantly associated with poorer current level of functioning and wellbeing included: younger participants (≤40 years), recent diagnoses, aggressive tumour types and presence of pain. No significant differences in scale scores were found across various treatments (surgery, chemotherapy or radiotherapy) on outcomes used. Implication on rehabilitation Long-term physical and psychological morbidity associated with brain tumour as in other cancer patients can be under estimated. Rehabilitation for brain tumour survivors is challenging and requires long-term management particularly of psychological sequelae impacting activity and participation.

PO-0170

IMPACT OF RHEUMATOID ARTHRITIS TREATMENT ON ARTERIAL STIFFNESS

Mihai Dragoi, Razvan Gabriel Dragoi*, Claudiu Avram, Mihaela Oravitan, Cristian Milicin, Adina Octavia Duse, Roxana Adela Cerbulescu
"Victor Babes" University of Medicine and Pharmacy, Timisoara, Romania

Objective: The present study is aiming to investigate the relation between arterial stiffness and treatment with disease-modifying antirheumatic drugs (DMARDs) and tumor necrosis factor-a antagonists (anti-TNF) in patients with rheumatoid arthritis. *Method:* We performed a cross-sectional study on 31 patients with rheumatoid arthritis treated with DMARDs (28 patients) and/or anti-TNF (16 patients). None of these patients was previously diagnosed with cardiovascular diseases or diabetes, except hypertension - which was previously controlled by medication (mean systolic blood pressure was 129.1±16.4 mmHg and diastolic blood pressure 77.9±11.2 mmHg). All patients were interviewed in regard to past and current medication and investigated in regard to arterial stiffness using a pulse wave velocity measurement device (Arteriograph, Hungary). *Results:* Pulse wave velocity (PWV) significantly correlated with the intake of methotrehxate (r^2=0.16, p=0.05) and sulfasalazine (r^2=0.35, p=0.002), but not with leflunomide. We found also significant and negative correlations between PWV and anti-TNF treatment (r^2=0.21, p=0.026) and the duration of anti-TNF treatment (r^2=0.52, p=0.004). *Conclusion:* In patients with rheumatoid arthritis, arterial stiffness may be associated with methotrexate or sulfasalazine intake. The study results suggest that both anti-TNF treatment and treatment duration with anti-TNF may have a beneficial effect on arterial stiffness and therefore cardiovascular risk. However, larger studies are warranted to confirm these findings. *Implications on Rehabilitation:* Taking in consideration that arterial stiffness is an independent predictor of cardiovascular morbidity, comprehensive cardiovascular rehabilitation programme should take in account the impact of medication on arterial stiffness in patients with rheumatoid arthritis.

PO-0171

THE RESULTS OF THE NON-INVASIVE CARDIAC REVASCULARIZATION - APPLICATION OF COMBINED METHODS OF THERAPEUTIC ANGIOGENESIS (EXTERNAL ENHANCED COUNTERPULSATION (EECP) AND CARDIAC SHOCKWAVE THERAPY (CSWT)

Victoria Petukhova*, Tatyana Shapovalenko, Konstantin Lyadov

Medical and Rehabilitation Center, Russia

Introduction: Recurrent angina after successful surgical revascularization is quite often seen. In some cases reoperation is hardly possible. In this context, a combination of methods of non-invasive revascularization is relevant. *Purpose:* To assess outcomes of combined application of EECP and CSWT in rehabilitation of patients with severe coronary artery disease. *Methods and subjects:* We studied 20 patients. All patients overcame myocardial infarction and surgical revascularization. Reoperation was impossible. The main group consisted of 9 patients, the control - 11 patients. The main group treated by EECP (35 h sessions, 6 days a week) and CSWT (9 sessions, 3 time a week every two week) during 7 weeks. The control group received treatment only by EECP. Courses were repeated every 6 months. All patients were followed for 5 years. *Results:* The exercise tolerance increased in both groups: peak oxygen consumption (by ESM) in the main group increased on 23.2% vs 18.4% in the control group, p<0,05. End-diastolic diameter LV decreased in the main group on 4,0±0,23% vs 3,3±0,37% in the control group, p<0,05. Ejection fraction LV increased in the main group on 9,7±0,18%, in the control group 8,9±0,26%, p<0,01. The ischemic area (by myocardial perfusion SPECT) decreased on 18.4% in the main group vs 12.6% in the control group, p<0,05. *Conclusion:* Combined application of EECP and CSWT can be considered the effective method for non-invasive revascularization can improve the quality of life in patients with severe coronary artery disease.

PO-0172

TWO CONTRASTIVE CASES OF PEDIATRIC OBESITY WITH OR WITHOUT THE EARLY THERAPEUTIC INTERVENTION

Tamao Takahashi, Fumika Suzuki, Yoshiko Sakata, Makoto Nagasaka, Nobuyoshi Mori, Satoru Ebihara, Osamu Ito, Masahiro Kohzuki

Tohoku University Graduate School of Medicine, Japan

Case 1: a 9-year-old boy diagnosed obesity and fatty liver was referred to our hospital. His height, body weight and BMI were 149cm, 93kg, and 41.9kg/m^2. AST and ALT were 144 and 244IU/l. He was underwent a diet of 1900kcal and physical exercise with bicycle ergometer and walking in the hospital for 40 days, and continued these therapy at home. Body weight decreased, and levels of transaminase normalized, which maintained at the age of 17 years. *Case 2:* a 12-year-old girl was first admitted for the treatment of anterior cruciate ligament injury. She was diagnosed as obesity and border-line diabetes mellitus. She refused our suggestion of continuation of the therapeutic intervention. Since then, her body weight increased by approximately 20kg. At the age of 18 year, she was admitted to our hospital for the treatment of obesity. Her height, body weight and BMI were 172cm, 151.7kg, 49.5kg/m^2.AST and ALT were 137and182IU/l. HbA1c was 10.8%, and CT showed thick subcutaneous and visceral fat, and severe liver steatosis. She underwent a diet of 1500Kcal and physical exercise with aquatic treadmill. After 60 days, the body weight decreased by 12kg, and levels of serum liver enzymes, lipoprotein and blood glucose improved. However, she dropped out of our follow-up after discharge. *Conclusion:* These two cases suggest that the early therapeutic intervention enables long-term maintenance of lifestyle modification, which is important to prevent metabolic complications.

PO-0173

REHABILITATION IN LUNG CANCER

Elisangela Pinto Marinho De Almeida[1], Maíra Saul[1], Rebeca Boltes Cecatto[1], Rodrigo Guimarães De Andrade[1], Christina May Moran Brito[1], Linamara Rizzo Battistella[2]

[1]Rehabilitation Service of the Cancer Institute of the State of São Paulo, School of Medicine, University of São Paulo, SP, BrazilBrazil, [2]Clinical Research Center. Institute of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine,Brazil

Objective: Provide information about the rehabilitation treatment of patients with lung cancer. *Method:* A multidisciplinary team elaborated 8 questions related to lung cancer and exercises, exercises to reduce complications in the pre and post workout for dyspnea and fatigue, psycho educational program with cognitive-behavioral therapy for quality of life, physical conditioning to improve tolerance exercise, ergogenic supplementation, and guarana to fatigue. The final data of the research were in June 2012 and the Pubmed Database was used as a source of research for the use of articles. The search strategy was made in the PICO format (Patient, Intervention, Comparison and Outcome). *Results:* 28 articles were selected. There are few studies on lung cancer and exercise, hampered the accuracy of its recommendation, however there are reports that in healthy patients with an indication for surgical resection for lung cancer, aerobic exercises related to physical therapy to improve lung capacity. Supervised aerobic exercise of moderate intensity in the postoperative period decrease dyspnea and fatigue during exercise. Psycho educational programs may improve symptoms of anxiety,

fatigue and breathlessness and functional ability in patients with advanced lung cancer. Aerobic moderate exercise (30 min, 3 times per week) improves the exercise tolerance. No evidence of use of supplements or ergogenics as guarana extract shows to improve fatigue. *Implications/Impact on rehabilitation:* While exercises can be performed pre and postoperative lung cancer, studies are few and less consistent or not controlled, making the exact recommendation, requiring therefore, caution your prescription and execution.

PO-0174

EFFECTS OF FUNCTIONAL MAGNETIC STIMULATION ON TREATING THE OVERACTIVE BLADDER AFTER SPINAL CORD INJURY

Haijie Liu, Zhiqiang Zhang
Tianjin Medical University General Hospital, China

Objectives: To investigate the effect of functional magnetic stimulation (FMS) for treating the overactive bladder after spinal cord injury and discuss the action mechanism. *Methods:* Urodynamic study and Voiding diary of five days are checked before and after treatment. Urodynamic study results include the functional bladder capacity, maximum detrusor pressure on voiding, urodynamic curve, the maximum urethral closure pressure and other data. Voiding diary includes each voiding time and urine output. We can get the average daily frequency of urination, the average daily urine output and the maximum daily urine output according to the records. *t*-test was used for comparison of the effects before and after treatment. *Results:* 14 patients join in our study and two of whom quitted. Comparison of urodynamic results before and after treatment showed: functional bladder capacity and the maximum detrusor pressure on micturition decreased; the results were statistically significant ($p<0.05$). Maximum urethral pressure is no statistically significant before and after treatment. Voiding diary results showed that the average daily frequency of urination reduce, average daily frequency of urination and the maximum daily urine output increase significantly ($p<0.05$). All the patients in our study did not reveal any adverse reactions. *Impact on Rehabilitation:* The study demonstrates that there is a definite effect of FMS for treating the overactive bladder in spinal cord injury. It is an new method for treating overactivity bladder after spinal cord injury. It can modify frequent urination. Its mainly action maybe through inhibiting the detrusor excitability and increasing the maximum bladder capacity. But individualized treatment is important.

PO-0175

INTERVENTION STUDY ON STROKE INPATIENTS WITH URINARY INCONTINENCE

Li Guo, Li Wang, Wen-Zhi Cai
School of nursing.sorthern medical university, China

Objective: To evaluate the clinical effects of toilet training in patients with functional constipation (FC). *Methods:* Twenty-eight FC patients received bowel training with an instrument which can carry on manometry feedback training and rectum sensory training follow-up for three months. The clinical symptoms and anorectal motility of FC patients were evaluated before and 3months after the treatment. The clinical symptoms and anorectal motility of 24 health volunteers were evaluated as a control group. *Results:* The residual anal pressure of FC patients before treatment was significantly higher than that of the control group ($p<0.05$). After the bowel training, the residual anal pressure of FC patients was significantly lower than before the training (p<0.01=, and was similar to the control group ($p>0.05$): the rectal squeeze pressure and defecation index of FC patients were significantly higher than before the training ($p<0.01$), and the rectal squeeze pressure of FC patients was significantly higher than that of the control group ($p<0.05$). The first sensation of distention, sensation of defecation, sensation of urgency and maximum tolerable volume of FC patients before the training were significantly higher than those of the control group ($p<0.01$). After the bowel training, the above indexes of FC patients were significantly reduced ($p<0.01$) and were similar to the control group ($p>0.05$). The frequency of defecation, stool form and stool volume of FC patients after the training were significantly improved than before ($p<0.01$); the symptoms of straining, sensation of incomplete evacuation, anorectal obstruction and flatulence were significantly relieved ($p<0.01$). *Implications:* The bowel training technique can effectively strengthen the functions of pelvic floor muscles and anal sphincter, improve the coordination of external anal sphincter, reduce the threshold of rectal sensation and relieve the clinical symptoms of FC patients.

PO-0176

EFFECTS OF VARIOUS EXERCISE INTENSITY WITH THE SAME ENERGY EXPENDITURE ON GLUCOSE HOMEOSTASIS AND INSULIN SENSITIVITY IN TYPE 2 DIABETES MELLITUS

Wen Zhang, Qi Guo, Jiazhong Wang
Tianjin Medical University, Tianjin, China

The purpose of this study was to determine whether exercise prescriptions differing in volume or intensity with the same energy expenditure, also differ in their ability to retain the training-induced improvement in glucose homeostasis and insulin action in type 2 diabetes mellitus (T2DM). Sedentary T2DM patients (age 51.2±1.3 years) were assigned to either a low-intensity (50% VO2peak, $n=27$) or a high-intensity exercise group (75%VO2peak, $n=28$), and followed a 12-week exercise program of 5 sessions/week and 240 kcal/session. Insulin sensitivity (oral glucose tolerance test, ISI) was measured when subjects were sedentary and at 16-24 h and 15 days after the final training bout. The body mass, total body fat, systolic blood pressure, fasting insulin and HOMA-IR were significantly improved at the 16–24 h after the final training bout compared with baseline, but this effect was lost by 15 days in 2 groups.VO2peak was significantly increased at the 16–24 h after the final training bout compared with baseline in 2 groups, but was retained at trained levels after 15 days of training cessation in low-intensity group. ISI increased with training compared with baseline at 16–24 h with 2 exercise prescriptions. At 15 days of training cessation, ISI was still significantly elevated compared with baseline in low-intensity group, but not in high- intensity group. The present findings suggest there is a persistence of the training-induced improvement in insulin action maybe more dependent on the exercise duration compared with exercise intensity with the same energy expenditure in T2MD.

PO-0177

CLINICAL OBSERVATION IN PATIENTS WITH NEUROGENIC BLADDER AFTER A COMPREHENSIVE BLADDER FUNCTION TRAINING

Ling Pang[1], Guijie Li[1], Zhuo Xu[1,2]
[1]China-Japan Union Hospital OF JILIN University, Changchun, China, [2]Research Institute for Diseases of Old Age, Juntendo University School of Medicine, Tokyo, Japan

Objective: To investigate the effect of a comprehensive bladder functional training on the recovery for the patients for neurogenic bladder after a spinal cord injury. *Method:* Twenty patients with neurogenic bladder were randomly assigned in to either the Observation Group ($n=10$) or the Control Group ($n=10$). There was no significant difference in the functional classification between the two groups ($p>0.05$). Both groups received clinical drug therapy, exercise therapy, occupational therapy, physical factors, treatment and rehabilitation care (intermittent clean catheterization, etc.). For the Observation Group, we also added the comprehensive bladder functional training of Crede hand pressure (20~3 min/time),

Valsalva breath-hold method (2 times/day), stimulating urination technology (6 times/week), and the pelvic floor muscle training techniques (6 times/week) for four weeks. The residual urine and urodynamic were examined for both groups. SPSS15.0 was used for data analysis. *Results:* Patients in both groups completed the study. The results showed a significant improvement in residual urine volume was observed for the Observation Group ($p<0.05$). In addition, the residual urine volume for the Observation Group was larger than the Control Group ($p<0.05$). No uronephrosis and renal dysfunction was observed for both groups during this study. However, three patients in the Control Group suffered from urinary tract infection during this study. *Implications:* We conclude that the comprehensive bladder function training protocol used in the current study improved bladder function recovery for neurogenic bladder patients after spinal cord injury and worth clinical application.

PO-0178

AGE-RELATED CHANGES OF NEURONAL APOPTOSIS IN SPONTANEOUSLY HYPERTENSIVE RATS

Yali Li[1], Qiaojun Zhang[1], Xiaolin Niu[2]

[1]Department of Rehabilitation, the Second Affiliated Hospital, School of Medicine, Xi'an Jiaotong University, Xi'an, China, [2]Department of cardiology, the Second Affiliated Hospital, School of Medicine, Xi'an Jiaotong University, Xi'an, China

Objective: The present study aimed to investigate age-related changes of hype:rtensive neuronal apoptosis in hippocampus of spontaneously hypertensive rats (SHRs). *Method:* 16 w, 32 w and 64 w SHR and age-matched WKY rats were selected to explore the age-related expression changes of GFAP-positive astrocytes by immunohistochemistry method. Age-related changes of PPAR-γ, P47phox, iNOS, Bax, Bcl-2, Caspase-3 expression were investigated by Realtime RT-PCR and Western blot techniques. Also, the apoptotic ratio of neurons in CA1 subfield of hippocampus and its age-related changes were explored by TUNEL staining method. *Results:* 16 w, 32 w and 64 w SHR groups showed significantly increased SBP compared with age-matched WKY rats. The activated rate of GFAP-positive astrocytes and apoptotic cell ratio of neurons in CA1 subfield of hippocampus were progressively increased with aging in SHR group. Except for 16 w group, 32 w and 64 w SHR groups showed significant difference with age-matched WKY group. The expression of Bax, Caspase-3 mRNA and protein and ratio of Bax/Bcl-2 were progressively increased with aging in SHR group. 32 w and 64 w SHR groups showed significant difference with age-matched WKY group. On the contrary, the expression of PPAR-γ and Bcl-2 were progressively decreased with aging in SHR group. 32 w and 64w SHR groups showed significant difference with age-matched WKY groups. The expressions of P47phox and iNOS protein were also increased with aging in SHR group. 32 w and 64w SHR groups showed significant difference with age-matched WKY group. 64 w WKY group also showed up-regulated iNOS and P47phox protein expression. *Conclusion:* PPAR-γ expression decreased progressively in SHR group. On the contrary, the SBP, activated rate of GFAP-positive astrocytes, apoptotic cell ratio of neurons in CA1 subfield of hippocampus and indexes of oxidative stress and apoptosis were progressively increased with aging in SHR group. The results indicated that decreased expression of PPAR-γ may participate in the age-related brain damage of SHR and have implication in cognitive decline of hypertensive patients.

PO-0179

DIABETIC NEUROPATHY AND PHYSICAL ACTIVITY

Sebahat Zeqiri, Nexhmi Zeqiri*

University Clinical Center of Kosovo, Physical Medicine and Rehabilitation Clinic, Albania

Objective: Diabetes is a comprehensive disease; by time it causes diabetic neuropathy which represents damage of evident symmetry of peripheral nerves in distal parts of extremities. Neuropathy is a disorder with often prevalence at patients with diabetes. The goal was to improve the neuropathy signs of diabetics, decreasing of glycemy rates and improvement of life style through physical activity. *Method:* 30 patients participated in the study; they were treated in a working group with DM type I and type II that had signs of neuropathy. They had developed physical activity for 1 month continuously (free exercise, step-treadmill and exercise with progressive load). *Results:* 15 patients with DM in the working group that had neuropathy signs were treated only with medical therapy. *Implications/Impact on rehabilitation:* Almost all the patients of working groups had positive results in improvement of neuropathy signs, decrease of glycemy rates and in the mean time improvement of life style in particular.

PO-0180

METASTATIC MALIGN MELANOMA OF SUPRASPINATUS MUSCLE

Koray Aydemir, Serdar Kesikburun*, Arif Kenan Tan

Gülhane Military Medical Academy, Department of PM&R, Turkish Armed Forces Rehabilitation Center, Ankara, TURKEY,Turkey

Objective: To present a case of malign melanoma metastatic to supraspinatus muscle who presented with shoulder pain. *Method:* A 78-year old female patient presented with unrelenting shoulder pain mimicking rotator cuff pathology. The shoulder MRI revealed a mass showing contrast uptake in supraspinatus muscle. *Results:* Based on the patient reported a history of malign melanoma on his back thirty years ago, Positron emission tomography (PET) was determined to take. PET showed multip metastasis of malign melanoma to subacromial region and axillary lymph nodes. *Implications/Impact on rehabilitation:* Metastatic malign melanoma is usually seen in lymph nodes, muscles, bones and nerves. The metastasis may arise many years later after primary disease. Physiatrists should be aware of this rare neoplastic condition.

PO-0181

IMPACTS OF APOCYNIN AND ALLOPURINOL ON EXERCISE TRAINING-UPREGULATED NITRIC OXIDE SYNTHASES IN SPONTANEOUSLY HYPERTENSIVE RATS

Pengyu Cao[1,2], O Ito[2], A Sakuyama[2], D Ito[2], R Rong[2], Y Muroya[2], N Mori[2], M Kohzuki[2]

[1]The First Hospital of Jilin University, Changchun, China, [2]Department of Internal Medicine and Rehabilitation Science, Tohoku University Graduate School of Medicine, Sendai, Japan

Background: It has been recently reported that the exercise training (Ex) increases nitric oxide (NO) production and NO synthase (NOS) expression not only in vasculatures but also in the kidney of spontaneously hypertensive rats (SHR) with the reduction of systemic blood pressure. To clarify the mechanism of the Ex-increased NOS expression, the impacts of inhibitors of NADPH oxidase and xanthine oxidase on the Ex-increased NOS activity and expression were examined in SHRs. *Methods:* Five week-old, male SHRs were trained with treadmill running. Apocynin (2 mmol/L in drinking water), an inhibitor of NADPH oxidase or allopurinol (1.5 mmol/L in drinking water), an inhibitor of xanthine oxidase was given for drug treatments. After 8 weeks, H2O2 and NO2/NO3 (NOx) in plasma and urine were measured. The NOS activity and expression were examined in the kidney cortex, the outer medulla, the inner medulla and thoracic aorta. *Results:* The Ex significantly increased H2O2 and NOx in plasma and urine, NOS activity and endothelial and neuronal NOS (eNOS and nNOS) expressions in the kidney cortex, the outer medulla, the inner medulla and thoracic aorta. Apocynin significantly decreased these of SHR. Apocynin

blocked the Ex-induced changes of aortic NOS activity and expression, but allopurinol blocked the Ex-induced changes of H2O2 and NOx levels and renal NOS expression. *Conclusions:* These results indicate that the Ex-increased NOS activity and expression in aorta were mediated through NADPH oxidase, but in the kidney were mediated through xanthine oxidase in SHR.

PO-0182

SOD MIMETIC TEMPOL ENHANCES EXERCISE TRAINING-INDUCED NITRIC OXIDE SYNTHASES IN THE KIDNEY OF SPONTANEOUSLY HYPERTENSIVE RATS

Pengyu Cao[1,2], O Ito[2], D Ito[2], R Rong[2], Y Muroya[2], A Sakuyama[2], Y Sakata[2], N Mori[2], M Kohzuki[2]

[1]The First Hospital of Jilin University, Changchun, China, [2]Department of Internal Medicine and Rehabilitation Science, Tohoku University Graduate School of Medicine, Sendai, Japan

Background: The exercise training (Ex) and superoxide dismutase (SOD) mimetic tempol have antihypertensive effects in spontaneously hypertensive rats (SHR). To clarify the mechanism of antihypertensive and renal-protective effect of the Ex, the present study tested the effects of the Ex and tempol on the NOS expression in the kidney of SHR. *Methods:* 5-week-old, male SHRs were randomly divided into four groups; a control group, an Ex group, a tempol-treated (Tmp) group and an Ex+Tmp group. The treadmill running (20 m/min, 60 min/day, 6 times/week) was performed to the Ex and the Ex+Tmp groups, and tempol in drinking water (1 mmol/l) was given to the Tmp and the Ex+Tmp groups. H2O2 and NO2/NO3 (NOx) in plasma and urine were measured by Amplex Red and Griess reagents. The expression of endothelial and neuronal NOS (eNOS and nNOS) proteins in aorta and kidney sections was analyzed using Western blots. *Results:* Ex and tempol attenuated the development of hypertension while deceasing the renal NADPH oxidase activity in SHR. Ex and tempol also upregulated the eNOS and nNOS expressions in the kidneys of SHR with the increased plasma and urinary H2O2 and NOx. Furthermore, the effects of the combination therapy with Ex and tempol on these factors were cumulate in SHR. *Conclusions:* These results indicate that tempol enhances the Ex-induced antihypertensive and renal-protective effects through the upregulation of NOS expression and NO production in SHR. H2O2 may mediate these effects of the Ex and tempol in SHR.

PO-0183

EFFECT OF INDIVIDUALIZED REHABILITATION NURSING OF NEUROGENIC BLADDER IN SPINAL CORD INJURY PATIENTS AFTER INJECTION ON BOTULINUM TOXIN A

Xiaoyan Feng, Cai Ping

The First Affiliated Hospital of Suzhou University, jiangsu, China

Objective: To study the effective of individualized rehabilitation nursing on spastic neurogenic bladder rehabilitation process for patients with spinal cord injury (SCI) after a injection of botulinum toxin A into external urethral sphincter. *Method:* select 30 patients with post-injection of botulinum toxin A into external urethral sphincter for treating spastic neurogenic bladder after spinal cord injury.30 patients were randomly divided into control group (15 cases) and individual group (15 cases). Routine nursing was given in control group, and individualized nursing was given in individual group. The time of self-voiding, residual urine volume (RUV), and the incidence of urinary tract infection are recorded and compared between two groups. *Result:* In individual group, the time of self-voidingm was shorter, RUV and the infection of urinary system was lower than that of control group ($p<0.05$). *Conclusion:* The individualized rehabilitation nursing could promote the recovery of bladder function for patients with spastic neurogenic bladder after injection of botulinum toxin A and reduce the incidence of urologic complications.

PO-014

EFFECT OF PELVIC FLOOR MUSCLES ELECTRICAL STIMULATION ON SPINAL CORD INJURED PATIENT WITH NEUROGETIC BLADDER URINARY RETENTION

Fen Ju, Wei Liu, Xiang Mu

Xi Jing Hospity of the fourth Military Medicine University, China

Objective: To study the effect of Pelvic floor muscles electrical stimulation on Spinal Cord Injured Patient with Neurogenic Bladder Urinary Retention. *Method:* Select September 2011 to September 2012 inmy department treatment of patients with spinal cord injury (ASIA A level, above the level of T11) were forty cases. The course of disease were less than two months. They were randomly divided into two groups. The experiment group (20 cases) was given pelvic floor muscles electrical stimulation (DIGITAL URO STIM ST-608),with drug therapy and clean intermittent catheterization. The control group (20 cases) was given drug therapy and clean intermittent catheterization. The treatment is for 30 days. Record clean urethral catheterization times and the residual urine output before the treatment and after treatment begins every two days. *Result:* One month after treatment in experiment group, the clean catheterize frequency and residual urine significantly reduced. It has statistical significance ($p<0.05$). *Conclusion:* Pelvic floor muscles electrical stimulation with drug therapy and clean intermittent catheterization can improve neurogenic bladder urinary retention effectively.

PO-0185

INCREASED CIRCULATING ENDOTHELIAL PROGENITOR CELLS IN PATIENTS WITH CORONARY HEART DISEASE: THE EFFECTS OF PHYSIOLOGICAL ISCHEMIA TRAINING

Yongxue Li[2], Jianan Li[1]

[1]The First Affiliated Hospital of Nanjing Medical University, China, [2]The First Affiliated Hospital of Sun Yat-sen University, China

Objective: Physiological ischemia training (PIT), which is a kind of isometric exercise, has been shown to improve angiogenesis in remote ischemic heart region of animals. We measured the effects of PIT on circulating endothelial progenitor cells (EPCs), vascular endothelial growth factor (VEGF) and nitride oxide (NO) in patients with coronary artery disease (CAD). *Method:* Twenty patients with CAD were divided into training group ($n=10$) and control group ($n=10$). The patients in training group involved a three-month PIT while patients in control group remained sedentary. PIT was induced by isometric exercise (handgrip) with maximal voluntary contraction. EPCs were measured by flow cytometry at baseline and after training. Plasma concentrations of VEGF and NO were determined by ELISA and the method of nitrate reductase, respectively. *Results:* EPCs increased significantly in training group, with the number of (0.044±0.016) % after training ($p=0.015$). VEGF levels in training patients also increased after three months ($p<0.01$). We found a significant increase in the concentration of NO after three months ($p=0.001$). After three-month PIT, the number of EPCs was positively correlated with both, the level of VEGF (training group: r=0.727, $p=0.017$: control group: r=0.785, $p=0.007$) and the concentration of NO (training group: r=0.923, $p=0.000$: control group: r=0.778, $p=0.008$). A positive correlation was observed between the level of VEGF and NO in both groups after three months ($p<0.05$).*Implications:* PIT increased EPCs, VEGF and NO in CAD patients, which may contribute to collateral angiogenesis in the remote ischemia heart region.

PO-0186

DIAGNOSIS AND TREATMENT OF ACUTE CYTARABINE-INDUCED CEREBELLAR SYNDROME: A CASE REPORT AND REVIEW

Casandra Rosenberg*, Kenley Schmidt
Mayo Clinic,United States

Case Presentation: A 48-year-old man hospitalized with acute lymphoblastic leukemia was referred for acute-onset gait dysfunction and dysarthria. Chemotherapy included systemic dasatinib, cyclophosphamide, vincristine, and doxorubicin, with intrathecal cytarabine and methotrexate.Symptoms presented on day seven of the second treatment cycle. Physical examination revealed limb and truncal ataxia with ataxic dysarthria. The neurological examination was otherwise normal. Emergent computer tomography and subsequent magnetic resonance imaging (MRI) were normal. Cerebrospinal fluid (CSF) serology, microbiology and cytology were unremarkable. Diagnosis Symptoms were attributed to cytarabine toxicity and intrathecal treatment was suspended. Over several days his ataxia improved; he progressed from minimal assistance ambulating 100 feet, to supervision ambulating 250 feet with a walker. His dysarthria had not improved at the time of dismissal. *Discussion:* Central nervous system toxicity is a known complication of intrathecal cytarabine, especially with multi-drug therapy. Cerebellar syndrome is particularly common following systemic administration. Symptoms typically improve within five days of discontinuation, though 30% of patients never regain normal cerebellar function. CSF and initial MRI findings are usually normal, though delayed cerebellar atrophy has been described. *Impact on Rehabilitation:* While the differential diagnosis of acute cerebellar ataxia includes stroke and cancer involvement, cytarabine-related ataxia should be recognized, particularly given the chance for rapid symptom improvement.

PO-0187

EFFECTS OF COMBINED AEROBIC AND RESISTANCE TRAINING ON PATIENTS WITH TYPE 2 DIABETES IN GHANAIAN POPULATION

Emmanuel Bonney
Xianya Hospital, Central South University, China

Objective: To investigate the effects of 12 weeks of combined training (CT) and aerobic (AER) exercise on glycemic control, blood pressure, exercise capacity, depression and quality of life of type 2 diabetics. *Methods:* Forty-five patients with type 2 diabetes, aged between 20-70years, were randomly allocated to combined training (n=15), aerobic exercise (n=15) or a control group (n=15). CT and AER participants completed 12 weeks of training (3sessions per week), while the control group continued their usual daily routine. Glycosylated haemoglobin, fasting blood glucose, blood pressure, exercise capacity, depression and quality of life were assessed pre and post-intervention. *Results:* Combined training and aerobic exercise elicited a significant decrease in plasma glycosylated haemoglobin levels (p<0.05), while the control group did not. FBG decreased by 7.4% in CT group and by 2.4% in AER group but not in the control group. Combined training group exhibited significant reductions in blood pressure and depression (p<0.05). Improvements in quality of life and exercise capacity were seen in both exercise groups. *Implications/Impact on Rehabilitation*; The results suggest that combined training is a more effective form of exercise training than aerobic exercise alone in improving glycemic control, blood pressure and depression in patients with type 2 diabetes in an African community.

PO-0188

REHABILITATION NURSING OF NEUROGENIC BLADDER AFTER SPINAL CORD INJURY

Beibei Xu, Ping Cai
First Affiliated Hospital of Soochow University, China

Objective: To investigate the rehabilitation nursing techniques and key points of neurogenic bladder after spinal cord injury. *Methods:* Intermittent catheterization, bladder retraining and other rehabilitation nursing measures were used for patients. Patients, families and nurses were given health education and psychological counseling. *Conclusion:* Intermittent catheterization and bladder retraining nursing could improve neurogenic bladder function and the patients life quality.

PO-0189

PHYSICAL REHABILITATION IN PNEUMONIA PATIENTS

Fedor Mukharlyamov, Marina Sytcheva*, Marina Rassulova, Tatiana Grushina, Alexander Razumov
Scientific and practice Center of medical rehabilitation, restorative and sport medicine of Health D, Russia

Purpose. Estimating of efficacy of physical rehabilitation rehabilitation (PR) using simulators in pneumonia patients. *Material and methods*: (PR) is carried out to 27 patients suffered from pneumonia (P) of various localization; no respiratory insufficiency was marked. Control group has made 16 patients comparable to the basic group by whom PR was not carried out. PR began on the average on 5-7 day after hospitalization. Rate PR has consisted of 10 trainings which were provided with monitoring of cardiorespiratory system using telemetry system. For PR cyclic and power simulators were applied. Employment began with cyclic simulators (foot horizontal or vertical, then - manual ergometer), then - on power simulators which task was to make active respiratory muscles: a diaphragm, muscles of anterior abdomen wall, a thorax and a humeral zone. All exercises were carried out with strict synchronization of breath; at the final stage was used treadmill within 5-10 min. *Results:* Rate PR significant acceleration of positive clinical and radiological evaluation of the pneumonic focus - on the average on 5 – 8-th days was marked in comparison with group of the control, increasing of SatO2 at 2-3 % already after 3 – 4-th employment (56 % of patients), improvement of spirometry down to normalization by the end of cycle of PR at 89 % of the patients. *Conclusions:*. PR is an method allowing with maximal efficiency to optimize a recovering of patient with P and in short terms to adapt the patient for a habitual way of life.

PO-0190

CANCER REHABILITATION ALGORITHM IN LYMPHOEDEMA IN CERVICAL CANCER

Maya Zheleva
National Cancer Medical Center, Bulgaria

In late preposition period on of complications in cancer of cervical is lymphoedema of the lower extremities. One of main factors it is lymphatic dissection and others risks factors it is varicose veins, obesity, deformities, that increase the risk of it this syndrome. Purpose of this study was to establish cancer rehabilitation algorithm, which includes: Medicament: venotonic and heparin containing ugventi. Physiotherapy program: individual recovery, improvement of the trophic, motor function and volume of move of joints, soft tissuetechniques – PIR, suspensiterapy, mehanoterapy including simulators – stationary bike and treadmill. Cryotherapy: ice blocks and compression Manual lymph drainage: Compression therapy divice with 24 cameras: Compression bandages: *Material and Methods:* Followed were ten ambulatory patients with cervical cancer and lymph node dissection for two weeks. They were divided into two groups - control group with five patient and test group with five patient. Control group – medicaments, physiotherapy program and lymphatic drainage. Test group - medicaments, physi-

otherapy program, cryotherapy before and after lymph drainage and compression bandages.

PO-0191

ANALYSIS OF INFLUENTIAL FACTORS OF COMPLIANCE WITH THE PATIENTS WHO USE THE NONINVASIVE VENTILATOR

Haiqing Xu, Wengji Cheng, Guoxia He
Shanghai Jinan Geriatric Hospital, China

Aim: To analyze the influential factors of compliance with the patients who use the noninvasive ventilator. *Methods:* A total of 138 patients were investigated, including of sex, age, culture level, living conditions, economic status, cognitive, psychology, basic diseases. *Results:* There are 43 patients were good at using noninvasive ventilator and there were 95 ones weren't. Factors were analyzed by using Logistic Regression. cognitive (OR=25.790: 95%C.I.: 3.076-216.260) was protective factor with the patients who use the noninvasive ventilator. Low degree of culture level (OR=0.163: 95%C.I.: 0.062-0.431) ; Low degree of economic status (OR=0.160: 95%C.I.: 0.054-0.479) and slight obstructive sleep apnea-hypopnea syndrome and continuous positive airway pressure were risk factors. *Conclusion:* Our results suggest that age, culture level, economic status, obstructive sleep apnea-hypopnea syndrome, cognitive impairment, continuous positive airway pressure in all could influence the compliance with the patients who use the noninvasive ventilator.

PO-0192

STABILOTRENING IN COMPLEX TREATMENT OF PATIENTS WITH ARTERIAL HYPERTENSION AND CHRONIC CEREBRAL ISCHEMIA

Viktoriya Badtieva[1], Nino Sichinava[2]*, Elena Styazhkina[2], Yullia Vasilieva[2]
[1]Moscow Research Center Of Medical Rehabilitation And Sports Medicine,Russia, [2]Russian Scientific Center For Medical Rehabilitation And Balneology, Russia

The purpose of the study was the development and evaluation of stabilotraining with biofeedback in rehabilitation of patients with arterial hypertension and chronic cerebral ischemia. We observed 60 patients with arterial hypertension and chronic cerebral ischemia, who were divided into 2 groups of 30 people. Patients in the first group received iodide-bromine baths and magnetic field. The patients in the second group additionally received stabilotraining with biofeedback. Including stabilotraining (group 2) increased positive trend, which showed a decrease of episodes of headache, dizziness, decrease in heart rate at rest, reduced emotional lability and sleep disorders, memory improvement. Decreased blood pressure, respectively, 50% and 77.3% of cases in group 1 and 2. Improving symptoms of VBI was 40% and 62% respectively in patients 1 and 2 groups, and the vestibular-ataxic - 50% and 67% of cases. Improvement of MMSE score in both groups was registered. According to the daily monitoring, decrease in SBP and DBP, indicators of variability, the degree of "pressure load" - IVG indices of systolic and diastolic blood pressure, rate of morning rise in SBP and DBP were noted. Including stabilotraining with BOS had a positive effect on the development of hypotensive effect by normalizing the autonomic innervation and reduced peripheral resistance, to improve cognitive function due to the normalization of the integrative processes in the brain.

PO-0193

SERUM PROSTATE-SPECIFIC ANTIGEN CONCENTRATION AND HEMODILUTION AMONG CHINESE MIDDLE-AGED OBESE MEN: A HEMATOCRIT-BASED EQUATION FOR PLASMA VOLUME ESTIMATION IS INDUCED

Feng Li, Zhenhai Shen, Yun Lu, Jingyun Lv
Taihu Lake Cadre's Sanatorium of Jiangsu Province, China

Background: A hematocrit (HCT)-based and a body surface area (BSA)-based equations were applied for plasma volume (PV) estimation, respectively, to confirm and quantify the hemodilution effect in prostate-specific antigen (PSA) screening among obese men. The agreement between the equations was additionally investigated. *Methods:* A total of 1,444 men were retrospectively collected, with ages 40 to 65 years, PSA 0 to 4 ng/mL,and no prostate cancer. PSA mass was calculated as PSA concentration multiplied by PV. Multivariable linear regression models, theoretical models, and the Bland-Altman method were used. *Results:* PSA concentration significantly decreased with increasing body mass index (BMI; β=-0.011, p<0.001); however, PSA mass estimated by HCT- (β=0.004, p=0.132) and BSA (β=-0.003, p=0.094)-based equations remained consistent. A screening PSA of 4.0 ng/mL in nonobese men was found to be corresponding to 3.32 and 3.68 ng/mL in obese men extrapolated by PV on the basis of HCT and BSA, respectively. Moreover, the mean (95% confidence interval) difference of PV between the two equations was 0.33 (-0.06 to 0.73) L. *Conclusions:* The inverse relationship between PSA concentration and BMI might be explained by a hemodilution effect among obese men. There is significant variation in PV calculated by the two equations.

PO-0194

THE OBSERVED URODYNAMICS EFFECTS OF AUTHIGENIC URINE VOLUME PRESSURE MEASURED IN STROKE PATIENTS WITH URINARY INCONTINENCE

Hui Ding
The first affiliated hospital with nanjing medical university, China

Objective: Detrusor hyperreflexia after stroke is the most common urinary incontinence of urodynamic abnormalities, the water column method bladder authigenic urine volume measurement can be accurately used to urine dynamics assessment, and guide the clinical treatment and rehabilitation care. *Methods:* To measure the stroke Abnormal urodynamic inpatients' bladder pressure in rehabilitation department Respectively by means of physiological saline perfusion pressure method and authigenic urine volume of pressure method, collecting the corresponding data and then analytic comparing which method of detrusor reflection hyperfunction urine dynamics detection is more accurate and safer. *Results:* The values of authigenic urine volume of pressure method and the physiological saline infusion method are significant difference. *Discussion:* There are many factors are related to the occurrence of post-stroke urinary incontinence. Urodynamic studies can provide guidance for clinical treatment and care, the water column method bladder authigenic urine volume measurement is most appropriate assessment methods of stroke urinary incontinence.

PO-0195

FEMALE STRESS URINARY INCONTINENCE AND PELVIC FLOOR MUSCLE TRAINING: A CASE SERIES STUDY

Francesca Gimigliano*, Loredana Maria Colella, Assunta Tirelli, Veronica Cascone, Maria Teresa Prudentino, Annamaria Pagano
Second University of Naples, Naples, Italy, Italy

Objective: Pelvic floor muscle training (PFMT) program is recommended in the treatment of stress urinary incontinence (SUI). The outcome of our study is to evaluate the change in the endurance, increase in the number of possible repetitions and in the strength of pubococcygeus muscle after PFMT programs in female SUI. *Method:* From January 2012 to May 2012 we treated five patients with SUI. Each patient underwent an evaluation protocol before (T0)

and after five weeks of treatment (T1). We evaluated the pelvic floor muscle (PFM) strength as the maximum voluntary contraction of the pubococcygeus muscle (PC test 0-3), pubococcygeus muscular endurance, as the maintenance of muscle contraction in seconds and the number of possible repeatable contractions before fatigue by digital palpation. The exercise protocol for the PFMT provided three times a week 1-h session for five weeks. *Results:* The enrolled patients had a mean endurance of3”-3.6”at T0 and7.2”-7.8”at T1 respectively on the right side and3.6”on the left side. The mean number of contractions increased from 6.2 at T0 to 13 at T1. Before treatment, a mean score at PC Test of 1.6 on the right and 1.6 on the left was observed, while after the treatment it was 2 on the right and 2.2 on the left. Implication/*Impact on rehabilitation:* Pelvic floor muscle training is easy to perform and results in an improvement in the endurance of the pelvic floor muscle and in the number of possible repeatable contractions.

PO-0196

EXERCISE TRAINING IMPROVED ISLET MASS AND FUNCTION IN STZ-INDUCED DIABETIC RATS

Yawen Wu[1], Zhongli Jiang[2], Feng Ling[1], Zhiqiang Xu[1]
[1]The First Hospital of Shanxi Medical University, China, [2]The First Affiliated Hospital of Nanjing Medical University, China

Objective: Exercise is the basic measure of diabetes treatment. The effect of exercise on islet mass and function is rarely concerned. We hypothesized that swimming training for 8 weeks could increase serum and tissue insulin levels and partly ameliorate pancreatic islet morphology in streptozotocin-induced diabetic rats. *Method:* Twelve diabetic rats induced successfully by streptozotocin (STZ, 55 mg/kg) were randomly divided into exercise group (D-Ex, n=6) and sedentary group (D-Sed, n=6). Twelve Sprague-Dawley rats with euglycemia were randomly divided into exercise group (C-Ex, n=6) and sedentary group (C-Sed, n=6). The exercise rats were forced to swim 60 min/d with 5d/w for 8 weeks. At the end of experiment, fasting blood glucose (FBG) and insulin levels in serum (SINS) and pancreatic tissues (PINS) were determined by RIA. The morphology of pancreatic islet was evaluated by Image-Pro Plus 6.0. *Result:* After 8 weeks, the body weight significantly increased, while the levels of FBG significantly decreased in D-Ex. The levels of SINS and PINS in D-Ex were significantly higher than that in D-Sed and significantly lower than that in C-Ex and C-Sed. The levels of SINS were significantly lower in C-Ex than in C-Sed, while the levels of PINS were significantly higher in C-Ex than in C-Sed. The longest diameter, area and number of pancreatic islet in D-Ex increased significantly in comparison with D-Sed (p<0.05), and the longest diameter of islet was significantly less in D-Ex than in C-Ex and C-Sed. *Implications:* These results demonstrated that exercise training can increase insulin secretion capacity and ameliorate pancreatic islet morphology.

PO-0197

ASSESSMENT OF THE SOCIAL FUNCTION AND QOL OF ELDERLY PATIENTS WITH URINARY INCONTINENCE

Shu Cai, Wen-Zhi Cai
School of nursing sorthern medical university, China

Objectives: This study is to conduct an overall assessment of social function of elderly patients with urinary incontinence (UI) and the factors that affect the social function exactly. Thus, some nursing intervention can be taken out for the patients. *Methods:* Three instruments were selected to carry on the data collection according to research *Purpose:* International Consultation on Incontinence Questionnaire Short Form (ICI-Q-SF), Incontinence Quality-of-Life Measure (I-QOL), Social Disability Screening Schedule (SDSS). *Results:* The mean score of SDSS of patients was 4.0, this score was between patients with neurosis and patients with mental illness. The number of elderly patients with UI investigated in this research who had social disability was 90. The incidence of social function defect was 81.82%. Social activities decreased, having little interest and concern to outside world, responsibility and plans being affected were all the prominent characteristic of the patients with social function defect. Age and UI severity are the main factors that the social function of elderly patients with UI.There was significant correlation between social function and quality of life (p<0.01). *Implications:* Social function defect exists in many of the elderly patients with urinary incontinence. Some nursing interventions must be taken out to raise their healthy level and social function level.

PO-0198

EXERCISE PERFORMANCE AFTER THE RADIOFREQUENCY CATHETER ABLATION

Nobuyoshi Mori*, Naohiro Kashiwazaki, Kumiko Ito, Chaeyoon Cho, Geumju Lee, Tiantian Jia, Jongwoo Kim, Masahiko Kuwahara, Seiko Yamakoshi, Bin Xu, Fumika Suzuki, Tamao Takahashi, Peijun Gui, Koji Fukuda, Yuji Wakayama, Makoto Nakano, Masateru Kondo, Hasebe Yuhi, Hiroaki Shimokawa, Masahiro Kohzuki
Tohoku University Graduate School of Medicine, Japan

Objective: Atrial fibrillation is the most common sustained arrhythmia observed in clinical practice. The radiofrequency catheter ablation procedure is increasingly utilized in the treatment of persistent and paroxysmal atrial fibrillation. Our purpose was to compare pre- and post-operative exercise state. *Method:* We included patients who underwent the catheter ablation procedure at our institution between April 2011, and July, 2012, free from any arrhythmia recurrence, and in whom we had performed pre- and post-operative exercise stress tests. We used a ramp bicycle protocol to measure consumption of oxygen. *Results:* We studied 33 patients, including 26 male and 7 female, having a median age at intervention of 62 years, with a range from 36 to 71 years. Median time from the intervention to the second exercise stress test was 7 months, with a range from 4 to 13 months. There was a trend toward lower peak oxygen consumption before the procedure, at 20.9 plus or minus 5.1 milliliters per kilogram per min. There was no difference in peak consumption of oxygen before and after the operation. In 16 of the patients, peak oxygen consumption improved after the operation. *Implications/Impact on rehabilitation:* In the majority of patients following the catheter ablation procedure, exercise performance is stable and may be lower the normal range of a healthy population, for the custom of sedentary behaviors, which was acquired already.

PO-0199

NANO-PHOTOSENSITIZER TRANSFECTED REV-CASPASE-3 AND PHOTODYNAMIC THERAPY EFFECT ON NASOPHARYNGEAL CARCINOMA CELLS

Dingqun Bai[1], Christine M.N. Yow[1]
[1]Department of Rehabilitation Medicine, The First Affiliated Hospital, The Chongqing Medical University, Chongqing, China, [2]Department of Health Technology Informatics, Hong Kong Polytechnic University, Hung Hom, HKSAR, China

Objective: The aim is to investigate the effects of Nano-photosensitizer transfected Rev-caspase-3 and nano-photosensitizer-mediated PDT on the NPC/CNE-2 cells and its mechanism. *Method:* Plasmid was amplified using Competence method. Identification of plasmid was performed using DNA double-digestion, and the binding capacity of nano-photosensitizer with plasmids was detected with gel retardation experiments. The expression of Nano-photosensitizer

transfected Rev-caspase-3 inthe cell was measured using flow cytometry. Nano-Photosensitizer-mediated photodynamic therapy and transfected Rev-caspase-3 into cells, the inhibition of cell proliferation was measured using MTT colorimetric assay. The apoptosis was detected post PDT and transfection by use of PI staining with flow cytometry. *Results:* Amplified plasmid was cut to two bands by DNA double-enzyme, which represented empty vector and Rev-caspase-3 sequence respectively. Gel retardation experiments showed that the higher the mass ratio of Nano-photosensitizer to plasmid, the stronger the ability of combination plasmid. Nanophotosensitizer-carried Rev-caspase-3 into the NPC/CNE-2 cells, then expression rate of caspase-3 was detected at 63.10% 24h post transfection. Cell survival rate after the combined treatment of Rev-caspase-3 transfection and nano-photosensitizer-mediated photodynamic therapy was significantly decreased compared with these two alone. Sub-G1 peak and apoptotic index was 24.65% after the treatment of Rev-caspase-3 transfection and nano-photosensitizer-mediated photodynamic therapy together. *Implications:* Hypocrellin B-modified nano-photosensititer can effectively combine with Rev-caspase-3 plasmids, and it can transfect Rev-caspase-3 into the NPC/CNE-2 cells, then expressed active caspase-3. Our experimental results showed that nano-liposomes were a good carrier for plasmid transfection. Transfection of Rev-caspase-3 and nano-photosensitizer-mediated PDT can effectively kill nasopharyngeal carcinoma cells, and induce apoptosis. Photodynamic therapy combined with gene transfer may be a promising strategy for cancer treatment.

PO-0200

ELECTRICAL MUSCLE STIMULATION TO THE ABDOMEN PRESERVES MOTOR PERFORMANCE FOR THE BLADDER URETHRAL CATHETER LONG—TERM CUSTODY IMPOTENCE PATIENTS

Noriaki Tanaka, Misa Miura*, Makoto Nagasaka, Osamu Ito, Masahiro Kohzuki

Tohoku University Graduate School of Medicine,Japan

Objective: The bladder urethral catheter long-term custody patient of frail elderly is an increase tendency with aging. The bladder urethral catheter long-term custody is associated with increased morbidity and mortality, and let limit physical action, and care burdens increase. In a place,abdominal muscle plays an important role for an urination function. However,abdominal muscle is easy to catch aging and influence of disuse. This studyinvestigated that electric stimulation (ES) to abdomen gave focus and influence to activity of daily living (ADL). *Method:* Five elderly people (83.5±3.5 years) with needs care, who were admitted to a nursing home for daily care due to disuse, participated in this sturdy. Common physical therapy was performed for all of subjects twice a week during the study period. The subjects were assigned to the ES and non-ES groups. ES was applied to the abdomen of three subjects of the ES group for half an h a day, five-day-week during 8 weeks. Surface electrodes were placed on the area of the bilateral abdominal oblique muscle. *Result:* In a score of Functional Independence Measure (FIM), an abdominal muscle power, the sit-ups number of times, the intervention group accepted maintenance or improvement, but the control group showed constant or degradation. *Conclusion:* The results of this study showed the change of motor performance. Electrical stimulation to the abdomen might be one of the new rehabilitation programs for the frail elderly with the bladder urethral catheter.

PO-0201

EFFECT OF LIFESTYLE INTERVENTION ON EXAMINATION INDEX OF EARLY ARTERY DISEASES IN METABOLIC SYNDROME PATIENTS

Yun Lu[1], Zhenhai Shen[1], Hongwei Li[1], Yinbo Feng[1], Lin Wang[1], Zhongli Jiang[2]

[1]Taihu Lake Cadre's Sanatorium of Jiangsu Province, China, [2]Jiangsu Provincial Peoples Hospital, China

Objective: To explore the effects of lifestyle intervention on examination index of early artery diseases in nondiabetic patients with metabolic syndrome. *Methods:* Eighty-seven nondiabetic patients with metabolic syndrome were randomly divided into intervention group (n=47) and control group (n=40). The patients in intervention group were treated with health management including health education, diet control, regular exercise, correcting the bad habits and the control group did not receive any intervention. All patients were followed up 9 months. *Results:* (1) Compared with the control group, Body mass index, waist circumference, high-dendity lipoprotein, fasting blood glucose, triglyceride,HbA1c,fasting insulin, HOMA-IR and high sensitivity C-reactive protein had significant improvement in intervention group after 9 months treatment (p<0.05). (2) After 6 and 9 months intervention, brachial-ankle pulse wave velocity (baPWV) and ankle-brachial index (ABI) had significant change (p<0.05) in intervention group and carotid intima-media thickness of carotid had no change (p>0.05). BaPWV and ABI were changed significantly in intervention group compared to those in control group after 9 months (p<0.05). (3) BaPWV and ABI were associated with high sensitivity C-reactive protein, HOMA-IR. *Implications:* In nondiabetic metabolic syndrome patients, health management can significantly improve insulin resistance, correct metabolic disorders, has anti-inflammatory effect and retard atherosclerosis at some extent.

PO-0202

USE OF THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) TO DESCRIBE PATIENT-REPORTED DISABILITY IN PRIMARY BRAIN TUMOUR IN AN AUSTRALIAN COMMUNITY COHORT

Bhasker Amatya*, Fary Khan

Royal Melbourne Hospital, Melbourne Health, Australia

Objective: To describe patient-reported disability in primary brain tumours using the International Classification of Functioning, Disability and Health (ICF); and comparison with categories within the core-sets for stroke and traumatic brain injury (TBI). *Method:* Using prospective cross-sectional survey, problems reported by primary brain tumour survivors were linked with ICF categories using 'linkage' rules. Participants rated 'activities and participation' and 'environmental factor' components of ICF checklist (using qualifiers); and responses compared with categories within core-sets for stroke and TBI. *Results:* Participants' (n=106) mean age was 51 years, median time since diagnosis 2 years; over one third had high grade tumours. The participants' report of a large number of categories of the ICF checklist reflects the clinical complexity of brain tumours. Participants considered 44 categories in 'activities and participation' and 16 categories (barriers) in 'environmental factors' as relevant (≥10% response) using ICF checklist. Reported problems included: Mobility, Domestic life, General tasks/demands; and Human made changes to environment. Although the linked categories for primary brain tumour survivors were similar to those in the core-sets for stroke and TBI, there was more commonality with the TBI core-set. *Implications/ Impact on rehabilitation:* These preliminary findings are a first step towards developing an ICF core-set for brain tumours, which may assist in facilitating clinical care and agreement, and in development of outcome measurement. The existing stroke and TBI ICF core-sets incorporate issues relevant to brain tumour survivors in rehabilitation settings, however, possibility of using a single core-set relevant to most long-term neurological conditions needs to be explored.

PO-0203

EVIDENCE OF SIGNIFICANT CENTRAL FATIGUE IN PATIENTS WITH CANCER-RELATED FATIGUE

Bin Cai[1], Zhiguo Jiang[2], Venkatesh Rajagopalan[2], Didier Allexandre[2], Guanghui Yue[2]

[1]Department of Orthopaedics and Rehabilitation, Ninth People's Hospital Affiliated to Shanghai Jiaotong University Medical School,

Shanghai, China,[2]Human Performance & Engineering Laboratory, Kessler Foundation Research Center, New Jersey, USA

Objective: To investigate central and peripheral contributions to motor task failure in patients with cancer-related fatigue (CRF). *Methods:* 14 patients with CRF who were off chemo and radiation therapies and 10 healthy controls with similar age and body mass index were enrolled. All participants completed Brief Fatigue Inventory (BFI) and performed a fatigue task consisted of intermittent elbow-flexion contractions at submaximal (40% maximal) intensity till self-perceived exhaustion. Each contraction lasted 5 seconds with a 2-second rest between trials. Subjects followed visual cues to time initiation and halt of each contraction. To estimate peripheral fatigue (PF) and central fatigue (CF), a ratio of maximal twitch force (TF) (elicited by electrical stimulation) of biceps brachii muscle at rest after fatigue task to that before fatigue task was quantified. A ratio far below 1 suggests severe PF but minimal CF; a ration close to 1 indicates opposite. The total number of trials performed by subjects was also counted to see how PF/CF influences performance. *Results:* BFI scores were higher (p<0.001) in CRF than controls, indicating greater feeling of fatigue in CRF patients than controls. The number of trials performed by CRF patients is smaller than that of controls (p<0.05). The TF ratio (84.3%) in CRF is higher (p<0.05) than that of controls (50.7%), suggesting CRF patients experienced significantly greater CF but less PF than controls. *Implications/Impact on rehabilitation:* CRF is more of central origin rather than having a peripheral cause. Significant CF in CRF patients limits their ability to prolong motor performance.

PO-0204

EFFECT OF EXERCISE TRAINING ON ADIPONECTIN EXPRESSIONS IN INSULIN RESISTANCE RATS

Xuanlin Shen

Department of Rehabilitation, Fifth Clinical Medical College of Yangzhou University, China

Objective: To investigate the effects of exercise training on the expressions of adiponectin in circulation and skeletal muscle tissue of high-fat/high-sucrose diet induced insulin resistance rats. *Methods:* 27 S-D rats were randomly divided into 2 groups, control group (9 rats) and high-fat/high-sucrose diet group (18 rats). After fed for 6 weeks, 18 rats with insulin resistance were randomly divided into 2 groups, model group (n=9) and exercise group (n=9). After 6 weeks swimming training, serum adiponectin concentration was measured by ELISA and adiponectin mRNA expressions in skeletal muscle tissue was measured by RT-PCR. *Results:* Fasting plasma glucose (FPG) and fasting serum insulin (FINS) levels increased significantly and insulin sensitivity index (ISI) decreased significantly in rats of model group than those in control group (7.49±1.13 vs 5.06±0.38; 33.57±4.87 vs 13.61±2.94; -5.51±0.16 vs -4.21±0.22, all p<0.05). Serum adiponectin concentration was significantly lower in model group (0.77±0.09 vs 0.86±0.08, p<0.05). Expressions of adiponectin mRNA in skeletal muscle tissue significantly decreased in rats of model group compared to those in control group (0.25±0.10 vs 0.85±0.13, p<0.01). FPG and FINS levels decreased significantly and ISI increased significantly in rats of exercise group than those in model group (5.77±1.17 vs 7.49±1.13; 25.69±4.27 vs 33.57±4.87; -5.10±0.31 vs -5.51±0.16, all p<0.05). Serum adiponectin concentration was significantly higher in rats of exercise group than those in model group (0.86±0.10 vs 0.77±0.09, p<0.05). Expressions of adiponectin mRNA increased significantly in rats of exercise group compared to those in model group (0.97±0.20 vs 0.25±0.10, p<0.01). *Implications:* Exercise training can significantly improve insulin resistance in rats, which may be through modulating the expressions of adiponectin.

PO-0205

QUANTITATIVE CARDIAC REHABILITATION

Jiankang Wu[1], Shoulin Li[2]

[1]University of Chinese Academy of Sciences, China, [2]Capital Medical University School of Rehabilitation Medicine, China

It is common understanding that exercise plays very important role in cardiac rehabilitation. It is also understood that cardiovascular system performances need to be evaluated in daily life as physiologic responses during normal periods of activity, rest, and sleep, which are realistic health indicators of the patient and the patient response to therapeutic intervention. As such, we have developed and trialed a quantitative cardiac rehabilitation solution. The patient wears a tiny device on chest and holds a smart phone, which continuously acquires and analyses EGC and activity signal, detect RR interval and abnormalities, activity types and intensity. The solution consists of three steps: step one, the doctor examines the patients, decides the rehab prescription, inputs the target heart rate and exercise time and duration into the patient's smart phone. Step two, the patient wears the device and takes the smart phone in his daily life, performs exercise according to the prescription. The smart phone shall warn when the target heart rate is exceeded, remind when the exercise is completed, and record all RR interval and activity information, together with ECG signal when there is abnormalities and at the beginning and the end of the exercise. Step three, the patient comes back to the doctor, the doctor reads the stored information from the smart phone into his computer, views and analyses the events, the performance and progress of the rehabilitation, review and update the prescription. The heart rate variability at patient's static state and its 24 h circadian represents the status of autonomic nevus system regulation and is taken as cardiovascular dynamic performance measure. The trial started from February 2013 and shall continue for another two months, aiming at further validation and improvement of the cardiac rehabilitation solution.

PO-0206

MULTIDISCIPLINARY APPROACH TO IMPROVE THE NUTRITION STATUS FOR CANCER PATIENTS

Xiaoyan Sheng[1,2], Wenzhi Cai[1,2], Jingxia Miao[2]

[1]School of Nursing, Southern Medical University, Guangzhou, China, [2]Nanfang Hospital, Guangzhou, China.

Introduction: Malnutrition has since long been known to be associated with adverse outcomes in cancer patients. Cancer-induced cachexia remains a significant cause of morbidity and mortality in cancer treatment. Despite cancer research and development continues at an aggressive pace and performed in strict compliance with published treatment regimens and the nutrition support guidelines, a degree of cancer malnutrition is experienced to 40%-80%, and the cancer-induced cachexia is by up to 80% of advanced stage cancer patients. Hypermetabolism over a long period of disease progression and increased resting energy expenditure related to the systemic inflammatory response are common to cancer patients, which due to anorexia may thus constitute a vicious circle in the development of cancer cachexia. *Discussion*: Understanding the causes of cachexia sheds light on the subsequent need for multi-modality therapy including clinical intervention with specialized nutrition support, drug therapy, and lifestyle and diet changes. Thus, improved management of cancer patients' nutrition status, including cachexia may require a multi-disciplinary approach and is best commenced earlier rather than later. Early start of therapy also facilitates the use of oral nutritional supplementation, which is preferable to parenteral nutrition in the majority of cases and exercise during cancer treatment, which improving multiple posttreatment adverse effects on bone health, muscle strength, and other quality-of-life measures. It is important to identify the patients' nutrition status and understand the mechanism of the cachexia. Once a patient is severely wasted it may be neither practical nor ethical to intervene with anything else than supportive care. *Conclusion:* Patients with cachexia is difficult to make an improvement in the nutrition condition, however, the goal must be to prevent or delay further decline. Currently, strategies to counteract both hypermetabolism and reduced dietary intake

and to increase physical activity have been demonstrated to be of importance for the survival, function and quality of life of cancer patients and should be further explored in interventional studies.

PO-0207

EFFECT OF COMPLIANCE OF AEROBIC EXERCISE ON LIPID PROFILE IN OBESITY WITHOUT COMPLICATION

Rizky Pratama Roesnawi, Tirza Ediva Tamin*
Cipto Mangunkusumo Hospital, Indonesia

Objective: The purpose of this study is to evaluate the effect of compliance of aerobic exercise on lipid profile, BMI and waist circumference in obesity without complication in 40-60 years obese. *Methods:* A pre and post experimental study was conducted. Lipid profile, BMI and waist circumference was measured. Aerobic exercise was done on static cycle with intensity 60-70% HRmax three times a week for 12 weeks with duration on 1st week 15 min, 2nd week 30 min, 3rd and 4th week 45 min, 5th-12th week 60 min. The exercise compliance was measured every attendance, lipid profile was measured in the beginning and last aerobic exercise, BMI and waist circumference was measured every week. Before the research, subject was measured with Physical Activity Level and Estimated Food Record on 4th week and 12nd week. *Result:* Thirty six subjects aged 40-55 years old with obesity without complication and increase of lipid profile were analyzed in this study. With 80% (median 78.5%) compliance of aerobic exercise, there was decrease significantly in Triglycerides (p=0.028), Total Cholesterol (p=0.001), LDL (p=0.004), IMT (p=0.001), Waist circumference (p=0.001) and there was increase of HDL (p=0.259) but not significantly. Implication/*Impact on rehabilitation:* Aerobic exercise using static cycle decreased Triglycerides, Total Cholesterol, LDL, IMT and Waist circumference thus is considered safe for 40-55 years obese.

PO-0208

EFFECT OF ACU-TENS TREATMENT FOR COPD PATIENTS

Wenli Wang[1], Moxian Chen[1], Mai Li[1], Rui Li[1,2], Hongmei Fang[1,2]
[1]The 2rd Affiliated of Kunming Medical University, China, [2]The 2rd People's Hospital of Kunming City, China

Purpose: Transcutaneous electrical nerve stimulation over acupoints (Acu-TENS) is a physical therapy method. To observe the effect of COPD patients used Acu-TENS to stimulate over acupoint Ex-B1. And find a new treatment method for COPD patients. *Method:* 20 COPD patients are tested with the GOLD classification stage II between 50~65 years old, and gave Acu-TENS to stimulate over acupoint Ex-B1 bilaterally (0.5 'cun' lateral to the spinous process of the 7th cervical vertebra) for 45 min. Control group (12 patients)received placebo-TENS with identical electrode placement but no electrical output despite a flashing light indicating stimulus delivery. To assess the effect of pre and post treatment on shortness of breath score and pulmonary function test and six min walk test. Result After 45 min stimulated program, the experimental group had a significant increased in FEV1 and FEV1/FVC% (p=0.02<0.01): shortness of breath score increased significantly more (p=0.00<0.05): six min walk test no significant increased pre and post stimulated treatment (p=0.06>0.05). *Conclusion:* Acu-TENS stimulate treatment for COPD patients can improve shortness breathe and pulmonary function. But for walking ability no significant increased. So we need a long term protocol for COPD patients to study walking capacity and quality of life.

PO-0209

EFFECTS OF EUPOLYPHAGA-CONTAINING SERUM ON HORMONE-INDUCED PROTEOMICS

Weihong Zhong[1], Shizhong Wang[1], Zhenxi Qi[2]
[1]Rehabilitation Hospital of Fujian University of Traditional Chinese Medicine, China, [2]Fujian University of Traditional Chinese Medicine, China

Objective: To investigate the effects of eupolyphaga-containing serum on the target or related proteins inhibiting adipogenic differentiation and promoting osteogenic differentiation of bone marrow mesenchymal stem cells. *Methods:* Passage 3 bone marrow mesenchymal stem cells were cultured with DMEM containing blank serum (blank control group), dexamethasone (hormone group) and eupolyphaga-containing serum (eupolyphaga group). After 6 days of culture, isobaric tag for relative and absolute quantitation (iTRAQ) technique was used to quantify proteins from three groups. The proteins were identified and relatively quantitatively analyzed by 2D LC-MS/MS mass spectrometry.*Results:* Relative to the hormone group, there were 15 proteins significantly up regulated and 12 proteins significantly down regulated in the blank control group, and there were 16 proteins significantly up regulated and 14 proteins significantly down regulated in the eupolyphaga group. Hspa1L1 and PrxV may be the targets of anti-apoptosis in eupolyphaga. The expression of Serpinh1 and ADP/ATP translocase 1 may be the targets of promoting osteogenic differentiation in eupolyphaga. *Implications:* Eupolyphaga containing serum can inhibit the adipogenic differentiation of BMSCs and promote osteogenic differentiation of BMSCs.

PO-0210

CLINICAL BENEFITS OF THE DUAL MODEL OF HEALTH EDUCATION ON PATIENTS WITH NEUROGENIC BLADDER

Wei Jiang, Maoshu Zhang, Shuying Pu, Lianghong Li, Bisan Hu, Ying Yin
The Second Affiliated Hospital of Chongqing Medical University, China

Objective: To observe the clinical benefits of the dual model of health education on patients with neurogenic bladder. *Method:* 86 patients with neurogenic bladder were randomly divided into experimental group and control group of 43 each. Patients in experimental group received dual model of health education, while others in control group got traditional health education for 3 months respectively. For analysis, we used Incontinence Quality of Life (I-QOL), Morisky 8-Item Medication Adherence Questionnaire (©MMAS-8), self-rating anxiety scale (SAS) and oral test for the knowledge about neurogenic bladder. *Results:* Compared with control group, the scores of ©MMAS-8 and SAS were greatly reduced (p<0.05), however the scores of I-QOL were significantly increased (p<0.01) in patients with dual model of health education. Also, the patients in experimental group got higher scores in oral test on knowledge of neurogenic bladder (p<0.05). *Implications:* Dual model of health education can significantly enhance the treatment compliance and knowledge about the disease in neurogenic bladder, reduce anxiety and improve the life style in patients with neurogenic bladder.

PO-0211

EFFECTS OF TRANSCUTANEOUS ELECTRICAL ACUPOINT STIMULATION ON PATIENTS WITH TYPE TWO DIABETES: A RANDOMIZED CONTROL CLINICAL TRIAL

Zhiyuan Wu[1], Ming Yang[1], Jie Jia[1], Yi Wu[1], Tiansheng Huang[2], Hongmei Su[2], Songwei Wang[1], Jiamin Lu[1], Ying Lv[3], Jie Zhu[4]
[1]Department of rehabilitation medicine, HuaShan Hospital FuDan University, ShangHai, China, [2]ShangHai JiaDing Traditional Chinese Medicine Hospital, ShangHai, China, [3]ShangHai JiaDing District MALU community health service center, ShangHai, China,

[4]ShangHai JiaDing District JUYUAN Community Health Service Center, ShangHai, China

Aim: Observing the biochemical and physical indexes of type 2 diabetic patients, study the curative effect of transcutaneous electrical acupoint stimulation on type 2 diabetes and enrich the clinical treatments. *Method:* 90 patients with type 2 diabetes were divided randomly into aerobic exercise group (30 cases), electro-acupuncture (EA) group (30 cases), and transcutaneous electrical acupoint stimulation (Acu-TENS) group (30 cases). In the basic of conventional medical therapy, the patients of EA group and Acu-TENS group were selected the pathognostic points of treating diabetes to be treated separately by EA and Acu-TENS. And aerobic exercise group patients were treated by walking exercise. The treatment time of every group is 30 min every day, 5 times per week, lasting two months. The indexes of 2 h postprandial blood glucose, glycosylated hemoglobin, serum insulin, triglyceride, cholesterol, and body mass index were detected respectively at prior treatment and post treatment and follow-up. EA group sheds off 3 cases and other two groups are no loss. *Results:* At post treatment all the above indexes of three groups decreased comparing with prior treatment ($p<0.05$). At follow-up, there were statistically significant differences in glycosylated hemoglobin ($p<0.05$) comparing with prior treatment and post treatment except EA group. And other indexes have rebounded, but still have decreased comparing with prior treatment ($p<0.05$). At the point of each time on every index, there was no statistically significance ($p>0.05$). *Conclusion:* Acu-TENS can improve the state of type 2 diabetes patients and be used as a new therapeutic approach in clinical application.

PO-0212

PULMONARY REHABILITATION FOR SCOLIOSIS OPERATION OF NEUROMUSCULAR DISEASE WITH LOW VITAL CAPACITY

Jang-Woo Lee[1], Seong-Woong Kang[1]*, Won-Ah Choi[1], Yu-Hui Won[2], Hyun-Jung Kang[1]

[1]Yonsei University College of Medicine,Korea, [2]Ewha Womans University School of Medicine,Korea

Objective: In patients with neuromuscular disease, scoliosis correction operation was not recommended to whom forced vital capacity (FVC) is below 30% of predictive value because of subsequent complications. But recently, it is reported that operation could be done safely for these patients. This study is to report the usefulness of pulmonary rehabilitation in scoliosis operation of patients with neuromuscular disease, despite low FVC. *Method:* Total 15 patients were recruited. They could have scoliosis operation successfully. We monitored the ventilatory conditions, including level of end tidal or transcutaneous CO2. As the result, if needed, noninvasive positive pressure ventilation (NIPPV) was applied. And they are educated about air stacking exercise, manually assisted coughing and application of mechanical insufflation-exsufflator. *Result:* In total 15 patients (4 Ducheene muscular dystrophies, 5 spinal muscular atrophies, 3 congenital myopathies, 1 Guillain-Barre syndrome, 1 congenital muscular dystrophy and 1 limb-girdle muscular dystrophy), average age was 13.9 years. The average FVC was 20.5% and PCF was 106L/min. In 13 patients, NIPPV was applied. For all patients, by application of mechanical insufflation-exsufflator, toileting of sputum and air stacking exercise were done. Except 2 patients, endotracheal tube was removed in 2 days after operation, and all patients could transfer to general ward in 3 days after removal. 7 patients had complications, such as pneumonia, wound infection, acute heart failure, and poor general condition, but there was no fatal complication. *Implications:* Through pulmonary rehabilitation, we could make successful scoliosis operation to neuromuscular disease patients whose FVC is below 30% of normal predictive value.

PO-0213

PRE AND POST-SURGERY REHABILITATION INTERVENTION IN CHILDREN WITH CONGENITAL HEART DEFECTS: A CASE SERIES

Anshory Sahlan[1,2], Andriati [1,2], Hening Laswati[1,2]*

[1]Physical and Rehabilitation Medicine dr. Soetomo General Hospital Surabaya Indonesia, Indonesia, [2]School of Medicine Airlangga University, Indonesia

Objective: Our goal is to report case series of pediatric patients with CHD underwent pre and post-surgery rehabilitation program. We want to show that rehabilitation intervention would benefit in improvement of recovery phase, increase physical capacity, and minimize complication. *Method:* Three patients with various type of CHD were admitted in dr. Soetomo General Hospital, Surabaya, Indonesia. All patients presented with chief complain shortness of breath during physical activity. First patient, a female, 10 y.o, appeared cyanotic, was diagnosed with Tetralogy of Fallot. Second patient, a male, 5 y.o, was diagnosed with Ventricular Septal Defect. Third patient, a female, 4 y.o, was diagnosed with Patent Ductus Arteriousus. Correction surgeries were performed to each patients. All patient underwent pre and post-surgery rehabilitation program. Pre-surgery rehabilitation program consists of patient education, pursed lip breathing, chest expansion exercise, and forced expiration technique. The post-surgery rehabilitation program consists of pre-surgery rehabilitation program, chest physiotherapy, and early mobilization. *Result:* The length of hospital stay of the first patient was 11 days, second and third patients was 6 days. All patients can do physical activity without complaint when discharged. We didn't found any complication in all patients. This finding indicated that pre and post-surgery rehabilitation intervention give benefit to children with CHD, regardless the CHD type. *Implications:* All patients showed improvement in recovery phase and increase physical capacity without any complications. Early rehabilitation programs in pre and post-surgery of children with various type of CHD can provide benefit and should be regularly implemented.

PO-0214

RELIABILITY OF THE SIX MIN WALK TEST PERFORMED ON RECTANGULAR TRACT FOR INTELLECTUAL DISABILITY PATIENTS WITH OBESITY IN JAKARTA

Tirza Ediva Tamin, Ferial Hadipoetro Idris*, Damayanti Rusli Sjarif, Muchtaruddin Mansyur

Cipto Mangunkusumo Hospital, Indonesia

Objective: The purpose of this research was to measure the reliability of 6 min walking test on 20 x 2 meter rectangular tract which is considered easy to perform by Intellectual disability (ID) with obesity. *Methods:* Subjects of the study are ID individuals age 10 – 30 years from the SLB C and C1 in Jakarta in 2008-2009 with obesity and willingness to participate in research with signed informed consent by parents/guardians. Twelve subjects were involved in this study. The subjects are then asked to perform the Six Min Walking Test on an oval & rectangular track. Reliability of the Six Min Walking Test on a rectangular track is measured using the Cronbach Alpha reliability test and Correlation of the Six Min Walking Test distance between the rectangular and oval track is measured using the Pearson Correlation Test. *Result:* Statistical analysis showed that Cronbach Alpha of 6-min walking test on rectangular tract is 0.93 with correlation value is 0.88. *Implication/Impact on Rehabilitation:* It is concluded that the six min walk test performed on rectangular tract has good reliability.

PO-0215

THE APPLICATION OF CANCER REHABILITATION IN TAIWAN: A RETROSPECTIVE LONGITUDINAL COHORT STUDY FROM 2000 TO 2009

Hsiu-Chen Yen[1], Willy Chou[1,2], Pei-Chi Hsiao[1], Hank Ho[3], Daniel Chiung-Jui Su[1], Jr-Yan Huang[1]

[1]Department of Physical Medicine and Rehabilitation, Chi Mei Medical Center, Tainan, Chinese Taipei, [2]Department of Recreation and Health-Care Management & Institute of recreation Industry Management, Chia Nan University of Pharmacy & Science, Tainan, Chinese Taipei, [3]Department of Research, Chi Mei Medical Center, Tainan, Chinese Taipei

Objective: Our study is to investigate the application of cancer rehabilitation in Taiwan. As cancer rehabilitation services are fully reimbursed by National Health Insurance (NHI) in Taiwan, this study used a nationwide cohort database to investigate demographics, cancer types, and time trend of usage of patients with cancer. *Method:* The present study used the NHI Research Database from 2000 through 2009, with a subset of 1 million beneficiaries randomly drawn from the population. Patients with newly added cancer coding (by ICD-9) from 2000 to 2009 and who also receiving cancer rehabilitation for the first time during this period were selected as our study group. The rate of cancer rehabilitation application adjusted for numbers of cancer persons per year with each cancer types. *Results:* There were 2754 patients with cancer rehabilitation in our study. The prevalence rate of cancer rehabilitation service was 10.11% from 2000 through 2009. Breast cancer was the most frequently recorded type of cancer rehabilitation (22.48%), followed by head and neck tumor (18.16%) and GI tumor (17.32%). Besides, the rate of cancer rehabilitation application in each cancer type also showed increase from 2000 to 2009 (Hematologic tumor having 2.53 times in 2009 when compare to 2000; Breast cancer: 2.07 times; Gynecologic cancer: 1.73 times; Head and neck tumor: 1.56 times). *Implications/Impact on rehabilitation:* We found that only a small proportion of patients with cancer received rehabilitation therapy in Taiwan. Fortunately, our study pointed out that there is an increasing trend of cancer rehabilitation application among cancer patients.

PO-0216

IMPACT OF AEROBIC EXERCISE TRAINING ON ENDOTHELIAL FUNCTION IN ACUTE CORONARY SYNDROME

Chul Kim, Seong Hoon Kang, Hee Eun Choi, Hee Jin Jung*, Byeong Ju Lee

Dept. of Rehabilitation Medicine, Sanggye Paik Hospital, Inje University, Korea

Objective: We utilized flow mediated dilation (FMD) testing by ultrasonography to measure the improvement of arterial endothelial function by aerobic exercise training in acute coronary syndrome. *Method:* Patients who received percutaneous coronary intervention with drug eluting stent insertion due to acute coronary syndrome were included as study subjects. The patients who participated in cardiac rehabilitation (CR) program were categorized as the exercise group (EG), and others who did not participate the program were categorized as control group (CG). Both groups received graded exercise test (GXT) and FMD testing. The EG performed hly ECG monitored aerobic exercise training sessions. Patients in CG only received advice regarding exercise methods. After six weeks, both groups received follow-up GXT and FMD testing. *Results:* There were 19 patients in each EG and CG. There were no significant differences in the general characteristics, location and number of disease vessel, and medications between two groups. The VO2max was 27.52±5.83 in EG, 30.82±7.48 in CG at first GXT and 31.39±7.34 in EG, 31.97±6.85 in CG after 6 weeks. There is a statistically significant improvement of VO2max only in EG. FMD value was 7.93±1.43% in EG, 7.86±1.64% in CG at first and 9.39±2.19% in EG, 8.96±2.31% in CG after 6 weeks. There is also statistically significant improvement of FMD value only in EG. *Implication:* According to arterial endothelial function evaluation by FMD testing, six week aerobic exercise training improved VO2max and endothelial function significantly. Thus, exercise based CR program is necessary in patient with coronary artery disease.

PO-0217

THE STUDY OF THE EFFECT OF THE PSYCHOLOGICAL REHABILITATION ON HEPATIC CARCINOMA PATIENTS WITH THE INTERVENTIONAL THERAPY

Yan Li, Juping Yuan, Changqing Shi

the Affiliated He-Ping Hospital of ChangZhi Medical College, China

Objective: To investigate the effect and result of the psychological rehabilitation of the whole-step assessments and treatments on hepatic carcinoma patients with the interventional therapy. *Methods:* 50 hepatic carcinoma patients in the first interventional therapy were randomly divided into psychosocial rehabilitation group (rehabilitation group) and control group. The latter was notified methods and announcements of the treatment, and the former involved the notified methods and notification as well as treatments of directive psychosocial rehabilitation. And both of them were observed on anxiety and intraoperative changes of vital signs and postoperative complications. *Results:* All patients on admission had similar anxieties, but after psychological rehabilitation, the rehabilitation group decreased much than the control group on the anxiety value ($p<0.01$), intraoperative vital signs more stable ($p<0.01$), postoperative nausea and vomiting lighter ($p<0.05$). *Conclusion:* The psychological rehabilitation can improve the patient's anxiety degree, stabilize intraoperative vital signs, and reduce postoperative complications. It makes patients in the best mental state to receive the interventional therapy, and therefore can relieve more pains and improve efficacy.

PO-0218

EFFECT OF EXERCISE TRAINING FOR INTERMITTENT CLAUDICATION DUE TO INCOMPLETE PERSISTENT SCIATIC ARTERY

Takaaki Kakihana, Osamu Ito*, Fumika Suzuki, Masahiro Kohzuki

Tohoku University Graduate School of Medicine, Japan

Objectives: Sciatic artery usually disappears during developmental process of lower extremity artery system, and persistent sciatic artery (PSA) sometimes causes intermittent claudication (IC). There is no report of the effect of exercise training on PSA. We examined effects of exercise training in a patient with incomplete PSA. *Case Description:* A 21-year-old female was admitted with about three years history of left leg pain on walking. She was diagnosed as pseudoxanthoma elasticum (PXE) in past days, and her systemic vascular system was checked because PXE causes complications of the vascular disease. Left and right ankle-brachial pressure index (ABI) was 0.67 and 1.05 respectively. Computed tomographic angiography showed left incomplete PSA branched off from the internal iliac artery. Left external iliac artery was hypoplasty and blood flow to peripheral artery was supplied by collaterals from the inferior epigastric artery. She underwent supervised exercise training program including treadmill walking and resistance training. The exercise training program was 5 sessions per week during hospitalization for the first month and 1 session per week as outpatient for last two months. The exercise training increased the pain-free walking distance from 107m to 253m, maximum walking distance from 385m to 1267m and left ABI from 0.67 to 0.77. Exercise training also improved the score "distance" from 40.3 to 75, "speed" from 50 to 82.6 and "stair climbing" from 79.1 to 87.5 of walking

impairment questionnair (WIQ). *Conclusions:* Exercise training is effective for the improvement of walking ability and quality of life in incomplete PSA with IC.

PO-0219

THE CLINICAL APPLICATION OF BLADDER CAPACITY METER IN THE ASSESSMENT OF NEUROGENIC BLADDER

Li Zhou

Jiangsu province peoples hospital rehabilitation medicine department, China

Objective: Through the bladder capacity meter for spinal cord injured patients with neurogenic bladder evaluation, Analyzing the barrier type of bladder, thus to provide objective data for clinical bladder care and bladder treatment, prevent the occurrence of urinary complications and promote recovery of bladder function. *Method:* choose 48 cases of hospitalized patients with spinal cord injury from January 2011 to December 2012, with the bladder capacity meter to measure the bladder capacity of patients with spinal cord injury intervention and post-intervention Determination, analyze the type of bladder barrier, take the corresponding treatment and rehabilitation nursing measures: To observe the effect of intervention and adjust processing measures to promote the bladder function recovery. *Result:* After therapy and nursing 7 patients recovered automatic micturition, 20 patients reduced in the number of urinary leakage, 41 patients established clean intermittent catheterization, no urinary tract infection. *Conclusion:* Proper bladder function assessments will provide objective data on the late bladder treatment and effective rehabilitation care, effective prevent the occurrence of complications of the urinary system. Establishing the safety of urination For spinal cord injury patients, to promote recovery of bladder function, and play an important role in the establishment of a new balance of bladder.

PO-0220

EFFECTIVENESS OF DRAGON BOAT TRAINING ON SHOULDER MUSCLE STRENGTH IN POSTOPERATIVE BREAST CANCER PATIENTS

Huo-Mu Chen[1], Tsai-Ling Shih[2], Deng-Yau Shy[3], Chung-Miaw Kao[2], Shu-Ying Chen[2], Ran-Chou Chen[4]*

[1]Taipei City Hospital-hepingfuyou Branch Breast Surgical Department,Chinese Taipei, [2]Taipei City Hospital-hepingfuyou Branch Rehabilitation Department, Chinese Taipei, [3]College of Sports and Recreation Department of Physical Education National Taiwan Normal University,Chinese Taipei, [4]Taipei City Hospital-hepingfuyou Branch Radiology Department, Chinese Taipei

Objective: Some reports have indicated that postoperative breast cancer patients with excessive exercise would increase risk of muscle fatigue and lymphedema of limb. However, the purpose of the study was to investigate whether adoption of dragon boat training produced better outcomes than standard exercise training among postoperative patients but without muscle fatigue and lymphedema of limb. *Method:* The study was prospective in design. We recruited patients diagnosed with breast cancer, undergone total or partial mastectomy, no brachial plexus injury or shoulder movement problems, no other treatment, were consciously aware and willing to participate in the research. we recruited 26 cases (17 with total mastectomy and 9 partial) in the dragon boat exercise training program for 12 weeks and assessed degrees of pain, lymphoedema, shoulder mobility and muscle strength on the operated side in both groups before and after intervention. *Results:* Patients undergone total mastectomy exhibited significantly improved shoulder muscle strength after the intervention ($p<0.05$). Differences between arm circumferences on the affected and sound sides before and after intervention were not statistically significant ($p=0.05$). Those undergone partial mastectomy demonstrated only improved shoulder internal and external rotation strength ($p=0.03$). Similarly, difference between arm circumferences on the affected and sound sides before and after intervention were not statistically significant ($p=0.42$). No obvious variation was observed regarding pain and shoulder joint mobility in either group. *Implications:* Our primary assessment found no increased risks of developing lymphoedema in breast cancer patients during the dragon boat training sessions. Moreover, this mode of exercise resulted in enhanced muscle strength on the operated side.

PO-0221

EFFECT OF COMPREHENSIVE REHABILITATION IN PEDIATRIC NON-ALCOHOLIC FATTY LIVER DISEASE (NAFLD)

Osamu Ito*, Fumika Suzuki, Tamao Takahashi, Yoshiko Sakata, Nobuyoshi Mori, Makoto Nagasaka, Satoru Ebihara, Masahiro Kohzuki

Tohoku Univesity Graduate School of Medicine, Japan

Objective: Non-alcoholic fatty liver disease (NAFLD) is a phenotype of metabolic syndrome. Paralleling the increasing prevalence of obesity, NAFLD becomes to be common and potentially serious even in children. There are few reports of therapeutic intervention for pediatric NAFLD. Thus, we determined the beneficial effects of comprehensive rehabilitation in children with NAFLD. *Method:* Ten obese children (age 12.0±1.4 years, male/female 7/3), who had elevated serum transaminases and the diagnosis of fatty liver by plain computer tomography were admitted to Tohoku University Hospital for 60±46 days. They underwent exercise therapy with a bicycle ergometer and an underwater treadmill and mild diet therapy of 1,900 kcal. After a guidance of life style modification, they followed at home for 6 months. *Results:* On admission, the height and the body weight were 157.9±6.2 cm and 83.8±12.9 kg. Blood pressure was normal. Serum asparatate transaminase (AST) and alanine transaminase (ALT) were 80±34 IU/l and 141±61 IU/l. Serum triglyceride was a high range in 5 cases, and low-density lipoprotein (LDL) cholesterols was a high range in 4 cases, but high-density lipoprotein (HDL) cholesterols was a low range in 5 cases. Diabetes mellitus was shown in 3 cases. The homeostatic model assessment insulin resistance index (HOMA-IR) was 5.2±1.6, which indicated insulin resistance. After the comprehensive rehabilitation, the body weight decreased by 8.7±7.2 kg, and serum AST and ALT decreased to 21±4 IU/l and 28±7 IU/l, respectively. *Conclusion:* The clinical course of these cases indicates that the comprehensive rehabilitation has beneficial effects in pediatric NAFLD.

PO-0222

TETRASPANIN CD82 TRANS-DOMINANTLY INHIBITS VASCULAR MORPHOGENESIS BY ALTERING ENDOCYTOSIS OF CELL ADHESION MOLECULES

Quan Wei[1,2], Xiaolin Huang[1], Xin Zhang[2]

[1]Departments of Rehabilitation Medicine and Internal Medicine, Tongji Hospital, Huazhong University of Science and Technology, Wuhan, China, [2]2Stephenson Cancer Center and Departments of Physiology and Pathology, University of Oklahoma Health Science Center, Oklahoma City, OK, USA

Objective: The regulation of blood vessel formation is fundamentally important for many biological processes and becomes a therapeutic strategy against the diseases ranging from inflammation to cancer. Although tetraspanin CD82 is widely expressed in various endothelial cells, the vascular function of CD82 remains unknown. *Methods and Results:* We found that Cd82-null mice displayed marked increases of 1) pathological angiogenesis in Matrigel plug, tumor, and retina in vivo, 2) angiogenesis from aortic ring ex vivo, and 3) vasculogenesis in vitro. The major behavior changes of Cd82-null endothelial cells are the enhanced migration and invasion, likely resulting from the upregulated expression of

CD44 and integrins, enhanced Src-Akt signaling, and increased membrane extrusions. Without CD82, the cytoskeletal interaction and membrane microdomain partition of cell adhesion proteins and maturation of focal adhesion were enhanced, leading to less endocytosis of cell adhesion protein and more outside-in signaling. *Implications:* CD82 trans-dominantly inhibits cell adhesion proteins by altering molecular interaction and dynamics at the plasma membrane, and consequently the endothelial cell movement required for vascular morphogenesis becomes perturbed. In addition to unveiling the vascular function of CD82, our study *i*) revealed a novel regulatory mechanism of vascular morphogenesis, i.e., the strength of cell-matrix adhesion and trafficking of cell adhesion proteins directly fine tune vascular morphogenic potential, and *ii*) discovered CD82 as a putative therapeutic target for vascular abnormality in various diseases.

PO-0223

EFFECTS OF HIGH-INTENSITY INTERVAL TRAINING ON MYOCARDIAL OXYGEN CONSUMPTION IN YOUNG MEN

Lei Dong, Wenliang Zhang, Kangling Xie, Suixin Liu
Xiangya Hospital of Center South University, China

Objective: High-intensity interval training (HIIT) and moderate-intensity continuous training (MICT) are two ways of aerobic training. The purpose of this study is to compare myocardial oxygen consumption in young man of these two ways. *Methods:* Sixteen healthy young men were enrolled (age 23.3 ± 2.3 years). First, all subjects went through a stress test and a maximal aerobic power test to make individualized training prescriptions. Then, all subjects completed one session of HIIT and one session of MICT on different days. HIIT intensity was set at 100% maximal aerobic power, with 15s/15s training and interval ratio, lasted for 32 min exclusive of warm-up and cool-down; MICT intensity was set at 70% heart rate reserve with energy consumption equal to HIIT session. During the two training sessions heart rate (HR), blood pressure (BP), rate-pressure product (RPP), oxygen saturation (SaO2) and Borg's score were recorded. *Results:* HR reserve during HIIT was 68.0% ± 8.9%, which was at the same level with MICT; 2. Systolic blood pressure during HIIT sessions was significantly lower than MICT (p<0.001); 3. RPP in HIIT was significantly lower than MICT (p 2 during HIIT kept above the 95% level, no significant difference between the two training sessions; 5. No significant difference in Borg's score between the two training sessions. *Implications:* HIIT induces lower BP level and myocardial oxygen consumption compared with MICT, which prompted that HIIT might be more tolerable than MICT among cardiovascular patients.

PO-0224

SERUM PROSTATE-SPECIFIC ANTIGEN CONCENTRATION AND HEMODILUTION AMONG CHINESE MIDDLE-AGED OBESE MEN: A HEMATOCRIT-BASED EQUATION FOR PLASMA VOLUME ESTIMATION IS INDUCED

Feng Li
Taihu Cadres Sanatorium of Jiangsu Province, China

Background: A hematocrit (HCT)-based and a body surface area (BSA)-based equations were applied for plasma volume (PV) estimation, respectively, to confirm and quantify the hemodilution effect in prostate-specific antigen (PSA) screening among obese men. The agreement between the equations was additionally investigated. *Methods:* A total of 1,444 men were retrospectively collected, with ages 40 to 65 years, PSA 0 to 4 ng/mL, and no prostate cancer. PSA mass was calculated as PSA concentration multiplied by PV. Multivariable linear regression models, theoretical models, and the Bland-Altman method were used. *Results:* PSA concentration significantly decreased with increasing body mass index (BMI; β=-0.011, p<0.001); however, PSA mass estimated by HCT- (β=0.004, p=0.132) and BSA (β=-0.003, p=0.094)-based equations remained consistent. A screening PSA of 4.0 ng/mL in nonobese men was found to be corresponding to 3.32 and 3.68 ng/mL in obese men extrapolated by PV on the basis of HCT and BSA, respectively. Moreover, the mean (95% confidence interval) difference of PV between the two equations was 0.33 (-0.06 to 0.73)L. *Conclusions:* The inverse relationship between PSA concentration and BMI might be explained by a hemodilution effect among obese men. There is significant variation in PV calculated by the two equations.

PO-0225

COMPARISON OF RELAXATION RESPONSES BETWEEN MANUAL BREATHING ASSISTANCE AND DEEP BREATHING EXERCISE

Masami Yokogawa
Kanazawa University, Japan

Objective: This study investigates the comparison of relaxation responses between manual breathing assistance and deep breathing exercise in a supine and sitting position. Manual breathing assistance is a physical therapy technique which consists of passive squeezing on the chest wall in time with the expiratory phase. *Partipants and Methods:* The participants consisted of 10 healthy women. Each subject had manual breathing assistance performed and executed deep breathing exercises in a supine and sitting position. Each measurement consisted of a 3-min rest and a 4-min intervention period. For the manual breathing assistance, a physical therapist assisted the squeezing of participants' upper chest walls during expiration, and released them during inspiration. Participants were instructed to breathe in deeply and slowly for the deep breathing exercise. Physical evaluation for relaxation response was assessed by oxygen uptake (Vo2), respiration rate, heart rate, and autonomic nerve activity. *Results:* In both assisted manual breathing and deep breathing, the Vo2 significantly decreased in the supine position; there were no significant changes in the sitting position. In both intervention periods, the respiration rate and heart rate significantly decreased irrespective of the posture. Although the LF/HF, an index of sympathetic activity, increased during deep breathing in both postures, it showed a siginificant increase in a supine position. In contrast, the LF/HF in assisted manual breathing did not show significant changes in either posture. *Conclusion:* The sympathetic nerve activity in the relaxation response for assisted manual breathing was different from that for deep breathing exercise.

PO-0226

PROMOTION OF EXERCISE PRESCRIPTION OF TRADITIONAL CHINESE MEDICINE TO PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASES IN COMMUNITIES

Wen Zhang[1], Wenhua Chen[1], Xianqiao Jin[2],[1], Jingqing Hang[3],[1], Kewen Chen[4],[1], Jianwen Xu[5], Zhengqing Ge[1], Guogang Xie[2], Fengying Zhang[3], Bo Yu[1], Qiang Qu[1]
[1]Department of Rehabilitation, Shanghai First Peoples Hospital, China, [2]Department of Respiration, Shanghai First Peoples Hospital, China, [3]Department of Respiration, Shanghai Putuo District People's Hospital, China, [4]Department of Respiration, Baoshan Branch of Huashan Hospital, China, [5]Jingansi Community Health Service Centers of shanghai, China

Objective: To promote exercise prescription of Traditional Chinese Medicine (TCM) to patients with Chronic Obstructive Pulmonary Diseases (COPD) in stable stage, and investigate its influence on activities of daily living (ADL) and quality of life (QOL) of COPD patients in remission period. *Methods:* 74 cases of COPD patients in stable condition from 3 hospitals were selected to receive individualized exercise prescription of TCM, and then took a 10-week exercise at home or in community. Dyspnea index, exercise tolerance, mental

status, ADL and QOL were evaluated before and after the treatment. Patients were required to develop exercise habit. After one year observation, both the AECOPD outpatient and hospitalization rates were measured. One of the hospitals established a control group of 20 cases. SPSS11.5 was adopted for statistics. *Results:* 66 patients finished the exercise training; exercise tolerance, dyspnea index, mental status and ADL of intervention group were significantly improved. After intervention using exercise prescription of TCM, Borg scale score, SAS, SDS and IADL score were greatly decreased, while 6MWD was obviously increased. The St. George's Respiratory Questionnaire (SGRQ) scores also shows that compared with last year, the numbers of AECOPD outpatient and hospitalization have been statistically significantly reduced. *Conclusion:* Exercise prescription of TCM is safe and effective. The intervention can improve exercise capacity, ADL and QOL, can relieve dyspnea, anxiety, and depression, and can reduce the number of AECOPD as well as the burden on patients, their families and our society.

PO-0227

THE EFFECTS OF MODIFIED BREATHING EXERCISES ON PULMONARY FUNCTION IN PATIENTS WITH STROKE AND STABLE CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Zhifei Yin, Ying Shen
the First Affiliated Hospital of Nanjing Medical University, China

Objective: To observe the effects of modified breathing exercises on pulmonary function of patients with stroke and Stable Chronic Obstructive Pulmonary Disease (COPD). *Methods:* Sixty patients with stroke and stable COPD were randomly divided into the experimental group (n=30) and the control group (n=30). The patients in the experimental group were given modified breathing exercises training; the controls only accepted oxygen therapy. Both groups were arranged with rational long-term treatment of COPD with medicine and stroke rehabilitation training. After six months of pulmonary rehabilitation training, FEV1, FEV1/FVC, FEV1%pred and BODE index were tested to evaluate the effects of modified breathing exercises on pulmonary function. *Results:* Before training, FEV1/FVC, FEV1, FEV1%pred and BODE index of patients in two groups had no significant difference (p>0.05). After six months of pulmonary rehabilitation training, FEV1/FVC, FEV1 and FEV1%pred of patients in the experiment group were significantly better than before and than those of patients in the control group (p<0.05), while BODE index had no significantly improved (p>0.05). This study showed that modified breathing exercises can increase pulmonary function of patients with stroke and stable COPD. *Implications:* These results contribute to a new therapy for patients with stroke and COPD.

PO-0228

CANCER REHABILITATION AND THE EFFECT OF PSYCHOLOGICAL PROBLEMS ON THE REHABILITATION PROCESS

Ahmad Al Khayer[1,3]*, Fahim Anwar[2,3], A M Weir[3]
[1]Al Alhi Hospital, Doha, Qatar,Qatar, [2]Cambridge University Hospitals NHS Trust, UK,Qatar, [3]Greater Glasgow & Clyde NHS Trust, UK, Qatar

Background: The role of rehabilitation services in the management of cancer patients has not yet gained popularity despite the evidence supporting its use. *Aim of the study:* To identify the extent of gains made by cancer patients and the effect of psychological problems on the multidisciplinary rehabilitation intervention. *Design, subjects and setting*: Retrospective case series review of cancer patients undergoing inpatients multidisciplinary rehabilitation for functional impairment at a rehabilitation department. *Method:* Clinical notes over 56 months period were reviewed. Information on FIM scores, length of hospital stay, psychological complications, discharge destination were collected. *Results:* · 35 patients (19: 16 M: F). · Mean hospital stay 54 days. · 33 (92%) patients were admitted from other hospital departments or hospice. 3 (8%) were admitted from home. 26 (75%) were discharged home following rehabilitation. · 20 (57%) patients achieved their rehabilitation goals; their FIM improved from median 86 (41-118) on admission to median 110 (60-125) on discharge. On individual level the minimum improvement in FIM was 7 points. 9 (45%) out of these patients had mild psychological problems. · 11 (31%) patients did not fully achieve their rehabilitation goals. 5 (12%) did not participate in the goal planning meetings altogether. 14 (88%) out of these patients had severe psychological complications. *Discussion*: Cancer patients appear to benefit from multidisciplinary rehabilitation. Significant number of cancer patients experience psychological challenges that may affect the rehabilitation intervention. *Conclusion:* Multidisciplinary rehabilitation teams need to be prepared to accept cancer patients. Early recognition of psychiatric problems may be useful.

PO-0229

THE STUDY OF THE REHABILITATION OF THE ACUTE MYOCARDIAL INFARCTION PATIENTS IN THE MODERATE RISK

Changqing Shi
The peace hospital of the changzhi medical college, Changzhi, China

Objective: It is to study of rehabilitation of the acute myocardial infarction (AMI) patients in the intermediate risk. To improve AMI classical treatment and reduce AMI recurrence and death the new clinical treatment mode was explored. *Methods:* In 1998 year-2011 year the 40 AMI were treated. On the basis of propaganda and education of the AMI rehabilitation intervention 40 AMI can be divided into the rehabilitation evaluation and treatment group (the rehabilitation group) and the simple drug group (the drug group). The 3 high-risk patients and the 5 low-risk patients were eliminate, the 32 patients in the intermediate risk are grouping, 15 people in the rehabilitation group, 17 people in the drug group of.The treatments of the drug treatment group include: ECG monitoring, the bed care, standard drug therapy (including intravenous thrombolytic therapy, Except for coronary-artery bypass grafting (CABG) and vascular interventional therapy). The rehabilitation treatment group: on the basis of the same treatments of the drug group, in the first 2 weeks the intervention treatments are made by the rehabilitation procedures of 2 weeks. 2 weeks after, the comprehensive rehabilitation measures were implemented (including the movement evaluation test by symptoms to restrict, the appropriate rehabilitation therapy in the stages, the psychological persuation, the rehabilitation education, the guidance of the household life and the work time and the work strength). *Results:* After 4 weeks in that early rehabilitation evaluation and treatment are made the angina are three (3/15) in the rehabilitation group vs. the angina nine (9/17) in the drug group, p<0.05.The palpitations are four (4/15) in the rehabilitation group vs. the palpitation ten (10/17) in the drug group, p<0.05. During a follow-up period of 1 year, 2 patients were in hospital because AMI relapse again and 3 AMI were dead in the drug group. In rehabilitation group is no longer MI and death. *Conclusion:* In patients with AMI in the intermediate risk, the early rehabilitation therapy is safe and can improve the AMI patients clinical condition, effectively relieve clinical symptoms, such as the angina, the palpitations. The comprehensive rehabilitation therapy measures of AMI have had a protective effect of recurrence and sudden death. The rehabilitation intervention is a kind of new mode of treatment of AMI.

PO-0230

EFFECT OF ONE-PERSON OPERATION COMPARE WITH DOUBLE OPERATION APPLIED TO BALLOON CATHETER DILATION TECHNIQUES

Peng Liang, Huichang Zhou, Pande Zhang, Lishan Chen
The Department of Rehabilitation, The First Peoples Hospital of Foshan City, China

Objective: This study aimed to observe the effect of balloon catheter dilation techniques operated by one person and by two people in treatment of cricopharyngeal achalasiapremium. *Methods:* 20 dysphagic NPC patients who had received radiation therapy were randomly assigned to one-person operation group (n=10) and double group operation (n=10). Both group received urethral catheter balloon dilatation therapy combined with conventional swallowing therapy and low frequency electric stimulation. Patients received treatment 3 times a week, 18 times in total. Before and after treatment the effects were evaluated with a video fluoroscopic study of swallow and recorded duration of each operation. *Results:* Both groups had significantly improvement after treatment on swallow function (p<0.05). There was no significance between two groups (p>0.05). But the duration of one-person operation was less than that of double operation (p<0.05). *Conclusions:* There was no significance between one-person operation compare with double operation applied to balloon catheter dilation techniques. And one-person operation cost less time and human resource.

PO-0231

EFFICACY OF ANTIBIOTIC THERAPY ON CLOUDY URINE WITH PYURIA DURING VEGETATIVE STATE PATIENTS OF BRAIN INJURY

Tao Wu, Jian Hua Li
Sir Run Run Shaw Hospital of College of Medicine of Zhejiang University, Hang Zhou, China

Objective: To observe the efficacy of antibiotic therapy on cloudy urine with pyuria during vegetative state patients of brain injury. *Methods:* 30 cloudy urine specimens with pyuria from 19 vegetative state patients of brain injury were divided into a treatment group (18 specimens) and a control group (12 specimens). *Results:* The pyuria negative rate in treatment group after antimicrobial therapy was 72.2%, 41.7% in control group, the difference was significant (p<0.05). In the following month, pyuria recurrence rate of the treatment group was 77.8% and control group was 75.0%, the difference was not statistically significant (p > 0.05). Incidence of urinary tract infection in treatment group was 22.2% and 25.0% in control group, the difference was not statistically significant (p> 0.05). *Implications:* Antibiotic therapy on cloudy urine with pyuria during vegetative state patients of brain injury could make pyuria improved in the short term, but the recurrence rate of pyuria and symptomatic urinary tract infection rate were similar to non-antibiotic therapy, so take antibiotic treatment had no significant benefit.

PO-0232

EFFECT OF HEALTH-CARE BY QIGONG BA DUAN JIN ON THE TYPE 2 DIABETES MELLITUS

Yunchuan Wu, Jiaqi Zhou
Nanjing University Of Traditional Chinese Medicine, China

Objective: By observing exercises Qigong Ba Duan Jin 1 time, 2 times and3 times, walk, control five different methods for type 2 diabetes to explore the characteristics and dose-effect relationship. of the Health Qigong Ba Duan Jin adjuvant treatment of type 2 diabetes. *Method:* (1) Select the type 2 diabetic patients, 35 cases were randomly divided into control, walking, Ba Duan Jin 1 time, 2 times & 3 time groups, each seven cases. Control group: subjects volunteers in addition to the use of drugs, do not participate in any prescription exercise. Walking groups: subjects volunteers to walk two times a day. Ba Duan Jin Group: Health Qigong Ba Duan Jin interventions, patients were 1 times/day, 2 times/day, 3 times/day workout session, for three consecutive months. *Result:* (1) Three months later, compared with the control group, Ba Duan Jin 1 time group and Ba Duan Jin 2 times groups, FBG of Ba Duan Jin 3 times groups and walking group, the degree of improvement is greater than these two groups (p<0.05). *Conclusion:* Ba Duan Jin exercises can control of FBG and HbA1C. Ba Duan Jin exercises has a certain dose-effect relationship with diabetes treatment, exercise Ba Duan Jin 3 times daily, the adjuvant treatment of diabetes effect is most obvious.

PO-0233

EFFICACY OF PELVIC FLOOR MUSCLE TRAINING WITH VAGINAL PRESSURE FEEDBACK FOR STRESS URINARY INCONTINENCE IN WOMEN

Zhoukai Pi, Pande Zhang, Huichang Zhou, Huiqiong Chen
the First People's Hospital of Foshan, China

Objective: To evaluate the efficacy of vaginal pressure biofeedback-assisted pelvic floor muscle training (PFMT) for stress urinary incontinence (SUI) and to determine the patient characteristics predictive of success. *Methods:* Seventy-two women with SUI were randomized to vaginal pressure biofeedback-assisted PFMT (PFMT group, n=36) or health education with ventral muscle exercise (control group, n=36) for 4 weeks. As primary outcome measures, subjective symptoms were assessed by International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF), pelvic floor muscle force (PFMF) were assessed by maximum vaginal squeeze pressure with dynameter. Changes in the outcomes were assessed before and after 4 weeks exercise. *Results:* Off the standard cases were 6 and 1 in the PFMT group and control group respectively. The scores of ICIQ-SF significantly decreased in both groups after therapy (p<0.01), and the PFMT group decreased more than control group (2.47±1.24 vs 0.51±0.89, p<0.01). The PFMF significantly increased in PFMT group after therapy (p<0.01), it was not significant (p> 0.05) in the control group. The PFMT group increased more than control group (1.20±0.89 vs 0.11±0.40, p<0.01). *Conclusions:* The results indicate that vaginal pressure biofeedback-assisted PFMT is effective for treating SUI.

PO-0234

REHABILITATION ON SPIROMETRY AND EXERCISE TOLERANCE IN HOSPITALIZED PATIENTS UNDERGOING CORONARY ARTERY BYPASS SURGERY

Yuewen Ma[1], Jiaqi Zhu[1], Tianxiang Gu[2], Yuhai Zhang[2]
[1]Dept. of Rehabilitation Medicine, First Hospital of China Medical University, China, [2]Dept. of Cardiac Surgery, First Hospital of China Medical University, China

Objective: To verify whether the early postoperative cardiopulmonary rehabilitation might help to decrease postoperative respiratory dysfunction and increase exercise tolerance. *Methods:* 40 patients of both genders after coronary artery bypass graft (CABG) were assigned to two groups. 20 patients were included in a rehabilitative program of 2 weeks for postoperative respiratory training, exercise training, risk factor management, disease counseling and psychosocial interventions. The other 20 patients received general advice and did not train the inspiratory muscle. Spirometry, the 6-min walking test (6MWT) and Short-Form Health Survey-36 item (SF-36) were evaluated in both groups in the 15th day after operation. *Results:* We observed that cardiopulmonary rehabilitation increased the forced expiratory volume in first second (FEV1) (69.11±10.13 vs. 58.57±12.89, p<0.01) and forced vital capacity (FVC) (71.48±11.01 vs. 63.57±12.60, p<0.05). The evolution of the 6MWT (354.75±85.83 vs. 295.60±67.83, p<0.05) and SF-36

measuring (97.64±12.61 vs. 87.19±11.80, $p<0.05$) was with the outcomes also being similar. *Conclusion:* We concluded that for the patients after CABG, early cardiopulmonary rehabilitation can improve the spirometry results, exercise tolerance and quality of life.

PO-0235

EFFECT OF ACUPOINT CATGUT EMBEDDING AND SALMETEROL/FLUTICASONE PMPIONATE ON CLINICAL OBSERVATION AND IMMUNITY IN PATIENTS WITH ASTHMA

Su-E Shen, Jing Su, Xiao-Yan Gu, Ning Shang, De-Sheng Jiang
Department of Rehabilitation Physiotherapy, China

Objective: To investigate the effect of acupoint catgut embedding and salmeterol/fluticasone pmpionate on clinical observation and immunity in the treatment of asthmatic patients. *Methods:* 70 asthmatic patients were randomly divided into treatment group (35 cases) and control group (35 cases). The patients in the treatment group mainly received acupoint catgut embedding and salmeterol/fluticasone pmpionate therapy. The patients in the control group were given salmeterol/fluticasone therapy only. The clinical symptom score (ACT), lung function, serum IL-4 and IFNγ levels, and T cell subsets were detected before and after treatment for 3 months. *Results:* After treatment, ACT score and lung function of the two groups were improved, while ACT score, FEV1 /% and FEV1/FVC (%) of treatment group were superior than those of control group ($p<0.05$); Both the number of CD4+ cells and the ratio of CD4+/CD8+ in treatment group were highter than before treatment (all $p<0.05$). Interestingly, serum level of IL-4 in the treatment group were lower than before ($p<0.05$), but IFN-γ was increased ($p<0.05$). Moreover, IFN-γ in the treatment group was significantly higher than that of control group ($p<0.05$). *Conclusion:* Acupoint catgut embedding and salmeterol/fluticasone pmpionate therapy could effectively improve the symptom and lung function of asthmatic patients, as well as ameliorating cell immunity.

PO-0236

CLINICAL ANALYSIS OF 7 VENOUS THROMBOEMBOLIC EVENTS IN REHABILITATION SETTING

Chuandao Liu, Huai He, Weixin Yang
First Affiliated Hospital of Suzhou University, China

Objective: To strengthen physiatrist's knowledge of diagnosis and treatment of venous thromboembolism by analysis of 7 venous thromboembolic events in rehabilitation setting. *Method:* Seven cases with venous thromboembolism (VTE) in our department were involved in this study. Related data of these patients were collected, investigated and analyzed. *Results:* Among the 7 thromboembolic events, 6 cases were deep venous thrombosis (DVT), one case was pulmonary embolism (PE). The patients with DVT were treated successfully by thrombolytic and/or anticoagulant therapy as well as later rehabilitation treatment, and the patient with PE was cured after intra-arterial mechanical thrombolysis therapy and later anticoagulant therapy. *Conclusion:* Prevention and treatment of VTE is becoming a very important issue in rehabilitation setting with rehabilitation development in our country. Active prevention, early recognition and treatment are very important for the prognosis of patients with VTE.

PO-0237

GUIDELINES ON REHABILITATION IN BREAST CANCER-RELATED LYMPHEDEMA

Maira Saul[1], Christina May Moran Brito[1], Maria Inês Paes Lourenção[1], Mellik Bazan[1], Priscilla Otsubo[1], Marta Imamura[2], Linamara Rizzo Battistella[2]
[1]Serviço de Reabilitação do Instituto do Câncer do Estado de São Paulo da Faculdade de Medicina da Universidade de São Paulo,Brazil, [2]Clinical Research Center, Institute of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation, Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objective: To review the literature and make recommendations about Rehabilitation interventions for Breast cancer-related lymphedema. *Method:* Pubmed search of clinical trials using P.I.C.O. strategy to answer questions about interventions in Breast cancer-related Lymphedema rehabilitation. Search included: Breast Neoplasm, Mastectomy; Lymph Node Excision, Lymphedema, Exercise, Complex Decongestive Therapy, Compression Bandages, Physical Therapy Modalities, Early Intervention, Prevention and Control, Postoperative Care, Recovery of Function, Rehabilitation. Quality was assessed by JADAD score with evidence A) Experimental and Observational studies of better consistency and B) Experimental and Observational studies of lower consistency. *Results:* 17 articles were included. Manual Lymphatic Drainage (MLD) plus kinesiotherapy and/ or compressive bandages help controlling lymphedema in early stages. MLD alone does not show any benefit (B). Compression Bandaging with alginate-drenched and Compression Armsleeves may reduce the volume of lymphedema by 1 cm at each perimetry (B). Intermittent Pneumatic Compression is not effective alone (B), but If combined with compressive bandage/ armsleeves and MLD is effective in reducing the volume of the lymphedema by at least 1 cm in each perimetry (B). Early physiotherapy can reduce 8% to 53% the incidence of Lymphedema (B). Physical activities should be encouraged starting the day after the lymph node ressection with less repetitions and low weight, expecting a reduction and control of the volume in the future (B). *Implications/Impact on rehabilitation:* Early physical therapy intervention, supervised exercise, compressive bandages or armsleeves, Intermitent compression (combined with manual lymphatic drainage) help prevent, reduce and control Breast Cancer-related Lymphedema.

PO-0238

STUDY REGARDING THE IMPACT OF URINARY INFECTIONS IN THE REHABILITATION PROGRAM IN PATIENTS WITH STROKE

Sarah Adriana Nica[1,2]*, Gilda Mologhianu[1,2], Lili Silvia Miron[2], Brandusa Ilinca Mitoiu[1,2]
[1]University of Medicine and Pharmacy Bucharest, Romania, [2]National Institute of Rehabilitation Bucharest, Romania

Objective: Complex rehabilitation program of stroke patients has among its main objectives the aim to restore the functionality of the body segment affected by disease,in order to gain the ability to perform ADL and to have a better quality of life. In the clinical practice one frequent situation encountered is the presence of urinary tract infections. *Material and Method:* We analyzed the patients admitted in our clinic, from December 2010- December 2012 (total-2,458 patients, stroke patients- 1,452). The patients with stroke have been divided in 2 subgroups: group I -patients with history of urinary tract infections before the stroke (487) and the group of patients with no urinary infections before the stroke (995) - group II. 15 patients from the second group were with permanent urinary catheter. They were assessed from clinical-functional and paraclinic point of view. It was performed urinalysis, urine culture and sensitivity. All patients were evaluated with pelvic ultrasound. They received complex rehabilitation program for 2 weeks. *Results:* In group I we observed that 336 patients had urinary infections with known germ, but with no sensibility to the tested antibiotics. 56 patients had clinical symptoms, but no germs in the urine culture.

In group II 296 patients had urinary infections with known germ but no sensibility to tested antibiotics.116 patients had clinical symptoms, but no germs in the urine culture. *Implications/Impact on rehabilitation:* The urinary infection is a known risk factor to increase the degree of spasticity in stroke patients. There for, any infection, and such was in our study (urinary tract infections), should be treated very good.

PO-0239

PSYCHOLOGICAL OUTCOME OF CARDIAC REHABILITATION PROGRAMME AMONG D.A.S.S. POSITIVE PATIENTS ENROLLED IN HOSPITAL SERDANG

MY Saari[1], A Atikah[1]., I Zurianti[1], J Rohana[1], NA Harris[2], KZ Athirah[2], N Asiyah[2], AN Nurul[2], A Sakinah[2]

[1]Medical Rehabilitation Department, Hospital Serdang, [2]Medical Faculty, International Islamic University of Malaysia

Objective: To measure psychological outcome of cardiac rehabilitation programme among D.A.S.S. positive enrolled in Hospital Serdang. *Method:* A retrospective cohort study design, whereby a collection data was obtained from recorded notes of the participants of cardiac rehabilitation who had completed phase 3 medical surveillance. *Result:* Fifteen (20.83%) out of 72 participants were psychologically distress based on DASS at initial evaluation of CRP and upon completion there is 60% significant overall improvement noted ($Z=-2.196$, $p=0.013$). Further analysis also done on individual components of DASS (i.e. depression, anxiety and stress) and we found that only anxiety modelled a statistical significant improvement of severity after completion of CRP ($Z=-2.127$, $p=0.033$). However, individual phases of CRP failed to give an impact independently ($p>0.05$). *Conclusion:* This study has shown that CRP did have an impact on psychological status of participants if complete adherence and compliance is meeting. Hence, the findings of this research should be used to further emphasize the need of clinical preventive medicines such as CRP integrated in the treatment equation of cardiac patients. D.A.S.S=Depression Anxiety Stress Scales, *CR*P*=Cardiac Rehabilitation Program.

PO-0240

RELATION BETWEEN OBESITY AND ARTERIAL STIFFNESS IN YOUNG INDIVIDUALS

Claudiu Avram

West University of Timisoara, Romania

Objective: Studies demonstrated a linear age-related increase in arterial stiffness, but the influence of obesity on arterial stiffness in young individuals without comorbidities is not well established. The aim of the current study was to determine the influence of obesity degree on arterial stiffness and hemodynamic parameters in a cohort of overweight and obese individuals. *Method:* We perform a cross-sectional study on 236 Caucasian young obese patients (mean age: 22±4.8 years, mean body mass index: 29.2±3.3 kg/m^2). Subjects with hypertension (peripheral blood pressure ≥140/90 mm Hg), diabetes mellitus, hypercholesterolemia, cardiovascular or renal disease (defined as a clinical history) were excluded from the analysis. This yielded a total of 184 individuals who were available for the current analyses. Hemodynamic and arterial stiffness parameters were calculated with the patient in the supine position using the oscillometric technique (Arteriograph, Hungary). *Results:* The linear regression analysis show that there is a positive relation between body mass index, pulse wave velocity ($r^2=0.34$, $p<0.001$) and central systolic blood pressure ($r^2=0.24$, $p<0.001$) and there is a negative relation between body mass index and ejection duration ($r^2=0.22$, $p<0.001$). Waist circumference (a common index of abdominal obesity) correlates significantly with resting heart rate ($r^2=0.14$, $p<0.001$) and pulse wave velocity ($r^2=0.24$, $p<0.001$). *Implications on Rehabilitation:* Studies show that arterial stiffness is an independent predictor of cardiovascular and total mortality. The present study suggests that obesity degree and abdominal obesity increase aortic blood pressure and arterial stiffness of young obese individuals. Cardiovascular prevention and rehabilitation programmes should be addressed to young obese patients in order to reduce their cardiovascular risk.

PO-0241

CLINICAL IMPLICATION OF ARTIFICIAL EXTERNAL GLOTTIC DEVICE FOR TRACHEOSTOMY DECANNULATION

Hooyoung Lee, Seongwoong Kang*, Wonah Choi, Jungwha Choi, Hyunjung Kang

Yonsei University College of Medicine, Korea

Objective: High cervical cord injuries and neuromuscular diseases develop respiratory muscle weakness which often require tracheostomy. Tracheostomy impairs glottis function and make PCF uncheckable or inacuurate. In the present study, we measured assisted PCF using an artificial external glottic device (APCF-AG) in tracheostomized patients. Also, clinical implication of using the device in PCF measurement for deciding decannulation was studied. *Method:* The study was conducted on 14 (12 male, 2 female) tracheostomized patients (8 spinal cord injuries, 6 neuromuscular diseases) whose PCF were uncheckable or were below 160 L/min. We measured and compared spontaneous PCF (UPCF), PCF assisted with manual assist (APCF), spontaneous PCF after applying the device (UPCF-AG), PCF assisted with maximal insufflation and manual assist after applying the device (APCF-AG). PCFs measured in the spontaneous method and the device assisted method were directly compared. After all of the subjects succeeded in decannulation, unassisted and assisted PCFs in the spontaneous method and the device assisted method were measured. Wilcoxon signed-rank test was used to determine the statistical significance. *Result:* UPCF was measured 37.86 L/min, APCF 22.14 L/min, UPCF-AG 44.29 L/min, and APCF-AG 230.71 L/min, respectively. APCF-AG was measured significantly greater than both APCF and 160 L/min ($p<0.0001$). After decannulation, PCF of 13 subjects were evaluated. Mean UPCF was measured 144.6 L/min and mean APCF was 286.1 L/min. *Implication/Impact on rehabilitation:* Measurement of APCF-AG allows objective and safe analysis of expectoration ability and contribute to greater chance of decannulation. APCF-AG above 160 L/min is suggested as a new deccanulation criterion.

PO-0242

IMPROVEMENT OF TASTE SENSITIVITY BY PULMONARY REHABILITATION IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Kumiko Ito, Satoru Ebihara*, Peijun Gui, Naohiro Kashiwazaki, Masahiro Kohzuki

Tohoku University Graduate Scnool of Medicine, Japan

Background and Objective: Loss of body weight is an adverse prognostic factor in patients with Chronic Obstructive Pulmonary Disease (COPD). Anorexia may contribute to weight loss in patients with COPD. Change in taste perception is postulated to be associated with anorexia. Although pulmonary rehabilitation is known to improve exercise performance and quality of life (QOL) in patients with COPD, the relationship between pulmonary rehabilitation and taste perception has not been evaluated yet. The objective of this study was to determine if there were any taste recognition threshold differences between before and after pulmonary rehabilitations in patients with COPD. *Methods:* 22 subjects (17 males, 5 females, mean age 72.4 ± 8.6 [SD] years old) were willing and eligible to participate. Taste perception was estimated by the filter-paper disc method for 5 tastants before and after pulmonary rehabilitations. Tastants are salty, sweet, sour, umami and bitter tastes. 6-min walk

distance (6MWD), COPD assessment test (CAT) and body mass index (BMI) were also evaluated before and after pulmonary rehabilitations. The analysis for the effects of pulmonary rehabilitation was conducted on alterations of 6MWD, CAT, BMI and 5 taste recognition thresholds with paired *t*-test. *Results:* 6MWD, CAT and salty, sweet, umami and bitter recognition thresholds were significantly improved (p=0.001, p=0.004, p=0.001, p=0.036, p=0.004 and p=0.027, respectively) whereas BMI and sour recognition thresholds did not change significantly by pulmonary rehabilitation. *Conclusion and impact on rehabilitation:* These results suggest that the pulmonary rehabilitation may improve taste perception in patients with COPD.

PO-0243

EFFECT OF BLADDER TRAINING ON NEUROGENIC BLADDER FOLLOWING SPINAL CORD INJURY

Youhui Gong, Weiwei Li
Jiangsu Shengze Hospital, Wujiang 215228, China

Objective: To study the effect of bladder training on neurogenic bladder following spinal cord injury. *Method:* Thirty patients who suffered from neurogenic bladder following spinal cord injury were involved in this study. All of the patients were given the treatment of intermittent catheterization, Crede method, Valsalva method, promoting urination technique. The treatment lasted for 8 weeks. The safe capacity and residual urine volume were recorded before and after training. *Results:* After 8 weeks training, 23 patients can urinate by themselves. The safe capacity was significantly increased while the residual urine volume was significantly decreased (p<0.05). *Conclusion:* The bladder training on neurogenic bladder following SCI can improve the condition of bladder.

PO-0244

THE EVALUATION OF CHRONIC DISEASE SELF-MANAGEMENT PROGRAM OF KUNMING

Lifen Zhang, Lei Wang, Fengling Wang, Moxian Chen
Department of Rehabilitation and Physiotherapy, Kun Ming Medical College, Kunming, Yunnan Province, China

Object: Although the aging process in China is intensifying, no sophisticated chronic disease self-management mechanism has been well established. Older adults lack the knowledge of their own condition, therefore through education of self-management could be efficient to improve health status and quality of daily living. *Method:* The paper randomly recruited 23 volunteers who were diagnosed with at least one chronic condition within Kunming city region to participate the Chronic Disease Self-management Program, CDSMP. All samples aged from 49 to 77 years old, and participated the program once a week for six weeks. The two administrators of the program were trained and approved by Patient Education Research Center of Stanford University. The outcome of the participants was analyzed to determine any changes. *Results:* After the program, the participants showed improvements in the following areas: 1) Energy level: 2) Motivation for physical exercises: 3) Adjustment of negative mood and feelings: 4) Confidence of coping with disease: 5) Reduced frequency of seeing a doctor: 6) Communication with health workers. *Conclusion:* The chronic disease self-management program is effective in enhancing patients' understanding of the disease, ability of self control and confidence of managing the condition, thus improve the quality of life.

PO-0247

SONOELASTOGRAPHIC FINDINGS ACCORDING TO SPASTICITY OF ELBOW FLEXOR IN POST-STROKE HEMIPLEGIA

Gi-Young Park, Dong Rak Kwon, Wonhub Lee
Catholic University of Daegu School of Medicine, Korea

Objective: To investigate muscle architecture and elastic property of spastic elbow flexor and to evaluate the correlation between clinical findings of spastic elbow flexor and parameters of real-time sonoelastography (RTS) in post-stroke hemiplegia. *Materials and Methods:* Nineteen patients (15 males and 4 females, mean age 55 years, mean duration after stroke 43 months) with post-stroke hemiplegia were included. Nineteen affected and 19 unaffected arms were evaluated. Clinical outcomes were assessed using modified Ashworth scale (MAS) score for elbow flexor spasticity and Medical Research Council (MRC) grade for muscle strength of elbow flexor, and Brunnstrom stage of upper limb. RTS image indicates the relative hardness of the examined muscles ranged from red (hard) to purple (soft) for color-scale, and from black (hard) to white (soft) for hue scale. Color and hue histogram of the biceps and brachialis were analyzed using Image J software, and median red, blue, and hue pixel intensity was obtained. *Results:* MAS score, MRC grade, and Brunnstrom stage of the affected elbow flexor were 2.3 ± 1.3, 2.8 ± 0.9, and 3.5 ± 1.0, respectively. Thickness of affected brachialis and biceps was significantly lower than unaffected ones (19.6 mm ± 5.3 and 8.3 mm ± 2.2 vs. 23.1 mm ± 4.2 and 10.8 mm ± 2.8, p<0.05). Red pixel intensity of affected biceps and brachialis was significantly higher than those of unaffected side. (139.7 ± 10.7 and 149.5 ± 12.8 vs. 129.8 ± 7.8 and 139.4 ± 6.9, p<0.05) Hue and red pixel intensities of biceps were significantly higher/lower than those of brachialis in both sides (p<0.05). MAS score of the affected elbow flexor was negatively correlated with hue and blue pixel intensity in affected brachialis (r=-0.756/-0.631, p<.01). There was no correlation between MRC grade and pixel intensities in affected elbow flexor. *Conclusion:* Our study revealed that red pixel intensity on RTS was significantly different between affected and unaffected elbow flexor in post-stroke hemiplegia. Hue pixel intensity of affected brachialis was significantly correlated with the spasticity of affected elbow flexor. Therefore, RTS can be used as an useful imaging method to assess the biomechanical property of spastic elbow flexor in patients with post-stroke hemiplegia.

PO-0248

MEETING THE CHALLENGES IN ADMITTING ACUTE REHAB PATIENTS IN THE UNITED STATES

Eileen Kowal
Rusk Institute of Rehabilitation Medicine, United States

The process of selecting and admitting patients to acute rehabilitation facilities in the United States has significantly evolved over the past few years. This discussion will provide detail how the Prospective Payment System (PPS) and the 75% Rule impact the selection of acute rehab patients. It will also demonstrate how these government rules have shifted patients from the acute rehab arena into other institutions like subacutes or to home environments. Before the advent of the PPS (Prospective Payment System) with its '75% rule', our goal was to admit 'appropriate' and medically stable patients who could benefit from three h of therapy a day and who have a viable discharge plan. This 75% rule, which has recently been changed to the CMS 60% Rule requires that 60% of all patients admitted to acute inpatient rehab facilities fall into one of 13 Qualifying Conditions. Patients who were admitted in the past like those with a single joint replacement or a cardiac diagnosis need to be limited to maintain that 60% of all admission are Qualifying Conditions. Documentation becomes even more crucial to insure that it supports the Qualifying Condition or impairment that has been selected. The identification of Comorbid conditions are another crucial part of this process. They are specific patient conditions secondary to the patient's principal diagnosis. For PPS reimbursement, active comorbidities can provide additional hospital reimbursement. They also help us prove that the patient needs to be

in an acute rehab setting because they have medical necessity for such. They are conditions that require medical management, and increase burden of case as well as affecting the patient's functional performance. The lecture will include how the clinical liaisons in the Admitting Department assess potential patients for admission and maintain at least 60% 'compliant' cases. It will also provide information about criteria, preadmission documentation, referral source marketing and patient/family education. The standards that the Medicare payors (our primary payor source) are looking for have provided many challenges for the rehab staff. Our strategies for meeting these standards will be shared.

PO-0249

NEW INSIGHTS IN THE PHYSIATRIC APPROACH TO KNEE OSTEOARTHRITIS

Francesca Gimigliano*, Giovanni Iolascon
Second University of Naples, Italy

The increased aging of the population worldwide has led to a rise in chronic degenerative diseases, including osteoarthritis (OA). Historically osteoarthritis (OA) has been classified as 'primary' and 'secondary' according to the presence or not of a known cause. The classification of OA is usually based on clinical and radiographic observations in subjects with an advanced stage of disease (Kellgren & Lawrence classification). Late-stage OA is usually characterized by articular cartilage attrition and therefore the anatomical basis for disease has been viewed in terms of cartilage, even though the widespread application of magnetic resonance imaging in early OA has confirmed several different anatomical abnormalities within diseased joints. Recently McGonagle et al. proposed a novel classification making a distinction between cartilage-, ligament-, bone-, meniscal- and synovial-derived OA, together with disease that can be classified as being of multifocal origin. This anatomical OA classification permits the development of a logical site-specific approach to both diagnosis and therapy in early disease. This site-specific anatomical classification would certainly help to program the most appropriate rehabilitative approach.

PO-0250

INTEGRATING PATIENT-REPORTED OUTCOME MEASURES AND COMPUTERIZED ADAPTIVE TEST ESTIMATES ON THE SAME COMMON METRIC: AN EXAMPLE FROM THE ASSESSMENT OF PHYSICAL ACTIVITIES IN RHEUMATOID ARTHRITIS

Beyza Doganay Erdogan[1], Atilla H. Elhan[1], O. Tolga Kaskati[1], Derya Oztuna[1], Ayse A. Kucukdeveci[2]*, Kutlay Sehim[2], Alan Tennant[1]
[1]Faculty of Medicine, Department of Biostatistics, Ankara University, Ankara, Turkey,Turkey, [2]Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Ankara University, Ankara, Turkey,Turkey, [3]Department of Rehabilitation Medicine, Faculty of Medicine and Health, Leeds University, Leeds, UK, Turkey

Objective: The aim of this study was to explore the potential of a fully-integrated measurement system for activity limitations, as defined in the International Classification of Functioning, Disability and Health, incorporating classical patient-reported outcome measures and Computerized Adaptive Testing (CAT). *Method:* A total of 300 outpatients (mean age 52, 75% female) with rheumatoid arthritis (RA) responded to relevant questions from a range of questionnaires. Data were then fitted to the Rasch model in order to create an item bank. Then a further 100 RA patients were asked to complete both the full item bank (θRasch) and CAT application (θCAT). By using an anchored test-equating procedure, a direct translation from the item bank to a traditional patient-reported outcome measure, Health Assessment Questionnaire (HAQ), was sought. *Results:* Fifty items were identified as relevant. After adjustment for local dependency and misfit, 28 items were calibrated on a unidimensional interval scale common metric. CAT used a mean of 7 items to estimate θCAT. The agreement between θRasch and θCAT was high (Intra-class correlation coefficient 0.97). A conversion table for the common metric item bank to the HAQ scores was successfully provided. *Implications/Impact on rehabilitation:* Modern measurement estimates satisfying Rasch model requirements can be fully compatible to the conventional patient-reported scales which are routinely used for outcome measurement in rehabilitation.

PO-0251

INTER-RATER RELIABILITY OF EIPCIOS

Zhe-Min Lin, Shih-Heng Sun*, Ya-Hwe Hung
China Medical University, Chinese Taipei

Objective: Nowadays, family centered approach becomes the mainstream of early intervention. Early intervention services focus not only on the development of the child, but also on the families that take care of the child. "Early Intervention Parent-Child Interaction Observation Scale" (EIPCIOS) was a newly developed tool that evaluates parenting ability in early intervention. The aim of this study was to investigate the inter-rater reliability of the EIPCIOS. *Method:* Eighty parents and their children recruited from local Early Intervention Notification and Referral Centers (EINRC) and Early Intervention Case Management Centers (EICMC). Parent and child were video-recorded when they interact in two scenarios "playing blocks" and "playing balls". Two independent evaluators using EIPCIOS scored the interactions. *Results:* Five dyads were randomly selected for inter-rater reliability test. The results showed the Pearson' correlation coefficient reached high level of correlations ("playing blocks", r=0.833, $p<0.01$; "playing with balls", r=0.984, $p<0.01$). *Implications/Impact on rehabilitation:* Parent-child interaction can be used as in indicator for outcome evaluation in early intervention programs. This study support that EIPCIOS exhibits good inter-rater reliability. The results of EIPCIOS were consistent when different evaluators use it to assess the same dyad.

PO-0252

STUDY ON THE RELIABILITY AND VALIDITY OF THE ICF-CY MOTOR SETS FOR THE CHILDREN WITH CEREBRAL PALSY

Fuxiang Song[1,2,3], Xiaojie Li[1,2,3], Wei Pang[1,2,3]
[1]Third Affiliated Hospital of Jiamusi University; Jiamusi, Heilongjiang, China, [2]Children Neural Rehabilitation Laboratory of Jiamusi University, Jiamusi, Heilongjiang, China, [3]Rehabilitation College of Jiamusi University, Jiamusi, Heilongjiang, China

Objective: To analyze and study the reliability and validity of the International Classification of Functioning, Disability and Health-Children and Youth Version (ICF-CY) motor sets for the children with cerebral palsy. And to discuss the clinical practical values of ICF-CY motor sets. *Method:* Fifty children with cerebral palsy were involved in this study. The functional evaluation were assessed by ICF-CY motor sets, the Gross Motor Function Measure (GMFM), Peabodymotor developmental measure scale and PEDI children ability evaluation measure scale. The inter-rater reliability was analyzed using Kappa correlation statistics. The concurrent criterion validity was analyzed by Spearman rank correlation coefficients. *Result:* Except "moving around by using the means of transport", Kappa value of the other categories are 0.650-0.902 from moderate to excellent. Correlation analyses showed that the total score of the ICF-CY motor sets except "moving around by using the means of transport" were highly associated with scores of GMFM, Peabody and PEDI. Spearman's rho in GMFM, Peabody and PEDI were -0.967, -0.832, -0.874, respectively ($p<0.01$). *Implications/Impact on rehabilitation:* The ICF-CY motor sets is reliable and valid as a measurement for the children with cerebral palsy.

PO-0253

THE CORRESPONENCE OF PARAMETERS BETWEEN HIGH-RESOLUTION MANOMETRY AND VIDEO FLUOROSCOPIC SWALLOWING STUDY DURING THE PHARYNGEAL PHASE OF SWALLOWING

Zulin Dou, Yue Lan, Guifang Wan, Ming Liang, Fan Yu
The Department of Rehabilitation Medicine, The Third affiliated hospital of Sun Yat-sen University,Tianhe Road, No 600, Guangzhou, Guangdong, China

Objective: The objective of the current study was to evaluate the correlation between the pharyngeal constriction ratio (PCR) and pharyngeal maximum pressure, upper esophageal sphincter (UES) opening size and UES Nadir pressure. *Methods:* Swallowing function was examined using videofluoroscopy (VFSS) and high-resolution manometry in 24 stroke patients with dysphagia. PCR is the pharyngeal area (including residual bolus material) visible in the lateral radiographic view at the point of maximum pharyngeal constriction during swallow divided by the area with blous held in the oral cavity. UES opening size is the widest portion of the bolus flow at the level of C4-C6 by drawing a horizontal line across it. Pharyngeal maximum pressure and UES Nadir pressure were measured by manometry. Spearman's analyses were used to evaluate the correlation between manometric and fluoroscopic variables. *Results:* Increases in pressure wave amplitude were significantly correlated with decreased PCR (r=-0.849, p<0.0001).Increase in UES opening size were significantly correlated with decreased UES nadir pressure (r=-0.609, p<0.0001). Certain VFSS measures were significantly correlatedwith measures of pressure assessed with manometry. Measures from VFSS may be deemed sufficient for determining pressure-generation difficulties during the swallow in patients who are unable or unwilling to submit to manometric testing. *Implications:* The nutility of an objective fluoroscopic measure in assessing pharyngeal strength and UES relaxation function when manometry may not be available or possible. Pharyngeal manometry complements the modified barium swallow with videofluoroscopy (VFSS) in diagnosing pressure-related causes of dysphagia.

PO-0254

ITEMS FROM BERG BALANCE SCALE CAN BE CONSTRUCED AN ICF INTERVAL SCALE TO REALIZE CONVERSION BETWEEN SCORES AND ICF QUALIFIER

Pu Wang[1,2], Junmei Zhang[3], Huagang Li[4], Yuxiao Xie[5], Ruidong Ge[5], Zhuoying Qiu[6], Yi Guo[7]
[1]Department of Rehabilitation Medicine, West China Hospital, Sichuan University, Chengdu, 610040 Sichuan Province, China, [2]Sichuan Province Key Laboratory of Rehabilitation Medicine, Chengdu, Sichuan Province, China, [3]Department of Sports, Wuhan University of Technology, Wuhan, Hubei Province, China, [4]Department of Neurology, Zhongnan Hospital, Wuhan University, Wuhan, Hubei Province, China, [5]Department of Rehabilitation Medicine, China-Japan Friendship Hospital, Beijing, China, [6]Institute of Rehabilitation Information, Chinese Rehabilitation Research Center, Beijing, China, [7]Department of Epidemiology, Wuhan University, Wuhan, Hubei Province, China

Objective: The aim of this study was to exemplify the construction of an interval scales for "d415 Maintaining a body position" of the International Classification of Functioning, Disability and Health (ICF) by reintegrating items from clinical test-Berg Balance Scale to realize conversion between scores and ICF qualifier. *Method:* Constructing interval scales for "d415 Maintaining a body position" of ICF by reintegrating items from Berg Balance Scale. Psychometric study using data from a convenience sample of 208 patients with post-stroke. The contents of berg balance scale items were linked to the ICF categories. The modern psychometric method-Rasch analyses for ordered-response options were used to examine whether these items addressing the ICF category "d415 Maintaining a body position" constitute a psychometrically sound interval scale. *Results:* Ten items from BBS were linked to "d415 Maintaining a body position". Seven of the 10 items fit the Rasch model according to the chi-square ($\chi 2$) statistic ($\chi 2$ df=14 =14.959, p=0.381) and the Z-fit statistic (Z mean=-0.513, ZSD =1.140 and Z mean =-0.378, Z SD =1.056 for itmes and persons, respectively). The Person Separation Index $\gamma\beta$ was 0.931. Interval scales of"d415 Maintaining a body position"could be constructed to serve as an interface between the clinical test and ICF. The original format of the items included in the interval scales remains unchanged. *Impact on rehabilitation:* The ICF category interval scales to operationalize single ICF categories can be constructed. This study represents a step forward in the operationalization and future implementation of the ICF, instruments of ICF and ICF qualifier.

PO-0255

CLINICAL VALUE OF FOUR-POINT METHOD TO MEASURE JOINT ANGLE

Wenchao Yi[1], Jianping Hu[2], Jianan Li[1]
[1]Physical medicine and rehabilitation department of Nanjing Medical University affiliated first hospital, Nanjing, China, [2]Nanjing bo sea rehabilitation hospitalhospital, Nanjing, China

Objective: To study the clinical value of four-point method (FP) to measure joint angle. *Subjects and methods:* Twenty five subjects without knee dysfunction were studied. Every knee joint was tested on three different positions which were extension, below 90 degree flexion and above 90 degree flexion by the traditional three-point method (TP) and the new four-point method (FP). Use X-ray as the gold standard. Analyze the data using Bland-Altman plots which can obtain the 95% limits of agreement (LOA). *Results:* 1. Joint measurement center moved when the position changed. 2. Reliability tests showed that the 95% LOA of the inter-tester reliability was (-5.0, 2.7) with FP and (-6.5, 4.4) with TP. The 95%LOAs of the intra-tester reliability were (-3.6, 4.0) and (-4.1, 4.8) with FP, while (-5.0, 6.4) and (-6.1, 5.8) with TP. 3. Validity tests showed that the 95%LOAs of the three positions aforementioned were (-3.5, 2.6), (-3.3, 3.6) and (-1.9, 5.7) accordingly with FP. And (-6.8, 1.1), (-4.0, 7.1) and (0, 8.5) were the results with TP. *Conclusion:* The results of this study indicated that FP was better than TP either in reliability or in validity.

PO-0256

GONIOMETRIC MEASUREMENT: A COMPARATIVE STUDY OF DISTAL INTERPHALANGEAL JOINT IN DIFFERENT POSITION AND IN DIFFERENT AGE

Anjing Zhang[1,2], Fang Li[1,2]
[1]Department of Rehabilitation Medicine, East Hospital, Tongji University, Shanghai, China, [2]Department of Rehabilitation Medicine, Huashan Hospital, Fudan University, Shanghai, China

Objective: The range of motion (ROM) of distal interphalangeal (DIP) joint was measured in different positions in different aged participants using the universal goniometer. *Method:* One examiner measured AROM and PROM of DIP joint with the proximal interphalangeal (PIP) joint at flexion or extension positions twice on 40 healthy participants (20 young and 20 old adults). *Results:* Level of significance was set at p<0.05. At the same age group, the PIP joint flexion or extension were noted for flexion ROM of DIP joint. Whilst the PIP joint is kept at the same position, the active and the passive ROM of DIP joint are still significantly distinct. Additionally, the DIP active ROM measurements with PIP extension are much smaller than the DIP passive ROM measurements with PIP flexion. Significant differences (p<0.05) existed between the

young adults and the old adults at each position. *Implications:* In our study, we confirmed that hand position and age could influence the flexion ROM of DIP joint. This phenomenon could be closely related to the tendinous effect of DIP joint and its conjected joint. In addition, our study provided a useful starting point for treatment the DIP disorders.

PO-0257

TRANSLATION OF CHINESE VERSION OF PATIENT ACTIVATION MEASURE (PAM - 13) FOR USE IN PATIENTS WITH CHRONIC STROKE

Tai Wa Liu[1]*, Shamay S.Y. Ng[2]

[1]Nursing, School of Science and Technology, The Open University of Hong Kong, Hong Kong, China, [2]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong, China

Objective: The aims of the present study were to (1) translate the 13-item Patient Activation Measure (PAM-13) into Chinese (Cantonese) and perform cultural adaptation for Chinese patients with stroke; and (2) examine the internal consistency and test-retest reliability of the Chinese version of PAM -13. *Method:* Two bilingual professional translators forward- and backward-translated the English version PAM – 13 into Chinese. Then the translated version PAM – 13 was reviewed for content validity by an expert panel composed of 5 physiotherapists. Discussion and reconciliation among translators, investigators, and patients with stroke were held to produce the final version of scale (PAM-13-C). Then the PAM – 13 – C was administered to 60 subjects with chronic stroke to evaluate the internal consistency of PAM – 13 – C, of which 21 subjects were reassessed to establish test-retest reliability after a 1-week interval. *Results:* The PAM – 13 – C had good internal consistency with Cronbach α=0.86. Test-retest reliability was also reported to be good with intraclass correlation coefficients 0.81. *Implications/ impact on rehabilitation:* The PAM-13 – C is a reliable and useful tool for assessing the level of self-competency of physical activity in Chinese patients with chronic stroke. Future study on investigating the validity of PAM-13- C would provide further evidence to support the use of this assessment tool for evaluating activation level in-patient with strokes.

PO-0258

ADAPTATION AND VALIDATION OF THE OSWESTRY DISABILITY INDEX FOR LOW BACK PAIN FOR USE IN THE KINGDOM OF SAUDI ARABIA

Ali Garni

MOH,Saudi Arabia

Objective: To adapt and validate the Oswestry index for low back pain in the KSA population. *Background:* the Oswestry functional disability index to assess low back pain was adapted to the Tunisian population. *Patients and methods:* Arabic translation of the Oswestry index (items 8-10 missing in the Tunisian index) was obtained by the "forward translation/backward translation" method. Adaptations were made after a pilot study involving 30 patients aged 18 to 65 years old. Inter-rater reliability was assessed by use of the in Pearson coefficient. Construct validity was investigated with use of the Spearman rank correlation coefficient (convergent and divergent validity), and factor analysis was performed. Internal consistency was assessed by use of the Cronbach alpha coefficient. *Results:* One hundred saudian patients with low back pain were included in the validation study. No items were excluded. Pearson coefficient was excellent (ICC = 0.99). Expected divergent and convergent validity results suggested good construct validity. Two main factors were extracted by factor analysis and explained 63.5 % of the cumulative variance: the first factor represented discomfort in dynamic activities, the second discomfort in static activities *Conclusion:* We translated and adapted the Oswestry index for the Arabic language in a population of Saudi Arabian with low back pain. This version is reliable and valid. Although the scale was validated in a Tunisian population which is an arabo musulmann society, we found that some adaptation should be done when used in an another Arabic spoken society.

PO-0259

RELIABILITY AND VALIDITY OF METHODS FOR MEASURING HEAD POSTURE: A LITERATURE REVIEW

Jian Hua Lin[1], Grace P.Y. Szeto[2], Jia Hu[1]

[1]Department of Physiotherapy, Shanghai Sunshine Rehabilitation Center, Shanghai, PR China, [2]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hung Hom, Hong Kong

Objective: To evaluate the reliability and validity of the objective methods measuring head posture relative to the neck which are applicable to clinical practice. *Method:* Literature search was performed in the following computerized bibliographic databases: Medline, CINAHL, and Pubmed. Key words included "neck/cervical/spine/cervical spine", "head posture", "craniovertebral angle", "reliability/validity/reproducibility/repeatability", and derivatives of these terms. Two independent authors retrieved relevant studies, extracted data and evaluated the level of the reliability and/or validity of the instruments. Studies aiming to assess inter- and/or intra-rater reliability and/or validity of the instrument for measuring instantaneous posture of head on neck were selected. The categorization method described in Swinkels' study was adopted to assess the level of reliability and/or validity of instrument. *Results:* Six studies were selected in this review. Two categories of instruments including photographic imaging or goniometer were investigated. Five studies examine the reliability (Intraclass Correlation Coefficient: 0.34-0.98) and three evaluate the validity of the methods (Pearson correlation coefficient r: 0.71-1). Among those instruments, the Electronic Head Posture Instrument was found to be the most reliable (Intraclass Correlation Coefficient: 0.86-0.94) and valid (Pearson correlation coefficient r=1) instrument in measuring head posture in sagittal plane. *Implications:* This review provides clinicians a better understanding of appropriate selection of instrument to measure head posture in clinical practice.

PO-0260

CONTENT COMPARISONS OF DEPRESSION AND ANXIETY-SPECIFIC SCALES AND QUESTIONNAIRES BASED ON THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH

Junmei Zhang[1], Pu Wang[2,3]

[1]Department of Sports, Wuhan University of Technology, China, [2]Department of Rehabilitation Medicine, West China Hospital, Sichuan University, China, [3]Sichuan Province Key Laboratory of Rehabilitation Medicin, China

Purpose: To link the concepts underlying the depression and anxiety-specific scales and questionnaires with the international classification of functioning, disability and health (ICF). This will facilitate the understanding of the relationships between those scales and questionnaires between and the ICF. *Method:* Linking of concepts in the depression and anxiety-specific scales and questionnaires was carried out by two independently trained health care professionals who applied the standardized ten linking rules. The degree of agreement between the health care professionals was determined by kappa coefficients. *Results:* The 114 items of depression and anxiety-specific scales and questionnaires, 154 concepts were identified. The level of agreement between the health care professionals should that the Kappa coefficients ranged from 0.63 to 1. 15 concepts could not be linked to the ICF and were coded as

not covered. 139 were linked to the ICF categories for the following components: 11-body functions; 108-activity and participation and 20-environmental factors. *Implications:* Several categories of the ICF were linked to the items of depression and anxiety-specific scales and questionnaires, which acceptable levels of agreement. These categories were specific and meaningful for depression and anxiety subjects. The findings indicated that the ICF provided a useful framework for the conceptual understanding of the psychological problems, which demonstrated multiple representations of the ICF categories and covered a broad range of the ICF components that were meaningful for the depression and anxiety subjects.

PO-0261

VALIDATION OF THE POSTURE AND GAIT ASSESSMENT FOR STROKE PATIENTS (PGA-SP)

Etienne Allart[1]*, Caroline Rogeau[1], Julie Paquereau[2], Walter Daveluy[1], Odile Kozlowski[1], Marc Rousseaux[1]

[1]Neurorehabilitation unit, Lille University Hospital, France, [2]Neurorehabilitation unit, Sainte-Anne Hospital, Paris, France

Objective: Stroke often leads to posture and gait disturbances, whose evaluation generally separates impairments and activity limitations and don't address ecological aspects and patient's point of view. *Method:* The PGA-SP scale includes 30 items that assess the patient's (questionnaire, Q) and the examiner's (test, T) evaluation of main posture and gait disturbances in activities of daily living, evaluating both impairments and activity limitations. The aims of this pilot study were to begin the validation process (reliability, construct validity, internal consistency, predictive validity and feasibility) and to compare evaluations by patients and examiners. *Result:* Thirty-five stroke patients with a wide range of functional levels were included (Barthel Index=71.4 ± 19.7). Mean completion time was 25 ± 6 min for the Q and T parts. Intrarater reliability ranged from good to excellent (ICC > 0.82), interrater reliability was more moderate (0.67 < ICC < 0.9). The scale showed excellent construct validity against neuromotors deficiencies (motor weakness, spasticity; p<10-3), postural capacities (PASS; p<10-4), severity of gait impairments (GAITscale; p<10-3), gait capacities (NFAC, 10 mWalkTest; p<0.01) and functional level (p<10-4). Internal consistency (Cronbach-α > 0.84) and predictive validity were excellent. Finally, evaluations of patients and examiners were highly correlated (p<10-3). *Implications/Impact on rehabilitation:* The PGA-SP has good psychometric properties. It represents an innovative tool that could be of interest in the integrative evaluation of posture and gait disturbances, with both the patient and examiner points of view being represented.

PO-0262

APPLICATION OF LOWER EXTREMITY FUNCTIONAL SCALE IN LOW ACK PAIN AND SCIATICA

Kai-Shiang Chang[1], Huey-Wen Liang[1]*, Wen-Hsuan Hou[2,3]

[1]Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Taiwan, ROC, Chinese Taipei, [2]School of Geriatric Nursing and Care Management, College of Nursing, Taipei Medical University, Taipei, Taiwan, ROC, Chinese Taipei, [3]Department of Physical Medicine and Rehabilitation, Taipei Medical University Hospital, Taipei, Taiwan, ROC, Chinese Taipei

Objective: Lower extremity Functional Scale (LEFS) is region-specific functional questionnaire for lower limb disorders, but was not yet applied to neurological conditions, such as sciatica. The goal of the current study is to test the psychometric properties of LEFS for low back pain with or without sciatica and explore its applicability for further research in these patients. *Methods:* This cross-sectional study included patients who were aged at least 18 years and had low back pain with or without sciatica. The questionnaire included demographic data, back pain history, pain intensity by visual analogue scale (VAS), Roland-Morris Disability Questionnaire (RMQ) and LEFS. Only those reported at least 10 out of 100 on VAS were included. The data of 242 patients were analyzed and 40 of them were tested in average of 3.1 days. Internal consistency, test-retest reliability, floor and ceiling effects, dimensionality, and construct validity were studied. *Results:* No floor and ceiling effects were found for LEFS. LEFS had high internal consistency (Cronbach alpha: 0.94) and test-retest reliability (Intraclass correlation coefficient (2,1): 0.8). Principal component analysis identified one major factor that had an eigenvalue of 9.9 and explained 49.6% of the total variance. Correlations between LEFS and RMQ was larger than that between LEFS and VAS (–0.71 vs. –0.40). *Impact on Rehabilitation:* LEFS had satisfactory psychometric properties in low back pain with or without sciatica and could be an alternative outcome measure to assess their activity limitation.

PO-0263

A STUDY ON RELIABILITY AND VALIDITY OF THE CHINESE VERSION OF NATIONAL INSTITUTES OF HEALTH STROKE SCALE

Jialing Wu, Dongzhe Hou, Linying Zhang, Wanjun Wang, Chunlin Gao

Tianjin Huanhu Hospital, China

Objective: To study the reliability and validity of the Chinese Version of National Institutes of Health stroke scale (NIHSS). Subjects and *Method:* Totally 222 consecutive inpatients with acute stroke onset were included in the study. They were assessed when admitted, at the 14th and 90th day of hospitalization by different rators using the NIHSS. Intrarater and interrater were determined by using Kappa correlation. The split-half reliability and internal consistency were evaluated using Cronbach's α coefficient. Concurrent validity and the predictive validity were determined by spearman rank correlation coefficients. Construct validity was assessed by the factor analysis. *Results:* In the Chinese version of NIHSS, the items of "facial muscle function "and "ataxia" have modest reliability and the internal consistency is good as demonstrated by the score of Cronbach's α (0.861). The item of "facial muscle function" has low validity. There is not a specific item to evaluate the function of cerebellum and brain stem except the item of "ataxia". The scores of NIHSS have a high correlation with stroke outcome (both p=0.000). *Conclusion:* The Chinese version of NIHSS has a good internal consistency. It is consistently predictive of stroke outcome, focusing more on the evaluation of disorders of arteria carotis interna than those of vertebrobasilar artery. Addition of the items and/or weight to assess the function of cerebellum and brain stem is necessary.

PO-0264

SENSITIVITY AND INTER RATER RELIABILITY OF STROKE ICF BRIEF CORESET IN THE ACUTE SETTING

Nidhi Gupta

SWSLHD, Australia

Objective: Assess sensitivity and inter-rater reliability of Brief International Classification of Functioning, Disability and Health (ICF) stroke core set for measuring functional change in stroke patients in the acute hospital. *Background:* Efforts have been made to develop more generalized assessment tools using the ICF as a framework in a patients' journey from acute hospital to the community. *Methods/Design:* Cohort of 100 patients admitted with a diagnosis of stroke in the acute hospital. The patients were scored using the ICF qualifiers (scale 0-4) with 0 equalling no problem and 4 maximum problem (additional rough scoring guidelines added for each qualifier) for the 18 items in the brief stroke core-set.; 6 items for body function, 2 for body structure, 7 for activity and participation restriction and 3 for environmental factors. Analysis

of independently scored qualifiers on admission and discharge was done using the non parametric Wilcoxon signed rank test for each of the15 items to assess sensitivity. The inter rater reliability was tested using the kappa test (cutoff of 0.4) (environmental factors excluded). *Results:* Most items in the ICF brief core set showed improvement from admission to discharge but this did not reach clinical significance as most items had more than 50% paired tied results. Inter-rater reliability was generally acceptable except mental function of language and the environmental items (kappa score > 0.4). *Implications on Rehabilitation:* The ICF stroke brief core set demonstrates acceptable inter rater reliability in this study. Sensitivity in the acute setting is limited, as in most cases there is little or no change in the ICF qualifiers between admission and discharge. Further research into the implications of this is required. In particular comparison to changes in other measures eg the FIM would demonstrate if this is a lack of sensitivity of the ICF brief core set for stroke or reflects an absence of change in the patient status during their inpatient state in the acute stroke unit.

PO-0265

AN ANALYSIS OF THE EFFECTIVENESS OF DIFFERENT TIME OF PSYCHOLOGICAL REHABILITATION WITH PARAPLEGIC SPINAL CORD INJURY PATIENTS

Youguo Hao, Weiwei Lu, Haiyan Shi, Xu Li, Kangkang Chen

Songjiang Hospital affiliated to Shanghai Jiaotong University School of Medicine, Shanghai, China

Objective: To study the effectiveness of different time of psychological rehabilitation with paraplegic spinal cord injury (SCI) patients. *Methods:* eighty patients with SCI-caused paraplegia were divided randomly into early psychological rehabilitation group and late psychological rehabilitation group. The routine treatment was administered to both groups, and psychological rehabilitative therapy was also administered to patients in three weeks after admission and admission respectively. Functional assessments,psychological state and quality of life evaluation were performed with the two groups pre—treatment and 60 days post-treatment. *Results:* The early psychological rehabilitation group achieved, on average, greater improvement in their physical functions, as demonstrated by their much higher scores in terms of the Barthel index,FIM and the World Health Organization"s quality of life than those of the late psychological rehabilitation group (p<0. 05). Hamilton depression and anxiety scale score of psychological rehabilitation group were lower than those of the late psychological rehabilitation group. *Implications:* Paraplegia patients caused by spinal cord injury have different degree of psychological disorder and early psychological rehabilitation is beneficial to the patients with functional and psychological state recovery.

PO-0266

TRANSLATION OF CHINESE VERSION OF COMMUNITY INTEGRATION MEASURE (CIM) FOR USE IN PATIENTS WITH CHRONIC STROKE

Tai Wa Liu[1]*, Shamay S.Y. Ng[2], Gabriel Y.F. Ng[2]

[1]Nursing, School of Science and Technology, The Open University of Hong Kong, Hong Kong, China, [2]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong, China

Objectives: The objectives of this study is to (1) translate and culturally adapt the 10-item Community Integration Measure (CIM) into Chinese (CIM-C); (2) evaluate the internal consistency and test-retest reliability of the Chinese version of CIM. *Method:* The forward and backward translations of the English version of the Community Integration Measures (CIM) to Chinese were conducted by two bilingual professional translators. The content validity of Chinese version of CIM was verified by an expert panel of 5 physiotherapists. Meetings with translators, investigators, and patients with stroke were organized to generate a final version of questionnaire (CIM-C). Sixty-two subjects with chronic stroke were recruited to investigate internal consistency of CIM-C, of 25 subjects were reassessed to establish test-retest reliability after a 1-week interval. *Results:* The internal consistency of the final 10-item CIM-C was good (Cronbach's). Test-retest reliability was also found to be good, with intra-class correlation coefficients of 0.84. *Implications on rehabilitation:* The CIM-C has good comprehensibility and reliability and is useful for measuring self-perceived level of community integration in Chinese older adults with stroke. Further study on investigating validity of CIM-C could further support the use of CIM-C as an assessment tool for community integration among patients with chronic stroke.

PO-0267

DEVELOPMENT OF A MOTOR DEVELOPMENTAL SCALE FOR PRESCHOOL CHILDREN IN TAIWAN: A PILOT STUDY

Chia-Ling Chen[1,2], Chia-Chi Wang[2], Mei-Yun Liaw[3,4], Chia-Ying Chung[1,4], I-Hsuan Shen[5], Ching-Yi Wu Wu[5], Wei-Hsien Hong Hong[6], Simon Fuk-Tan Tang[1,4]

[1]Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital, Linkou, Taiwan,Chinese Taipei, [2]Graduate Institute of Early Intervention, Chang Gung University, Taiwan,Chinese Taipei, [3]Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital, Kaohsing, Taiwan,Chinese Taipei, [4]School of Medicine, College of Medicine, Chang Gung University, Taiwan,Chinese Taipei, [5]Department of Occupational Therapy, Chang Gung University, Taiwan,Chinese Taipei, [6]Department of Sports Medicine, China Medical University, Taiwan, Chinese Taipei

Objectives: The aim of this study is to develop a motor development scale for preschool children (MDSPC) in Taiwan. *Methods:* The study design involved scale development with expert panels and 30 participants (6 months-6 years) recruiting for the reliability. Through consensus we established 2 gross and fine motor subscales with 259 items. The gross motor consisted of stationary (32 items), locomotion (50 items), and body coordination (41 items). The fine motor consisted of grasping and release (17 items), hand manipulation (30 items), tool use (38 items), and visual-motor integration (49 items). *Results:* The content validity (S-CVI/UA) values were 0.66 for gross motor subscale and were 0.74 for fine motor subscale. The intraclass correlation coefficients reflecting test-retest reliability were 0.99 for gross motor subscale and were 0.99 for fine motor subscale. The Cronbach alpha coefficients reflecting internal consistency were 0.97 for gross motor subscale and were 0.95 for fine motor subscale. *Implication and Impact on rehabilitation:* Pilot testing supported the MDSPC had fair content validity and excellent internal consistency and reliability. Further study will include large sample of participants and focus on the criterion-related validity.

PO-0268

OBSERVATIONAL GAIT ANALYSIS AND ITS USE IN REHABILITATION OF CHILDREN WITH CEREBRAL PALSY

Jifang Qiu[1], Yumin Hu[1], Xiang'Er Ye[1], Lili Zhang[1], Xin Chen[1], Shifang Zhou[2], Jian'An Li[2]

[1]Dept. of Rehabilitation Medicine, Zhejiang Civil Affairs Rehabilitation Center, Hangzhou, China, [2]Dept. of Rehabilitation Medicine, Jiangsu Provincial Peoples Hospital, China

Observational gait analysis (OGA) is the most commonly used clinical method of analysing the gait of children with cerebral palsy (CP). OGA has the advantages of low cost and ease of use. In this article, following questions as what OGA is, how to do OGA were answered. Some recent advances of OGA were reviewed, among which A standardized

video recording protocol was recommended. In an effort to find more objective and reliable OGA scale, a number of observational gait scales were reviewed, including the Physician's Rating Scale (PRS); the Observational Gait Scale; and the Visual Gait Assessment Scale, etc. A more recently developed visual gait assessment scale, the Edinburgh Gait Score (EGS),was also developed for children with CP to optimize reliability. Indications for OGA were also mentioned in this article, as well as key questions considered while observing gait. Finally, the use of OGA in children with cerebral palsy was elucidated. The conclusions were that Observational gait analysis consists of observing a patient without the use of formal gait analysis equipment. Experience and use of a systematic method can improve the ability to identify primary and compensatory gait deviations. Various forms and scales have been developed to assist the observer in organizing the analysis as well as for reporting the observations. The Observational Gait Scale, and the Edinburgh Visual Gait Score are validated scales for outcome measurement. Viewing a video of a patient walking is more consistent than viewing the patient live with repeated walks. Finally, if slow motion video is used, the consistency of observation improved markedly.

PO-0269

CARDIORESPIRATORY FUNCTIONAL EVALUATION IN PATIENTS WITH SPINAL CORD INJURY

Leticia Rivero González[1],[1],[1]*, Sara Estévez Sarmiento[1], Guillermo Miranda Calderin[2], Carolina Alemán[2], Arantza Ugarte[3], María Del Carmen Naranjo[4], José Luís Méndez[2]

[1]MIR Medicina Física y Rehabilitación Hospital insular de Gran Canaria, Spain, [2]Adjunto Medicina Física y Rehabilitación Hospital insular de Gran Canaria, Spain, [3]Fisioterapeuta Medicina Física y Rehabilitación Hospital insular de Gran Canaria,Spain, [4]Enfermera Medicina Física y Rehabilitación Hospital insular de Gran Canaria, Spain

Introduction and Objectives: The incremental ergometry with oxygen consumption is a study which determines functional ability. The objective is to identify the complications resulted in patients with spinal cord injury. *Design:* Descriptive retrospective study including 44 patients with Spinal Cord Injury (SCI), who did an incremental ergometry. *Materials and Methods:* The subjects used an arm ergometer (Ergoselect 400) and the gas analysis were performed using Medgraphics software, following a 5-20 w/min incremental work rate protocol with a warming up exercise and a recovery of 3 min each one. It was analysed with a SPSS 19.0 software. *Results:* 37 men and 7 women, with an average age of 39 years old (18-62) and Spinal cord injury (84% thoracic and 16% lumbosacral). As cardiovascular risk factors: 1 diabetic, 6 patients with elevated blood pressure, one with history of ischemic cardiomiopathy, 18 smokers and an average total cholesterol levels of 187. Average high work rate 85,7W, the average of VO2 at high intensity 18ml/kg/min. The average time of the test was of 10 min, 5,7 METS of average and the average of the respiratory exchange ratio was of 1,3. The average heart rate was of 87 bpm. No relevant complications were registered, the principal causes to stop the test were exhaustion (40), high blood pressure (2), muscle spasms or pain (2), In three cases appeared isolated ventricular extrasystoles. In 32% of the cases it was necessary to restart the EVO2 because of technical problems. *Conclusions:* The EVO2 is a complex technique, it needs fine adjustment. However it has few medical complications and it is very useful in the initial assessment and the long-term follow-up of patients with spinal cord injury.

PO-0270

QUALITY OF LIFE AND DISABILITY IN A COHORT OF PATIENTS WITH TRAFFIC ACCIDENTS ONE YEAR AFTER

Luz Helena Lugo[1,1]*, Ana Maria Muñoz[1,2], Hector Ivan Garcia[1,2], Blanca Cecilia Cano[1,2], Juan Carlos Arango[1,2], Gilma Norela Hernandez[1,2]

[1]Universidad de Antioquia, grupos de Rehabilitacion en Salud y Epidemiologia clinica,Colombia, [2]Colciencias,Colombia

Objective: The aim of this study was to explain the existing quality of life (QOL) at 12 months in patients with traffic accidents (TA) based on the disability status in Medellin 12 months after de injury. Study design and settings: 834 patients with traffic accidents in the metropolitan area of Medellin during the years 2010 – 2011 participate in this study. The QOL was assessed through the different domains of the health questionnaire SF-36 after 1 year of the TA. We included variables related to contextual factors, health and functioning condition and disability using the WHO-DAS II domains. An analysis of correlation between the SF-36 and the WHO DAS II was done. We performed a multiple linear regression of explanatory type to identify which variables explain in a greater variation in the QOL of patients with TA. *Results:* From the total sample 80% of patients had evaluation after a follow-up year. Most affected patients were young male adults. The initial values and the ones after one follow-up year of the health questionnaire SF-36 and WHO DAS II had a statistically significant difference with p value of 0.05; with higher values of SF 36 and lower in WHO DAS II after one follow up year. There is a moderate correlation and inversely proportional between the SF-36 domains and WHO DAS II. Multiple linear regression of explanatory type showed that the most important variables was Visual Analogue Scale (VAS), move in the environment, social participation, understanding and communication and activities outside the home; explanation percentages were between 41 and 71%, the highest percentage was for the body pain domain. Impact of Rehabilitation: The concept of disability explains in a 50% the perception of quality of life of patients one year after being victims of TA. Further researches should be performed focused on identifying which other factors influence the quality of life of patients and in which of them we could impact from the clinical or the public health ambit.

PO-0271

INTRA- AND INTERRATER RELIABILITY OF THE ACTION RESEARCH ARM TEST IN PATIENTS WITH STROKE

Åsa Nordin, Margit Alt Murphy, Anna Danielsson

University of Gothenburg, Sweden

Objective: To examine the intra- and interrater reliability of the Action Research Arm Test (ARAT) at item level after stroke. *Method:* Two experienced physiotherapists simultaneously scored the 19 items of ARAT at two occasions approximately one hour apart. A convenience sample of thirty-four patients participated in the study (mean age 60 years, mean time post-stroke 30 month). The intra- and interrater reliability was tested at item level and the agreement measured with Percentage Agreement (PA). The Svensson's method for paired ordinal data was applied to identify and measure systematic disagreement in position; Relative Position (RP) and concentration; Relative Concentration (RC), separately from disagreement caused by individual variations; Relative rank Variance (RV). The RP and RC values ranges from -1to 1 (0=no difference, -1/1=large difference), while RV goes from 0 to 1 (RV<0.1=negligible). *Results:* Good intrarater agreement (PA>80 %) was noted for 16 of the 19 items and good interrater agreement for 13 items. Within the examiners, statistically significant systematic disagreement in position was found for one item (item 11); RP 0.119. Between-examiners, a systematic disagreement in position was found for four items (item 1, 4, 7, 12) with RP ranging from -0.092 to 0.113. For relative concentration, systematic disagreement was found for two items (item 1, 19); RC -0.143 and 0.181. There was no disagreement caused by individual variations (RV≥=0.1) within or between the examiners. *Implications/Impact on rehabilitation:* ARAT is a reliable rating

scale for the upper extremity performance after stroke but training of examiners is highly recommended before use.

PO-0272

TO EXPLORE THE INFLUENCE FACTORS OF CHILDREN WITH CEREBRAL PALSY REHABILITATION EFFECT

Fenfen Sun
RUIHAIBO Medical Rehabilitation Center, China

Rehabilitation treatment diagnosis is not clear, make the child to achieve significant curative effect in a short period of time, and did little to improve the curative effect is not obvious or function for a long time, families may make children lose faith and give up treatment. One reason and most of the therapists cerebral palsy rehabilitation professional knowledge training and basic education has the certain relations. The importance of rehabilitation treatment diagnosis, worth attention. How to improve the rehabilitation therapists basic concept and professional knowledge, diagnosis, selection of the right entry point and formulate rehabilitation treatment? Accurate assessment and analysis of main problems of children with cerebral palsy, and is the key to a quick curative effect, also is the assurance of cerebral palsy rehabilitation efficacy.

PO-0273

ARABIC ADAPTATION OF THE DASH INDEX

Mohamed Guermazi[1], Sofiane Ghorbel[2,5], Abdelmonem Yahia[3], M Khemakhem[4], Mh Elleuch[3]
1. Unite´ de recherche de l'e´valuation des pathologies de l'appareil locomoteur 04/UR/08-07, Saudi Arabia, [2]Department of rehabilitation KKH Hail KSA, Saudi Arabia, [3]Service de me´decine physique et re´adaptation fonctionnelle, CHU Habib Bourguiba, Sfax, Tunisia, Saudi Arabia, [4]Service de neurochirurgie, CHU Habib Bourguiba, 3029 Sfax, Tunisia, Saudi Arabia, [5]Université de Tunis El Manar, Faculté de Médecine de Tunis, Tunisie, Saudi Arabia

Objective: To adapt and validate an Arabic version of "Disabilities of the Arm, Shoulder and Hand scale (DASH) in a Tunisian population; Patients and *Methods:* We used the Method of "forward/backward translation." Have been included in this study patients with periarticular pathologies of the shoulder;. Clinical measurements included the assessment of pain and functional disability by the functional visual analogue scale (VAS). Adaptations were carried out after a preliminary test including 15 patients (10 men, 5 women). The interrater concordance was evaluated by intraclass correlation coefficient (ICC) and Bland and Altman method; the validity of construct was assessed using the Spearman correlation coefficient and the factorial analysis followed by orthogonal rotation. The internal consistency of each factor was graded by the study of Crohnbach alpha coefficient. *Results:* have been included eighty people in the study. The interrater concordance was excellent (ICC=0.805) confirmed by Bland and Altman Method, The validity of convergence studied on the analysis of Cronbach alpha coefficient assessed on all item was 0,701 Factorial analysis led to the extraction of two factors with a cumulative variance rate of 57.6% that could not be explained. *Conclusion:* Cross cultural adaptation of the DASH index to the arabic posses good methological qualities. Further studies on other arab populations will assess its applicability.

PO-0274

EFFECTS OF 660NM RED LIGHT THERAPY ON RAT SCIATIC NERVE RECOVERY AFTER CRUSH INJURY

Song Li, Yang Zhao, Long Chen, Yuxia Chen, Ling Liu, Nong Xiao
Children's Hospital of Chongqing University of Medical Science, China

Objective: To explore the best treatment mode and provide forward-looking basis for clinical application eventually, We investigate effects of different experimental parameters of 660 nm red light irradiation on the rat sciatic nerve injury. *Methods:* Adult male rats were divided into two groups: control and red light therapy and then group of red light therapy are divided into four:L1,L2,H1,H2. The right sciatic nerves of rats are injured by crushed. Experimental groups received irradiation for 21 days under different parameters continuously. During treatment we flow up the latency (LAT) and amplitude (AMP) of Compound Muscle Action Potentials (CMAP) and nerve conductive velocity (NCV). Sciatic Functional Index (SFI) is used to evaluate the ability to walk in rats. *Results:* After 21 days of continuous treatment. Each experimental group compared to the control group, the right sciatic nerve LAT and AMP of CMAP with no significant difference. On 21day NCV of group H1 compared to control, the difference was statistically significant. On 21 days SFI of group L2 and H1 compared to control with statistically significant. *Conclusion:* Red light irradiation therapy can promote recovery of sciatic nerve injury of rats, thereby improving walking function.

PO-0275

THE CHANGE OF SPASTIC RAT WITH SPINAL CORD INJURY IN ELECTROPHYSIOLOGY

Jie Wang[1], Lijuan Ao[2]
[1]Departtment of Rehabilition, the First Affiliated Hospital of Zhengzhou University, Zhengzhou, Henan Province, China, [2]Department of Rehabilitation and Physiotherapy, Kun Ming Medical College, Kunming, Yunnan Province, China

Objective: To observe the changes in nerve electrophyationsiology of spastic rat with spinal cord injury, and study the correlation between spasticity with neurophysiological examination. *Methods:* 56 healthy adult female Sprague-Dawley (SD) rats, weighing 200-250 g, were randomly divided into an experimental and control group; The experimental group was divided into 7 groups, n=8, according to time after spasm appearance at 1 week, 2 weeks 3 weeks, 4 weeks, 6 weeks, and 8 weeks. Allen's method was applied to treatment group while normal control group without any treatment. Both groups received the behavioral assessment, Ashworth grade and neural electrophysiology examination before and after surgery, *Results:* 1. The differences of Ashworth score between experiment group and the normal control group were statistically significant (p<0.05) while the 3 week group and 4 week group scored the highest. 2. Neural electrophysiology: SEP latency of 1 week and 2 week group was significantly longer than the control group (p<0.05); F wave minimum latency of 2 week, 3 week and 4 week groups were shorter than the control group (p<0.05); The shortest F wave latency and Ashworth score were negatively correlated; The rate of H reflex of the experimental group increased faster than the control group. Hmax/Mmax of the 1 week, 2 weeks, 3 weeks and 4 weeks group increased more than the control group (p<0.05); Hmax/Mmax and the Ashworth score was positively correlated. *Conclusion:* SEP can be made in the model as the assessment criteria of spinal cord injury and restore the integrity; Neuronal excitability increased in the spastic rat with spinal cord injury; F wave latency and Hmax/Mmax ratio have a good correlation with Ashworth scores of animals, and can be used as a quantitative assessment standards of spasticity.

PO-0276

ESTABLISHMENT OF SPINAL CORD INJURY RAT SPASTICITY MODEL

Yu Fu[1], Lijuan Ao[2], Yongmei Li[2], Wenli Wang[2], Xiu Hua He[1], Hai Wang Li[1]
[1]Department of Rehabilitation, the Alxa League Central Hospital, Neimeng Province, China, [2]Department of Rehabilitation and

Physiotherapy, Kun Ming Medical College, Kunming, Yunnan Province, China

Objective: To Establish a stable spinal cord injury rat spastic model which produces muscle spasm easily, thus provide a good basis for future research. *Methods:* sixty SD rats with equal number of gender and a weight range of 230-270g were divided into three groups (a,b,c), with twenty rats a group. The model of spinal cord injury was established by injuring the T10 segment. Group A's spinal cord was only exposed, group B were established by cutting out of dura at T10, group C received heavy strike at T10 segment. Then Ashworth score, the inclined plane test and electron microscopy were performed in all the groups. *Results:* The Ashworth score of group C was significantly higher than group B and group A ($p<0.05$); the sarcomere length of group C was significantly shorter in group A; group C showed significantly increased muscle spasm and abnormal posture. *Conclusion:* Impact sourced spinal cord injury is a more practical method of building spasticity rats model. *Implications:* Impact of spinal cord injury in the rat can be successfully prepared spinal spasticity in spinal cord injury rats model, and has obvious behavior anomaly.

PO-0277

THE EFFECTS OF DIFFERENT WALKING TRAINING REGIMENS ON MOTOR FUNCTION IN PATIENTS WITH SUBACUTE STROKE

Hua Wu, Xu-Dong Gu, Yan Li, Yun-Hai Yao, Hui Li
The Jiaxing second hospital rehabilitation medical centre, Zhejiang, China

Objective: To observe the effects of different walking training regimens on motor function in patients with stroke. *Method:* Sixty patients with subacute stroke were randomly into robot group, body weight support treadmill training (BWSTT) group and control group (n=20 in each). All patients were only treated with different therapies 8 weeks, the motor functions were assessed with the Fugl-Meyer Assessment (FMA), Functional Ambulation Category (FAC), and Modified Barthel Index (MBI) in pre-treatment and post-treatment 4 weeks and 8 weeks. *Result:* In the BWSTT group and the robot group, FMA, FAC and BMI scores increased significantly at all time points compared with the control groups. There was no significant difference in rehabilitative effects between the BWSTT group and the robot group. *Implication:* All three walking training regimens can improve motor function, but the effects robot of and BBSTT are better than that of routine rehabilitation training.

PO-0278

ALTERED REGIONAL HOMOGENEITY IN EXPERIMENTALLY INDUCED LOW BACK PAIN: A RESTING-FMRI STUDY

Wen Wu, Shan-Shan Zhang, Zi-Ping Liu, Guo-Zhi Huang
Zhujiang Hospital, Southern Medical University, China

Background: Functional imaging studies indicate that low back pain patients with chronic pain have significant reductions in cerebral cortex grey matter. However, the mechanisms governing the nociceptive pathways of human brains are unclear. *Objective:* The aim of this study is to investigate alterations in resting-state brain activity that exist for experimental back muscle pain using functional magnetic resonance imaging (fMRI) and regional homogeneity (ReHo). *Method:* Healthy subjects (n=15) had baseline and painful (intramuscular injection of 3% hypertonic saline in low back) fMRI 3.0T conducted. *Results:* Compared to baseline, experimentally induced low back pain scans had increased ReHo in the right medial prefrontal cortex (mPFC), right middle frontal gyrus, right insula, right precuneus, right parahippocampa gyrus, and right cerebellum posterior lobe, and decreased ReHo in the right superior temporal gyrus, left middle temporal gyrus, left primary somatosensory cortex (S1), left anterior cingulate cortex (ACC), left parahippocampa gyrus, right inferior parietal lobule ($p<0.05$, cluster threshold ≥ 10). *Implications:* The findings suggest that the resting-state abnormal spontaneous activity of certain brain regions may be associated with pain processing. These changes may account for the process of recognition, execution, emotion processing, and memory that are involved in low back pain.

PO-0279

THE INFLUENCE OF TRUNK RESISTANCE EXERCISE COMBINED WITH LUMBAR TRACTION ON PATIENTS WITH LUMBAR INTERVERTEBRAL DISC

Yan Xu, Wen-Long Xie
Department of Rehabilitation, Huzhou Central Hospital, Zhejiang province, China

Objective: To observe the clinical effect and recurrence of trunk resistance exercise combined with lumbar traction on patients with lumbar intervertebral disc. *Methods:* 50 patients with lumbar disc herniation were randomly divided into control group (25 cases) and treatment group (25 cases). Both groups were given regularly medicine treatment and lumbar traction, while treatment group also received trunk resistance exercise. Before and after 6 weeks treatment, all patients were assessed with the scale of Visual Analogue Scale (VAS) and the scale of Japanese Orthopedic Association Scoring System (JOA) also used for the recurrent rate after 1 year's treatment. *Results:* Before intervention, there were no significant difference between both groups in any of the assessment ($p>0.05$). After treatment, the scores in both groups were greater than before ($p<0.05$), and all the assessment scores obtained with the VAS and JOA in the treatment group were significantly better than those in the control group ($p<0.05$). After follow-up for one year, the recurrent rate in the treatment group was obviously lower than in the control group. *Implication:* Trunk resistance exercise combined with lumbar traction could strongly improved the effect of Lumbar Intervertebral Disc, and prevent the recurrence of Lumbar Intervertebral Disc.

PO-0280

THE MODIFIED EVALUATION OF SODIUM VALPROATE-INDUCED ANIMAL MODEL OF AUTISM OF RAT

Zhimei Jiang, Lijun Cui, Shiling Zhang, Jin Guo, Lanmin Guo
The 3rd AffIliated Hospital of Jiamusi University;Children Neural Rehabilitation Laboratory of Jiamusi University, China

Objective: Establish a sodium valproate-induced animal model of Autism, observe their growth and behavior characteristics, reference and improve Schneider and Silverman's methods to evaluate the animal model of Autism.we evaluated model group in the field of physical development, social interaction,communication and stereotyped, repetitive patterns of behaviors,and compared with control group. *Methods:* The pups from these females which received a single intraperitoneal injection of sodium valproate (VPA,600 mg/kg) on the 12.5 day after conception used as model group; and these from control females that injected with physiological saline at the same time, used as control group. Sodium valproate was dissolved in saline at a concentration of 250 mg/ml. Observe and test the physical development, social interaction, communication and stereotyped, repetitive patterns of behaviors of the pups. *Results:* Compared with control group, model group rats showed lower body weight, delayed open eyes, attenuated coordination of direction and swimming, lower levels of following and push–crawl and higher levels of self-grooming,and lower levels of sniffs of the cotton swab of rat urine. *Conclusion:* Compared with the control group, rats in model group showed growth retardation, decreased number of social

behaviors, increased number of stereotyped, repetitive patterns of behaviors and lower levels of sniffs of social odours.

PO-0281

MECHANISMS OF MICROWAVE TREATED ON REGENERATION OF PERIPHERAL NERVES

Sujuan Zhang[1], Jun Wu[2], Xuemei Fan[1]

[1]Department of Rehabilitation Medicine, General Hospital of Datong Coal Mine Group, China, [2]Department of Rehabilitation Medicine, the Second Affiliated Hospital, Dalian Medical University, China

Objective: To explore the mechanism of microwave treatment on regeneration of peripheral nerves. *Method:* Sixty-four male adult SD rats were used to establish of the right sciatic nerves, and randomly divided into two groups: the microwave treatment group (n=32) and the operative control group (n=32). Each group was subdivided into the 3th (n=8), the 7th (n=8), the 14th (n=8) and the 28th (n=8) day postoperative groups. Then the rats of the microwave treatment group was fixed on a table prostrated and the injured part was exposed to microwave at 6W for 6min each time, 5 days each week from the first day after operation to the day for sacrifice. The rats of the control group were also fixed on a table prostrated at the same time, but they were not exposed to microwave. To observe the general view of rats and analyze the wet weight of the gastrocnemius muscle together with diameter of the muscle cell, immunohistochemistry staining techniques were employed for the detection of GAP-43. Result The general view of the microwave treatment group was better than the control group, the wet weight of the gastrocnemius muscle on 28th day after the operation in the microwave treatment group was higher than that in the control group (p<0.05). The diameter of the muscle cell in the microwave treated group shrivel on 28th day postoperatively, that in the control group shrivel on 21th day postoperatively. The immunohistochemical staining showed that GAP-43 protein expression in the spinal cord was increased after sciatic nerve was injured, and that on 3th, 7th and 14th day postoperatively in the microwave treated group was more significant than that in the control group (p<0.05, p<0.01). *Conclusion:* Microwave could enhance the expression of GAP-43 protein and the delaying of denervated muscle cell atrophy, promote the regeneration and functional recovery of the injured peripheral nerve soon after irradiation.

PO-0282

THE RELATIONSHIP BETWEEN CCP AFTER SCI AND THE CONCENTRATION OF MGLUR1, NOS AND SP OF THE SPINAL DORSAL HORN IN SCI RATS*

Hong Dai**, Zhifang Liu, Zhongxin Xiao, Xiulai Gao, Peng Jing, Xiaofeng Jiang

Capital Medical University, China

Objective: To probe the relationship between Chronic Central Pain (CCP) after Spinal Cord Injury (SCI) and neurobiochemical changes at dorsal horn of spinal cord in the rats. *Methods:* 28 SD rats were divide into four groups: group A (control); group B (sham-operation) ; group C (no CCP after SCI), and group D (have CCP after SCI).Using WADE method to injury L1 spinal cord section to made a model of CCP rats after SCI, observe the pain behavior changes of these rats. Take the sections of T13 and L2 inspinal cord of its, observe concentration changes of mGluR1 through immunohistochemistry staining in conjunction with imaging analysis; observe changes in number of NOS positive cells through NADPH histochemistry staining; and observe concentration changes of SP in the spinal dorsal horn of the sections through immunofluorescence histochemistry staining in conjunction with confocal laser scanning microscope. *Results:* There were 9 rats (D group) occurred CCP among 16 SCI rats, occurrence rate was 56.25%.The concentration of mGluR1 and the number of NOS positive cells in group D increased significantly compared with the groups C (p<0.05), A and B (p<0.01) ; that of group C is higher than that of group A and B (p<0.05).The concentration of SP in group D decreased significantly compared with the groups C (p<0.05), A and B (p<0.01) ; that of group C is less than that of group A and B (p<0.05).There were no significant differences between group A and B (p>0.05) in comparing to the concentration of three substances both groups. *Implications:* The rat model established on the basis of WADE method is proper to research CCP after SCI. Complicated neurobiological transformation of the spinal dorsal horn takes place after SCI, mGluR1 may participate excessively excitation process of central nervous system, being closely related with the occurrence of CCP after SCI.NOS may take effect in changes of excitation of central nervous system too. It is considered that SP might have inhibitional effect to CCP after SCI in some degree.

PO-0283

ELECTROACUPUNCTURE AT ACUPOINTS OF QUCHI AND ZUSANLI EXERTS ANTIAPOPTOTIC ROLE IN CEREBRAL ISCHEMIA-REPERFUSION INJURED RATS VIA NF-KB PATHWAY

Jing Tao[1,2],[1], Lan Lan[1], Azhen Chen[1], Lidian Chen[3]

[1]College of Rehabilitation Medicine, China, [2]Fujian Rehabilitation Hospital, China, [3]Fujian University of Traditional Chinese Medicine, China

Objectiv: To investigate electroacupuncture exerts antiapoptotic role in cerebral ischemia-reperfusion injured rats via NF-kB pathway. *Methods:* 96 male adult SD rats were randomly divided into the sham-operated group, the model group and the EA group. Using a focal cerebral ischemia/reperfusion injured rat model, electroacupuncture was applied to the acupuncture points of Quchi (LI11) and Zusanli (ST36). The degree of apoptotic in cerebral I/R cord were visualized by TUNEL-staining. The subsequent experiments pursued the mechanistic hypothesis that electroacupuncture exerted antiapoptotic effects through detecting the important molecule of NF-kB pathway by RT-PCR, Western Blot and ELISA. *Result:* We found that electroacupuncture at Quchi (LI11) and Zusanli (ST36) acupoints on the paralyzed limb significantly improved neurological deficits and reduced the ischemia-associated apoptotic in the injured cortex. The crucial signaling molecules in NF-κB signaling pathway were regulated by acupuncture, which coincided with suppressed secretion levels of cytokines such as TNF-α. *Impact on rehabilitation:* Electroacupuncture promote limb functional rehabilitation in short time. Meanwhile, electroacupuncture prevents apoptosis through regulating NF-κB signaling pathway. Consequently, Electroacupuncture is a novel and potent therapeutic tool for cerebral ischemia.

PO-0284

DIFFERENCE BETWEEN THE CONCENTRATION OF CYTOKINES IN PATIENTS WITH OSTEOARTHRITIS OF THE KNEE AND FIBROMYALGIA

Marta Imamura[1], Rosa Alves Targino[1], Helena H.S Kaziyama[2], Luiz P.M. Souza[2], Wu Tu Hsing[3], Satiko Imamura[1], Raymundo Soares Azevedo[4], Túlio Oliviera Kalife[5], Lucy Santos Villas Boas[6], Fábio Marcon Alfieri[1,7], Thais Filippo[1], Talita Justino Santos[1]

[1]Clinical Research Center. Institute of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital of Clinics Clínicas. University of São Paulo School of Medicine,Brazil, [2]Division of Physical Medicine, Institute of Orthopedics and Traumatology, University of São Paulo,Brazil, [3]Director of the Center for Acupuncture of IOT – HC – FMUSP, Brazil, [4]Department of Pathology, University of São Paulo, Brazil, [5]University of São Paulo School of Medicine, Brazil, [6]of Faculty of Medicine University of São Paulo, Brazil, [7]São Paulo Adventist University Center, Brazil

Objective: To observe the differences in the concentrations of cytokines in patients with osteoarthritis of the knee versus fibromyalgia. *Methods:* The study included individuals diagnosed with knee osteoarthritis with pain of moderate to severe intensity (visual analogic scale - VAS >4) and in time of pain ≥ 3 months. Also participated women with fibromyalgia with pain of moderate to severe intensity (VAS> 4) and diagnosed according to American College of Rheumatology. For dosage of interleukins blood collection was done in the morning, retreating 5ml cubital vein. The material was centrifuged at 4 ° C, separating in 100 ul aliquots and stored at -80 ° C until processing. To check the values of concentrations of cytokines the method BD Cytometric Bead Array (CBA) was used. The cytokines were measured: IL-12p70,TNF-α, IL-10,IL-6, IL-1β, IL-8. Data were Analyzed with the Student's, *t*-test, Mann-Whitney test. *Results:* The study included 82 patients with osteoarthritis of the knee (69.71 +/-7.61 years old) and 60 fibromyalgia (54.07 +/-8.07 years old). After adjustment of age, only the cytokines IL-1 b and IL-8 show statistically significant differences between groups (p=0.004 and p=0.001 respectively), with higher values of both cytokines in patients with fibromyalgia. *Impact on rehabilitation:* Patients with fibromyalgia have higher concentrations of proinflammatory cytokines than those with osteoarthritis of the knee showing the complexity of the inflammatory process of fibromyalgia that should be taken into consideration in the rehabilitation process, especially on the issue of pain permanently.

PO-0285

THE 4 POLE ELECTRICITY INTERFERENCE-BASED TREATING GASTROPLEGIA SYNDROME AFTER ABDOMINAL SURGERY

Liemi Huang

Department of Rehabilitation Medicine, Wuhan the Sixth Hospital, Wuhan, China

Objective: To explore the clinical efficacy of electricity interference-based treatment stomach paralysis syndrome through the sinuses ventriculi projection area after abdominal surgery. *Method:* From 2007 to 2011, 28 cases age 26-73 years old (13 male and 15 female) were done gastroscope inspection or upper gastrointestinal sorbent imaging, no gastric peristalsis or weak peristalsis, eliminate mechanical obstruction, no obstruction sign with an abdomen plain film. After operation, treatment with gastrointestinal decompression, nutritional support, maintain water electrolyte metabolism balance, application drug to promote gastrointestinal peristalsis, treatment effects are not evident. And then, we use 4 pole electrotherapy interference and thermal design power (TDP) irradiation on sinuses ventriculi area and its back for once a day and six days a course of treatment. After three course of treatment, we analysis daily gastric lead flow, gastrointestinal power recovery time, abdominal pain, abdominal distension, nausea and vomiting symptoms relief, eating time, weight change and other indicators. *Results:* Twenty-eight cases all are cured. From the sixth day, patients gradually restore gastrointestinal function. Abdominal pain, abdominal distension, nausea and vomiting symptoms are recovery firstly. On the third day, patients began to exhaust, average daily gastric flow fluid from the original 1500 ml to 260 ml. no one is relapsed during one year follow-up. *Conclusions:* After abdominal surgery, patients are caused stomach power weaken or change, affected the gastrointestinal peristalsis compatibility and stomach tension, resulted in gastrointestinal inverse peristalsis, reduced stomach storage and the machinery ability to digest food. The treatment method with 4 pole electricity interference 4000 HZ in frequency to the acupuncture points in the sinuses ventriculi area and the second lumbar vertebral body, can directly stimulate the stomach to improve muscle tension, to reduce pain, to improve the digestive functions, to improve appetite, to promote gastrointestinal muscle contraction, to restore gastrointestinal peristalsis ability. At the same time, TDP can promote abdominal blood circulation, accelerate blood to supply gastrointestinal muscle, enhance the ability of peristalsis. Therefore, its curative effect is obviously that 4 pole electricity interference to treat gastric paralysis syndrome after abdominal surgery.

PO-0286

CLINICAL PRACTICE GUIDELINES OF REHABILITATION IN CHINA- THE STATUS QUO AND PROSPECTS

Ying Huang[1], Haiying Guo[1], Zhe Hu[1], Feng Yan[2], Pengfei Zhang[1]

[1]Nanjing Universiy of Chinese Medicine, China, [2]Jiangsu JianKang Vocational College, China

Objective: To evaluate the status and the development of the clinical practice guidelines of rehabilitation in China. Methord We searched the database of Clinical Evidence, Uptodate, Dynamed, GIN, CPGN, Pubmed, Embase, CNKI, CBM and Wanfang, by the Mesh and keywords. We evaluated the quality of the included guidelines through the guideline appresal instrument "Appraisal of Guidelines for Research and Evaluation II" (AGREE II). 4 appraisers rated 23 key items organized within 6 domains and 2 global rating items ("Overall Assessment"). Separately, each item was rated on a 7-point scale (1–strongly disagree to 7–strongly agree). *Results:* We included 6 guidelines, the scopes of which were neurological disorders and orthopedic disorders. The mean sores of the 2 "Overall Assessment" of the 6 guidelines were 2.83±1.20 (min was 1, max was 6) and 3.08±1.28 (min was 1, max was 6). *Implications:* Now, the quantity of guidelines applied to the clinical practice of rehabilitation in China is very small, and the scopes are narrow. As the quality of the clinical practice guidelines of rehabilitation in China was very low, they may not meet the standard of the methodology of Evidence Based Medicine, and are insufficient to direct the clinical practice of rehabilitation. The research in methodology of the clinical practice guidelines of rehabilitation in China must be enhanced.

PO-0287

UNUSUAL FOREIGN BODY ATTACHED ON EPIGLOTTIS CAUSED DYSPHAGIA

Lzumi Kondo[1]*, Ozaki Kenichi[1], Matsuo Hiroshi[1,3], Shino Mori[1], Aiko Ohsawa[2,1], Shinichirou Maeshima[2,3], Eiixhi Saitoh[3]

[1]National Center for Geriatrics and Gerontology,Japan, [2]Saitama Medical University,Japan, [3]Fujita Health University, Japan

A 92-year-old man was referred to our clinics and evaluated for a complaint of dysphagia. Videofluorography (VF) revealed a large foreign body attached on the epiglottis. It was removed during VF examination and turned out to be a conglomeration of sputum debris and food residue. Its size was 5 x 3 x 2 cm. VF after the removal of the conglomeration, his dysphagia was gradually improving. His past history was remarkable for an infectious illness and a sore throat, possibly epiglottitis. We speculated that this unusual case most likely represented a sensory disturbance of oro-pharyngeal region occurred with the lowered arousal level. We are going to present this case, radiographic findings, and a discussion of the differential diagnosis.

PO-0288

TONGDU MASSAGE THERAPY THEATMENT OF STROKE SPASTIC PARALYSIS OF THE CLINICAL RESEARCH

Yun Dong, Panfu Hao, Erzhen Wang, Jian Huang, Cong Chen

Affilioted Acupunctnre Hospital of Anhui College of T.C.M, China

Objective: To investigate the Tongdu massage therapy theatment of stroke spastic paralysis of the clinical efficacy. *Method:* Sixty patients of stroke spastic paralysis were randomly divided into 2 groups: A control group,a group for the theaatment group. The 2 groups were evaluated with Ashworth (ASS), Fugl-Meyer

(FMA), before and after the treatment. *Result:* The control group after treatment in patients with muscle tone,motor function before treatment,no significant change compared ($p > 0.05$), Patients treated muscle tone,motot function changed significantly compared with before treatment ($p < 0.01$). *Conclusion:* It is a significant therapentic effect in stroke spastic paralysis with Tongdu massage.

PO-0289

CLINICAL EFFICACY OF ELASTIC BANDAGE CONTINUOUS TRACTION TO IMPROVE FLEXOR OBSTACLES OF THE POST-TRAUMATIC CONTRACTURE FINGER JOINTS

Jinrong Zhao, Qingyan Long, Yanping Guo
Department of Rehabilitation, Ruihua affiliated Hospital of Soochow University, Soochow, China

Objective: To observe the clinical effect of elastic bandage continuous traction to improve flexor obstacles of the post-traumatic contracture finger joints. *Methods:* 354 finger contracture joint divided into group A (202) and group B (152). Both groups were using the same tactics as joint mobilization.group A: after practices joints loose, bandage the contracture finger joints with elastic bandage like Boxing glove and continuous traction for 1 h, maximum tolerance of patients with treatment intensity, then loosen the bandage to rest for 0.5 h, about 3 to 4 times everyday. Group B simply the way loose. Active range of motion increases ≥ 10° for efficacy evaluation criteria. 10 days observation efficacy. *Results:* A group of 202 joints, effective 187 invalid 15, the effective rate of 93.07%; B group 152 joint effective 106 invalid 46, 69.74% efficiency using the X2 test, X2 value of 31.72, $p < 0.01$, the two groups have significant differences. *Conclusion:* On the basis of the way loose elastic bandage continuous traction improve hand injuries in contracture flexion obstacles better than a simple gimmick loose.

PO-0290

STROKE REHABILITATION OF AN LVAD PATIENT

Sunlung Suen*, Tommy Yu
University of Wisconsin Hospitals and Clinics,United States

Objective: Provide acute inpatient stroke rehabilitation to a patient with a left ventricular assist device (LVAD). *Method:* A 37-year-old patient with a history of idiopathic cardiomyopathy, systolic heart failure and cardiogenic shock status post HeartMate II LVAD implantation complicated by chronic device driveline infection sustains a right middle cerebral artery infarction 8 months after device implantation that results in near complete left hemiplegia and left neglect. The patient then undergoes 40 days of intensive, multidisciplinary acute inpatient stroke rehabilitation. *Results:* On admission to acute inpatient rehabilitation, the patient was entirely non-ambulatory, not able to take a step even with the assist of 3 persons. On discharge, the patient was walking with a single-point cane. Four months after discharge from acute inpatient rehabilitation, the patient is still living in the community and preparing for heart transplantation. *Implications/Impact on rehabilitation:* Patients with LVADs respond well to acute inpatient rehabilitation. Despite their usual large number of significant co-morbidities, we recommend that LVAD patients who can tolerate multiple h of daily therapies be provided the opportunity for acute inpatient rehabilitation.

PO-0291

NEUROMUSCULAR ELECTRICAL STIMULATION CONTROLLING THE METABOLIC RISKS EFFECTIVE AND AUXILIARY IN TYPE 2 DIABETES MELLITUS WITH ABDOMINAL OBESITY

Chong Gao[1], Liping Huang[2], Li Li[1]
[1]DaGang Oil Field General Hospital,TiabJin,China, [2]TianJin University Of Sports, China

Objective: To investigate the metabolic profile improvements after neuromuscular electrical stimulation training on Type 2 diabetes mellitus with abdominal obesity. *Method:* Fifty people with Type 2 diabetes mellitus and abdominal obesity, volunteered to participate in the experiment after health screening and medical examination. The participants were randomly divided into training group (25 subjects) and control group (25 subjects). The training group was given neuromuscular electrical stimulating training which protocol was 30 min a day with frequency 30 Hz, wave width 300 us, on and off ratio 2: 6, intensity10-20 mA. Both groups took part in rehabilitation education for body weight control once a week. *Result:* 1)Training group showed a lower BW, BMI, WC and HC than those in control group ($p < 0.05$) after the program. 2) The serum glucose (GLU), triglyceride (TG), free fatty acids (FFA), INS, leptin (LEP), visfatin and insulin resistance (IRI) in training group reduced significantly reduced than training before ($p < 0.01$, $p < 0.001$). 3) The serum cholesterol (CHO), low-density lipoprotein (LDL), TG, and GLU levels reduced significantly in training group than those in control group ($p < 0.05$). But, those blood high density lipoprotein (HDL) didn′t change significantly ($p > 0.05$). The serum FFA, INS, LEP, visfatin and IRI decreased significantly in training group compared with those in control group ($p < 0.05$). *Conclusion:* After long-term neuromuscular electrical stimulation program, the metabolic risks are effective and auxiliary control in Type 2 diabetes mellitus with abdominal obesity. The serum glucose, lipids, insulin resistance and leptin resistance decreased significantly, while the rehabilitation education only for weight control didn't result in significant change.

PO-0292

STUDY ON THE ASSESSMENT OF DTI TO THE MOTOR FUNCTION RECOVERY AFTER CEREBRAL INFARCTION

Fangyuan Guo, Haifeng Yuan, Qiaojun Zhang
Department of Rehabilitation, the Second Affiliated Hospital of Xian Jiaotong University, China

Objective: To evaluate the significance of DTI on the prognosis of cerebral infarction through investigating the correlation between impairment of cortical spinal tract (CST) and motor function recovery after cerebral infarction by diffusion tensor imaging (DTI). *Methods:* 46 patients with acute cerebral infarction who were attacked in three weeks and had varying degrees of limbs dysfunction, were examined by conventional imaging and DTI, and the CST was performed DTT. These patients were evaluated by the National Institutes of Health Stroke Scale (NIHSS) and the Fugl-Meyer Motor Scale (FMA) before and after the treatment. We used the SPSS 13.0 statistical software to process the data. *Results:* 1) FA values in the affected side of infarction were significantly decreased, and its contralateral side had statistical differences ($p < 0.05$). There are inverse correlations between rFA values of CST and NIHSS ($r = -0.289$, $p = 0.013$). 2) The analysis on the correlation between the grades of CST and FMA shows that motor function recovery after cerebral infarction was related to DTT grades of CST ($r = -0.215$, $p < 0.01$). If the DTT grade was higher, the FMA after treatment was lower, and motor function recovery was much worse. *Implications:* As an important tool to evaluate the integrity of white matter fiber bundles in living bodies, DTI have important values in evaluating the prognosis of the motor function recovery in patients with cerebral infarction.

PO-0293

RATING OF PERCEIVED EXERTION TO IDENTIFY APPROPRIATE TRAINING INTENSITY FOR CARDIAC REHABILITATION

Sen-Wei Tsai[1,2]*, Chen-Rong Tsao[3], Chih-Tai Ting[3], Yan-Wen Chen[1], Chen-Ling Chen[1]

[1]Department of Physical Medicine and Rehabilitation, Taichung Veterans General Hospital, Taichung, Taiwan,Chinese Taipei, [2]Center of General Education, National Taichung University of Science and Technology, Taichung, Taiwan,Chinese Taipei, [3]Cardiovascular Center, Taichung Veterans General Hospital, Taichung, Taiwan,Chinese Taipei

Objective: To determine the influence of β-blockers on ratings of perceived exertion (RPE) during phase I cardiac rehabilitation (CR) for patients with a recent acute myocardial infarction. *Method:* One hundred and 5 patients with a recent acute myocardial infarction who received a successful percutaneous coronary intervention and completed a phase I CR program were recruited into this study. During a cardiopulmonary exercise test, the RPE was assessed every min, and parameters obtained were recorded for analysis. *Results:* The subjects entering cardiac rehabilitation had relatively low mean peak oxygen consumption (VO2max). The resting heart rate was not influenced by β-blocker use, but the peak heart rate and VO2max were lower in the subjects taking β-blockers. The RPE value at the ventilatory threshold was significantly higher (12.7 ± 1.7) in subjects who were taking β-blockers relative to those who were not (11.4 ± 1.4). *Implications/Impact on rehabilitation:* The results suggested that use of β-blockers increased the RPE value at the ventilatory threshold but did not affect the resting heart rate. Additionally, RPE 13 and 11 are valid indicators for exercise in patients who do not undergo a cardiopulmonary exercise test independent of β-blocker use.

PO-0294

FACTORS ASSOCIATED WITH RETURN TO WORK AFTER ISCHEMIC HEART DISEASE

Nadia Mohd Mustafah[1,2]*, Lydia Abdul Latif[1], Fazah Akhtar Hanapiah[2], Mohamad Rodi Isa[2]

[1]University of Malaya, Malaysia, [2]Universiti Teknologi Mara, Malaysia

Introduction: Cardiac rehabilitation program has been given attention among cardiologists, cardiothoracic surgeons and rehabilitation physicians, this study is hope to give knowledge on local prevalence of returning to work after ischaemic heart disease and what are the predictors of return to work (RTW). *Methods:* 112 subjects who had acute myocardial infarction (AMI)/ post coronary artery bypass graft (CABG) and worked prior to that were interviewed. A set of questionnaire containing sociodemographic variables, medical factors, work related questions and SF-36 were used to gather information. *Results:* 66.1% returned to work and 33.9% did not return to work. Both groups did not differ in sociodemographic and occupation except age. Cardiac diagnosis, vessels affected, treatment received, presence of diabetes mellitus (DM) and hypertension were significantly associated with the return to work status. Physical Functioning, Social Functioning and Mental Component Summary (MCS) scores were also statistically associated with return to work status. However, multivariate analysis only showed age, vessels affected, present of diabetes mellitus and Mental Component Summary score as an independent predictor of return to work. *Conclusion:* Increasing age, multiple vessels affected, presence of DM and lower MCS scores were negative predictor of RTW.

PO-0295

APPLICATION OF HUMAN UMBILICAL CORD BLOOD STEM CELLS IN THE TREATMENT OF TRAUMATIC SPINAL CORD INJURY PATIENTS

Liqing Yao[1], Chuan He[1], Ying Zhao[1], Ji Rong Wang[1], Mei Tang[1], Jun Li[1], Ying Wu[1], Li Juan Ao[2], Xiang Hu[3]

[1]Department of Rehabilitation, 2nd affiliated Hospital of Kun Ming Medical University. Kun Ming, Yun Nan Province, China, [2]Correspondence to: Li juan Ao, MD, Professor, Department of Rehabilitation, 2nd affiliated Hospital of Kun Ming Medical University.Kun Ming, Yun Nan Province, China, [3]Shenzhen Beike Cell Engineering Research Institute, Shenzhen, China

Backgroud: The treatment for SCI patients in late stage is a big challenge, the stem cells therapy provides hope for SCI patients' rehabilitation.The aim of this study is to evaluate the safety and effect of human umbilical cord blood stem cells (hucbsc) treatment for patients with traumatic spinal cord injury (SCI). The stem cells were supplied by Shenzhen Beike Cell Engineering Research Institute. *Objective:* 25 traumatic SCI patients in late stage were included in the study. *Method:* They underwent allograft therapy in the rehabilitation department, the hucbsc were transfused combined with intravenous and intrathecal injection. Their ASIA score, autonomic nerve function, Ashworth scales, somatosensory evoked potentials (SSEPs) value in limbs were evaluated and recorded at different time points before and after treatment.The time of followed up was 12 months. *Results:* 10 patients (40%) showed improvement of neurological status at different degree, 9 patients (36%) showed improvement of somatosensory evoked response to peripheral stimuli. No statistically significant difference about ASIA score was found among different time points in stem cells treatment group. *Impact on Rehabilitation:* This study proved the safety and effects of hucbsc treatment in SCI patients.

PO-0296

CLINICAL STUDY OF STANDARDIZED SPLINT USEING IN PROMOTING FUNCTIONAL RECOVERY AFTER THE DORSAL DIGITAL APONEUROSIS REPAIR

Qingyan Long, Yanping Guo, Jinrong Zhao, Haibo Zhu

Dept. of Rehab. Medicine. Ruihua Affiliated Hospital of Soochow University, Soochow, China

Objective: To explore the effects of standardized splint using in promoting digital stretch functional recovery after the dorsal digital aponeurosis repair. *Methods:* All 40 patients after the dorsal digital aponeurosis repair were randomly divided into treated group and control group, treated group (20 cases 22 fingers) give standardized splint using and function exercise. The control group (20 cases 22 fingers) only give function exercise. Two groups are entered the group at postoperative 2 weeks with the joints of injury finger 0° a fixed. 6 months after treatment by the total active motion (TAM) system evaluation method to assess with movement function. *Results:* The treated group and the control group after treatment, the difference was highly statistical significance ($p<0.01$), the treated group was better than the control group. *Conclusion:* Standardized splint using can promot digital stretch functional recovery after the dorsal digital aponeurosis repair.

PO-0297

EFFECTS OF TRANSCUTANEOUS POSTERIOR TIBIAL NERVE STIMULATION ON THE OVERACTIVE BLADDER

Rd Haryadi, Sm Mei Wulan, Aisyah

Department of Physical Medicine & Rehabilitation, Indonesia

Objectives: To evaluate the effect of non-invasive stimulation of the posterior tibial nerve for the treatment of overactive bladder (OAB). *Methods:* A randomized controlled experimental study involved fourteen women with OAB were divided into two groups: first group - seven patients underwent posterior tibial nerve stimulation once a week for five weeks and the second group - the seven patients without stimulation as controls. All patients filled out questionnaires and voiding diaries the Incontinence Quality of Life (IQoL) before and after five weeks of therapy. Reduction in symptoms by 50% or more is considered as an objective success. Results of the seven

patients in the first group, micturition frequency was reduced 46%, 69% reduced nocturia and urgency decreased 56%. IQoL improved significantly. The second group showed no change in the complaint. *Implication/Impact on Rehabilitation:* The therapy of the posterior tibial nerve neuromodulation improve subjective and objective symptoms of OAB, has no side effects and well tolerated.

PO-0298

FALL CHARACTERISTICS AMONG DIFFERERNT DEPARTMENTS IN HOSPITALIZED PATIENTS

Haowei Tang, Ta-Sen Wei*

Department of Physical Medicine and Rehabilitation, Changhua Christian Hospital, Chinese Taipei

Objective: The aim of this study is to determine the fall rates and explore the characteristics of fallers in different hospital departments. *Method:* A 6-year prospective evaluation was performed. Four representative departments were chosen, the internal medicine, surgery, neuro-rehabilitation and psychiatry departments. Data collected using the computerized fall reporting system included patient demographics and characteristics of fall events (time, location, circumstances of the fall, and severity of injuries). *Result:* A total of 1,752 fallers (61% male) were enrolled, aged 62.5±16.7 years. The overall fall rate was 0.85 per 1,000 patient-days. The fall rate in the psychiatry department is the highest (2.98 per 1000 patient-days), followed by the neuro-rehabilitation department (1.81), internal medicine departments (1.00), and surgery departments (0.50). In this study, 24.9% of fallers experienced repeat falls, and the highest proportion of repeat fallers was in the psychiatry department (57.3%). The overall injury rate was 25.2% (441), with significantly lower values in the neuro-rehabiliation and psychiatry departments (17.1% and 19.5%, respectively; p=0.001). A higher proportion of falls occurred during the night nursing shifts (40.9%). The locations of falls differed significantly among departments (p<0.001), with higher proportions of falls in corridors in the psychiatric department (21.6%), and at the beside in the neuro-rehabilitation department (67.3%). *Implications/Impact on rehabilitation:* The fall rates and circumstances varied significantly across clinical departments. Therefore, different characteristics of inpatient falls should be considered in making fall prevention strategies and in patient education.

PO-0299

A VALIDITY COMPARISON OF BETWEEN IMAGE PROCESSING AS INNOVATIVE METHOD AND GONIOMETRY IN MEASURING Q ANGLE

Mohammad Rahimi[1], Mohammad Hosaine Alizadeh[1], Reza Rajabi[1], Naser Mehrshad[2]

[1]Tehran university,Iran, [2]Birjand university,Iran

Objective: Q angle is defined as an acute angle between two imaginary lines drawn from the ASIS to the center of patella, and from the center of the patella to the Tibial tubercle. Measuring of Q angle is conducted in the supine position by two main methods, invasive methods such as radiography and CT scan, and non-invasive methods, including goniometry and photogrammetry. In this study, having presented a new method, the researcher wants to answer the following question: which one of the non-invasive methods is more valid? *Method:* In order to answer this question, the Q angle of 18 knees, with mean and standard deviation of age 23.55±2.24 (years), mean weight of 73.00±10.47 (kg), thigh length of 43.11±3.17 cm, pelvis width of 39.66±3.00, using CT scan method, innovative method of image processing and goniometry in the supine position were calculated and the correlation between the innovative method of image processing, goniometry, and CT scan was computed via Pearson correlation coefficient. *Results:* Findings of this study revealed a significant relationship between Q angles obtained through the innovative method of image processing and CT scan method in the supine (r=0.92), it also showed the same relation between Q angle obtained with the goniometry and CT scan in the supine position (r=0.81) (p=0.001). *Implications/ Impact on rehabilitation:* According to the result of this research, tools and instruments applied for Q angle calculation can be rated according to the correlation rate they have with the CT scan method. Therefore, the innovative method of image processing can be an appropriate substitute for goniometry method in measuring Q angle in the supine position.

PO-0300

DEVELOPMENT OF A RETURN-TO-WORK VOCATIONAL ASSESSMENT TOOL USING VIRTUAL REALITY TECHNOLOGY AND MANIPULATION INTERFACES

Ying-Chih Wang[1,2,3], Katherine Byers[4], Robert Trierweiler[3], Keith Edyburn[5], Michael Jesselson[3], Matthew Insley[3], Elliot Roth[3]

[1]University of Wisconsin-Milwaukee, USA.,United States, [2]Northwestern University, USA.,United States, [3]Rehabilitation Institute of Chicago, USA,United States, [4]West Virginia University, USA,United States, [5]Rehabilitation Research Design & Disability (R2D2) Center, USA,United States

Objective: To develop a rich but compact vocational assessment package that is designed specifically to provide a global assessment in a confined area for stroke survivors whose short- or long-term goal is to return to work. *Method:* Twenty-one stroke survivors (mean age 58 ± 11 years, time post-stroke was 8.0 ± 5.9 years) were recruited for pilot testing of the Virtual Reality Vocational Rehabilitation (VR2) assessment tool. Additionally, each subject was evaluated with several clinical assessments including Fugl-Meyer motor assessment, Box-and-Block-Test (B&B), 9-Hole-Pegboard-Test, and Functional Independence Measure. We initially examined three motor function indexes derived from the VR2 and their relationships to the clinical assessment. Path ratio was operationally defined as the reaching distance of the paretic arm divided by that of the non-paretic arm. Range index was defined as the average active range of motion of five fingers. Average reaching velocity (m/s) was computed during a 30-second finger to nose reaching tasks. *Results:* Average reaching velocity, path ratio, and range index correlated moderately with Fugl-Meyer (Pearson r correlation coefficients=0.78, 0.60, 0.76). Similarly, all three indexes correlated moderately with B&B (Pearson r=0.71, 0.65, 0.61), which supported their initial use. In addition, we found that the range index and average reaching velocity of the paretic arm were statistically smaller than the non-paretic arm (p=0.027, p=0.018, respectively), which supported that these indexes were able to distinguish different level of motor function. *Implications/Impact on rehabilitation:* Preliminary analyses supported initial use of the VR2 for stroke patients.

PO-0301

POSTURAL CONTROL POST-STROKE AND FUNCTIONAL ELECTRO STIMULATION: CASE REPORT

Costa Thais*, Alessandra Barbosa, Maria Fernanda Oliveira, Pedro Castro, Maria Cecília Moreira, Daniel Goroso, José Augusto Lopes, Ayres Denise, Linamara Battistella

Clinical Research Center- Institue of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, São Paulo, Brazil, Brazil

Objective: The purpose of this study was to investigate the response of postural control in two individuals with hemiparesis after stroke by the application of Functional Electrical Estimulation (FES) in a short period. *Method:* The experimental protocol had four phases. A: pre FES; B: Immediately after the application of FES; C: 45

min after the application of FES; D: 90 min after application of FES. The participants were positioned on a force platform (AMTI 100Hz) and performed by three attempts the task chosen, the test of the third finger on the floor. The software Matlab 7.0 provided the variable Center of Pressure velocities in medio-lateral (Vmx) and antero-posterior (Vmy) direction. *Results:* For participant 1 was observed of the phase A to D, Vmx discrete reduction of 0.62%, and an increase of 7.62% in Vmy. As for the second participant 2 Vmx increased of 7.04% in the phase A to D, while Vmy presented discrete reduction of 0.59%. Therefore, when participants presented reduction less than 1% in Vmx and Vmy, it possibly indicated the same regulatory activity before application of FES or a lower regulatory activity, even after the application of FES. *Implications/ Impact on rehabilitation:* These results may be relate to the type of protocol used because in this study was made a single session of application of FES while in most protocols are made from three to five applications per week for a five months. Therefore, only one application of FES probably is not sufficient for the formation of new engrams neuromotor.

PO-0302

NEW CHALLENGE ON FUNCTIONAL ELECTRIC STIMULATION ON DROP FOOT

Cátia Galvão[1]*, Joana Paula[2], Paulo Melo[2], Carlos Vasconcelos[2], Jorge Martins[2], Miguel Silva[2]

[1]Department of Physical Medicine and Rehabilitation, Hospital de Curry Cabral, Lisbon, Portugal, Portugal, [2]IDMEC, Instituto Superior Técnico, Universidade Técnica de Lisboa, Lisbon, Portugal, Portugal

Objective: Functional Electrical Stimulation (FES) is based on the electrical stimulation of the neuro-muscular tissue that lacks normal nervous control, allowing an involuntary muscular contraction to occur. FES has several clinical uses, one of those is to assist gait. *Methods:* We examine scientific publications on some of the major FES-assisted walking devices that have been developed for experimental and commercial purposes over the last decades, including drop foot stimulators, multichannel stimulators and hybrid orthotic systems. *Results:* FES is an effective method for the treatment of gait disorders, mainly in stroke and spinal cord injury, improving the gait pattern. In some patients with stroke, random control trials have demonstrated the superiority of FES over conventional treatment (mainly ankle foot orthosis). The first applications of FES date back to the 1960s. The last technological innovations resulted from the introduction of multichannel stimulators, able to apply a different variety of stimulus profiles and new sensing modalities combining inertial and force sensitive resistors. New concepts in drop foot stimulation have been recently developed with the introduction of natural sensors, implantable electrodes and minimally invasive microstimulators, such as the BION (BIOnic Neuron). *Implications/Impact on rehabilitation:* FES-assisted walking devices have therapeutic benefits that mainly include the increasing of gait velocity. Beyond the functional benefits, FES allows spasticity decreasing, the improvement of muscle strength and bone density, to name just a few.

PO-0303

APPLICATION OF NEURAL IMAGING IN EVALUATING SPINAL CORD NEURAL PLASTICITY AFTER SPINAL CORD INJURY: A CASE REPORT

Zhiguo Jiang[1,2], Gail Forrest[1], Steven Kirshblum[3], Bing Yao[4], Guang Yue[1]*

[1]Human Performance and Engineering Laboratory,Kessler Foundation Research Center,West orange, NJ 07052,United States, [2]Department of Biomedical Engineering, New Jersey Institute of Technology, Newark,NJ 07103,United States, [3]Kessler Institute for Rehabilitation, West Orange, NJ 07052,United States, [4]Center for Neuroimaging Reserach, Kessler Foundation Research Center, West orange, NJ 07052, United States

Objective: There have been limited options for accurate and objective evaluation of SCI and its progression and recovery following rehabilitation. The goal of this study was to use non-invasive functional magnetic resonance imaging (fMRI) and diffusion tensor imaging (DTI) to quantify functional and structural plasticity of the SC and relate the plasticity with sensorimotor function in a patient with chronic SCI. *Method:* Data of fMRI and DTI were planned to be collected at two time points (4-8 weeks in between) using Siemens 3T Skyra scanner in one patient with chronic SCI. The patient was to participate in rehabilitation prescribed by his physician during the time span. DTI indices of the SC fiber tracts, including fractional anisotropy (FA) and mean diffusivity (MD), and fMRI signals in motor task-related clusters in the SC ventral horn nuclei were to be analyzed. Changes in the DTI and fMRI indices following 8 weeks rehabilitation were to be compared with improvements in motor and sensory scores. *Results:* Both DTI and fMRI measurements were expected to change with improvements in motor and sensory scores of the patient.

PO-0304

RELIABILITY OF A NOVEL WEARABLE INERTIAL SENSING INSTRUMENT FOR SHOULDER RANGE OF MOTIONS MEASUREMENT

Yu Ching Lin, Yu Liang Hsu, Jeen Shing Wang*, Yi Ju Tsai, Shu Min Chen

National Cheng Kung University, Chinese Taipei

Objective: To compare the reliability of a novel wearable inertial sensing instrument with the universal goniometer and an electrogoniometer for measuring active and passive range of motions (ROMs) of shoulder. *Method:* The wearable inertial sensing instrument is composed of a set of sensor modules and an algorithm running in a personal computer. Each sensor module contains an accelerometer, a gyroscope, a magnetometer, a microprocessor and a Bluetooth module. Fourteen patients (6 males and 8 females, ages between 41-82 years old) with frozen shoulder participated in this study. They were instructed to execute the active and passive ROMs of shoulder including flexion, abduction, extension, external rotation, and internal rotation. Experienced physical therapists used the inertial sensing instrument, universal goniometer, and electrogoniometer to measure active and passive shoulder ROMs for each participant. Intratester reliability was evaluated by intraclass correlation coefficient (ICC). *Results:* Intratester ICCs were 0.924 (ranged from 0.810 to 0.983), 0.957 (ranged from 0.879 to 0.988), and 0.945 (ranged from 0.861 to 0.978) for the active shoulder ROMs made with the inertial sensing instrument, universal goniometer, and electrogoniometer, respectively. For the passive shoulder ROMs, the ICC values were 0.948 (ranged from 0.907 to 0.981), 0.969 (ranged from 0.958 to 0.987), and 0.947 (ranged from 0.948 to 0.959) with the three instruments, respectively. *Implications/Impact on rehabilitation:* The inertial sensing instrument showed excellent intratester reliability similar to the universal goniometer and electrogoniometer. Clinicians can shorten the measuring time for active and passive shoulder ROMs with this reliable novel inertial sensing instrument.

PO-0305

INSPECTING OSTEOPOROSIS USING ULTRASOUND BY VISUALIZATION OF INTERNAL MICROSTRUCTURE OF HEEL BONE

Kenji Kagechika[1], Minori Nakata[1]*, Misao Tsubokawa[1], Aki Nakanami[2], Yasutaka Takagi[2]

[1]Kanazawa Medical University,Japan, [2]Tonami General Hospital, Japan

In order to estimate fracture risk of in vivo bone based on biomechanics, microarchitecture of cancellous bone and its stiffness are needed. We have established technique for visualizing architecture of heel bone (calcaneus) using ultrasound amplitude-mode (A-mode) signals. The technique is based on separation between bone and bone marrow using both signal-amplitude and signal-attenuation variations. In first, we examined to clarify the validity of this technique using some cancellous bone and spongy-shaped ceramic specimens. The pixel size of architecture created was 0.2 (width) × 0.15 (depth) mm for bone marrow and 0.2×0.3 mm for the bone substance; the pixel size depends on the difference in sound of speed in substance. Then, we applied in vivo heel bone to validate the technique by showing multi-layer images. It is found that the technique could create an image size of ~5 mm depth from the cortical bone surface using 7.5 MHz transducer of a general medical device. A new transducer has developed for quick measurement of the heel bone in several 10-second. It is concluded that the technique would be applicable to assess fracture risk and to diagnose osteoporosis based on the biomechanics.

PO-0306

ARTERIOSCLEROTIC AND RUPTURED BLOOD VESSEL APPEAR AS A CHANGE IN THE DYNAMIC PROPERTY OF VESSEL WALL DYNAMIC DEFORMABILITY AND STRENGTH BY CAROTID ARTERY ECHO

Kenji Kagechika[1], Minori Nakata[1]*, Misao Tsubokawa[1], Aki Nakanami[2], Yasutaka Takagi[2]

[1]Kanazawa Medical University, Japan, [2]Tonami General Hospital, Japan

Purpose of this study is establishment of metrology that detects progress of arteriosclerosis by carotid artery echo and new diagnostic method. Consideration of effectiveness of Stiffness parameter Eth by clinical data acquisition. Method and measurement principle is that arteriosclerotic and the ruptured blood vessel appear as a change in the dynamic property of the vessel wall (dynamic deformability and strength). Then, the change in the vessel diameter according to the ictus is measured from the echo view, and stiffness and blood vessel rupture strength of the vessel wall are evaluated by biomechanics. The feature of this *Method:* Stiffness is evaluated according to the several echo dynamic scenes and the blood pressure. The vessel diameter can be measured from the echo view. On the other hand, the distorsion depends on the speed of the external force because the blood vessel has both elasticity and the viscosity characters. *Result and Conclusion:* Eth-Ep has an excellent relationship in both examined and Ep also examined whether it was an effective notation admitted. It was admitted that one axis stretch condition necessary to measure strength of the material, equivalent Eth notation to the tensile test result was appropriate. As a result, the thing that was a blood vessel that was about as much as seven times harder was shown as for the artery of lower extremity. It is possible to apply it to the blood vessel to be able to acquire the echo view such as the common carotid artery, aorta abdominalis, and artery of lower extremities.

PO-0307

IMPACT OF TWO TYPES OF COMMERCIALLY AVAILABLE "UNSTABLE" SHOES ON GAIT. A 3D KINETIC, KINEMATIC AND ELECTROMYOGRAPHIC EVALUATION

Alberto Esquenazi, Patrizio Sale, Mukul Talaty

MossRehab, United States

Objective: The aims of this study are to investigate the differences in the gait kinematic, kinetic and electromyography (EMG) activation patterns of selected lower limb muscle of 10 healthy volunteers when comparing 2 different commercial "unstable" shoes Skechers Shape Up® (SK) and Masai Barefoot Technology® (MBT) to a New Balance® walking shoe (NB). *Design:* A within-subject study-design was used. Setting Ten healthy subjects underwent 3D gait analysis and surface electromyography following CODA protocol. Surface EMG (sEMG) recordings were obtained using Motion Lab System electrodes.The subjects were asked to walk with SK, MBT and NB shoes at their self-selected walking velocity along a 12-meter walkway whith 5 Bertec force platforms embedded in the floor. The order of shoe training and testing was randomized. Interventions Subjects had 30 h of training time with each shoe prior to testing. *Results:* Kinematic parameter results from base line condition (NB) of all 10 subjects were compared to the 2 "unstable" conditions (SK and MTB). There were no significant difference on walking velocity between conditions and cadence parameter. Periods of double support showed a decrease for SK (Right 9.00±2.00 % and Left 9.700±1.059 %) when compared to NB and MBT. Kinematic changes were evident with increase Ankle Eversion for SK in 70% of subject and increase in Hip Abduction in 30%. Ankle Dorsi-Plantarflexion changes were noted in 20% of the subject with a decrease in plantarflexion and in 30% an increase in dorsiflexion. Kinetic parameter demonstrated increase in vertical force application. Forty percent of subjects showed a decrease in Hip Moment and a decrease in ankle power in 50 %. The sEMG activation pattern was also altered. *Discussion:* Our findings support the premise that MBT and SK "unstable" shoes produce significant kinematic, kinetic and sEMG activation changes in the walking pattern of normal subjects when compared to gait with a NB walking shoe. The gait with the tested shoes appears to produce instability at the ankle and hip with increase ankle eversion and hip abduction for a large proportion of the subjects. Also ankle dorsiflexion was decreased for many subjects using MBT and increased for SK. Increase vertical forces were also noted for both shoes. Firing pattern changes in sEMG correlate with the biomechanical findings. *Conclusions:* Gait with these shoes may be less efficient and unstable forcing compensatory locomotor patterns. In healthy subject the biomechanical changes could result overtime in neuromuscular problems based on the reported changes. These "unstable" shoes may have a role in persons with neurological and/or orthopedic diseases but this requires further study.

PO-0309

LONGITUDINAL VALIDITY OF UPPER EXTREMITY KINEMATICS IN DRINKING TASK DURING THE FIRST THREE MONTHS AFTER STROKE

Margit Alt Murphy*, Carin Willén, Katharina S Sunnerhagen

University of Gothenburg, Sweden

Objective: Kinematic movement analysis is increasingly used as an outcome measure in the evaluation of upper extremity function after stroke. Little is known, however, what observed longitudinal changes in kinematics mean in context of an individual's functioning. In this study, the longitudinal validity and expected change in kinematic measures associated with clinically meaningful improvement in upper extremity were evaluated. *Method:* Kinematic movement analysis of a drinking task and Action Research Arm Test (ARAT) were performed early (mean 9 days post stroke) and at three months after stroke in 51 subjects. The linear regression analyses were used to evaluate responsiveness of nine kinematic measures incorporating the aspects of movement speed, smoothness and compensation). *Results:* For the subgroup (n=24) that demonstrated clinically meaningful improvements in upper extremity function (>10% improvement of ARAT score), statistically significant associations between change scores of ARAT and kinematics were detected in movement time, smoothness, trunk displacement and angular velocity of elbow joint. An approximate 10% improvement from baseline in kinematics was associated with clinically meaningful improvement in upper extremity function. *Implications:* Kinematic measures of movement time, smoothness,

trunk displacement and angular velocity of elbow are responsive measures for capturing improvements in upper extremity function during the first three months after stroke. This knowledge is valuable both for clinical and movement analysis research as well as when most appropriate kinematic outcome measures are selected for clinical trials.

PO-0310

MYONUCLEI RELATIONSHIP AND FUNCTION OF RAT SKELETAL MUSCLE CELLS RESEARCH

Yanwei Wang[1], Mingjin Wang[1], Xuewei Lu[1], Suzhen Zhou[1], Bin Zhao[1]

[1]Hebei normal university, [2]Shijiazhuang college

There are lots of myonuclei in skeletal muscle cell. But there were a few works in myonuclei function. *Objective:* myonuclei of skeletal muscle would be marked with 5-bromo-2-deoxyuridine and sought the myonuclei. Through training studied on skeletal muscle volume increased and the number of muscle cells. *Method:* 14 months old rats were randomly grouped into quiet and training group. For the 10 weeks of the experiment, these rats were injected brud in the last 10 days. The nucleus was studied by immunohistochemistry experiments. *Results:* the skeletal muscle of rats have new myonuclei and There is a positive correlation of total protein in muscle cells and average myonuclei coefficient. *Implications:* The number of skeletal muscle cells is a dynamic change. Proper exercise can raise the amount of myonuclei in skeletal muscle cells and increase the total protein.

PO-0311

THE IMPORTANCE OF DETERMINING THE OPTIMAL HEAD POSITION OF PATIENTS WITH VERTEBRO-BASILAR INSUFFICIENCY TO INCREASE THE EFFECTIVENESS OF THEIR TREATMENT

Rada Chudnaya*, Georgii Marchuk, Vitaliy Zorgach, Sergey Dibkaluk

National Medical Academy of Postgraduate Education name of P.L. Shupyk, Canada

Objectives: To determine an optimal body, head and neck position for patients with vertebro-basilar insufficiency during physio and manual therapy. *Methods:* Ultrasonography linear transducer with a frequency of 7, 5-13, 0 MHz in triplex mode was applied to the patient's neck to the both sides in supine position. The vertebral arteries and collateral circulation between vertebral arteries and veins, at anterior, posterior, deep and superficial plexus of cervical vertebrae were examined during turning of head to the "right" and "left". Examination was continued when the patient was lying on the right and left side and then on stomach, turning head "right" and "left" in order to determine the position when the circulation in the target vessels was the most optimal. The following criteria was used: diameter of blood vessels (normal 2,8-3,8 mm), systolic (normal 31,0-51,0 cm/sec), medium (normal 15,0-26,0 cm/sec), diastolic (normal 9,0-16,0 cm/sec) and volume (normal 60,0-125,0 ml/min) velocities decreased pulsation (normal 1,1-2,0) and resistant index (rate 0, 63-0,77) of vertebral arteries and reduce the diameter (normal to 1.0 mm). *Result:* Method was applied to 450 patients with vertebro-basilar insufficiency during rehabilitation treatment including physiotherapy, manual therapy and massage. The number of patients who developed symptoms of vertebro-basilar insufficiency was significantly less in main group compared to control group. *Implications:* Our initial assessment of the results showed the importance the optimal position of patients head and body to increase the effectiveness of the treatment and prevent symptoms of vertebro-basilar insufficiency.

PO-0312

A VIVO ANIMAL STUDY OF SELECTIVE NERVE ACTIVATION INDUCED BY ELECTRICAL STIMULUS OF DIFFERENT ELECTRODES

Xiaojin Zhu[1], Xu Zhang[1], Hui Wang[2,3], Zhaohui Ren[1], Qingkai Liu[1], Chunchan Li[1], Lili Yan[1]

[1]School of Biomedical Engineering, Capital Medical University, Beijing, China, [2]Beijing Chaoyang Hospital, Beijing, China, [3]Key Laboratory of Otolaryngology Head and Neck Surgery, Capital Medical University, Beijing, China

Objective: Many studies have shown that the nervous tissue can be excited or blocked by Functional electrical stimulation (FES) to a peripheral nerve. FES has a potential to provide a non-destructive, non-side effects therapy to stimulate selectively different diameter nerve fibers in a compound nerve trunk. To compare the effect of low - frequency stimulation signal and high-frequency stimulation signals to nerve fibers with three biphasic stimulation modes respectively using monopolar, bipolar and tripolar electrodes, this study aimed to find an optimal electrodes stimulus pattern for the selectively stimulating nerve fibers effectively. *Method:* We used the sciatic nerve of live animals as the research object. We used the symmetry biphasic pulses to compare the effect of nerve excitement generated by monopolar, bipolar and tripolar electrodes. *Results:* The results indicated that the nerve fibers can be selectively stimulating effectively under the three biphasic stimulation modes with monopolar, bipolar and tripolar electrodes. *Implications:* The results of the experiment may provide the research foundation for the scientific research and clinical application of the treatment of pathological hyperactivity using FES.

PO-0313

BENEFITS OF ROBOT-ASSISTED GAIT IN SPINAL CORD INJURY: A SYSTEMATIC REVIEW

Francine Souza*, Pedro Castro, Maria Cecília Moreira, Linamara Battistella

Clinical Research Center. Institute of Physical and Rehabilitation Medicine.Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, São Paulo, Brazil, Brazil

Objective: To evaluate the quality of current evidence regarding effectiveness of body weight-supported, robot-assisted gait in subjects with spinal cord injury, with emphasis on gait performance. *Methodology*: A survey was conducted in PubMed, Lilacs and Embase using the keywords "spinal cord injury" and (gait or walking or deambulation) reahbilitation and robotic and (Lokomat or ReoAmbulator or Formador Gait). Clinical trials published between 2001-2012 which compared locomotor training with or without other intervention were included. *Results:* From the 8 selected studies, only one did not findimprovement in gait performance. From the studies which found improvement, 6 found statistically significant improvement and one found no significant difference, although a tendency to improvement was noticed. The findings of these studies were obtained through assessment tools like the six-min and the ten-meter walk tests, FIM (Functional Independence Measure, WISCI II (Walking Index for Spinal Cord Injury), among others. Some studies pointed to a decrease in the need for orthotics and assistive devices in this group. Regarding methodological quality, 6 articles presented scores lower than 3 points and only one article got the maximum score 5 in JADAD scale (low quality less than 3). Implication/*Impact on rehabilitation:* In spite of the small quantity of articles found, of the low methodological quality noted and the fact that this is a costly and new modality of intervention, the results are significant when compared to conventional physical therapy and to other well-established techniques in physical therapy.

PO-0314

RECOGNITION METHOD OF EEG-EMG FUSION BASED ON LMD-MULTISCALE ENTROPY AND EXTREME LEARNING MACHINE

Xiaoling Chen[1], Ping Xie[1], Yuping Su[1], Peipei Ma[1], Xiaoli Li[1]

[1]Institute of Electrical Engineering, Yanshan University, Qinhuangdao, Hebei 066004, China, [2]Department of rehabilitation, Qinhuangdao peoples hospital, Qinhuangdao, hebei 066000, China

Objective: The main aim of this study is to develop a method to accurately predict human movement intention by means of the fusion of EEG and EMG data from the patients with perceptual-motor dysfunction (PMD). *Method:* A quantitative method is proposed to extract instantaneous feature of EEG and EMG based on local mean decomposition and multiscale entropy (MSE). The EEG and EMG are adaptively decomposed into product functions (PFs) and the effective PFs are quantitatively described by the MSE to consist a multiple features information space (MFIS). Then, a fusion model based on Extreme Learning Machine is established to build a map from the MFIS to the human movement intention (HMI). *Results:* The method was tested with the EEG and EMG data synchronously recorded from 20 patients with PMD in lower limbs (10 stroke patients in chronic phase (stroke) and 10 with peripheral nerve injury (PNI)) and 10 healthy people (HP) performing knee extension and flexion task. Three trainings (group 1: EEG as input; group 2: EMG as input; group 3: EEG-EMG as input) were performed. The results illustrate that the identification accuracy for group 3 (84.4% (stroke), 85.3% (PNI), 98.9% (HP)) is better than group 1 (69.2% (stroke), 75.4% (PNI), 85.3% (HP)) and group 2 (80.5% (stroke), 79.6% (PNI), 93.4% (HP)). *Implications on Rehabilitation:* Conclusion is obtained that human movement intention can be predicted complementarily by EEG and EMG features. In particular, the proposed method can improve the identification accuracy and can be helpful to biological feedback control in rehabilitation training process for the PMD patients.

PO-0315

ABDOMINAL BREATHING EXERCISE USING EXTERNAL PRESSURE: TO IMPROVE THE FUNCTION OF PECTORAL BREATHING IN NECK SPINAL FRACTURE PATIENTS

Yuan Zhang[1], Chengyu Liu[1], Xuecheng Cao[1]

[1]Department of Orthopedic Surgery, Jinan Military General Hospital, Jinan, China, [2]School of Control Science and Engineering, Shandong University, Jinan, China

Objective: Neck spinal fracture patients have a week function of pectoral breathing and muscle strength. This paper aims to assess the effect of abdominal breathing exercise to improve the function of pectoral breathing in neck spinal fracture patients. *Method:* A total of 8 subjects (3 females and 5 males, age 36.1±5.9 years) were enrolled. Each subject accepted the abdominal breathing exercise from the day after surgery until exercising successive 10 days. In each day, the subject accepted 5 exercise sessions and each session lasted for about 30 min. Exercise was prohibited within 1 h after meal and was arranged dispersedly as much as possible. In each session, the subject was asked to lay supine on a bed for a 10 min rest period to allow cardiovascular stabilization. Then rehabilitation physician placed an external pressure on the subject's abdomen when he/she exhaled and then released the external pressure when inhaled. The above action was repeated about 3-4 times in one min. The respiratory rate was selected for the effect assessment of the proposed method. This index was recorded before the exercise and after 10-day exercise. The pectoral muscle strength was also observed. *Results:* Respiratory rate significantly decreased by 7 time/min after exercise (15±4 vs 22±5 time/min, $p<0.01$). The pectoral muscle strength has enhanced after 10-day exercise. *Implications/Impact on rehabilitation:* Abdominal breathing exercise using external pressure is a useful method for neck spinal fracture patients to improve their pectoral breathing and muscle strength.

PO-0316

EFFECTIVE SITE OF SURFACE ELECTRODES TO STIMULATE THE SUPRAHYOID MUSCLES

Takahiro Momota[1], Hitoshi Kagaya[2], Noki Sakano[1], Eiichi Saito[2]

[1]Faculty of Rehabilitation, School of Health Sciences, Fujita Health University,Japan, [2]Department of Rehabilitation Medicine I, School of Medicine, Fujita Health University, Japan

Purpose: To examine the effective site to place surface electrodes on the neck to elevate hyoid bone by electrical stimulation. *Method:* A pair of single-channel surface electrode were attached to the anterior neck in 10 healthy subjects. The electrodes were placed at 1cm superior and 2 cm lateral, 1cm superior and 3 cm lateral, 2 cm superior and 2 cm lateral, and 2 cm superior and 3 cm lateral from the hyoid bone. A 100Hz of electrical stimulation were given to the subjects by using the PAS system (OG Giken). The movement of hyoid bone during electrical stimulation were recorded by videofluoroscopy and analyzed by using image analysis software (Image-J). *Results:* The hyoid bone shifted to superior and anterior during electrical stimulation. The hyoid bone moved more superior when the electrodes were placed 2cm lateral and more anterior when they were at 3cm lateral. *Implications/Impact on rehabilitation:* The site of electrodes placement is important to apply electrical stimulation to the suprahyoid muscles.

PO-0317

LONG-TERM QUANTITATIVE MEASUREMENT OF SPASTICITY AFTER BOTULINUM TOXIN TYPE A INJECTION BY AN OBJECTIVE SPASTICITY EVALUATION SYSTEM

Yu Ching Lin, Pin-Cheng Kung, Ming-Shaung Ju, Chou-Ching K Lin, Shu-Min Chen

National Cheng Kung University, Chinese Taipei

Objective: To investigate the time course of forearm spasticity in patients with upper motor neuron syndrome after botulinum toxin injection by an new spasticity evaluation system. *Method:* The spasticity evaluation system included a rotational mechanism, an AC servo motor, a motion controller, position sensors, custom-made torque sensors, and a safety device. It surpasses the clinical manual assessments by combining both constant speed and constant torque controls. The system could stretch supination movement for forearm of patients. The quantitative index in supination, passive stretching angle was formulated. Three patients (one spinal cord injury, one stroke and one traumatic brain injury) with spasticity received botulinum toxin type A (Botox 200 units) into the Pronator Teres and Biceps Brachii muscles. The spasticity of the forearm pronators was assessed by this spasticity evaluation system and the Modified Ashworth Scale (MAS), at baseline, and at Week 1, 2, 4, 8, 12, 16, 20, 24, 28 and 32 after injection. *Results:* After Botox injection, the stretching angle of all patients increased during 4 weeks. The angle gradually decreased after 8 weeks. The correlation between the stretching angle and MAS was -0.61 ($p<0.0001$). In particular, the stretching angle of the spinal cord injury patient returned to baseline at 28 weeks after first injection. But after second injection, the difference of angle still maintained 25.1 degree between baseline and 32 weeks. *Implications/Impact on rehabilitation:* The spasticity evaluation system provides quantifiable and reliable data for spasticity measurement. It can be used as an objective tool to supplement clinical manual examination in management of spasticity.

PO-0318

COMPARISON BETWEEN TWO METHODS FOR THE QUANTIFICATION OF MECHANICAL WORK IN THE ANALYSIS OF POSTURAL CONTROL

Pedro Castro*, Daniel Goroso, José Augusto Lopes, Maria Cecília Moreira, Linamara Battistella

Clinical Research Center- Institue of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation, Hospital das Clínicas. University of São Paulo School of Medicine, São Paulo, Brazil, Brazil

Objective: The purpose of this study is to compare two calculation methods for quantification of mechanical work (W) as a tool for analysis of postural control in subjects undergoing motor and visual disturbances. *Method:* The sample consisted of 10 male healthy subjects, age range=25,6 (± 2,2) years. Five trials were performed by each subject in both conditions.This stud focuses on the quantification of W performed by muscular system before, during and after trunk extension for straight posture (self-disturbance) in subjects with preserved vision (VP) and temporary deprivation of vision (PMV) is approached in this study through two methods called: *i*) Total mechanical work (Wtot) and *ii*) Mechanical work of the centre of mass (Wcm). An image system for tridimensional, optoelectronic tracking, consisting of 8 (eight) video cameras with a capture frequency of 200 Hz was used to collect data. *Results:* A strong correlation between W obtained through both methods was observed through linear regression analysis (r2=0,77 for PV condition and r2=0,84 for MPV). *Implications/Impact on rehabilitation:* We concluded that both methods enable the investigation of alterations on posture control after motor and sensorial disturbances and, therefore, they can be used as an assessment tool in physical rehabilitation.

PO-0319

THE VALIDITY OF A NOVEL CALIBRATION METHOD TO MEASURE RELATVIE CHANGES IN RESPIRATORY PARAMETERS DURING QUIET BREATHING AND EXERCISE

Wai Leung Ambrose Lo[1], Anne Bruton[1]*, Anna Barney[2]

[1]Faculty of Health Sciences, University of Southampton, Southampton, SO17 1BJ, United Kingdom,United Kingdom, [2]Institute of Sound and Vibration Research, University of Southampton, Southampton, SO17 1BJ, United Kingdom,United Kingdom

Objective: To investigate if respiratory inductive plethysmography (RIP) garment can estimate predictable proportionate relative changes in respiratory parameters in healthy subjects at rest and exercise when calibrated by a novel method. *Method:* Tidal volume (Vt) and expiration time (Te) were simultaneously measured by RIP and pneumotachograph (pNT) in eleven healthy subjects during 35 min of rest and 25 min of moderate exercise. RIP was calibrated with a variation of the Qualitative Diagnostic Calibration on a breath by breath basis. *Results:* The correlation coefficients of mean Vt between devices were significantly correlated ($p<0.001$) at 0.8 during rest and exercise. Mean coefficient of variation of Vt between devices was significantly correlated ($p<0.001$) at 0.8 during rest and exercise. The mean difference in Te between RIP and PNT was 0.5 second during rest and 0.1 second during exercise. Difference in Te is statistically significant in all participants during rest and in seven participants during exercise. Bland & Altman analysis showed that RIP had overestimated Te. 95% limits of agreement of Te was -1.0 to 1.9 during rest and -0.69 to 0.74 during exercise. ICC of Te between RIP and PNT at was 0.8 and 0.9 during exercise. Standard error of measurement between devices was 0.5 second and 0.3 second at rest and exercise respectively. *Conclusions:* The novel calibration method is a valid method to estimate relative changes in respiratory parameters. Calibration of RIP on breath by breath basis is therefore feasible and is clinically advantageous.

PO-0320

ERGONOMIC ANALYSIS OF ROBOTIC DEVICE FOR UPPER LIMB: RELATIONSHIP BETWEEN MEASURES OF EQUIPMENT AND PERFORMANCE

Thais Tavares Terranova, Vivian Daniela Barbosa Vicente, Gracinda Rodrigues Tsukimoto, Linamara Rizzo Battistella

Institue of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation, Hospita, Brazil

Objective: Collect data and analyze the ergonomics aspects during robotic therapy performed by patients with motor impairment after neurological injury. *Methods:* 30 individuals, comprising a heterogeneous sample in terms of sex, age, anthropometric characteristics and motor impairment. *Results:* showed the need for changes about the depth of the robot table at approximately 10 cm, enabling the achievement of the targets above and thereby ensuring greater reliability of the kinematic parameters obtained by the device. Regarding the seat, there was need for greater adjustability of seat belts in order to increase the comfort and safety of users of the equipment. *Implications/Impact on rehabilitation:* From these results, it is suggested that the ergonomic study must be included since the early stages of development of robotic devices for rehabilitation of people with disabilities. Thus, the variables measured by the robotic system will have a greater degree of reliability and a higher correlation with the functional assessment scales in general.

PO-0321

OSTEOGENIC DIFFERENTIATION OF AMNIOTIC EPITHELIAL CELLS: SYNERGISM OF PULSED ELECTROMAGNETIC FIELD AND BIOCHEMICAL STIMULI

Qian Wang[1], Xiaojing Liu[1], Hongchen He[1], Chengqi He[1]

[1]Department of Rehabilitation Medicine, Key Laboratory of Rehabilitation Medicine of Sichuan Province, West China Hospital, Sichuan University, P. R. China, [2]Laboratory of Cardiovascular Diseases, Regenerative Medicine Research Center, West China Hospital, Sichuan University, P. R. China

Objective: Pulsed electromagnetic field (PEMF) is a non-invasive physical treatment used in the clinic rehabilitation, which facilitates the osteogenesis by direct actions on osteoblasts and bone marrow mesenchymal stem cells (BM-MSCs) in vitro. Amniotic epithelial cells (AECs) have been proposed as a potential source of stem cells for cell therapy. However, whether PEMF could modulate the osteogenic differentiation of AECs is unknown. *Methods:* AECs were isolated from amniotic membrane of human term placenta by trypsin digestion. The effects of PEMF on the osteogenic differentiation of AECs were investigated. *Results:* The PEMF, or osteogenic-inducing medium alone could induce osteogenic differentiation of AECs, as shown by expression of osteoblast specific genes and proteins including ALP and OC. Furthermore, a combination of PEMF and osteogenic-inducing medium had synergy effects on osteogenic differentiation. The signal transduction of osteogenic was further investigated. BMP-2 and Wnt/β-catenin pathways play important roles in the PEMF-induced osteogenic differentiation of AECs. Nrf2 and Keap1, two critical regulators of the generation of reactive oxygen species (ROS), might also be involved in the osteoblast differentiation of AECs induced by PEMF. Moreover, integrinβ1 may act as a PEMF- sensitive receptor in the process. *Implications:* Together, our results demonstrated that combined application of physical (PEMF) and biochemical stimuli (osteogenic-inducing medium) was synergistic for the osteogenic differentiation of AECs. It might be a novel approach in the bone regenerative medicine.

PO-0322

QUANTIFYING BALANCE AND FUNCTIONALITY IN PATIENTS WITH STROKE UNDERGOING VIRTUAL REALITY THERAPY: PRELIMINARY RESULTS

Jaqueline Almeida*, Amábile Ferreira, Francine Souza, Pedro Castro, Maria Cecília Moreira, Denise Ayres, José Augusto Lopes, Daniel Goroso, Linamara Battistella

Clinical Research Center - Institute of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation, Hospital das Clínicas, University of São Paulo School of Medicine, São Paulo, Brazil, Brazil

Objective: To verify the efficacy of virtual environment (VE) on balance and functionality in patients with motor disability caused by stroke receiving physical rehabilitation, by comparing it to conventional treatment. *Method:* Our sample consisted of four people (2 female and 2 male) with stroke, mean age 55.25 ± 5.79 years, randomly distributed in 02 groups: Control Group (CG) – subjects realized physical rehabilitation only and Experimental Group (EG) – subjects received therapy in VE together with physical rehabilitation. The VE was created using a 32-inch LCD television and a videogame Nintendo Wii Fit Plus® connected to a balance board. A simple-blind assessment using Berg Balance Scale (BBS) and Rivermead Mobility Index (RMI) was performed, before and after the intervention. Subjects received 24 sessions of VE therapy, twice a week, during 60 min. 6 games specifically designed to promote balance were used, creating a game protocol aiming to progressively increasing difficulty, variability and repetition. *Results:* EG showed an increase on BBS – respectively 16.2% and 14.5% - while CG showed a discrete gain of 1.8% on BBS for one of the subjects and a decrease of 8.9% for the other. Concerning RMI, EG showed respectively an increase of 12.5% and decrease of 3.7% for the subjects, while CG showed a decrease of 6.4% for the first subject and an increase of 3.8% for the second. *Implications/Impact on Rehabilitation:* EG was more expressive regarding balance and functionality than CG. A larger sample is necessary to achieve stronger evidence.

PO-0323

EVALUATION OF ROBOTIC THERAPY ON FUNCTIONAL RECOVERY OF THE UPPER LIMB IN PATIENTS WITH HEMIPARESIS AFTER STROKE

Thais Tavares Terranova, Vivian Daniela Barbosa Vicente, Gracinda Rodrigues Tsukimoto, Linamara Rizzo Battistella

Institue of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation, Hospital, Brazil

Objective: to assess the improvement upper extremity functional motor recovery of 4 patients with hemiparesis due to stroke after robotic therapy. *Methods:* Patients were in a multidisciplinary rehabilitation program performed 36 sessions using the robotic therapy, each one with 1,024 repetitions of movements, three times a week. *Results:* According to the pre-and post-intervention evaluation: Functional Independence Measure (FIM), Fugl-Meyer, Wolf Motor Function Test, The Arm Motor Ability Test (AMAT), Stroke Impact Scale, the patients showed improvement in the upper extremity functional motor recovery. There was a decrease in time to accomplish the tasks proposed by Wolf Motor Function for all patients and evaluations FIM and AMAT showed improvement in functional ability with greater independence in daily activities. Therefore robotic therapy using In Motion platform showed improvement in functional motor recovery of the upper limb according to the evaluations used, when associated with multidisciplinary rehabilitation program. *Implications/Impact on rehabilitation:* robotic therapy intervention three times a week, during 36 sessions, could improve upper extremity functional motor recovery when associated with conventional therapy. It was also observed a high degree of patients satisfaction, about the intervention and results.

PO-0324

VIRTUAL REALITY AS INTERVENTION IN PATIENT'S POSTURAL CONTROL AFTER A STROKE: PRELIMINARY RESULTS

Amábile Ferreira*, Jaqueline Almeida, Francine Souza, Pedro Castro, Maria Cecília Moreira, Denise Ayres, José Augusto Lopes, Daniel Goroso, Linamara Battistella

Clinical Research Center- Institue of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation, Hospital das Clínicas, University of São Paulo School of Medicine, São Paulo, Brazil, Brazil

Objective: Verify the efficacy of treatment with Virtual Reality (VR) using videogame integrated with balance board for balance training in subjects after stroke compared to conventional physiotherapy. *Methods:* Two male subjects with chronic hemiparesis participated in this study. The subjects underwent balance evaluation using kinetic variables - Centre of Pressure (CoP), before the intervention and three months later, under both eyes open and closed conditions. Area and speed of CoP were chosen as variables for analysis; both variables were measured under a 1000 Hz frequency and processed in Matlab software. Participants were randomized in two groups – control group (CG) and experimental group (EG). In CG patients received conventional physiotherapy. In EG patients received the same treatment plus therapy in virtual environment (EV) created by a television and a Nintendo Wii Fit plus videogame integrated with a balance board, twice a week. *Results:* An increase of speed for CoP was noticed on the subject in CG - 8.7% for eyes-closed and 1.42%, for eyes-opened; also, a decrease of area (50.9%) was noticed for eyes-opened, while an increase (50.2%) was observed in eyes-closed condition. On the other hand, the patient in EG presented a decrease of speed of 29% and 20.1%, as well as a decrease of area (33.4%) for eyes-opened and increase (37.3%) for eyes-closed. *Implications/Impact on rehabilitation:* We found that the patient in CG presented an increase of average speed and decrease in area of CoP, therefore showing a reduced oscillation and reduced exploration of postural control – contrarily to the patient in GE, who presented better exploration of his posture control. In spite of the significant results observed in GE, an evaluation of the whole casuistry is necessary.

PO-0325

EXAMINE THE EFFECT OF CHINESE HERBS BATH ON SENSITIZATION DERMATITIS FROM 85 CASES

Aimin He

Hainan General Hospital

Objective: To investigate the efficacy of Chinese herbs Bath on sensitization dermatitis. *Methods:* 85 patients with sensitization dermatitis were divided into treatment arm with 42 patients and control arm with 43 patients respectively. Patients in treatment arm were got antianaphylactic treatment added with Chinese herbs Bath, and patients in control arm were only got antianaphylactic treatment. The efficacy was observed after 5 days of treatment. *Results:* It showed significant difference ($p<0.05$) between treatment arm (38 patients cured and 4 patients improved) and control arm (27 patients cured and 16 patients improved). *Conclusion:* Antianaphylactic treatment combined with Chinese herbsBathis a better and more valued therapy for sensitization dermatitis that it can relieve symptoms and disease distress within shorter time and decrease pathogenesis span. Acute phase response. Method all patients received rehabilitation.

PO-0327

EFFECTS OF THE CITICOLINE ACUPUNCTURE POINT INJECTION ON LEARNING AND MEMORY FUNCTION OF RATS WITH TRAUMATIC BRAIN INJURY

Ou Li, Zhixue Guo, Chun Wang
Department of Rehabilitation Medicine, Hangzhou Sanitarium of Nanjing Military Area, Hangzhou, China

Objective: To explore the effects of citicoline injection into Zusanli point on learning and memory function in rats after traumatic brain injury (TBI). *Methods:* The model was induced by the improved Feeney method. The rats were randomly divided into 4 groups: sham-operation group, control group, acupuncture point saline injection group, intraperitoneal drug injection group and acupuncture point drug injection group with 8 rats in each group. The rats in the acupuncture point drug or saline injection group were treated with acupuncture injection of citicoline or saline daily. The rats in the intraperitoneal drug injection group and control group were treated with intraperitonea injection of citicoline or saline daily. The treatment continued for 14 d. The learning and memory function was evaluated by the Morris water maze test and passive avoidance test. *Results:* Acupuncture injection of citicoline can significantly shorten the escape latent period of TBI rats in Morris water tests and extend the latent period of learning and memory of TBI rats ($p<0.05$). *Conclusion:* Acupuncture point injection therapy is effective on the recovery of learning and memory function in rats after TBI.

PO-0328

LOW-LEVEL LASER THERAPY WITH DIFFERENT FLUENCES ON CARTILAGE DESTRUCTION IN RAT ARTHRITIS INDUCED BY COMPLETE FREUNDS ADJUVANT

Fang-Chuen Huang[1], Yueh-Ling Hsieh[1], Chen-Chia Yang[2], Chang-Zern Hong[3], Li-Wei Chou[4]*
[1]China Medical University,Chinese Taipei, [2]Taichung Tzu Chi General Hospital,Chinese Taipei, [3]Hungkuang University,Chinese Taipei, [4]China Medical University Hospital, Chinese Taipei

Objective: Rheumatoid arthritis (RA) is a chronic, inflammatory and systemic autoimmune disease that leads to progressive cartilage destruction. Low-level laser therapy (LLLT) is the proven and recommended intervention for managing RA on alleviating pain. But the effective fluence of LLLT on prevention of cartilage degradation in RA is still unclear. The objective of this study was to assess the effects of LLLT with high- and low-fluence on RA-related dysfunction of chondrocytes in rats. *Method:* Monoarthritis was induced in adult male Sprague-Dawley rats (250-300 g) via intraarticular injection of complete Freund's adjuvant (CFA) into the tibiotarsal joint. Three days after CFA-induced arthritis, arthritic joints were irradiated with either high (72 J/cm^2) or low (4.5 J/cm^2) fluence of GaAlAs laser (660 nm) for 10 consecutive days. Animals were sacrificed and ankles were collected for assessing the cartilage by histology and immunofluorescent study for cartilage oligomeric matrix protein (COMP). *Results:* The expressions of COMP immunoreactivities were significantly abundant in arthritic rats irradiated with 72 J/cm^2 than those of 4.5 J/cm^2. Histology also revealed an intense safranin O staining in animals received with 72 J/cm^2 of LLLT. *Implications/Impact on rehabilitation:* Cartilage formation was significantly preserved in arthritic animals received with 72 J/cm^2 of LLLT confirmed by safranin O staining and COMP immunoreactivity. It was possible to suggest that the LLLT at high fluence had a positive effect to protect cartilage against destruction in RA.

PO-0329

THREE FIXATION METHODS FOR INTRA-ARTICULAR FRACTURES OF THE DISTAL RADIUS: AN IN VITRO BIOMECHANICAL STUDY USING CADAVERIC MODEL

Yuming Hu, Renguo Xie
Department of Rehabilitation Medicine, Affiliated Hospital of Nan Tong, Nantong, China

Objective: Fractures of the distal radius are the most common in all extremity fractures. The purpose of the study was to compare the biomechanical properties of distal radius fracture fixation with 3 implants, the K-wires, cannulated screws and Locking compression plates, in fixation of a cadaver bone model of a distal radius fracture. *Methods:* Intra-articular distal radius fracture was created in eighteen cadaver radius specimens. The specimens were randomly assigned to K-wires fixation group, cannulated screws fixation group, and volar plated with screw-fixation group. All the specimens were placed in the material testing machine for axial loading test, the load-displacement of each specimen were recorded. *Results:* The axial compression test showed statistically significant difference of compression strength among the three groups ($p<0.05$). The mean peak load was (872.31±34.32) N and displacement was (1.87±0.72) mm for the volar plating with screw fixation group, (432.31±41.45) N for cannulated screws fixation group with displacement of (2.53±0.92) mm, and (279.73±29.57) N for K-wires fixation group which displacement is (3.78±1.02) mm. Similarly, there was statistically significant difference in the axial compression rigidity among them ($p<0.05$), That of the volar plating with screw fixation group being strongest, followed by the cannulated screws fixation group, the K-wires fixation group was the weakest. *Conclusion:* Volar plating with screw fixation and cannulated screws fixation are strong enough for the fixation of intra-articular distal radius fractures and provide favorable clinical results. The Volar plating with screw fixation provided more stability than the cannulated screws in the mean peak load and the axial compression rigidity.

PO-0330

REMOTE EFFECTS OF DRY NEEDLING AT MYOFASCIAL TRIGGER SPOTS ON BETA-ENDORPHIN LEVELS IN PROXIMAL SKELETAL MUSCLE, DORSAL ROOT GANGLION AND SERUM

Szu-Yu Liu[1], Yueh-Ling Hsieh[1], Chang-Zern Hong[2], Li-Wei Chou[3]*
[1]Department of Physical Therapy, Graduate Institute of Rehabilitation Science, China Medical University, Taichung 40402, Taiwan, Chinese Taipei, [2]Department of Physical Therapy, Hungkuang University, Taichung 43302, Taiwan, Chinese Taipei, [3]Department of Physical Medicine and Rehabilitation, China Medical University Hospital, Taichung 40402, Taiwan, Chinese Taipei

Objective: To investigate the biochemical effect of dry needling at remote myofascial trigger spots (MTrS) on the levels of beta-endorphin expressed in the proximal muscles containing MTrS, dorsal root ganglion (DRG) and serum. *Method:* New Zealand rabbits (2.5-3.0 kg) were used in this study. Treatments were performed either with one session (one dosage, 1D) or five daily sessions (five dosages, 5D) of dry needling at MTrS of the unilateral gastrocnemius (i.e., distal muscle). Bilateral biceps femoris muscles (i.e., proximal muscle) and DRG of L2-L5 were sampled immediately and 5 days after dry needling. Serum beta-endorphin level was also sampled before and after dry needling. These levels of beta-endorphin were

determined by immunoassays. *Results:* The beta-endorphin levels in the biceps femoris and DRG were significant increased immediately after 5D dry needling treatment. The protein level of beta-endorphin in serum also increased significantly immediately after both 1D and 5D dry needling, as well as at the 5th day after these treatments. *Implications/Impact on rehabilitation:* 5D dry needling at distal MTrS may elevate the levels of beta-endorphin in the proximal skeletal muscle, DRG and serum. The findings of this study can clarify the biochemical mechanisms associated with antinociception induced by remote effects of dry needling and provide information for developing therapeutic strategies in myofascial pain treatment.

PO-0331

ANTI-ALLODYNIC EFFECTS OF THERAPEUTIC ULTRASOUND ON OXALIPLATIN-INDUCED PERIPHERAL NEUROPATHY IN RATS

Ya-Chien Fan, Yueh-Ling Hsieh*

China medical university,Chinese Taipei

Objective: Oxaliplatin, a platinum-based chemotherapeutic agent, causes an unusual acute peripheral neuropathy with symptoms including cold sensitivity and neuropathic pain. Therapeutic ultrasound (US) is a physical modality used for the treatments of several neurological symptoms including pain, allodynia, and numbness in clinical trials. However, there is few data to conduct the effect of US on pain behavior, allodynia and motor dysfunction on oxaliplatin-induced neuropathy. In this study, we investigated the effect of therapeutic ultrasound (US) on oxaliplatin-induced neuropathy in rats. *Methods:* Sprague Dawley rats (350-400 gw) were treated with a single dose of oxaliplatin (4 mg/kg, i.p.) on three alternate days to induce sensory allodynia. Four h later after oxaliplatin-induction at acute neuropathy phase, US treatments (0.5 w/cm^2, 50% duty cycle, 5 min/limb) were applied to the allodynic limbs for 12 consecutive days. The anti-allodynic effects of US were assessed by using cold and von Frey test. *Result:* US almost reversed the effects of both cold and mechanical allodynia induced by oxaliplatin. *Implications/Impact on rehabilitation:* These results implied that US may attenuate oxaliplatin-induced neuropathic pain by elevating the threshold of cold and mechanical pain sensation. Thus, we suggest that intervention of US may improve the quality of life of cancer patients receiving chemotherapy.

PO-0332

DIFFERENCE BETWEEN THE CONCENTRATION OF PRO-INFLAMMATORY CYTOKINES (IL-6, IL-8, TNF-ALPHA) AND ANTIINFLAMMATORY CYTOKINES (IL-10) IN PATIENTS WITH OSTEOARTHRITIS OF THE KNEE ASYMPTOMATIC AND SYMPTOMATIC

Marta Imamura[1], Tulio Oliveira Kalife[2], Maurício Cantarino[2], Rosa Alves Targino[1], Ines Kobayashi Dohi[3], Lucy Santos Villas Boas[4], Wu Tu Hsing[5], Fábio Marcon Alfieri[1,6]*, Thais Filippo[1], Talita Justino Santos[1]

[1]Clinical Research Center. Institute of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital of Clinics Clínicas. University of São Paulo School of Medicine,Brazil, [2]University of São Paulo School of Medicine,Brazil, [3]Physicial Maceió,Brazil, [4]Biologist of LIM-56 da FMUSP,Brazil, [5]Director of the Center for Acupunture of IOT – HC – FMUSP,Brazil, [6]São Paulo Adventist University Center,Brazil

Objective: We investigated whether the seric concentration of pro-inflammatory cytokines (IL-6, IL-8, TNF-alpha) and anti-inflammatory cytokines (IL-10) are different between pain symptomatic and asymptomatic patients with knee osteoarthritis. We also attempted to correlate the levels of these potential biomarkers with functional capacity, and tolerance to pain pressure threshold (PPT) values. *Method:* The study included individuals of both genders aged over 60 diagnosed with knee osteoarthritis with pain of moderate to severe intensity and in time of pain ≥ 3 months. Also participated healthy subjects without pain. Participants answered the WOMAC questionnaire that is specific to assess functions. PPT was measured by algometer. To check the values of concentrations of cytokines method was used BD Cytometric Bead Array. Data were analyzed with the Student's *t*-test, Mann-Whitney test and Spearman correlations. *Results:* We divided the 101 patients: symptomatic (n=56; 68.11+/-7.26 years old) and asymptomatic (n=45; 71+/-7.64 years old). We found that only IL-6 showed statistically significant differences between the groups (p=0.017). Serum measurements of IL-8, IL-10, and TNFa did not show significant differences between the groups. We also demonstrated that symptomatic patients presented less resistance to algometer than asymptomatic ($p < 0.5$) in all 24 muscular, ligamentous and subcutaneous points tested, and therefore not only at the knees. IL-10 displayed positive correlation with WOMAC score regarding pain, as well as a few muscle and subcutaneous PPTs. *Impact on rehabilitation:* This is the first report regarding the possible association between serum proinflammatory cytokines and PPTs that are located further beyond the painful area at the involved joint.

PO-0333

A NOVEL METHODOLOGY TO DETECT DEPENDENCE IN SMALL DATA SETS

Linamara Rizzo Battistella[1]*, Marta Imamura[1], Jesus E. Garcia[2], Veronica A. Gonzalez-Lopez[2]

[1]Clinical Research Center, Institute of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation, Hospital das Clínicas. University of São Paulo School of Medicine, São Paulo, São Paulo, Brazil, [2]State University of Campinas, Institute of Mathematical Statistics and Computer Science, Department of Statistics, Campinas, São Paulo, Brazil

Objective: In this paper we introduce a novel methodology, a statistical test specially designed to detect dependence between pair of random variables X and Y with small sample sizes. *Method:* The test is based on the longest non-decreasing subsequence (LND) defined by the permutation, which maps the ranks of the X-observations to the ranks of the Y-observations. We apply LND in 15 scores coming from 13 patients, 6 of them with a diagnosis of ischemic stroke and 7 with a diagnosis of hemorrhagic stroke. The scores were collected applying 5 protocols twice, at the beginning of the diagnosis (t1) and after several months (t2). The protocols were (*i*) Wolf Motor Function Test (WOLF), composed by two scores: time and functional ability, (*ii*) Arm Motor Ability Test (AMAT) composed by two scores: functional ability and quality of movement, (*iii*) Functional Independence Measure (FIM), (*iv*) Stroke Impact Scale Test (SIS) composed by nine scores, measurements of quality of life and (*v*) Fugi Meyer (FM). *Results:* LND recognizes consistent differences between the diagnosis: ischemic stroke and hemorrhagic stroke. LND reveals the overlapping information of several protocols. The analysis for the ischemic group points robust dependence between the WOLF test (time component) and the information given by FIM, and AMAT (functional ability). In addition, for this group, WOLF test shows overlapping information with FM. For the hemorrhagic group, the robust dependence is confirmed between FM and WOLF (time component), some scores of SIS and other two protocols: FIM and AMAT (quality of movement).

PO-0334

A QUANTITATIVE ANALYSIS OF THE SENSORY AND MOTOR FIBRES OF THE BRACHIAL PLEXUS IN MAN

Bernhard Gesslbauer[1,2], Marie Hahn[1,2], Roland Blumer[3], Oskar C. Aszmann[1,2]*

[1]Division of Plastic and Reconstructive Surgery, Department of Surgery, Medical University of Vienna, Austria, Austria, [2]CD Laboratory for Restoration of Extremity Function, Austria, [3]Center of Anatomy and Cell Biology, Integrative Morphology Group, Medical University of Vienna, Austria, Austria

Introduction: Any surgical nerve reconstruction must take into account the topography and quantity of individual nerve fibres at any given level of injury. To date, however, literature on qualitative and quantitative assessment of axons of the peripheral nerves of the upper extremity is scarce. Furthermore, none of these studies have depicted the topography of motor fibres along the entire course of these peripheral nerves. The aim of the present study is to count the total number of motor fibres of the brachial plexus and its peripheral nerves. Material and *Methods:* Nerve samples have been harvested from 5 organ donors immediately after death. From 8 incisions ranging from the neck to the wrist a total of 36 nerve samples were gained per organ donor. Immunofluorescence was applied to visualise the specific structure of interest. Antibody against neurofilament served to determine the total amount of axons. Antibody against choline acetyltranferase (ChAT) was used to detect cholinergic/motor fibres. *Results:* Around one-tenth of all axons in a mixed peripheral nerve are cholinergic fibres (motor fibres). In a pure motor nerve (thoracodorsal nerve) one-third of the axons are cholinergic. Furthermore, a pure motor cranial nerve (accessory nerve) also has an afferent fibre proportion. As expected, sensory nerves do not contain axons exhibiting ChAT immunoreactivity. *Conclusion:* Here we present for the first time a quantitative analysis of all cholinergic fibres of the brachial plexus and its consecutive nerves. These results should contribute to improve the functional outcome after nerve suture.

PO-0335

MANG PEOPLE GROUPS IN THE ORIGINAL LIFE STATE: NO NEED FOR REHABILITATION

Gaogui Huang, Yun LIU

The childrens Hospital of Kunming, Department of rehabilitation medicine

Objective: To explore the rehabilitation needs of Mang in the natural living condition. *Methods:* Mang in the natural living condition were investigated and follow up 20 years. *Results:* of 20 years of follow-up and a cross-sectional survey: 0 cases of children with cerebral palsy, mental retardation in 0 cases. Conclusion no need for rehabilitation. Mang people save the best choice of racial groups under certain conditions: "give up the treatment of problem newborn", is in no means of modern medicine, follow the nature law of survival.

PO-0336

HOUSEWORK ACTIVITIES AND QUALITY OF LIFE IN FEMALE PATIENTS WITH CHRONIC STROKE

Yoko Goto, Mariko Nakamura*

Occupational Therapy, School of Health Science, Sapporo Medical University, Japan

Objective: We examine the QOL of post-stroke female patients with chronic hemiparesis who perform housework every day. *Method:* Seven chronic stroke female patients with hemiparesis (65.4+/-6.7 years old) participated in this study, and 7 healthy women (68.6+/-1.4 years old) as a control group. All of them took part in some housework. We examined relations between their physical functions and QOL by SF -36. *Results:* Three patients have right hemiparesis and four left hemiparesis out of seven. Six patients use only their non-paralysis hands in their daily life, and two of them had to use their non-dominant hands. Six patients had limitation in the movement of their joints, 2 patients had a sensory disorder. In the grip power of both groups, there was a significant difference in their right hands; the post-stroke patients (the right side 12.8+/-6.1kg, the left side 12.1+/-10.8kg), and the control group (the right side 24.6+/-12.5kg, the left side 20.9+/-4.5kg). As for the result of the QOL, general health (GH) and role emotional (RE) scores in the post-stroke group were higher than those of the control group. *Implications/Impact on rehabilitation:* Chronic extremity hemiparesis following a stroke is a serious impairment that can limit a persons independence in all aspects of their daily life. However, it may be possible for patients with physical disabilities to maintain high level of QOL when they spend positive life. It is also important to have a domestic role as a member of family, which may be able to improve their QOL.

PO-0337

EFFECTS OF INTEGRATED CARE AFTER PRIMARY IMPLANTATION OF TOTAL ARTHROPLASTY OF THE UPPER LIMB

Ulrich Christian Smolenski[1], W.-D. Müller[2], P. Bak[1], S. Heinle[1], U. Irlenbusch[3]

[1]School of Medicine, Jena University Hospital, Department of Physiotherapy,Germany, [2]m & i Clinic Bad Liebenstein,Germany, [3]Marienstift Arnstadt,Germany

Background: Multidisciplinary inpatient rehabilitation is usual care in Germany after total arthroplasty. The aim of this study was to assess the effects of integrated care strategy after implantation of hip (THA) or knee (TKA) arthroplasty in terms of their health-related quality of live and functional status. *Methods:* Prospective observational study comparing the outcomes of integrated inpatient and outpatient rehabilitation in 57 patients following total hip and 40 patients following total knee arthroplasty (mean age 65.5 years). The primary outcome measures were SF-36, WOMAC and EQ-5D which were self-administered on admission, at discharge and 3, 12 and 18 months after discharge. Longitudinal changes as well as group differences for every point of assessment were computed. For statistical analyses we computed mean values and means of effective thickness for all different time points, each for the whole group as well as for the subgroups. *Results:* We found considerable deficits in general (SF-36, EQ-5D) and specific health status (WOMAC) before surgery. Positive longitudinal changes with moderate to large effect sizes were observed for all outcome measures in both groups. There were significant differences between patients with hip arthroplasty and patients with knee arthroplasty, whereby patients with osteoarthritis of the hip show performed better especially at the end of the rehabilitation process. In summary, both groups profited from surgery as well as from rehabilitation. *Discussion*: Our study had limitations. The samples were too small to allow generalisation of the results. However, our study shows that integrated care does improve function and participation in these two patient groups. It is an interesting result that patients with osteoarthritis of the knee do not improve as much as patients with osteoarthritis of the hip do. Many other co-variables as BMI, co-morbidities, sex and weight bearing could have confounded results. These seem to be in concordance with the literature showing better outcomes in the THA group at discharge as compared with the TKA group. *Conclusion:* THA and THK represent two different states in terms of functional health. Therefore, flexibility in integrated therapy and rehabilitation is required to achieve comparable functional outcomes. Further research is needed to investigate whether different timing, different intensity or different rehabilitation strategy could further improve the outcomes of rehabilitation after THA and TKA.

PO-0338

EFFECT OF SUPPLEMENTING QI AND ACTIVATING BLOOD THERAPY (NAOLUOXINTONG) AND TONIFYING THE KIDNEY TO PROMOTE GENERATION OF THE BRAINS THERAPY (ZUOGUIWAN) ON PROLIFERATION AND DIFFERENTIATION OF NEURAL STEM CELLS IN CEREBRAL ISCHEMIC RATS

Wei Tang[1], Jian Wang[1], Chao Min Ni[1,2], Wei Lan[1], Ye Nong Chen[1], Xiao Min Li[1,3]
[1]Anhui University of Traditional Chinese Medicine, [2]Affiliated Provincial Hospital of Anhui Medical University, [3]Peoples Hospital of Huaibei City

Objective: To compare the difference between supplementing qi and activating blood therapy and tonifying the kidney to promote generation of the brains therapy in inducing proliferation and differentiation of NSC in cerebral ischemic rats. *Method:* Rat models of MCAO were established. The rats were divided into 4 groups: sham-operated group;model group; supplementing qi and activating blood therapy group (Naoluoxintong–treated group, N group); tonifying the kidney to promote generation of the brains therapy group (Zuoguiwan-treated group, Z group). The scopes of cerebral ischemic regions were measured and the marks of neural function defect were noted down separately. At 1 d, 3 d and 7 d of reperfusion after 2 h of MCAO, single and double immunohistochemistry or immunofluorescence staining were applied to identify NSC and differentiated neural cells in rats which were treated with Naoluoxintong and Zuoguiwan respectively. The expression of BrdU and Nestin,and of GFAP and NSE were detected. Result: Compared with control group, the number of BrdU+ and Nestin+ cells increased in model group. Compared with model group, the scopes of cerebral ischemic regions and the marks of neural function defect were decreased. N group performed significantly better than Z group. At 3 d, the expression of BrdU and Nestin in Z group was stronger than that in N group. In addition, after Naoluoxintong and Zuoguiwan administration, a small number of BrdU/GFAP cells were detected at 3 d and BrdU/NSE cells were detected at 7d, the rate of differentiated cells in N group was higher than that in Z group. *Implications:* Both Naoluoxintong and Zuoguiwan enhance the ability of the proliferation and differentiation of NSC in vivo, Zuoguiwan performs better in promoting the proliferation of NSC, whereas Naoluoxintong performs better in decreasing the scopes of cerebral ischemic regions, the marks of neural function defect and promoting the differentiation of NSC.

PO-0339

PAISHA THERAPY, A NEW TECHNIQUE TO REJUVENATE TRADITIONAL CHINESE MEDICINE

Junhong Huang
[1]World Academic Society of Medical Qigong, [2]Yongji Traditional Chinese Medicine Hospital, Shanxi

The pathological mechanism of channels was discovered by Huang Junhong in 1997, based on which the Paisha therapy was developed. In the treatment of about one million patients with this therapy, the accuracy of the channel theory is verified and the existence of channels with its pathological mechanism is universally known. For the first time lots of pictures prove the fact that blood is circulating in the channels, neither in arteries nor in veins. It reveals the cause of retrogression of the effect of TCM is blockage of channels, which tells us that illness is only an appearance, but blockage of channels is the essence. Traditional Chinese medicine insists that health means balance of the body, and it will become inevitably one of mainstream medicines. Big breakthroughs have been made in the treatment of coronary heart disease, pain of the neck, shoulder and lower back, chronic gastritis and colitis considered difficult to cure by Western medicine, yet they respond positively to this therapy. From above we can see it is a leap in the effectiveness of TCM and will become the backbone technique of TCM in the process of its rejuvenation.

PO-0340

INVESTIGATION ON STATUS OF LOST TO FOLLOW-UP HIGH RISK INFANTS AND COUNTERMEASURES IN KUNMING AREA

Yun Liu, Gaogui Huang
Children's Hospital of Kunming City

Objective: To explore reasons of the lost to follow-up of high risk infants follow-up in Kunming area. *Methods:* 3,032 cases of children'sHospital of Kunming ICU discharge to high-risk infants follow-up do not receive follow-up, loss to follow-up status summary. *Results:* 3,032 cases were followed up after discharge is not 58.2%, first times, second times, 3-4 times and 5-6 times during follow-up of loss to follow-up rates were 58.1%,77.1%, 87.4%, 94% and seventh and above 97.5%. *Conclusion:* High risk infants follow-up work in Kunming does not accept the follow-up and loss to follow-up phenomenon is very outstanding, construct and perfect the high-risk infants follow-up and management system is imminent, how to carry out in-depth study should be of high risk infants follow-up and management in minority area.

PO-0341

PRACTICE AND PROBE ON SPECIALTY CONSTRUCTION OF THERAPEUTIC REHABILITATION

Shaolan Zhang, Guqiang Li, Juan Zhi, Zhengping Chen
Yancheng Institute of Health Science, Yancheng Jiangsu

Objective: In addition to the aim of providing continued guidance for securing basic level employment, and providing service to our community, we are especially committed to the successful cultivation of highly skilled talents - fully competent in the area of medical rehabilitation technology. We are trying to build up a first-rate and nationally recognized specialty in therapeutic rehabilitation through the innovation and reform that is a product of our talent training model, academic curriculum, faculty, and our teaching practices. *Method:* Creating the three combinations of education-practice-service and progressive talent-training mode via vocational training; Structuring the curriculum system based on the working process of therapeutic rehabilitation; Forging a two-sided employment and full-time or part-time combined teacher-doctor team; Building national therapeutic rehabilitation training base through cooperation between colleges and hospitals; Perfecting the multi-participant teaching quality evaluation system. *Results:* Our specialty was evaluated as Unique Specialty among Jiangsu institutes of higher education in 2010; We were granted the training base construction project at national level financed by central government revenue in 2011; Our Therapeutic Rehabilitation Professional Team was authorized as Jiangsu Provincial Major Professional Team in 2012. *Implications/ Impact on rehabilitation:* To Provide a model of exemplary practices and bring out widespread positive influence among vocational colleges nationwide.

PO-0342

"EFFECT OF PRANAYAMA AND MEDITATION AS AN ADD-ON THERAPY IN REHABILITATION OF PATIENTS WITH GUILLAIN-BARRÉ SYNDROME-A RANDOMIZED CONTROL PILOT STUDY"

Anupam Gupta
National Institute of Mental Health & Neuro Sciences, India

Objective: To study the add-on effects of pranayama and meditation in rehabilitation of patients with Guillain-Barré syndrome (GBS). *Patients & Method:* This randomized control pilot study was conducted inneurological rehabilitation unit of university tertiary research hospital. Twenty-two GBS patients, who consented for the study and satisfied selection criteria, were randomly assigned to yoga and control groups. Ten patients in each group completed the study. The yoga group received 15 sessions in total over a period of 3 weeks (1 h per session), one session per day on five days per week that consisted of relaxation, Pranayama (breathing practices) and Guided meditation

in addition to conventional rehabilitation therapeutics. The control group received usual rehabilitation care. All the patients were assessed using Pittsburgh Sleep Quality Index, Numeric pain rating scale, Hospital anxiety and Depression scale and Barthel index score. Mann-Whitney *U* test and Wilcoxons signed rank test were used for statistical analysis *Results:* Quality of sleep improved significantly with reduction of PSQI score in the yoga group (p=0.04). There was reduction of pain scores, anxiety and depression in both the groups without statistical significance between groups (pain p>0.05, Anxiety p>0.05 and Depression p>0.05). Overall functional status improved in both groups without significant difference (p>0.05). *Conclusions:* significant improvement was observed in quality of sleep with yogic relaxation, pranayama, and meditation in GBS patients.

PO-0343

WHEELCHAIR TAIJIQUAN – TRANSFORMING ASSISTIVE DEVICE TO THE TOOL OF EMPOWERMENT AND "NORMALIZATION"

Zibin Guo
University of Tennessee Chattanooga, United States

From medical, philosophical and martial arts origins centuries old, to the modern day, Tai Chi Chuan has become one of the most effective and widely practiced mind and body exercise models in the world. Since 2005, when a wheelchair Tai Chi Chuan program was developed and introduced in China, the practice of wheelchair Tai Chi Chuan has quickly gained an enormous popularity in both of the "able-bodied" and "disabled" populations in China. This presentation, based on the presenter's participatory and ethnographic experience in working with individuals with ambulatory disability and various organizations developing the wheelchair Tai Chi Chuan program, discuses the rationales of developing the 13 Postures Wheelchair Tai Chi Chuan; public responses to the development of wheelchair Tai Chi Chuan, and; the way that the performing of wheelchair Tai Chi Chuan by people with disability challenges perceptions about physical and psychological space and limitation for the "able-bodied" population. This presentation will also suggest that the concepts of "able" and "disabled" bodies are culturally and socially constructed and are developed according to the behavioral/functional norms shared in a particular social and cultural realm. This behavioral/functional based categorization of human body would provide little significance for the understanding of human diversity and promoting public health; it would rather be more likely to evoke different level of social stigma and further hinder individuals who bear the brunt of negative societal reactions to engage in social life and become a productive member of society.

PO-0344

QUALITATIVE STUDIES IN REHABILITATION RESEARCH – A SYSTEMATIC REVIEW

Thorsten Meyer*, Christiane Patzelt
Hannover Medical School, Germany

Objective: The use of qualitative research has been called for in rehabilitation research explicitly (WHO & World Bank 2011; Ohmann 2005). This paper aims to determine the present state of qualitative research within the rehabilitation literature. *Method:* Literature search was based on the top 28 journals of the Journal Citation Report 2010 (Science Edition) in the rehabilitation domain with an impact factor > 1. These journals were searched within Medline with a comprehensive search filter from 2000 to 2010. Publications of 2010 were analysed in depth. *Results:* The proportion of publications with qualitative research methods has risen from 1.76% in 2000 to 4.24% in 2010. In 2010 we identified n=125 publications with qualitative methods, of which 89 could be regarded as qualitative papers on rehabilitation. These were conducted by institution in Europa (n=47), North-/South America (n=28) and Australia/New Zeeland (n=14). 84% of these papers were exclusively qualitative, 16% mixed methods. Individual interviews were used dominantly (73%) as well as focus groups (21%). Samples included patients (68 papers), professionals (24) and family members (14), also general population (2) and (disability) organizations (2). Main patient groups represented were those with stroke, cancer or brain trauma. *Implications:* Qualitative research has taken a regular place in rehabilitation research literature and is increasing slightly. Individual as well as group interviews have been used dominantly, while observational methods have hardly been applied. The latter have a high potential to capture aspects of everyday life and therefore are a promising approach to further qualitative research in rehabilitation. Literature Ohmann, A. (2005): Qualitative methodology for rehabilitation research. J Rehabil Med, 37.273-280.World Health Organization & World Bank (2011): World Report on Disability. Geneva: World Health Organization.

PO-0346

CASE-CONTROL STUDIES ON LOWER EXTREMITY MUSCLE CHAINS AND QUADRICEPS FEMORIS TRAINING FOR THE TREATMENT OF KNEE OSTEOARTHRITIS

Xiaolin Liu, Jian Lin, Xiongang Huang, Tianwu Jiang
Department of rehabilitation medicine, Zhejiang Province Peoples Hospital

Objective: To evaluate clinical effects of knee osteoarthritis with the treatment of the lower extremity muscle chains training and quadriceps femoris training, *Methods:* From March 2010 to Septemper 2012, 70 patients with knee osteoarthritis were divided into two groups according to visiting sequence, including 32 males and 38 females, ranging in age from 46 to 73 years, with an average of 61.9 years, the course of disease was 6 m-10 y, with an average of 2.4 y 70 subjects were randomly divided into the research group (n=35) and the control group (n=35). there was no statistical significance in gender, age, course of disease, Lysholm score and JOA score (p > 0.05). Patients in the control group were given routine quadriceps femoris training, the research group were given lower extremity muscle chains training, After eight weeks, used Lysholm score, JOA score as index evaluating the clinical effect *Results:* When traning for 8 weeks, the levels of Lysholm score and JOA score were increased significantly (p<0.05) as compared with those before treatment, The Lysholm score and JOA score in research group were significantly higher than those in control group (p<0.05). *Conclusion:* The lower extremity muscle chains training has obvious effect in improving joint function than the quadriceps femoris training for the treatment of knee osteoarthritis, which has a good effect in the clinical effects.

PO-0347

EVALUATION OF CURATIVE EFFECT ABOUT CT-GUIDED PERCUTANEOUS INTERVENTION INJECTION TREATMENT FOR ACUTE DISCOGENIC LUMBAGO-LEG PAIN

Dechun Dai[1], Guohai Tong[1], Lianlong Bian[1], Chunlin Tang[1], Weifang Zhu[1], Linfeng Mei[1], Changgen Shi[1], Hao Jiang[1], Fangjie Hang[1]
[1]kunshan hospital of TCM,jiangsu province, [2]ruijin hospital affliated to Shanghai Jiaotong University

Objective: To evaluate the effectiveness of CT-guided percutaneous intervention injection treatment for acute discogenic lumbago-leg pain. *Methods:* Fifty-seven patients involved with discogenic lower back pain and radical leg pain underwent CT-guided percutaneous intervention injection treatment.Injection medicine was consisted of diprospan, neurotropin, tanshinone, iohexol and normal saline. Macnab criteria and Oswestry low back pain disability questionnaire were used to assess the curative effect. *Results:* CT-guided

percutaneous intervention injection could relieve acute discogenic lower back pain and radical leg pain and improve activities of daily living,the efficacy rate was 86%.Two years follow-up on thirty-four patients indicated that mid-term outcome was good and no significant complications. *Conclusion:* CT-guided percutaneous intervention injection was valuable recommended effective treatment for acute discogenic lumbago-leg pain.

PO-0348

EFFICACY ANALYSIS OF THE TREATMENT OF PATELLOFEMORAL PAIN CURED BY MCCONNELL TAPING

Shengfei Luo[1], Ninghua Wang[2], Bin Xie[2]
[1]The fifth center hospital of tianjin, [2]Peking University First Hospital

Objective: To evaluate the clinical effect of McConnell taping using the isokinetic testing technology. *Methods:* 34 patients with PFPS were compared before and after the intervention of McConnell taping by knee isokinetic contraction of muscle testing and VAS pain assessment values,and test angular velocities were 60 °/s and 180 °/s, respectively. *Results:* After the intervention, VAS values, the peak torque value, the value of the total power and average power value, testing in angular velocity of 60 °/s, there was no significant difference than it was before ($p > 0.05$), and in 180 °/s angular velocity test, there were significant difference than it was before ($p < 0.05$). *Conclusion:* McConnell taping could effectively relieve PFPS patients'pain, improve quadriceps strength, and is worthy of clinical application.

PO-0349

THE INFLUENCE OF "WUQINXI" EXERCISES ON LUMBOSACRAL MULTIFIDUS

Jing Zhang, Feng Zhang, Yu-Hua Bai, Jian-Ye Cao, Li-Wei Dong, Wei-Wei Wu
Department of Rehabilitation Medicine, The Third Hospital of Hebei Medical University

Objective: To investigate the effect of Five animals (wuqinxi) exercises on the lumbosacral multifidus. *Method:* This study enrolled two groups of volunteers, including 15 patients who did five animals exercises in experimental group and 15 patients who did aerobic exercise (walking) in control group. The subjects are asked to perform flexion, extension,and return to the neutral position at their own speed three times, with rest between. The average of surface electromyography (ASEMG) in the process of flexion and extension was recorded by the analysis software (DASYLab10.0), and the flexion extension ratio (FER) was calculated. *Result:* The ASEMG in the process of flexion was lower than the ASEMG in the process of extension (p<<0.05). The FER of interventional group was lower than the control group (p<<0.05). There was no significant difference between the two sides in the same participant (p>>0.05). *Implications on Rehabilitation:* The "wuqinxi" exercises could improve the function of lumbosacral multifidus so as to reduce low back pain.

PO-0350

EFFECT OF LOW INTENSITY PULSED ULTRASOUND ON PROLIFERATION AND DIFFERENTIATION OF MYOBLASTS IN VITRO

Bin Shu, Wanling Jiang, Zhibin Wu, Xiangqin Fang, Haoyue Deng, Qing Duan
Institute of Field Surgery, Daping Hospital, Third Military Medical University,Chongqing, China

Objective: To study the effect of low-intensity pulsed ultrasound (LIPUS) on the proliferation and differentiation of cultured myoblast in vitro, and to explore the cellular and molecular mechanisms of LIPUS therapeutic effect. *Method:* The myoblasts were isolated from mouse skeletal muscle and cultured in vitro, the experimental groups and the control groups were established in the proliferating and differentiating myoblasts. Experimental groups are treated by LIPUS with the ultrasound frequency of 1.5 MHz and the spatial and temporal average intensities of 30 mW/cm^2, for 20 min every time, once a day, 6 days of continuous stimulation (proliferation culture), 4 days (differentiation culture). The proliferating myoblasts, cell proliferation kinetics was analyzed by flow cytometry, expression of myoblast growth factor MyoD, heme oxygenase-1 (HO-1) were detected by immunofluorescence staining; The expression of myosin heavy chain (MHC) were analyzed by immunofluorescence staining, and myoblast fusion index were analyzed. *Results:* In the proliferating myoblasts, compared with the control groups, the LIPUS treatment groups have the higher number of active cell cycle G2 and S phase, and the proliferation index was significantly increased (p<0.05), and the expression of HO-1 was upregulated; During the induction of differentiation experiments, the myoblast of the treatment groups fused into smaller myotubes and the myoblast fusion index was significantly lower than that of the control groups (p<0.05). *Implications:* The Low-intensity pulsed ultrasound can promote myoblast proliferation, while inhibiting their differentiation, but does not affect the myogenic properties, heme oxygenase-1 may be involved in the proliferation process.

PO-0351

ULTRASOUND ON SERUM TNF-A, LPO LEVELS, CHONDROCYTES APOPTOSIS, PROTEIN AND GENE EXPRESSION OF CASPASE-8 AND CASPASE-3 IN ARTICULAR CARTILAGES OF KNEE OSTEOARTHRITIS IN RABBITS

Hua Guo, Qinlu Luo, Jinlong Zhang, Haidan Lin, Jun Zhou, Chengqi He
West China Hospital, Chengdu, China.

Objectives: Ultrasound (US) has been confirmed to relieve pain and improve movement function of Osteoarthritis (OA) patients, however the potential mechanism of management is unclear. The purpose of this study focused on the possible mechanism of US management on OA in rabbits to provide considerable evidences for clinical management on OA patients. *Methods:* 24 rabbits were randomized to organize the normal group, model group andUSgroup. The immunohistochemistry, Western blot and RT-PCR assessment were used to assess the expressions of caspases3 and 8, as while TUNEL was used to assess the ratio of chondrocytes apoptosis in cartilage of rabbits' knees, enzyme-linked immunosorbent assay (ELISA) was used to assess serum TNF-α and LPO levels. One-way ANOVA was used to statistics analysis. *Results:* Our study confirmed that, in model of animal, US can slow down the development of OA through improving the organizational structure of cartilage cells of knee OA, reducing expression of caspase-3 and caspase-8, cutting down chondrocyte apoptosis and decreasing serum TNF-α and LPO levels. *Conclusion:* US treating OA in rabbits might be attributed to intervene the processing of chondrocyte apoptosis, which might reflect the underlying mechanism of management of OA.

PO-0352

REHABILITATION EFFECTS OF THERA-BAND EXERCISES ON SHOULDER JOINT DYSFUNCTION

Yan Wang, Huiqing Liu, Beibei Wang, Liansheng Zhang, Dongdong Ge, Yiyu Gu
Dept.of Rehabilitation Medicine, Nanjing Benqhospital, 210019

Objective: To discuss the effects of Thera-Band exercises coordinating with regular manners on shoulder joint dysfunction. *Methods:*

Forty-five patients with shoulder joint dysfunction were divided into two groups. Twenty-one were in the regular group with electrical therapy and mobilization.The treatment frequency was once each day. Another twenty-four were in Thera-Band group in which Thera-Band exercise coordinated and the treatment frequency was 1.5 h each day. Six times in one period and total three.CMS system was adopted before, after one period and three-period separately,then compared their effects. *Results:*After one period, indexes of the soreness, functional activity, muscle strength and ROM in Thera-Band group were all improved significantly than before (p<0.05). Indexes of the functional activity, muscle strength and ROM in the regular group were all improved significantly (p<0.05),the index of soreness had no apparent difference (p<0.05) and the total scores of CMS shoulder function after the treatments were both improved significantly (p<0.05) than before. However there was no apparent difference between them (p<0.05).After three periods, four indexes above were both improved significantly than before (p<0.05); Compared with the regular group, Thera-Band group had a relatively significant improvement on indexes of soreness, functional activity and muscle strength (p<0.05) and there was no significant difference on index of ROM between them (p>0.05).The total scores of CMS shoulder function both had significant improvements than before the treatment (p<0.05). And Thera-Band group improved significantly than that in the regular group (p<0.05). *Conclusions:* Both groups could improve the shoulder dysfunction and the second one would have a more significant effects.

PO-0353

THE CORRELATION BETWEEN SEVERITY OF ELECTROMYOGRAPHIC RESULTS AND ULTRASONOGRAPHIC FINDINGS IN CARPAL TUNNEL SYNDROME AND USEFULNESS OF NERVE/TUNNEL INDEX IN DIAGNOSING CARPAL TUNNEL SYNDROME

Hyoung Seop Kim[1], Seong Woo Kim[1], Byung Kook Ye[1], Yong Wook Kim[2]

[1]National Health Insurance Corporation Ilsan Hospital, Korea, [2]Yonsei University College of Medicine, Rehabilitation Medicine, Korea

Objective: The aims of this study are to define the correlation between the severity of electromyography (EMG) results with ultrasonographic indexes which include the cross sectional area (CSA) of the median nerve and the carpal tunnel, and the nerve/tunnel index, and to determine the usefulness of sonographic measurements in diagnosing carpal tunnel syndrome (CTS) and to provide a possible pathophysiology of CTS. *Method:* Data was collected from 54 female patients. Severity of carpal tunnel syndrome was classified according to EMG results; normal group as Grade 0, very mild and mild groups as Grade 1, moderately severe and severe groups as Grade 2, and very severe and extremely severe groups as Grade 3. Ultrasonographic measurements included proximal and distal CSA of the median nerve and carpal tunnel. The proximal and distal nerve/tunnel index was obtained by calculating the ratio between the CSA of the median nerve to that of the carpal tunnel. *Results:* Severity determined by EMG results was statistically correlated with proximal CSA of the median nerve and carpal tunnel as well as the distal CSA of the median nerve and carpal tunnel. However, there was no relationship between the proximal and distal nerve/tunnel index and the severity determined by EMG. *Conclusion:* Not only CSA of median nerve but also CSA of carpal tunnel also increases and CSAs of median nerve and carpal tunnel are correlated with the severity by EMG, However the nerve/tunnel index is constant irrespective of the severity.

PO-0354

ISOLATED INJURIES OF ANNULAR PULLEY OF THE FINGER FLEXOR IN KENDO PLAYER: TWO CASES REPORT

Hyoung Seop Kim[1], Seung Ho Joo[1], Byung Kook Ye[1], Yong Wook Kim[2]

[1]National Health Insurance Corporation Ilsan Hospital, Korea, [2]Yonsei University College of Medicine, Korea

Introduction: Around the synovial tendon sheath of the fingers, there are a series of retinacular structures forming the annular pulley system (A1-A5). Pulley ruptures usually involve A2 pulley of the fourth finger of the non dominant hand. However, isolated rupture of the finger annular A1 pulley in Kendo player has not been reported. *Case 1:* A 24 year-old male national kendo athlete visited for left fourth and fifth finger pain lasting for a year. Left fourth finger tendon protruded from the palm when fingers were flexed against resistant force. Absence of A1 pulley of the left fourth finger and detachment of the flexor tendon from the volar plate was observed on sonography. MRI performed to confirm the lesion showed signal changes at the flexor tendon. *Case 2:* A 53 year-old amateur kendo athlete visited for left fourth MCP joint pain. Physical exams were similar to the previous case. Detachment of the flexor tendon from the volar plate was not clear on longitudinal scanning, but the hypoechoic A1 pulley was not observed in longitudinal and transverse views. *Conclusion:* Isolated A1 pulley rupture in kendo players is suspected to be caused by the grasping method of the bamboo sword. In A1 pulley injuries, ultrasonographic examination with active forced flexion may not show a difference of increment of TP distance compared with the ultrasonographic examination at rest as in A2 pulley injuries. And the transverse view study is as important as the longitudinal view study in detecting A1 pulley injuries.

PO-0355

PROPRIOCEPTION AND STABILIZING REACTIONS OF THE QUADRICEPS AND HAMSTRINGS IN PATIENTS WITH KNEE OSTEOARTHRITIS

Mowaffak Saad, Noha Abdel-Halim, Hamdy Koryem, Ibrahim Khalil

University of Alexandris, Faculty of Medicine, Egypt

Background: Postural evoked responses of the quadriceps and hamstring muscles may be affected by deficient proprioception in knee osteoarthritis causing deleterious effect on the joint integrity. *Objective:* To evaluate the proprioceptive-mediated stabilizing quadriceps/hamstring muscles activity evoked by support surface perturbation in patients with knee osteoarthritis. *Methods:* Recording postural-evoked surface EMG (SEMG) of the quadriceps and hamstrings following downward perturbation of the support surface of 40 patients with knee osteoarthritis and 20 matching healthy control subjects. Knee proprioception assessment by measuring inaccuracy of reproducing 10, 20 and 30 degrees active flexion angle while standing. Postural stability was assessed by recording parameters of the center of pressure (COP) of single legged stance using a force platform. *Results:* Patients showed bilaterally larger quadriceps SEMG amplitude (Z=-3.994 and -3.035, p=0.000 and 0.002). Patients showed bilaterally larger amplitude (Z=-3.296 and -1.822, p=0.001 and 0.021) and delayed peak latency of hamstring activation (Z=-1.966 and -2.666, p=0.049 and 0.008). Latency and amplitude asymmetry were observed in patients regarding the quadriceps and hamstring bilateral responses. Patients showed proprioception inaccuracy with 30 degree knee flexion reproduction (Z=-2.443, p=0.015). Significant correlations has been found between SEMG variables and each of the COP parameters, knee joint proprioception inaccuracy. *Conclusion:* Results support assumption that knee joint proprioception deficiency has significant effect on the postural-evoked responses of the quadriceps and hamstrings in patients with knee osteoarthritis. Accordingly, improvement of thigh muscles proprioceptive-mediated postural activity could be a valuable component of the rehabilitation exercises designed for those patients.

PO-0356

OBSERVATION OF CLINICAL EFFECT ON TREATMENT OF NON-SURGICAL DECOMPRESSION WITH CERVICAL SPONDYLOSIS AND RADICULOPATHY

Le Hua Yu, Yuang Zhou, Gongwei Jia, Lang Jia, Lingchuan Niu, Ruogu Zhao, Xiao Liu

Department of Rehabilitation Medicine of The second Affiliated Hospital of Chongqing Medical University

Objective: To observe therapeutic effectiveness and safety of non-surgical spinal decompression system SDS9000 in treatment of cervical radiculopathy and cervical spondylosis. *Methods:* 30 patients diagnosed with cervical radiculopathy and cervical spondylosis were recruited and treated with SDS9000. Assessments such as Clinical Assessment Scale of Cervical Spondylosis (CASCS), and Visual Analog Scale (VAS) for pain were performed prior to the study and after five sessions of treatment (total 10 treatment sessions). The weighted value of VAS ≥25%-50% indicated clinically effective; VAS ≥50% is significantly effective; VAS <25% is invalid. The statistical difference of VAS and CASCS at treatment session 0, 5, and 10 were further analyzed with PASS software. *Result:* Comparison of VAS at the initial and post 10 treatment sessions, the effective rate was 86.67%, significant efficiency was 70.00%, $p<0.001$. With no clinical side effects and statistical indication of VAS and CASCS differences, 10 sessions of treatment would be optimal. *Conclusion:* SDS9000system demonstrated clinical efficacy and safety in treatment of cervical radiculopathy and cervical spondylosis; therefore, we recommend 10 treatment sessions for one target area.

PO-0357

POPOYE SIGN: A RARE CAUSE OF PAIN AND ARM WEAKNESS IN ELDERLY

Zahid Rustam[1], Nasir Mansoor Sahibzada[2]

[1]Combined military hospital Muzaffarabad Pakistan, Pakistan, [2]Combined military hospital Kohat Pakistan, Pakistan

Objective: To present a rare case of shoulder pain and weakness in elderly *Method:* A 67 years old previously healthy gentleman presented with two month history of pain and weakness left shoulder and arm. He gave history of lifting a heavy bag of wheat one month back when he felt a sudden "pop" and excruciating pain in his left upper anterior arm near the shoulder. He consulted local GPs for the pain and it responded well to NSAIDs and hot fomentation. On examination there was mild restriction of range of motion of left shoulder both actively and passively. There was a visible lump in left forearm that was firm and non tender and became prominent on resisted flexion of arm. There was mild weakness of left biceps brachii (MRC Grade4). There was no signs of impingement. Rest of the musculoskeletal examination and neurological examination was unremarkable. A diagnosis of ruptured long head of biceps brachii along with early adhessive capsulitis was confirmed on musculoskeletal ultrasonography (USG). As there was no evidence of shoulder impingement or injury, MRI of rotator cuff was not done. Patient was recommended surgical repair. He was lost to follow up. *Results:* Rupture of long head of biceps is a rare presentation in the elderly and though very obvious is often missed, it causes morbidity in terms of pain and weakness of arm and secondary adhessive capsulitis can develop. *Implication/impact on rehab*: Early diagnosis can prevent morbidity in the elderly.

PO-0358

INCREASED POSTURAL SWAY IN OLDER PATEINTS WITH CHRONIC LOW BACK PAIN DURING CLIMBING STAIRS WITH DIFFERENT HEIGHT

Chieh Chie Chia[1], Sang-I Lin[1], Kuo-Yuan Huang[2], Yi-Ju Tsai[1]*

[1]National Cheng Kung University, Tainan, Taiwan,Chinese Taipei, [2]Department of Orthopedics, National Cheng Kung University Hospital, Tainan, Taiwan, Chinese Taipei

Objective: To investigate the differences of postural sway in older adults with and without Chronic Low Back Pain (CLBP) during climbing a stair with different height. *Method:* Older adults aged over sixty years participated in this preliminary study including six older patients with CLBP and six as healthy older controls. Postural sway indicated as center of pressure (COP) was measured using a portable force platform while subjects stepped onto a stair with two levels of height: 9 cm and 18 cm. The COP parameters were calculated during the single limb support phase identified using footswitches. Repeated measures analysis of variance with group x step height condition (repeated) was performed. *Results:* Older patients with CLBP had significantly greater COP antoposterior displacement ($p=0.033$), total path length ($p=0.006$) and path ellipse area ($p=0.044$) than healthy controls. More importantly, older patients with CLBP had significantly greater COP path length in the 18-cm stair condition compared to the 9-cm condition ($p=0.001$), while the healthy older adults did not differ significantly between the two height conditions ($p=0.179$). *Implications on Rehabilitation:* The COP findings indicated older patients with CLBP had increased postural sway during climbing stairs than the healthy older adults suggesting poorer posture control. Greater postural sway while climbing onto a higher stair was observed in older patients with CLBP but not in healthy older controls suggests increased stair height place more balance challenge to older patients with CLBP. Postural control and balance deficits should be assessed and intervened in older patients with CLBP for preventing fall problems.

PO-0359

ASSOCIATION BETWEEN ULTRASOUND MEASUREMENTS OF MUSCLE THICKNESS, PENNATION ANGLE, ECHOGENICITY AND SKELETAL MUSCLE STRENGTH IN THE ELDERLY

Eva Maria Strasser[1,2], Thomas Draskovits[2], Markus Praschak[2], Graf Alexandra[3], Michael Quittan[1,2]

[1]Institute of Physical Medicine and Rehabilitation, Social Medical Center South,Austria, [2]Karl Landsteiner Institute of Remobilisation and Functional Health, Austria, [3]Medical University of Vienna, Austria

Objective: The increase of elderly in our society requires simple clinical tools for quantification of sarcopenia in inpatient and outpatient settings. The aim of this study was to compare parameters determined with musculoskeletal ultrasound (M-US) with muscle strength in young and elderly patients. *Method:* In this prospective, randomized and observer blind study 26 young (24.2 ± 3.7 years) and 26 old (age 67.8 ± 4.8 years) patients were included. Muscle thickness, pennation angle and echogenicity of all muscles of m. quadriceps were measured by M-US and correlated with isometric maximum voluntary contraction force (MVC) of m. quadriceps. Reproducibility of M-US measurements as well as simple and multiple regression models were calculated. *Results:* Of all measured M-US variables the highest reproducibility was found for measurements of thickness (ICC 85-97%). Simple regression analysis showed a highly significant correlation of thickness measurements of all muscles of m. quadriceps with MVC in the elderly and in the young. Multiple regression analysis revealed that thickness of m. vastus medialis had the best correlation with MVC in elderly. *Implications/Impact on rehabilitation:* This study showed that measurement of muscle thickness, especially of m. vastus medialis, by M-US is a reliable, bedside method for monitoring the impact of sarcopenia.

PO-0360

RISK FACTORS OF VASCULAR PENETRATION IN CERVICAL TRANSFORAMINAL EPIDURAL STEROID INJECTIONS

Hyeonghui Jeong, Yusun Min, Won Kim, Sun Gun Chung

Department of Rehabilitation Medicine, Seoul National University Hospital, Korea

Objective: Vascular penetrations in cervical transforaminal epidural steroid injection (CTFESI) procedures are known to be related with serious complications. It would be important to acknowledge factors suggesting higher incidence of vascular penetration. In this retrospective research, we investigated factors of the patients contributing to vascular penetration during CTFESI. *Method:* The study included 240 patients, who had first CTFESI in a rehabilitation outpatient clinic of a university hospital. CTFESI were performed one interventionist, according to the accepted standard technique. Contrast patterns were examined with real-time fluoroscopic surveillance and the resulting images were also stored. The relationship between incidence of the vascular penetration and factors of the patients were analyzed retrospectively. The vascular penetration patterns were categorized as one of followings: vertebral artery pattern (VA), radicular artery (RA) pattern, intraverterbral venous plexus pattern (VP), vertebral vein pattern (VV). *Result:* There were 71 cases of vascular penetration (29.6%) among 240 cases of CTFESI. Most of which were VP (n=50). The VV (n=13), VA (n=5), and RA (n=4) were aslo observed. The mean age of vascular pattern group (59.94 years) was significantly older than that of non vascular pattern group (55.79 years). 34.8% of the female patient and 22.2% of the male patients were vascular penetration group (p=0.025). And 71.43% of C3/4, 40.74% of C4/5, 29.29% of C5/6, and 23.44% of C6/7 were vascular penetration group. *Conclusion:* Vascular penetration occurred in about 29.6% of the CTFESI. The almost all vascular penetrated structure was the venous plexus. The study suggests that the older age group (OR 1.030/1 yr), female (OR 2.175), and higher cervical injection level (OR 1.820) would have a higher likelyhood to result in vascular penetration. More careful approach and manipulation is needed when an interventionist performs CTFESI on higher cervical levels of old, female patients.

PO-0361

BONE MASS AND HORMONE ANALYSIS IN SPINAL CORD INJURY PATIENTS

Alexandra Gaspar[1], Marise Lazaretti[1], Cynthia Brandao[1]*

[1]UNIFESP,Brazil, [2]AACD, Brazil

Spinal cord injury (SCI) patients have many long term complications like bone mass loss and fractures. Several factors (mechanical, neurovascular, hormonal and genetic) have been implicated in osteoporosis' (OP) physiopathology and hormone alterations are among them. *Methods:* Twenty-five males with SCI (ASIAA and B) level T2-T12 were included in this study. Additional eighteen able bodied age paired adults served as control group. Subjects were submitted to BMD by DXA at inferior limbs (femoral neck (FN), total femur (TF) and distal femur (DF), lumbar spine (LS) and total body (for DF analysis) and inferior limbs and LS X-ray. Blood analysis was performed including kidney and liver function, collagen type I telopeptide carboxiterminal (CTX), 25 (OH) vitamin D [25 (OH)D], serum total testosterone (testo), free testosterone, prolactin (PRL), lutein hormone (LH), follicle stimulating hormone (FSH) and sexual hormone binding globulin (SHBG). *Results:* Comparing young traumatic complete paraplegic patients to controls, an inverse correlation between testosterone and BMD for TF (r=-0.53, p=0.01) and FN (r=-0.44, p=0.03) was found, while no correlation between BMD for all sites and gonadotropins was observed. *Implications:* explain better OP in SCI patients and find modifiable factors making the treatment and fractures avoidance easier. In conclusion, there was an inverse correlation between testosterone and TF and FN BMD in SCI subjects while no direct influence of standing, 25 (OH) D or gonadotropins on BMD for our SCI population.

PO-0362

CLINICAL OBSERVATION OF THE THERAPEUTIC EFFECT OF EXTRACORPOREAL SHOCKWAVE THERAPY FOR THE TREATMENT OF PATELLAR TENDENIOPATHY

Weiliang Zhu, Congxia Huang, Suiqiong Wu, Yuanhui Cai, Jinhai Li

Guangzhou Orthopedic Hospital

Objective: To observe the therapeutic effect of extracorporeal shockwave therapy (ESWT) for the treatment of patellar tendeniopathy (PT). *Methods:* 136 PT patients (63 male and 73 female) were treated with ESWT using a Swiss EMS low-energy radial ESWT generator at a dose of 2,000 times, a frequency of 10 times/second, a pressure of 2-2.5 bars, and 7 days as a cycle of treatment for 1-5 consecutive cycles. *Results:* All the patients were followed up 2-3 months after treatment. The overall effective rate was 52%, and the effective rate in patients who completed the treatment as required was 70%. *Conclusion:* The clinical data show that ESWT has an accumulative effect during the course of treatment. The effective rate in patients who complete the treatment as required should be between 52% and 70%.

PO-0363

GUIDELINES ON NECK PAIN REHABILIATION: NON-FARMACOLOGICAL INTERVENTIONS

Danielle Rampim, Paula Delfino, Fabio Alfieri, Gustavo Fadel, Talita J Santos, Satiko Imamura, Marta Imamura, Linamara R Battistella

Clinical Research Center. Institue of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine.,Brazil

Objective: To assess the non-pharmacological interventions to treat chronic non-specific neck pain (CNSNP). *Method:* A Pubmed database search of randomized clinical trials was conducted using P.I.C.O. strategy (Patient, Intervention, Comparison and Outcome). The following terms were arranged for each search strategy: physical modalities, exercise therapy, physical activity, posture ergonomic, work style intervention and manipulation. Methodological quality of the studies was assessed by JADAD score. *Results:* The search strategies retrieved 1495 articles of which 91 articles were related to neck pain treatment. After methodological quality assessment, 23 articles were used. The ultrasound at 1,5W/cm^2 over the upper trapezius muscle followed by cervical stretching (US/CS) is superior to cervical stretching alone (CS) in reducing pain (pre and post-treatment VAS for US/CS 7.24±1.62 and 3.08±2.42; p<0.001) (B). Cervical strengthening and stretching exercises reduce neck pain when compared with usual physical therapy programs (pre and post-treatment median and CI95%: Strengthening: 12, 10-15 and 6, 4-9; Physical Therapy: 12, 10-15; 8, 6-11, p<0.05) (B). Ergonomic practices can reduce neck discomfort in computer workers from 49% to 18% after 12 weeks of use of a forearm supportive device (X2=5.05; p=0.008) (B). Vertebral Manipulation reduces cervical pain (pre and post-treatment VAS medians and CI95%: Manipulation = 8, 7-10; 4, 4-5; Strengthening: 8, 7-10; 5, 4-7; Physical Therapy: 9, 8-11; 4, 3-6; p<0.05) (A). *Implications/Impact on Reabilitation:* Different modalities can improve neck pain. Cervical strengthening, vertebral manipulation and ultrasound associated with neck stretching, can reduce pain and may be recommended to treat CNSNP. Also, patients can benefit from simple ergonomic practices.

PO-0364

COMPARATIVE ANALYSIS OF DEGENERATIVE CHANGES OF ROTATOR CUFF TENDONS IN SHOULDER MRI

Byung Kook Ye, Hyoung Seop Kim, Seung Ho Joo
National Health Insurance Corporation Ilsan Hospital, Korea

Introduction: In previous studies, we have compared clinical factors (sex, side, age) with injuries of the supraspinatus tendon. In this study, we aim to analyze the degenerative changes that occur at the supraspinatus, infraspinatus, and subscapularis muscles, and correlate them with groups with and without subdeltoid bursitis. *Method:* 233 cases of shoulder MRI taken for shoulder pain were collected retrospectively. The supraspinatus, infraspinatus and subscapularis tendons were graded into normal =0, tendinosis =1, partial tear =2, full thickness tear =3, and complete rupture =4, and degree of degenerative change was compared with age. The degree of degenerative change at the tendons were also correlated with the presence of subdeltoid bursitis. *Results:* Age and degenerative changes of all rotator cuff tendons showed statistically significant correlation. The supraspinatus tendon showed the greatest degenerative change with correlation of 1.68±0.77, while subscapularis and infraspinatus tendons showed 0.53±0.76, 1.10±0.9 correlation respectively. Degenerative changes of the supraspinatus and infraspinatus tendons showed correlation with presence of bursitis by 1.83±0.69 and 1.25±0.88 respectively, while those of cases without bursitis were 1.49±0.81 and 0.90±0.95 respectively. However, degenerative changes of the subscapularis muscle showed no statistically significant difference between groups with and without bursitis. *Conclusion:* The degree of degenerative changes of the rotator cuff tendons showed correlation with age, of which it was more severe in shoulder external rotators and abductors. As the group with bursitis showed greater degenerative changes in supraspinatus and infraspinatus tendons, they can be suspected as accompanying lesions to the degenerative changes rather than an exclusive entity.

PO-0365

THE EFFECT OF GENICULAR NERVE BLOCK IN KNEE OSTEOARTHRITIS

Evren Yaşar, Serdar Kesikburun*, Mehmet Ali Taşkaynatan, Birol Balaban, Arif Kenan Tan
Gülhane Military Medical Academy, Department of PM&R, Turkish Armed Forces Rehabilitation Center, Ankara, Turkey, Turkey

Objective: To investigate the effect of ultrasound and neurostimulator guided genicular nerve block in patients with knee osteoarthritis. *Method:* 27 patients who underwent genicular nerve block for their knee pain were reviewed. All patients had knee pain more than six month and medial compartment narrowing of the knee in plain radiographs. Superior and inferior medial genicular branches of the tibial nerve that innervate the knee joint was localized with the help of ultrasound and neurostimulation guidance before the injection. A mixture of 1 ml corticosteroid and 4 ml local anesthetic was administered for blockade of the nerves. The records of Brief Pain Inventory (BPI) at both preinjection and one month after the procedure were used as the source of information in the study. *Results:* Pain interference and pain severity scores in BPI decreased significantly one month after the procedure compared to preinjection (p<0,05). *Implications/Impact on rehabilitation:* The results suggest that ultrasound and neurostimulator guided genicular nerve block has positive effects on pain in knee osteoarthritis.

PO-0366

THE HEMORHEOLOGICAL SAFETY OF PULSED ELECTROMAGNETIC FIELDS IN POSTMENOPAUSAL WOMEN WITH OSTEOPOROSIS IN SOUTHWEST CHINA: A RANDOMIZED, PLACEBO CONTROLLED CLINICAL TRIAL

Huifang Liu[1], Lin Yang[1], Hongchen He He[1], Jun Zhou Zhou[1], Ying Liu[2], Chunyan Wang[3], Yuanchao Wu[1], Chengqi He He[1]
[1]Department of Rehabilitation Medicine, West China Hospital, Sichuan University, Chengdu, Sichuan, China, [2]Department of Geriatrics, West China Hospital, Sichuan University, Chengdu, Sichuan, China, [3]Department of Rehabilitation, Tianjin Medical University, Tianjin, China

Objective: Apart from medications, pulsed electromagnetic fields (PEMFs) are used to treat osteoporosis nowadays. However studies on hemorheological safety of PEMFs were scarce. This randomized, placebo controlled clinical trial assessed whether PEMFs could lead to significant hemorheological changes. *Method:* Fifty-five postmenopausal women were randomly assigned to receive placebo or PEMFs. Venous blood samples were collected at baseline and after treatment to measure 14 hemorheological determinants. Independent samples *t*-test, paired samples t-test and chi-squared tests were performed respectively. Relationships between variables were determined by Pearson correlation analysis. Multiple linear stepwise regression analysis was used to explore predictors of selected determinants. *Results:* No significant differences existed between the placebo and PEMFs groups for any of the 14 hemorheological determinants (p> 0.05) or the percentage of patients with hemorheological determinant within reference range (p > 0.05). Hematocrit was found to be correlated with BMI (p=0.007). The most significant predictor of blood reduced viscosity at low shear rate was blood viscosity at low shear rate. And blood reduced viscosity at high shear rate was the most important predictor of plasma viscosity. *Implications:* These results showed, compared with placebo, PEMFs treatment of postmenopausal osteoporosis was not associated with adverse changes in hemorheological determinants, which may contribute to venous thromboembolism.

PO-0367

PULSED ELECTROMAGNETIC FIELDS ON POSTMENOPAUSAL OSTEOPOROSIS IN SOUTHWEST CHINA: A RANDOMIZED, ACTIVE-CONTROLLED CLINICAL TRIAL

Huifang Liu[1], Lin Yang[1], Hongchen He[1], Jun Zhou[1], Ying Liu[2], Chunyan Wang[3], Yuanchao Wu[1], Chengqi He[1]
[1]Department of Rehabilitation Medicine, West China Hospital, Sichuan University, Chengdu, Sichuan, China, [2]Department of Geriatrics, West China Hospital, Sichuan University, Chengdu, Sichuan, China, [3]Department of Rehabilitation, General Hospital of Tianjin Medical University, Tianjin, China

Objective: A randomized, active-controlled clinical trial was conducted to examine the effectiveness of pulsed electromagnetic fields for women with postmenopausal osteoporosis in southwest China. *Method:* Forty-four participants were randomly assigned to receive alendronate or one course of PEMFs treatment. Bone mineral density (BMD) of lumbar spine (L1-4) and left proximal femur, total lower-extremity manual muscle test (LE MMT) score and Berg Balance Scale (BBS) score were recorded at baseline and 5, 12 and 24 weeks later. And serum 25OH Vitamin D3 concentrations were measured at baseline and 5 weeks. *Results:* Using mixed linear model with adjustment for covariables including participant's age, menopause age, time since menopause, Body mass index (BMI) and the corresponding baseline value, there was no significant treatment difference (mean percentage changes from baseline to the three follow-up visits) with respect to BMD of lumbar spine (L1-4) and left proximal femur, total LE MMT score and BBS score ($p \geq 0.05$). And mean percentage changes of serum 25 OH Vitamin D3 concentrations between the two groups were not significant with independent samples *t*-tests ($p \geq 0.05$). *Implications:* These results suggested

that a course of PEMFs treatment with specific parameters was as effective as alendronate in treating postmenopausal osteoporosis.

PO-0368

EFFECTS OF HOME-BASED REHABILITATION ON HEALTH-RELATED QUALITY OF LIFE IN PATIENTS FOLLOWING LUMBAR DISC OPERATION

Chaoqun Ye, Congwei Wang, Fang Li, Guangmin Zhao, Tiansheng Sun
The Beijing Army General Hospital, Beijing, China

Objective: To determine the effects of home-based rehabilitation (HBR) on pain, mood, functional status and health-related quality of life (HQOL) in patients following lumbar disc operation. *Methods:* 120 patients with selective operation because of lumbar disc herniation were prospectively included in this study. All of the patients received HBR education by oral and written information before discharge. The HBR program comprised stabilisation of trunk, motion of back and hip, strengthening of back, abdominal and leg muscles. The back and leg pain, functional status, HQOL was evaluated with the visual analogue scales, Oswestry Disability Index and SF-36 respectively, and mood with self-rating Anxiety Scale and self-rating Depression Scale, at admission and discharge. The evaluation was repeated in the 3rd and 6th months after discharge. *Results:* Of 120 patients, 30% performed HBR program 2–3 times a week for 6 months, 20% performed for 2–3 months, while 25% for less than 1 months, 25% for 0 day. Significant improvement in pain, mood, functional status and HQOL were observed over time in all patients. Especially, patients for 6 months rehabilitation and 2–3 months demonstrated better improvement than patients for 0 day and less than 1 months rehabilitation at the 3rd month, while only patients for 6 months rehabilitation showed significant improvement than other patients at the 6th month. *Implication:* The results indicate long term regular HBR is effective and essential for patients following lumbar disc operation to improve the HQOL.

PO-0369

CLINIC STUDY OF CORRELATE BETWEEN SOMATIC TINNITUS AND MUSCULAR TENSION IN HEAD AND NECK

Quan Tao, Qing Du, Xuan Zhou, Xiaoyan Yang, Gang Liu, Yuwei Feng, Lin Mao
Department of Rehabilitation, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

Objective: To investigate the correlate between somatic tinnitus and muscular tension in head and neck, evaluating the treatment diffrence in chiropractic group as compared with the transcutaneous electrical stimulation (TENS) group. *Method:* 28 cases of tinnitus patients who were subjected to a selective process according to Levine′s table about somatic modulation of tinnitus and Long cenghua′s assessment way about the upper cervical spine articulation subluxation between the occiput (C0), the atlas (C1) and the axis (C2) by taking anterior-posterior view, lateral view and open-mouth view x-ray. All cases we recruited into this study were cross- assigned to either chiropractic group (14 cases, 9 men, 5 women; 8 left tinnitus, 6 right tinnitus) or TENS group (14 cases, 8 men, 6 women; 9 left tinnitus, 5 right tinnitus) according to waiting list.We have measured tinnitus patients before and after treatment bilateral silent potential changes in mastication,sternocleidomastoid,superi or trapezius by sEMG and tinnitus loudness changes by the visual analog scale (VAS). The results were analyzed using SPSS statistical software. *Results:* The ratio between strong silent potential by sEMG and ipsilateral tinnitus was 87.5% in left tinnitus and 83.3% in right tinnitus in chiropractic group,while in TENS group was 81.5% and 80.0% respectively. Before and after treatment, average silencet patential values of tinnitus have been decreased in Chiropractic group from 12.6 to 8.7, $p<0.001$,and TENS group from 12.4 to11.0, $p<0.05$, and Chiropractics was more effective tinnitus modulation.Tinnitus loudness average VAS pre- and post-treatment in chiropractic group and TENS group have been improved from 5. 8 to 3. 9 (p<0.001), 5. 7 to 5.1 (p<0.05), respectively.There were 4 cases tinnitus disappeared, 6 cases reduced, the effective rate was 72.5% in chiropractic group, and 1 case tinnitus disappeared, 5 cases improved, the effective rate was 42.8% in TENS group. The statistical analysis demonstrated a significant diffrence in chiropractic group as compared with the TENS group *Implications/Impact on rehabilitation:* There is strong relationship between somatic tinnitus and muscular tension in head and neck. Somatic tinnitus caused by muscular tension in head and neck can be improved by chiropractic or TENS, and chiropractic is better.

PO-0370

EFFECTS OF PULSED ELECTROMAGNETIC FIELDS ON POSTMENOPAUSAL OSTEOPOROSIS

Huifang Liu[1], Lin Yang[1], Ying Liu[2], Chunyan Wang[3], Yuanchao Wu[1], Chengqi He[1]
[1]Department of Rehabilitation Medicine, West China Hospital, Sichuan University, Chengdu, Sichuan, China, [2]Department of Geriatrics, West China Hospital, Sichuan University, Chengdu, Sichuan, China, [3]Department of Rehabilitation, Tianjin Medical University, Tianjin, China

Objective: We investigated the effects and optimal treatment frequency of pulsed electromagnetic fields (PEMFs) on postmenopausal osteoporosis (PMO). *Method:* A comparison was made of the cyclical alendronate and a course of PEMFs in the treatment for postmenopausal osteoporosis on bone mineral density (BMD), pain intensity and balance. *Results:* There is no significant difference between the two groups on mean percentage changes from baseline of BMD within 24 weeks after randomization ($p \geq 0.05$). However, at 48 weeks and 72 weeks, BMD of the PEMFs group were significantly lower than that of the alendronate group. *Implications:* Compared with cyclical alendronate, a course of PEMFs was as effective as alendronate in treating PMO for at least 24weeks. So its optimal treatment frequency for PMO may be one course per six months.

PO-0371

OBSERVATION ON THE EFFECT OF EXERCISE PRESCRIPTION FOR OFFICE WORKERS WITH NECK-SHOULDER PAIN

Shizhong Liu, Jun Liang, Qian Lin, Feifei Li, Chengmeng Li, Liping Huang
Tianjin University of Sport,tianjin,China

Objective: To investigate the effects of exercise prescription for office workers with neck-shoulder pain. *Method:* Sixty participants are recruited from a large company, who worked in the office in computer. The neck shoulder pain related questionnaires were written by them. Forty four subjects with pain for more than 30 days during the last year,who adapt to the demands of experiment, are picked up and randomly devided into experimental group (n=22) and control group (n=22).Visual analogue scale (VAS) for pain, resting surface EMG, isometric maximum voluntary contraction (MVC), and fatigue testing of upper trapezius were tested before and after exercise intervention. The exercise prescription was designed as muscle strengthening, stretching and relaxation in the neck and shoulder. All the people in experimental group were instructed to take the exercises twice a day (1 h before off-working in the morning and afternoon during workday), 20 min a session, meanwhile the controls take a break with chatting. After 6 weeks, the same outcome measures were taken for both groups. *Results:* All the measurements were the same for both groups before the

experiment. Compared to the controls, the pain of the participants in experimental group was significantly reduced ($p<0.01$), ROM in cervical rotations were significantly improved ($p<0.05$), and isometric MVC of upper trapezius increased ($p<0.05$) after training. But no differences of the amplification of rest sEMG and fatigue test were found in experimental group than controls. ($p>0.05$). The exercise prescription aimed to neck-shoulder pain is effective for reducing pain through increasing shoulder muscles strength and neck ROM.

PO-0372

RADICULAR LUMBAR BACK PAIN IN PARKINSON´S DISEASE: A CASE STUDY AND REVIEW OF THE LITERATURE

Anja Zhang, Eduard Kraft*

Department of Physical Medicine and Rehabilitation, University of Munich, Germany

Objective: Pain has been increasingly recognized as a non-motor symptom of PD contributing to disability in the course of the disease. In particular radicular pain syndromes present major challenges to functioning and participation of PD patients. Previous work has indicated that PD patients do suffer more commonly from radicular back pain compared to elderly individuals of the same age group. *Method and Results:* A 73 year old patient with a 4 year history of PD (Hoehn-Yahr stage III) was admitted to the hospital complaining of immobilizing lumbar back pain (intensity 10/10 NRS). Extensive osteochondrotic changes and a disc protrusion with root irritation at the level of right side root L5 was identified. During the 2 weeks of in patient treatment fluctuating responses to analgesic medication and dexamethasone therapy was noted. He was discharged with almost resolved symptoms 2/10 NRS. *Implications/Impact on rehabilitation:* So far no systematic case series has reported the specific issues related to this clinical scenario nor are there randomized trials examining possible specific regimens for patient with Parkinson´s disease. Our case illustrates some important clinical questions that require further study.

PO-0373

AVULSION FRACTURE OF ISCHIAL TUBEROSITY IN A YOUNG MILITARY RECRUIT

Selim Akarsu[1], Alparslan Bayram Çarlı[2], Levent Tekin[1]

[1]Gülhane Military Medical Academy Haydarpaşa Training Hospital, Department of Physical and Rehabilitation Medicine,Turkey, [2]Bursa Military Hospital, Department of Physical and Rehabilitation Medicine, Bursa, Turkey, Turkey

Introduction: Ischial tuberosity pain in athletes might be caused by several clinical entities, such as acute and chronic bony or periosteal avulsions and apophysitis. These types of injuries, especially in young athletes, were as a consequence of forces exerted by sudden, muscular contractions across open apophyses. Individuals those young age had the highest risk of avulsions and they were often diagnosed as musculotendinous injury. *Case report:* A 21 years-old military recruit referred to our department with the complaint of pain in his right hip and posterior aspect of his thigh. He had been complaining from the pain for 4 months. He declared that the pain was started after 100 metres running sports. The physician had treated him with the diagnosis of muscle strain. He had returned to his sports activities after a week of rest since his complaints were mostly relieved. However, two months after the injury he had noted a severe pain in his left hip and posterior aspect of his thigh when he was running. The patient was referred to our department with the provisional diagnosis of muscle injury in chronic phase. Physical examination revealed prominent tenderness over left ischial tuberosity and the patient had pain with active hip extension and adduction. Pelvis plain x-ray was taken. The x-ray revealed a fragment inferior to the ischial tuberosity indicating the diagnosis of avulsion of ischial tuberosity. *Implications/Impact on rehabilitation:* Apophyseal avulsions in pelvic region of adolescents usually involve ischial tuberosity and these injuries are particularly seen during sportive activities. However, the ischial apophyseal injuries were usually diagnosed as muscle injuries as seen in the presented case. A detailed history and x-ray were important for the diagnosis of avulsion injuries involving ischial tuberosities.

PO-0374

MEDIAL COLLATERAL LIGAMENT INJURY OF THE KNEE – APPROACH AND REHABILITATION

Rui Sales Marques

Hospital de Faro, E.P.E., Portugal

Objective: The objective of this study is to review the correct approach, management and rehabilitation of the patient with probable medial collateral ligament (MCL) injury. *Method:* In this research, a systematic review was made using database of MD Consult, UpToDate, Pub-Med and Science direct. The expression "medial collateral ligament knee injury rehabilitation" was searched and 436 articles were found. *Results:* Medial collateral ligament injuries appear to be the most common of athletic knee injuries. They occur frequently in athletes, particularly those involved in sports that require sudden changes in direction and speed, and in patients struck on the outside of the knee. MCL injuries are categorized by grade: a Grade 1 injury is minor and stable; a Grade 2 injury is a partial tear and demonstrates some instability; a Grade 3 injury is a complete tear and creates gross instability. MCL injury can be diagnosed by a good history and physical examination alone in most cases. Imaging, including MRI, is used most often to exclude concomitant injury. Isolated MCL injuries may be treated with functional rehabilitation (Grade 2B). Early joint motion is encouraged, weight bearing and activity are advanced as tolerated by the patient. Surgery is indicated only for injuries refractory to rigorous conservative treatment and those with gross knee instability or multiple ligamentous injuries. *Implications/Impact on rehabilitation:* The long-term prognosis for all grades of MCL injury is excellent if there is a well-done rehabilitation programme.

PO-0375

A CASE OF PREGNANCY AND LACTATION ASSOCIATED OSTEOPOROSIS LEADING TO VERTEBRAL COMPRESSION FRACTURE

Birol Balaban[1]*, Serdar Kesikburun[1], Emre Adıgüzel[1], Alper Sönmez[2], Arif Kenan Tan[1]

[1]Gülhane Military Medical Academy, Turkish Armed Forces Rehabilitation Center, Ankara, Turkey, Turkey, [2]Gülhane Military Medical Academy, Division of Endocrinology & Metabolism, Ankara, Turkey, Turkey

Objective: To describe a patient with low back pain developed during the postpartum period and diagnosed as vertebral compression fracture due to pregnancy and lactation associated osteoporosis. *Method:* A 28-year old woman presented with complaints of low back pain started two months after her first delivery. Bone mineral density (BMD) measurement, biochemical evaluation and lomber spinal MRI were performed. *Results:* Lomber spine BMD was extremely decreased: L2-4:0,685 g/cm^2, T-score -3.9, Z-score -3.9. MRI revealed a compression fracture of T12 vertebra. Because the patients was investigated in terms of all possible risk factors and hormonal pathology causing osteoporosis and there wasn't any abnormality, it was diagnosed as pregnancy and lactation associated osteoporosis. Cease of the lactation and treatment with teriparatide was recommended to the patient. *Implications/Impact on rehabilitation:* Clinicians should take in to account of pregnancy and lactation associated osteoporosis when evaluating patients with low back pain during early postpartum period.

PO-0376

EVALUATION OF QUALITY OF LIFE IN POSTMENOPAUSAL OSTEOPOROTIC WOMEN

Alize Yilmaz, Kurtulus Koklu*, Sumru Ozel, Canan Culha

Ankara Physical Theraphy and Rehabilitation Education and Research Hospital, Ankara, Turkey, Turkey

Objective: The primary aim of this study was to investigate the effect of postmenopausal osteoporosis (PMO) on quality of life. In addition, we investigated the effect of fractures and physical examination findings on quality of life in patients with PMO. *Methods:* In this study, 81 women with PMO and 53 postmenopausal women without osteoporosis aged between 50-75 who were admitted to our hospital and had bone mineral densitometry (BMD) measurement were included. Patient informations were questioned with Clinical Information Form and quality of life was assessed by means of Quality of Life Questionnaire of the European Foundation for Osteoporosis (QUALEFFO). *Results:* The quality of life in women with PMO was significantly worse than the postmenopausal women without osteoporosis. Physical function for postmenopausal osteoporotic women with previous fracture history was worse than postmenopausal osteoporotic women without previous fracture history. Total score of quality of life and social function, mental function sub-scales of quality of life for postmenopausal osteoporotic women with vertebral fractures were worse than postmenopausal osteoporotic women without vertebral fractures. Total score of quality of life and pain, mental function sub-scales of quality of life for postmenopausal osteoporotic women with vertebral tenderness on palpation were worse than postmenopausal osteoporotic women without vertebral tenderness on palpation. *Implications/Impact on rehabilitation:* Quality of life in women with PMO was worse. In addition, previous fracture history has negatively effect on physical function and physical examination findings such as vertebral tenderness on palpation have negatively effect on quality of life.

PO-0377

MEDIAL CALCANEAL NEUROPATHY AFTER ACHILLES TENDON SURGERY: TWO CASE REPORTS

Jiaxin Tran[1]*, Mooyeon Oh-Park[2]

[1]UMDNJ-New Jersey Medical School,United States, [2]Kessler Institute for Rehabilitation, United States

Objective: Medial calcaneal neuropathy can cause disabling heel pain, but it has never been reported after Achilles tendon surgery. *Method:* We describe two individuals who presented with neuropathic heel pain after Achilles surgery. Both patients were allegedly diagnosed as "recurrent Achilles tendinosis" and recommended to have re-operation. A 56-year-old female underwent Achilles tendon debridement and Haglund deformity resection for hindfoot pain two years ago. She developed a burning sensation over the medial heel after surgery, although the Achilles tendon pain improved. Similarly, a 30-year-old female presented with burning pain of medial and plantar heel after heel spur removal. In both cases, the surgical scar was along the medial calcaneus. On exam, the medial heel was most tender and Tinel's sign could be elicited along the incision. Sensory mapping – an adjunct measure for abnormal sensory examination, whereby the extent of sensory loss was outlined using a paper clip – delineated a discrete loss of sensation along the medial calcaneal nerve distribution. *Results:* A clinical diagnosis of medial calcaneal neuropathy was made for both patients. The first patient had notable pain improvement with a one-quarter-inch heel lift, focal pressure relief over the maximum tender point of the heel, and initial application of Unna's paste boot. Patient was subsequently fitted for Haglund orthosis with focal relief. *Implications/Impact on rehabilitation:* Medial calcaneal neuropathy causing disabling heel pain can develop after Achilles tendon surgery when the incision is made too medial. With meticulous clinical evaluation and a high index of suspicion can avoid unnecessary invasive procedures.

PO-0378

MEASURING CROSS-SECTIONAL AREAS OF CERVICAL SPINAL NERVE ROOTS ON ULTRASONOGRAPHY IN PATIENTS WITH CERVICAL RADICULOPATHIES

Bumjun Park, Hyojung Kang*, Seungnam Yang, Joonshik Yoon, Seijoo Kim

Korea University Guro Hospital, Korea

Introduction: Cervical radiculopathy is a cause of neck, shoulder and upper extremity pain. Recently, Sonographic assessment has been considered an alternative method for evaluating the cervical root lesions. The aim of this study was to investigate the clinical usefulness of measuring cross sectional areas (CSA) of cervical spinal nerve roots on high-resolution ultrasonography (US) in patients with cervical radiculopathies *Method:* Twenty – four patients (9 female, mean age: 53.7 ± 11.5 years) who were electrodiagnostically confirmed to have unilateral cervical radiculopathy participated in this study. US of spinal nerve roots was performed with a 5 - 12 MHz real-time linear-array transducer (HD 15 Philips Medical Systems). One examiner performed all the US examinations. CSA of cervical spinal nerve roots was obtained at the most proximal location possible where the nerve root exited over the transverse process or just distal to that point. The probe was manipulated until the most circular shape of the nerve root as well as the brightest echo of the nerve root. The CSA was measured three times using the trace tool available on the US device. The CSA of the each contralateral nerve roots were served as control. *Results:* The CSA were measured on US in 5 pairs of C5 roots, 12 pairs of C6 roots and 7 pairs of C7 roots. The mean CSA of affected and unaffected side were 17.7 ± 2.5 mm^2 and 14.3 ± 2.6 mm^2 in C5 roots (p=0.043), 17.9 ± 1.8 mm^2 and 14.9 ± 1.6 mm^2 in C6 roots (p=0.026), and 22.3 ± 2.7 mm^2 and 17.4 ± 2.0 mm^2 in C7 roots (p=0.018). *Conclusion:* This is the first comparative study to obtain CSA measurements of the cervical spinal nerve roots between normal and cervical radiculopathies. Increased CSA of spinal nerve roots shown on US may be useful as an additive clue to the diagnosis of cervical radiculopathies.

PO-0379

THE MULTI JOINT SYSTEM IN COMPLEX REHABILITATION OF IMPINGEMENT SYNDROME OF THE SHOULDER

Evgenia Tsvetkova*, Anna Albegova, Tatyana Shapovalenko, Konstantin Lyadov

Medical and Rehabilitation Center, Russia

Objective: To assess the efficacy of complex rehabilitation of impingement syndrome of the shoulder using the Multi Joint System and dedicated rehabilitation software *Method:* The Multi Joint System is a rehabilitation device in the field of robotic neurorehabilitation and trauma. It is used for patients exhibiting motor dysfunction of the upper extremity. Subjects (n=53), ROM: abduction –30 degree, flexion –40 degree, extension –10 degree, external rotation –5 degree, internal rotation – 5 degree; age 48±7, divided into 2 groups: Experimental group (n=26), age-matched control group (n=27). All subjects received 15 sessions, each approximately 45 min; 5/wk. Experimental group received MJS combined with ESWT (3/wk) and massage (5/wk). Control group received traditional treatment (exercises, PT, massage) of a similar duration and frequency. *Results:* After 15 consecutive sessions, all patients were re-evaluated by American Shoulder and Elbow Surgeons Assessment (ASES), Shoulder Score Index (SSI) and ROM measurements recorded using MJS. Statistical analysis indicated significant improvement within the experimental group when compared to the control group: 1)

(ASES): p=0.016; 2) (SSI): p=0.042; 3) performance accuracy on x axis: p<0.001; and 4) performance accuracy on y axis: p<0.001. *Implications:* Combination of Multi Joint System with ESWT and massage proved to be significantly more effective than traditional therapy.

PO-0380

CLINICAL EFFICACY OF NERVE MOBILIZATION TECHNIQUE ON PAIN RECURRENCE AFTER LUMBAR NERVE ROOT CANAL DECOMPRESSION SURGERY

Bingchen An, Ying Wang, Zude Liu, Lie Qian, Guibin Zhong, Taojie Liu, Yun Liu
Renji Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

Objective: To observe nerve mobilization technique on the pain recurrence after the lumbar nerve root canal decompression surgery. *Method:* 36 patients with lumbar nerve root canal stenosis were randomly divided into nerve mobilization technique's treatment group and the control group. After nerve root canal decompression surgery, the treatment group received manual therapy; control group didn't receive manual therapy. The visual analogue scale (VAS) was applied to assess the pain recurrence. *Results:* Two groups did not differ significantly before surgery. After single manual therapy, VAS value decreased by 1.65 ± 0.81 in treatment group, compared with the minimum difference of clinical symptoms (1.2) was statistically significant (p=0.023). VAS values in patients of the control group continued to rise significantly (p=0.017) in post-surgery 4, 5, 6 day; conversely, VAS value significantly decreased in treated patients gradually (p=0.000). In 3 months follow-up, the radicular irritation was disappeared in both groups. There was no complication and adverse effect also. *Conclusion:* Nerve mobilization technique is a good choice for the pain recurrence rehabilitation after nerve root canal decompression surgery, safe and reliable.

PO-0381

STANDARDIZATION ISOKINETIC LOAD CAPACITY IN HEALTHY INDIVIDUALS

Lucia Allen, Yazmin Ordoñez, Ana Cecilia Garcia*
Mexican Social Security Institute, Mexico

Objective: Standardize the load capacity in healthy individuals of working age by isokinetic testing. *Methods:* Prospective, without intervention, observational, non-comparative Transversal descriptive study in Physical Medicine and Rehabilitation No.1 Center in isocinetics department, 65 individuals both sexes 18-45 years old, was performed isokinetic testing using WS Contrex as loading lever attachment, performing 5 repetitions per set scheduled at a speed of 120 m/s; data were analyzed with statistical analysis using measures central tendency and Pearson correlation test for gender, age and weight with the percentage of total work. *Results:* We mean, median, mode, range, standard deviation, maximum and minimum values for the variables height, weight, torque, mean torque, mean torque/kg, average power, work environment, work fatigue and total work, finding a statistically significant correlation for age and weight (p<0.05) and no significant correlation for sex. *Conclusion:* standardization was performed isokinetic load capacity in healthy individuals, establishing the required parameters for standardization and calibration for equipment assembly.

PO-0382

STUDY OF EFFECTS OF POLARIZED POLYCHROMATIC NONCOHERENT LIGHT (BIOPTRON) THERAPY ON PATIENTS WITH CARPAL TUNNEL SYNDROME

Sajjad Rezaei
Mazandaran University, Iran

Study of effects of Polarized Polychromatic Noncoherent Light (Bioptron) therapy on patients with carpal tunnel syndrome. *Introduction:* Carpal tunnel syndrome CTS, a neuropathy caused by compression of the median nerve at the level of the carpal tunnel, delimitated by the carpal bones and by the transverse carpal ligament, is the most common entrapment neuropathy. Its prevalence is about 2.7% in general population.Several surgical and nonsurgical treatments have been proposed for this syndrome, but there is no consensus regarding the prioritization of the suggested nonsurgical treatments. The goal of this study was to study of effects of Polarized Polychromatic Noncoherent Light (Bioptron) therapy on patients with carpal tunnel syndrome. *Materials and Methods:* During this randomized clinical trial, 44 hands with mild or moderate CTS (confirmed by clinical and EDX studies), were divided randomly into two groups.The first,Control group (21 hands) received wrist splints with extension degree of 0° (neutral position) for 8 weeks.The second,Bioptron group (23 hands), received wrist splints (in neutral position) and Bioptron light (eight sessions, 3/week). A Bioptron 2 device (Harrier Inc.) was used to deliver the Bioptron light with the following output characteristics: rated power of halogen =90 W; light wavelength =480–3400 nm; degree of polarization =95%; specific power density =40 mW/cm^2; and energy density =2.4 J/cm^2. Pain severity and electrodiagnostic measurements were compared from before to 8 weeks after completing each treatment. Data were analyzed with SPSS 17software and non parametric tests. *Results:* Generally, the mean age of patients was 42.8 years, duration of pain was 7.6 months, male to female ratio was 1:3, and pain severity using Visual Analogue Scale (VAS) was 6.1 cm. The severity of the disease based on electrodiagnostic studies was 61.4% mild and 38.6% moderate. The electrodiagnostic characteristics of the median nerve prior to treatment were included mean sensory peak latency of 4.01 ms, mean sensory amplitude of 42.67μv, mean motor onset latency of 4 ms and mean motor amplitude of 8.6 mv. There was no meaningful difference between two groups regarding the demographic characteristics and electrodiagnostic measures (p>0.05). Eight weeks after treatments, the mean of pain severity was decreased 2.3 cm in control group and 2.4 cm in Bioptron therapy group, the mean of median sensory peak latencies was decreased 0.22 ms in control group and 0.18 ms in Bioptron therapy group and the mean of motor onset latencies was decreased 0.11 ms in control group and 0.08 ms in Bioptron therapy group. The severity of disease based on electrodiagnostic studies became 28.5% normal, 52.5% mild and 19% moderate in the control group and 26.1% normal, 56.5% mild and 17.4% moderate in the Bioptron therapy group. There was no meaningful difference between two groups regarding the changes in the pain severity and electrodiagnostic measures. *Conclusion:*There is no priority for Bioptron therapy compared to splinting alone in the treatment of carpal tunnel syndrome. Bioptron dose not cause therapeutic effect more than wrist splint alone in the treatment of carpal tunnel syndrome.

PO-0383

EFFECT OF RADIAL EXTRACORPOREAL SHOCK WAVE THERAPY (RESWT) IN MUSCULOSKELETAL DISORDERS

Dragana Dragičević-Cvjetković, Nevenka Jovičić, Slavko Manojlović
Institute of Physical medicine and Rehabilitation Dr Miroslav Zotović Banja Luka, Bosnia and Herzegovina

Objective: To examine the effect rESWT in the treatment tennis elbow, rotator cuff syndrome (with or without calcium deposits) and plantar fasciitis. *Methods:* In a prospective clinical trial were observed 30 patients divided according to the clinical diagnosis of the three groups. The first group was consisted of 12 patients with the tennis elbow. A second group of 14 patients was divided into two subgroups: with or without calcium deposits rotator cuff

syndrome. The third group was consisted of 4 patients with plantar fasciitis. All patients were treated with 2000 pulses rESWT, low dose in three sessions with a break of seven days between each. Follow up period was four weeks. The outcomes were measured through the visual analogue scale (VAS). *Results:* Statistically significant improvement in applied rESWT was observed in all three groups. *Implications/Impact on rehabilitation:* These results demonstrate that low-dose rESWT is safe and effective treatment in chronic musculoskeletal pain.

PO-0384

OBSERVED THE EFFICANCY OF THE TEMPOROMANDIBULAR JOINT DYSFUNCTION TREATMENT WITH THE INFRARED POLARIZED ACUPOINT IRRADIATION JOINT FACIAL ULTRASHORT WAVE THERAPY

Jing Zheng
Rehabilitation department, The first affiliated hospital of medicine college in Shihezi university.

Purpose: To explore the effect of the temporomandibular joint dysfunction with the infrared polarized joint facial ultrashort wave. *Method:* 61 cases of patients diagnosed in dentistry with temporomandibular joint dysfunction during 2010 to 2012 year,including 27 males and 34 females, aged 18 to 67 years old; course of 10 days to more than six months; bilateral in 19 cases, 42 cases of unilateral. The patients were randomly divided into two groups. Treatment group, which 31 cases of using polarized light facial ultrashort wave therapy, and 10 times as a course of treatment. The control group of 30 patients treated by simple ultrashort wave therapy and observed the efficancy after 21 days. *Result:* Treatment group healed in 12 cases (38.71%), 15 cases (48.39%) cured, improved in 3 cases (9.68%) and ineffective in 1 (3.23%); 6 cases (20.0%) of the control group healed, 11 cases (36.67%) cured, improved in 10 cases (33.33%) and 3 cases (10.0%). Two groups overall difference in the critical level (p=0.061), and between the two groups there were no significant difference in cure rates (p=0.109). Efficiency differences between the two groups but there were no significant difference (p=0.285), There were significant differences in effective rate (heal + markedly) markedly between two groups. There were significant differences ($\chi 2$=7.828, p=0.005). Mild and moderate patients more efficiency significantly, but significant efficiency differences were not statistically significant between two group of patients with different severity (all p>0.05). *Conclusion:* The temporomandibular joint dysfunction treatment with the infrared polarized acupoint irradiation joint facial ultrashort wave therapy have a good effection, ultrashort wave therapy is superior to the traditional pure, it is worthy of clinical using.

PO-0385

BONE LOSS AFTER SPINAL CORD INJURY: A SURVEY ON DIAGNOSTIC AND PRESCRIPTION PATTERNS AMONG PHYSIATRISTS IN BRAZIL

Joao Eduardo Teixera[1], Adriana Lovisotto Cristante[2], Leslie Morse[3,4], Marcelo Ares[2], Alexandra Gaspar[2]*
[1]Medical Resident on Physical Medicine and Rehabilitation at Associação de Assistência à Criança Deficiente (AACD), São Paulo, Brazil,Brazil, [2]Physical Medicine and Rehabilitation specialist at AACD,São Paulo, Brazil , [3]Spaulding-Harvard SCI Model System, Spaulding Rehabilitation Hospital,Boston,MA, Brazil, [4]Department of Physical Medicine and Rehabilitation, Harvard Medical School, Boston, MA, Brazil

Objective: Bone loss is a common condition after Spinal Cord Injury (SCI). Local practices and physician preferences influence the clinical decision-making process and heterogenic management strategies might be related to uncertainties regarding diagnosis and treatment. We performed a study to investigate current diagnostic and treatment strategies and barriers for the management of bone loss after SCI among physiatrists inBrazil. *Methods:* Web-based self-administered national survey. We assessed approaches and barriers for screening, diagnostic and prevention strategies for bone loss after SCI. *Results:* The response-rate was 16.4%. Fifty-one physiatrists were included in the sample. Among Brazilian physiatrists, 31 (60.7%) reported screening tests to assess bone health after SCI, mostly DXA scan (30; 96.7%) and serum screening with PTH/Vitamin D/Calcium (23; 74.2%). The hip (30; 96.7%) and the lumbar spine (27; 87.1%) were reported as the preferred sites for bone mineral density screening. Only 8 (25.8%) subjects reported the knee region as a preferred site for BMD screening. This screening was frequently performed during the rehabilitation phase (20; 64.5%). Thirty-four subjects (66.6%) prescribe medications including calcium (33; 97%), Vitamin D (31; 91.2%) and bisphosphonates (30; 88.2%). Among those who do not prescribe medication (17; 33.3%) the most frequent reported barriers were no clear guideline for drug prescription (11; 64.7%) and costs/access to assessment tools (5; 29.4%). *Implications on Rehabilitation:* Heterogenic approaches for bone loss after SCI underscore the need for development of a standard of care and targeted educational initiatives.

PO-0386

CLINICAL EFFECT OBSERVATION OF SHORT WAVE UNION TRIPLE PUNCTURE ON OSTEOARTHRITIS OF THE KNEE

Wan-Rong Zhang, Pei-Shun Chen, Tao Zhong, Bi-Dong Tan, Ru-Tong Su, Haixia Yan
Department of Rehabilitation of Panyu Central Hospital

*Objective:*To observe the clinical efficacy of short wave union triple puncture on osteoarthritis of the knee. *Methods:* 60 cases of osteoarthritis of the knee were randomly divided into a treatment group of 30 cases treated with short wave union triple puncture, and a control group of 30 cases supplied with Meloxicam tablets and Glucosamine hydrochloride capsules.The clinical effect of two groups was compared after 30 days. *Results:* The treatment group were cured within 30 days with an effective rate of 86.7%, Which Was better than 73.3%in the control group (p<0.01). *Implications:* Short wave union triple puncture has obvious anti-inflammatory and analgesic clinical effect on Osteoarthritis of the knee.

PO-0387

STRETCHING AND STRENGTHENING EXERCISES FOR THE TREATMENT OF ROTATOR CUFF SYNDROME

Roberto Rached
HC-FMUSP, Brazil

Objective: To assess the effects of exercises therapy for Rotator Cuff Syndrome. *Method:* Pubmed database search of randomized clinical trials was conducted using P.I.C.O.strategy (P.I.C.O. stands for: Patient, Intervention, Comparison and Outcome). The following MeSh terms were the search strategy: (Rotator Cuff OR Shoulder Impingement Syndrome) AND (Exercise Therapy OR Exercise OR Proprioception) from Jan 2009 to Nov 2011. *Results:* The search strategy retrieved 421 articles of which 19 were related to rotator cuff and exercise therapy. Eleven randomized trials were included; were excluded two published in a non-english language and one pilot study. Five were included systematic review.Strengthening exercises program with individual physiotherapy may be indicated,because, are able to decrease pain and help the strength gain. The association of exercise with manual therapy enhances the effect of the benefit in function, range of motion and muscle strength. Exercise may be similar to surgery for rotator cuff injury class II. *Implications/Impact on Rehabilitation:* The progressive resistance training program was effective in reducing pain and improving function. Manual therapy

combined with supervised exercise is better than exercise alone to increase strength, decrease pain and improve rotator cuff function. No diferences were found between surgery and supervised exercises for rotator cuff injury class II.

PO-0388

THE CLINICAL EFFECT OF ACTIVE FUNCTIONAL TRAINING FOR PATIENTS WITH DISTAL FEMORAL FRACTURES IN THE EARLY POSTOPERATIVE REHABILITATION

Jian-Ye Cao, Feng Zhang, Jing Zhang
Department of Rehabilitation Medicine, The Third Hospital of Hebei Medical University

Objective: To observe the clinical effect of active functional training for patients with distal femoral fractures in the early postoperative rehabilitation. *Methods:* Sixty patients with distal femur fracture at 2 weeks after surgery were divided into two groups, including intervention group and control group. The patients of intervention group received ice, passive exercises, active exercises, medications and physical agent modilities. The patients of control group received ice, passive exercises, medications and physical agent modilities, without active exercises. All patients were assessed by the hospital for special surgery score (HSS), visual analog scale (VAS), and range of motion (ROM) before the rehabilitation treatment and at 4 months after surgery. *Results:* Before the rehabilitation treatment, there was no significant difference of HSS, VAS and ROM between the two groups (p>>0.05). At 4 months after surgery, the score of HSS and ROM in intervention group was higher than control group (p<<0.05) while the score of VAS in intervention group was lower in intervention group than control group (p<<0.05). *Conclusion:* The active exercises in the early postoperative rehabilitation was beneficial for the patients with distal femoral fractures, including pain release, knee range of motion promotion and knee function improvement.

PO-0389

KINETIC AND KINEMATIC CHARACTERISTICS OF GAIT IN PATIENTS FOLLOWING UNILATERAL TOTAL HIP ARTHROPLASTY

Jiangli Zhao[1], Yurong Mao[1], Peihui Wu[2]
[1]Department of Rehabilitation, First Affiliated Hospital, Sun Yat-sen University, [2]Department of Joint Surgery, First Affiliated Hospital, Sun Yat-sen University

Objective: The purpose of this study was to investigate the kinematic and kinetic parameters during walking in patients following total hip arthroplasty (THA), and to guide physical rehabilitation. *Method:* 14 patients (8 females and 6 males with an average age of 63.9 years) who underwent unilateral THA 5 to 10 years (mean,7.6 years) ago were recruited. The affected hip included 5 left hips and 9 right hips. Additionally 14 age, gender, hight and weight-matched healthy controls were recruited. We investigated kinematic and kinetic parameters during walking of affected and non-affected lower extremities in patients and healthy controls. Vicon system and AMTI force plates were used in gait capture. All three-dimensional kinematic and kinetic parameters of lower limbs were analyzed with Ploygon. Group differences were compared using one-way ANOVA. *Results:* A significant decrease in the affected hip flexion moment were observed together with a significant increase in ipsilateral knee flexion and ankle plantarflexion (p<0.05); a significant decrease in the affected hip motion was concomitant with a significant increase in ipsilateral ankle motion (p<0.05), when compared to that of healthy controls. *Implication:* The results suggest that affected hip muscles especially flexor should be strengthened, in order to prevent overload at the knee and ankle joints and to reduce the risk of implant loosening during postoperative rehabilitation for patients with THA.

PO-0390

CONSERVATIVE COMBINATION TREATMENT FOR FAILED BACK SURGERY SYNDROME OF LUMBAR VERTEBRA: A RETROSPECTIVE CASE SERIES

Ki-Ok Kim[1], Yongjae Jeong[1], Yousuk Youn[2], Jeongcheol Choi[1], Jaehong Kim[1], Sangho Lee[1], Tae-Hun Kim[1]
[1]Mokhuri Neck & Back Hospital,Korea, [2]Suwon Mokhuri Neck & Back Hospital, Korea

Objective: Failed back surgery syndrome is one of the bothering conditions which are observed comparatively frequently among patients after spinal surgery. We present cases of patients with FBSS after intensive conservative combination treatment sessions. *Method:* This is a retrospective case series. At Mokhuri Neck and Back Hospital, Republic of Korea during March, 2012 to October, 2012, we reviewed the medical records of patients with FBSS, who presented continuous low back pain or sciatica after within 3-year of any spinal surgeries surgery. All the patients took body acupuncture, pharmaco-acupuncture, Chuna and oral administration of herbal medicines everyday during about one month of treatment. Zero to ten pain numerating rating scale (NRS) of pain and SF-36 were assessed before and after treatment. SAS 9.2 package software was used for statistical analysis. *Results:* Total fourteen patients who took lumbar surgery were treated during the period. Low back pain improved from median 6.5 [the minimum 1 to the highest 9] to 2.5 [1 to 7] (Student's t -test, p=0.0014) and sciatica also improved from 6.0 [2 to 10] to 2.0 [1 to 7] (p=0.0025) significantly. The total score of SF-36 increased from 20.91 [15.75 to 26.06] to 25.47 [24.88 to 26.06] but there was no significant difference between the groups (p=0.5). *Implications/Impact on rehabilitation:* Conservative combination treatment may be effective for FBSS. However, this case series only suggest limited evidence. Future long-term clinical trials with enough sample size and validated outcomes will be necessary for the evaluation of this treatment program.

PO-0391

ULTRASONOGRAPHIC MEASUREMENT OF VERTEBRAL ARTERY BLOOD FLOW IN A NONHUMAN PRIMATE MODEL OF HYPERTROPHIED UNCOVERTEBRAL JOINT

Kai-Qi Cui, Lehua Yu
Department of Rehabilitation Medicine and Physical Therapy, the Second Affiliated Hospital of Chongqing Medical University, N0.74 Linjiang Road, Yuzhong District, Chongqing, China

Objective: The purpose of this study was to characterize the hemodynamic features and the association with hypertrophied uncovertebral joint at C5/6 in a rhesus macaque model. *Method:* One pre-adult male rhesus macaque underwent anterolateral arthrodesis at the uncovertebral joint of C5-C6 with ceramic/collagen sponge carrier (15% hydroxyapatite/85% tricalcium phosphate) loaded with 9 mg recombinant human bone morphogenetic protein 2 (rhBMP-2) per side. Musculoskeletal ultrasound with color Doppler imaging was used to image both the contra- and ipsi-lateral internal carotid and vertebral artery. Arterial diameters, peak systolic velocity, end diastolic velocity, and resistive index were measured with the neck in neutral and manipulated positions. X-ray and 3D-CTA were conducted within one week following the MSUS assessment to provide a qualitative assessment for joint arthropathy and artery pathology. *Results:* The rhBMP-2 delivered in biphasic ceramic phosphate/collagen sponge carrier induced fusion in the uncovertebral joint of nonhuman primate with the confirmation of X-ray and 3D-CTA. There were no significant differences (p>0.05) between mean neutral blood flow values and resting blood pressure before and after arthrodesis. There were significant changes in mean blood flow during the manipulation test. *Implications:* High resolution

musculoskeletal ultrasound is a well-accepted imaging technique that enables direct assessment of the flow in vessels and spectral waveform analysis at the point of maximum stenosis.

PO-0392

NON-OPERATIVE KOREAN MEDICINE COMBINATION THERAPY FOR LUMBAR SPINAL STENOSIS: 1-YEAR FOLLOW-UP REPORTS

Ki-Ok Kim[1], Yongjae Jeong[1], Yousuk Youn[2], Jeongcheol Choi[1], Jaehong Kim[1], Sangho Lee[1], Tae-Hun Kim[1]

[1]Mokhuri Neck & Back Hospital,Korea, [2]Suwon Mokhuri Neck & Back Hospital, Korea

Objective: To assess the mid-term effectiveness of non-operative Korean medicine combination therapy for lumbar spinal stenosis (LSS), telephone interviews with the patients were conducted at least one-year after the intensive admission treatment. *Method:* We reviewed all data from the patients, who were treated at Mokhuri Neck and Back Hospital, Republic of Korea during November, 2010 and January, 2012. After that, current pain and function of each patient over one year after intensive treatment sessions were evaluated through telephone survey. T-test was conducted for within group analysis. *Results:* Among 33 LSS patients who participated in the treatment, 24 were connected by telephone and finished the interview. Zero to ten pain-numeric rating scale (NRS) decreased significantly during the treatment from 7.86 (1.48) to 2.33 (1.37, $p<0.001$) and it continued to improve at the 1.5-year of follow-up evaluation (2.10 (1.98), $p<0.001$). Walking duration without pain also showed significant improvement during the treatment (4.21 min (5.48) in the pre-treatment and 16.00 (7.30) in the post-treatment assessments) and it continued after about 1.5 year (20.25 (10.56), $p<0.001$). *Implications/Impact on rehabilitation:* The result of this study suggests that non-operative Korean medicine treatment has possibility to be effective for pain and function rehabilitation of LSS patients and the effect continues more than 1 year. Future long-term randomized controlled trial will be necessary for establishing clinical evidence of this treatment for LSS.

PO-0393

EXPERIMENTAL STUDY OF THE EFFECTS OF SILVER NEEDLE ON RATS ACHILLES TENDINOPATHY

Caizhong Xie, Beibei Liu, Qinneng Ding

Department of rehabilitation medicine, jinling hospital, nanjing, jiangsu, China

Objective: To observe the effects of silver needle on Achilles tendinopathy by stimulating some points of Rat's ill lower limb and to p rovide informations for silver needle treatment of Achilles tendinopathy. *Methods:* Sixty-six Sprague Dawley rats were randomly divided into blank contrast group (A group), control group (B group) and silver needle ill side group (C group). The models of rat's Achilles tendinopathy were established to jump using electric stimulation with gradually increasing voltage once a day, 6 days per week, for a total of 4 weeks. The model rats were divided into control group (B group), silver needle ill side group (C group). Group B was divided into three subgroups (B1, B2, B3, B4, B5 group) and group C were divided into three subgroups (C1, C2, C3, C4, C5 group). After four weeks of setting up the model, C1 and C2 and C3 groups were treated by silver needle the ill limbs. C groups were treated by silver needle the ill limbs. Group A and B were not be treated. Sampling started at day 1, day 3, day 5, day 7 and day 14 respectively for Group B and C. Sampling was performed at day 1 for control group A. Morphological structure (stained with HE), the expression changes in TGF-β1 and HSP70 positive cells of Achilles tendon and its insertion of rat right rear foot was observed. *Results:* Typical enthesiopathy appeared in group B; The TGF-β1 and HSP70 positive cells in Group B and C were significantly higher than those in group A, while the TGF-β1 and HSP70 positive cell expression in group B were significantly less than those in group C. *Conclusions:* Silver needle treatment can improve effectively the recovery ofAchilles tendinopathy. It can enhance fibroblast proliferation and promote collagen synthesis by stimulating the synthesis of TGF-β1 and HSP70. Silver needle treatment can imp rove the structure rearrangement of collagen fiber during the recovery of Achilles tendinopathy.

PO-0394

A STUDY OF SHOULDER ROTATION OF SUBACROMIAL IMPINGEMENT SYNDROME

Wenjin Yang

Department of acupuncture, Dongfang Hospital, the second clinical medical college of Beijing University of Chinese Medicine

Objective: Using the isokinetic device of BIODEX-3, 12 cases of with subacromial impingement syndrome was evaluated. We compared the performance of the involved shoulder with the uninvolved shoulder. *Methods:* Isokinetic device was applied to evaluate 12 cases of patients with subacromial impingement syndrome of shoulder joint in medium-speed ((120°/s angular velocity) under a modified neutral external rotation/internal rotation position shoulder test. Peak torque (PT), total work (TW), and avenge power (AP) of both the two side were compared. *Result:* During the external rotation, the involved shoulder peak torque, total work and avenge power were lower than uninvolved side, resulting in significant differences ($p\leq0.01$) ; during the internal rotation, the involved shoulder total work and avenge power resulting in statistical differences ($p\leq0.05$). *Conclusion:* The function discrepancy between the involved and the uninvolved shoulder of the patients with subacromial impingement syndrome is significantly showed in the external rotation movement, less discrepancy was found in the internal rotation time. This study suggests that for the patients with subacromial impingement syndrome it is much meaningful to focus on the change of the total work and the avenge power than the peak torque.

PO-0395

A POPULATION BASED SURVEY FOR RHEUMATIC AND OTHER MUSCULO-SKELITAL DISORDERS IN VILLAGE NAORA, WEST BENGAL, INDIA

Rathindranath Haldar[1,2]*, Rajesh Pramanik[1,2]

[1]Indian Association Of Pmr,India, [2]International Rehabilitation Forum, India

Objective: To estimate the prevalence of rheumatic and other musculoskeletal disorder in a village of West Bengal, India. *Methods:* In the light of community oriented programme for the central of rheumatic disease (COPCORD) a random sample of 4,426 (2,154 male & 2,272 female) individual with mean age of 28.1+- 18.2 years were interviewed from Naora, south 24 parganas, West Bengal, India- 40 km away from Kolkata on 2006-2007.Home visit (phase I & II) for primary screening held by 17 groups consisting of 2-3 health guide or local community people and NGO. Those people with musculoskeletal problems were requested to attend the next level 'health visit'. They were examined and reviewed (phase III) by our team. *Results:* interestingly 831 were affected though 49 parsons didn't turn up. Studied population were 782 (515 male and 267 female). Mechanical back pain were the commonest (male 34% and female 32%) problem followed by Knee osteoarthritis (male 17% and female 18%), General soft tissue rheumatism (male 1% and female 7%), local soft tissue rheumatism (male 10% and female 8%), fibromyalgia (male 1% and female 1%), symptoms related (male 16% and female 12%), vague symptoms (male 6% and female 6%), trauma related (male 6% and female 2%), rheumatoid (male 0%

and female 3%), sero-negative spondylo-arthropathy (male 2% and female 3%) and others (male 1% and female 2%). Pain localization areas were also studied which showed that mostly affected area was low back 26% followed by knee (23%). Implication in rehabilitation: Similar studies were also done in different parts of the world. This and relevant data established a pattern of musculoskeletal disability in a low resource country like India.

PO-0396

THE EFFECTS OF NEUROMUSCULAR JOINT FACILITATION (NJF) ON THE KNEE JOINT DYSFUNCTION

Sheqin Che, Mei Shen, Mengmeng Zhao, Surui Zhang, Ping Wang, Cuizhen Li

The effects of neuromuscular joint facilitation (NJF) on the knee joint dysfunction

Objective: To Study the effects of neuromuscular joint facilitation (NJF) on the knee joint dysfunction. *Method:* 45 non-athletes patients with knee joint dysfunction in single knee were divided randomly into experimental group, the control group 1 and group 2 (15 cases in each group), all were performed routine therapy. The experimental group was performed NJF. The control group1 was performed the mobilization and the proprioceptive neuromuscular facilitation (PNF). The control group 2 was performed the mobilization. All were assessed with AROM/PROM, visual analogue scale (VAS) and Lysholm knee score in the 4th, 8th and 12th week respectively. *Results:* In experimental group, comparison among adjacent time points assessment on VAS had statistical significance ($p<0.01$). Except comparison between 8th and 12th week, AROM/PROM and Lysholm in other adjacent time points had statistical significance ($p<0.05$ on AROM/PROM, $p<0.01$ on Lysholm). Component comparison: 1) Between experimental group and control group1, AROM in 4th and 8th week and PROM in 4th week had statistical significance ($p<0.05$). AROM/PROM of experimental group and control group1 in 4th and 8th week had significantly different compared with group 2 ($p<0.05$). 2)VAS of experimental group in 8th and 12th week compared with other groups had significantly different ($p<0.05$ in 8th week, $p<0.01$ in 12th week). 3) Lysholm of experimental group had significantly difference, in the 4th and 8th week compared with the control group1 and in all time point compared with the control group2 ($p<0.05$ in group 1, $p<0.01$ in group 2). *Implication:* In each treatment cycle, the NJF promoted ROM, pain relief and functional motion.

PO-0397

THE CPM TECHNOLOGY WITH MANUAL THERAPY REHABILITATION DIVISION ABOUT SHOULDER DYSFUNCTION EFFECT OF COMPARISON

Yanxiang Shi
Capital Uiversity of Physical Education and Sports

Purpose: The study for the shoulder joint fracture early postoperative soft tissue adhesions lead to patients is limited by the shoulder joint activity were used, on the basis of traditional acupuncture, physiotherapy treatment, the therapist manual therapy or pure CPM treatment effect comparative analysis A group of shoulder flexion average improvement of 74 degrees. Group B of shoulder flexion average improvement of 48 degrees. Can be seen in the degree of improvement in shoulder mobility in patients after the intervention of the CPM technology significantly better than patients treated with traditional therapist practices. But the reaction of the overall activities of the shoulder joint function recovery Fugl-Meyer score is better than Group A Group B treatment by rehabilitation therapists approach is better than simply using CPM technology. *Conclusion:* Improve shoulder soft tissue adhesions after surgery shoulder dysfunction, rehabilitation therapist manual therapy and CPM treatment techniques have their own advantages and disadvantages.

PO-0398

THE EFFICACY STUDY IN EARLY SCAPULA ACTIVE EXERCISE OF PATIENTS WITH ROTATOR CUFF INJURY AFTER SHOULDER ARTHROSCOPY

Jingjie Zhou, Tao Wang
XuZhou Central Hospital

Objective: The efficacy study in early scapula active exercise of patients with rotator cuff injury after shoulder arthroscopy. *Methods:* Randomly divided 30 rotator cuff injury patients who were after shoulder arthroscopy into 2 groups which are observation group and control group with 15 cases in each group. Both groups that were informed with preoperative rehabilitation education were doing rehabilitation exercises and passive scapula loosening of flexion and external rotation exercises. Only the observation group did scapula active exercises. After six weeks of treatment, observed 2 groups by using UCLA evaluation standards. Compared the 2 groups with shoulder pain, joint function, range of motion, muscle strength, and patient satisfaction. *Results:* Compared two groups of patients after treatment using UCLA score, the observation group with an average of 24 points scored from 19 points to 29 points, the control group with an average of 16.5 points scored 12 points to 20 points. *Impact on rehabilitation:* The treatment methods in both groups helped the restoration of rotator cuff injury patients after shoulder arthroscopy. But the group with scapula early active exercise had better efficacy.

PO-0399

CLINICAL EFFECTS OF PLATELET-RICH PLASMA INJECTION FOR ROTATOR CUFF INJURY - A PROSPECTIVE RANDOMIZED CONTROLLED TRIAL -

Jeong Hwan Seo, See Hyun Park, Myoung Hwan Ko, Sung Hee Park
Chonbuk National University Medical School, Korea

Objective: The purpose of this study was to analyze the clinical effects of platelet-rich plasma (PRP) injection for rotator cuff injury. *Methods:* Seven patients (3 males, 4 females) diagnosed rotator cuff tear using ultrasonography (US) were enrolled. Two among seven patients had bilateral rotator cuff tear. We conducted a prospective clinical trial involving nine shoulders in seven patients who were randomly assigned to receive either PRP injection or a sham saline injection. One patient with unilateral rotator cuff tear dropped out for surgical treatment. Patients received injection two times at 2-week intervals. We measured the length of a partial-thickness tear or degree of retraction of a full-thickness tear (measured on longitudinal views oriented parallel to the long axis of the cuff) and width (measured on transverse views oriented perpendicular to the long axis of the cuff). We evaluated the range of motion of shoulder flexion, abduction, external rotation and internal rotation, manual muscle testing of shoulder abduction, external rotation and internal rotation and UCLA score. All tests were conducted before injection and after 1st injection and 2nd injection and 4 weeks, 12 weeks and 24 weeks from 2nd injection. *Results:* The average VAS score before injection was 6.8 for PRP injection group and 6.0 for saline injection group. The average VAS score 12 weeks after injection was 5.4 for PRP injection group and 6.6 for saline injection group. The average UCLA score before injection was 16.6 for PRP injection group and 18.6 for saline injection group. The average UCLA score of 12 weeks after injection was 19.8 for PRP injection group and 19.6 for saline injection group. *Conclusion:* In our preliminary study, we suggest that PRP injection for rotator cuff injury in comparison to saline injection is able to increase pain relief and functional improvement.

PO-0400

SIMVASTATIN - PLGA MICROSPHERES COMPOSITE MEMBRANE FOR THE RATS DISUSE OSTEOPOROSIS INHIBITION RESEARCH

Yongxin Sun

Rehabilitation department of China medical university first affiliated hospital

Objective: To study the inhibition of simvastatin-PLGA microspheres composite membrane on disuse osteoporosis rats, and provide the evidence on how to treat and prevent osteopomsis. *Methods:* Fifty-five female healthy SD rats were randomly divided into 4 groups,Group A:tail-hanged and treatment group, Group B: tail-hanged and control group,Group C: tail-hanged and blank group. Making Osteoporosis model in the medial tibial of Group A, Group B and Group C rats by micro - drill,Group A: Give the fiber membrane with simvastatin - PLGA microspheres composite membrane at osteoporosis,Group B :Give the fiber membrane without simvastatin - PLGA microspheres composite membrane at osteoporosis,Group C: Give no fiber membrane,then feeding the Group A,Group B and Group C rats with hanging their tails,Group D: normal feeding. Obtain the femoral artery blood at the 1th, 2nd, 3rd, 4th, 5th week after surgery, Detect Type I collagen piiint, bone alkaline phosphatase and blood calcium indicators by enzyme - linked immunosorbent. *Results:* According to the enzyme - linked immunosorbent,control with the Group B and Group C rats,there have been obvious osteoporosis at the third week after surgery of the Group A rats. In the inhibiting osteoclast and the promotion of bone formation the Group A is significantly better than Group B and Group C. onclusion: Apply the slow - release of simvastatin -plga Nano - Fiber membrane, there have been continuing role of Bone defect, can reduce the amount of local bone loss and promote osteoporosis Bone defect healing, achieve the purpose of the treatment of osteoporosis, fractures and bone defects.

PO-0401

PRELIMINARY ANALYSIS OF THIGH MUSCLE STRAIN EARLY LOWER LIMB MUSCLE STRENGTH AND GAIT CHARACTERISTICS

Mei Xue

Capital University of Physical Education and Sports

Objective: The thigh muscles is an important factor to maintain gait stability, the purpose of this study was to explore the thigh muscle strain early gait changes, looking for its regularity, and to provide a basis to guide rehabilitation after muscle damage. *Methods:* College students 20 to occur thigh muscle strain 1 week was the experimental group, 40 injuryUniversitystudents as a control group. Were no significant differences in the average age of the two groups, height, weight. Treadmill gait analysis to test the experimental and control groups, respectively. To ensure the accuracy of the test data were tested twice, every three min, break of five min. *Results:* A gait of the control group, in the case does not consider the gender difference, the parameters of the normal gait are basically the same.2, the control group, the right leg the step length slightly longer than the left leg of the step length. 2, the walking speed of the experimental group decreased, the decline in total walking distance.4, the experimental group ipsilateral leg step shortened the average step length32 cm,46 cmlong contralateral step.5, the experimental group suffering from leg strength decreased, accounting for about 32% of the lower extremity muscle strength when walking, showed obvious the contralateral leg compensatory role. *Conclusion:* Gait analysis treadmill gait changes, can be used to study lower limb muscle injury after for guidance injury rehabilitation has some value.

PO-0402

THE EFFECT OF ABDOMINAL ACUPUNCTURE IN REHABILITATION OF LUMBAR DISC HERNIATION: A LITERATURE REVIEW AND CASE STUDY

Sheung Sheung Hung[1], Mason Cp Leung[2], Leung Kim Hung[1]*

[1]The Chinese University of Hong Kong,Hong Kong, China, [2]The Hong Kong Polytechnic University,Hong Kong, China

Objectives: To investigate the clinical efficacy of using Abdominal acupuncture (AA) in the rehabilitation of Lumbar Disc Herniation (LDH). Methodology: Literature Review: clinical studies are collected and evaluated on the efficacy of using Abdominal Acupuncture for LDH. Study objects are 20-85 years old with diagnosis of LDH by Magnetic Resonance Imaging (MRI) or Computed Tomography (CT). The efficacy was evaluated by TCM Diagnostic and Therapeutic Effect Criteria, Visual Analog Scale (VAS) and/or Japanese Orthopaedic Association (JOA) score and the quality assessment is by Jadad Scale and Cochrane. *Case Report:* A 34-year-old laboratory researcher had 3 years of low back pain and episodic left sciatica. She had positive Straight Leg Raising Test on the left side. Spinal CT showed disc herniation at L4-L5 level. She had AA treatment and the symptoms were partially gone. *Results:* 27 clinical reports from different acupuncture experts in China. The typical abdominal acupuncture regimens for LDH were 3 acupoints, ShuiFen (CV9), Qihai (CV6), Guanyuan (CV4). Different controls were used to compare with AA. The Diagnostic and Therapeutic Effect Criteria, VAS and JOA had shown that there was clinical improvement in using AA for LDH. *Implications on Rehabiliation:* Abdominal Acupuncture has shown effect on pain reduction. The required skills may achieve a specific effect higher than the conventional acupuncture. It is a relatively painless and effective technique and it is recommended to be used in conservative rehabilitation of LDH.

PO-0403

A COMPARATIVE STUDY BETWEEN FASCIA MANIPULATION ® AND LASER THERAPY IN THE CONSERVATIVE TREATMENT OF CARPAL TUNNEL SYNDROME

Marco Pintucci[1]*, Elisa Pratelli[2], Pina Cutrera[2], Enrico Baldini[3], Marta Imamura[1], Pietro Pasquetti[2]

[1]Instituto de Medicina Física e de Reabilitação (IMREA) do Hospital das Clínicas da FMUSP; Sao Pualo, Brazil, [2]Ospedale Universitario Careggi; Florence, Italy, [3]Private clinic, Florence, Italy

Objective: To compare the efficiency of manual therapy (Fascial Manipulation®) and laser therapy in the conservative treatment of carpal tunnel syndrome. *Method:* Fifty patients, with clinical and instrumental diagnosis (upper limb EMG examination not earlier than six months after the start of treatment) of carpal tunnel syndrome were included in the study. The patients were randomized in two groups: 25 patients were treated with Fascial Manipulation® (5 weekly session, 30 mins duration) and 25 patient with Low Level Laser therapy (10 daily sessions, 10 mins each). They were evaluated with the Boston Questionnaire and visual analog scale (VAS) of the ipsilateral upper limb. The scales were administered at T0 (before treatment), at time T1 (10 days after the last treatment) and T2 (3 months after the last treatment). T-student test was used for statistical analysis. *Results:* Both groups had between T0 and T1 a statistically significant reduction of the Boston scale and VAS scale. The improvement of the group treated with Fascial Manipulation® between T0 and TI is statistically higher ($p<0.001$) compared to the group treated with laser therapy.The follow-up at T2 of the group treated with Fascial manipulation® showed that the benefits were maintained at 3 months contrarily the group treated with laser therapy that presented a worsening of the symptoms. *Implication:* In our experience the Fascial Manipulation® is a viable alternative to conservative treatments currently used for carpal tunnel syndrome with good results on local symptoms, functionality an its associated symptoms.

PO-0404

THE CURATIVE EFFECTS OF BADUANJIN APPLIED ON LUMBAR DISC HERNIATION PATIENTS

Hui Pang
Department of Rehabilitation Medicine, Beijing Massage Hospital

Objective: To observe the effects of BADUANJIN applied on Lumbar disc herniation patients. *Methods:* Sixty-four patients with Lumbar disc herniation were randomly divided into a training group and a control group (n=32 in each group). The training group received BADUANJIN treatment.The control group received conventional rehabilitation treatment.The results were rated using Visual analogue scale (VAS) and Oswestry disability index (ODI),before and after 8 weeks of treatment. *Results:* After 8 weeks, VAS scores were decreased significantly in 2 groups.ADL ability had improved significantly in 2 groups.The improvement of ODI scores in the training group was superior to that of the control group. *Implications:* BADUANJIN can improve ADL ability of Lumbar disc herniation patients.

PO-0405

THE EFFECT OF ELECTRIC ACUPUNCTURE COMBINED WITH REHABILITATION TRAINING ON PATIENTS WITH AVASCULAR NECROSIS OF THE EARLY AND MIDDLE STAGE ON HIP FUNCTION AND QUALITY OF LIFE

Tianshen Ye, Ying-Ying Li, Qi-Hui Li, Xiao-Pei Li, Fang Li, Zhi-Hui Li
The First Affiliated Hospital of Wenzhou Medical College

Objective: To observe the effects of electric acupuncture combined with rehabilitation training on patients with avascular necrosis of the early and middle stage on hip function and quality of life. *Methods:* A total of 40 patients with Osteonecrosis of the Femeral Head who met the inelusion criteria were divided into two groups at random:an experimental group and a matched group.Both of the patients in the two groups were treated with electroacupuncture treatment.The experimental group patients have both electric acupuncture treatment and rehabilitation training,and all ofthem have the treatment for a total of 3 months.The hip function score (Harris score) and quality of life (SF - 36) were used to measure performance before treatment and after 3 months of treatment. Another comparison was intra-group between before and after treatment. *Results:* There were statistically significant differences in the assessment results of Harris score in both of the groups after treatment compared with those before treatment. After treatment,difference comparison of Harris score between two groups was not statistically significant (p>0.05).There was significant difference in terms of SF-36 assessment between the experimental groups of patients and the matched (p<0.05). *Conclusion:* Compare to electroacupuncture treatment, the comprehensive treatment that combined the electric acupuncture and rehabilitation training, can significantly improve the life quality and improve the hip function of patients with ONFH of the early and middle stage.

PO-0406

EFFECT OF FUNCTIONAL ACTIVITY FOR NURSE CARE OF AUTO-MOXIBUSTION TREATMENT OF LUMBAR OSTEOARTHRITIS

Qiong-Yu Xu, De-Rong Feng, Yi-Na Ou, Feng Zhu
Baoan Hospital of the South Medical University

Objective: To observe the effect of appropriate nurse care in auto-moxibustion treatment of lumbar osteoarthritis. *Method:* 60 patients with lumbar osteoarthritis were randomized according to the random number table. The control group was conventional auto-moxibustion method, while the observation group was rehabilitation nursing on the basis of it. The oswestry disability index and side effects were observed. *Results:* After treatment, ODI had shown more improvement in the treatment groups (p<0.01), but improvement in the control groups (p<0.05), and there was statistically significant in both groups (p<0.05). There was significant difference for itching, blisters after treatment in the two groups (p<0.05). *Conclusion:* The appropriate nurse care is good for recovery of functional activity for auto-moxibustion treatment of lumbar osteoarthritis. Lower side occurs in the appropriate nurse care groups.

PO-0407

THE OUTCOMES MEASURES OF LOCAL STEROID INJECTION BY TWO DIFFERENT GUIDANCE METHODS IN CARPAL TUNNEL SYNDROME

Ya Ping Pong*, Yu-Chi Huang, Lin-Yi Wang, Chau-Peng Leong
Kaohsiung Chang Gung Memorial Hospital, Chinese Taipei

Objective: To compare the outcomes between sonography-guided steroid injection and direct steroid injection on carpal tunnel syndrome. *Method:* We have enrolled 12 ideopathic carpal tunnel syndrome patients (minimal to moderate according to Padua's classification) to receive local steroid (betamethasone 7mg) injections with two different guidance methods. Six patients were allocated in sonography approach group (SAG) and 6 patients were placed in direct approach group (DAG). We compared the outcomes between the two groups, including symptom severity scale (SSS), functional status scale (FSS), subjective discomfort by visual analog scale (VAS), monofilament, muscle power, QuickDASH, nerve conduction study, and sonography before injection (T0), 1 (T1), 3 (T3) and 6 (T6) months after injection. *Results:* There are significantly worse QuickDASH, more subjective hand weakness and increased retinacular bowing on sonography in SAG at T0. No significant difference of all outcome parameters except lower FSS in SAG were found between two groups at T6. In SAG group, significant improvements in monofilament, SSS, subjective discomfort by VAS and cross-sectional area of the median nerve (pisiform bone level) on sonography were found at T3 and T6. In DAG group, there are no significant improvements in outcome parameters at all evaluation time except pinch power at T3 and monofilament at T6. The hand discomfort symptoms within 1 week after local injection were significantly increased in DAG group. *Implications/Impact on rehabilitation:* Sonography– guided local steroid injection may provide better outcomes and avoid complications after local injection than direct local steroid injection in patients with carpal tunnel syndrome.

PO-0408

RAPIDLY DESTRUCTIVE ARTHROSIS OF THE HIP JOINT: A CASE REPORT

Mehmet Zeki Kıralp[1],[1], Selim Akarsu[1], Alparslan Bayram Çarlı[2]*, Levent Tekin[1]
[1]Gülhane Military Medical Academy Haydarpaşa Training Hospital, Department of Physical and Rehabilitation Medicine,Turkey, [2]Bursa Military Hospital, Department of Physical and Rehabilitation Medicine, Turkey

Introduction: Rapidly destructive arthrosis of the hip joint (RDA) is an uncommon syndrome of unknown etiology, resulting in rapid destruction of both the acetabular and femoral aspects of the hip joint with disappearance of the femoral head. It has been reported to be seen commonly in elderly females and has usually a unilateral involvement. It occurs in a joint that initially appears normal or with arthrosis, but over 6-12 months imaging shows destruction of the joint and disappearance of the joint space or the femoral head. *Case Report:*

A 67-year-old man presented with left hip pain since one week. On detailed questioning, he declared that he was under chemotherapy for prostate cancer. Medical and family histories were otherwise unremarkable. On physical examination, left hip range of motion was mildly limited and painful. X-ray demonstrated slight joint space narrowing and sclerosis consistent with osteoarthritis. Laboratory tests including erythrocyte sedimentation rate and C-reactive protein were normal. No evidence of infection or inflammatory arthropathies was detected. He was prescribed non-steroidal anti-inflammatory drugs. After 3 months, at the second visit, he came using a wheelchair. His complaints had worsened and he could not walk. There was no history of trauma. Radiographs obtained revealed severe collapse and destruction of the femoral head. The patient was consulted to Urology department but no metastase was considered and he underwent hip arthroplasty. *Conclusion:* Reporting this patient of ours we call attention of clinicians to a rare cause of rapid destruction of the hip joint.

PO-0409

EFFICIENCY OF PHARMACOPUNCTURE WITH DISCUS COMPOSITUM IN PATIENTS WITH DORSOPATHY AT THE LUMBAR LEVEL

Alexey Chigarev*, Sergey Khakimov, Tatyana Shapovalenko, Lev Agasarov, Konstantin Lyadov
Medical and Rehabilitation Center, Russia

Introduction: Patients with low back pain needs of efficacy treatment with long-term remission. *Objectives*: Assessment of pharmacopuncture treatment in patients with dorsopathy at the lumbar level. *Materials and methods:* Study includes 120 patients with low back pain, divided into 4 groups (30 patients each). 1 group got ten intramuscular injection of Discus Compositum in trigger points and acupuncture points together with standard course of dorsopathy treatment (kinesiotherapy, massage, chiropractic technique). 2 group got only standard therapy. 3 group got complex treatment includes intramuscular injection of Discus Compositum. 4 group got ten intramuscular injection of physiological solution in trigger and acupuncture points together with standard therapy. Pain syndrome evaluated with the use of Visual Analogue Scale, tensoalgomerty data by pain indicator F-meter (Storz), psychological tests (McGill Pain Questionnaire, Roland-Morris disability scale). Range of lumbar spine motion in sagittal and frontal plane evaluated by MES 9000 Dynamic ROM system. *Results:* Improving health condition took place in all groups of patients according with subjective and objective assessments: 1 group in 70%, 2 group – 50%, 3 group – 55%, 4 group – 64%. According to follow-up study after six month after treatment course, stable pain attenuation took place in 1 group, less significant effect registered in 2 and 3 groups, least significant effect took place in 4 group. *Conclusions*: Using of pharmacopuncture with Discus Compositum in patients with dorsopathy at the lumbar level is effective treatment with long-term working.

PO-0410

THE USE OF EIGHT TRIGRAMS BOXING IN CERVICAL SPONDYLOSIS REHABILITATION CARE

Qian Yi, Menghui Gao, Bo Liu
Department of Rehabilitation, Sichuan Province Orthopedic Hospital

Objective: To observe the auxiliary effect of eight trigrams boxing on the rehabilitation of 52 cervical spondylosis patients,by taking part eight trigrams boxing action into rehabilitation care. *Methods:* Initial stage,patients practice one time every day, every action in 3-7 breaths; later, three times every day,every action in 7-21 breaths. And the eight trigrams boxing is coached by nurse one-to-one in patients' room. To observe the effect with the Improvement of cervical spondylosis assessment scale. *Results:* With three weeks observation, the effect of cervical spondylosis was improved obviously by taking eight trigrams boxing into cervical spondylosis patients' rehabilitation care.

PO-0411

LASER ACUPOINT IRRADIATION TREATMENT OF LUMBAR COMPRESSIBILITY CURATIVE EFFECT OBSERVATION OF FRACTURE

Wei Wang
The fourth military medical university hospital XiJing

Objective: To evaluate laser acupoint irradiation treatment of lumbar compressibility fracture clinical curative effect. *Methods:* randomized study method, the selected fifty patients were randomly divided into two groups, in conventional medicine and rehabilitation treatment on the basis of physical therapy, treatment group with laser acupoint irradiation treatment group, the acupuncture treatment. Two groups in the treatment of 30 days, the clinical pathology fracture clinical healing efficacy evaluation standard for the fracture healing and the before and after treatment serum calcium and determined the alkaline phosphatase comparison. *Results:* laser acupoint irradiation treatment effectiveness 92%, while the traditional acupuncture treatment was 88%, the difference was not statistically significant, the two groups ($p>0.05$), curative effect is quite. But the treatment group of serum calcium and determined the alkaline phosphatase is before treatment have difference ($p<0.05$). And this study showed that increase with age, healing effect gradually become low. *Conclusion:* Laser acupoint irradiation can improve lumbar compressibility fracture of serum calcium and alkaline phosphatase level, thus speeding up the time of fracture healing.

PO-0412

THERAPY OF LOW BACK PAIN AND NECK PAIN INTERCONNECTED WITH TRIGGER POINTS BY ACTIVATION DEEP MUSCLE STABILIZING SYSTEM

Vlasta Tosnerova[1], Aneta Maresova[1], Zuzana Hamarova[2]
[1]Rehabilitation Department of Medical Faculty in Hradec Kralove, Charles University in Prague, Czech Republic, Czech Republic, [2]Rehabilitation Department of University Hospital in Hradec Kralove, Czech Republic, Czech Republic

Objective: First aim of study was to define TrPs in muscles according to scheme in patients with low back pain (LBP) and neck pain (NP). Next we tested ability to activate deep muscle stabilizing system (DMSS) by diaphragm test (DT). After functional diagnostics we used physiotherapy to activate DMSS by using exercises of muscles in sagital plane that is the most responsible for posture (exercises from developmental kinesiology). After therapy we checked number of TrPs if there are the same or if changed and if patients were able to activate DMSS and how patients improved or unimproved concerning pain. *Method:* We investigated patients ($n=10$) with LBP and NP. Pain was asked using Visual Analogical Scale (VAS). We palpated TrPs according to defined protocol. We tested diaphragm test (DT), we were interested if patient are able to activate it or not. We compared pain before physiotherapy (activation of DMSS - 5 courses) and after. We tested the same method control group ($n=5$) without LBP or NP. Three independent investigators performed all investigations. We evaluate findings by Kappa method. *Results:* 10 patients (100%) with LBP a NP at the beginning were not able to activated DMSS and DT was positive. After physiotherapy (5 courses) by activation of DMSS 5 patients (50%) were able to activate DMSS and DT was negative. Compared control group was able to activate DMSS (100%) from the beginning, DT was negative and TrPS were latent and no spontaneous pain. Concerning TrPs in patients with LBP and NP, TrPs were in very similar number in defined muscles as people from control group. After physiotherapy patients with LBP and NP improved evaluated by VAS, their manifested TrPs changed to latent once. Spontaneous pain diminished. Concerning localiza-

tion of TrPs the most of them were in upper part of m. trapezius, mm. sternocleidomastoids, m. erector spine in thoracolumbar region and in diaphragm. Kappa was on good statistical level. *Implications/ Impact on rehabilitation:* Results suggest that activation of DMSS positively influents LBP and NP caused by dysfunction of motor system. Activation of DMSS could be very important physiotherapy and prevention of LBP and NP.

PO-0413

THE RESEARCH IDEA ABOUT THE TREATMENT OF TRADITIONAL CHINESE MEDICINE BATH OF

Lin Zhao, Xingmian Shi
Hebei Yiling hospital

The disuse osteoporosis could easily cause brittle fracture, seriously affecting the patients' life quality. By inspected in the literature, and combined with the practice of previous drug use, the use of the hydrated warm effect and the percutaneous absorption of systemic medicine bath provided a new research idea for curing disuse osteoporosis, based on traditional Chinese medicine bath and the doctrine of collateral disease.

PO-0414

THERAPEUTIC EFFECTIVENESS OF KINESIO TAPING PLUS CONVENTIONAL PHYSIOTHERAPY IN PATIENTS WITH SUB-ACUTE ANKLE SPRAIN

Yingchu Zhao[1], Wen Zhang[2]
[1]Shanghai University of Sport, [2]Shanghai First Peoples hospital

Objective: The purpose of this pilot study was to investigate the effectiveness of kinesio Taping (KT) combined with conventional physiotherapy (CP) for relieving major symptoms of patients with Sub-acute ankle sprain. *Methods:* 48 patients (age=31±10.88, 24male and 24 female) with Sub-acute ankle sprain were randomly and equally divided into experimental group (KT plus CP) and control group (CP only). The conventional physiotherapy (CP) including Shortwave Diathermy, intermediate-frequency electric therapy, joint mobilization and strength training. The kinesio Taping (KT) was used to reduce pain and inflammation, support injured muscles and joints, provide a sensory input via cutaneous receptors and promote muscle activity. The ankle joint function scores and treatment effects of the two groups were compared after 3 weeks by using Baird-Jackson ankle function score. *Results:* There were no significant differences in general condition and severity of injury in two groups before treatment (p>0.05).After 3 weeks of treatment, the Baird-Jackson ankle function score of the both groups was significant higher than that of their baseline evaluation (p=0.000, t=5.993; p=0.002, t=3.559). In the experimental group the improvement was more significant than which in the control group (p=0.049). No obvious allergy was recorded. *Implications on Rehabilitation:* In addition to conventional physiotherapy (CP), The kinesio Taping (KT) is an effective and safe way to treat Sub-acute ankle sprain.

PO-0415

EFFECT OF LATERAL WEDGE SHOE MODIFICATION ON TIBIO-FEMORAL OSTEOARTHRITIS

M. Habibur Rahman*, Tariqul Islam Khan
NITOR, Dhaka, Bangladesh, Bangladesh

Objective: Osteoarthritis is the commonest form of arthritis and one of the most important causes of long term disability in adults. During the mid stance phase of gait, about 60 to 80% of the load is distributed through the medial compartment of the normal knee, which is one of the reasons why knee OA frequently involves the medial compartment. Varus angulation deformity may occur in medial compartment knee OA and contribute to the progression of OA by causing increased load to the medial knee compartment. Surgical wedge osteotomy has been used for many years to correct varus deformity by shifting weight away from the diseased knee compartment. An alternative non-operative approach is to realign the weight-bearing load through footwear modification. In this study, an attempt has been made to find out the effects of lateral-wedge insoles on OA knee. *Methods:* This was a randomized control trial done in the department of Physical Medicine, NITOR, Dhaka in the year 2012. 90 cases were selected according to selection criteria. Patients were divided into two groups randomly. Group- A was given NSAID, Exercises, ADL instructions & Group-B was given NSAID, Exercise, ADL instructions & lateral wedge shoe modification. Result After one month of treatment WOMAC Pain subscale score showed marked improvement in group-B (p<0.005). Other parameters also showed significant improvement in group-B patients. *Implications:* Osteoarthritis of knee is the commonest cause of disability of adults. This study will help the rehabilitation specialist to make rehab plan for osteoarthritis.

PO-0416

OBSERVE THE EFFECT OF CRYOTHERAPY AND COMPRESSION SYSTEM IN REAHABILITATION TREATMENT FOR RECONSTRUCTION OF ANTERIOR CRUCIATE LIGAMENT

Hao Su, Zhi Qiang Zhang
Shengjing Hospital of China Medical University Rehabilitation Center

Objective: Explore the impact of the effect of cryotherapy and compression in reahabilitation treatment for reconstruction of anterior cruciate ligament *Method:* 120 patients who had been treated with Acl reconstruction were randomly divided into cryotherapy / compression and ice bag groups with 60 in each group.All patients did systematic rehabilitation treatment in our rehabilitation center for three months, and were followed for six months. Pain scores,the degree of swelling, Lysholm and IKDC score were observed. Result The two groups VAS pain scores of 48 h post-operation, test group 3.1±0.6, control group 4.8±0.5, has significant difference (p<0.05) ; the degree of swelling of two weeks post-operation, has significant difference (p<0.05); lysholm of four weeks post-operation, test group 65.2±12.3, control group 60.2±12.5, has significant difference (p<0.05) ; IKDC of four weeks post-operation, test group65.3±14.3, control group 59.4±13.5, has significant difference (p<0.05). The degree of swelling of four weeks post-operation, lysholm and IKDC of three and six months post-operation has no significant difference (p>0.05). *Conclusion:* Cryotherapy and compression can relive the swelling and pain early post-operation to improve the effect of early rehabilitation training, but have little impact on the long-term rehabilitation training.

PO-0417

EFFICACY OF THE FOCUSED ULTRASOUND AND THE COMMON ULTRASOUND TREATMENTS FOR TENNIS ELBOW

Ying Shen, Yabei Fan, Tong Wang
Rehabilitation Medicine Center, First Affiliated Hospital of Nanjing Medical University, Nanjing, China

Objective: To evaluate the treatment effectiveness of the focused ultrasound and the common ultrasound methods for tennis elbow. *Methods:* Sixty patients with tennis elbow were randomly assigned to three groups that received 10 days of focused ultrasound (FU) (n=20), common ultrasound (CU) (n=20) and no ultrasound treatment (n=20), respectively. At the same time, all patients were administrated with the standard treatments. For the FU group, continuous mode focused ultrasound was applied daily at a frequency of

0.8MHz and an intensity of 0.7 w/cm^2 for 5 min. For the CU group, continuous mode common ultrasound was applied daily for 10 min with the same frequency and intensity parameters of the FU group. The group that received no ultrasound treatment was considered as the control group. The visual analogue scale (VAS) and Mayo Clinic elbow performance index (MCEPI) were used to evaluate the treatment effectiveness before, and at the 5th and 10th day of the treatment. *Results:* Compared with the baseline values, the VAS and MCEPI at the 5th day of treatment were significantly reduced for the FU and CU groups ($p<0.05$). The change of the indices was relatively small for the control group ($p>0.05$). As a result, both indices were lower for the FU group than for the control group ($p<0.05$). At the 10th day of treatment, the VAS and MCEPI were reduced in all 3 groups compared with the baseline values ($p<0.05$). Both indices of the FU group were lower than those of the CU ($p<0.05$) and the control ($p<0.05$) groups. The indices of the CU group were also significantly lower than those of the control group ($p<0.05$). *Implications:* Ultrasound treatment effectively alleviates the pain and improves the joint function for tennis elbow. Focused ultrasound provides better treatment outcomes than common ultrasound.

PO-0418

EFFECTIVENESS OF LIDOCAINE BLOCKS, A PROGRAM OF THERAPEUTIC EXERCISE AND THE TWO IN COMBINATION; FOR PAIN MANAGEMENT, THE FUNCTION AND HEALTH RELATED QUALITY OF LIFE IN MYOFASCIAL PAIN SYNDROME

Jesus Alberto Plata Contreras, Luz Elena Lugo Agudelo, Hector Ivan Garcia Garcia*
Universidad de Antioquia, Colombia

Introduction: Myofascial pain syndrome (MPS) is a major cause of chronic musculoskeletal pain, prevalence varies from 21% in general practice up to 85% to 93% in specialized pain management. There are different treatments for this syndrome. At present there is no clarity about which treatment is most effective for MPS, whether to perform a therapeutic exercise program or block trigger points (BTP) with local anesthetics or combine the two interventions *Objective:* Show whether the combination was more effective than the BTP lidocaine with therapeutic exercise program, to improve pain, function and health related quality of life in a group of patients with MPS of the shoulder girdle and the cervical spine, than the BTP or therapeutic exercise plan alone. *Design:* Randomized controlled clinical trial, single-masked. Participants: 127 patients diagnosed with MPS between January 2009 and October of 2010, divided into 3 groups. *Results:* Quality of life in a month there was no significant difference in the scales of the SF-36 except health change. At three months the pain significantly improved in all groups like the PHQ and SF36. Complications in the 2.66%. *Conclusions:* No differences between the interventions evaluated in outcome chosen, allows possibly leave open the discussion for new research proposals that make up the medium and long term structured programs of therapeutic interventions over time, whether institutional or home.

PO-0419

ORTHOPEDIC BALLISTIC SHOCK AND FOREARM EXTENSOR MUSCLES PNF TRAINING FOR THE TREATMENT OF RECALCITRANT TENNIS ELBOW

Huaimin Lu, Bo Liu, Hui Liu
The Orthopedic Hospital of Sichuan Province

Objective: To observe short and long-term clinical effects of recalcitrant tennis elbow by the treatment of Orthopedic ballistic shock and PNF training. *Methods:* 80 cases were randomly divided two groups. Therapeutic group was treated with Orthopedic ballistic shock and forearm extensor muscles PNF training lasting three weeks: Control group was treated with local injection once a week, lasting three times. The short and long-term clinical effects were assessed respectively by Verhaar tennis elbow clinical evaluation Standard and recur rate within 1 year. *Results:* After 3 weeks of treatment,two groups in clinical effect were compared,Statistical study showed that the difference was significant ($p<0.05$).Statistical recurrence within 1 year,treatment group acumulated six cases,the recur rate is 15%,control group accumulated 14 cases, the recur rate is 35%,the recur rate of treatment group was significantly lower than control group ($p<0.05$). Orthopedic ballistic shock and forearm extensor muscles PNF training is superior to local injection in short and long-term clinical effects of recalcitrant tennis elbow. Conclusions: Orthopedic ballistic shock and forearm extensor muscles PNF training is superior to local injection in short and long-term clinical effects of recalcitrant tennis elbow. The method is easy to accept by patients and deserve the promotion and application in the clinical treatment.

PO-0420

A QUALITY OF LIFE AND UPPER EXTREMITY FUNCTION FOLLOWING IMMEDIATE BREAST RECONSTRUCTION SURGERY USING LATTISSIMUS DORSI (LD) FLAP ON PATIENTS WITH BREAST CANCER: PROSPECTIVE LONGITUDINAL COHORT STUDY

Jin Young Ko
Department of Rehabilitation Medicine, Kyung-pook National University College of Medicine, Taegu, South Korea, Korea

Introduction: The lattisimus dorsi (LD) muscle flap is one of the most commonly used flaps. The purpose was to evaluate the quality of life and shoulder function prospectively after breast reconstruction with LD muscle flap surgery. *Methods:* Between Jun 2011 and Jan 2012, 21 breast cancer patients were enrolled but 14 patients were analyzed. The primary outcome is quality of life (QoL) which measured by the 36-item short-form health survey (SF-36). Secondary outcomes were Disabilities of Arm, Shoulder, and Hand (DASH), manual muscle test (MMT), range of motion (ROM), and visual analogue scale (VAS). Assessments were carried out before the surgery and then at 6, 12, and 24weeks postoperatively. *Results:* About the QOL, Physical Function ($p=0.005$), Role Physical ($p=0.007$), and Physical Component Summary ($p=0.001$) were abnormal at 12 weeks after surgery. All of these scores, except Role Physical ($p=0.653$), were still abnormal at 24 weeks. However Mental Component Summary (MCS) and another subdomains of SF-36 didn't show any significant changes through the 24 weeks. DASH score was also observed constantly high during the 24 weeks ($p=0.002$). Flexion ($p=0.034$), horizontal abduction ($p=0.034$), horizontal adduction ($p<0.001$), internal rotation ($p=0.013$) of MMT, flexion ($p<0.001$) and abduction ($p=0.003$) of ROM were abnormal at 6 weeks. However MMT and ROM were fully recovered at 24 weeks. There was no significant changes in VAS scores through the 24 weeks. *Conclusion:* The recovery of the lowered QOL and upper limb disability that occurred after surgery was not directly correlated with the improvement of strength and ROM. Therefore therapeutic intervention program should be performed for all the patients underwent breast reconstruction surgery using LD flap.

PO-0421

PERCUTANEOUS ENDOSCOPIC LASER ANNULOPLASTY FOR DISCOGENIC LOW BACK PAIN

Sang-Ho Lee, Jung Hwan Lee*
Wooridul spine hospital, Korea

Objective: Percutaneous endoscopic laser annuloplasty (PELA) is a minimally invasive technique, using endoscopic forceps, laser and

a bipolar radiofrequency (RF) to remove the inflamed disc granulation tissue associated with annular tears and to ablate hyperplastic sinuvertebral nerves. We intended to demonstrate the safety and efficacy of PELA for controlling discogenic low back pain (DLBP) *Method:* Clinical outcomes of PELA were investigated in patients with DLBP who were refractory to other conservative treatments including transforaminal epidural injection and showed annular tear and concordant discogenic pain by provocative discography. Ten patients were followed up at least 3 months. Outcomes were assessed using the visual analog scale (VAS) and the modified Macnabs criteria. *Results:* The mean back pain VAS score improved from 6.2 to 2.2 ($p<0.001$) and the modified Macnabs criteria also showed a good outcome with a success rate of 70%. There were no serious complications observed during follow-up. *Implications/Impact on Rehabilitation:* PELA provided favorable outcomes and reduced the surgical requirements for patients with DLBP.

PO-0422

THE CLINICAL OBSERVATION OF JOINT MOBILIZATION COMBINED WITH MASSAGE MANIPULATION FOR TREATMENT OF THE LIMITED SHOULDER MOTION OF THE PATIENTS WITH STROKE-INDUCED HEMIPLEGIA

Shuyu Zhang
Address is missing

Objective: To objectively evaluate the impact of joint mobilization combined with massage manipulation for therapy of the limited shoulder motion of the patients with stroke-induced hemiplegia. *Method:* There were 50 patients were collected for this observation, who suffered from limited shoulder motion and omodynia after stroke-induced hemiplegia.The 50 cases were divided into treatment group and matched group by random number table, the 25 cases of treatment group were given to joint mobilization combined with massage manipulation for treatment. The 25 cases of matched group were given traditional treatment. After the treatments for a month, the two groups were conpared to observe the effect of the limited shoulder motion and omodynia. Consequence: Both of treatment group and matched group after treatment improved in different degrees.The treatment group significantly improved more after treatment ($p<0.05$), the 25 cases of treatmennt group obviously had an advantage in shoulder motion to the 25 cases of matched group, in the meantime, omodynia more relieved than the matched group. *Conclusion:* It can effectively and safely relieve shoulder motion and omodynia of the patients with stroke-induced hemiplegia by joint mobilization combined with massage manipulation, and it deserve applying extends

PO-0423

EFFECTS OF AEROBIC EXERCISE ON CARDIOPULMONARY AND ADL IN PATIENTS WITH SPINAL CORD INJURIES

Jun Wang, Zhi Xi Shi, Si Wen Liu, Dan Tang
Guangdong Work Injury Rehabilitation Center

Objective: To study the effects of aerobic exercise on cardiopulmonary function and ADL in patients with SCI at above T6 level *Methods:* 56 patients with spinal cord injury at above T6 level were randomly divided into the treatment group (28 cases) and the control group (28 cases). Patients in the control group were treated with routine comprehensive rehabilitation (including muscle strength, standing exercise, balance exercise, transfer, passive joint motion, ADL, bladder function). Treatment group was treated with routine treatment and arm cycling. Initial load of arm cycling and the rate of increase of load and duration were based on level of injury, weight, sex, old and height. The functions of all patients were assessed by Resting Heart Rate, Blood Pressure, Maximal Oxygen Consumption (VO2max), Oxygen Saturation (SpO2),Vital Capacity (VC), Forced Vital Capacity (FVC), Maximal Voluntary Ventilation (MVV), Forced Expiratory Volume in the first second (FEV1), Modified Barthel Index (MBI), Functional Independent Measure (FIM) on admission and post-4 weeks rehabilitation. *Results:* After 4 weeks rehabilitation, cardiopulmonary function and ADL of all patients were significantly increased, and improvement of ability in treatment group was superior to that in control group ($p<0.05$). *Conclusion:* Aerobic exercise combined with comprehensive rehabilitation have clinical effects on cardiopulmonary function and ADL in patients with SCI at above T6 levels.

PO-0424

DO THERAPEUTICALLY EFFECTS OF ULTRASOUND THERAPY DIFFERE WITH DOSES IN KNEE OSTEOARTHRITIS?

Rodica Ungur, Ileana Monica Borda, Lászlo Irsay, Viorela Ciortea, Ioan Onac
Rehabilitation Department,"Iuliu Haţieganu" Universityof Medicine and Pharmacy, Cluj-Napoca, Romania, Romania

Objectives: The aim of this study was to compare clinical effects of therapeutic ultrasound with 850±5% KHz frequency at 0,5W/cm^2 and at 1W/cm^2 power in knee OA. *Method:* 30 patients (40-70 year old), diagnosed with knee OA according to American College of Rheumatology criteria, stage1-3 (modified Kellgren-Lawrence classification) on a frontal knee radiography were enrolled in a cross-over study. The patients were treated initially with ultrasound therapy with 850±5% KHz frequency, 0,5 W/cm^2 power, continuously applied on the OA knee for 5 min, 10 sessions. After a wash out period (6 months) the same patients were treated with ultrasound therapy with 850±5% KHz frequency, 0,5W/cm^2 power, continuously applied on the OA knee for 5 min, 10 sessions.The pain on Visual Analogue Scale (VAS), WOMAC score (WS) and Lequesne index (LI) were evaluated before, at the end of therapy and 14 days after the end of ultrasound therapy. SPSS software version 17 was used for statistical analysis. *Results:* After the treatment a statistically significant decrease of pain on VAS, WS and LI was observed for both variants of ultrasound power ($p<0,05$). This improvement was significantly higher for ultrasound therapy at 0,5W/cm^2 power compared with ultrasound therapy at 1W/cm^2 power only for pain on VAS at 14 days after the end of treatment ($p=0,022$). *Implications on Rehabilitation:* Both power (0,5 W/cm^2 and 1 W/cm^2) are efficient, but on short-term the power of 0,5 W/cm^2 is more efficient.

PO-0425

THE EFFECT OF 12WEEKS TERGUMED TRAINING FOR CHRONIC LOW BACK PAIN

Liancheng Wang, Shibo Xu, Liqin Zhang, Suli Teng
Department of Rehabilitation,Tianjin TEDA Hospital, Tianjin, China

Objective: to decide the effect of Tergumed lumbar spine training for chronic low back pain patients. *Method:* the research selected 40 chronic low back pain patients and randomly divided into Tergumed training group ($n=23$) and control group ($n=17$). The training group received 12 weeks training by using Tergumed training machines. The training sessions were three times a week (36 training sessions). The control group did not receive any treatment except keeping normal daily activities. All patients got the neuromuscular assessment and VAS pain evaluation before and after training sessions. All the results analysis statistically ($p<0.05$). *Result:* there was significant difference before and after training in the training group (flexion and extention muscle strength $p<0.01$, flexion/extention strength $p<0.001$, pain $p<0.01$). However, the control group did not show any significant difference ($p>0.05$). *Conclusion:* 12 weeks Tergumed training can decrease low back pain and improve neuromuscular strength. It is an effective training therapy.

PO-0426

EFFECT OF DYNAMIC HUMERAL CENTERING TREATMENT ON PAINFUL ACTIVE ELEVATION OF THE ARM IN SUBACROMIAL IMPINGEMENT SYNDROME: A RANDOMIZED CONTROLLED TRIAL

Alain Yelnik[1], Sandra Lasbleiz[2], Mounir Aout[3], Eric Vicaut[3], Thomas Bardin[2], Philippe Orcel[2], Johann Beaudreuil[2]

[1]Lariboisière-F.Widal Hospital, Paris Diderot University France, France, [2]Rhumatology Department, G.H. St. Louis-Lariboisière-F. Widal, University Paris Diderot, 200 rue du Faubourg Saint Denis, 75010 Paris France, France, [3]Clinical ersearch unit, G.H. St. Louis-Lariboisière-F.Widal, University Paris Diderot, 200 rue du Faubourg Saint Denis, 75010 Paris France, France

Background: The physiotherapy dynamic humeral centering (DHC) aims to prevent subacromial impingement of rotator cuff tendons during elevation of the arm. The objective of the present study was to determine whether DHC acts via an effect on subacromial impingement mechanism by assessing its effect on painful elevation of the arm in subacromial impingement syndrome. *Methods:* The study is a randomized controlled trial. Sixty-nine patients with subacromial impingement syndrome were prospectively included. Patients and the assessor were blinded to the study hypothesis and treatment, respectively. Patients underwent DHC or nonspecific mobilisation as a control for 6 weeks in 15 supervised individual outpatient sessions with home exercises. Outcomes were pain-free range of motion (graded as 0, 0-30 degrees; 2, 31-60; 4, 61-90; 6, 91-120; 8, 121-150; and 10, ≥ 151) and presence of painful arc of the shoulder, both in active flexion and abduction of the arm at 3 months. *Results:* The two treatment groups did not differ in baseline characteristics. At 3 months, pain-free range of motion, both flexion and abduction, was greater in the DHC (median: 8 corresponding to the range 121-150 degrees) than in the mobilisation group (median: 6 corresponding to the range 91-120 degrees, $p<0.05$). Fewer patients in the DHC group (6 folds less) than in the mobilisation group showed painful arc of the shoulder during active flexion of the arm. Implication in rehabilitation: DHC improves painful active elevation of the arm. We suggest that DHC may act via a specific effect on subacromial impingement mechanism.

PO-0427

GUIDELINES ON NECK PAIN REHABILITATION: PHARMACOLOGICAL INTERVENTIONS

Danielle Rampim, Paula Delfino, Luis Carlos Tomikawa, Patrick Raymond Stump, Gustavo Fadel, Satiko Imamura, Marta Imamura

University of São Paulo, Brazil

Objective: To assess the pharmacological interventions to treat chronic non-specific neck pain (CNSNP). *Method:* A Pubmed database search was conducted using P.I.C.O. strategy (Patient, Intervention, Comparison and Outcome). The following terms were arranged for search strategy: neck pain, analgesics, paracetamol, non-narcotics, analgesics, opioid, muscle relaxants, cyclobenzaprine, carisoprodol, non-steroidal anti-inflammatory agents, nerve blocks, local anesthetics, botulinum toxin. Methodological quality of the studies was assessed by JADAD score. *Results:* Ninety-one articles were related to neck pain treatment and 7 articles were used to produce the guideline. The use of Paracetamol in the maximal daily dose of 4g for up to nine weeks doesn't improve neck pain and only 5% of the patients presented complete pain relief. Celecoxib in daily single-doses of 200 and 400mg for up to 9 weeks also doesn't alleviate pain. Daily cyclobenzaprine 10 mg a day for 1 month alleviates the pain related to myofascial pain syndrome of upper trapezius (4.6±2.5 vs 3.1±1.8; difference -1.2±0.9, $p<0.01$). Trapezius anesthetic block with 0.1% lidocaine followed by cervical stretching is superior to cervical stretching alone (SMD-1.36; IC95%:-1.93 to -0.80; NNT=3). Botulinum Toxin type A 100 U (TBA) injected at 2 to 34 U doses in trapezius muscle doesn't improve pain (pre and post-treatment VAS for saline vs TBA: 4.3±2.4, 3.3±2.0 vs 4.1±2.1and 3.3±2.2; $p>0.05$). *Implications/Impact on Reabilitation:* Evidences don't support the use of Paracetamol, Celecoxib or TBA to treat CNSNP while cyclobenzaprine 10 mg and upper trapezius muscle block with 0.1% lidocaine in myosfacial trigger-points may be recommended to reduce pain in CNSNP.

PO-0428

REHABILITATION OUTCOME FOLLOWING HIP FRACTURE SURGERY IN DEMENTIA PATIENTS WITH BEHAVIORAL AND PSYCHOLOGICAL SYMPTOMS

Naofumi Tanaka[1,2]*, Kenji Takeda[2], Keiko Aizawa[2], Kasumi Arai[2], Kenta Aizawa[2], Asuka Shiroishi[2], Aya Shoji[2], Nobumichi Ichikawa[2], Kozo Oonami[2], Hiroshi Ishii[2], Shin-Ichi Izumi[1]

[1]Tohoku University Graduate School of Medicine, Japan, [2]Kawasaki Kokoro Hospital, Japan

Objective: To compare functional outcomes after rehabilitation following hip fracture surgery in dementia patients with and without behavioral and psychological symptoms (BPSD). *Method:* Hip fracture patients with dementia who were hospitalized for postoperative rehabilitation were evaluated prospectively. Functional outcome was assessed by the Functional Independence Measure motor subscale (mFIM) at admission and discharge. Dementia severity was estimated with the Mini-Mental State Examination (MMSE) (mild ≥20, moderate 19-11, severe ≤10), and BPSD were assessed using the Behavioral Pathology in Alzheimers Disease Frequency Weighted Severity Scale at admission. *Results:* Twenty patients were included (age 83.5 ± 4.8 years, 12 women). Of these, 9 patients had BPSD at inclusion. The patients with BPSD had significantly lower mFIM score gain and mFIM efficiency than those without BPSD. These differences were associated with significant lower MMSE score and mFIM at admission in the patients with BPSD. According to the MMSE score, there were 4 patients with mild dementia, 15 with moderate dementia, and 1 with severe dementia. Among the subgroup with moderate dementia, 8 patients had BPSD. The subgroup with BPSD had significantly lower mFIM score gain and mFIM efficiency than the subgroup without BPSD (9.3 ± 8.7 vs. 19.6 ± 10.6, $p=0.027$; 0.11 ± 0.11 vs. 0.26 ± 0.17, $p=0.020$), while there were no significant differences in MMSE score and mFIM at admission between the both subgroups (13.5 ± 2.8 vs. 14.6 ± 3.9, $p=0.518$; 46.3 ± 13.3 vs. 58.1 ± 13.5, $p=0.093$). *Implications/Impact on Rehabilitation:* These results suggest that the evaluation of BPSD is useful in predicting rehabilitation outcome following hip fracture surgery in patients with dementia.

PO-0429

SARCOPENIA AND FRAGILITY FRACTURES

Francesca Gimigliano, Antimo Moretti, Maria Teresa Giamattei, Maria Teresa Prudentino, Annamaria Pagano, Giovanni Iolascon, Raffaele Gimigliano

Second University of Naples, Naples, Italy, Italy

Objective: Sarcopenia is the age-associated loss of skeletal muscle mass and function. Sarcopenia was significantly associated with osteoporosis in a large sample of women following a fragility fracture of the hip. The primary aim of our study is to investigate the prevalence of sarcopenia in osteoporotic women with vertebral fragility fractures. *Method:* In this pilot study, we evaluated the prevalence of sarcopenia in involutional osteoporotic women (55 years or older) who already sustained a vertebral fracture, attending the outpatient clinic of Physical Medicine and Rehabilitation of the Second University of Naples, during a period of one year (June 2011- June 2012). Dual-Energy X-Ray Absorptiometry (DXA) was

used to measure whole and regional body composition. Appendicular lean mass (aLM) was calculated as the sum of lean mass (LM) in arms and legs. We calculated the skeletal muscle mass (SM) index (aLM/height squared): sarcopenia was defined as a SM index *Results:* A total of 67 women were included. The mean age was 69.88 ± 7.28 years. Thirty-five women (52.23%) had a vertebral fracture, whom 8 (22.85%) were sarcopenic. Thirty-two women (47.76%) had multiple vertebral fractures, whom 14 (43.75) were sarcopenic. *Implications:* Our results suggest that sarcopenia is common among osteoporotic women increasing along with the number of vertebral fragility fractures.

PO-0430

THE ASSOCIATION OF THE KNEE AND HIP OSTEOARTHRITIS AND OVERWEIGHT

Gordana Stefanovski[1]*, Zana Banjanin[1]

[1]Institute,Bosnia and Herzegovina, [2]Dom Zdravlja LAKTASI, Bosnia and Herzegovina

Objective: The aim was to examine the correlation between overweight and osteoarthritis (OA) of the hip and knee in the population of Banjaluka region. *Methods:* Retrospective, population-based study included 865 patients (mean age 59,08) treated for simptomatic or radiographic OA from Jan, 2006. till Dec, 2010. We assessed the percentage of overweight patients (as defined by body mass index (BMI) of greater than or equal to 30 kg/m^2) who had OA.Statistical analyzes were done by SPSS 15.0 (SPSS Inc.2006). *Results:* From 865 participants, 295 (34.1%) had OA of hip (199 or 67.46% female and 96 or 32/24% male). OA of the knee was found in 570 (65.9%) participantes (376 or 65.96% female and 194 or 34.04% male). BMI >30 was found in 95 (30.6%) patients with hip OA (68.42% female and 31.58% male) and in 221 (69.94%) patients with OA of the knee (72.4% female and 27.6% male). OA of the knee was significantly associated with overweight (p>0.01). *Implications:* Overweight is significantly associated with OA of the knee (p>0.01). Obesity increases the risk of developing hip OA, though the correlation is not as strong as it is with knee OA (p>0.05). Obese people should be on time reffered by family doctor to PRM specialist in order to prevent developmant of OA. ReferencesA Tukker, TLS Visscher, HSJ Picavet. Overweight and health problems of the lower extremities: osteoarthritis, pain and disability. Public Health Nutrition, 2008; 12 (3), 359-368.

PO-0431

THE COMPARATIVE STUDY OF CURATIVE EFFECT BETWEEN EXTRACORPOREAL SHOCK WAVE AND ULTRASONIC IN TREATING HUMERAL EPICONDYLITIS

Tao Fan, Guozhi Huang, An Cao, Xibo Zhong

Dept. Of Rehabilitation, Zhujiang Hospital of Southern Medical University

Objective: To compare the clinical treatment effect of extracorporeal shock wave with ultrasonic on humeral epicondylitis. *Method:* Sixty patients with humeral epicondylitis participated in this study,and were randomly selected into extracorporeal shock wave group and ultrasonic group (30 subjects in each group). The two groups then received extracorporeal shock wave or ultrasonic treatment respectively. The clinical treatment effects were observed. Result The effective rate of extracorporeal shock wave group was 96.67%, which was significantly higher than that of ultrasonic group (76.67%) (p<0.05). Obviously, in this comparative study, the after-treatment VAS score of extracorporeal shock wave group was lower than that of ultrasonic group (p<0.01). The difference between VAS score of prior-treatment and post-treatment of extracorporeal shock wave group showed a greater increasment than that of ultrasonic group (p<0.01).After-treatment ADL score of extracorporeal shock wave group was also evidently higher than the ultrasonic group (p<0.01). And, the difference between ADL score of prior-treatment and post-treatment of extracorporeal shock wave group increased much more than that of ultrasonic group (p<0.01); *Conclusion:* The treatment effect of extracorporeal shock wave on humeral epicondylitis was obviously better than that of ultrasonic, It's a safe and effective treatment methods, and worth widely used in clinical.

PO-0432

THE EFFECT OF ZOLEDRONIC ACID TREATMENT ON BONE MINERAL DENSITY AND BACK PAIN IN POSTMENAPOUSAL AND ELDERLY WOMEN

Aynur Sahin, Ebru Yilmaz Yalcinkaya, Belgin Erhan, Isıl Turna, Berrin Gunduz, Alkan Ozturk

Istanbul Physical Medicine and Rehabilitation Training and Research Center, Turkey

Osteoporosis is a chronic metabolic bone disease leading to progressive destruction of bone microarchitecture and loss of function. The late clinical stage of osteoporosis is characterized by insufficiency fractures which are often followed by chronic back pain. Treatment of osteoporosis is very important for postmenapousal and elderly women' s quality of lives. Zoledronic acid is a new generation biphosphanate used for osteoporosis treatment. *Objective:* To evaluate the effects of 1 year zoledronic acide treatment on bone mineral density T score and back pain. *Method:* One year follow-up 42 patients, using zoledronic acide, data were analyzed. Lunar Dual Energy X-Ray Absorptiometry device (DXA) was used for all patients before zoledronic acide treatment and after 1 year follow up.Visuel Anolog Scale (VAS) (0-10) were used for pain evaluation. *Results:* Forty seven patients data were investigated. Five women excluded from the study (2 patients had rheumatoid arthritis, 1 patient was taken her DXA at a different center and 2 patientshad missing data) Mean age was 66,55 + 8,18 years. Femur neck, L1-L4, L2-L4 and total femur T scores and bone mineral density (BMD, g/cm^2) were significantly improved after 1 year treatment (p<0,01). Visual analog scale (VAS) was significantly decreased (p<0,01). T scores changes (gain) and VAS changes were not significantly correlated. Adverse effects were miyalgia (11,6%), arthralgia (9,3%), subfebril fever (9,3%), headache (8,7%), fatigue (8,7%), dispepsi (2,2%) and nausea (4,3%). *Impact on rehabilitation:* Zoledronic acide is a good choice for osteoporosis treatment. And back pain decreased significantly after 1 year treatment.

PO-0433

SONOGRAPHIC DIAGNOSIS OF RECURRENT PERONEAL TENDON SUBLUXATION: A CASE REPORT

Alparslan Bayram Çarlı[1]*, Selim Akarsu[2], Levent Tekin[2], Mehmet Zeki Kıralp[2]

[1]Bursa Military Hospital, Deparment of Physical and Rehabilitation Medicine, Turkey, [2]Gülhane Military Medical Academy Haydarpaşa Training Hospital Department of Physical and Rehabilitation Medicine, Turkey

Introduction: Recurrent peroneal tendon subluxation (PTS) is an uncommon disorder which is commonly associated with sports including skiing, ice skating, soccer, basketball, rugby, gymnastics, and motor vehicle accidents. On the other hand, ultrasonography (USG) has proven its place in sports medicine as an excellent imaging tool for the diagnosis, follow-up and treatment of sports injuries. *Case Report*: A 20-year-old football player presented with pain and a sensation of instability and snapping at the left ankle since two years. On detailed questioning, he declared that the pain was particularly during walking on uneven ground. On physical examination, there

was pain at the retromalleolar region and a palpable click on dorsiflexion and eversion against resistance. Dynamic USG at the level of lateral malleolus revealed anterior subluxation of the peroneal tendons over the lateral malleolus and a relative flat fibular groove. The patient underwent repair surgery. *Conclusion:* The literature is poor regarding peroneal tendon subluxation and there are few reports on USG in evaluating this pathology. Dynamic USG is the best choice of imaging method compared with static tools such as magnetic resonance imaging and computerized tomography in the diagnosis of peroneal tendon subluxation.

PO-0434

CONSERVATIVE COMBINATION TREATMENT FOR CERVICAL OR LUMBAR DISC HERNIATION: A RETROSPECTIVE AUDIT OF MOKHURI NECK AND BACK HOSPITAL IN 2012

Ki-Ok Kim[1], Yongjae Jeong[1], Yousuk Youn[2], Jeongcheol Choi[1], Jaehong Kim[1], Sangho Lee[1], Tae-Hun Kim[1]

[1]Mokhuri Neck & Back Hospital,Korea, [2]Suwon Mokhuri Neck & Back Hospital, Korea

Objective: Cervical and lumbar disc herniations are common conditions which induce severe pain and disability. We assessed the clinical effectiveness of conservative combination treatment. *Methods:* This is a retrospective audit. We reviewed all the medical records of patients with cervical or lumbar disc herniations, who attended intensive conservative combination treatments at Mokhuri Neck and Back Hospital, Korea during March, 2012 to October, 2012. All the patients took combination treatments of acupuncture, Chuna and herbal medicines during the hospitalization treatments. Zero to ten pain numerating rating scale (NRS) of pain and SF-36 were assessed before and after treatments. *Results:* During the period, 182 and 292 patients with cervical and lumbar disc herniation participated in the treatments, respectively. Average admission duration were 15.5 days (SD 9.4) in cervical disc and 18.6 (10.3) in lumbar disc patients. For cervical patients, neck pain NRS decreased from 6 [the minimum 0 to the highest 10] to 3 [0 to 10] (Student's *t*-test, $p<0.001$) and radiating pain from 7 [0 to 10] to 3 [0 to 8] ($p<0.001$) significantly. For lumbar patients, low back pain NRS decreased from 6 [0 to 10] ($p<0.001$) to 3 [0 to 10] and radiating pain from 6 [0 to 10] to 3 [0 to 9] ($p<0.001$). Total SF-36 score increased significantly after treatment in lumbar disc patients ($p=0.0476$) but not in cervical disc patients ($p=0.6983$). *Implications/Impact on rehabilitation:* Conservative combination treatment can be effective in pain and quality of life of patients with cervical and lumbar disc herniations.

PO-0435

EFFICACY OF HYALURONIC ACID ACCORDING TO THE AGE IN SHORT TERM IN KNEE OSTEOARTHRITIS

Demet Erdogan Ucar[1], Demirhan Diracoglu[2], Turker Suleyman[2]

[1]Deparment of Physical Therapy & Rehabilitation, Dicle University Medical Faculty, Diyarbakir,Turkey, 21280,Turkey, [2]Department of Physical Treatment & Rehabilitation, Istanbul University Medical Faculty, Istanbul, Turkey, 34093, Turkey

*Objective:*Osteoarthritis (OA) is the most common degenerative disease in the world. We aimed to compare the short time effects of hyaluronic acid (HA) injections in elderly and middle aged patients with knee OA. *Method:* One hundred seventy two patients who were diagnosed knee OA according to the American College of Rheumatology criteria and classified radiological stages of II or III according to Kellgren and Lawrence and received three consequtive intraarticular injections of HA (30 mg/2 ml) weeklywere included in the study. Sixty five years old and upper ages were accepted as "eldery group" and lower the 65 years old were accepted as "middle aged" group. The evaluation instruments, Visual Analog Scale (VAS) and Western Ontario and McMaster Universities Index for Osteoarthritis (WOMAC) were applied the patients before and after the third enjection. SPSS17 was used for istatistic analysis. *Results:* Mean age was 54,5years (range: 34-64) and 71,3 years (range: 65-84) in the groups. VAS scores of pain at rest, at night, and during the physical activity and WOMAC pain, stiffness, and physical function subscales were significantly decreased after 4 weeks ($p<0.001$) in both two groups. Difference between initial and after injections in VAS scores of pain during the pyhsical activity and physical function subscale score of WOMAC were found significantly better ($p<0.05$) in "eldery group". Impact of Rehabilitation Intraarticular HA injections diminish pain and and improve disability within 4 weeks and were well tolerated especially in elderly patients in short term.

PO-0436

MANAGEMENT OF QUADRICEPS WEAKNESS, PATELLOFEMORAL JOINT PAIN INHIBITION IMPROVED KNEE FUNCTION: A CASE REPORT

Baoyu Chen

West China Hospital, Sichuan University

Study design: Case report. *Objective:* To describe an alternative explanation and treatment approach for quadriceps weakness or knee giving way. *Background:* As we all know, weakness of knee leads to knee dysfunction or patellofemoral pain syndrome. Pain can cause muscle weakness. However pain inhibition also cause muscle weakness. Pain inhibition have been suggested, but remain unclear as potential causes of PFPS. *Method and measure*: The patient presented in the case did not exhibit obvious knee pain and patellofemoral joint misalignment or tracking problems ; However, the patient demonstrated knee giving way. Muscle strength training was not change this kind of situation. Reassessment the patient, when pushing down the patella to the end range, patient felt pain NPRS: 2. Mobilized the patella in end range provoking pain NPRS: 6 for 5 times. *Results:* The patient improved in walking significantly. And muscle strength is improved.Manual muscle test: quadriceps 3 to 4. *Impact on rehabilitation:* Pain inhibition is a reason for quadriceps weakness and a reason for PFPS. Assessment and treatment of knee giving way should be considered in pain inhibition. Key words: quadriceps weakness, knee giving way, patellofemoral pain syndrome, pain inhibition.

PO-0437

THE CLINICAL RESEARCH OF MASSAGE WITH UNBLOCKING MERIDIANS AND GOVERNOR VESSEL TUINA FOR ISCHEMIC STORKE PATIENTS

Huaping Pan, Hui Feng, Yajuan Li, Hongzhu Jin

The Affiliated Jiangning Hospital of Nanjing Medical University/ Nanjing Jiangning Hospital, Nanjing,China

Objective: Using convalescent patients after ischaemic stroke as the research model and biological mechanics, kinematics technology, modern rehabilitation function evaluation system as the research analysis method, this study evaluated the therapeutic effect of unblocking meridians and governor vessel tuina on motor function of ischemic stroke patients and discussed the mechanism to improve the function. *Methods*: This study included a total of 120 convalescent patients after stroke from October 2009 to October 2011, all of whom were recruited from Rehabilitation Department and Neurology of Nanjing JiangBei Hospital. The inclusion criteria were: diagnosis according with 1995 cerebrovascular disease classification and approved by CT or MRI. Subjects were randomly assigned into 3 groups:41 subjects received unblocking meridians and governor vessel tuina therapy (the treatment group), 40 subjects received common massage therapy (the control group), while the rest of 39 subjects received rehabilitation therapy (the rehabilitation

group). All subjects received drug treatment corresponding with its related disease. At the same time, 10 patients were chosen from each group to receive gait kinematical analysis test according to random arrangement data tables. The research time was 8-weeks. At conclusion, assessments observed before therapy and 8 weeks post therapy were conducted with regard to clinical effects (Clinical curative effect score), neural function (neural function defect degree rating scale, NFDS),muscular tension (modified Ashworth scale, MAS), motor function (Fugl-Meyer assessment, FMA),balance (Berg balance scale, BBS), comprehensive function (functional comprehensive assessment, FCA), activities of daily living (modified Barthel index, MBI), the quality of life (SF-36 scale), gait time-space parameters, lower limb joint Angle and walk efficiency indexes. *Results*: (1), General condition: There were no statistically significant differences in physical or demographic characteristics among three groups,such as gender,age, height, the course, the hand side, the hemiparalysis side. There were no statistically significant differences among NFDS, MT, FMA, BSS, FCA, MBI and SF-36 before therapy. Also, There were no statistically significant differences among gait time-distance parameters, lower limb joint angle and walk efficiency indexes. So each group was comparable. (2), Compared with that before treatment, improved outcomes in the patients of the treatment and rehabilitation group have been shown respectively on the assessment items, such as the total scores of NFDS, MT, FMA, and BSS, FCA, MBI, and SF-36, etc. There were significant differences between the total scores of the assessment items when compared with that before and after 4 weeks and 8 weeks treatment, and compared with that after 4 weeks and 8 weeks treatment respectively. (3), Compared with that before treatment, improved outcomes in the patients of the control group have shown respectively on the assessment items, such as the total scores of NFDS, MT, FMA, and BSS, FCA, MBI, and SF-36, etc. There were significant differences between the total scores of the assessment items, such as the total scores of MT, FMA, and BSS, FCA, MBI, and SF-36 when compared with that before and after 4 weeks and 8 weeks treatment, and compared with that after 4 weeks and 8 weeks treatment. But there was no significant difference on NFDS when compared with that before and after 4 weeks treatment. (4), Compared among groups: After 4 weeks treatment, compared between the treatment group and the control group, the difference had statistical significance on the items, such as NFDS and BSS. Compared between the treatment group and the rehabilitation group, the difference on BSS had statistical significance. Between the control group and the rehabilitation group, a statistical significance on NFDS was also shown. After 8 weeks treatment, compared between the treatment group and the control group, the difference had statistical significance on the items, such as NFDS, MT and BSS. Compared between the control group and the rehabilitation group, the difference on the assessment items, such as the total scores of NFDS, MT, BSS, FCA, SF-36 had statistical significance. Compared between the treatment group and the rehabilitation group, the difference on the assessment items, such as the total scores of MT, BSS, FCA, and SF-36 also had statistical significance. (5), Compared the Clinical effects before and after treatment: Compared with that before treatment, the score of the clinical curative effect of all groups increased. Treatment group raised significantly, rehabilitation group and control group also increased obviously. The difference were significant compared the treatment group and the rehabilitation group to the control group, but no difference was revealed between the treatment group and the rehabilitation group. (6), After the treatment in the three groups, improved outcomes in the patients have been shown respectively on the assessment items, such as the total scores of NFDS, MT, FMA, and BSS, FCA, MBI, and SF-36, etc., which showed active prevention therapy could significantly improve the functions of the ischemic stroke patients. (7), Compared with that before treatment, improved outcomes in the patients of the treatment and control group have been shown respectively on the assessment items, such as the total scores of MT, FCA, and SF-36, etc., which indicates that Tuina has a special curative effect on the patients' psychosomatic state and it can decrease the muscle tone. And during the treatment it is utilized for the overall therapy and doctors pay more attention to communicate with patients and respect patients' feeling, which in turn are willing to be accepted by patients and get higher adherence. It can significantly improve stoke patients' psychosomatic state and activities of daily life. (8), Gait time-space parameters: The stride length, distance, frequency and width of all groups did not change obviously, whereas, the speed, limb-support time and swing time changed significantly after therapy. Compared among groups, between the treatment group and the control group or between the treatment group and the rehabilitation group, the difference had statistical significance,but there was no difference between the control group and the rehabilitation group. It indicated rehabilitation had positive function on prompting the hemiplegia gait, and the unblocking meridians and governor vessel tuina work best among the three. (9), Lower limb joint Angle: The maximum stretch angle in support-phase and flexion angle in swing-phase of knee-joint all changed obviously, at the same time, the maximum stretch angle in support-phase and swing-phase and flexion angle in support-phase of ankle-joint also changed obviously. Compared among groups, between the treatment group and the control group, or between the treatment group and the rehabilitation group, or between the control group and the rehabilitation group,the difference had no statistical significance. (10), Walk efficiency: After therapy, the stride speed of three groups increased, whereas the oxygen consumption and oxygen valence decreased, so the walk efficiency improved obviously. Compared among groups, between the treatment group and the control group or between the treatment group and the rehabilitation group, the difference had statistical significance,but there was no difference between the control group and the rehabilitation group. The result showed unblocking meridians and governor vessel tuina can obviously improve the walk efficiency of hemiplegics. *Discussion*: (1) The etiology and pathogenesis of ischemic stroke are complicated. Stroke is marked by faint and hemiplegia caused by the obstruction of the brain vessels due to various kinds of factors, such as stagnation of blood stasis, internal accumulation of phlegm-heat, or yang turning into endogenous wind, blood flowing with adverse qi. Stroke can be treated by the method of dredging the governor meridian and massage. Through regulating the general qi flow and dredging the meridians and collaterals of the trunk, limbs and muscles, smooth qi movement of governor meridian, modified qi and blood circulation of the meridians and collaterals as well as the recovery of visceral function can be achieved. And thus, the purpose of nourishing yin and suppressing yang, unblocking the fu-organs and resolving the phlegm, activating blood circulation and dredging the collaterals, invigorating qi and nourishing blood can also be achieved. (2) The damage of upper-motor neuron and the excessive release of lower-motor neuron leads to the disorder of muscle function, which also expresses movement disability and the decline in the quality of life in ischemic stroke patients. The unblocking meridians and governor vessel tuina can improve the motor function of hemiplegics. The most likely mechanisms are that it can influence the rhythmic movement of peripheral neurons to reconstruct the muscle function by intervening muscle biological resonant frequency and, fix abnormal motor pattern to promote the balance and coordination among muscle groups and increase the muscle endurance and the accuracy of activity. (3) By intervening muscle biological resonant frequency and balancing and coordinating nerve muscle function, the unblocking meridians and governor vessel tuina can combine the coordination of the trunk and extremities with the participation of feeling function, which leads to the improvement of the motor function and walking ability and ADL and life quality in hemiplegics. It has good short-term curative effect. (4) The unblocking meridians and governor vessel tuina have a good therapeutic effect on hemiplegics, it is a confirmed and exercisable clinical therapy, which is proper to popularize and worthy of further discussion and study.

PO-0438

COMPARISON OF THE THERAPEUTIC EFFECTS IN PATIENTS WITH LUMBAR DISC HERNIATION BETWEEN SUSTAINED AND INTERMITTENT TRACTION APPLICATION

Zhifei Yin, Guangxu Xu
the First Affiliated Hospital of Nanjing Medical University

Objective: To observe the therapeutic effects of sustained and intermittent traction on the patients with lumbar disc herniaton. *Methods:* Sixty patients were randomly divided into two groups, sustained traction group (n=30) and intermittent traction group (n=30). Patients were treated with sustained or intermittent traction combined with medium frequency electrostimulation respectively. The treatment effects was assessed by Visual Analogue Scale (VAS), Japanese Orthopaedic Association (JOA) and Straight Leg Raising Test (SLR). The evaluation was performed before the treatment and at the 10th day and the 20th day during the treatment. Result:1) VAS, JOA and SLR scores in sustained traction group were signifcantly improved (p<0.05) following an initial 10th days' treatment and were higer than that of in intermittent traction group (p<0.05). Intermittent traction produced significantly improved score of SLR. (p<0.05), but no siginficant differences score of JOA and SLR were found (p>0.05). 2) Sustained traction group demonstrated further increases in all 3 indices (p<0.05) at the 20th day. Sustained traction group achieved better VAS, JOA and SLR outcomes than intermittent traction group (p<0.05), in which, VAS performance was significantly better than prior to the intervention, (p<0.05), and SLR score was also improving (p<0.05) compared to the 10th day. However, JOA score was observed better without statistical significances (p> 0.05) *Conclusion:* Sustained traction treatment could be superior to intermittent traction treatment in cure of LIDP. *Implications:* Theser esults contribute to further understanding of the treatment in cure of LIDP.

PO-0439

ISOKINETIC TESTING PATIENTS WITH COLLES FRACTURE TYPE A1 AND A2 OF THE INTERNATIONAL CLASSIFICATION AT THE END OF THEIR REHABILITATION TREATMENT IN PHYSICAL MEDICINE AND REHABILITATION UNIT NO. 1, MEXICAN INSTITUTE OF SOCIAL SERVICES, MONTERREY, NUEVO LEÓN, MEXICO

Irene Rodriguez Ramírez
Mexican Institute Of Social Services, Monterrey, Nuevo León, Mexico, Mexico

Backgrownd: Colles fracture is located within 3 cm of the radiocarpal joint. They are most common in people over 40 years. These fractures seriously affect the quality of life and affect high social and economic development. An objective way to evaluate the strength of the wrist after Colles fracture is through the use of isokinetic equipment. Objetive Make an isokinetic evaluation of patients with Colles fracture type A1 and A2 of the international classification upon completion rehabilitation treatment. *Methods:* We study comparative, observational, analytical, prospective sample of 21 patients with Colles fractures type A1 and A2 of the International Classification to which underwent isokinetic evaluation at the end of his rehabilitation treatment valuing torque, work, power and fatigue at 90º/sec. The data were analyzed using Student's t-test. *Results:* The isokinetic testing showed a decrease in parameters of torque, average work, fatigue and strength statistically significant p<0.05 with respect to standardized. Impact isokinetic testing shows a decrease in strength in patients with Colles fracture despite having completed rehabilitation treatment.

PO-0440

THE IMPACT OF PERLECAN ON MUSCLE STEM CELLS GROWTH FACTOR IGF-1 AND MYOSTATIN SIGNALING PATHWAY IN MICE OF MUSCLE ATROPHY

Zhuo Xu[1,2], Huiqiu Yu[1], Chaoyi Wang[3], Eri Hirasawa[2], Minhua Yu[1]
[1]China-Japan Union Hospital OF Jilin University, Changchun, China, [2]Research Institute for Diseases of Old Age, Juntendo University School of Medicine, Tokyo, Japan, [3]Texas A&M University, Texas, United States

Objective: To investigate the effect of perlecan on muscle stem cell growth factor IGF-1 and Myostatin signaling pathways after the sciatic nerve damage caused by muscle atrophy. *Methods:* The methods of immunohistochemistry, quantitative realtime RT-PCR, western blot and other methods at level of in vivo and in vitro were performed on a C57 mouce and eighteen Perlecan kock out mice. *Results:* The immunohistochemical analysis results showed us that the lack of Perlecan led to an increase of the cross-sectional area of the muscle fibers. In addition, both the analysis of the quantitative realtime RT-PCR and the western blot indicated that the absence of the Perlecan resulted in a decrease in Myostatin, but an increase the amount of IGF-1, ps <0.01. *Implications:* Perlecan as an important component of extracellular matrix molecules, is widely exists in the neuromuscular junctions. The missing of Perlecan resulted in a decreased expression in myostatin signal and an enhanced expressing in the signal of IGF-1, thus caused the proliferation of muscle fiber hypertrophy. In addition, in the previous study with SAKAI, we also found the the conjunction between the Domain 5 of heparan sulfate lock and muscle proliferation inhibitor Myostatin showed that Perlecan may play an important role in regulating the signaling pathways that lead to muscle atrophy denervation.

PO-0441

ACUPUNCTURE FOR CHRONIC NECK PAIN: A REVIEW OF RANDOMIZED TRIALS

Danielle Rampim, Marta Imamura*
Clinical Research Center. Institue of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation, Hospital das Clínicas, University of São Paulo School of Medicine, Brazil

Objective/Design: To assess the effectiveness of acupuncture to treatment chronic nonspecific neck pain. We reviewed articles found in the databases of MEDLINE, beginning to May 2011 and were evaluated critically according to the Jadad scale. The search strategy used was based on the PICO structure (The initial "Patient," "Intervention," "Control", "Outcome"). The exclusion criteria for articles were: Jadad <3, fracture, previous surgery, radiculopathy, neck pain resulting from "whiplash", arthritis, dystonia, headache. *Results*: We found 317 articles and 95 filtered as therapy/narrow. *Seven* randomized controlled trials were included, with a total of 11078 patients. Acupuncture reduces chronic neck pain uncomplicated with more than three months duration from 41.9 (32.7 – 51.0) (p<0.001) to 70% (p<0.001). When performed in five sessions maintained for three weeks for twenty to thirty min and stimulated manually every 5 min, acupuncture is better than massage (p=0.0052) to reduce neck pain both in a short-term, immediately and 1 week after treatment (Decrease Pain-VAS %= 62.2 (28.5) with p<0.001) and in the long term at 6 months post treatment (p=0.014). Main acupuncture points used in the selected trials are: GB20, GB21, LR3, LI4, GB34 and UB10, UB60, TE5. Significant improvement in pain scores are achieved when patients choose to receive acupuncture (p=0.001). There is evidence that the association with auricular acupuncture (p<0.001) and electroacupuncture significantly improves chronic neck pain, with a higher cost-benefit ratios (p<0.001). *Implications/Impact on Rehabilitation*: Acupuncture is effective to reduce chronic neck pain in the short and long term.

PO-0442

LOWER LIMB MUSCLES SEMG ANALYSIS UNDER DIFFERENT VIBRATION CONDITIONS

Yuanyaun Zhang[1], Huaping Pan[1], Guangxu Xu[2], Wentong Zhang[2], Yi Zhu[2], Rong Cao[2], Mei Du[2]

[1]The Affiliated Jiangning Hospital of Nanjing Medical University, [2]The First Affiliated Hospital of Nanjing Medical University

Objective: To explore the influence of vibration stimulation to normal human lower limbs major muscles under different local vibration stimulation conditions, and to determine the best vibration frequency and location by SEMG analysis. *Methods:* Ten normal male college students (age 23 + /-1.7 yrs, height 173.5 + /-4.5 cm, weight 70.4 + /-8.2 kg) were involved in this study. All of them were in squat (knee flexion 300) position, accepted the 10-50 Hz different frequencies vibration stimulations and were collected the surface electromyography. Left rectus femoris and semitendinosus, left anterior tibial muscle and the medial head of gastrocnemius were detected. The vibration stimulation point was on the left distal tibia surface and achilless tendon, respectively. The surface EMG characteristics of lower limbs major muscles were analyzed under different vibration stimulations. *Results:* The calf muscles were activated significantly under different vibration conditions ($p<0.05$). The EMG values of the anterior tibial muscle were significantly different with vibration frequency increasing ($p<0.05$). However, there were no significant difference among 30 Hz, 40 Hz and 50 Hz under the two positions ($p>0.05$). The gastrocnemius EMG values were not significantly different with vibration frequency increasing ($p > 0.05$), as the vibration location was on the left distal tibia surface. But on the achilless tendon the EMG values of the gastrocnemius were significantly different with vibration frequency increasing ($p<0.05$), and there were no significant difference among 30 Hz, 40 Hz and 50 Hz ($p > 0.05$). The thigh muscles were no activated significantly under different vibration conditions ($p > 0.05$). *Conclusion:* (1)The calf muscles were activated significantly under different vibration conditions, but the thigh muscles were no activated significantly. (2) The vibration frequency at 30-50Hz maybe the calf muscles best activated frequency. (3)The vibration stimulate position of achilless tendon is more likely to activate the calf muscles than the anterior tibial muscle.

PO-0443

THE EFFECT OF PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION TO FUNCTIONAL ANKLE INSTABILITY

Jinghua Qian, Wei Jiao

Beijing Sport University

Objectives: Functional Ankle Instability (FAI) was a common disability condition related to repeat ankle sprain. The effect of Proprioception Neuromuscular Facilitation (PNF) to FAI rehabilitation was unknown. The purpose of this study was to observe muscle activation pattern, proprioception and functional change of FAI after 4 weeks PNF application. *Methods:* 28 unilateral FAI males and 28 males without low limb injury experience were included. D2 pattern of PNF training lasted for 4 weeks, 3 times a week. Range of motion in three dimensional plane and sEMG of 5 key muscles during single-leg jumping test were collected by BTS SMART-D Integrate Motion Analysis System, proprioception of active closed-chain and ankle joint function were assessed pre and post PNF application. Result 1)There were significant difference in muscle activation pattern and range of motion during single-leg jumping test after PNF training (p<0.05). 2)In active close-chain proprioception assessment, the average length error of medial-lateral direction and average of trace error of multidiretion increased in FAI group (p<0.05), both of them decreased to control group level after PNF training (p>0.05): 3) After PNF training, ankle joint functional assessment score increased and the frenqucy of giving way decreased (p<0.05). *Implications on Rehabilitation:* By modified neuromuscular control of proximal joint and proprioception facilitate, D2 pattern of PNF training was effective to Functionl Ankle Instability rehabilitation. Besides neurological disorder, PNF technique should be widely implicated in sport rehabilitation, especially to improve joint stability.

PO-0444

ANTERIOR TIBIAL AND PERONEUS BREVIS TENODESIS TO ACHIVE DORSI FLEXION AND EVERSION FOR THE EQUINOVARUS OR DROP FOOT

Yoshifumi Kiyono*, Hisatoshi Kinoshita, Yutaka Tateiwa, Isao Yoda

Department of Orthopaedic Surgery, Prefectural Nagano Rehabilitation Center, Nagano, Japan, 381-3953, Japan

Objective: To assess our new method of surgical correction of the equinovarus or drop foot to achieve dorsi flexion and eversion. *Method:* Surgical correction was performed on 9 feet in 8 patients with cerebrovascular accident, cerebral palsy, polio, lumbar spinal canal stenosis, and compartment syndrome. Both the anterior tibial and peroneus muscles were not functional in all patients. Operative procedures: Peroneus brevis tendon is dissected at muscle-tendon junction. The tendon is brought out distally at its insertion and rerouted into the anterior tibia. Anterior tibial tendon and the transferred peroneus brevis tendon are tenodesed to tibia by plate fixation. Adequate foot position (dorsi flexion and eversion) is obtained by adjusting the tension of the two tendons. Tendo Achilles lengthening and/or toe flexor release are performed if necessary. Postoperative casting for 3 weeks and ankle foot orthosis for 3 months is necessary. *Results:* Satisfactory correction was achieved in all patients and resulted in even weight bearing on the sole of the affected foot.These tenodesis is sufficient to maintain the neutral position of the foot on walking. *Impact on Rehabilitation:* Anterior tibilal and peroneus brevis tenodesis to tibia by plate fixation is simple and reliable method to achieve dorsiflexion and eversion for the equinovarus or drop foot.

PO-0445

THE STANDARDIZED INDEX OF SHOULDER FUNCTION (FI2S): A NEW SCALE TO ASSESS SHOULDER DISORDERS

Jacques Pelissier[1,2]*, Arnaud Dupeyron[1,2], Marc Julia[1,2], Christian Herisson[1,2]

[1]Academic Hospital Montpellier-Nîmes,France, [2]Movement to Health, EuroMov, Montpellier-1 University, Montpellier, France, France

*Objective:*s. Though no less than 40 assessment tools are available in the literature, very few of them are correctly validated. The Standardized Index of Shoulder Function (FI2S) encompasses pain, mobility, strength and function. The goal of this work is to describe the FI2S and to study its construct validity, reliability and responsiveness to change. *Methods:* The FI2S was compared to the Disabilities of the Arm, Shoulder and Hand questionnaire (DASH), to the Constant-Murley Score (CMS), and to a Visual Analog Scale for pain. 59 patients with non-surgical (rotator cuff lesions, frozen shoulders, osteoarthritis) or post-surgical (acromioplasty, repairs of rotator cuff tears, arthroplasty) shoulder disorders were included. *Results:* Inter-test reliability and inter-rater reliability are excellent with CCIs of 0.93 [0.90-0.96] and 0.94 [0.88-0.96], respectively. Under a convergent hypothesis, the Spearman's correlation coefficients with the CMS and DASH scores are 0.91 ($p<0.0001$) and - 0.64 ($p<0.0001$) respectively. Correlations between the FI2S and the CMS are excellent for mobility and strength but moderate for pain and functional capacities. Under a divergent hypothesis, no correlation is observed between the FI2S total score and age. Responsiveness to change is excellent. *Discussion and Conclusion*:

The FI2S appears to be a proper assessment tool for pain, mobility, strength and function in shoulder disorders, easy to administer and of good metric value.

PO-0446

WHOLE-BODY VIBRATION: A PROMISING NEW CLINICAL PHYSICAL THERAPY FOR OSTEOPOROSIS

Xiaofei Wei, Pu Wang, Chengqi He
[1]Department of Rehabilitation Medicine, West China Hospital, Sichuan University,Chengdu, 610041 Sichuan Province, Peoples Republic of China

Objective: The purpose of this review was to identify what kind of potential patients with osteoporosis (OP) are suitable for a promising new physical therapy: Whole-body vibration (WBV), and investigate its effectiveness and safety. *Method:* We used these key words: whole-body vibration, osteoporosis, bone mineral density, and performed an electronic search to identify relevant articles via the MEDLINE, EMBASE, Pubmed and Cochrane library databases. The title and abstract of each identified study were assessed by two independent and 'blinded' reviewers to survey the application of WBV in clinical and other aspects, and decide which kind of WBV therapy was of benefit to patients with OP, especially in aspects of bone mineral density (BMD), leg muscle strength, and fracture. *Results:* Animal experiments have showed that this kind of vibration not only increases the anabolic activity of bone tissue but also improves biomechanical property, whereas examples of WBV applied to human patients are limited. What's more, published researches on WBV training in human beings lie in various kinds of standards. We found these points: (1) Only few studies found significant but small improvements in BMD in postmenopausal women and the reason may be that they use DXA to measure the BMD which is not tridimensional; (2) WBV could improve leg muscle strength, which could reform OP patients' balance, decrease fractures, and could also improve BMD indirectly; and (3) WBV could be regarded as a substitute therapy option for patients who cannot tolerate other intensive exercises. *Conclusion:* Although the mechanism of WBV therapy is not well-understood, WBV is a promising new physical therapy for osteoporosis. There would be large-scale long-term randomized controlled trials to be taken for determining the optimal magnitude, frequency, and duration of WBV therapy before recommendations can be made for clinical application.

PO-0447

CLINICAL EXPERIENCE OF OCCUPATIONAL THERAPY FOR RADIUS FRACTURE 1 YEAR AFTER INJURY: A CASE REPORT

Yuting Zhang
Department of Rehabilitation Medicine, West China Hospital, Sichuan University, Chengdu, Sichuan, China

Objectives: The author reports one case of distal radius fracture with reflex sympathetic dystrophy 1 year after injury who received occupational therapy (OT) regarding the physical functioning and disability. *Material and Method:* A 25 year old Chinese lady was admitted to out-patient service for pain and stiffness over elbow, wrist and finger joints, as well as limitation of her role as a postgraduate student, one year after open reduction and internal fixation of radius in Italy. Because of long time stabilization and lack in moving, decreasing in range of motion, strength and participation of activities were present and being measured. Dynamic active splints, remedial activities and functional activities training were applied. *Result:* Short term OT service was applied for 2 weeks. The patient was followed for 1 year. She regained her previous occupation. *Impact on rehabilitation:* The case demonstrates the OT treatment provided for clients closely interrelated with occupation and role progressively.

PO-0448

LOCATION OF MULTIFIDUS ATROPHY IN PATIENTS WITH UNILATERAL SINGLE LEVEL CERVICAL RADICULOPATHY

Jung-Il Kang, In-Sik Lee*
Konkuk University Medical Center, Korea

Objective: To identify the relationship between the location of multifidus atrophy and the level of cervical radiculopathy. *Method:* Thirty-six patients who had unilateral C6 or C7 cervical radiculopathy confirmed by electrophysiologic studies were evaluated. The patients were divided into 2 groups; a C6 radiculopathy group (C6 RAD) and a C7 radiculopathy group (C7 RAD). Bilateral cervical multifidus muscles at the mid-spinous process (MSP) levels from C4 to C7 vertebrae were identified in T1 axial MRI. The total muscle cross-sectional area (CSA) of multifidus muscles (TMCSA) and the pure muscle CSA of multifidus muscles (PMCSA) were measured by a computerized analysis program, and the ratios of PMCSA to TMCSA (PMCSA/TMCSA) were calculated. Result TMCSA was not significantly different between the involved and uninvolved sides at the all levels. PMCSA and PMCSA/TMCSA in the involved side was significantly smaller than those in the uninvolved side at the C6 and C7 MSP levels in the C6 RAD group, and at the C7 MSP level in the C7 RAD groups ($p<0.05$). We found that the level of the most severe multifidus atrophy was at the C6 MSP level of involved side in the C6 RAD group, and at the C7 MSP level of involved side in the C7 RAD group. *Implications:* This study demonstrated that the level of the most severely atrophied multifidus on the involved side correlates with the level of cervical radiculopathy. We suggest that the location of multifidus atrophy in MRI may assist inferring the level of cervical radiculopathy.

PO-0449

AND THE EXPERIENCE TYPE TRAINING CHILDREN LEFT FOREARM ISCHEMIC CONTRACTURE GUIDE

Yin Huang
Sichuan Province Department of orthopedics hospital rehabilitation department, China

Objective: To observe the auxiliary effect of induction training on the rehabilitation of ischemic contracture patient. *Methods:* To observe the effect with the hand function evaluation form, by taking induction training into rehabilitation treatment and rehabilitation care. *Results:* With 16 weeks observation, the hand function was improved obviously by taking induction training into patients' rehabilitation treatment and care. *Conclusion:* Induction training plays a vital roal in the hand function recover of ischemic contracture patients

PO-0450

A RESEARCH ON TRUNK MUSCLE STRENGTH AND SEMG SIGNALS OF BASEBALL PLAYERS WITH CHRONIC LOW BACK PAIN

Hong Zhang, Yongli Wang, Guohui Zhang, Guangyuan Zhang, Qing Qu
Department of rehabilitation Medicine, Yueyang Hospital of Integrated Traditional Chinese and Western Medicine, Shanghai University of Traditional Chinese Medicine

Objective: To explore the trunk muscle strength and SEMG signals of baseball players with chronic low-back pain so as to guide the physical training of professional athletes. *Methods:* 25 professional baseball players in the study came from the same team. The study group consisted of 11 players had been experiencing low-back pain for at least 3 month, and the control group included 14 players without known low-back trouble. All the athletes were tested by Biodex System 3 Isokinetic Test and Noraxon Surface Electromyography

Test at the same time. Trunk flexion/extension worked at speed of 60-, 90-, and 120-degrees/second. Trunk rotated at speed of 30-, 60-, and 120-degrees/second. Therefore the signals of abdominal, lumbar, and left and right rotation muscles were collected. Both groups had lumbar spine X-ray examination. Cobs and Lumbosacral angles were measured. *Results:* PT, PT/BW and TPT values of lumbar muscles were lower and F/E values were higher in players with low-back pain ($p<0.05$), and that of other muscles had no significant difference between two groups ($p>0.05$). Work Fatigue of muscles had no difference also ($p>0.05$). Cobs and Lumbosacral angles had no significant difference between two groups ($p>0.05$). Implication Professional baseball players suffered from low-back pain had lower lumbar muscle strength, muscle explosiveness and trunk stability. Therefore, lumbar muscle strength and muscle explosiveness training should be enhanced in physical training.

PO-0451

A CLINICAL STUDY OF LUMBAR SEGMENT INSTABILITY

Weixin Yang, Yunqiang Zan, Huai He
Department of Rehabilitation medicine, The First Affiliated Hospital of Suchoow University,Suzhou, Jiangsu, China.215006, China

Objective: This study was performed to explore factors that may be linked to the cause of lumbar segment instabilities. *Methods:* 57 subjects aged 43.67 years with lumbar segment instabilities and 22 subjects with facetectomy at level L4-5 were examined. X-ray plain were taken in sagittal, flexion and extension. Computed tomographic scans were defined the axial morphology of the facet joint. Magnetic resonance scans were described disc degeneration. 19 subjects were as control. Result The facet joint was oriented significantly more sagittally in the forward translation group in flexion than in the control group. The disc degeneration was light in the rotational instability group. Total facetectomy group exited translation instability. *Implications/Impact on Rehabilitation:* A more sagittally oriented facet and disc degeneration are associated with translation instability and may be the cause of degenerative spondylolisthesis, whereas ligment failure is associated with rotational instability.

PO-0452

CAN EXERCISE CORRECT FLATFOOT?

Jialin Zhou, Dongmei Luo
Beijing sports university

Objective: The research is designed to analyze the effects of exercise intervention on mild and moderate reusable flatfoot and to explore the effect of exercise on the treatment of flatfoot. *Method:* Give 4 weeks of exercise intervention to 18 mild and moderate flatfoot subjects, compare muscle characteristics and plantar pressure distribution of the subjects before and after the exercise intervention, and go on a statistical analysis. *Result:* After 4-weeks' intervention, the contact area of arch is significantly decreased, meanwhile the contact area of the forefoot increases in walking. The impulse of the heel increases, the impulse of arch area and forefoot decrease. The initial contact phase and forefoot contact phase extend, foot flat phase decreases, as well as the flexibility of plantar soft tissue enhance. When the subjects are walking, the working status of the muscle which maintain foot arch (tibialis anterior muscle, peroneus longus muscle, medial head of gastrocnemius muscle and the lateral gastrocnemius) have been improved and the muscle recruitment act more coordination and reasonability; meanwhile, the mobilization of tibialis anterior process better, so that the foot dorsiflexion action is completed more fully and the situation is improved in that the buffer of flatfoot crowd in walking is less. *Impact on Rehabilitation:* 4-weeks' exercise intervention can modify mild and moderate reusable flatfoot.

PO-0453

A STUDY OF THE PRESCRIPTION FOR ENFORCING SPLEEN AND NOURISHING KIDNEY WITH MAGNETOTHERAPY TO TREAT POST MENOPAUSAL OSTEOPORMS

Yuanyuan Guo, Jianping Chen
Department of Rehabilitation Medicine, The fifth affiliated hospital of GuangZhou Medical University

Objective: To explore the clinical effect of the Prescription for enforcing spleen and nourishing kidney with magnetotherapy to treat post menopausal osteoporms. *Methods:* 62 patients with post menopausal osteoporms were divided randomly into a treatment and a control group, treatment group used the Prescription for enforcing spleen and nourishing kidney and used magnetotherapy, control group used magnetotherapy for pain. Visual Analogue Scale (VAS), BMD,T-Score and QOL were used to evaluate the results. *Results:* The VAS score, BMD and QOL of both groups improved after treatment, and the VAS score and QOL of treatment group are significant than that of the control group ($p<0.05$). Implication the Prescription for enforcing spleen and nourishing kidney with magnetotherapy is an effective therapy to patients with post menopausal osteoporms, it can improve the quality of life.

PO-0454

CROSSFIT – A RARE CAUSE OF RHABDOMYOLYSIS

Suzanne Gutierrez
NY Sports Medicine & Physical Therapy, United States

Objective: To present an uncommon presentation of bilateral upper arm edema with discomfort, as a result of Crossfit training, to an outpatient sports medicine office. *Method:* A 33-year-old female patient presents with bilateral arm swelling and general discomfort after completing a Crossfit class, involving 100 pull-ups and push-ups. No associated popping sensation, or bruising. Denies noticing any blood in urine or any color changes. On exam, there is marked edema throughout both upper extremities associated with erythema and warmth in certain areas. Neurological exam was intact. *Results:* Patient was referred to seek immediate care in a nearby emergency department, where Rhabdomyolysis was confirmed with a creatine kinase (CK) of 33,000. Patient was hospitalized and started in intravenous fluid management. No renal compromise. *Implications on Rehab/ Impact on Rehabilitation:* Acute Exertional Rhabdomyolysis (AER) is a result of skeletal muscle injury from strenuous exercise. Patients usually present with delayed-onset pain, and swelling of the affected muscles. This is associated with the release of different proteins, including CK, lactate dehydrogenase (LDH) and myoglobin, into circulation system. AER has been reported in athletes, or jobs that require extreme physical work. Crossfit has been associated with a few cases. Eccentric exercises tend to have the highest risk for muscle injury. Early recognition of AER helps prevent severe complications, which include electrolyte abnormalities, renal failure, compartment syndrome, disseminated intravascular coagulation, and death. Adequate hydration is the essential aspect of the management. Furosemide and Mannitol are used in the presence of renal failure. Sports medicine physicians have to educate athletes about proper prevention techniques.

PO-0455

CURATIVE EFFECT OBSERVATION OF TREATMENT FOR HAND DYSFUNCTION BY MANIPULATION COMBINED WITH MODULATED MEDIUM FREQUENCY ELECTRIC

Zhonghe Zhao, Xiao Chen
Shaotou Central Hospital,Shaotou, China

To observe the clinical efficacy of treatment for traumatic hand dysfunction by manipulation combined with modulated medium frequency electric. *Methods:* 50 cases of traumatic hand dysfunction patients according to the type of injury were randomly divided into the experimental group and the control group, the experimental group with manipulation mainly combined with modulated medium frequency electric treatment, the control group with frequency modulation combined with ultrasonic treatment, and the affected hand of two groups were evaluated with upper extremity function index (UEFI) before and after treatment. *Results:* After treatment, UEFI score of the 50 patients were improved, and UEFI scores of the experimental group was significantly higher than the control group, the difference was statistically significant ($p<0.05$). *Conclusion:* manipulation combined with modulated medium frequency electric treatment for traumatic hand dysfunction, its effect better than modulated medium frequency combined with ultrasonic therapy.

PO-0456

LONG TERM EVALUATION FOR POSTTRAUMATIC ORTHOPEDIC RECOVERY IN EUROPE. ADVANCED TECHNOLOGIES COMBINED WITH NATURAL CLIMATE FACTORS

Stratulat Ioan Sorin
[1]Faculty of Medicine/ Dental medicine, University of Medicine and Farmacy "Gr. T. Popa" Iasi, Romania [2] Clinic of Recovery Medicine, Physical Medicine and Balneo-climatology, Clinic Hospital C.F. Iasi, Romania, Romania

Introduction: The fracture of calcanei presents various problems for post operative recovery. New technology (metal implants) and operative technique can induce very good programs for recovery. Bone cancer can benefit by new methods for treatment with good recovery evolution. These clinical cases benefits by medical network in Europe. *Methods:* We present two orthopaedic cases. First one with fractured of calcaneus bone in twelve pieces after a car accident in Romania who was evaluated in an Aschaffenburg Klinikum and was operated with special methods and metal implants. Second it is the bone tumor of humerus bone, evaluated in Romanian and operated in an Aschaffenburg Klinikum. *Results:* These two cases have different periods of recovery treatment and analyzed periodically two, three, six, twelve months and two years. We obtain very good results from the point of view of the patient/index of satisfaction for the treatment. *Conclusions:* In the future Europe, medical fields and especially for recovery medicine has good opportunities for development and new challenges. Each clinical case, traumatisms of the bone can be individualized as a singular case with special diagnostics for operation and special program for recovery. The most importing thinks, as daily living activity and return to the work with all physical capacity must be the target for the present and future. Analyse of medical costs of these treatments show a low level of expenses than classical treatment. The existing of bio bank cell tissue makes a great opportunity for the future in the field of recovery medicine.

PO-0457

EFFECT OF DOUBLE-LEG SEMISQUAT WITH HIP ADDUCTION ON VASTUS MEDIALIS OBLIQUE OF PATIENTS WITH PATELLOFEMORAL PAIN SYNDROME

Ping Miao, Chuhuai Wang
Department of Rehabilitation Medicine, the Second Affiliated Hospital of Guangzhou Medical College

Objective: The patellofemoral pain syndrome (PFPS) can be defined as retropatellar or peripatellar pain resulting from physical and biomechanics changes in the patellofemoral joint. The purpose of the study is to investigate the possible effect of double-leg semisquat with hip adduction on the imbalance between vastus lateralis (VL) and vastus medialis oblique (VMO) of patients with PFPS. *Methods:* 30 patients with PFPS were selected to the study group, while 30 healthy subjects matched were enrolled as the control group. VL and VMO activities were recorded with sEMG during double-leg semisquat (DLSS) and double-leg semisquat with hip adduction (DLSS-HA). Collect and analyze all the electromyography data by extracting time domain indexes. *Results:* In the study group, the differences of the time domain indexes (ZCR, RMS, IEMG) between VL and VMO were significant in the test of DLSS ($p<0.05$) while there was no significant differences in the test of DLSS-HA ($p>0.05$). The time domain indexes (ZCR, SPA, RMS, IEMG) of VMO were significantly different in the test of DLSS and DLSS-HA ($p<0.05$). The values of the aboved indexes were higher in DLSS-HA. *Conclusions:* More activities of VMO sEMG signals were seen in the exercise of double-leg semisquat with hip adduction than without hip adduction. The finding indicates that more selective VMO activation can be obtained in the exercise with hip adduction and help to balance the VL and VMO. This may be of importance in designing training programs aimed toward control of the patellofemoral joint.

PO-0458

OBSERVATION OF CLINIC EFFECT OF TREATMENT OF SCAPULOHUMERAL PERIARTHRITIS BY JOINT MOBILIZATION TOGETHER WITH MASSAGE THERAPY

Jia Bin Li, Ya Zhou, Chao Zhu Zheng
Department of Rehabilitation of Yancheng City No.1 Peoples Hospital

To discuss the clinic effect and correlative mechanism of treatment of scapulohumeral periarthritis using massage combing joint mobilization. *Method:* To choose 152 cases of scapulohumeral periarthritis in therapy group and comparison group. Therapy group adopts massage and kinesitherapy combing joint mobilization, and comparison group just does massage and joint mobilization. Curative effect of two groups would be assessed after three periods of treatment (thirty times). *Result:* Shoulder joint function grades of two groups improve in evidence comparing to non therapy. Difference has statistics meaning ($p<0.05$). Therapy group improves in evidence comparing to comparison group. Difference between two groups has statistics meaning ($p<0.05$). *Conclusion:* Using massage combing joint mobilization to treat scapulohumeral periarthritis can improve clinic effect evidently. It is worth spreading and practice.

PO-0459

QUALITY OF LIFE IN DENTISTS WITH UPPER LIMB MUSCULOSKELETAL PROFESSIONAL DISORDERS

Elena Amaricai[1,1], Dan Nemes[1,2]*, Daniel Popa[1,2], Liliana Catan[1], Mihai Dragoi[1,2], George Puenea[1], Diana Andrei[1]
[1] "Victor Babes" University of Medicine and Pharmacy, Timisoara, Romania, [2]City University and Emergency Hospital, Timisoara, Romania

Objectives: The musculoskeletal disorders are often encountered among the dentists. To point out the efficiency of medical rehabilitation in dentists with musculoskeletal disorders involving the upper limb and to achieve correlation between their pain level, general health status and the number of days off owing to these disorders. *Material and method*: In a 2 years period, 177 dentists with rotator cuff tendinitis, epicondylitis, epitrochleitis, effort-induced tenosynovitis, carpal tunnel syndrome and secondary vascular involvement

following the professional exposure to vibrations and posture, were assessed, initially and every year, after specific therapy. 3 homogenous batches underwent different therapies according to their compliance: batch 1- specific medication, batch 2 -medication and medical rehabilitation therapy, batch 3- an adapted home kinetotherapy program was added to the medication and medical rehabilitation therapy. The assessment was carried out using the Visual Analogue Scale of pain (VAS), the Health Assessment Questionnaire for Dentists (HAQD) and the number of induced day off. *Results*: In terms of decrease concerning VAS score, the increase of life quality and the decrease of days off the best results were achieved in the dentists from batch 3, they underwent medication, periodical physical and kinesiotherapy, along with an adapted kinesiotherapy at home. *Implication/Impact on Rehabilitation*: A complex medication and medical rehabilitation treatment associated with kinetotherapy at home are required to achieve a proper quality of life in dentists with underlying musculoskeletal disorders involving the upper limb.

PO-0460

DIFFERENT GENE EXPRESSION OF CHONDROCYTES IN RESPONSE TO IMMOBILIZATION AND HIGH-INTENSITY RUNNING

Guoxin Ni[1], Yue-Zhu Zhou[2], Lei Lei[3], Sheng-Yao Liu[1], Zhe Li[1]

[1]Department of Orthopeaedics and Traumatology, Nanfang Hospital, Southern Medical University, 1838 Guangzhou Avenue (N), Guangzhou 510515, China, [2]Department of Rehabilitation, 1st Affiliated Hospital, Fujian Medical University, 20 Chazhong Road, Fuzhou 350005, China, [3]Department of Rehabilitation Medicine, Longyan People's Hospital, 31 Denggao Road (W), Longyan 364000, China

Objective: Non-physiological mechanical load, both overload and *reduced* load, may have deleterious effects on the homeostasis of cartilage. In this study, related gene expression of chondrocytes were evaluated following knee immobilization and high-intensity treadmill running in a rat model, respectively. *Methods*: A total of 24 male Wistar rats were randomly assigned into groups of control (CON), high-intensity running (HIR), and immobilization (IM). Rats in HIR group were trained for 8 weeks on the treadmill with high intensity, whereas, left knees of rats in IM group were immobilized in flexion for 8 weeks. After sacrifice, right tibial plateau samples were collected for histological observation. In addition, gene expression of biglycan, fibromodulin, Collagen- II and TGF-βwas analysed by quantitative real-time reverse transcription-polymerase chain reaction on total RNA extracted from the cartilage. *Results*: Both HIR and IM groups showed osteoarthritic changes by histological observation. In comparison to CON group, HIR group existed higher biglycan, fibromodulin, Collagen- II mRNA expression and lower TGF-β gene expression, without statistical significance. On the contrary, IM group showed significantly lower biglycan, fibromodulin, Collagen- II gene expression, and significantly higher TGF-βgene expression compared with CON group. *Implications/ Impact on rehabilitation:* Although both lead to OA-like changes, more serious cartilage degeneration would occur secondary to immobilization. It appears that cartilage destruction and repair coexist in response to high-intensity exercise, whereas, the chondrocytes lose their capacity to maintain cartilage structure and function following immobilization.

PO-0461

QUANTIFYING IN VIVO VERTEBRAL MOTIONS DURING IMPULSIVE SPINAL MANIPULATION

Christopher Colloca[1]*, Robert Gunzburg[2], Marek Szpalski[3], Mostafa Afifi[4]

[1]Biomechanics Laboratory, Kinesiology PhD Program, Arizona State University, Tempe, Arizona, U.S.A.,United States, [2]Department of Orthopaedic Surgery, Edith Cavell (CAV), Brussels, Belgium,United States, [3]Department of Orthopaedic Surgery, Centre Hospital Moliere Longchamp, Brussels, Belgium,United States, [4]Faculty of Kinesiology, University of Calgary, Calgary, Alberta, Canada, United States

Objective: To quantify in vivo lumbar spine motions in human subjects during impulsive spinal manipulative therapy (SMT) delivery. *Method:* Tri-axial accelerometers were attached to intraosseous pins rigidly fixed to adjacent vertebrae at L4 and L5 spinous process of three patients undergoing lumbar decompressive surgery. Lumbar spine acceleration responses were recorded during the application of 12 externally applied posteroanterior (PA) impulsive SMTs delivered by an Impulse iQ medical device equipped with an accelerometer. Three force settings were delivered to two contact points (facet joint and spinous process) at two vectors (cranial and caudal) in a repeated measures design (n=144) in each subject. Displacement-time responses in the PA, axial (AX) and medial-lateral (ML) axes were obtained from the acceleration-time histories using trapezoidal numerical integration. Statistical analysis of the effects of contact point, force magnitude, and vector on peak-to-peak displacements was performed. Correlation of non-invasive stylus accelerations was compared to interosseous pin accelerations using least-squares linear regressions. *Results:* Peak-to-peak ML, PA, AX vertebral motions increased significantly (p<0.05) with increasing applied force. Cranially directed SMTs created significantly greater L4-L5 motions compared to caudally directed thrusts (p<0.01). Contacts to the facet joints induced greater ML motions than those applied to the spinous processes (p<0.01). Non-invasive stylus accelerations were positively correlated to the main invasively measured accelerometer motion (linear regression R^2=0.988, p<0.01). *Implications/ Impact on rehabilitation:* In vivo kinematic spinal measurements during SMT in human subjects provide novel findings that aid in the understanding of its mechanisms and development of non-invasive strategies to objectively biomechanically characterize the spine.

PO-0462

EFFECTS OF TAI CHI FOR PATIENTS WITH KNEE OSTEOARTHRITIS: A SYSTEMATIC REVIEW

Jiajia Ye, Shizhon Wang

Department of Rehabilitation Assessment, Rehabilitation Hospital, Fujian University of Traditional Chinese Medicine, China

Objective: The aim of this study was to seek the evidence for the effectiveness of Tai Chi on patients with knee osteoarthritis (KOA), based on the data from randomized controlled trials (RCTs). *Method:* Systematic searches were conducted on China Journals Full-text Database, Pubmed, Medline, Science Direct-Online Journals by Elsevier Science, and CINAHL between 2000 and 2011. Studies which published in English or Chinese with randomized controlled trials and participants were diagnosed with knee osteoarthritis according to the classification criteria of American Rheumatism Association (ARA) or American College of Rheumatology (ACR) or radiographic evidence on the Kellgren/Lawrence Scale grade were included in. *Results:* Six studies met all inclusion criteria. All of them suggested that there was a significant pain reduction on WOMAC or VAS compared to control groups. Five articles mentioned about the physical function, of which four reported significant improvement. Two papers noticed the improvement of balance and one article reported no change in flexibility. *Implications:* The evidences showed that tai chi was an effective way to relieve pain and to improve the physical function. Further work is suggested that randomized controlled trials with large sample sizes and long training period are needed to compare groups who perform Tai Chi training with other groups who undergo other forms of physical exercise in order to confirm the efficacy of tai chi.

PO-0463

THE OBSERVATION ON CLINICAL CURATIVE EFFECT OF CORE STABILITY EXERCISE COMBINED WITH WAIST PROPRIOCEPTION TRAINING IN PATIENTS WITH LUMBAR DISC HERNIATION

Weiwei Lu, Youguo H, Haiyan Shi, Kang Chen, Xu Li
Songjiang Hospital affiliated Shanghai Jiaotong University School of Medicine, Department of Rehabilitation

Objective: To investigate the changes in pain intensity, core muscle functional status, motor control, and recurrence rate of core stability exercise (CSE) combined with waist proprioception training after 8 weeks in patients with lumbar disc herniation (LDH),and refine management of LDH, find the specific treatments to the sub-groups of LDH, then promote these methods in the community. *Method*: Subjects (n=90) in with LDH of at least 3 months' duration *were* randomly assigned to 8 weekly treatments with CSE combined with waist proprioception training, CSE or only physical therapy in groups. There are 30 subjects (average age 40±5.6 years, 18 females) in the synthesis intervention groups, 30 subjects (average age 42±5.6 years, 12 females) in the CSE groups, 30 subjects (average age 43±5.6 years, 15 females) in the physical therapy groups All of participates had physical treatments (ie: heat therapy, transcutaneous electrical nerve stimulation, traction) taken. The ability of waist proprioception was assessed using Biodex Balanced System by posture stability and limits of stability. Core muscle functional status was assessed using surface electromyography (SEMG). Subjects were asked o fill in short form McGill Pain Questionnaire (SF-MPQ) to determine pain level, as well as Barthel Index of disability. After one year, follow-up dispatch recurrence rate. *Results*: Pain level decreased significantly for all subjects (F=20.43, p=0.001), but there was no difference between groups (F=0.56, p=0.47). Core muscle functional status improved in both synthesis groups and CSE groups (F=0.83, p<0.01),and that of one year's recurrence rate also reduced. Motor control was improved in synthesis group (F=38.62, p<0.01), (center-left/backward movement especially), better than did CSE group (F=35.37, p<0.05). The synthesis group take less time to recover than did CSE. *Implications*: Pain decreased was no obvious correlation with improved core muscle. The results indicating waist proprioception training could achieve the same effect as CSE did, and deserve more attention in therapy. In addition, all exercises investigated in this study were of use in rehabilitating LDH patients. Further work is need, however, more effectiveness treatments to subgroups of LDH.

PO-0464

AQUIRED FLAT FOOT: TWO RARE CAUSES

Nasir Mansoor Sahibzada
CMH Kohat, Pakistan, Pakistan

Objective: To present two rare causes of acquired flat foot. *Method:* Two cases of acquired flat foot, diagnosed after significant delay are reported. Thirteen years old previously healthy boy presented with one year history of pain right foot on walking and playing and occasional falls while running. There was history of trauma to the right foot. On examination he had a right flat foot, weak foot inversion and adduction. There was no past or family of rheumatic or orthopedic problems. X-ray was normal. A provisional diagnosis of tibialis posterior tear was made and confirmed on MRI.Second patient, a 23 years old previously healthy male presented with progressively increasing pain and swelling right foot for the last one year. The pain was aggravated by prolonged standing and walking. There was no history of trauma or joint pains. On examination he had right flat foot along with mild swelling, tenderness on the medial aspect. X rays revealed an accessory navicular bone. *Results:* The first patient was advised NSAIDs and medial arch support and was referred to orthopedic surgeon for surgical repair/ tendon transfer of the tibialis posterior. The second patient was advised rest, NSAIDs and modified footwear and medial arch support. Pain and swelling improved remarkably. Surgical option was explained and reserved for resistant situation. *Implication/impacton rehab:* Tibialis posterior rupture and accessory navicular bone are documented cause of acquired flat foot but are often missed and diagnosed late. Early diagnosis and rehabilitation can prevent complications and aid early recovery.

PO-0465

QUALITY OF LIFE IN PATIENTS WITH ROTATOR CUFF INJURY: A PILOT STUDY

Zhao Ma, Yong Xuan
Beijing Hospital

Objectives: To investigate the influence of rotator cuff injury on the quality of life of the patients. *Methods*: 2012 May to 2012 December, 30 cases of patients with rotator cuff injury were randomly selected as the research objects. The SF-36 questionnaire was used for investigation on quality of life of those patients, compared with baseline of health people. *Results*: Two of eight indicators in the SF-36 questionnaire are statistically lower in patients with rotator cuff injury, including the indicator of physical function (67.9 vs. 90.6, p=0.005) and the indicator of body pain (48.7 vs. 85.6, p<0.0001). The other six indicators showed no significant abnormality. *Conclusions:* The rotator cuff injuries affect the quality of life of the patients.

PO-0466

ULTRASONOGRAPHIC ASSESSMENT OF THE FEMORAL CARTILAGE IN OSTEOARTHRITIS PATIENTS WITH AND WITHOUT OSTEOPOROSIS

Alparslan Bayram Çarlı[1]*, Selim Akarsu[2], Levent Tekin[2], Muzaffer Sağlam[3], Levent Özçakar[4], Mehmet Zeki Kıralp[2]
[1]Bursa Military Hospital, Department of Physical and Rehabilitation Medicine, Turkey, [2]Gülhane Military Medical Academy Haydarpaşa Training Hospital, Department of Physical and Rehabilitation Medicine, Turkey, [3]Gülhane Military Medical Academy Haydarpaşa Training Hospital, Department of Radiology,Turkey, [4]Hacettepe University Medical School Department of Physical and Rehabilitation Medicine, Ankara, Turkey, Turkey

Objective: To evaluate the possible effect of osteoporosis (OP) on the femoral cartilage thickness in female patients with knee osteoarthritis (OA) using ultrasonography (US). *Methods:* 80 patients with a diagnosis of knee OA. 40 subjects -who were diagnosed to have also OP - comprised Group I and the remaining 40 subjects without OP comprised Group II. Antero-posterior knee radiographs were obtained in standing position and they were evaluated according to Kelgren-Lawrence (K-L) grading scale. Femoral cartilage evaluations were performed using a linear array US probe (7-12 MHz). Bilateral cartilage thickness measurements were done axially at the suprapatellar region and mid-point measurements were taken from the lateral condyle, intercondylar area and the medial condyle. An eventual mean value of three repeat measurements was recorded for each site. Additionally, ultrasonographic femoral cartilage grading was also performed for each knee. *Results:* Left knee scores pertaining to both gradings were found to be lower (p=0.02, p=0.04, respectively) in Group I when compared with those of Group II. The two grading scores were positively correlated for both knees -being statistically significant only for the right knee though (r=0.727, p=0.01). No significant difference was found between the groups in terms of femoral cartilage thicknesses (all p>0.05). *Implications/ Impact on rehabilitation:* Ultrasonographic and roentgenographic gradings were consistent and patients with OP had lower scores for both gradings. On the other hand, the presence of OP did not seem to have any effect on cartilage thickness measurements.

PO-0467

THE PROBABILITY OF SPONTANEOUS REGRESSION OF LUMBAR HERNIATED DISC: A SYSTEMIC REVIEW

Chun-Chieh Chiu[1]*, Wen-Yen Hsu[1], Tai-Yuan Chuang[1], Kwang-Hwa Chang[1], Chien-Hua Wu[2], Po-Wei Lin[1]

[1]Department of Physical Medicine and Rehabilitation, Wan Fang Medical Center,Chinese Taipei, [2]Chung-Yuan Christian University, Chinese Taipei

Objective: To determine the probability of spontaneous disc regression among each type of lumbar herniated disc through systemic review. *Methods:* The Medline, Cochrane Library, CINAHL, and Web of Science were searched using keywords for relevant original articles published before Dec 2012. Articles were limited to English language and human. To be included in this review, articles need to (1) include patients with lumbar disc herniation treated conservatively, (2) have at least two times of image evaluation of lumbar spine, and (3) exclude patients with prior lumbar surgery, spinal infections, tumors, spondylolisthesis, or spinal stenosis. Two reviewers independently extracted studies details and findings. Thirty studies met the inclusion criteria. Furthermore, if the classification of herniation was agreeable to the recommended classification of the combined Task Forces, the data were used for combined analysis of the probability of disc regression of each type. The data were applicable in nine studies for probability calculation. *Results:* After combined analysis of nine studies for probability of spontaneous disc regression, the rate of spontaneous regression is 96.3% for disc sequestration, 70.1% for extrusion, 40.9% for protrusion, and 13.3% for disc bulging. The rate of complete resolution of herniation is 42.9% for sequestrated discs and 15.0% for extrusion discs. *Implications on Rehabilitation:* The reviewed evidences support that spontaneous regression of herniated tissue indeed happens, even completely resolves. Disc extrusion and sequestration had significantly higher possibility of spontaneous regression than disc bulge and protrusion; and disc sequestration had significantly higher rate of complete regression than disc extrusion.

PO-0468

A NEW STRATEGY FOR CONSERVATIVE TREATMENT OF NECK PAIN AND LOW BACK PAIN

Qian Gao, Fei Wang, Gang Wang, Zhi-Li Yang, Wen-Yu Zhang, Sha Wen

Department of Rehabilitation Medicine,Chinese PLA General Hospital

Objective: There are too many methods in conservative treatment for neck pain and low back pain.Because the target of therapy is missed,The "over-therapy and blind-therapy" is the main problem in this area. The purpose of the paper puts forward A new strategy of conservative treatment to solve the problem. *Method:* The authors summarize the clinical practice and Myofascial cycle pathogenesis hypothesis of neck pain and low back pain. The authors attempt to set up relationship between pathogenesis hierarchical structure (muscle,nerve,joint and blood vessel) of neck pain and low back pain and clinical manifestations. *Results:*The new strategy is the stratified assessment and the targeted therapy based on mechanisms of Myofascial cycle pathogenesis of neck pain and low back pain. The stratified assessment in neck pain and low back pain is evaluation of extent of spinal cord structure (muscle,nerve,joint and blood vessel) lesions,the targeted therapy is selection of therapeutic methods accord to pathogenesis hierarchical structures. *Implications:* A new strategy for conservative treatment of neck pain and low back pain should be the stratified assessment and the targeted therapy. The new theory is need to be developed at present and will be prooved on more evidence in future.

PO-0469

EFFECTIVENESS OF ULTRASOUND COMBINE TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION (TENS) IN TREATMENT OF UPPER TRAPEZIUS MYOFASCIAL PAIN: A RANDOMIZED CONTROLLED TRIAL

Bootsakorn Loharjun[1]*, Jariya Boonhong[2], Donruedee Srisuppaphon[1], Phakhaon Saiphan[1], Sirapat Intarujikul[1]

[1]Sirindhorn National Medical Rehabilitation Centre,Thailand, [2]Faculty of Medicine, Chulalongkorn University, Thailand

Objective: Myofascial pain syndrome (MPS) is one of the most common causes of musculoskeletal pain and common dysfunction. Among various therapeutic approaches, the simultaneously combined treatment using ultrasound and transcutaneous electrical nerve stimulation (or US-TENS) may provide a novel curative strategy for MPS victims. We assessed the effectiveness of US-TENS in comparison with solely therapeutic ultrasound (US) for treatment of MPS in upper trapezius muscle. *Method:* The MPS patients who met the inclusion criteria of the current were randomized into two groups. Participants had received ten treatment sessions of US-TENS (intervention group) or US with sham TENS (control group) for two weeks. They were assessed for pressure pain threshold (PPT). Visual analogue scale at rest (VAS-R) and that during activity (VAS-A) on the first day and the day after ten treatment sessions were also evaluated by the blind assessor. *Results:* Among 19 participants who received US-TENS showed increase of PPT by 9.6%, reduction of VAS-R and VAS-A by 57.0% and 56.2%, respectively. In control group, 20 participants had the elevation of PPT by 19.9%, decrease of VAS-R and VAS-A by 64.2% and 50.7%, respectively. However, the therapeutic tendencies between US-TENS and US were comparable by which there were no differences in average change of PPT and both VAS values (p>0.05) between the intervention and control groups. *Implications/Impact on rehabilitation:* Either US-TENS or therapeutic US was effective when being used as physiotherapy for acute and sub-acute MPS. However, there was no significant difference found between these two types of treatment.

PO-0470

PLATELET RICH PLASMA INJECTION IN THE TREATMENT OF CHRONIC ROTATOR CUFF TENDINOPATHY: A RANDOMIZED CONTROLLED TRIAL WITH A ONE-YEAR FOLLOW-UP

Serdar Kesikburun*, Arif Kenan Tan, Bilge Yılmaz, Evren Yaşar, Kamil Yazıcıoğlu

Gülhane Military Medical Academy, Department of PM&R, Turkish Armed Forces Rehabilitation Center, Ankara, Turkey, Turkey

Objective: To investigate the effectiveness of platelet rich plasma (PRP) injections in chronic rotator cuff tendinopathy in a double-blind randomized placebo controlled clinical trial. *Method:* The patients with shoulder pain for more than 3 months and with MRI findings of rotator cuff tendinosis or partial tendon rupture were randomized into the PRP group (n=20) or placebo group (n=20). The ultrasound-guided injection into the subacromial space contained either 5 ml of PRP prepared using the platelet separation kit or 5 ml of saline in a syringe covered opaque band. All patients received a six-week standard exercise program. The outcome measures (the Western Ontario Rotator Cuff Index (WORC), the Shoulder Pain and Disabilty Index (SPADI), 100mm-visual analog scale (VAS) of shoulder pain with Neer test, and shoulder range of motion) were assessed at baseline and 3, 6, 12, 24 weeks and one year after injection. *Results:* Comparison of the patients revealed no significant difference between the groups for change in the WORC, SPADI and VAS scores at one year (p=0.174, p=0.314, p=0,904, respectively).

Similar results were found at other assessment points. Within each group, the scores for WORC, SPADI and VAS showed significant improvement compared to baseline at all time points (p<0,001). In the range of motion measures, there wasn't any significant interaction between group and time. *Implications/Impact on Rehabilitation:* The PRP injection was found to be no more effective in improving quality of life, pain, disability, and shoulder range of motion than placebo in patients with chronic rotator cuff tendinopathy who were treated with an exercise program.

PO-0471

RELIABILITY OF MAXIMUM ISOMETRIC TRUNK MUSCLE MOMENT MEASUREMENTS IN SUBJECTS OLDER THAN 50 YEARS OF AGE

Thomas Kienbacher
Rehab Zentrum Liesing, Austria

Objective: To test short- and long-term test-retest reliability of maximum isometric trunk muscle moment measurements in healthy subjects older than 50 years and to compare these results with those from subjects younger than 50 years of age. *Method:* 41 elderly subjects (21 females) between 50 and 90 years and 40 younger subjects (18 females) between 18 and 50 years performed maximum isometric trunk muscle extension, flexion and rotation tests with 3 different dynamometers (DAVID®, Fi). Tests were repeated after 1-2 days (short-term) and after 6 weeks (long-term). Reliability was evaluated for age and gender related subgroups separately with the intra class correlation coefficient (ICC2,1), the standard error of measurement (SEM and SEM%) and the smallest real difference (SRD and SRD%). *Results:* No evidence for inter-test bias in any of the measurements was noted. Measurement precision for maximum trunk extension and flexion moments as quantified by the SEM% and SRD% varied up to 10% (SEM%) and up to 34% (SRD%) in both elderly and younger male and female subjects. SEM% and SRD% were worse for trunk rotation tests. Test-retest agreements were high (ICC2,1 >0.75) in any of the measurements and unanimous between age and gender groups. *Impact on Rehabilitation:* Isometric maximum trunk extension and flexion moment measurements from both female and male subjects older than 50 years are as highly reliable as those from younger ones. Thus, these measurements are able to detect expected changes as a result of exercise interventions.

PO-0472

THE EFFECT OF PHYSICAL THERAPY ON SYNOVIAL PERFUSION AND FUNCTIONAL STATUS IN PATIENTS WITH KNEE OSTEOARTHRITIS

Sonja Muraja, Branko Markulinčić*
Special hospital for physical medicine and rehabilitation Stubičke Toplice, Croatia

Purpose the aim of our study is to present efficiency of physical therapy in treatment of knee osteoarthritis (OA) and evaluate synovial perfusion after termotherapy. *Materials and methods:*In this study 40 patients with knee OA were included at the average age of 63. 20 patients received short wave diathermy (SWD) whereas 20 of them received kriotherapy. All patients were given kinesitherapy and the length of treatment was 15 days. Shimatzu 2200 was used for ultrasound examination by means of a linear probe at the frequency of 8,5-10 MHz. Synovial blood flow was visualised with Doppler ultrasonography and the unit then calculated resistive index (RI) as indicator of synovial perfusion. Doppler measurements were done before, immediately after and 1 h after termotherapy. Clinical evaluation included knee pain on VAS and WOMAC. Both parameters were observed before starting, after 15 days and 4 months after treatment. Results statystical analysis was carried out with t- test above the level of p = 0,01. Clinical parameters showed significant improvement after 15 days and also 4 months after physical therapy in both groups. There were no significant changes of RI after kriotherapy, while we found a significant decrease of RI immediately after SWD. There were no differences in clinical improvement between two groups. *Conclusion:* Physical therapy proved to be efficient in treating knee OA. Kriotherapy had no influence on synovial perfusion, while SWD had only a short term increased synovial perfusion which did not influence either early or long term outcome of treatment applied.

PO-0473

FUNCTIONAL EVALUATION IN POLITRAUMATIZED PATIENTS WITH PELVIC FRACTURES

Alina Totorean[1]*, Bogdan Anglițoiu[2], Roxana Onofrei[1], Andreea Niță[1], Mircea Popescu[3]
[1]Timişoara University of Medicine and Pharmacy, Rehabilitation Department, Romania,Romania, [2]Timişoara University of Medicine and Pharmacy, Orthopaedie and Traumatology Department, Romania,Romania, [3]Politrauma Department from Timişoara County Hospital, Romania

*Objective:*s. Functional evaluation in politraumatized patients with pelvic fractures using a Zebris three-dimensional ultrasound-based system for gait analysis. *Material and method:* 18 politraumatized patients with surgically-treated pelvic fractures were evaluated. 4 patients had only pelvic fractures, 8 patients had associated leg trauma (tibial and femoral fractures, crural or common peroneal nerve lesion), and 4 had both arm and leg multiple traumas. All patients followed a 12-month rehabilitation program, adapted to associated lesions. *Results:* Evaluated Zebris spatial-temporal gait parameters were: swing and stance period (%), single support period (%), load response period (%), step time, step length, stride length. Gait analysis showed quasi-normal parameters at 12 months post-surgery in patients with pelvic fractures. Cases with associated leg traumas presented abnormal parameters. No significant differences were recorded between patients with pelvic fractures and leg traumas compared with those with associated arm and leg traumas. *Implications/ Impact on rehabilitation:* Quantitative gait analysis offers important data for the rehabilitation process. The politrauma patients with pelvic fractures remain a challenge for the rehabilitation specialist.

PO-0474

THE SURVEY OF PHYSIOLOGICAL FUNCTIONS IN 30 OSTEOPOROSIS PATIENTS WITH KYPHOSIS

Zhiwei Hu, Yanyan Yang, Mouwang Zhou
Department of Rehabilitation Medicine, Peking University Third Hospital

*Objective:*To explore physiological dysfunctions in osteoporosis patients with kyphosis and provide a direction for rehabilitation. *Methods:* 30 osteoporosis patients with kyphosis (test group)were investigated with Cobb angle, pain, low back muscle strength, spine activity, balance, pulmonary function and activity of daily life. 30 cases without kyphosis were as control (control group). *Results:* There were significant differences in height decrease, VAS, low back muscle strength, pulmonary function and Oswestry disability index (ODI) by t-test. Balance in both groups is lower than normal adults. Correlation analysis showed ODI were correlated with the timed 'up and go', occipital-wall distance, VAS, thoracic expansion amplitude, height decrease and six min walk test. *Implications on Rehabilitation:* Kyphosis may affect height, pain, low back muscle strength, pulmonary function and activity of daily life among osteoporosis patients with kyphosis. Rehabilitation program should include: pain relief and low back muscle strength, pulmonary function, balance training.

PO-0475

OBSTRUCTION OF THORACIC DUCT IN A PATIENT WITH ANKYLOSING SPONDYLITIS

Ümüt Güzelküçük*, Yasin Demir, Kutay Tezel, Evren Yaşar, Mehmet Ali Taşkaynatan, Ahmet Özgül, Arif Kenan Tan

Turkish Armed Forces Rehabilitation Center, Turkey

The thoracic duct of the lymphatic system is largest lymphatic vessel in the body. It collects most of the lymph in the body and drains into the brachiocephalic vein. A 51-year-old man with 25 years of ankylosing spondylitis, receiving treatment with etanercept presented with fatigue, and swollen lowerlimbs of 8-month history. Physical examination revealed bilateral pretibial edema, and moderate amount of ascites. The routine biochemical tests, bilaterally low extremity arterial and venous doppler ultrasound was normal. Abdominal imaging showed intraperitoneal effusion and periportal edema. We planned the lymphoscintigraphy and it demonstrated obstruction of distal part of the thoracic duct. The commonest causes are thoracic surgery, trauma, or malignancy obstructing the duct. There are numerous less common causes, including tuberculosis, filariasis and lymphangioleiomyomatosis. To our knowledge this is the first ankylosing spondilitis case with obstruction of the thoracic duct.

PO-0476

EFFECTS OF KINESIO TAPING ON RELIEVING SWELLING AND PAIN IN PATIENTS WITH ACUTE ANKLE SPRAIN:A PILOT STUDY

Bo Yu

Shanghai First People's Hospital Affiliated to Shanghai Jiaotong University

Background: Kinesio Tape (KT) has gained huge popularity in rehabilitation setting for decades, yet there is still less scientific evidence and it is even frowned upon by lots of professionals, partly due to the lack of quantitative analysis or somewhat conflicting results. *Objective:* This pilot study was designed to investigate instant effects of KT on relieving major complaints, such as swelling and pain of patients with acute ankle sprain (AAS). *Method:* 40 AAS patients 1:1 matched in body mass index (BMI) and degree of injury were randomly divided into study group (applied KT and routine local modalities) and control group (only local modalities) with 20 cases included in each group. Swelling girth (using a modified 8-figured circumference measure), Visual Analogue Scale (VAS) and Self Assessed Function for Lower Quarter (SAF) were managed to evaluate the degree of swelling, pain and ankle function as a whole.A matched t -test was used to compare the significance of mean differences of quantitative data between two groups at each time point. A repeated measures ANOVA was also adopted for analyzing the repeated designed data. $p<0.05$ was considered as statistically significant. Result The baseline and related scale of AAS before treatment were not significantly different ($p>0.05$). Ankle circumference in study group reduced more significantly than that in control group at the 1st day (38.31±1.24 cm vs. 39.80±0.84 cm, $p<0.01$, t=4.449) and 3rd day (37.22±1.17 cm vs. 38.83±1.02 cm, $p<0.01$, t=4.638) after intervention. The tendency of VAS showed the same inclination as girth's ($p<0.01$, t=4.783, t= 4.129).There were no significant differences between two groups at 5th day after therapy as far as VAS and girth were concerned, but the results of study group were still slightly better than that of control group.The SAF showed significantly difference between two groups through the treating process (FSAF=11.733, $p<0.05$). No evidence of obviously allergic event was recorded. *Conclusion:* KT can be an effective method of integral therapy on AAS, and it invites further studies and clinical applications on this area.

PO-0477

TO EVALUATE THE RESULTS OF OPERATION FOR NERVE ROOT TYPE CERVICAL SPONDYLOSIS BY USING SURFACE EMG

Wang Junjie[1], Jiao Gang[2], Lv Hong[2]

[1]Shanghai Sunshine rehabilitation certer, China, [2]Shanghai Kaiyuan Orthopaedic Hospital, China

Objective: Using surface electromyography (sEMG) technical assessment of nerve root type cervical spondylosis (Nerve root type cervical spondylosis) after the effects of isokinetic training biceps. Methods C5/6 with unilateral nerve root compression of nerve root type cervical spondylosis in 21 cases, all male, aged 24 to 57 years, mean 43.6 ± 12.05 years. Were hospitalization, surgery and months after the month when the participants took the biceps isometric contraction test, of which 13 cases begin in the month after isokinetic training as a training biceps Group, the others served as controls. Specific *Methods:* sitting position, told his subjects were forced to maintain maximum elbow flexion force 10 s, also produced by Canada's Thought ten channel surface EMG EMG records, testing the uninvolved surface of the biceps EMG median frequency slope (MFs), the average EMG amplitude (AEMG). *Results:* Month after surgery, patients with symptomatic relief in all patients, ipsilateral attenuation of MFs decreased compared with before treatment were significantly different ($p<0.05$). *Conclusion:* Isokinetic training biceps training effect on the true surface electromyography nerve root type cervical spondylosis can be used as clinical assessment of objective indicators, and has good clinical application.

PO-0478

THE ABILITY OF TWO DIFFERENT QUANTITATIVE ULTRASOUND SYSTEMS TO IDENTIFY OSTEOPOROSIS IN WOMEN

Aydan Oral*, Ayse Yaliman, Pinar Kursuz Koseoglu, Dilsad Sindel

Istanbul University, Istanbul Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Turkey

Objective: The aim of this study was to investigate the ability of two different quantitative ultrasound (QUS) systems for identifying women with or without osteoporosis as measured by DXA. *Methods:* Bone status was evaluated using dual-energy X-ray absorptiometry (DXA), a calcaneal and a multi-site QUS device in a series of 113 women aged between 21 and 79 years. Osteoporosis at the lumbar spine (L1-L4 vertebrae) and at the hip (neck of the femur and total hip) was defined according to the WHO criteria in postmenopausal women in the sample studied, a patient being considered as having osteoporosis in the presence of a T-score ≤-2.5 in any of the regions of interest (ROI). In premenopausal women, Z-scores of ≤-2.0 were used for defining osteoporosis or bone mineral density (BMD) below the expected range for age. *Results:* Left heel QUS measurements [quantitative ultrasound index (QUI), broadband ultrasound attenuation (BUA) and speed of sound (SOS)] showed significant correlations with DXA BMD measurements in all ROIs mentioned ($p<0.001$ for all). However, no significant correlations were found between either radial or tibial SOS measured at the left side using the multi-site QUS and DXA BMD measured in any ROI, except for the only significant correlation between left tibial SOS and lumbar spine BMD ($p=0.023$). While the areas under the receiver operating characteristic curves (AUCs) for calcaneal QUS variables for predicting BMD below the expected range or osteoporosis were 0.727 for calcaneal QUI ($p<0.001$), 0.722 for calcaneal BUA ($p<0.001$), and 0.742 for calcaneal SOS, the AUCs for radial [0.617 ($p=0.056$)] and tibial SOS [0.555 ($p=0.055$)] represented poor or failing accuracy. *Conclusion:* The results of this study in the sample studied indicated the usefulness of only heel QUS in predicting osteoporosis or BMD below the expected range in women.

PO-0479

EXTRACORPOREAL SHOCK WAVE THERAPY IN PLANTAR FASCIITIS

José Antonio Mirallas-Martínez
General University Hospital of Castellón, Spain

Objective: To study the effectiveness, tolerance and satisfaction of extracorporeal shock wave therapy (ECSWT) in plantar fasciitis. *Method*: Between 24 february, 2002 and 31 october 2012, we prospectively studied 161 consecutive adults patients with plantar fasciitis, treated with ECSWT, 1 session for week, 4 weeks. All were assessed before each treatment and one month, after completion of therapy. SPSS 17.0 was used for statistic analysis.102 (63.4 %) were women, and 59 (36.6 %) men, of 51.6±11.2 (24-74) years old. The side was left in 79 (49.1 %) and right in 82 (50.9 %). The mean duration of symptoms was 1.5±2.2 years. They had previously been treated with: medication 141 (87.5%), steroid injection 70 (43.5%), electrotherapy 70 (43.5%), sonotherapy 93 (57.8%), Cyriax 46 (28.6%), thermotherapy 25 (15.5%), kinesitherapy 70 (43.5%) and others 45 (28%). The interval between the last treatment and the ECSWT was 2±2.4 months. *Results:* The energy density was 0.35±0.13 mJ/mm^{2,} with 1468.8±565.5 impulses. At 1 month after the ECSWT, the evaluation resulted in significant improvement in pain (77.8% less in activity) and in active articular rank (5.4º±2.2º more). The limitations in daily living activity, sporting and working activity that initially existed in 161 (100 %), persisted at the month in 10 (6.2%) and 13 (8.1%) respectively. The fasciitis that existed in 29 (18%) and calcification in 6 (3.7%) disappeared. The spur that existed in 62 (42.9%) persisted. The tolerance was good without important pain in 122 (75.8%) and without secondary effects of interest. *Implications:* Energy used, number of shots and pain comparative with others are respectively: 0.35 mJmm^2/0.45 mJmm^2, 1468.8/2000, and 77.8%/21%-84%. ECSWT is increasingly used for plantar fasciitis, but limited evidence supports its use. A meta-analysis of data from six randomised-controlled trials (RCT), that included a total of 897 patients was statistically significant in favour of ECSWT for the treatment of plantar heel pain but the effect size was very small. Of 17 articles included of fasciitis treated with ECSWT: effectiveness 12, not 4 and doubt 1. A sensitivity analysis including only high quality trials did no detect a statistically significant effect. Obtaining evidence is often complicated, so that the physician often receives contradictory results. At present there is evidence for the effectiveness of ECSWT in plantar fasciitis. *Impact on Rehabilitation:* ECSWT in plantar fasciitis, are well tolerated, and shows a significant effectiveness for pain relief, functional restoration, with a mean satisfaction of 8.1±1.9 (0-10).

PO-0480

PROLAPSED LUMBAR INTERVERTEBRAL DISC (PLID) -CLINICAL EVALUATION OF 240 CASES

M Mahfuzur Rahman
Sir Salimullah Medical College & Mitford Hospital, Dhaka, Bangladesh, Bangladesh

Objectives: The objective was to see the age, sex, occupational pattern and to evaluate the effectiveness of different modalities of physical treatment in the conservative management of patients with PLID. The study was conducted in the department of Physical Medicine and Rehabilitation, SSMC & Mitford Hospital, Dhaka, Bangladesh, from July 2011 to June 2012. *Methods:* The patients were grouped on simple random sampling into the following groups:- Group i) SWD group-having 15 min exposure three times weekly for two weeks. ii) SWD group-having 15 min exposure three times weekly plus spinal muscle exercises daily for two weeks. iii) SWD group-having 15 min exposure three times weekly plus spinal muscle exercises daily for two weeks along with NSAIDs and muscle relaxant. All the patients were given ADL (Activity of Daily Living) instructions and the patients were evaluated periodically after every two weeks to observe the results. *Results:* The improvement of symptoms was 51.25% in group i), 67.50% in group ii) and 86.25% in group iii). The combined treatment shows better result. Next Steps An increased awareness among the common people about the development of such a disorder due to gross negligence and lack of knowledge about physical balance to overcome the situation must be highlighted through different media and with personal physician contact.

PO-0481

INJECTIONS OF THE HYALURONIDASES (LIDASE) AND CHONDROPROTECTOR (ALFLUTOP). IS EFFECTIVE METHOD IN COMPLEX REHABILITATION TREATMENT PATIENTS WITH LUMBAR RADICULOPATHIES

Vitaliy Gubenko*, Georgii Marchuk, Ludmila Melnichenko
Nationa Medical Academy of Postgraduate Education, Canada

Introduction: The treatment of patients with low back pain and especially lumbar radicular pain is one of most challenging problem of modern medicine. *Objectives:* The goal of this study was to determine the effectiveness of combined injections of the hyaluronidase (Lidasa) and chondroprotector (Alflutop) in the treatment of patients with lumbar radiculopathies due to compression by disc herniation. *Methods:* 34 patients with lumbar radiculopathies due to disc herniation received paravertebral and nerve root injections of hyaluronidases (Lidasa) and chondroprotective agent (Alflutop) with standard rehabilitation treatment including physiotherapeutic modalities (TENS, laser etc.), kinesiotherapy, traction, NSAID and other medication. A control group of 29 patients of comparable age, sex, clinical syndrome and level of pain received the same standard rehabilitation treatment and lidocaine injections but without Lidasa and Alflutop. The Visual Analogue Scale (VAS), McGill Pain Assessment Questionnaire, Range of Motion and MRI were used to determine effectiveness of treatment. *Results:* After 6 weeks of the dynamics of pain reduction, clinical symptoms and MRI parameters (decreased size of herniated disc) were more positive in the main group compared to control ($p<0.05$). Further investigation phase 2 will follow in 12 weeks and 18 weeks. *Implications:* Initial assessment revealed that the combination of the hyaluronidase (Lidasa) and chondroprotector (Alflutop) injection is an effective method in complex rehabilitation treatment in patients with lumbar radiculopathies.

PO-0482

LONG-TERM STUDY OF THERAPEUTIC LASER-MASSAGE FOR THE TREATMENT OF TENDINOSIS

Edward Ryan
USA Basketball, United States

Objective: Previous studies with low-intensity lasers provided mixed results for the treatment of tendinosis. This study investigates the efficacy of a high power therapeutic laser-massage technique to provide more consistent clinical outcomes. *Method:* Patients diagnosed with tendinopathy by blinded ultrasound assessment were randomized into laser treatment or sham groups. The laser group received 8 treatments withinin 18 days, each lasting 5.5 min, delivering 10 J/cm^2 over the elbow. Clinical outcomes included both functional measurements and visual analog pain scores. Patients were assessed before treatment, after the treatment period and then at 3, 6 and 12 months. *Results:* The laser treatment group improved in all measures at the end of the treatment period and the trend continued to grow during the follow up. At the 3, 6 and 12 month assessments, the laser group had statistically significant improvement in Handgrip Strength in the affected arm compared to sham control. The treatment group also had decreased Functional

Impairment, Pain With Maximal Handgrip, Pain With Resistance Extension Middle Finger and Lateral Pain With Palpation when compared with the sham control group. *Implications/Impact on rehabilitation:* This study demonstrates the effectiveness of high-power therapeutic Laser-Massage for the treatment of tendinosis in the elbow. This result demonstrates that Laser-Massage stimulates healing in the tendon that continues for months after the treatments have been administered leading to consistent long-term improvement. Clinicians should consider this conservative therapy as a first-line treatment option to help reduce pain and provide patients long-term relief from Tennis Elbow.

PO-0483

A CLINICAL RESEARCH ON TREATMENT OF SUBAXIAL CERVICAL INSTABILITY BY CERVICAL STABILITY TRAINING AND SOFT TISSUE TAPING

Shuyan Qie, Quan-Sheng Ma, Xia-Lin Zhang, Yu Pan, Li-Hua Zhang
Dept. of Rehabilitation Medicine, Beijing Rehabilitation Center

Objective: To observe the clinical effect of cervical stability training and soft tissue taping to subaxial cervical instability patients combined with sympathetic nervous symptoms. *Methods:* A total of 46 subaxial cervical instability patients were randomly divided into two groups. In the treatment group, 24 patients were treated with cervical stability training and soft tissue taping. The cervical stability training were used five times a week by sling exercise, the taping technique were used twice a week. In the control group, 22 patients were treated only with cervical stability training. All patients were evaluated with VAS (Visual analogue scale), NDI (neck disability index)and HRV (heart rate variability,included TP,LF,HF,LF/HF) after 4 week- training. *Result:* After 4 week-training, both groups scored lower on VAS, NDI,LF and LF/HF significantly compared with pre-treatment ($p<0.05$), the treatment group was more lower than the control group ($p<0.05$); TP and HF of both groups had no significant difference after treantment ($p>0.05$). *Implications:* In this research we drew a conclusion that the cervical stability training and soft tissue taping can enhance the cervical stability, relieve the symptoms and improve the sympathetic nervous function of subaxial cervical instability patients. The cervical stability training worked through activation of the local stabilized muscles, which can improve the intersegmental stabilization, And the soft tissue taping worked through accordion effect to relieve the pain and other symptoms and activated the muscles reflectively. We also concluded that the HRV test was an effective means for assessment of sympathetic nervous system.

PO-0484

A NEW METHOD TO REDUCE THE PAIN IN KNEE-JOINTS IMMOBILIZATION-SEGMENTAL NEUROMYOTHERAPY

Yanyan Yang
Peking University 3rd Hospital

Objectives: To study the effect of segmental neuromyotherapy (SNMT) on reducing the pain in immobilization and its influence on the patients' functional recovery. *Methods:* 32 patients were involved in this study, whose range of motion (ROM) training of knee joints were delayed by pain. 17 patients (SNMT team) received SNMT therapy, followed by normal immobilization and other functional rehabilitative training. The else 15 patients (control team) just received normal immobilization and other functional rehabilitative training. 0-10 Numeric Rating Scale (NRS) were valued by the patients before and after SNMT therapy, and before and after immobilization, and 1 week, 4 weeks, 3 months and 6 months after the treatment time point. Passive range of motion (PROM) were measured before and after SNMT therapy, and also 4 weeks and 6 months after the treatment. *Results:* The average NRS scores were 8.02±1.28 in SNMT team and 7.24±1.01 in control team, and 3.35±1.67 immediately after SNMT, 2.43±1.34 6 months after in SNMT team and 3.43±1.44 in control team. The scores in SNMT team after treatment changed significantly to the ones before SNMT therapy ($p=0.000$). The average ROM before SNMT therapy was 90.50±25.06 degree in SNMT team and 88.39±26.26 degree in control team, 106.83±25.11 immediately after SNMT trerapy, 119±27.27 degree 4 weeks after in SNMT team and 103.72±7.08 in control team ($p=0.004$), 126±25.64 6 months after in SNMT team and 123±23.27 degree in control team. *Implications & Impact on Rehabilitation Medicine:* This study proves that SNMT has immediate and long- term effects on the pain in knee joint's immobilization, and can also help to develop the PROM immediately.

PO-0485

SONOGRAPHIC EVALUATION OF PLANTAR FASCIA

Seyed Kazem Shakouri*, Arash Babaei-Ghazani, Bina Eftekhar Sadat
Physical Medicine and Rehabilitation Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Objective: There is currently no objective reliable diagnostic test for plantar fasciitis in as much as diagnosis cannot be made on the basis of finding a heel spur on radiography (x-ray). Ultrasound is an excellent tool for evaluating common ankle problems especially plantar fasciitis (PF). *Method:* This prospective study was conducted on 36 patients with heel pain and the physical characteristics of PF. In addition, heels of 36 asymptomatic volunteers, age and sex matched were recruited into the study as a control group and were examined to provide a baseline as to the normal appearance of the plantar fascia. Sonographic examinations were performed with a commercially available scanner. Heel fat pad thickness was also measured. *Results:* Significant increase was observed in plantar fascia thickness, heel fat pad thickness, Daily pain severity, Morning pain severity, weight, and BMI in patients with PF in relation to the control group ($p=0.0001$). Plantar fascia thickness in conjunction with calcaneus were 6.24 ± 1.12 and 2.76 ± 0.88 mm in case and control groups, respectively. This different was statistically significant ($p=0.0001$). *Implications/Impact on rehabilitation:* Although MRI is the modality of choice in the morphologic assessment of different plantar fascia lesions; sonography can also serve as an effective time-saving tool in diagnosis and rehabilitation follow-up of PF.

PO-0486

SUPERIORITY OF INTRA-ARTICULAR STEROID INJECTION OVER NSAIDS AND OTHER PHYSIOTHERAPEUTIC MEASURES IN THE MANAGEMENT OF FROZEN SHOULDER

M Mahfuzur Rahman
Sir Salimullah Medical College & Mitford Hospital, Dhaka, Bangladesh, Bangladesh

Objectives: To evaluate the effectiveness of intra-articular steroid injection in patients with frozen shoulder and to lessen the sufferings as well as rehabilitation both physically and psychologically. The study was conducted in the department of Physical Medicine and Rehabilitation, SSMC & Mitford Hospital, Dhaka, Bangladesh, from March 2012 to August 2012 for the period of six months. *Methods:* 120 patients were included in this study. The patients were grouped on simple random sampling into the following groups:-i) Intraarticular injection (Methyl-prednisolone-40 mg.) fortnightly for 4 doses along with NSAIDs plus ROM exercises daily.ii) SWD group -having 15 min exposure three times weekly plus ROM exercises daily for eight weeks along with NSAIDs. All the patients were evaluated periodically after every two weeks to observe the results. *Discussion:* The study showed maximum patients in group

i) 47 out of 60 (78.33%) except few showed dramatic improvement irrespective of duration of the disease with intra-articular steroid injections along with NSAIDs and the early cases showed quick recovery. On the other hand in group ii) the improvement was 28 out of 60 (46.66%).*Potential Implications:* Intra-articular steroid injections are more effective though requires special application skills in reducing the sufferings of the patients from frozen shoulder. Next Steps Large scale randomized trial should be studied with safety measures.

PO-0487

THE CLINICAL EFFECT COMPARISON BETWEEN OPEN AND CLOSED CHAIN EXERCISE AFTER MEDIAL PATELLOFEMORAL LIGAMENT RECONSTRUCTION

Feng Zhang[1], Jun Wang[2], Fei Wang[3], Hui-Jun Kang[3], Bai-Cheng Chen[3]

[1]Department of Rehabilitation Medicine, Third Hospital of Hebei Medical University, [2]Depatrtment of Orthopedics, Cangzhou central hospital, [3]Department of Joint Surgery, Third Hospital of Hebei Medical University

Objective: To compare the effect of open-chain and closed-chain exercise on the long-term and short-term outcome after medial patellofemoral ligament reconstruction. *Methods:* Forty patients (40 knees) who underwent medial patellofemoral ligament reconstruction due to chronic patellar dislocation were randomly divided to open-chain exercise (OCE) group (20 knees) and closed chain exercise (CCE) group (20 knees). At 3rd, 6th and 12th month after surgery, the follow-up evaluations were performed, including visual analog scale, range of motion, mean change of thigh circumference, Lysholm score and single leg hop test. *Results:* At 3rd month after surgery, the visual analog scale score and mean change of thigh circumference in CCE group was lower than the OCE group while the Lysholm score of CCE group was higher than the OCE group (p<0.05). At 6th month after surgery, the score of Lysholm and single leg hop test in CCE group was higher than the OCE while the mean change of thigh circumference in CCE group was lower than the OCE group (p<0.05). At 12th month after surgery, the score of single leg hop test in CCE group was higher than the OCE group (p<0.05). *Impact on Rehabilitation:* The closed-chain exercise is better than open-chain exercise in both short and long term outcome after medial patellofemoral ligament reconstruction, including reducing patellofemoral pain, alleviating muscle atrophy and improving knee function.

PO-0488

COMPARISON OF THE SHORT-TERM EFFECT OF DIFFERENT CONSERVATIVE MANAGEMENTS ON HEALTH-RELATED QUALITY-OF-LIFE IN PATIENTS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS

Qing Du[1], Xuan Zhou[1], Li Zhao[2], Peijie Chen[3]

[1]Department of Rehabilitation, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, [2]Department of Pediatric Orthopedic, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, [3]Department of Kinesiology, Shanghai University of Sport

Objective: To compare quality of life between patients with adolescent idiopathic scoliosis (AIS) who treated with rehabilitation, treated with a brace and treated with combined rehabilitation. *Method:* The Chinese version of Scoliosis Research Society-22 (SRS-22) patient questionnaire was filled out by 104 AIS patients who had completed rehabilitation, brace, or combined rehabilitation treatment. The patients were divided into 3 subgroups: rehabilitation (R group), brace (B group) and combined rehabilitation treatment (CR group). Radiological parameters were assessed before and after treatment. The SRS-22 scores were compared among management subgroups. A correlation analysis was used to identify the correlations between SRS-22 scores and total treatment duration. *Results:* The maxiamal Cobb angles were smaller in R group than in B group or CR group. The maxiamal Cobb angles after the conservative treatment were significantly smaller than before treatment in B group and CR group. Function/activity was better for R group than for B group or CR group. Self-image/appearance and satisfaction with management were better for R group and CR group than for B group. There were no significant differences between treatment groups in pain and mental health. There was a significant correlation between total treatment duration and satisfaction with management within B group. *Implications/Impact on Rehabilitation:* Rehabilitation treatment has a positive influence on function/activity. Both Rehabilitation and Combined rehabilitation treatment have a positive influence on self-image/appearance, and satisfaction. We support preference of rehabilitation treatment and combined rehabilitation above brace treatment.

PO-0489

INTERMEDIATE OUTCOME FOR CLINICAL PATHWAY FOR REHABILITATION AFTER HIP FRACTURE

Gangpyo Lee, Jae-Young Lim

Seoul National University Bundang Hospital, Korea

Objective: To evaluate the outcome and major determinants of that during rehabilitation program after hip fracture surgery. *Method:* This is a retrospective study on the basis of chart review in rehabilitation facility. 186 patients who had received the unilateral hip surgery were followed-up from immediate post-operation to 6 months. They participated in the clinical pathway including early individualized rehabilitation, education for activity of daily livings, review of general medical condition, and arrangement of discharge settings. Several measures were used for evaluating functional and cognitive status. One geriatric rehabilitation specialist consecutively checked ambulatory function after discharge, using 3-level grading by physical dependency. *Results:* 74.6% of patients achieved independent ambulatory function at 6 months after surgery. The outcome was correlated with age, mobility (premorbid, transferred to rehabilitation department, at discharge), MMSE score, time interval between injury and operation (TI), LOS, and discharge location. The logistic regression analysis was also performed with representative variables (MMSE score, age, TI, LOS). The fit of this model was good by Hosmer and Lemeshow test (p=0.878). There were 68.1% patients with cognitive impairment (MMSE. *Implications/Impact on Rehabilitation:* This study reveals that well-designed rehabilitation program could restore the ambulatory independency in most elderly patients after hip fracture surgery.

PO-0490

LUMBO-ABDOMINAL MUSCLES ACTIVITIES OF ADOLESCENCES WITH IDIOPATHIC SCOLIOSIS IN STANDING POSTURE

Qing Du[1], Xuan Zhou[1], Li Zhao[2], Junlin Yang[3], Xiaoyan Yan[1], Nan Chen[1], Shuxin Zhang[1], Gang Liu[1], Juping Liang[4], Chao Wu[4], Peijie Chen[4]

[1]Department of Rehabilitation, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, [2]Department of Pediatric Orthopedic, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, [3]The First Affiliated Hospital, Sun Yat-Sen University, [4]Department of Kinesiology, Shanghai University of Sport

Objective: To investigate the lumbo-abdominal muscles activities of adolescent idiopathic scoliosis (AIS) patients in different stand-

ing posture using surface electromyography (sEMG). *Method:* For this study, 26 healthy subjects and 39 AIS patients were recruited. The sEMG signals from the lumbo-abdominal muscles of normal subjects and AIS patients were measured with the FlexComp Infiniti apparatus. The sEMG signals was recorded in different standing posture with and without visual and auditory information input. The activation of the lumbo-abdominal muscles was used to compare results between normal subjects and AIS patients. *Results:* The activation of the concave side of the apex level paraspinal muscle was lower than that of the convex side in the AIS group. The activation of the concave side of the upper end and bilateral apex level paraspinal muscles was lower in the AIS group than in the normal group. The activation of the bilateral apex level paraspinal muscles was lower during standing on the stable plane with visual and auditory information input than during standing on the soft cushion without visual and auditory information input in the AIS group. *Implications/Impact on Rehabilitation:* The activation of the bilateral apex level paraspinal muscles is asymmetry in AIS patients. The activation of the concave side of the upper end and bilateral apex level paraspinal muscles of AIS patients was lower than that of healthy subjects. It is easier to activate the bilateral apex level paraspinal muscles during standing on the soft cushion without visual and auditory information input in AIS patients

PO-0491

EFFICACY OF SYSTEMATIC REHABILITATION FOR LUMBAR DISC HERNIATION

Cheng Zhu
The Yang Zhi Hospital of Shanghai Sunshine Rehabilitation Centre

Objective: To observe the effects of the systematic rehabilitation for lumbar disc herniation (LDH). *Methods:* 228 consecutive cases of LDH were treated with the systematic rehabilitation that included integrated application computer- controlled lumbar traction, physical therapy, manual therapy and lumbar back muscles functional training. *Results:* The degree of lower extremity pain, the range of activities of lumbar spine, Lasgue sign, lower extremity sensorimotor dysfunction and self-care ablity in patients were assessed before and after treatment. The total effective rate was 95%. *Conclusion:* The systematic rehabilitation is an effective metnod for the conservative management of LDH. It can significantly improve patients' life quality.

PO-0492

CLINICAL EFFECTIVENESS OF PERCUTANEOUS ADHESIOLYSIS USING NAVICATH® AND PREDICTIVE FACTORS IN TREATMENT OF PATIENTS WITH LUMBOSACRAL SPINAL STENOSIS

Jung Hwan Lee, Sang-Ho Lee
Wooridul spine hospital, Korea

Objective: The patients with lumbosacral spinal stenosis (LSS) cannot always obtain satisfactory results from epidural injection because perineural/ epidural adhesions prevent the spread of injectate into the epidural space. Percutaneous adhesiolysis (PA) can eliminate the deleterious effects of adhesion. This study was to evaluate the effectiveness of PA in LSS that was refractory to transforaminal epidural steroid injection (TFESI) and to identify prognostic factors determining PA efficacy. *Method:* Sixty-five patients with LSS refractory to TFESI who underwent PA with NaviCath® were reviewed. We recorded the Numeric Rating Scale for back pain (NRS back) and leg pain (NRS leg) and the Oswestry Disability Index (ODI) at pretreatment, 2 weeks, and 3 months after treatment. Clinical data and radiologic findings were obtained to assess the possible predictive factors for PA efficacy. *Results:* Among 65 patients, 45 (69.2%), 40 (61.5%) and 39 patients (60.0%) obtained successful outcomes in NRS back, NRS leg, and ODI at 2 weeks, respectively. Among 63 patients who were followed up at 3 months, 34 (54.0%), 32 (50.8%), and 30 patients (47.6%) showed successful results in NRS back, NRS leg, and ODI, respectively. Spondylolisthesis, previous lumbar surgery, or foraminal stenosis was associated with a significantly higher proportion of unsuccessful result in NRS and ODI (%). *Implications/Impact on Rehabilitation:* PA was moderately effective for pain reduction and functional improvement. Therefore it could be useful treatment and reduce the surgical requirements in patients with LSS who did not respond to TFESI. Previous surgery, spondylolisthesis, or foraminal stenosis was revealed to be poor prognostic predictors.

PO-0493

COMPARISON OF EFFECTIVENESS OF VARIOUS FOOT ORTHOSES IN TREATMENT OF PLANTAR FASCIITIS

R Sharma[1], C Chethan[2], A Gupta[3]*, Sl Yadav[4]
[1]All India Institute of Physical Medicine & Rehabiliation, Mumbai, India, India, [2]Resident, Dept. of PM&R, VM Medical College & Safdarjang Hospital, New Delhi, India, India, [3]Assistant Professor, Dept. of PM&R, VM Medical College & Safdarjang Hospital, New Delhi, India, India, [4]Additional Professor, Dept. of PM&R, All India Institute of Medical Sciences, New Delhi, India

Background: Plantar fasciitis is one of the most common causes of heel pain, management of which continues to challenge physiatrists. This study was conducted to evaluate the effectiveness of three foot orthoses (University of California and biomechanics laboratory [UCBL] shoe insert, Silicone heel cup, Medial arch support with heel pad foot orthoses) in treatment of plantar fasciitis with respect to foot pain, foot function, general foot health and foot wear.Very few studies have evaluated effectiveness of custom made longitudinal arch support foot orthoses and silicone heel cup in treatment of plantar fasciitis and no such study has been done on the Indian Population. *Methods:* A prospective randomized clinical study, among patients attending PMR clinic in tertiary care hospital was conducted from October 2011 to January 2013. One hundred and five patients with plantar fasciitis were enrolled and were randomly assigned into three groups. Group A received University of California and Biomechanics Laboratory (UCBL) shoe insert, group B received silicone heel cup, group C received medial arch support with heel pad as therapeutic method and were followed up at 1 month, 3 months and 6 months. Statistical Analysis: Data will be analysed using statistical methods taking $p<0.05$ as significant and relevant conclusions will be drawn from them using ANOVA and Chi Square test. *Outcome Measures*: Assessment of scores and parameters were done using Foot Health Status Questionnaire (FHSQ) and Foot Function Index (FFI). *Results:* Out of 105 patients, 50 (47.6%) were males and 55 (52.4%) were females, 27 (25.7%) right foot, 18 (17.1%) left foot, 60 (57.2%) B/L feet were involved. The outcomes in these assessments will be presented in this study.

PO-0494

THE USE OF OPIOIDS IS EFFECTIVE IN ROTATOR CUFF SYNDROME?

Sandra Moraes
Instituto de Medicina Fisica e Reabilitação, Brazil

Early mobilization after shoulder surgery plays a vital role in successful functional rehabilitation. However, postoperative pain oftentimes reduces, or even prevents effective therapy. The effect of patient-controlled analgesia via interscalene technique (PCISB) using ropivacaine 0.2% initially (10 mg/h as a limit) and maximum daily dose of 450 mg, via interscalene catheter, early functional rehabilitation for immediate postoperative shoulder open, effective result in reducing back pain and early mobilization compared with opioid use in patient controlled analgesia by opioid (PCA) intravenous, with 2 mg of piritramide Boulos, with maximum daily

dose of 30 mg over 72 h after surgery. Physiotherapy is held for 3 days, during 60 min, after surgery, with already defined protocol, and range of motion with pain as a limiting factor. Evaluates the functionality 1 day before and 3 days after surgery, according to multifactor scoring system (Constant-Score), which assesses pain, activities of daily living, strength and range of motion. Monitors the intensity of pain using a visual analogue scale in the first 72 h after surgery and physiotherapy during hospitalization. No significant differences in mobility and strength observed between groups. Compared with the PCA PCISB is beneficial about pain at rest in 6 h (P surgery (p=0.016). (B) 1Hofmann-Kiefer K, Eiser T, Chappell D, Leuschner S, Conzen P, Schwender D., 2008 Recommendation: Compared with opioid-based PCA, interscalene analgesia but not the function, during early rehabilitation of the shoulder joint. Reference: 1. Kiefer, Hofmann K, Eiser T, Chappell D, Leuschner S, Conzen P, Schwender D. Does patient-controlled continuous interscalene block Improve early functional rehabilitation after open shoulder surgery? Anesth Analg. 2008 Mar; 106 (3) :991-6, table of contents.

PO-0495

THE EFFICACY OF CERVICAL STABILITY TRAINING COMBINED WITH BETAHISTINE FOR THE TREATMENT OF CERVICAL VERTIGO

Pingzhi Wang, Ying Liang, Quanbing Wang, Ruijun Chen

Shanxi Academy of Medical Sciences Shanxi Dayi Hospital

Object: To explore the clinical efficacy of cervical stability training combined with Betahistine for the treatment of cervical vertigo. *Methods:*Thirty patients diagnosed with cervical vertigowere randomly divided into two groups: intermediate frequency electric therapy combined with Betahistine (control group, n=15), sling exercise treatment combined with Betahistine (Treatment group, n=15). The indicators we observed are Cervical vertigo symptoms with the Functional Assessment Scale (ESCV) and neck disability index (NDI). Data were collected at pre- and post-treatment for 2 weeks in both groups. Group means were collected and calculated at two points and were compared statistically. *Results:*After treatment, the total effective rate of treatment group was 92%, and that of control group was 72%, the two groups was statistically significant (p<0.01). For ESCV Rating Scale, dizziness, neck pain, headaches, daily life and work of scores of the control group compared to the treatment group was statistically significant (p<0.01), however, psychological and social adjustment score between the two groups was not statistically significant (p> 0.05); NDI index between the two groups was statistically significant (p<0.01) before and after treatment. *Conclusion:* Cervical stability training combined with Betahistine can significantly improve the clinical manifestations of patients with cervical vertigo. Clinical attention should be paid to the cervical spine stability training for patients with cervical vertigo.

PO-0496

THE EFFECT OF MANIPULATION ON REHABILITATION AND D- DIMER LEVEL OF PATIENTS WITH OTAL KNEE ARTHROPLASTY

Zhiyuan Wu[1,3], Jie Jia[1], Guilin Ouyang[2], Yong He[2], Yanming Guo[2]

[1]Department of rehabilitation medicine Huashan Hospital Fudan University, Shanghai 200040, [2]Shanghai Changning District Guanghua integrated traditional Chinese and Western medicine Hospital, Shanghai 200052, [3]Fujian university of traditional Chinese Medicine, Fuzhou, 350108

Objective: Observation of rehabilitation condition and blood D dimer level of the total knee arthroplasty patients with early comprehensive manipulation, enrich the patients rehabilitation and prevention of lower extremity deep venous thrombosis treatment method after total knee arthroplasty. *Methods:* 60 osteoarthritis patients with total knee arthroplasty are randomly divided into control group and manipulation group, 30 cases in each group. The control group use conventional anticoagulant drugs and manipulation group use conventional anticoagulant drugs combining with manipulation. Through the contrast observation of the two groups before and after treatment of joint function of the patients with HSS score and blood D dimer level changes, assessment of manipulation as a means of rehabilitation and prevention of deep venous thrombosis of the lower extremity effect. *Results:* After treatment two groups of patients, knee function HSS score is more improved than before (p<0.05). Manipulation group is better than control group (p<0.05). Two groups patients of D dimer levels are increased (p<0.05), but the manipulation group rising level are significantly lower than control group (p<0.05). *Conclusions:* Manipulation can promote the patient of osteoarthritis after total knee arthroplasty in the recovery of joint function, and can reduce the blood D dimer level resulting in prevention of lower limb deep venous thrombosis.

PO-0497

IMMEDIATE EFFECT OF MCCONNELL TAPING FOR PATELLOFEMORAL PAIN: RETROSPECTIVE ANALYSIS

Xiaogang Li, Qile Zhang, Lijuan Ao, Liqing Yao

Department of Rehabilitation Medicine,the Second Affiliated Hospital of Kunming medical university, Kunming, China

Objective: To investigate the immediate effect of McConnell Taping for patellofemoral pain. *Methods:* 34 patients with patellofemoral pain were divided into a surgical treatment group (patients with patellofemoral pain after arthroscopy of knee) included 16 cases and a non-surgical treatment group (patients with patellofemoral pain having no surgery of knee) included 18 cases,all of whom,sex,age, Q angle and initial flexion angle of knee pain as Squating were recorded. One therapist applied elastic adhesive tape to each patient by the McConnell Taping method. Patients scored their pain by using Numeric Pain Rating Scale (NPRS) before and after taping while completing three actions including stair climbing,level walk and squat. The change of both the score was compared. It is a study of retrospective analysis. *Results:* Pain scores of all patients before and after taping while completing the three actions including of stair activity,level walk and squat was improved (p<0.001). Percentage of pain release degree in non-surgical treatment group was better than surgical treatment group while squating (p<0.05). *Conclusion:* Immediate Effect of McConnell Taping for Patellofemoral pain is very well, which was found better for non-surgical treatment group in comparison with surgical treatment group while squating.

PO-0498

THE EFFECTS OF YIJINJING ON CERVICAL MUSCLES IN PATIENTS WITH NECK TYPE OF CERVICAL SPONDYLOSIS BASED ON SEMG

Weihong Zhong, Shizhong Wang

Rehabilitation Hospital of Fujian University of Traditional Chinese Medicine

Purpose: To explore the mechanism of Yijinjing technique on treating the neck type of cervical spondylosis via surface electromyogram. *Methods:* Two groups pre and post tests. Yijinjing technique was provided by experiment group while traditional massage was prepared by control group. *Results:* Both groups increased the ability of anti-fatigue of upper trapezius and sternocleidomastoid. But,significant difference was found in MF compared to massage group (p<0.05). *Conclusion:* Intervention of Yijinjing technique for raising the ability of anti-fatigue on neck type of cervical spondylosis is better than that of traditional massage.

PO-0499

HETEROTOPIC OSSIFICATION IN PATIENT WITH SPINAL CORD COMPRESSION DUE TO THORACIC SPINAL ACTINOMYCOSIS: A VERY RARE CASE REPORT

Ohnmar Htwe
University Kebangsaan Malaysia Medical Centre, Malaysia

Heterotopic ossification is common in patients with traumatic brain injury, spinal cord injury and after arthroplasty, however, is very rare in spine infection especially spinal actinomycosis *Method:* We report a case of spinal cord compression caused by Actinomyces israelii, complicated with heterotopic ossification (HO) in both hip joints in 42 year-old Malay gentle man. He presented with gradual onset of bilateral lower limb weakness associated with constitutional symptoms and difficulty in passing urine for 3 months. On physical examination, his neurological level was T12 AIS (American Spinal Injury Association Impairment Scale) B. Bony swelling was noted over antero-lateral aspect of the proximal thigh (Left). There was limited range of motion in both hip joints. *Results:* Laboratory tests indicated leukocytosis with raised ESR and C Reactive Protein. Alkaline phosphatase was 176 U/L (32-104)). Radiograph of the pelvis (AP view) showed heterotopic ossification in both hip joints and it was graded as Class 4 on Brooker's classification. Magnetic Resonance Imaging (MRI) scan of the thorax showed paraspinal mass at thoracic (T2-9) region which extended intraspinally causing compression of the spinal cord. CT guided biopsy was done and HPE results showed inflammation with actinomyces infection. Therefore, decompression and spinal fixation was offered but patient refused and opted for conservative management. *Implications/ Impact on rehabilitation:* Although heterotopic ossification is rarely seen in patient with spinal cord compression due to thoracic spinal actinomycosis, physicians should bear in mind this rare incidence so as to get early diagnosis and give prompt and effective treatment.

PO-0500

INTERTROCHANTERIC STRES FRACTURE WITHOUT A RISK FACTOR, A CASE REPORT

Duygu Tecer[1], Emre Adiguzel[2], Evren Yasar[2], Mehmet Ali Taskaynatan[2]*, Gunsah Sahin[1]
[1]Mersin University, Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Mersin, Turkey,Turkey, [2]Gulhane Military Medical Academy, Department of Physical Medicine and Rehabilitation, Ankara, Turkey, Turkey

Stress fractures result from abnormal stresses imposed on normal bones by the continued and repeated actions of muscles. This fractures occur more commonly in lower extremities than in upper extremities. Stress fractures are common in athletes and military recruits who participate in repetitive, high-intensity training. Here, we present a patient without a risk factor who sustained non traumatic stress fractures in right intertrochanteric femur. A 42 years old female patient referred with pain lasting 3 months in her right hip. She was a housewife and she had no history of any specific trauma. At physical examination, her hip movements were painful. There was no abnormality in hip plain radiography. She was treated with nonsteroidal anti-inflammatory drugs, hot pack and TENS on right hip twice a day for 1 month. However, hip pain was persistent. MRI with contrast and CT of right hip were obtained and consistent with intertrochanteric stress fracture. Then, she was recommended resting and taking calcium and D vitamin supplements. As a result, femoral neck stress fracture represents only % 8 of all stress fractures. However, it is an important cause of hip pain because of the relative high risk of nonunion, complete fracture or long term disability. Therefore, it should be keep in mind when there is persistent hip pain despite an appropriate conservative treatment.

PO-0501

THE RECOVERY EFFECT ON PATIENTS LIMB FUNCTION OF TKA BY COMPREHENSIVE REHABILITATION INTERVENTION WITH ACUPUNCTURE AND CUPPING

Xiaoling Wang, Xiangbin Wang, Jie Liang
The Department of Physical Therapy in Fujian University of Traditional Chinese Medicine, China

Objective: Observe recovery effect on patient's limb function of total knee arthroplasty by Comprehensive rehabilitation intervention with acupuncture and cupping. *Method:* The patient was a female, 68 years old, left knee joint pain pain 10 years, increasing more than 1 year. The diagnosis was serious knee varus with lateral collateral ligament relaxation. Physical examination findings were Left knee varus 20°, ROM: 75°-15°, KSS: 30 score.We had comprehensive rehabilitation intervention after TKA. (1) The day after surgery - the 3 day: Raised limb, quadriceps femoris isometric exercise; Passive flexed and stretched ankle; Decubitus straight-leg raising practice. (2) The 4-7days:seat knee flexion practice beside bed; vertical legs practice, Knee flexion reached 90 degrees or more (4) The 8-14 days: continued the previous stage of practice; gradually increased the seat to the transfer of standing; half squat practice; walking practice;be treated with acupuncture and cupping 1 time around the knee joint. (5) the 3-4 week: The main increased muscle strength practice, continued to strengthen straight-leg raising practice, knee flexion practice, half squat practice and walking practice. *Results:*The patient was ROM: 100°-0°; KSS: 8 scores at 15 days after surgery; ROM: 120°-0°; KSS: 2 score at 30 days after surgery. *Impact on rehabilitation:* It could especially ease the buckling contracture and eliminate swelling by acupuncture and cupping.We should pay attention to maintenance and disinfections etc.It promoted the functional recovery in patient of TKA by comprehensive rehabilitation intervention with acupuncture and cupping.

PO-0502

EXTRACORPOREAL SHOCK WAVE THERAPY IN CALCIFIC TENDINOSIS OF SHOULDER

José Antonio Mirallas-Martínez
General University Hospital of Castellón, Spain

Objective: To study the effectiveness, tolerance and satisfaction of the extracorporeal shock wave therapy (ECSWT), in patients with calcific tendinosis of shoulder. *Method:* Between 14 february, 2002 and 31 October, 2012, we prospectively studied 161 consecutive adults patients with calcific tendinosis of shoulder, treated with ECSWT, 1 session for week, 4 weeks. All were assessed before each treatment and one month, after completion of therapy. SPSS 17.0 was used for statistic analysis. 120 (74.5%) were women and 41 (25.5%) men, of 48.6±7.8 years old. The side was right in 89 (55.3%) and left in 72 (44.7%). The mean duration of symptoms was 2.7±3.1 years. They had previously been treated with: medication 147 (91.3%), steroid injection 77 (47.8%), electrotherapy 100 (62.1%), sonotherapy 86 (57,3%), Cyriax 39 (24.2%), thermotherapy 52 (32.3%), kinesitherapy 83 (51.6%), and others 28 (17.4%) patients. The interval between the last treatment and the ECSWT was 2.7±3.1 years. *Results:* The energy density was 0.66 ± 0,20 mJ/mm^2, with 2185,7±773,6 impulses. At 1 month after the ECSWT, the evaluation resulted in significant improvement in pain (64.4% less in activity) and active articular rank (23.6º more in abduction). The limitations in daily living activity, sporting and working activity that existed initialy in 161 (100 %), persisted in 20 (12.4%) and 28 (17.4%) respectively. The calcifications that existed in 161 (100 %), persisted in 62 (38.5%). The tolerance was good without important pain in 150 (93.2%), without secondary effects of interest. *Implications:* Energy used, number of shots and

pain comparative with others are respectively: 0,66 $mJmm^2$/0.60 $mJmm^2$, 2185,7/2000, and 64.4%/21%-84%. Of 957 articles of musculoskeletal pain treatment with ESWT, were included 9 with calcifying tendonitis of shoulder (effectiveness 9); 4 with not calcifying tendonitis of shoulder (effectiveness 1, doubt 3). Obtaining evidence is often complicated, so that the physician often receives contradictory results. ECSWT must be considered before surgical treatment in patients with calcifying tendonitis of shoulder, refractory to conventional physical and rehabilitation-medical treatment. *Impact on Rehabilitation:* ECSWT in calcific tendinosis of shoulder are well tolerated, and shows a significant effectiveness for pain relief, functional restoration and calcifications lithotripsi, with a mean satisfaction of 8.2±1,9 (0-10).

PO-0503

THE ROLE OF PLANTAR PRESSURE EVALUATION IN REHABILITATION OF PATIENTS WITH ACHILLES TENDON RUPTURES

Alina Totorean*, Oana Suciu, Roxana Onofrei, Andreea Niță

Timişoara University of Medicine and Pharmacy, Rehabilitation Department, Romania, Romania

Objective: The objective of our study was to demonstrate the role of plantar pressure in establishing functional treatment of patients with surgically repaired Achilles tendon ruptures. Material and *Methods:* We evaluated 10 cases of surgically repaired Achilles tendon ruptures using Zebris FDM system, a plantar pressure device running on capacitive forces sensors. It allowed us to analyze plantar pressure and also gait parameters. The assessment was made after cast removal and then after 1, 3 and 6 months of rehabilitation treatment. Supplementary we used the calf circumference in our evaluations. *Results:* The first evaluation was the base in establishing the rehabilitation treatment. We used an adapted, individualized kinetic therapy based on improving the gait parameters. After the first month of rehabilitation treatment there were some improvements in gait parameters and calf circumference. After 3 months the step length of the affected leg and the swing period increased and the step time decreased significantly. At the end of the 6 months of rehabilitation there was a significant decrease of step time and enhancement of the walking speed and cadence. Regarding the plantar pressure there was a better load of the lateral border, metatarsal heads and hallux. *Implications/Impact on rehabilitation:* Zebris FDM system is a very quick and simple analyze of important gait parameters. It has an important role in establishing and managing rehabilitation treatment because it allowed us to work on specific improvements regarding gait parameters using an adapted kinetic therapy program.

PO-0504

VALIDITY ANALYSIS OF SCOLIGAUGE TO ASSESS SCOLIOSIS

Xiaoyan Yang, Qing Du, Xuan Zhou, Nan Chen, Xiaojie Li, Chenhui Pan, Gang Liu, Weiwei Deng, Yuwei Feng

Department of Rehabilitation, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

*Objective:*To quantify the measurement obtained from the iphone scoligauge to the standard Scoliometer for assessing the trunk asymmetry in school screening for scoliosis. *Method:*The study covered eight primary schools of ChongmingIsland,Shanghai,China. A total of 457 students (254 boys and 203 girls), aged between 10 and 14 years old were screened. Two medical providers each read a standard scoliometer, simultaneously a blinded observer recorded the measurement from iphone scoligauge. For statistical analysis the measurements were divided by spinal levels into upper thorax, lower thorax and lumbar segments. The correlation between the two measurements were calculated by a Pearson coefficient with a *p*-value, and P. *Results:*The Pearson correlation coefficient of the three segments (upper thorax, lower thorax and lumbar segments) were 0.8018, 0.8659, 0.8174. And for all segments *p*-values. *Impact on Rehabilitation:* The iphone scoligauge is a clinically equivalent, convenient novel measurement tool to the standard Scoliometer in scoliosis screening. This new device demonstrates the potential to increase the distribution of scoliosis screening tools to a broad population of medical providers.

PO-0505

USEFULNESS OF A MYOFASCIAL TRIGGER POINT INJECTION FOR GROIN PAIN IN PATIENTS WITH CHRONIC PROSTATITIS

Sang Chul Lee[1], Dong Suk Kim[2]

[1]Yonsei University College of Medicine,Korea, [2]Myongji Hospital, Kwandong University College of Medicine, Korea

Objective: To investigate the therapeutic effectiveness of trigger point injection into the muscles around the groin in patients with clinically diagnosed chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS). *Method:* Patients with clinically diagnosed CP/CPPS who are suspected of having myofascial pain syndrome were treated with trigger point injections under ultrasound guidance. Visual analog scale (VAS), National Institutes of Health Chronic Prostatitis Symptom Index (NIH-CPSI) score, and injection-associated complications were measured. *Results:* Ultrasound (US)-guided trigger point injection of the iliopsoas, hip adductor, and lower abdominal muscles resulted in excellent outcomes. The mean values of the NIH-CPSI score decreased significantly from 20.2 pretreatment to 12.5 after the first treatment ($p<0.05$). The mean values of VAS decreased significantly from 6.3 pretreatment to 2.9 after the first treatment ($p<0.05$). *Implication/Impact on Rehabilitation:* In patients with CP/CPPS, US-guided trigger point injections of the iliopsoas, hip adductor, and abdominal muscles provide a safe and effective diagnostic and therapeutic means when the cause of groin pain is suspected to originate from muscles. In particular, the iliopsoas muscle was affected in all patients in this study.

PO-0506

EDUCATIONAL NEEDS OF PATIENTS WITH PSORIATIC ARTHRITIS CORRELATES WITH GENDER, DISEASE ACTIVITY AND PHYSICAL FUNCTIONING

Razvan Gabriel Dragoi[1,2], I Ndosi Mwidim[3], Martina Sadlonova[1], Jackie Hill[3], Mona Dür[1], Claudiu Avram[4], Mihai Drăgoi[2], Josef Smolen[1], Tanja Alexandra Stamm[1]

[1]Medical University of Vienna, Clinic of Internal Medicine III, Department of Rheumatology,Romania, [2]Victor Babeş" University of Medicine and Pharmacy Timişoara, Department of Rehabilitation, Physical Medicine, Balneology and Rheumatology,Romania, [3]Academic & Clinical Unit for Musculoskeletal Nursing, Division of Rheumatic and Musculoskeletal Diseases, University of Leeds, UK,Romania, [4]West University of Timisoara, Faculty of Sports and Kinetotherapy, Romania

Objectives: Describe the educational needs of patients with psoriatic arthritis (PsA) and explore relationships between educational needs, gender, disease activity and function. *Method:* Educational needs across diagnostic group and subgroups of patients with PsA were evaluated using the Austrian-German educational needs assessment tool (OENAT) and summarized descriptively. Relationships with disease activity and physical functioning were explored. Internal construct validity was assessed by Rasch analysis. *Results:* The sample comprised (125) patients with PsA. Their mean ages (SD) were 51 (11) years and disease duration was 11 (11) years. 74% of patients showed interest in receiving education about their disease. Female patients expressed more educational needs than males ($p=0.04$) and scored higher on movements ($p=0.005$) and

feelings domain (p=0.004). Older patients scored higher than their younger counterparts in the pain domain (p=0.05). Disease duration had significant effects, patients with longer disease duration (>5 years), expressed higher educational needs in movements, (p = 0.005), and those with lower educational background, scored higher on movement and arthritis process. OENAT domains correlated with the disease activity indices for psoriatic arthritis (DAPSA and CDAI). Physical functioning, measured by HAQ significantly correlated with the following OENAT domains: movements (r=0.38, p<0.001), feelings (r=0.33, p=0.01), arthritis (r=0.32, p=0.01) and support (r=0.28, p=0.03) showing significant correlation with physical functioning. *Conclusion:* The OENAT is a reliable tool in assessing educational needs among population suffering from PsA, being useful in enabling physicians and health professionals to plan patient education strategies effectively and guiding them in elaborating individualized and target-centered treatment programs.

PO-0507

A PRELIMINARY STUDY ON THE APPLICATION OF MUSCULOSKELETAL ULTRASOUND FOR OBSERVING CERVCIAL LUSCHKA JOINTS NEAR VERTEBRAL ARTERY

Le Hua Yu, Kai-Qi Cui, Jing Yu, Qiao Fu, Gongwei Jia, Yuanyi Zheng, Yamei Li

Department of Rehabilitation Medicine and Physical Therapy, the Second Affiliated Hospital of Chongqing Medical University, N0.74 Linjiang Road, Yuzhong District, Chongqing, China

Objective: The aim of this study was to explore the role of musculoskeletal ultrasound (MSUS) in observing cervical Luschka Joint (uncovertebral joint, UJ). *Method:* MSUS was firstly operated on human cadaver to ascertain the location of UJ on the image; then operated on23 patients clinically diagnosed as cervical spondylosis of vertebral artery (CSA). The patients are also given 3D-CTA examination. With 3D-CTA as the gold standard, the results were compared and the association and agreement between MSUS and 3D-CTA were analyzed. Descriptive statistics of the measurement data of lateral osteophytes of UJ by MSUS were calculated. *Results:* MSUS is able to image UJ. The base of uncinate process is continued with the upper margin of the vertebrae, and the lateral border if the process is on a straight line with the lateral margin of vertebrae, with vertebral artery in front of the line. Some images of the uncinate process pass the line and become closer to the artery. In this condition, we assessed the UJ exists lateral osteophyte formation, and measure the distance from cutting line of lateral cortical margin of the vertebrae to outer cortical margin of the lateral of the uncinate process. Statistical analysis showed that there is no significant difference between the assessment of MSUS and that of 3D-CTA, and they have good association and agreement. The mean value of the measurement data by MSUS of 55 UJ with lateral osteophyte formation was 2.58±1.2 mm. *Implications:* Since MSUS can offer inexpensive, non-invasive, non-radioactive and rapid examination, we strongly advocate that MSUS can be used prior to any other tools as screening method for patients clinically diagnosed as CSA.

PO-0508

COMPARE THE EFFECTS OF COMBINED STANDARDIZED ABDOMINAL AND BACK MUSCLE STRENGTHENING TRAINING VERSUS CONVENTIONAL THERAPY FOR LOW BACK PAIN ON MOBILITY

Jintao Fan, Yan Zhang

TianJin Medical University General Hospital

Objective: Compare the effects of combined standardized abdominal and back muscle strengthening training versus conventional therapy for low back pain on mobility. *Methods:* Thirty-six adults with LBP with or without leg pain for more than 6 monthes from TianJin Medical University General Hospital OPD department or Rehabilitation department. All of them randomly divided into the treatment group and the conventional group respectively with a signed consent from the patients. All of patients received five physiotherapy sessions in 1 week (1 h duration in each session). All patients of 2 groups were treated by lumbar spine passive mobilization in pain level, IFT in pain region for 1 week (5 days/wk). Patients in treatment group also was by treated combine abdominal and back muscle strength exercise. The trier measured AROM for lumbar spines each day due in the therapist period, involve pre-treat & post-treat every days. Then record and analyze the outcome. *Results:* After the treatment, the average of treatment group higher than the average of conventional group in common level of mobility improvement. *Impact on rehabilitation:* The effect of mobility improvement use by combined standardized abdominal and back muscle strengthening training of lumbar spine more better than only use by conventional therapy for lower back pain.

PO-0509

MANAGEMENT OPTIONS OF CHRONIC LOW BACK PAIN: A RANDOMIZED BLINDED CLINICAL TRIAL

Mahmoud Nazzal, Mohammed Saadah*

King Abdallah University Hospital, Jordan

Objective: To compare efficacies of 2 active programs in management of CLBP. *Methods:* This study was conducted in the department of Rehabilitation medicine, King Abdullah University hospital, Irbid, Jordan, between January and October 2009. A total of 100 patients were randomized to either 6-weeks of multidisciplinary rehabilitation (group A) or therapist assisted exercise (group B). At baseline and 6 weeks, visual analogue scale (VAS) was estimated, as a primary outcome measure. Mc Gill and Oswestry disability scales, trunk forward flexion and extension, left and right lateral bending, were applied before and after treatment as secondary outcome measures. *Results:* All outcome measures significantly improved in group A after treatment, compared to group B. VAS, McGill, Oswestry disability scales, left and right lateral bending decreased significantly (p=<0.05), whereas forward and backward bending increased (p=<0.05). Significant number of patients returned to work (p=<0.05) in group A at end of 6 weeks, compared to group B. These effects were maintained over 12 and 24 weeks follow-up. *Implications/Impact on Rehabilitation:* Our results indicated that the combined, comprehensive and intensive multidisciplinary biopsychosocial rehabilitation management program improved spinal function and mobility measures and reduced pain scale scores. The negative impact on health and the socioeconomic consequencies associated with CLBP, gave these results notable interest. Multidisciplinary rehabilitation improved functional indices and pain scales in group A compared to B. This might be an effective strategy in CLBP management. Up to our knowledge, this is the first study that examined the effects of this particular combination of physical modalities on these spinal functionality measures and pain scales. Future studies could probe such combination in larger samples and multiple centers.

PO-0510

THE EFFECTS OF LOW-INTENSITY PULSED ULTRASOUND AND NANO MAGNET APPLICATION ON THE EXPRESSIONS OF MMP-13 AND MAPKS IN RABBIT KNEE OSTEOARTHRITIS

Xueping Li, Qiang Lin, Kai Cheng, Junlong Yu, Aicui Lin, Mingxia Gao, Anliang Chen

Nanjing Hospital Affiliated to Nanjing Medical University (The First Hospital of Nanjing)

An animal model of Osteoarthritis (OA) was established to observe the influences of low-intensity pulsed ultrasound (LIPUS) and nano magnet application (NMA) on Collagenase 3 (MMP-13) expression and the activation status of mitogen activated protein kinases (MAPKs) in rabbit. 24 experimental rabbits from New Zealand were randomly divided into four groups: LIPUS, NMA, LIPUS+NMA group, and control group. The experimental rabbit OA model was established in the right knee joint of rabbits received ACLT operation. Rabbits in LIPUS group received LIPUS treatment and rabbits in NMA group were given NMA treatment. In LIPUS+NMA group, both treatments were applied on experimental rabbits everyday. However, the rabbits in control group only underwent ACLT operation. Four weeks later all rabbits were killed and changes of histopathology in rabbit articular cartilage were assessed and evaluated using Mankin method (Modified Mankin Scale). The protein expressions of MMP-13 and MAPKs were estimated using Western Blot. The results showed that both LIPUS and NMA treatments could significantly decrease the Mankin scores and suppress the expression level of MMP-13. However, there were some inverse results of MAPKs expression in these two applications and imply their treatment mechanisms of OA were different from each other.

PO-0511

ASSESSMENT OF CLINICAL RISK FACTORS IN TURKISH POSTMENOPAUSAL OSTEOPOROTIC WOMEN: RISKFACT STUDY

Yeşim Gökçe Kutsal[1], Serpil Savaş[2]*, Fatma İnanıcı[3], Oya Özdemir[4], Sevilay Karahan[5], Asuman Doğan[6], Sami Hizmetli[7], Ayhan Kamanlı[8], Banu Kuran[9], Sema Öncel[10], Selda Sarıkaya[11], Kazım Şenel[12], Hatice Uğurlu[13], Pelin Yazgan[14]

[1]Hacettepe University School of Medicine, Dept. of Physical Medicine and Rehabilitation, Ankara, Turkey,Turkey, [2]Süleyman Demirel University School of Medicine, Dept. of PM&R, Isparta, Turkey,Turkey, [3]Hacettepe University School of Medicine, Dept. of Physical Medicine and Rehabilitation, Ankara, Turkey,Turkey, [4]Hacettepe University Kastamonu Medical School, Dept of PMR, Ankara, Turkey,Turkey, [5]Hacettepe University School of Medicine, Dept of Biostatistics, Ankara, Turkey,Turkey, [6]Ankara Physical Medicine and Rehabilitation Research and Training Hospital, 5th PMR Clinic, Ankara, Turkey,Turkey, [7]Cumhuriyet University School of Medicine, Dept of PMR, Sivas, Turkey,Turkey, [8]Fırat University School of Medicine, Dept of PMR, Elazığ, Turkey,Turkey, [9]Şişli Etfal Research and Training Hospital, PMR Clinic, İstanbul, Turkey,Turkey, [10]Dokuz Eylül University School of Medicine, Dept of PMR, İzmir, Turkey,Turkey, [11]Karaelmas University School of Medicine, Dept of PMR, Zonguldak, Turkey,Turkey, [12]Atatürk University. School of Medicine, Dept of PMR, Erzurum,Turkey,Turkey, [13]Selcuk University School of Medicine, Dept of PMR, Konya, Turkey,Turkey, [14]Harran University School of Medicine, Dept of PMR, Şanlıurfa, Turkey

Objectives: To describe the frequency of clinical risk factors for osteoporosis in Turkish postmenopausal women with osteoporosis. *Methods:* In this cross-sectional observational multicenter study, a total of 730 postmenopausal Turkish women were assessed for risk factors for osteoporosis. Assessment included a standardised questionnaire that recorded information on risk factors for osteoporosis. The risk factors assessed were family and personal histories of fractures, prolonged immobilisation, sun exposure, lifelong sedantary lifestyle, smoking, low calcium intake in childhood and adulthood, excessive caffeine intake, high sodium intake, inadequate protein intake, number of pregnancies, age at menopause, premature menopause, primary and secondary amenorrhea, medical conditions and chronic drug intake. *Results:* The most frequent clinical risk factors for osteoporosis were inadequate sun exposure (53.3 %), current sedantary lifestyle (52.9 %), low intake of calcium in adulthood (45.1 %) and in childhood (41.9 %) and sedantary lifestyle in adolescence (27.9 %). Seven hundred and seven patients (96.5 %) described more than one risk factor. Of all, 74.3 % of patients reported clinical risk factors for secondary osteoporosis. *Implications:* Adequate sun exposure and adequate dietary calcium intake since childhood in combination with a lifelong daily physical activity may play a role in prevention of osteoporosis in Turkish postmenopausal women.

PO-0512

BIOMECHANICAL CHANGES IN MILD AND EARLY PHASE OF KNEE OSTEOARTHRITIS

June Ho Im, Kang Hee Cho*

Chungnam University Hospital, Korea

Objective: The objective of this study is to identify the biomechanical indicator of mild knee osteoarthritis (OA) for early rehabilitation. *Method*: Three-dimensional gait analysis were performed on a group of 43 participants with clinically diagnosed mild knee osteoarhtritis. Association between radiographic severity, defined using the Kellgren-Lawrence global radiographic score, and pain severity, defined with the pain subscale of the Korean Western Ontario and McMaster Universities (K-WOMAC) osteoarthritis index, with knee joint kinematics and kinetics, walking speed, isokinetic strength of knee joint, BMI and stability index were determined with correlation analyses. Multiple linear regression analyses of radiographic and pain severity were explored. *Results:* A Spearman rank correlation coefficient indicated no significant correlation between the radiographic and pain severity. Statistically significant correlations between pain severity and isokinetic strength of knee extension (r=-0.34, p=0.024) and walking speed (r=-0.42, p=0.008) were found. TheK-WOMAC (function) showed significant correlations with knee flexion excursion from loading response to mid stance (r=-0.48, p=0.002) and walking speed (r=-0.39, p=0.015). There were no significant correlation between radiographic severity and all factors. The combination knee flexion excursion from loading response to mid stance and age explained a significant portion of variability in pain severity (R^2=0.34, p=0.006).The combination knee flexion excursion from loading response to mid stance was only significant portion of variability in K-WOMAC (R^2=0.23, p=0.002) *Conclusion:* Our findings indicate that the knee flexion excursion from loading response to mid stance, isokinetic strength of knee extension and walking speed are associated with functional limitation and pain severity in mild knee OA.

PO-0513

THE RELATIONSHIP BETWEEN BODY FAT AND BONE MINERAL DENSITY IN KOREAN MEN AND WOMEN

Won Kim[1], Sun G. Chung[2]*

[1]Department of Rehabilitation Medicine, Asan Medical Center,University of Ulsan College of Medicine,Korea, [2]Department of Rehabilitation Medicine, College of Medicine, Seoul National University, Korea

Objective: To evaluate the effects of FM on BMD using nationwide data in Koreans. *Method:* This study is based on the Fifth Korea National Health and Nutrition Examination Survey, 2010. A total of 4,138 subjects were studied. Percent body fat (% BF), FM, lean body mass and BMD of the total hip, lumbar spine and arm were measured by dual energy X-ray absorptiometry scans. The relationship between FM and BMD was evaluated by multiple linear regression analysis. *Results:* %BF exhibited negative correlations with BMD. However, FM amount itself exhibited positive correlations with the total hip and lumbar spine BMD in pre- and postmenopausal women and old men. On the other hand, the positive correlation of FM with BMD disappeared or was substantially weakened in the arm BMD. In the analysis of the obese subjects, previously reported positive correlations of FM with the total hip and spine BMD were not observed. Moreover, in the case of the arm BMD, FM actually exhibited a negative correlation in premenopausal obese women.

Implications/Impact on rehabilitation: These results suggest that FM is generally beneficial on bone health in mechanically loaded areas of the body. However, excessive FM is not beneficial, but rather, potentially harmful for bone health.

PO-0514

INCREDIBLE SHORTENING OF HEIGHT DUE TO REPETITIVE CORTICOSTEROID INJECTION IN YOUNG ADULT

Yumi Jeon, Kang Hee Cho*
Chungnam Univ. Hospital, Korea

Object: Corticosteroids are the principal cause of secondaryosteoporosis due to drug treatment. Doses of more than 5 mg daily and periods of treatment lasting more than 3 months increase the risk of osteoporosis and fragility fractures. We experienced a young woman patient who had repetitive corticosteroid injection induced severe secondary osteoporosis with multiple compression fractures of spine. *Case:* A 28-year-old woman with no past medical history presented with a 2-week history of low back pain of spontaneous onset. She had been on corticosteroid injection (dexamethasone disodium phosphate 5 mg/ml), 3-4 times per week for the past 5months. Radiographs of the spine showed generalized osteoporosis and multiple compression fractures of T9-L5. This patient's BMD is much lower than would be expected for her age, which suggests a secondary cause for her bone loss (L-spine: -3.6, Femur: -3.0). Her height reduced 9cm than 6 months before and her history includes amenorrhea 7 months previously. She was started on Teriparatide 250μg with calcium and vitamin D supplementation. Now we consistently take medication and follow up her laboratory test and radiographs for prevention of aggrevation of endocrinologic function and musculoskeletal symptoms. *Conclusion:* We report this case because we experienced severe secondary osteoporosis with multiple compression fractures of spine due to repetitive corticosteroid injection in healthy young woman.

PO-0515

TERTIARY REHABILITATION PREVENTIONS FOR LOW BACK PAIN

Quancheng Peng
The corp first peoples hospital rehabilitation department

Objective: To observe the effects of tertiary rehabilitation precautions on low back pain. *Methods:* All 180 subjects were recruited according to the tertiary prevention standards, including 60 healthy ones and the last suffering low back pain, and then divided into three groups: group A-all the healthy subjects, group B and C were the rehabilitation precaution ones (n=60 each group). Meanwhile, they were separately subdivided into observation groups (group A1, B1, C1) and control groups (group A2, B2, C2) with 30 subjects each group. Group A1 were treated with health education and exercise training,without precautions for A2; Group B and C were given routine clinical treatment, in which group B1,C1 were given health education and rehabilitation treatments, whereas,Group C1 receive d orthoses if necessary. *Results:* The morbidity ofgroup A1 was obviously lower than that in group A2 (p<0.05) ;The recurrence rate of group B1 and C1 were correspondingly lower than that in group B2 and C2, and the VAS pain score and JOA lower back pain score improved a lot in group B1 and C1 than that in group B2 and C2. *Conclusion:* Tertiary rehabilitation preventive measures can greatly prevent the occurrence and development of low back pain.

PO-0516

EFFECTS OF SELECTIVE REHABILITATION ON CHRONIC CERVICAL SPONDYLOSIS- A CLINICAL TRIAL

Md. Abdus Shakoor
Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh, Bangladesh

Objective: To find out the effects of selective rehabilitation on the patients with chronic cervical spondylosis. *Methods:* A randomized clinical trial was done involving 150 patients. They were divided into two groups: group-A and group-B. Group-A: In this group 72 patients were treated with selective rehabilitation program that is - exercise, cervical collar, neck support, manual cervical traction at home, warm moist compression and instruction in posture. Group-B: In this group 78 patients were treated with NSAIDs only. All the patients were followed up and assessed weekly for six weeks. The results were expressed as mean ± SD and the level of significant expressed by p-value. Student's 't' tests was done to see the level of significance. *Results:* There was significant improvement in both the group after treatment (p=0.001). In comparison between two groups, there was no significant difference in improvement between two groups up to 5th weak (p>0.05). But there was significant improvement seen in Group-B than Group-A after six weeks treatment (p= 0.03). This result indicates that the improvement of the patient with chronic cervical spondylosis was seen in selective rehabilitation group and also in NSAIDs group. Improvement was more or less same in both the groups up to 5th week and after six weeks more improvement was found in NSAIDs group. *Implications/Impact on Rehabilitation:* To reduce pain and disability, rehabilitation treatment can be used for the treatment of chronic cervical spondylosis without analgesics.

PO-0517

THE EFFECT OF HOME BASED EXERCISE PROGRAMME ON PAIN, DISABILITY AND PHYSICAL FUNCTION AMONG PATIENTS WITH KNEE OSTEOARTHRITIS: A RANDOMIZED CONTROLLED TRIAL

Nerimane Abazi[1], Ardiana Murtezani[2], Arjeta Zogaj Berisha[3], Vale Hysenaj[4], Vlore Hysenaj[4,3]
[1]Physical Medicine and Rehabilitation Clinic, University Clinical Center of Kosovo, Kosovo,Albania, [2]Faculty of Medicine, University of Kosovo, Kosovo,Albania, [3]Primary health care, Prishtina, Kosovo,Albania, [4]Faculty of Medicine, University of Kosovo, Kosovo, Albania

Objective: Osteoarthritis of the knee (OA) is common condition that causes pain and physical disability in older people. Although pain is the cardinal symptom of knee OA, patients frequently report muscle weak-ness and fatigue. There is increasing interest in the role of various forms of exercise therapy in OA. The aim of this study was to assess the effect of home based exercise programme, designed to improve quadriceps strength, on knee pain, disability, and physical function. *Methods:* This is a 12-week randomized, controlled trial conducted in Physical Medicine and Rehabilitation Clinic of a University Clinical Center of Kosovo. A hundred community dwelling patients (68 women, 32 man), aged 58 years and older with knee OA, were assigned randomly to either a progressive home based exercise programme, (n=50), or a control, non- exercise group (n=50). All patients were given nonsteroidal anti-inflammatory medication (NSAID). Data on self reported knee pain (Visual Analogue Scale), disability (Western Ontario and McMaster universities, WOMAC) and physical function (6 Min Walking Test, 6MWT) were collected at baseline and after 12- weeks follow-up points. All analyses were performed using SPSS for windows 6.0 *Results:* After the exercise program highly significant reduction in knee pain, disability and physical function were apparent for the home based exercise group compared with the non-exercise group (p<0.001, unpaired t-test). *Implications/Impact on Rehabilitation:* Home based exercise programme reduces pain, disability and improve physical function in patients with knee osteoarthritis.

PO-0518

PROBLEMS IDENTIFIED IN PRE-PROSTHETIC PHASE OF REHABILITATION IN TRAUMATIC TRANSTIBIAL AMPUTEES

Hussain Shah*, Khalil Ahmad, Zaheer Gill, Waheed Akhtar
Armed Forces Institute of Rehabilitation Medicine Rawalpindi Pakistan, Pakistan

Objectives: To identify problems in traumatic trantibial amputees during preprosthetic phase of rehabilitation. *Materials and Methods:* It's a cross sectional study which included 64 traumatic transtibial amputees. *Results:* Total 64 patients were included in the study. All of them were males. Mean age of presentation was 36 yrs. Most common cause of amputation was mine blast injury 32 (50%) followed by IED blast 28 (43.8%) and gunshot wound 4 (6.3%). Average time elapsed between amputations and reporting to rehabilitation center was 5.5 months. In 6 (9.4%) patients, fibula was longer than tibia. In 6 (9.4%) patients bone edges were sharp, new bone was formed in 2 (3.1%) amputated bones. In 6 (9.4%) amputees scar was irregular and in 2 (3.1%) scar was adherent to stump. Joint contracture was found in 2 (3.1%) of amputations. Stump length was intermediate in 40 (62.5%) of stumps, long in 14 (21.9%) and short in 10 (15.6%). Poor soft tissue covering was present in 16 (25.0%) patients. Foreign body was present in 2 (3.1%) of patients. Associated traumatic injuries were present in 30 (46.9%) of patients. Stump infection was present in 16 (25.0%) patients. Revision surgery of stump was done in 6 (9.4%) patients. *Implications/Impact on Rehabilitation:* Traumatic transtibial amputation is associated with large number of associated injuries. Some of the problems identified in preprosthetic phase of rehabilitation were fibula longer than tibia, scar related problems, short stump length poor soft tissue covering, infection of stump tissues and delay in start of rehabilitation.

PO-0519

DOSE THE SONOELASTOGRAPHIC FINDING OF OSTEOARTHRITIC KNEE CARTILAGE REFLECT THE CLINICAL SEVERITY OF ARTHRITIS ?

Jae-Hyung Kim*, Jung-Hwan Kim, Kang-Jae Jung
Eulji Univeristy Hospital and School of Medicine, Korea

Objectives: To investigate the ultrasound elastographic analysis of the different site of articular cartilage with osteoarthritis (OA) of knee, and to determine the relationship between the sonoelastographic and clinical findings. *Methods:* Fifty-two patients with knee OA and 43 healthy persons were recruited. All subjects were examined using color-coded sonoelastography at the cartilage of medial and lateral femoral condyles. The color sheme was red (hard), green (medium stiffness) and blue (soft). The color histogram was subsequently analyzed. Each pixel of the image was separated into red, green, and blue components (color intensity rage, 0-255). The mean intensity of each color component of the pixel within a standardized area was obtained. We assessed the clinical severity by Western Ontario and McMaster University Osteoarthritis (WOMAC) index. *Results:* 1) At the cartilage of medial femoral condyles, the quantitative analysis of the color histogram revealed a significantly greater intensity of red (204±31 vs. 127±38, p=0.000) and a lower intensity of blue (108±47 vs. 192±37, p=0.000) than healthy subjects. 2) At the cartilage of lateral femoral condyles, the color histogram revealed a significantly greater intensity of red (150±41 vs. 105±50, p=0.015), green (225±21 vs. 182±59, p=0.020), and a lower intensity of blue (164±44 vs. 201±46, p=0.013) than healthy subjects. 3) The sonoelastographic data were not significantly correlated with the WOMAC index score (p>0.05). *Implications:* Sonoelastography revealed that the degree of articular cartilage stiffness was increased in patients with knee OA, but sonoelastographic data did not reflect the clinical severity.

PO-0520

MULTIPLE AVASCULAR NECROSES IN A WOMAN SUCCESSFULLY TREATED WITH ZOLENDRONIC ACID

Alp Cetin
Hacettepe University Medical School, Turkey

Multiple spontaneous avascular necrosis is an unusual pathology. Corticosteroids, smoking, alcohol, rheumatologic disorders, hematologic disorders, and metabolic disorders are considered as the main risk factors for this condition. Beside surgical decompression, current evidence indicates that bisphosphonates may rapidly reduce pain, and delay joint collapse in patients with osteonecrosis. A 40 years old woman developed avascular necrosis of right femoral head, right navicular bone and left femoral head respectively in 6 years time and each treated by surgical decompression. Her history and medical examination has not indicated any underlying disease or medicine explaining these multiple avascular necroses. After two years her last surgical intervention, pain on her right foot repeated. MRI examination of right foot showed avascular necrosis of talus. She was advised to have zolendronic acid 5mg intravenous injection. Her symptoms resolved within one month after zolendronic acid infusion. Her control MRI after one month also showed remarkable regression of bone marrow edema at talus and distal part of tibia. Intravenous bisphosphanates are recomended for the treatment of traumatic or corticosteroid related avascular necrosis. This case indicates that intravenous zolendronic acid infusion may be considered for the treatment of spontaneus avascular necrosis.

PO-0521

EXTRACORPOREAL SHOCK WAVE THERAPY IN LATERAL EPICONDYLITIS

José Antonio Mirallas-Martínez
General University Hospital of Castellón, Spain

Objective: To study the effectiveness, tolerance and satisfaction of the extracorporeal shock wave therapy (ECSWT) in lateral epicondylitis. *Method:* Between 28 may, 2002 and 31 october, 2012, we prospectively studied 80 consecutive adults patients with lateral epicondylitis. SPSS 17.0 was used for statistic analysis. 56 (70.1%) were women, and 24 (29.9%) men, of 47.1±7.9 (28-73) years old. The side was right in 65 (81.2%) and left in 15 (18.8%). The mean duration of symptoms was 10.6±10.3 months. They had previously been treated with: medication 66 (82.5 %), steroid injection 50 (62.5%), electrotherapy 56 (70%), sonotherapy 53 (66.3%), Cyriax 40 (50%), thermotherapy 17 (21.3%), kinesitherapy 35 (43.8%) and other 14 (17.5%). The interval between the last treatment and the ECSWT was 2.2±2.6 months treated with ECSWT, 1 session for week, during 4 weeks. All were assessed before each treatment and one month, after completion of therapy. *Results:* The energy density was 0.26±0.48 mJ/mm^2, with 1153.6±331.4 impulses. At 1 month after the ECSWT, the evaluation resulted in significant improvement in pain of 77.1% less in activity and active articular rank of 4.1º±9.5º more. The limitations in daily living activity, sporting and working activity that existed initialy in 80 (100 %), persisted only in 2 (2.5 %) at the month. The tolerance was good without important pain in 78 (97.5%) and without secondary effects of interest. *Implications:* There is conflicting evidence regarding ESWT for chronic tennis elbow. Energy used, number of shots and pain comparative with others are respectively: 0.26 mJ/mm^2/0.27 mJmm^2, 1153.6/1000, and 78%/48%-92%. With current studies heterogeneus in terms of duration of the disorder, type, frequency and total dose of ECSWT, period of time between ECSWT, type of management and control group, timing of follow-up and outcomes assessed, a pooled meta-analysis of ECSWT for lateral epicondylitis was considered inapropiate. A meta-analysis of data from 28 randomised controlled trials (RCT), was not statistically significant in favour of ECSWT for the treatment of lateral epicondylitis, or

the general physical therapy. *Impact on Rehabilitation:* ECSWT in lateral epicondylitis, are well tolerated, and shows a significant effectiveness for pain and relief, functional restoration, with a mean satisfaction of 8.14 ± 2.3 (0-10).

PO-0522

QUANTITATIVE MUSCLE ULTRASONOGRAPHY IN CARPAL TUNNEL SYNDROME

Ji Hyeon Shin, Min Kyun Sohn*, Sung Ju Jee, Hun Ho Lim

Department of Rehabilitation Medicine, Chungnam National University Hospital, Daejeon, South Korea, Korea

Obsectives: To investigate the correlation between quantitative muscle ultrasonography and electrophysiologic study in patients with carpal tunnel syndrome (CTS) and to assess the clinical significance of quantitative muscle sonography for the diagnosis of CTS. *Method:* The muscle ultrasonography and electrodiagnostic studies were measured in forty hands with suggestive symptoms and signs of CTS and 40 hands of asymptomatic volunteers. Electrodiagnostic study contained nerve conduction studies including median and ulnar nerves, and electromyography of abductor pollicis brevis (APB) and abductor digiti minimi (ADM). Ultrasonography were conducted in APB and ADM muscles. The muscle thickness, cross sectional area (CSA) and echo intensity (EI) were determined in each muscle. The echo intensity was measured using computer-assisted grayscale analysis. *Result:* There were significant differences in muscle thickness, CSA, and EI of APB between the CTS and the control group ($p<0.05$), whereas no significant differences in ADM. EI of APB showed highly significant positive correlation with electrophysiological severity, distal latency of median motor and sensory nerve ($p<0.05$). Muscle thickness and CSA of APB showed significant negative correlation with them. *Conclusion:* The quantitative muscle ultrasonography has a clinical significance in the diagnosis of CTS.

PO-0523

A REPORT ON 4 CASES OF APPLICATION OF MAGNETIC RESONANCE DIFFUSION TENSOR IMAGING (DTI) IN STEM CELL TRANSPLANTATION FOR SPINAL CORD INJURY TREATMENT

Ying Zhao, Li-Jua Ao, Ying-Ying Shang, Li-Qing Yao

The second affiliated hospital of kunming medical college

Objective: Application of DTI technique to observe the therapeutic effect of stem cell transplantation for treatment of spinal cord injury; *Method:* select 4 eligible patients from the patients with spinal cord injury undergoing stem cell transplantation therapy; apply MRI and DTI examination to the 4 patients before and after treatment; measure apparent diffusion coefficient (ADC) and fractional anisotropy (FA). *Result pretherapy:* The average ADC value is (3068.429±619.429) ×106 mm^2 /s, The average FA value is (152.00±79. 00) ×10-3; posttreatment: The average ADC value is (2762.857±657.857) ×106 mm^2 /s, The average FA value is (195.71±147.29) ×10-3. The ADC value decreases significantly, and the FA value increases. *Implications:* The DTI changes in stem cell transplantation for the treatment of spinal injury conform to the principles of spinal cord repair, but there is still a lack of adequate sample to prove its efficacy.

PO-0524

MOOD AND HEALTH-RELATED QUALITY OF LIFE (HRQOL) IN CHINESE PREOPERATIVE PATIENTS WITH LUMBAR DISC HERNIATION (LDH)

Chao-Qun Ye, Cong-Wei Wang, Fang Li, Guang-Min Zhao, Tian-Sheng Sun

Orthopaedic department of Beijing Army General Hospital

Objective: To explore the mood and HRQOL of the Chinese preoperative patients with LDH. *Methods:* A total of 251 patients diagonosed LDH admitted in our hospital from 2011.3-2012.6 were recruited. The low back and leg pain intensity was evaluated by visual analogue scale (VAS), anxiety and depression symptoms was evaluated by Zung Self-Rating Anxiety Scale (SAS) and depression Scale (SDS), function disability by Oswestry Disability Index (ODI), and HRQOL by SF-36 within 48 h of admission. *Results:* 232 patients including 142 (61.2%) males and 90 (38.8%)females were included to analysize in this study. The score of SAS, SDS, pain intensity and ODI was significantly increased, and the scores of total SF-36 and the diverse domain was decreased in patients with LDH. Among the patients, as high as 147 (63.3%)present severe pain in leg and 61 (26.3%) with moderate pain, 86 (37.7%)patients presenting depression, 127 (54.7%) with anxiety, 132 (56.9%) with sever and extreme sever function disability, 165 (71.1%) with poor HRQOL. Although age and sex make a difference in the HRQOL of the patients, after adjustment for age and sex, the scores of all the pain intensity in leg, SDS, SAS and ODI demonstrated significant association with the scores of SF-36 and diverse domains. *Conclusion:* The preoperative patients with LDH suffer from not only moderate to severe pain and function disability, but also evident mood disorder and HRQOL impairment. The results suggest that mood intervention should be considered as an essential component in the clinical therapy for the patients with LDH.

PO-0525

CENTRAL SENSITIZATION AND COMPLEX KNEE PAIN: A CASE REPORT

Herison Vaz[1], Fernando Borges[1], Fernando Hong[2], Marta Imamura[3]

[1]Academic League of Pain, University Potiguar, School of Medicine, Natal, RN, Brazil,Brazil, [2]University of Sao Paulo School of Medicine, Sao Paulo, SP, Brazil,Brazil, [3]Clinical Research Center - Institute of Physical Medicine and Rehabilitation, University of Sao Paulo School of Medicine, Sao Paulo, SP, Brazil, Brazil

Patient A 47-year-old woman diagnosed with congenital rachitis, chronic refractory knee pain for 47 months, severe varus deformity and secondary osteoarthritis of the left knee, fourth grade at the Lawrence Kellgran classification. *Methods:* The patient presented with signs of hyperalgesia and allodynia at L3, L4 and L5 spinal segments. Severe pain on palpation of the vastus medialis muscle and the medial interarticular line of the left knee and pronounced amiotrophy of the medical compartment of the left thigh. Received focal shockwave therapy 2.000 impulses, at 6 Hz, at the medial knee; paraspinous blocks at L3, L4: needling and infiltration of the vastus medialis muscle and L5 level (peroneal muscles): in two consecutive weeks; functional electrical stimulation was performed for three consecutive weeks over the vastus medialis muscles. Hialuronic acid intra-articular injection was also performed under ultrasonographic guidance. A total of 2.5 cc was injected in weekly intervals for three consecutive weeks. Paracetamol (500 mg), codeine (30 mg, three weeks): every six h; naproxene: 500 mg twice daily. *Results:* Three weeks after the treatment patient reported decrease in pain intensity. Improvement in: ability to walking and to keep orthostatic position for longer periods of time; sleep quality. Although residual pain, muscle palpation without signs of hyperalgesia. *Impact on Rehabilitation:* Removal of peripheral nociceptive impulses combined with central desensitization by paraspinous blocks may provide symptomatic pain relief and improvement in functional capacity when total knee replacement is indicated however not possible to be performed. Multipoint and multimodal interventions should be considered for patients who are scheduled for a knee replacement.

PO-0526

ELECTROACUPUNCTURE PREVENTS OVARIECTOMY-INDUCED OSTEOPOROSIS BY ACTIVATING WNT/B-CATENIN SIGNALING PATHWAY

Jun Zhou[1], Hongchen He[1], Lin Yang[1], Huifang Liu[1], Shiju Chen[1], Hua Guo[1], Lu Xia[1], Yuxi Qin[1], Chuan Liu[1], Xiaofei Wei[1], Chengqi He[1,2]

[1]Department of Rehabilitation, Rehabilitation Key Laboratory of Sichuan Province, West China Hospital, Sichuan University, [2]Corresponding author

Objective: This study aimed to systematically investigate the effects of electroacupuncture (EA) on bone mass and Wnt/β-catenin signaling pathway in ovariectomized rats. *Methods:* Thirty 3-month old female Sprague–Dawley rats were randomly assigned to one of three groups: sham-operated control (Sham), ovariectomy (OVX), and ovariectomy with EA treatment (OVX+EA). One week following ovariectomy, rats in the OVX+EA group received 12-week electroacupuncture treatments. After 12-week electroacupuncture treatments, serum biochemical markers, bone mineral density (BMD), bone microarchitecture, bone biomechanical properties, and mRNAs and protein expressions of low density lipoprotein receptor related protein 5 (LRP5) and β-catenin in bone marrow cells were examined. *Results:* After 12-week interventions, serum 17β-estradiol and bone-specific alkaline phosphatase levels increased in the OVX+EA group ($p<0.01$, $p<0.01$). BMD of the proximal femoral metaphysis and the fifth lumbar (L5) vertebral body also increased in the OVX+EA group ($p<0.05$, $p<0.05$). Histomorphometrical studies showed that there were apparent increases of trabecular bone area, trabecular number and trabecular connection, and diminished marrow cavity in the OVX+EA group compared to the OVX group. Biomechanical studies showed that electroacupuncture increased maximum load and energy to failure in L5 lumbar vertebral body ($p<0.01$, $p<0.01$). Quantitative real-time RT-PCR and western blot analysis showed that electroacupuncture increased the expressions of mRNAs (v0.01, $p<0.01$) and protein ($p<0.01$, $p<0.01$) for LRP5 and β-catenin in ovariectomized rats. *Implications/Impact on Rehabilitation:* The results demonstrated that PEMFs can prevent ovariectomy-induced bone loss and deterioration of bone microarchitecture and strength, at least partly, through activation of Wnt/β-catenin signaling pathway.

PO-0527

EXACERBATION OF MYASTHENIA GRAVIS BY ALENDRONATE

Ümüt Güzelküçük[1], Serdar Kesikburun[1]*, Semih Alay[2], Arif Kenan Tan[1]

[1]Gülhane Military Medical Academy, Department Of Pm&R, Turkish Armed Forces Rehabilitation Center, Ankara, Turkey,Turkey, [2]Gülhane Military Medical Academy, Department Of Neurology, Ankara, Turkey, Turkey

Objective: To present a patient with myasthenia gravis who had worsening of symptoms associated with use of alendronate. *Method:* A 24-year old patient with myasthenia gravis had been administered oral systemic corticosteroid (deflazacort 40 mg/day) for three years in order to control his myasthenic symptoms. One year ago, His lomber spine bone mineral density was decreased: L2-4:0, 382 g/cm^2, T-score -2.5, Z-score -2.5. The treatment of weekly 70 mg alendronate was started for his corticosteroid induced osteoporosis. *Results:* He reported an exacerbation of muscle weakness and extreme fatigue on days when he took alendronate. He couldn't work on these days and has to be on leave. Cease of the treatment was recommended to the patient. *Implications/Impact on rehabilitation:* Alendronate should be used with caution in patients with myasthenia gravis who have corticosteroid induced osteoporosis.

PO-0528

CLINICAL RESEARCH ON TREATMENT OF KNEE OSTEOARTHRITIS BY ACUPOTOMY AND CHINESE TRADITIONAL MANIPULATION

Yu Ning, Shu-Yan QIE, Yu PAN

Dept. of Traditional Chinese Medicine, Beijing Rehabilitation Center

Objective: To observe the clinical effect of acupotomy combined with Chinese traditional manipulation in treating knee osteoarthritis, and then disuss the therapeutic mechanisms of acupotomy. *Method:* A total of 140 patients with knee osteoarthritis were enrolled and randomly divided into two groups. In the treatment group, 73 patients accepted acupotomy and chinese traditional manipulation. Acupotomy were used once a week to release the soft tissue around knee joint, and chinese traditional manipulation were used to regulate the muscle balance after acupotomy five times a week. In the control group, 67 patients were treated only with chinese traditional manipulation. The improvement of patients were evaluated with VAS (Visual analogue scale) and knee joint functional scales before and after treatment. *Results:* After 3 weeks treatment, both groups scored lower on VAS and higher on knee joint functional scales significantly compared with pre-treatment ($p<0.05$), there were also remarkable difference between the scores of VAS and knee joint functional scales of two groups after treatment ($p<0.05$). Meanwhile, the total effective rate of the treantment group was higher obviously ($p<0.05$). *Implications:* We drew a conclusion from this study that acupotomy and chinese traditional manipulation can relieve the pain and improve the function of knee Which worked through releasing of high stress point and adhesion tissue and regulation of knee muscle balance.

PO-0529

INTENSITY-DEPENDENT EFFECT OF TREADMILL RUNNING ON THE MORPHOLOGY OF RAT ARTICULAR CARTILAGE

Guoxin Ni[1], Lei Lei[2], Yue-Zhu Zhou[3], Sheng-Yao Liu[1], Zhe Li[1]

[1]Department of Orthopeaedics and Traumatology, Nanfang Hospital, Southern Medical University, 1838 Guangzhou Avenue (N), Guangzhou 510515, China, [2]Department of Rehabilitation Medicine, Longyan People's Hospital, 31 Denggao Road (W), Longyan 364000, China, [3]Department of Rehabilitation, 1st Affiliated Hospital, Fujian Medical University, 20 Chazhong Road, Fuzhou 350005, China

Objective: To understand the morphological changes of articular cartilage in response to treadmill running with different intensities in a rat model. *Method:* A total of 24 male Wistar rats were randomly assigned into groups of control (CON), low-intensity running (LIR), moderate-intensity running (MIR), and high-intensity running (HIR). Rats in LIR, MIR, and HIR groups were trained for 8 weeks on the treadmill with low, moderate, and high intensity, respectively. After sacrifice, femoral condyles were collected to observe and analyze cartilage characteristics by histology, collagen fibers under polarizing light microscopy, as well as collagen- II content by immunohistochemistry. *Results:* Histological examination showed osteoarthritic changes in HIR group, characteristized by surface irregularities, cell cloning and cluster. In comparison to CON group, proteoglycans content and cellularity were significantly higher in LIR and MIR group, but lower in HIR group. Collagen fibers in HIR group presented a pattern of disorganization under a polarized light microscope. In addition, significantly lower content of type II collagen was found in HIR group compared with CON group. *Implications/Impact on rehabilitation:* These findings suggest low- and moderate-intensity running may be beneficial to maintain the integrity of articular cartilage. However, high-intensity running may lead to cartilage degradation.

PO-0530

HOME TRAINING FOR USE IN REHABILITATION AFTER TOTAL HIP ARTHROPLASTY WITH CROWE IV CONGENITAL HIP DISLOCATION

Li Li[1], Junying Sun[1], Wei Wang[1], Fengjuan Hu[1], Hongxing Xu[1]

[1]Department of rehabilitation, the First Affiliated Hospital of Soochow University

Objective: This study aimed to summarize cases with regards to studies of rehabilitation programmes that have tried to improve function after total hip arthroplasty with Crowe IV. *Methods:* From January 2000 to December 2010, total 18 patients (20 hips) of Crowe type IV CHD underwent cementless THA (16 unilateral, 4 bilateral).Total hip replacement were performed with the medial protrusion technique to stabilize the fit of a hemispherical metal cup in the acetabulum. There were 4males and 12 females with an average age of 51 years (range, 38 to 76 years). The indications for surgery was severe hip pain and leg length discrepancy with difficulty in walking and activating.Affter surgery give home exercise rehabilitation interventions to improve functional outcome in the post-operative period. The hip functions were evaluated by Harris hip score (HHS). The muscle strength of the gluteus medius were respectively evaluated in accordance with the standards of five classes and Trendelenburg test. *Results:* The follow up period ranged from 2 to 8 years. The average HHS improved from 32.7 points preoperatively to 94.6 points postoperatively. The use of a progressive resistance training programme led to significant improvement in muscle strength and function if the intervention was carried out early (< 1 month following surgery) in a home. *Conclusion:* The home exercise for postoperative rehabilitation has led to the development of our programs following Small acetabular components combined with medial protrusio total hip arthroplasty. In reviewing our early observations of a small series of patients, it appears this exercise can be utilized without early complications; however, further studies are necessary to confirm its utility and safety.

PO-0531

CLINICAL ANALYSIS OF THE TREATMENT OF EARLY SACROILIITIS WITH CT-GUIDED SACROILIAC JOINT INJECTION OF MEDICAL OZONE COMBINED ANTI-INFLAMMATORY ANALGESIC SOLUTION

Yanping Guo

Dept. of Rehab. Medicine. Ruihua Affiliated Hospital of Soochow University, Soochow, 215104, China

Objective: To observe the clinical efficacy of CT-guided medical ozone Joint anti-inflammatory analgesic liquid sacroiliac joint injection for the treatment of early sacroiliitis. *Methods:* 32 patients with early sacroiliitis admitted to our department since 2010, CT-guided use of medical ozone combined anti-inflammatory analgesic liquid sacroiliac joint injection therapy, and observation of the therapeutic effect. *Results:* After the first treatment, the group of patients ' pain were significantly alleviate,and 24 patients' symptoms and signs disappeared without recurrence in first injection; 2 months latter another 8 patients relapse after the first treatment. but after re-treatment has not recurred. This group of patients in the process of treatment and postoperative adverse reactions and complications were not found. *Conclusion:* CT-guided puncture site is accurate, good security; using medical ozone-injection treatment of joint anti-inflammatory analgesic liquid, low-cost, effective, and no significant side effects, is worthy of clinical application.

PO-0532

DOES WAITING TIME FOR INPATIENT REHABILITATION INFLUENCE PATIENT OUTCOMES AFTER TOTAL KNEE ARTHROPLASTY?

Thomas Bochdansky

Rehabilitationsklinik Schruns, Austria

Introduction: Inpatient rehabilitation (IR) after total knee arthroplasty (TKA) is often necessary for patients who cannot cope at home soon after surgery. However the optimal timing for the IR after the TKA and the benefits of an early onset as well as the functional result has always being questioned. The aim of this study was to determine the benefits of an early start for the IR after TKA. *Method:* We retrospectively reviewed records of 280 consecutive patients who had undergone TKA (age: 68,7y; SD: 8.5; ranging between 39 to 87 y). IR was performed in a standardized clinical setting during 3 weeks, 5.5 days per week. The following parameters were recorded: demographic factors, previous lower limb arthroplasty and time to IR after TKA as well as the "timed-up-and-go-test" (TUAG) and a patient-specific instrument (WOMAC) at baseline and after IR. Predictive factors for the TUAG and WOMAC after IR were analyzed using univariate linear regression. *Results:* The mean time between the TKA and IR was 18.7 days (SD: 17.4, Range 5/177 days). TUAG improved on average for 5.9sec (35.7%, SD 6.7, Range 77/-4 sec). WOMAC-pain improved on average for 34.8%, WOMAC-stiffness improved on average for 28.9% and WOMAC-ADL improved on average for 45.1%. WOMAC-summary improved on average for 42,1% (40.2 points, SD 38.5). In a univariate analysis the TUAG and WOMAC-summary after 3 weeks of IR depended only on age but not on time between TKA and IR. Patients with later IR onset had better results in the TUAG at baseline but after 3 weeks of IR they levelled with the early IR onset patients. *Conclusion:* Patients with an early IR onset after TKA seem to have higher functional limitations at baseline. Nevertheless after 3 weeks of IR those patients managed to level with the later IR onset patients showing equal functional and patient-specific outcomes. Age seems to be an independent limiting factor for IR.

PO-0533

SONOGRAPHIC EVALUATION OF THE ILIOTIBIAL BAND AT THE LATERAL FEMORAL EPICONDYLE: DOES THE ILIOTIBIAL BAND MOVE?

Elena Jelsing*, Jay Smith

Mayo Clinic, United States

Objective: To determine whether the iliotibial band (ITB) moves relative to the lateral femoral epicondyle (LFE) as a function of knee flexion in both non-weightbearing and weightbearing positions in asymptomatic recreational runners. *Methods:* Five male and fifteen female asymptomatic recreational runners (10-30 miles per week) ages 18-40 years were examined using sonography to assess the distance between the anterior fibers of the ITB and the LFE in full extension, 30 degrees of knee flexion and 45 degrees of knee flexion. Measurements were obtained on both knees in the supine and standing positions. *Results:* The distance between the anterior fibers of the ITB and the LFE significantly decreased from full extension to 45 degrees of knee flexion in both the supine (0.38 cm average decrease; $p<0.001$) and standing positions (0.71cm average decrease; $p<0.001$). These changes reflect posterior translation of the ITB during the 0 to 45 degree flexion arc in both supine and standing positions. During standing at full extension, the anterior fibers of the ITB were on average 0.297 cm more anterior to the apex of the LFE than during full extension in a supine position ($p < 0.001$). *Implications/Impact on Rehabilitation:* Sonographic evaluation of the ITB in our study population clearly revealed anterior-posterior motion of the ITB relative to the LFE during knee flexion-extension. Our results indicate that the ITB does in fact move relative to the femur during knee motion. Future investigations examining ITB motion in symptomatic populations may provide further insight into the pathophysiology of ITB syndrome and facilitate the development of more effective treatment strategies.

PO-0534

STUDY OF THE EFFECTS OF LOCAL PLATELET-RICH PLASMA (PRP) INJECTION VERSUS AUTOLOGOUS BLOOD INJECTION IN PATIENTS WITH LATERAL EPICONDYLITIS

Seyed Ahmad Raeissadat, Seyed Mansoor Rayegani, Mohammad Hasan Bahrami, Darioush Eliaspour, Rosa Rahimi*

Physical Medicine and Rehabilitation Research Center, Shahid Beheshti Medical University, Faculty of Medicine, Modarres Hospital, Iran

Objective: This study was designed to compare effects of PRP and autologous blood injection in patients with chronic lateral epicondylitis. *Method:*40 patients with chronic lateral epicondylitis and intractable pain were divided equally into 2 groups,group A and group B. Group A was treated with a single injection of 2 ml of PRP and group B with 2 ml autologous blood. Both groups used tennis elbow band and did stretching and strengthening exercises during 2 months of follow up.Pain visual analog scale (VAS), Mayo score (Modified Mayo clinic performance index for the elbow) and Pressure pain threshold (PPT) were evaluated at the beginning,4 and 8 weeks after treatments. *Result*: All parameters (VAS, PPT and Mayo) were improved in both groups, 4 and 8 weeks after injections and they were statistically significant except for PPT in PRP group. There was no significant difference between PRP and AWB in VAS, PPT or Mayo at 4 and 8 weeks (p>0/05).2 months after injections in comparison with 4 weeks, VAS (p=0/03) and Mayo score (p=0/006) were improved in PRP group but despite clinical improvement,they were not significant in AWB group (p > 0/05). *Implications/Impaction Rehabilitation:* PRP and autologous blood injections were both effective methods to treat chronic lateral epicondylitis although there is no superiority of PRP to AWB in short time follow up. But seems trend of improvement in PRP group continued significantly only.

PO-0535

COMPARATIVE EFFICACY OF INTR-ARTICULAR STEROIDS AND NSAIDS FOR QUICKER FUNCTIONAL IMPROVEMENT IN OSTEOARTHRITIS OF KNEE JOINTS

Shahidur Rahman

BSM Medical University, Bangladesh

Objectives: Osteoarthritis of knee is very common in older population. Most of them need compulsive knee bend for low seat in daily living and workplace activities. Intraarticular steroid and NSAIDs can provide quick functional improvement in osteoarthritis of knee. Safety and efficacy of one over other needs to be justified. This study was done to see their comparative efficacy in terms of quicker functional improvement. *Methods:* 140 patients with OA knee were randomly selected to divide into two equal groups; groupA and GroupB. Group A received IA steroid and group B received Naproxen 500 mg twice daily for 2 weeks. Quadriceps strengthening exercise and activity of daily living instructions were given to all patients. Outcomes were measured at 1 week and 2 weeks to see the status of painless knee bend, WOMAC score and Oxford knee score. Results were analyzed in SPSS and MS excel. *Results:* 90% of patients were able to bend knee and use stair with little or no pain at one week in group A and 30% and 50% of patient in group B were able to perform same activities at one and two week respectively. p-values were significant at both scoring parameters. Treatments were well tolerated. Adverse effects of treatment were negligible in each group. *Implications:* IA steroid can provide prompt relief of knee pain which is urgently asked by most patients to return to their compulsive low seat activity.

PO-0536

EFFICACY OF CORE STABILITY EXERCISE ON THE LOW BACK PAIN

Huijuan Pan[1], Yubin Wang[2], Huifang Wang[1,3], Bingyin Liang[1]

[1]Department of Rehabilitation Medicine, Shanghai East Hospital, Tongji University School of Medicine, No. 150 Jimo Road, Pudong New Area, Shanghai 200120, [2]Department of Sports Medicine, Shanghai East Hospital, Tongji University School of Medicine, No. 150 Jimo Road, Pudong New Area, Shanghai 200120, [3]Sunshine Rehabilitation Center, shanghai, 201619

Objective: The purpose of this study was to investigate the efficacy of core stability exercise on patients with lower back pain, and to discuss H reflex's value on assessment of curatio. *Method:* 30 cases of low back pain were randomly divided into two groups: 17 patients underwent core stability exercise in addition to traditional lumbar dorsal muscle exercise (Core Group), 13 patients underwent traditional lumbar dorsal muscle exercise only (Control Group). All patients complained lumbosacral pain, with or without leg pain or numbness, for a duration of two weeks to one year. All were diagnosed lumbar disc herniation by CT or MRI, partly with spinal canal stenosis or even nerve root damage. The results were evaluated with soleus H reflex before treatment, and three months after treatment. H reflex latency and amplitude were recorded and compared between two groups. *Results:* The scores in two groups showed no significant difference before treatment (p>0.05). Three months after treatment, the scores of McGill scale were improved in Control Group, and significantly improved in Core Group. There was significant difference between two groups (p<0.01). H reflex latency of Core Group was significantly shorter than Control Group, with H reflex amplitude bigger than Control Group. The difference was statistically significant (p<0.01). *Implications:* Core stability exercise is effective for the rehabilitation of low back pain. H reflex is reliable and sensitive in detecting the nerve root damage, and also is valuable to assess the curative effect on patients with low back pain.

PO-0537

COMPARISON OF THERAPEUTIC EFFECTS OF ULTRASOUND-GUIDED VISCOSUPPLEMENTATION AND COMBINED WITH PHYSICAL THERAPY IN PATIENT WITH ROTATOR CUFF TEARS

Dinghao Liu[1], Si-Huei Lee[1,2]*, Chen-Liang Chou[1,2]

[1]Department of Physical Medicine & Rehabilitation, Veteran General Hospital, Taipei, Taiwan, Chinese Taipei, [2]Department of Physical Medicine and Rehabilitation, National Yang-Ming University School of Medicine, Taipei, Taiwan,Chinese Taipei

Objective: To compare the efficacy of ultrasound-guided Hyaluronic acid (HA) injections plus physical therapy (PT) with that of viscosupplemention alone for the treatment of rotator cuff tear of the shoulder. *Method:* Prospective, randomized controlled trial. Patients (n=100) with rotator cuff of the shoulder were randomly placed into either of the following treatment groups: group 1, HA injections with PT (HAPT group); or group 2, HA alone (HA group). The patients in group 1 received ultrasound-guided injections of HA, 25mg, once per week for 2 consecutive weeks and also participated in a PT program for 3 months. The patients in group 2 received HA injection alone. Two groups completed twelve weeks of follow-up. The primary endpoint was pain on a visual analogue score (VAS), and secondary endpoint included the Constant Murley score, the Oxford Shoulder Scores, Active and passive range of motion (ROM) and manual muscle testing of the affected shoulder. *Results:* Both groups

got improvements in terms of pain, ROM and Constant Murley score after the treatments. When the groups were compared, no significant group effect was found for the primary outcome measurements, but Constant Murley score, Oxford shoulder scores and ROM had significant effect in HAPT than HA group. *Implications/Impact on rehabilitation:* Ultrasound-guided Hyaluronic acid injections plus physical therapy in patient with rotator cuff disease may facilitate functional recovery than Hyaluronic acid injection alone.

PO-0538

A LONG-TERM FUNCTIONAL FOLLOW-UP ON THIRTEEN FOREARM REPLANTATION CASES

Jun Wang

Rehabilitation Department, Wuxi No.9 hospital (Wuxi hand surgery hospital)

Object: The aim of this retrospective study was to analyse the results of 13 forearm replantations with special attention on functional outcomes. *Introduction:* Replantation of an amputation, even though avulsion and crush injuries constitute extensive damage of vessels and nerves, is no longer a difficult technical problem to hand surgeons nowadays. However, what we want is a functional hand. This led us to follow-up our case series of 13 forearm replantations to make good understanding on replanted hands through objective and subjective evaluating. *Material and Methods:* Thirteen patients with traumatic forearm amputation were enrolled in our study. Objective evaluation, including range of motion, grip strength, sensory recovery and Jebsen hand function test, were measured. The Disability of Arm, Shoulder and Hand (DASH) questionnaire survey was done as subjective perception of overall hand function recovery. *Results:* The average age at the time of surgery was 39.92±8.31 years (ranged from 24 to 57 years). There were 8 male and 5 female in our research, 9 patients injuried on the dominated side and 4 on the un-dominated side. The mean grip strength, tip-to-tip pinch and lateral pinch were 8.16 ± 10.58, 2.64 ± 3.19 and 5.33 ± 4.66 kg respectively. The total active motion (TAM) and the motion of wrist, forearm rotation were 154.8± 58.6, 60.7± 26.3 and 108.5 ± 41.3 degrees. There were 12 patients regained protective sensation (pain and temperature sensory), among which five patients' two-point discrimination recovered. There were 10 out of all 13 patients complained of cold intolerance. The Jebsen hand function test results revealed that most patients could fulfill daily living tasks using their involved hand, however, they consumed more time than un-involved hand. The average DASH score was 29.22±19.04 (ranged from 1.67 to 52.50). *Conclusions:* The long-term results of forearm replantation confirmed satisfactory outcomes in terms of general upper limb function, grip and pinch strength, range of motion and up-extremity function, as well as protective sensation. Hence, replantation is still the best way to reconstruct hand function after total amputation of a major limb segment.

PO-0539

THE EFFECT OF LOW-FREQUENCY PULSED ELECTROMAGNETIC FIELDS ON MUSCLE STRENGTH AND MUSCLE ENDURANCE OF PATIENTS WITH POST-MENOPAUSAL OSTEOPOROSIS

Hongchen He[1], Jian Xu[2], Lin Yang[1], Zhong-Jie Lei[1], Wei Xie[1], Yong-Hong Yang[1], Qiang Gao[1], Cheng-Qi He[1]

[1]Department of Rehabilitaion medicine, West China Hospital, [2]Huaxi 4th Hospital, Sichuan University

Purpose: To observe if the effect of pulsed electromagnetic fields (PEMFs) added to conventional drug therapy (CDT) is more effective than CDT alone in improving muscle strength and muscle endurance in post-menopausal women with osteoporosis (OP). *Design:* Forty-three patients were enlisted. Twenty-four OP patients were randomized to combined treatment (CT) performing CDT + PEMFs and 19 patients to CDT (CDT only). *Methods*: Both groups received conventional drug therapy. Meanwhile, combined treatment group was treated with PEMFs once a day, for 30 days. *Results:* The muscle strength of back muscle, abdominal muscle, quadriceps and the muscle endurance of these muscles were significantly increased in both groups with significant between-groups differences (p=0.002, p=0.007, p=0.004). In CT group, after treatment (p<0.05). In conventional drug therapy group, only the increase of abdominal muscle had statistical significance (p<0.05). Between the two groups, the increase of back muscle and abdominal muscle in combined treatment group was higher than conventional drug therapy group (p<0.01). *Conclusion:* PEMFs could improve the muscle strength of back muscle and abdominal muscle of post-menopausal women with osteoporosis. PEMFs combined with drugs could improve muscle strength of quadriceps and muscle endurance of back muscle, abdominal muscle and quadriceps of post-menopausal women with osteoporosis.

PO-0540

THE EFFECTS OF LOADED SWIMMING EXERCISE ON ARTICULAR CARTILAGE AND EXERCISE ABILITIES IN KNEE OSTEOARTHRITIS MODEL RATS

Wangshu Yuan, Lixia Chen, Shufen Liu

Department of Physical Medical Rehabilitation, Peking Union Medical Collage Hospital

Objective: To observe the effects of loaded swimming exercise on articular cartilage and exercise abilities in knee osteoarthritis model rats, and to discussed the mechanism of loaded swimming exercise in treating knee osteoarthritis (KOA), then to offer the theoretical evidence that loaded swimming exercise can be used in clinical practice. *Methods:* 50 male Wistar rats were divided randomly into a normal group (20 rats) and a model group (30 rats). Rats in the model group were established into knee osteoarthritis models by papain injecting. When models were done, took 10 rats from each normal group and model group: 1) observed pathological changes of knee articular cartilage in rats with eyes and optical microscopes, then scored; 2) observed the expressional rates of MMP-13 inknee articular cartilage in rats by using immunohistochemical technology; 3) evaluated exercise abilities of rats. The rests of the model group were divided into a loaded swimming group (10 rats) and a control group (10 rats). There were no extra interventions in rats in the normal group or the control group. Rats in the loaded swimming group took loaded swimming exercise for 6 weeks. After that, surveyed all 3 indicators which be mentioned before in all groups. *Results:* The scores of pathological changes and the expressional rates of MMP-13 inknee articular cartilage in rats in loaded swimming group were decreased significantly than the control group (p<0.05), and the exercise abilities were increased significantly than the control group (p<0.05). *Conclusions:* Loaded swimming exercise can delay the articular cartilage damage,and can increase the exercise abilities of KOA model rats. Loaded swimming exercise can be a physical therapy to treat KOA.

PO-0541

RELATIONSHIP BETWEEN ISOKINETIC STRENGTH, PAIN AND FUNCTIONAL STATUS IN PATIENTS WITH KNEE OSTEOARTHRITIS AGED OVER 80

Changshui Weng, Yan Mei Guo, Wei Chen, Na Wan, Li Ming Liu

Chinese PLA General Hospital (301 Hospital), beijing, 100853, China

Objective: This study was to evaluate the difference in isokinetic strength of knee muscles between patients with knee osteoarthritis (OA) aged over 80 and matched healthy controls, and to establish the correlation between the quadriceps of isokinetic strength and

function ability and clinical characteristics in patients with knee OA. *Methods:* 32 patients with a diagnosis of unilateral knee OA aged over 80, and 10 matched controls were enrolled. VAS and Lequesne index were used to assess patients with knee OA. Functional ability was assessed by the Timed up and go test (TUGT), Five times sit to stand test (FTSST) and Timed 10-meter walk test (TWT).Muscle strength was measured using the isokinetic dynamometer Biodex System 4 Pro®. Bilateral isokinetic (concentric) knee flexion and extension with the protocol of 60 degrees/sec (five repetitions), 180 degrees/sec (ten repetitions) were performed. *Results:* OA group and control group between two angular velocity of extensor and flexor peak torque was significantly different ($p<0.05$). Extensor peak torque and age, Liquesce index scores, FTSST, TUGT and TWT was a significant negative correlation ($p<0.05$). No correlation between Extensor peak torque and Radiographic score,BMI, VAS score and Lequesne index pain score ($p>0.05$). Using backward regression, Extensor peak torque, VAS score together significantly predicted Liquesce index ($p<0.001$,$R^2=0.41$). *Implications:* Quadriceps strength and intensity of pain is an important indicator to predict disability in elderly patients with Knee OA aged over 80. This has important therapeutic implications.

PO-0542

CLINICAL STUDY OF RADIOFREQUENCY THERMOCOAGULATION COMBINED WITH OZONE ABLATION IN TREATMENT FOR CERVICAL DISC HERNIATION

Xiaoli Yang, Xia Liao, Huiyong Nie, Zhonghua Wang, Xiaohong Hu

Department of Pain Management, the First Affiliated Hospital of Medical School, Xi'an Jiaotong University

Objective: To explore the effects of radiofrequency thermocoagulation combined with ozone ablation in treatment for cervical disc herniation. *Methods:* 160 patients with cervical disc herniation, who were diagnosed by MRI, were involved in this study. Under C-arm guiding, the needles were inserted into the nucleus pulposus or/and targets of cervic intervertebral disc through the path between anterior cervical vascular sheath and visceral sheath. Each disc was treated with radiofrequency thermocoagulation combined with ozone injection. *Results:* 24 h to 3 months after the treatment, VAS of pain were significantly improved, and the excellent rates were more than 90% without any serious complications. *Conclusion:* radiofrequency thermocoagulation combined with ozone ablation is an effective procedure for treatment of cervical disc herniation.

PO-0543

EARLY PROTECTIVE JOINT MOTION WITH ANTERIOR CRUCIATE LIGAMENT COMPLETE RUPTURE LEADS TO NATURAL HEALING

Takanori Kokubun[1,2], Naohiko Kanemura[1], Yuichi Nishikawa[3], Hiroshi Mejima[4], Sadao Morita[2], Kiyomi Takayanagi[1]

[1]Department of Physical Therapy, Saitama Prefectural University, Koshigaya, Japan, [2]Graduate School of Rehabilitation Medicine, Tokyo Medical and Dental University, Tokyo, Japan, [3]Department of Rehabilitation, Hiroshima University Hospital, Hiroshima, Japan, [4]Department of Tokyo Physical Therapy, Teikyo University of Science, Tokyo, Japan

Objective: To find the effect of early protective joint motion for anterior cruciate ligament complete (ACL) rupture by artificial ACL transection of rats. *Methods:* Thirteen-six complete mature male Wistar rats were divided into 3 groups: 1) control, 2) sham operated, and 3) Experiment. In the experiment group, ACL was surgically transected and then tied up the joint with nylon string to put brake on forward slides. For sham operated group, the procedure was same as Experiment group except ACL transection. Four rats of each group were sacrificed at three time point (2 weeks, 4weeks, and 6 weeks), and the ACL collected. The collected samples were analyzed histologically and biologically. *Results:* Within the experimental group, all the subjects at every time points showed natural healing of ACL at cellular level. Increased undifferentiated cells which connect to ACL fiber were verified within the conservative therapy group at 2 weeks, but not in the sham operated or control group. And biologically, alpha-smooth muscle actin and vascular endothelial growth factor; these were major healing related factor after injury gene expression of mRNA revel was higher at experiment group in each time points. *Implication/Impact on rehabilitation:* These results suggested that early protective joint motion takes an important role in acute stage rehabilitation of ACL complete rapture when its natural healing is expected.

PO-0544

THE CLINICAL EFFECTS OF COMPREHENSIVE PHYSIOTHERAPY IN THE TREATMENT OF TEMPOROMANDIBULAR DISORDERS

Lili Xu, Bin Cai, Zhongyi Fang, Xiaochang Shi

Shanghai ninth peoples hospital affiliated Shanghai Jiaotong University School of Medicine

Objective: To evaluate the clinical effects of comprehensive physiotherapy for temporomandibular disorders. *Methods:* 307 consecutive patients with temporomandibular disorder, who received comprehensive physical therapy were reviewed retrospectively between April 2011 to March 2012 (273 females and 34 males, 35.7 ± 18.2 years). The patients were complaining of preauricular pain, limited mouth opening, joint clicking, and so on. Comprehensive physiotherapy according to the patient's condition included patient education, physical therapy (ultrasound, ultrashort wave), soft tissue massage, joint mobilization and exercise. Patients received the treatment 3-6 times/week for 1-3 weeks. Maximum active mouth opening (mm), the degree of pain (the 0-10 VAS score) and joint clicking (100% before treatment) were assessed before and after treatment respectively. SPSS was used for data analysis. *Results:* At the end of treatment, the patient's maximum active mouth opening, pain intensity and joint clicking improved significantly ($p<0.001$). *Implications:* Comprehensive physiotherapy can improve symptoms of temporomandibular disorders and maybe an effective treatment for temporomandibular disorders.

PO-0545

CLINICAL EFFECT OF NEUROMUSCULAR ACTIVATION ON LUMBAR STABILITY OF POST OPERATION PATIENTS WITH LUMBAR VERTEBRA FRACTURE

Hanming Wang, Shu-Yan Qie, Jun Jiang, Li-Hua Zhang, Yong-Hong Ding, Yu Pan

Dept. of Rehabilitation Medicine, Beijing Rehabilitation Center

Objective To observe the clinical effect of neuromuscular activation on lumbar stability of post operation patients with lumbar spine fracture. *Methods:* Forty patients after lumbar vertebra fracture operation were randomly divided into training group ($n=20$) and control group ($n=20$). The training group received neuromuscular activation training by sling exercise, the control group received routine physical therapy to strengthen the low back muscles. Both groups received training five times a week for 6 weeks. All patients were evaluated with VAS (Visual analogue scale) and ODI (Oswestry Disability Index) before and after6 week- training. *Results:* There was no significant difference between two groups before training (p>0.05). After 6 weeks training, both groups scored lower on VAS and ODI Compared with before training (p<0.05). The scores of VAS and ODI were significant lower in training group

(p<0.05). *Conclusion:* Neuromuscular activation can relieve low back pain,enhance the lunbar stability and ability of daily living activities of post operation patients with lumbar vertebra fracture. The neuromuscular activation training worked through activation of the local stabilized muscles, which can improve the intersegmental stabilization and then relieve the clinical symptoms.

PO-0546

STUDY ON MUSCLE CONTRACTION DURING THE ELECTRICAL STIMULATION WITH DIFFERENT FREQUENCIES

Rong Xu, Zhen Han
Department of Rehabilitation, Nanjing Drum Tower hospital the affiliated hospital of Nanjing University Medical school

Objective: Use the mechanomyogram (MMG) to detect the affect to muscle function during the electrical stimulation with different frequency. *Methods:* Selected 25 healthy subjects. Comparing the MMG of muscle contractions under 20% maximum voluntary contraction (MVC)and electrical stimulation on 4 frequencies (20 Hz, 50 Hz, 100 Hz, 1000 Hz). Resolve the date of average frequency, and the trends of the amplitude. Result MMG Waveform analysis shows there are significant correlation between voluntary contraction and electrical stimulation when the frequencies are over 100Hz. On the other hand, with increasing the frequency of electrical stimulation, the amplitude a significant decreased. *Conclusion:* The paper presented electrical stimulations with 100 Hz or higher frequencies are more effectively on spasticity inhibition.

PO-0547

CORRELATION PAIN AND FUNCTIONAL DISABILITY WITH LUMBAR VERTEBRAE TRANSLATION AND ROTATION IN THE SAGITTAL PLANE IN PATIENTS WITH LUMBAR SEGMENTAL INSTABILITY

Yahya Javadian, Mohammad Taghipour Darzinzghibi*, Nasser Jan Mohammadi
Babol Medical University, Iran, Iran

Objective: Pain and functional disability in patients with lumbar segmental instability are common. The aim of study was to investigate correlation between pain and functional disability with sagittal plane lumbar vertebrae translation and rotation in patients with lumbar segmental instability. *Method:* Total of 30 male and female with the signs and symptoms of lumbar segmental instability according to Hick's criteria participated in this randomized clinical trial study. Study variables included pain intensity measured by VAS, functional disability measured by modified oswestry index and lumbar vertebrae translation and rotation in the sagittal plane measured by Panjabi method. Pearson correlation coefficient was used for statistic analysis by SPSS15. *Results:* The mean of pain and functional disability was 46.40±4.1 mm and %44.83 ±6.09. Correlation between pain and L3, L4 and L5 translation was 0.187, 0.01 and0.06 respectively. Correlation between pain and L3, L4 and L5 rotation was 0.01, 0.3 and 0.28 respectively. The results did not show any significance between functional disability and L3, L4, L5 translation and rotation in the sagittal plane. *Implications/ Impact on Rehabilitation:* The study results did not demonstrate any significant correlation between pain, functional disability and lumbar segmental translation and rotation in the sagittal plane. Therefore the amount of translational and rotational displacements cannot have impact on the level of pain or functional disability in these patients.

PO-0548

HERBAL REYANBAO BACKACHE AND INTERMEDIATE FREQUENCY THERAPY

Nian Zuo
Wuhan University Zhongnan Hospital Rehabilitation

Objective: Observation of Chinese medicine Reyanbao and intermediate frequency treatment of low back pain effect. *Method:* Patients with low back pain in 78, male 41, female 37; age 28-69 years old. Package using traditional Chinese medicine: Saffron, Lycopodii herb, Radix dipsaci, lopseed, windproof, mugwort leaf, Radix cyathulae, Caulis Spatholobi, pepper, dutchmanspipe, Angelica. Medicine is put into a small bag, First with blisters 2 h,by steamer steaming hot. During the treatment, will be close to the skin of patients with charge, The intermediate electrode placed in charge, Open the output frequency treatment, to tolerance, Once a day, every 20 min, a course on Monday. *Results:* After 1 ~ 2 courses of treatment, the symptoms were improved obviously. *Implications/ Impact on Rehabilitation:* In charge with promoting blood circulation and removing blood stasis, expelling wind and dampness, warming and activating meridian, Ruanjian Sanjie effect. If there is pain, promoting tissue repair.

PO-0549

THE CORRELATION BETWEEN LIFE STYLE FACTORS AND BMD IN WOMEN

Gordana Stefanovski
Institute Dr M.Zotovic, Bosnia and Herzegovina

Objective: Up to now there has no been statistical data about the risk factors for the osteoporosis in the female population of our region. Purpose to find out the relationship betweenlife style factors and bone mineral density (BMD) in women of this region. *Method:* The study included 582 Caucasian women (age 33 – 81; mean age 57.6) free of medications affecting bones. BMD was measured at lumbar spine and left hip by DXA (Hologic QDR 4500). According to the WHO definition of osteoporosis, the participants were divided into three (3) groups: normal BMD (N): 72 (12.37%); osteopenia (Opn): 178 (30.58%) and osteoporosis (Opz): 332 (57.04%). Data about lifestyle factors were collected by standardized numerical questionnaires. The accepted level of significance was sat at $p<0.05$. *Results:* In total sample correlation analyses indicated significant association between low BMD and: increased caffeine intake (c2gr=9.210; $p<0.01$), low calcium intake (c2gr=5.991; $p<0.05$) and inadequate physical activity (c2gr=9.210; $p<0.01$). In comparison between N and Opz groups, the significant association was found but at greater significance. Implications The results show the specifics of our population regarding the life style factors causing the changes in BMD. This could be useful in screening the patients for DXA.

PO-0550

ROLE OF AURICULAR POINT ACUPRESSURE IN ALTERATION OF INFLAMMATORY CYTOKINES FOR CHRONIC LOW BACK PAIN

Chao Hsing Yeh[1], Lung Chang Chien[2], Kathryn M. Albers[1], Lorna Kwai-Ping Suen[3]
[1]University of Pittsburgh,United States, [2]Department of Internal Medicine, Washington University in St. Louis,United States, [3]Hong Kong Polytechnic University, United States

Objectives This prospective, randomized clinical trial (RCT) was to investigate pro- and anti-inflammatory cytokine profile change patterns of auricular point acupressure effects and the associations between cytokines and pain intensity for chronic low back pain (CLBP). *Methods:* Participants were eligible if they had CLBP of at least three months duration and of at least moderate intensity (rating of at least four on a 0-10 scale). They were randomized to either true APA or sham APA. Duration of treatment was four weeks. Participants were instructed to press on the seed three times a day for three min.At the last assessment seeds were removed. A peripheral blood sample (10 ml) was collected into a red top color vacutainer

using standard phlebotomy procedures. *Results:* CLBP participants who reported a mean 70% reduction of pain intensity at the completion of a 4-week APA regimen exhibited a trend for changes in serum pro- and anti-inflammatory cytokines (decreased IL-1β, IL-4, IL-10; increased IL2, IL6, TNFα) compared to participants in the sham APA group, who reported a 29% pain reduction (decreased IL2, IL-4, TNFα; increased IL-1β, IL-6, IL10). This study found associations between IL-1β, IL2, IL6 and IL10 concentrations and the worst pain intensity score may play an important role for the APA effects for CLBP. *Discussion:* The change in cytokines levels after APA was administered suggests that the levels of cytokine concentrations were most likely caused by the APA.

PO-0551

THERAPY OF CERVICAL VERTEBRAE DESTABILIZING OF YOUNG PEOPLE

Yong Xuan, Zhao Ma, Yuming Li

Department of rehabilitation medicine of Beijing Hospital, China

Objective: To research therapeutic action that training of cervical muscle strength for cervical vertebrae destabilizing of young people. *Method:* to select 55 patients which is smaller than 35 years old. The cervical x-ray shows the consecutive vertebral body shifting ≥2 mm or ≥3 mm at hyperextension and hyperflexion attitude.The patients usually have headache, cervicodynia. All of patients have be measured the cervical muscle strength of anteflexion, hypsokinesis, left and right latexed. And be taught the training method of muscle strength. After 3 months, analyzing result. *Result:* From 55 patients, select 35 patients who's compliance is better regard as observation group, 20 patients regard as control group. To compare the difference of cervical muscle strength after therapy, we can find that the muscle strength of observation group was obviously improved, $p<0.01$, that indicate the cervical muscle strength of observation group is significant deviation than the control group. The mean of complaint improving percentage of observation group conspicuous difference than control group, and $p<0.01$. That indicate the complaint improving degree of observation group is better than control group. *Discussion*: Because the people of sitting work is more and more. The patient of cervical vertebrae destabilizing makes more youthful. From this search, we can find that improve cervical muscle strength will improve complaint of cervical vertebrae destabilizing. This search hint yet, to the pain of cervical part of young people, we must think highly of the hyperflexion and hyperextension X-Ray, it is important to early diagnose and therapy.

PO-0552

CORRELATION BETWEEN PAIN, DISABILITY, LUMBAR RANGE OF MOTION AND TRUNK MUSCLES ENDURANCE IN NON-SPECIFIC LOW BACK PAIN PATIENTS

Mohammad Taghipour Darzinaghibi[1], Samaneh Pourhadi[2], Somayeh Hosseinzadeh[3], Mahmoud Hajiahmadi[4]

[1]Babol University of Medical Sciences, Iran, [2]University of Social Welfare and Rehabilitation, Tehran, Iran, [3]Babol University of Medical Sciences, Babol, Iran, [4]Amirkola children's non-communicable diseases research center, Babol, Iran

Objective: Pain,disability, range of motion (ROM) and trunk muscles endurance are usually assessed by clinicians in clinical setting. Execution of these examinations is tiring both for patients and clinicians and needs a lot of time. The objective of the study was to answer these questions: Is there any correlation between these measures in LBP patients? Could a clinical finding be used to predict other? Is it needed to perform all clinical examinations in LBP patients? *Method:* A convenient sample of forty four Non-Specific LBP patients aged between 20-45 years was recruited. Variables included pain, disability, flexion and extension ROM, flexor, extensor and side flexors endurance which were measured by VAS, Oswestry index, modified Schober method Ito method and side support respectively. The Pearson correlation coefficient was used in statistical analysis. Results showed significant correlation between pain-right side flexor endurance ($p<$o o5, pearson ="-0.31) and" disability-flexor ="" endurance ($p<$o ="" data ="" demonstrated ="" significance ="" correlations ="" among ="" trunk="" muscle ="" endurance ="" as="" follow:extensor ="" endurance-right ="" side ="" flexor ="" ($p<$o ="" o1,pearson ="0.43), Extensor" endurance-left =""> *Implication/Impact on Rehabilitation*: The negative significant correlation between pain and muscle endurance of trunk right side flexor might be representative of this fact that many patients had right side LBP. We did not find any correlation between pain and disability which might mean these two variables are complex and have multi-dimensional aspects. Some clinical examinations such as muscle endurance can be explanted according the result acquired from others. However, clinicians must be cautious in using results of some clinical examinations in replace to another such as pain and disability. These findings must be expressed according to patient conditions.

PO-0553

AN ALTERNATIVE DIAGNOSIS OF A "POPPING"-LIKE SENSATION IN A PATIENT WITH HIP HEMI-ARTHROPLASTY: A CASE REPORT

Fajie Ma[1], Anatoly Shnayder[1]*, Ibrahim Nasser[2], Paul Pipia[1], Sanjeev Agarwal[1]

[1]SUNY Downstate Medical Center,United States, [2]Kings County Medical Center, United States

Setting Inpatient Rehabilitation Unit of a Tertiary Care Hospital Patient 55 year old female status-post right hip hemi-arthroplasty with a "popping"-like sensation revealing for a pulmonary embolism secondary to concurrent deep venous thrombosis. *Case Description:* Patient presented with hip hemi-arthroplasty for a hip fracture resulted by a ground level fall. Once on acute inpatient rehabilitation, patient had labile INR while on anticoagulation. Subsequently, she developed leg edema and pain that were appreciated. During a physical therapy session, patient reported to a "popping"-like sensation. Consequently, patient presented with acute dyspnea, diaphoresis, and vitals revealed tachycardia with oxygen desaturation. Pulmonary embolus was confirmed by a subsequent computed tomography angiography of the chest. Patient was transferred and treated in the intensive care unit. *Discussion:* Pulmonary embolus is a grave complication of a deep venous thrombosis. Up to 3% of untreated lower extremity deep venous thrombosis results in mortality-related pulmonary embolus. Virchow's triad – venous stasis, hypercoagulability state, and endothelial dysfunction – is widely accepted as concept for causes of venous thrombi. Some acquired risks factors include older age, orthopedic/major surgery, malignancy, and pregnancy/hormonal therapy. Different levels of venous thrombo-embolic prophylactic strategies are utilized depending on the patient's risk level and ranges from mechanical devices to pharmacological therapies. The therapies ranges from 60-80% efficacies and are often used in combination depending on the risk stratification. *Conclusion:* Usually, a "popping"-like sensation in a patient with hip surgery is concerning for a potential hip dislocation. Universal hip precautions are commonly utilized for patients with post-operative hip surgery to decrease the risks of such an event. In this case, the patient's presentation was suspicious for a pulmonary embolus confirmed on imaging. Although an atypical finding for a "popping"-like sensation, one should have heighten awareness for pulmonary embolism in a patient with a hip hemi-arthroplasty, labile INR, leg edema and pain who concurrently receives intense active physical therapy.

PO-0554

ASSESSMENT OF QUALITY OF LIFE IN NON-SPECIFIC LOW BACK PAIN PATIENTS USING WHOQOL-BREF QUESTIONNAIRE

Mohammad Taghipour Darzinaghibi[1], Samaneh Pourhadi[2], Somayeh Hosseinzadeh[3], Mahmoud Hajiahmadi[4]

[1]Babol University of Medical Sciences,Iran, [2]PhD candidate of Gerontology, University of Social Welfare and Rehabilitation, Tehran, Iran, [3]Babol University of Medical Sciences, Babol, Iran,Iran, [4]PhD candidate of biostatistics, Amirkola children's non-communicable diseases research center, Babol, Iran

Objective: Low back pain (LBP) and consequence disability is one of the most prevalence musculoskeletal disorders.Quality of life is a multidimensional concept and is beyond absolute physical health.There is lack of information about quality of life (QOL)of non-specific low back pain (NSLBP)patients as the main subgroup of LBP. The objective was to compare QOL between NSLBP patients and healthy Subjects using WHOQOL-BREF which is a generic and overall instrument. *Method:* A convenient sample of 126 NSLBP patients and 125 healthy subjects aged between 18-65 years old were recruited in this crossed sectional study.QOL was measures WHOQOL-BREF questionnaire which has four domains named physical health,psychological health,social relationships and environment health.The range of scores in each domain is from 4 to 20.The questionnaire has two questions about general QOL and general health too.The higher score indicates better QOL.The Mann-whitney test was used in statistical analysis. *Results:* The mean score of the physical health,psychological health,social relationships and environment health in NSLBP patients were 12.72, 13.11, 13.99 and 13.24 respectively.The mean scores of these four domains were 13.23, 13.44, 14.51and13.85respectively in healthy subjects.General QOL and general health had score equal to 3.47,3.32 in NSLBP patients and 3.66,4.00in healthy subjects respectively.The scores generally were lower in NSLBP patients as the results showed.The Mann-whitney results demonstrated significant difference between two groups in physical health, environment health and general health ($p<0.05$). *Implication/impact on Rehabilitation:* Lower QOL in LBP patients necessitates doing some interventions such as education and rehabilitation in this patients.This indicates the importance of paying more attention to this group of patients in planning future treatments in order to fortify these domains.

PO-0555

CHANGES OF A PEAK TORQUE AND REACHED TIME AND KNEE ANGLE TO PEAK TORQUE FOR KNEE EXTENSOR AND FLEXOR AFTER TOTAL HIP ARTHROPLASTY

Akio Kobe[1], Toshiyuki Muratani[1], Masayoshi Kawahara[1], Chiharu Tsuji[1], Shohei Yokogawa[1], Kazuki Ushiyama[1], Hirotada Maeda[1], Yoich Ohno[1], Kenji Kagechika[1], Ayumi Kaneuji[2]

[1]Department of medical rehabilitation, Kanazawa medical unversity Hospital, Japan, [2]Department of orthopedic surgery, Kanazawa medical unversity, Japan

Objective: The purpose of this study was to analyze changes of a peak torque and reached time and knee angle to peak torque for knee extensor and flexor after total hip arthroplasty (THA). *Method:* We measured the parameters using biodex machine under 60 and 120 degrees/s of angular velocity in 59 patients with osteoarthritis of a hip after THA. *Results:* The peak torque for the knee extensor was significantly decreased at one week and recovered to almost preoperative level at three weeks postoperatively in two angular velocities. On the other hand, the peak torque of the knee flexor showed a tendency to decline at one week and improved significantly at three weeks to compare the preoperative level. Although the time reached to the peak torque for the knee flexor at three weeks was significantly shorter than at one week in 60 degrees/s of angular velocity, there was not the significant difference for the knee extensor. Additionally there were no significant differences in knee angle reached to peak torque for the knee muscles. *Implication/Impact on rehabilitation:* It was suggested that different recovery processes of these muscular strength were due to differences of muscle composition and function of one or two joint muscle. We should be applied physical therapy for knee muscles strengthing exercise in THA patients.

PO-0556

CORRELATIONS BETWEEN TEMPOROMANDIBULAR AND CERVICAL SPINE DISORDERS: EFFICACY OF INTRA-ARTICULAR TREATMENT WITH HYALURONAN IN TEMPOROMANDIBULAR JOINT

Cristina Cadorin[1], Antonio Frizziero[1]*, Luca Guarda Nardini[2], Daniele Manfredini[2], Patrizia Poli[1], Stefano Masiero[1]

[1]Department of Physical and Rehabilitation Medicine, University of Padova, Italy, [2]TMD Clinic, Department of Maxillofacial Surgery, University of Padova, Padua, Italy

Introduction: Temporomandibular disorders (TMD) are characterized by pain and dysfunction in the temporomandibular joints. Several studies identified an association between TMD and cervical spine disorders (CSD) in terms of limited range of motion (40% of cases) and neck pain (10% of cases). The aim of the present study was to assess whether if arthrocenteses plus HA injections, with medium-molecular weight HA, could be effective in reducing pain symptoms, both in TMD and CSD. *Materials and Methods:* 12 patients were enrolled in the study. All patients underwent five weekly single-needle arthrocenteses plus medium-molecular weight HA injection. Were evaluated muscular strength, intensity of neck pain at rest measured by visual analogue scale and active cervical ROM measured by a goniometer (Inclimed®). These outcomes were assessed before treatment, and 1 month after the intervention. The Neck Pain Disability Questionnaire (NPDS) was also employed to investigate neck functional disability. *Results:* None of the 12 included subjects withdrew from the study. Findings suggest a trend toward an increase in many cervical movements and a trend toward a decrease in neck pain at rest. Especially post-treatment increasing for neck rotation supports the hypothesis of neuroanatomical connections and nociceptive relationships between the orofacial area and cervical rotatory muscles. No side effects have been reported. *Conclusions:* Considering the limits of our study this data will contribute to understand better the relationship between TMJ and CSD and to identify the first therapy target.

PO-0557

EFFECTIVENESS OF VIRTUAL REHABILITATION AND KINESIO TAPING ON PROPRIOCEPTION IN KNEE OSTEOARTHRITIS

Ali Akbar Yousefi Azarfam*, Alp Çetin

Hacettepe University, Turkey

Proprioceptive deficits in knee osteoarthritis have been documented in several studies. The methods to enhance knee proprioception, can help prevent falls in this group of patients. The aim of this study, was to establish the efficacy of kinesiotaping, and video game based virtual reality application, in the treatment of proprioceptive deficits in knee osteoarthritis. 40 patients, aged 50-75 years old, diagnosed as having right knee, or bilateral knee osteoarthritis, were enrolled in the current study. All patients were classified as garde 2 or 3 according to Kellgren-Lawrence radiologic grading scale. The patients were randomly assigned to three groups. The first group, as the virtual reality application group, were instructed to play a

simple video game, by knee movements, for 15-20 min everyday, apart from standard physical therapy program. They could control a rocket to beat a ball on computer screen, moving their knees. The second group, enrolled in a program of knee kinesiotaping, along with standard physical therapy program. The third group, as the control group, received superficial and deep heating application, and knee exercises, as a standard physical therapy program. The patients were assessed before and after the treatment, using VAS pain score, WOMAC osteoarthritis index, and right knee proprioception measurement by knee joint angle reproduction test. The results showed that VAS pain score, and WOMAC osteoathritis index values, significantly decreased in all groups, and kinesiotaping caused the most dramatic changes in pain. Although proprioception measurements showed mild improvement at 15 degrees of knee flexion among the patients in the second and third groups, the most significant changes of proprioception were detected in the first group. According to these findings, analgesic effects of kinesiotaping, and the effects of virtual reality training on proprioception, reveal the efficacy of these treatment options in knee osteoarthritis, along with standard physical therapy programs, specially in the elderly population.

PO-0558

A STUDY OF THE HIGH FREQUENCY HEAT THERAPY AND ACTIVITIES IN THE GARDEN TO TREAT OSTEOPOROSIS PRIMARY

Jianping Chen, Yuanyuan Guo
Department of Rehabilitation Medicine, the fifth Affiliated hospital of GuangZhou Medical University

Objective: To explore the clinical effect of the high frequency heat therapy and activities in the garden to treat Osteoporosis primary. *Methods:* 60 patients with Osteoporosis primary were divided randomly into a treatment and a control group, using magnetotherapy for control group, treatment group used high frequency heat therapy and activities in the garden everyday. Visual Analogue Scale (VAS), BMD,T-Score, QOL, the fall rate,the fracture rate were used to evaluate the results. *Result:* The VAS score, BMD and QOL of both groups improved after treatment, and the VAS score and QOL of treatment group are significant than that of the control group (p<0.05). The fall rate and fracture rate of treatment group are lower than that of the control group. *Implication:* The high frequency heat therapy and activities in the garden are effective in the analgesic effectiveness for Osteoporosis primary, that can reduce the fall rate and the fracture rate, and improve the quality of life.

PO-0559

PAIN RELIEF AND FUNCTION RECOVERY IN TRAPEZIOMETACARPAL OSTEOARTHRITIS AFTER SODIUM HYALURONATE (MW 500-730 KDA) INTRA-ARTICULAR INJECTIONS

Antonio Frizziero[1], Nicola Giordan[3,1], Stefano Masiero[2], Luigi Frizziero[1,1]
[1]University of Padova, Italy,Italy, [2]Rheumatology services, Villa Toniolo, Bologna Italy,Italy, [3]Fidia Farmaceutici, Clinical Research, Abano Terme, Padova, Italy

Objectives: The purpose of this retrospective open-label study was to evaluate the efficacy and tolerability of intra-articular injections of Hyaluronan for the treatment of pain and disability of trapeziometacarpal osteoarthritis (TMCJ OA). *Methods:* Fifty eight patients, 50 female (86,2%) and 8 male (13,8%), aged between 40-75 years, suffering from TMCJ OA according to Kellgren-Laurence grades 2-3 on standard X ray, were included. The cases with known inflammatory arthritis, previous thumb trauma and intra-articular (i.a.) injections with corticosteroids were excluded. Primary endpoints were: pain (VAS), NSAID intake, radial and palmar abduction, pinch strength. The patients received, an i.a. injection of 0,8 mL of Hyaluronan (MW 500-730 KDa) once weekly for three weeks. Control examinations were carried out at 1, 3, and 6 months. *Results:* i.a. Hyaluronan injections have significantly reduced spontaneous and provoked pain and improved hand mobility. In particular at 1,3, and 6 months from baseline, the spontaneous and provoked pain revealed a statistically significant improvement (p<0,0001). NSAID's intake also evidenced a statistically significant reduction against baseline (p<00,17). The adverse events occurring during the study (20,7%) are related to local symptoms such as pain during or following Hyaluronan administration. *Impact on rehabilitation:* This open-label study shows that i.a. Hyaluronan injections for TMCJ OA induce a significant improvement of function associated to stiffness decrease and pain relief. Our study confirms, also, that i.a. injections of Hyaluronan into TMCJ are easily administered, and may give symptomatic benefit with low side effects.

PO-0560

SHORT-TERM CLINICAL EFFECTS OF MANIPULATION AFTER EPIDURAL ANESTHESIA ON LUMBAR INTERVERTEBRAL DISC HERNIATION

Jianping Zhang, Xuanlin Shen, Xiaohuan Dai
Fifth Clinical Medical College of Yangzhou University, Changshu, China

Objective: To observe the short-term clinical effects of manipulation after epidural anesthesia on lumbar intervertebral disc herniation. *Method:* One hundred and eighty five patients with lumbar intervertebral disc herniation, male 101, female 84, the age from 18 to 69 years old were included. After epidural anesthesia, all patients were treated with the same eight step manipulation, including lumbar forwards continued traction for one min, lumbar forwards flexion manipulation, left lateral decubitus rotating manipulation, right lateral decubitus rotating manipulation, lumbar backwards continued traction for one min, dorsal expansion manipulation, bilateral straight leg raising and lumbar forwards continued traction for one min. The scores of McGill Pain Rating Scale, Visual Analogous Scale (VAS) and present pain intensity (PPI) were compared before and after treatment for one week. *Results:* After treatment, 170 patients (91.9%) scores of McGill Pain Rating Scale, VAS and PPI were significantly decreased (all p<0.01), 5 patients received surgery therapy, and other 10 patients received other therapies. *Implications:* Eight step manipulation after epidural anesthesia can effectively relieve pain in the patients with lumbar intervertebral disc herniation.

PO-0561

CHINESE HERBALL FUMIGATION EFFICACY OF SWELLING AND PAIN AFTER JOINT TRAUMA

Peilan Li, Zhongxia Jin, Xiaoxin Yang, Dan Hu, Chen Zhu
Shanghai Sunshine Rehabilitation Center

Objective: Chinese herbal fumigation compared with the wax therapy combined with manual therapy in the efficacy of reducing swelling and pain after joint trauma. *Methods:* 40 patients, 20 cases for the experimental group, Chinese herbal fumigation, 20 cases of the control group, wax therapy and manual therapy. 10-day course of treatment, the clinical results. *Results:* Chinese herbal fumigation group is significantly better than the the wax therapy combined with manual therapy group in the efficacy of reducing swelling and pain after joint trauma. *Impact on Rehabilitation:* On the one hand, chinese herbal fumigation by warm physical effect to ease the organization spasm, expend surrounding capillaries and promote micro-circulation, while the pharmacological effects of Chinese medicine can speed up the blood stasis discharge, Inhibition of inflammatory cytokine release. And then to reduce swelling and pain.In addition,chinese herbal fumigation to make the drug more easily absorbed.

PO-0562

EVALUATION OF TECAR THERAPY IN MUSCLE PAIN: OBSERVATIONAL STUDY

Guido Bernardi*, Barbara Magri, Elena Barbi, Melissa Barbi, Sara Grecchi, Giulia Squassabia, Viviaba Vendramin, Laura Ghidotti, Erika Bassoli, Rosa Laasorella, Margherita Corradini, Nicola Farinato, Giovanni Arioli

A.O Poma Hospital, Italy

The objective of this study was to evaluate the effect of Tecartherapy in improving rehabilitation in some osteoarticular pathologies, with the presence of pain. To evaluate the effectiveness of this therapy have been identified as indicators the perception of pain and range of motion (ROM). In order to carry out the study, were collected from folders rehabilitation, the data of 10 patients (mean age 53.2 ± 16.7ds), 3 men and 7 women, with pain in the musculo-skeletal inflammatory, traumatic and degenerative diseases. Each subject followed a rehabilitation program of daily sessions of manual therapy and physical therapy (8 sessions Tecartherapy to 20 min). Manual therapy included active and passive mobilization of the affected districts following a customized program for each patient, in addition, each of them had been prescribed the tecar terapia. The symptomatology was assessed by VAS (visual analogue scale). The data were statistically processed using the Student's *t*-test for paired data. Assessment of pain, as measured by the VAS, showed a steady reduction in all subjects, with an average increase of 6 points ($p<0.001$). With regard to the joint function is observed, even in this case, a significant improvement of the ROM. The lack of a control group and the presence of a personalized treatment for each patient are certainly biases that do not allow firm conclusions. However, these initial preliminary data it seems that the Tecartherapy can be a useful tool in the rehabilitation of the patient in reducing the painful symptoms

PO-0563

SONOGRAPHIC CHARACTERISTICS OF ROTATOR CUFF CALCIFIC NODULES TO PREDICT SUCCESSFUL BARBOTAGE

Yung Cho[1]*, Won Kim[1], Goo Joo Lee[1], Hee Sang Kim[2], Sun G. Chung[1]

[1]Department of Rehabilitation Medicine, Seoul National University College of Medicine, Seoul, Korea,Korea, [2]PM&R, Kyung Hee Medical School & Hospital, Seoul, Korea

Objective: Ultrasound-guided calcium aspiration (barbotage) is one of the most successful conservative treatment options for rotator cuff calcific tendinitis, which results in a wide range of outcomes depending on the shapes of calcific nodules. The aim of this study was to compare the outcomes of barbotage on contained versus non-contained calcium nodules. *Method:* A retrospective chart review was conducted for all patients treated with barbotage in outpatient clinic from Jan. 2009 to Dec. 2011. Two reviewers checked all the ultrasound images and classified the types of calcium deposits. A contained deposit was characterized as a spherical nodule filled with material with various consistencies. A linear calcific deposit or multiple nodules with contiguously spread were determined as non-contained. Outcomes were assessed with success of aspiration by chart review and pain reduction by telephone interview. *Results:* Total eighty patients, eighty-four shoulders were reviewed. Among 84 shoulders, 41.7% of calcium deposits were contained and 58.3% were non-contained. The aspiration success rate was significantly higher ($p<0.04$) in contained (80%) than in non-contained group (59.2%). Among 68 patients who participated in the telephone interviews, the patients with contained deposits had a higher rate (44.4%) of excellent pain reduction than the non-contained (34.1%), but it was not statistically significant. Regardless of containment, the proportion of patients with significant pain reduction was higher in calcium deposits with successful aspiration (75.6%) than the failed ones (42.8%, $p<0.022$). *Implications/Impact on rehabilitation:* The contained calcium deposits were more successfully aspirated and successful aspiration resulted in better amelioration of calcific tendinitis. These results suggest that contained calcium may indicate a better prognosis by barbotage.

PO-0564

EXERCISE THERAPY FOR ANKYLOSING SPONDYLITIS PATIENTS

Jian Lin, Xiaolin Liu, Xiongang Wang

Department of Rehabilitation Medicine, Zhejiang Provincial People`s Hospital

Objective: To study the effect of exercise therapy on alleviation of symptom in Ankylosing Spondylitis (AS) patients. *Methods:* 37 AS patients received 6 weeks (3 stages) of exercise therapy, which included contraction and relaxation training of lumbar dorsal muscle, core stabilization training and walking exercise. Subjects were assessed with Oswestry Disability Index, modified Schober's Test and Visual Analogus Scale #VAS# before and after 2, 4, 6weeks of training#. *Results:* After 6 weeks of exercise therapy, all patients scored better on Oswestry Disability Index, modified Schober's Test and VAS than before training with significant difference ($p<0.01$). 21 (56.76%), 10 (27.02%) and 6 (16.22%) patients achieved obvious, mild and no alleviation of symptom, respectively. None got worse. *Conclusion:* Exercise therapy could alleviate pain, improve functional activity and quality of life in Ankylosing Spondylitis patients.

PO-0565

SERUM VITAMIN D LEVELS IN PATIENTS ADMITTING TO A PHYSICAL MEDICINE AND REHABILITATION OUT-PATIENT CLINIC, IS PROPHYLACTIC SUPPLEMENTATION NEEDED?

Alkan Ozturk, Ebru Yilmaz Yalcinkaya, Berrin Gunduz, Belgin Erhan, Aynur Sahin

Istanbul Physical Medicine And Rehabilitation Research And Training Hospital, Turkey

Vitamin D plays an important role in many places throughout the body, including the development and calcification of the bones. Adaquate exposure to sunlight and the use of dairy products with vitamin D have significantly reduced the incidence of vitamin D deficiency. However, it is still a common problem in many populations. *Objective:* To investigate 25-hydroxyvitamin D (25-OHD) levels in out-patients of a physical medicine and rehabilitation clinic with respect to gender, age and diagnosis. *Method:* In this retrospective study, 740 patients were investigated. Malignancy, being under 18 years old, patients with history of renal disease and patients with vitamin D supplementation were ruled out; remaining data of 723 patients were analyzed. Age, gender, diagnosis, 25-OHD levels were reported. Descriptive studies, unpaired *t*-test and pearson correlation test were used for statistical analysis. *Results:* Mean age was 53.6±14.7 years (18-92). Female patients consisted 82% ($n=602$) of the study population and males 18% ($n=132$). Mean 25-OHD level was 19.5±12.5 ng/ml. Three hundred ten patients (41.89%) had 25-OHD levels lower than 20 ng/ml defined as deficency, 288 patients (38.92%) had between 20-30 ng/ml defined as insufficency. Serum 25-OHD level was significantly lower in patients diagnosed as myalgia and female patients ($p<0.05$). *Conclusion:* Vitamin D levels are low in majority of the patients in our group. Vitamin D levels evaluation must be kept in mined especially in patients complaning about nonspesific diffuse musculoskeletal pain.

PO-0566

CIRCUIT TRAINING IN PATIENTS WITH GRADE I SPONYDLOLITHEIS

Kai-Hua Chen[1,2], Yi-Hsuan Lai[1], Wing-Kay Kwan[1], Shuk-Fong Li[3], Robert Wen-Wei Hsu[4], Tsung-Jen Huang[4], Yen-Yao Li[4], Chin-Chang Cheng[4]

[1]Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital, Chiayi, Taiwan,Chinese Taipei, [2]School of Medicine, Chang Gung University, Taoyuan, Taiwan,Chinese Taipei, [3]Department of Athletic Sports, National Chung Cheng University, Taiwan,Chinese Taipei, [4]Department of Orthopedics, Chang Gung Memorial Hospital, Chiayi, Taiwan,Chinese Taipei

Objective: Spondylolisthesis is one of the common causes of low back pain, which may lead to inactivity, further lowering physical fitness, and potentially causing disability. This study investigate the effect of 12-week circuit training in patient with grade I spondylolithesis. *Method:* Six patients aged ≥40 years old, who suffered from Meyerding grade I spondylolisthesis were recruited. Twenty-week circuit training (3 times per session, 1 h per session) was given under instructor guided. Each session of circuit training included 20-min aerobic exercise, 20-min resistance training, and 20-min stretching exercise. The physical fitness evaluated by field tests, clinical symptoms evaluated by visual analog scale (VAS), disability severity evaluated by Roland-Morris Disability Questionnaire and QOL evaluated by 36-item Short-Form Health Survey (SF-36) were performed. The tests were performed before training, 6 weeks and 12 weeks after training. *Results:* There is significantly improvement of flexibility after 6-week and 12 week training. However, there was no obvious improvement or deterioration in other component of fitness, clinical discomfort, disability and QOL. *Implications:* Twenty-week circuit training in middle-aged and elderly patients with grade I spondylolisthesis had no positive effect on decreasing the clinical symptoms, disability and QOL.

PO-0567

THE EFFICACY OF SHEANUT OIL EXTRACT AND INFLUENCE OF ULTRASOUND IMAGING OF VASTUS MEDIALIS OBLIQUE IN KNEE OSTEOARTHRITIS PATIENTS

San-Pei Chen[1], Li-Wei Chou[2,3]*, Sui-Foon Lo[2,3], Kang-Ming Chang[4], Yu-Chia Wang[2], Kuo-Wei Yu[2]

[1]Department of Physical Therapy and Graduate Institute of Rehabilitation Science, China Medical University, Taichung, Taiwan,Chinese Taipei, [2]Department of Physical Medicine and Rehabilitation, China Medical University Hospital, Taichung, Taiwan,Chinese Taipei, [3]School of Chinese Medicine, College of Chinese Medicine, China Medical University, Taichung, Taiwan, Chinese Taipei, [4]Department of Photonics and Communication Engineering, Asia University, Taichung, Taiwan, Chinese Taipei

Objectives To examine the influence of Sheanut Oil Extract (SheaFlex75TM) on patients with knee osteoarthritis (OA). *Methods:* 33 patients, of average age 63.6 ± 5.8, with knee OA were recruited from the China Medical University Hospital, Taichung, Taiwan. Real-time ultrasound imaging and surface electromyography were used to objectively assess the morphological changes and the muscle activity of Vastus Medialis Oblique (VMO) during the 16-weeks intervention of SheaFlex75TM. The intraclass correlation coefficient (ICC) was calculated to examine the reliability of the inter-scans. A paired-sample *t*-test was used to assess the difference between the percentage of thickness changes and muscle activity. The Spearman's rank correlation coefficient was used to examine the relations among the variables of OA severity, pain duration, pain scale and percentage of thickness changes of VMO at different contraction status. *Results:* The baseline findings showed no significant differences among those variables. The reliability of inter-scans at pre-test day was high (ICC= 0.92-0.99) to prove the stability of the skills. The ability to contract muscles of knee at 30% contraction level was showed significant changes between the baseline and post-16 weeks, both on morphological changes (p=0.04) and muscle activities (p=0.03). Pain scale reported significant decrease (p=0.02) at the 16th week. *Implications/Impact on Rehabilitation:* The results suggest that the intervention of SheaFlex75TM relieve the symptoms of knee OA and cause the alteration of muscles control of knee. Our findings indicate that SheaFlex75TM delay deterioration of knee OA and allow preservation and improvement of functions.

PO-0568

EVALUATION OF THE MOTOR FUNCTIONS BY PDMS IN CHILDREN WITH CONGENITAL CLUBFOOT

Xuan Zhou[1], Qing Du[1], Peijie Chen[2], Li Zhao[3], Xiaoyan Yang[1], Xiaojie Li[1], Hai Li[3]

[1]Department of Rehabilitation, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, [2]Department of Kinesiology, Shanghai University of Sport, [3]Department of Pediatric Orthopedic, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine

Objective: To evaluate the motor fuctions of children with congenital clubfoot by Peabody developmental motor scale (PDMS). *Method:* 150 outpatients with congenital clubfoot and normal children below 2 years old were involved. Their foot deformity were evaluated by the Pirani method. Their motor functions were measured by PDMS. The gross motor quotient (GMQ), fine motor quotient (FMQ), total motor quotient (TMQ) were analyzed. *Results:* The Pirani score was higher for children with congenital clubfoot than for normal children. GMQ, FMQ and TMQ were worse for children with congenital clubfoot than for normal children. GMQ and TMQ of children with congenital clubfoot aged 12 to 24 months were worse than those aged 1 to 11 months. GMQ was worse than FMQ in children with congenital clubfoot aged 12 to 24 months. There were no significant differences between different types of congenital clubfoot in GMQ, FMQ and TMQ. There were no significant differences between males and females in GMQ, FMQ and TMQ. There were no significant differences between children aged 1 to 11 months and those aged 12 to 24 in FMQ. There were no significant correlation between GMQ, FMQ, TMQ and the Pirani score. *Implications/Impact on Rehabilitation:* PDMS can distinguish between the motor functions of young children with congenital clubfoot is normal or not. But the motor functions of young children with congenital clubfoot can not be effectively evaluated by PDMS.

PO-0569

CLINICAL OBSERVATION OF EARLY AND MIDDLE REHABILITATION TRAINING FOLLOWING REPLANTATION OF SEVERED FINGERS

Li Liu, Guiqing Jiang, Xueling Zhang, Binxia Qi, Xiuqin Yang

The Fifth Hospital, Harbin, China

Objective: To explore the effects of early and middle rehabilitation training on function recovery following replantation of severed fingers. *Method:* 40 patients (58 fingers) with replantation of severed fingers in our hospital during from July 2009 to december 2011 were studyed.The patients were divided into research group (early and middle rehabilitation training after replantation of severed fingers, 22 fingers) and control group (late rehabilitation training after replantation of severed fingers, 36 fingers) according to postoperative hospital stay. Early stage: postoperative 0 to 4 weeks; Middle stage: postoperative 5 weeks to 3 months; Late stage: postoperative at least 3 months. Kinesitherapy, physiotherapy, psychotherapy and corresponding period of rehabilitation training were used in this study. *Results:* Follow-ups were performed in the 6 month and 12

month after surgery. Compared with control group, replantation functional recovery rate of research group have significant difference (p<<0.05). *Impact on Rehabilitation:* Early and middle rehabilitation training following replantation of severed fingers can promote function recovery of severed finger.

PO-0570

TREATMENT OF TRIGGER FINGERS ASSOCIATED WITH CARPAL TUNNEL SYNDROME BY LOW-LEVEL LASER THERAPY AND SPECIFIC HAND MASSAGE: A CASE REPORT

Thanyaporn Aranyavalai*, Yupadee Fusakul
Department of Physical medicine and Rehabilitation, Faculty of Medicine Vajira Hospital, University of Bangkok Metropolis, Thailand

Low-level laser therapy (LLLT) as a new conservative treatment of musculoskeletal pain and nerve injury has shown effectiveness in its therapeutic effects in tissue healing and pain reduction. This case report describes the rehabilitation of 34-year old female right-handed patient, who had chronic trigger fingers with bilateral carpal tunnel syndrome (CTS). The patient complained localized deep pain in index and middle fingers for 7 months. She also suffered night awakenings from numbness and tingling in both hands. Clinical examination of passive and active movement elicited pain in wrist which involved stiff action of finger flexor tendons at distal crease associated with hand dysfunction in various activities. Electrodiagnosis showed moderate degree bilateral CTS. Treatment consisted of LLLT with energy dose of 2 Joules per tender point, and 18 Joules over carpal tunnel area with specific hand massage. The patient received therapy three times per week, for a total of 15 sessions. In the first 9 visits, the degree of pain and numbness was dramatically decreased with visual analogue scale (VAS) from 8 to 4. In the last 6 visits, the finger dysfunction disappeared and this complete relief of symptoms is still maintained at the three months of follow-up without recurrence. The case report emphasized the importance of combined treatment regimen to promote pain relief of trigger fingers associated with CTS. Further study should be implemented to investigate the combination of therapy effects in these patients.

PO-0571

THE CLINICAL EFFECT OF THE AUTO-IMPULSE IQ® ADJUSTING INSTRUMENT IN LUMBAR DISC HERNIATION

Guifang Zhang, Chuhuai Wang
First affiliated hospital of sun yat-sen university huangpu on campus

Objective: To observe the clinical effect of the Auto-Impulse iQ® Adjusting Instrument in lumbar disc herniation (LDH). *Method:* Thirty patients with LDH were divided randomly into a treatment group (15 patients) and a control group (15 patients). The regular rehabilitation included physical agent;massage and exercise therapy were perform with both groups, while the Auto-Impulse iQ® Adjusting Instrument was also administered to those in the treatment group. The Visual Analogue Scale/Score (VAS); range of motion (ROM) of the lumbar and the Oswestry disability index (ODI) were examined at the beginning of and after 2 and 4 weeks of treatment. Result After the treatment,the VAS, ROM of lumbar and the ODI of both two groups were significantly improved.The outcome of the treatment group was significantly better than the control group (p<0.05). *Conclusion:* The Auto-Impulse iQ® Adjusting Instrument can effectively alleviate symptoms in patients with LDH and improve their function.

PO-0572

MEASUREMENT OF MUSCULOSKELETAL FUNCTIONS: GONIOMETRY

Taslim Uddin
BSM Medical University, Dhaka, Bangladesh

Introduction: Musculoskeletal (MSK) components contribute to the formation of a functional and mobile unit that provides structural support and purposeful motion. WHO has divided these conditions into 04 main classes: back pain, periarticular disorders, Osteoarthritis and inflammatory arthritis. Activities of the human body depend on the effective interaction between joints and the neuromuscular units that move them; components of which comprises muscles, tendons, ligaments, cartilage, bones, joints and others. Methods of assessments 1. GALS (where G for gait, A for arms, L for legs and S for spine) that identifies the most common MSK problems. 2.Mannual muscle testing: 3. Goniometry: the system for measuring joint range of motion (ROM) using the appliance goniometer. There are different kinds of goniometry available of which plastic made universal goniometer of half circle using 0-1800 and full circle using 360 one used commonly. The joint to be measured is placed in anatomical plane and the goniometer is placed lateral to the joint keeping the pivot on the joint line and 00 point located over the patient's head. Recording is done with flexion/ extension or in the format like 100-00 (1800) - 1350 *Conclusions:* Medical practitioners, use goniometer to document initial and subsequent range of motion, at the visits for Occupational injuries, and by disability evaluators to determine a permanent disability. This is to evaluate progress, and also for medico-legal purposes. We urge all rehab related personal should master the simple process of MSK evaluation and follow up of therapy modalities.

PO-0573

CASE-CONTROL STUDIES ON CORE STABILITY TRAINING FOR THE FUNCTIONAL RECOVERY OF TOTAL HIP ARTHROPLASTY

Xiongang Huang, Xiaolin Liu, Jian Lin, Lin Li
Zhejiang Province Peoples Hospital, Department of rehabilitation medicine

Objective: To evaluate clinical effects of total hip arthroplasty (THA) with the treatment of core stability training combined with routine rehabilitation training. *Methods:* From January 2010 to June 2012, 60 patients with total hip arthroplasty were divided into two groups according to visiting sequence, including 37 males and 23 females, ranging in age from 45 to 76 years, with an average of 56.8 years, the hospitalization time was 15~25d, with an average of 19.5d, Preoperative mean Harris score was 12~43. 60 subjects were randomly divided into the research group (n=30) and the control group (n=30).there was no statistical significance in gender, age, prosthetic fixation and preoperative Harris score (p>0.05). Patients in the control group were given routine rehabilitation training after operation, the research group were given core stability training combined with rehabilitation training, Used Harris score, the postoperative morbidity rate (pain, joint adhesion, deep venous thrombosis) as index evaluating the clinical effect. *Results:* There was no statistical significance between research group and the control group in Harris score at first week (p>0.05). research group were higher than control group in Harris score at Second weeks and Fourth weeks (p<0.05). The postoperative morbidity rate in research group were significantly higher than those in control group (p<0.01) *Conclusion:* Massage combined with rehabilitation treatment can effectively reduce the incidence of postoperative complications, and have good effect on improving the recovery of function after THA.

PO-0574

ULTRASOUND FINDING IN VARIOUS ABNORMALITIES OF THE LONG HEAD OF THE BICPES BRACHII AND ADJACENT STRUCTURES

Kwang Jae Lee*, Suk-Bong Yun, Ki-Pi Yu, Jong-Yoon Kim

Presbyterian Medical Center (Jesus Hospital), Korea

Objectives: To recall the normal and ultrasound (US) anatomy of the long head of the biceps brachii (LHB) and surrounding structures. To present the US finding of various abnormalities of the LHB and adjacent structures. *Background:* LHB lesions are not uncommon condition in patients with shoulder pain and instability, but are less concentrated than those of the rotator cuffs. In addition to history taking and physical examination, several imaging studies have been developed to find the lesions of the LHB and surrounding structures. Several conditions such as post-traumatic edema and severe pain can limit physical examination and some lesions can be missed if an appropriate imaging study is not obtained. Early imaging diagnosis can lessen patient discomfort and lead to the correct choice of the appropriate treatment (surgical versus medical). Tendon evaluation represents probably one of the best applications of musculoskeletal ultrasound (MSUS) since recent high-frequency broadband transducers and US can detect subtle abnormalities of tendons and adjacent structures. Dynamic examination is also available and is a peculiar advantage of MSUS. LHB and surrounding structures are easily assessed by MSUS if the examiner has a good knowledge of the anatomy, uses a standardized technique of examination and has a clinical knowledge of the main disorders affecting them. Imaging findings or Procedure details: In the first part (of this educational poster), I present the normal and US anatomy of LHB and surrounding structures using comprehensible, annotated drawings and sonograms. Then, I illustrate abnormal findings of LHB and adjacent structures using US images stored in my patient examination files, mostly associated with schematic drawings to increase comprehension of the US images. *Conclusion:* US allows a ready, dynamic assessment of LHB and adjacent structures. When experienced operator exams them using a high-resolution equipment, MSUS can detect a fine and subtle structural abnormality and also reduce to use more sophisticated, expensive or invasive diagnostic modalities.

PO-0575

THE THERAPEUTIC EFFECT AND ADVERSE REACTION OF HYALURONATE SODIUM INTRA-ARTICULAR INJECTION COMPOUND WITH PHYSICAL THERAPY ON TRAUMATIC ARTHRITIS OF ANKLE JOINT

Guiyun Jiang
Affiliated Hospital of Chengde Medical College

Background: Hyaluronate Sodium is mainly used for osteoarthritis, traumatic arthritis is caused by the degeneration of the articular cartilage, there is few study reports on the use of hyaluronate sodium to traumatic arthritis of ankle joint. *Objective:*s The objective of this article is to determine the therapeutic effect and adverse reaction of Hyaluronate Sodium intra-articular injection compound with physical therapy on traumatic arthritis of ankle joint. *Methods:* 80 patients from department of rehabilitation medicine, affiliated hospital of Chengde Medical College joined this clinical trial. 1) Hyaluronate Sodium intra-articular injection :once a week,5 times as 1 course of treatment; 2) physical therapy: 1. keritherapy: 30 min erery day,10 times as 1 course of treatment; 2. Laser therapy: 30 min every day, 10 times as 1 course of treatment; Patients were evaluated by VAS (Visual analogue scale), ROM (Range of motion) and the pain-free walking distance after injections, 1 month and 6 months follow up. *Results:* all the patients get into the consequence analysis, the score of VAS decrease obviously (p<0.01).the score of ROM increase compared with pre-therapy (p<0.01), and there is a great improvemont in the pain-free walking distance (p<0.01). *Conclusions:* This randomized trial confirmed that Hyaluronate Sodium intra-articular injection compound with physical therapy on traumatic arthritis of ankle joint provide significant improvement in VAS, ROM and the pain-free walking distance.there is not any side effect during the therapy pricedure.

PO-0576

THE POTENTIAL ROLE OF LOCAL ANESTHETICS AND INJECTIONS TO DECREASE PAIN IN OSTEOARTHRITIS KNEE: A LITERATURE REVIEW OF CONTROLLED CLINICAL TRIALS

Fernando Borges[1], Herison Vaz[1], Chennyfer Paim[2], Marta Imamura[2]
[1]Academic League of Pain, University Potiguar, School of Medicine, Natal, RN, Brazil, [2]Clinical Research Center - Institute of Physical Medicine and Rehabilitation, University of Sao Paulo School of Medicine, Sao Paulo, SP, Brazil

Objective: Review the potential role of local anesthetics and injections to decrease pain in osteoarthritis knee. *Method:* We reviewed articles in the MEDLINE database (PubMed) and Cochrane Library were screened up to January 2012. The search strategy used was based on structured questions as PICO ("Patient," "Intervention," "Control," "Outcome"): Osteoarthritis Knee AND (Nerve Block OR Bupivacaine OR Lidocaine OR ropivacaine [Supplementary Concept] OR Anesthesia, Spinal). Studies were included for adults diagnosed with knee osteoarthritis, randomized controlled trials (RCTs), published in any date, in humans, in the English language and using intra-articular or periarticular injections. Methodological quality: assessed by the JADAD and Van Tulder scores. *Results:* We retrieved 89 citations and included ten RCTs, all low risk of bias, 873 patients, aged 63.9 years. Intra-articular injection of bupivacaine 0.25-0.5% provides similar results than hyaluronic acid, morphine or saline. Superior short term, but not long term improvement on pain and function is achieved with the association of methylprednisolone (1 ml, 40 mg) and lidocaine 1% (9 ml) than lidocaine 1% (9 ml) and saline 0.9% (1ml). The effect of multimodal intra-articular injection of bupivacaine 0.5%, morphine 10mg, methylprednisolone 40 mg and epinephrine is still controversial. Periarticular injection of bupivacaine 2 mg/ml, fentanyl and methylprednisolone is more beneficial than no infiltration. Intradermal injections of lidocaine 1% at periarticular trigger points provide similar results than injections of sterile saline at periarticular trigger points. *Impact on Rehabilitation:* The benefits of most local anesthetics and injections are similar to morphine, hyaluronic acid and placebo. Efficacy of the association of medications is still controversial and should be further investigated.

PO-0577

LLIOTIBIAL BAND INJURY REHABILITATION

Zhaohui Chen, Guorui Luan, Yang Zhang
Anhui University of Traditional Chinese Medicine

Lliotibial band injury most scholars as sports injuries. That prevalent in need repeated flexion and extension of the hip and knee joints. Common clinical iliotibial beam damage, chronic injury of the fascia part, mostly because of poor posture. Such as prolonged standing, prone position is incorrect, or sitting position setting up his one leg fixed to the other one, ipsilateral hip flexion, adduction posture, iliotibial receive passive traction. Long time, fatigue may cause damage. Lliac the tibia beam of the pelvis, hip and knee are supportive, stable role. Lliotibial front fiber for broad fascia tensor aponeurosis rear fiber for the continuation of the gluteus maximus fascia, the lower longitudinal fiber the apparent thickening Chengbian ribbon, interval connected with the lateral thigh muscle,down attached to the front of the lateral condyle of the tibia, fibula head and knee joint capsule. Tensor fascia lata to stabilize the pelvis, outreach thigh and hip flexor. Iliac the tibia beam of the pelvis, hip and knee are supportive, stable role. Iliotibial above characteristics of the anatomy and biomechanics, so its easy to damage Its treatment In addition to physiotherapy, exercise therapy, and Chinese medicine massage, acupuncture, it is necessary to strengthen health education

for patients, maintain good posture, which is an important measure to improve the efficacy and avoid recurrence.

PO-0578

THE SDUTY OF THE ISOKINETIC SYSTEM REHABILITATION TREATMENT FOR THE KNEE OSTEOARTHRITIS

Yongjun Wang
Department of rehabilitation medicine of Tianjin Peoples Hospital

Osteoarthritis (osteoarthritis, OA) is a common form of arthritis, is characterized by the degeneration of the articular cartilage damage, the joint marginal osteophyte formation and subchondral bone lesions [1,2]. Often causing pain, swelling, and joint dysfunction. Many involving the hand, knee, hip and spinal joints. Among the more common osteoarthritis of the knee. Osteoarthritis of the knee is the knee bone and cartilage degeneration based disorders, mainly for knee pain and dysfunction, accompanied by knee flexors, extensor group decline in muscle strength [3,4]. 44-70% of the epidemiological study shows that the incidence rate of knee OA in people over the age of 55, of which 10% have limited functionality, some patients will eventually develop into a disability, and finally had surgery to solve the problem.

PO-0579

ENVIRONMENTAL ASSESSMENT AND REFORM FOR PERSONS WITH DISABILITY BASED ON ICF

Tuling Zhu, Jiajin Fan, He Huang
Resource Center of Assistive Technology in Shenzhen of China

Objective: After comparing ICF with ICIDH, environmental factors of ICF and their qualifiers are understood deeper so that how to assess the environment and how to create the accessibility for persons with disability (PWD) are described by this paper. *Method:* The principles of environmental assessment for PWD and assessment procedure are proposed by the paper. Four principles are: 1) To assess the activity and participation of the individual is in the "standard environment" (no-barriers and no-assistance); 2) Assessed environment is real environment of the individual in the "standard environment"; 3) What needs to assess is whether to need the assistance from external environment (assistive devices or personal assistance) when the individual makes activity and participation; 4) Assessed environment is necessary for the individual and the individual can use assistive devices in the environment. The procedure of environmental assessment is: 1) To select the environments assessed for the individual is based on the category of disability; 2) To assess selective environment is based on the difficulties of activities and participation. 3) To fill in the reports of environmental assessment. *Results:* After environments of person with different disabilities (hemiplegia, CP children, paraplegia, polio, encephalatrophy, ALS) are assessed, assistive devices used for reforming their environments are suggested. *Impact on Rehabilitation:* The essential of comprehensive rehabilitation for PWD is to create accessibility i.e. accessibility of daily living, mobility, communication, education, employment, recreation, religion, activity at home, participation in public activities so that the first of all is to assess real environment of the individual.

PO-0580

FUMIGATION WITH TRADITIONAL CHINESE MEDICINE THERAPY IN THE TREATMENT OF OSTEOPOROSIS

Yusheng Jiang
Wuhan University Zhongnan Hospital Rehabilitation

Objective: Observation of herbal fumigation plus magnetic therapy efficacy in osteoporosis. *Method:* This group of case 62, 48 female, 14 male; age 49 - 72 years old. Traditional Chinese medicine fumigation by: Cassia twig, asarum, safflower, Lycopodium, Passepartout, teasel, Tougucao, windproof, mugwort leaf, Achyranthes bidentata, Caulis Spatholobi, pepper,The drug release fumigation machine heating,Patients with systemic exposure lying in the fumigation machine, To receive daily drug fumigation 20-30 min. At the same time every day to accept the magnetic bed treatment of 30-40 min. Before and after treatment for bone mineral density determination. *Results:* After treatment of bone density detection, improved obviously. *Implications/Impact on Rehabilitation:* Traditional Chinese medicine promoting blood circulation by removing blood stasis, dispelling wind and moisture, warming meridians, Ruanjiansanjie role. Magnetic therapy can stimulate osteoblast formation, increased bone density.

PO-0581

EFFECT OF SELF ASSEMBLED PEPTIDE-MESENCHYMAL STEM CELL COMPLEX ON DELAYING THE PROGRESSION OF OSTEOARTHRITIS

Sang Jun Kim[1], Sang Mok Lee[1], Ji Eun Lee[2], Soo Hyun Kim[2], Young Mi Jung[2]*
[1]Samsung Medical Center,Korea, [2]Korea Institute of Science and Technology, Korea

Objective: We find the therapeutic effect of self-assembled peptide (SAP) – mesenchymal stem cell (MSC) complex on delaying the progression of osteoarthritis in animal model. *Method:* Twenty three 12-week old Sprague-Dawley rats with transected anterior cruciate ligament and medial meniscectomy were used for the osteoarthritis model. They were randomly divided into 4 groups including control group. Mesenchymal stem cell, SAP, and SAP-MSC complex were injected into their arthritic joints respectively 3 weeks after the surgical induction of osteoarthritis. Nano-structured SAP consisting of 12 amino-acids (KLD-12) was prepared and used as a hydrogel scaffold which promotes articular tissue response and provides proper microenvironment for MSC recruitment and differentiation. Behavioral studies (number of rears and stride length) were done before and 6 weeks after the injection and the changes were calculated. Histologic examination (modified Mankin score), immunohistochemistry (Tunnel assay, caspase-8, TIMP-1), measurement of cytokine level in joint fluid (IL-1β and TNF-α), and micro-CT analysis (bone mineral density and semi-quantitative arthritis grade) were conducted 6 weeks after the injection to find their effect on delaying the progression of osteoarthritis. Biotinylated SAP was traced to investigate the pharmacokinetics in the joint cavity. Analysis of variance (ANOVA) test was done to find the group-difference. *Results:* Analysis of variance test found significant group difference (p=0.003) in modified Mankin score, and post-hoc Duncan test revealed that the modified Mankin score was significantly lower in SAP group than in control group (p=0.002). Neither the number of rears nor the stride length were significantly different between all groups (p=0.912 and.300). The bone mineral density and arthritis grade from micro-CT images were not significantly different in all groups (p=0.052 and.780). The level of IL-1β in joint fluid was significantly lower in SAP group than in control group (p=0.037), while TNF-α did not show any significant group difference (p=0.344). *Implication/Impact on Rehabilitation:* Self-assembled peptide (SAP) may promote the articular tissue response by itself through IL-1β recruitment and modify the balance between degeneration and regeneration of the articular cartilage in osteoarthritis. However, SAP has little therapeutic role as a scaffold for exogenous MSC injection in treating osteoarthritis.

PO-0582

GRAVITY LUMBER REDDUCTION THERAPY IN CONSERVATIVE MANAGEMENT OF SYMPTOMATIC PROLAPSE LUMBER INTRVERTEBRAL DISC

Kunjabasi Wangjam
Regional institute of medical sciences, Imphal, Manipur, India

Objective: This study was conducted to define role of gravity lumber reduction therapy program (GLRT) and its effectiveness was compared with that of epidural steroid injection (ESI). *Methods.* Study was conducted from September, 2010 to March 2012 RIMS, Imphal, involving 200 clinically diagnosed symptomatic PIVD cases randomly assigned to GLRT (101 cases) and ESI (99 cases). Mean age was 42.97+/-11.47 years. Mean duration since the onset to time of presentation was 7.3+/-3.8 weeks. In GLRT patient was suspended in erect position using a chest harness attached to tilt table at 450 for 30 min. Inclination was gradually increased to at least up-to 600. GLRT was given at home 3 times daily for half hour at the tolerated degree for 3 to 6 months. Result Outcome measures were VAS score, SLRT degree, claudication distance, restriction of foreward flexion of spine and Oswestry Disability Index (ODI). Means of these parameters at time of assignment and at third week were compared for early improvement by using paired t-test. Similar comparison between initial and 6th month means for late improvement was also significant. Out of 99 cases of GLRT, 7 did not complete follow-up. Of 92, nine (9.8%) did not improve; compared to 30 (30.9%) out of 97 ESI cases. *Conclusion:* GLRT was more effective than trans-laminar ESI in conservative treatment of symptomatic PIVD.

PO-0583

THE EFFICACY OF A STATIC PROGRESSIVE FINGER FLEXION SPLINTING PROGRAMME IN MANAGEMENT OF METACARPOPHALANGEAL JOINT STIFFNESS

Jun Wang
Rehabilitation Department, Wuxi No.9 hospital (Wuxi hand surgery hospital)

Objective: To evaluate the efficacy of a newly designed MCP flexion splint in managing metacarpophalangeal (MP) joint stiffness. *Methods*: A total of 31 patients with 116 MCP joints were recruited to join this splint regime using a convenient sampling method. They were injured due to trauma resulting MCP joint stiffness. A static finger flexion splint was developed to manage the traumatic metacarpophalangeal (MCP) joint stiffness. In addition, systematic mobilization programme was incorporated into the splinting programme. Before and after treatment, the passive range of motion (PROM) and active range of motion (AROM) were measured, Disability of Arm, Shoulder and Hand (DASH) questionnaire was investigated. *Results:* There were significant results in improvement of PROM, AROM and DASH score pre- and post-intervention. Mean PROM was 23.47±16.26 before the treatment, 59.01±14.75 after the treatment, the difference between the initial and final PROM measurements was 33.42±15.70 (t-value=22.63, p<0.01, df=115); Mean AROM increased from 10.29±10.67 to 25.03±18.25, the difference was 14.74±15.40 (t-value=10.31, p<0.01, df=115); Mean DASH score decreased from 40.71±13.22 to 24.26±11.33, the difference was 16.45±13.07 (t-value=7.00, p<0.01, df=30). *Conclusion:* Combined with serial hand therapy treatments, static finger flexion orthoses can effectively improve the PROM and the AROM of traumatic metacarpophalangeal joint stiffness. The DASH questionnaire survey result indicates significant improvement in patients daily living ability.

PO-0584

EFFICACY OF LATERAL WEDGING IN FOOTWEAR IN MEDIAL COMPARTMENT OSTEOARTHRITIS KNEE

Suman Badhal
Aiims new delhi, India

Introduction: In Knee osteoarthritis (OA) Shoe modifications, such as lateral-wedge insoles or shock absorbing shoes with insoles, have been recommended for conservative therapy of mild knee OA but with little objective data. Objective this prospective study was done to study the effect of lateral heel sole wedging (insole) in the patients of OA of knee (medial compartment) and its relation to function, pain and stiffness parameters status on VAS and WOMAC scale and to see the requirement of the number of NSAIDS tablets. *Methods:* 54 patients fulfilling the inclusion criteria after Informed consent of patients were enrolledand divided intointervention group A (29) and nonintervention or control group B (25) with random allocation. Paired t-test, WILCOXON SIGN RANK TEST and MANN WHITNEY U test were applied at significant p-value of <0.05%. *Results:* the reduction of mean difference in pain on VAS and Likerts scale, improvement in mean difference in function parametersthe mean reduction of pain in standing/ walking, bending and ascending/ descending at WOMAC scale wassignificantly higher in intervention group. Alsothe mean reduction in the need for NSAIDS was significantly lower in intervention group evident from fourth week onward to fifth and sixth week. *Conclusions:* Thelateral wedging in shoes in medial joint osteoarthritis is beneficial and it can be cost-effective conservative treatment modalities in early osteoarthritis patients, particularly in developing countries as it can reduces the requirement of NSAIDS and improve functional level of patients by reducing pain in various activities.

PO-0585

EFFECT OF PREPROSTHETIC TRAINING PROTOCOL ON STANDING BALANCE AND HOP-SKIP AMBULATION AMONG BELOW AND ABOVE KNEE AMPUTEES

Lohindren Adorable[1,2,3], Dans Magun[1,2]*
[1]Sacred Heart Hospital, Philippines, [2]Southwestern University, Philippines, [3]Vicente Sotto Memorial Medical Center, Philippines, [4]Philippine Academy of Rehabilitation Medicine, Philippines

Objective: This study determined the effect of preprosthetic training on standing balance and hop-skip ambulation of below and above knee amputees. It further determined the standing balance and hop-skip ambulation scores of amputees before and after the preprosthetic training, and significant difference on standing balance and hop-skip ambulation scores before and after the preprosthetic training. *Methods:* This study utilized a quasi-experimental design of research. Twenty-three amputees completed the training which consisted of range of motion exercises for about 10 repetitions; strengthening exercises for the upper extremities for about 10 repetitions; strengthening exercises for the lower extremities for about 10 repetitions; standing balance and coordination exercises as tolerated by the patient. The training was administered three times a week for eight weeks or about two months. Likert scale was used to score standing balance and hop-skip ambulation before and after two months of pre-prosthetic training. Paired t-test was used to determine the significant difference on standing balance and hop-skip ambulation scores before and after the preprosthetic training at 5% level of significance. *Results:* The differences between the standing balance scores before and after training (p-value 0.02) and the hop-skip ambulation scores before and after training (p-value 0) were all significant. *Conclusion:* The pre-prosthetic training protocol in this study is effective in improving the standing balance and hop-skip ambulation of below and above knee amputees.

PO-0586

A CLINICAL STUDY ON "WO-HU STYLE" OF YI JIN JING IN TREATMENT OF PATIENTS WITH LOW BACK PAIN

Tianjiao Li[1], Xiang Li[2], Shuijin Chen[1]
[1]Sports injuries Branch, Subsidiary Rehabilitation Hospital of Fujian University of Traditional Chinese Medicine, [2]Collge of Rehabilitation Medicine, Fujian University of Traditional Chinese Medicine

Objective: To observe and compare the effects in the treatment of patients with non-specific low back pain (NSLBP) by Yi Jinjing practice. *Methods:* 22 patients with diagnosed NSLBP were randomly divided into Yi Jinjing group (n=10) received "Wo-Hu Style" practice three times one day, 15 min perpractice) and the control group (n=12,) .All of the treatments lasted for 14 days. Oswestry disability index (ODI) and the visual analogue scale (VAS) were used for evaluating the effectiveness of treatment before and after the treatment. *Results:* (1) the ODI and VAS were significant reduced after the treatment in both groups (p<0.01); ODI score was significantly improved in Yi Jinjing group comparing to the control group (p<0.05) but there was no-significant difference in VAS between the two groups (p>0.05). (2) Yi JinJing set of bilateral multifidus Crouching Tiger-style action in the sEMG was significantly different when the threshold indicators, while the control group in the prone position with bilateral multifidus fly back when the threshold when the sEMG showed no significant difference. *Implications:* The Yi Jinjing "Wo-Hu Style"practice can effectively improve the NSLBP patient's functional disturbance.

PO-0587

THE EFFECT OF PROPRIOCEPTIVE TRAINING FOR ACUTE ANKLE SPRAIN

Dan Wang, Zhian Luo, Fusheng Li, Xian Long, Dexin Zeng
Changsha Social Work College

Objective: To evaluate the effectiveness of proprioceptive training after usual physical care in basketball players who had an acute ankle sprain. Method Participants were 37 basketball players who suffered acute ankle sprains during the season 2010-2011. They were randomly divided into two groups: group 1 (n=18), group 2 (n=19). Post-injury they received prevention, rest, ice, compression and elevation with an compressive bandage. After 5-7 days, group 1 was treated with usual physical treatment and group 2 added proprioceptive training, both for 4 weeks. Recurrences of ankle sprain during one year post-treatment were evaluated using a self report questionnaire as the primary outcome parameter. As the secondary one the ankle joint function was assessed using range of motion and visual analogue scale. *Results:* During the one year follow-up, 3 (15.8%) basketball players reported a recurrent ankle sprain in group 2 and 7 (38.9%) in group 1. Functional outcome of the ankle joint was similar between the two groups. Implication On Rehabilitation The rate of recurrences of ankle sprain in group 2 was significantly lower compared to the group 1 (15.8% versus 38.9%).The use of proprioceptive training after usual physical care of an ankle sprain is effective for the prevention of self reported recurrences.

PO-0588

HIGH SHEAR STRESS PARTICIPATES IN BRAIN ISCHEMIA-REPERFUSION INJURY

Yongshan Hu, Shan Tian, Yi Wu, Yulong Bai, Jie Jia, Yulian Zhu
Department of Rehabilitation, Huashan Hospital, Fudan University, Shanghai 200040, China;

Objective: Laminar shear stress (LS) is the tangential component of the mechanical forces generated by blood flow.Previous studies have showed that high blood flow was an injury for penumbra in the instant of reperfusion. We tested high LS effects for endothelial survival and functions in ischemia to study whether LS was a negative factor in ischemia-reperfusion injury. *Method:* Ischemic endothelial cells was induced by oxygen/glucose deprivation (OGD) and LS (5±0.05 dynes/cm^2 vs. 0 dynes/cm^2) was offered by parallel-plate flow chamber. PE Annexin V/7-AAD staining was used to observe the apoptosis as well as angiogenesis assay was used for endothelial functions. Real-time PCR and western blot were also adopted to test the mRNA and protein expressions of Tie-2 which were related to endothelial angiogenesis and anti-apoptosis. *Results:* High LS increased cells apoptosis and decreased angiogenesis.Simultaneously,Tie-2 who had the protective function of angiogenesis and survival was in a low expression when High LS was offered. *Implications/Impact on Rehabilitation:* High LS was an important physical factors in ischemia-reperfusion injury. Reducing reperfusion blood flow velocity could relieve brain damage.

PO-0589

AXILLARY NERVE LESION AFTER LATISSIMUS DORSI TRANSFER: A CASE REPORT

Maria Silva[1]*, Gonçalo Borges[1], Liliana Rocha[1], Hugo Lopes[2], Edgar Tamegão[1], Manuel Almeida[1]
[1]Hospital da Prelada,Portugal, [2]Centro Hospitalar de Trás-os-Montes e Alto Douro, Portugal

Objective: Characterize an axillary nerve lesion after a latissimus dorsi transfer that occurred in a patient referred to our Physical Medicine and Rehabilitation (PMR) department. *Method:* A 40 years male, furniture factory worker, suffered a right rotator cuff tear and underwent a transfer of the latissimus dorsi tendon in 22/11/2011. After the surgery the patient presented with severe limitations of the active range of motion and hyposthesia of the right shoulder. He was admitted to our PMR department as an inpatient, to complete the study of the lesion and start a rehabilitation program. *Results:* The electomyographic study confirmed our clinical suspicion of an axillary nerve lesion. For 3 months, he completed an intensive rehabilitation program as an inpatient. Our patient presented favorable neurological evolution although he could not return to his previous employment. We consider that his current functional limitations are most related to the biomechanical effect of latissimus dorsi tendon transfer. *Implications/Impact on Rehabilitation:* Latissimus dorsi tendon transfer is used to treat massive, irreparable posterosuperior rotator cuff tears. This procedure is preformed to restore functional range of motion and relieve pain, although its functional outcomes are unpredictable and vary among patients. Axillary nerve lesion is one of the possible complications of this surgery. PMR doctors must be familiarized with the functional limitations that this neurological lesion and surgical procedure may present, in order to establish a treatment plan and goals, and explain the patient the possible outcome.

PO-0590

THE APPLICATION OF VIRTUAL COGNITIVE REHABILITATION TRAINING SYSTEM TO THE REHABILITATION THERAPY OF MEMORY DYSFUNCTION AFTER CRANIOCEREBRAL INJURY

Rizhao Pang, Anren Zhang, Yue Jiang, Wenchun Wang, Yu Wang, Qian Wang, Chao Dong, Bei Li, Huihui Qin
Chengdu Military General Hospital

Objective: To observe the effect of virtual cognitive training system treating memory dysfunction after craniocerebral injury. *Method:* Divide all the 56 patients with memory dysfunction after craniocerebral injury into two groups randomly. Besides the common scalp acupuncture treatment, 28 patients in treatment group would take virtual cognitive training while the other 28 patients in controlled group take commonly used occupational therapy. The effectiveness would be measured with the second edition of rivermead behavioural memory test 8 weeks later. *Result:* The comparisons of the second edition of rivermead behavioural memory test standard score before and after the treatment in each group as well as between the treatment group and controlled group are of statistic significance. *Conclusion:*

The virtual cognitive training system has a better effect on memory dysfunction after craniocerebral injury than the commonly used occupational therapy.

PO-0591

SPINAL CORD INJURIES IN A REFERRAL CENTER IN SÃO PAULO - BRAZIL

Roberto Rached
HC-FMUSP, Brazil

Objective: To describe the epidemiological characteristics of traumatic spinal cord-injury (SCI) patients and their main complications in acute/sub acute phase in a referral center in São Paulo, Brazil. *Method:* Retrospective study of medical charts of 359 patients hospitalized from January 2003 to December 2009. We obtained demographic data, the classification according to the American Spinal Injury Association (ASIA) and the prevalence of the most common complications in the acute phase of the spinal cord injuries. *Results:* There was a predominance of male patients (83%), mean age was 36 years old. The majority were paraplegic (59%) and had complete spinal cord injury (Frankel A).The most common causes were falls (42%), car accidents (38%), injuries by firearms (14%) and diving into shallow water (6%). Among traffic accidents there was a major involvement of motorcycle accidents and car crashes. We noticed that there is a tendency for reduction in car accidents and an increase in the numbers of motorcycle accidents. *Implications/Impact on Rehabilitation:* In our hospital, the main causes of spinal cord injuries are traffic accidents and falls. The majority of patients are men and there is a ratio of 1 woman to 5 men. Most of the patients present severe neurological injuries (ASIA A).

PO-0592

VOLUME3 OMBINED THERAPY OF LOW FREQUENCY REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION AND INTENSIVE REHABILITAION (COMBINED PROTOCOL THERAPY) FOR CHRONIC POST-STROKE PATIENTS: EVALUATION BY JASMID- (JIKEI ASSESSMENT SCALE FOR MOTOR IMPAIRMENT IN DAILY LIVING)

Yusuke Haga[1], Yutaka Yoshida[1], Miki Kojima[1], Masaya Imai[1], Yosihide Ishiduka[1], Kouiti Kawada[1], Hisaaki Mori[1], Itumi Yoshida[1], Hiroaki Harashima[1], Satoshi Miyano[1], Hiroaki Abo[2]
[1]Tokyo General Hospital, Japan, [2]The Jikei University School of Medicine, Japan

PurposeWe examined effectiveness of combined protocol therapy by JASMID. *Methods and Materials:* Subjects were 310 patients with chronic hemiparesis and they had our combined protocol therapy.One hundred and seventy six patients (mean age; 60.9±12.3 year,period from the onset from the stroke; 57.8±66.7 months) had dominant hand paresis (Group A) and 134 patients (mean age; 61.5±13.2eyr year, period from the onset from the stroke; 67.9±64.9 months) had non-dominant hand paresis (Group B) Evaluation was made by JASMID which was a self-rating scale of evaluation for motor impairment in daily living, especially quality and frequency of upper extremity activities (The highest point is 500 points). *Results:* 1) The point of frequency of JASMID at the admission for Group A was181.6 point, 223.7 point at the discharge. 2) The point of quality of JASMID at the admission for Group A was174.0 point, 216.7 point at the discharge. 3) The point of frequency of JASMID at the admission for Group B was 179.2 points, 218.7 point at discharge. 4) The point of quality of JASMID for Group B was 169.8 point, 212.7 point at the discharge. After the combined protocol therapy,paretic side of upper extremity was used more often and more skillful at the discharge than at the admission. *Conclusion:* We examined paretic side of upper extremity function for chronic stroke patients by JASMID. Wefound that our combined protocol therapy was effective for paretic upper motor function of chronic stroke patients.

PO-0593

SHORT-TERM EFFECTS OF REPETITIVE VISUAL STIMULATION IN POST-STROKE PATIENTS WITH HOMONYMOUS HEMIANOPSIA USING A COMPUTERIZED TRAINING SYSTEM

Kikuo Ota, Satoshi Hirano, Miho Hayashi, Hiroyuki Kato, Eiichi Saitoh*
Fujita Health University, Japan

Objectives: We developed a training program for repetitive visual stimulation using a computerized training system. Training was carried out on post-stroke patients with homonymous hemianopsia. The effects were compared between a short-term intensive inpatient training program and a low-frequency outpatient training program. *Subjects and methods Subjects:* One inpatient for intensive training (age: 36). Three outpatients for low-frequency training (age: 38 to 64). *Methods:* With the chin fixed on a stand, the patients were asked to watch a fixed marker on a display 70 cm ahead. Then repetitive stimuli were given by moving the flashing point from the visual field toward the hemianopsia area along radial lines spaced at 9° intervals to find the boundary. The point was moved 2 mm toward the hemianopsia area when 90% or more of the answers were correct. Frequency and period of training: The intensive training involved 28 sets (about 4 h) in a day on average, six days a week for 4 weeks. The low-frequency training involved 2 sets (about 20 min) a day, once a week or once a month, over a period of several months. *Results:* In 2 weeks, the intensive training of repetitive visual stimulation increased the visual field. Ophtalmological perimetry also showed expanded visual fields in both right and left eyes. However, hemianopsia fields, which decreased during intensive training, expanded to the initial level after the training terminated. One of three low-frequency training patients has a slight increase of the visual field and maintains this effect.

PO-0594

THE EFFECTS OF SPHINGOMYELINASE IN ISCHEMIC STROKE

Shan Tian, Yongshan Hu, Yi Wu, Yulong Bai, Jie Jia, Yulian Zhu
Department of Rehabilitation, Huashan Hospital, Fudan University, Shanghai 200040, China

Objective: Sphingomyelin, which constitutes the lipid rafts on plasma membrane, plays an important role in maintain the integrity of cells membrane. Previous studies have found that serious membrane damage occurs on brain microvascular endothelial cell after ischemic stroke. sphingomyelinases (neutral and acidic) playing a major role in catalysing sphingomyelin were our focus in the study. *Methods:* Rats brain microvascular endothelial cells (rBMECs) avoiding oxygen and glucose were cultured in 0-6h. PE Annexin V/7-AAD staining was used to observe the cells apoptosis.The mRNA and protein expression of sphingomyelinases were measured with the Western blot and the Real-time PCR. The activity of sphingomyelinases was detected in chromatographic method. *Results:* Compared with the normal group, mRNA and protein expression of the neutral and acid sphingomyelinases increased with time. The activity increased too. With the degradation of sphingomyelin on the membrane, cell membranes were destroyed to result in apoptosis. These change trends were parallel. *Implications/Impact on Rehabilitation:* In ischemic stroke, sphingomyelinases play an important role in degradation of cell membrane. Therefore, the methods that could inhibit the expression and activity of sphingomyelinases should be adopted to maintain the integrity of the cell membrane. This study provides a therapeutic target for post-stroke rehabilitation.

PO-0595

NEUROLOGIC INJURY AFTER KNEE AND HIP ARTHROPLASTY

Maria Silva, Liliana Rocha, João Carvalho, Renato Nunes, Gonçalo Borges, Filipe Capa, Edgar Tamegão, Manuel Almeida
Hospital da Prelada, Portugal

Objective: Characterize neurologic complications after knee and hip arthroplasty, regarding the presentation, evaluation, treatment, and outcome, in patients referred to our Physical Medicine and Rehabilitation (PMR) department. *Method:* Longitudinal study of our inpatients, who developed nerve palsy after knee and hip arthroplasty, and were referred to our PMR department, from 1998/01/01 to 2012/03/31. We evaluated several conditions associated with nerve injury after knee and hip arthroplasty and the anatomy, presentation, examination techniques, management and evolution of the lesion. *Results:* We identified 30 patients with documented neurologic complications after knee and hip arthroplasty. One patient was lost to follow-up. Most of our patients underwent primary knee arthroplasty. The most commonly nerves injured were peroneal and tibial. Immediately after discovery of the nerve palsy, a rehabilitation program was employed for each patient, most of them in inpatient facilities. The majority of our patients showed at least a partial recovery at the end of follow-up, with several experiencing an almost complete recovery. *Implications/Impact on Rehabilitation:* Although the incidence of post-operative nerve palsy after knee and hip replacement is rare, it is an important cause of unsatisfactory recovery. PMR departments play an important role solving the motor and sensory deficits of these patients, generally with good results. We may conclude that characterization of these lesions is vital for the best performance of PMR doctors facing these neurological lesions.

PO-0596

DIFFERENT POSTURAL CONFIGURATIONS AFFECT THE ASYMMETRY OF VERTICAL FORCES DURING SIT-TO-STAND TASKS IN STROKE PATIENTS

Ta-Sen Wei[1,2], Liang-Wey Chang[1]*, Peng-Ta Liu[2]
[1]Institute of Biomedical Engineering, College of Medicine and College of Engineering, National Taiwan University, Taipei, Taiwan,Chinese Taipei, [2]Department of Physical Medicine and Rehabilitation, Changhua Christian Hospital, Changhua, Taiwan, Chinese Taipei

Objective: To investigate the effect of different hand and foot positions on symmetry of leg loads during sit-to-stand (SitTS) movement for a safe transfer of position and appropriate rehabilitation programs in the stroke patients. *Method:* Twenty-one stroke patients (4 females) were recruited 58.8±12.4 years in age, 18.5±14.4 months from lesion, and 108.6±17.3 in functional independence measure (FIM). A motion capture system was used to record the kinematic and kinetic data. Postural combinations of three hand positions (placed on knees (Hk), aside (Ha), clasped (Hc)) and four foot positions (spontaneous (Fsp), symmetric (Fs), affected forward (Faf), affected backward (Fab)) were tested in random sequence. Four events and three phases were indentified during the SitTS task and the effect of foot and hand position on duration, asymmetry index, and leg load discrepancy were evaluated at each event or phase. *Results:* Main effects of foot position or of hand position were found in this study, with one exception: the duration of the SitTS task was affected by an interaction of foot and hand position during rising up. The position of affected foot backward and hand clasped could force the affected leg to bear more weight and provide more symmetrical leg loading during the SitTS task in stroke patients. *Implications/Impact on Rehabilitation:* Modifications of the positions of feet and hands could affect the SitTS strategies used by stroke patients, and could also be implemented as a rehabilitation program for training of weight bearing in clinical practice.

PO-0597

EFFECTS OF ENRICHED ENVIRONMENT AND REHABILITATION TRAINING ON THE RECOVERY OF NEURAL FUNCTION OF RATS WITH TRAUMATIC BRAIN INJURY

Yana Li, Ling Li, Shan Jiang, Huihui Wang, Hongping Xie
First Affiliated Hospital of Chinese PLA General Hospital, Beijing, China

Objective: To study the effect of enriched environment and rehabilitation training on the recovery of neural function of rats with traumatic brain injury. *Method:* Sprague-Dawley adult male rats were made in traumatic brain injury model and then randomly assigned to model group, EE group, behavior training group, exercise group and comprehensive rehabilitation training group. Another ten rats were as normal group. The rats in the model group were feed in cages while those in the EE group were feed in enriched environment cages, Both of them were not given training. The rats in behavior training group were given Morris water maze training while those in the exercise group were given balancing, grasping and walking exercises everyday. Both of them were feed in normal cages. The rats in comprehensive rehabilitation training group were feed in EE cages and given Morris water maze training, balancing, grasping and walking exercises everyday. The rats in the control group were without any treatment. Neural function test at the time points of 3, 7, 14, and 21 days. Result The neural function of rats with traumatic brain injury was no different and worse than those in the control group at the time of 3 days. The ability of movement, learning and memory of rats in comprehensive rehabilitation training group improved to normal level at the time of 7 days. The ability of learning and memory of rats in behavior training group was improved to normal level at the time of 14 days. The ability of learning and memory of rats in EE group and exercise group was better than before at the time of 21 days but also worse than those in the control group. The motor function of rats in behavior training group was improved to normal level at the time of 14 days. The motor function of rats in EE group and behavior training group was better than before at the time of 21 days but also worse than those in the control group. The neural function of rats in model group was no change and worse than those in the control group at the time points of 3, 7, 14, and 21 days. *Conclusion:* Enriched environment and rehabilitation training can improve the ability of movement, learning and memory of rats with traumatic brain injury.

PO-0598

A CASE OF BRUXISM ASSOCIATED WITH BRAIN INJURY TREATED WITH BOTULINUM TOXIN INJECTION

Serdar Kesikburun*, Rıdvan Alaca, İlknur Tuğcu, Arif Kenan Tan
Gülhane Military Medical Academy, Department of PM&R, Turkish Armed Forces Rehabilitation Center, Ankara, Turkey

Objective: Bruxism defined as involuntary grinding of theeth may be seen as a complication brain injury. If untreated, it may lead to severe occlusal trauma. This case report describes a patient with traumatic brain injury who had nocturnal bruxism and treated with botulinum toxin injection. *Method:* A 21-year-old male patient with traumatic brain injury due to car accident was admitted to our inpatient rehabilitation unit. He had a history of two-week period of coma in the intensive care unit. The initial computed brain tomography indicated a superior thalamic hemorrhage. On admission to our department three months after injury, his mental status was good

and he was able to walk without assistance but, had a mild ataxia. He had a complaint about severe teeth grinding that was observed by his relatives during nights beginning two months after injury. *Results:* Botulinum toxin-A was injected into the masseter muscles (20 units for each muscle) and temporalis muscles (15 units for each muscle) bilaterally. A decrease in bruxism symptom was reported within three days. Clinical improvement was persisting at assessment after four months later. *Implications/Impact on Rehabilitation:* Botulinum toxin injection could be used as an effective treatment for bruxism associated with brain injury.

PO-0599

THE USAGE OF VOCASTIM DEVICE IN REHABILITATION OF THE PATIENTS WITH PHARYNGEAL DYSPHAGIA

Fong Fan, Yufeng Liu, Yan Zhang
the second affiliated hospital of Kunming medical University

Object: Pharyngeal dysphagia is frequent in neurological disorders and increases mortality, mainly due to pulmonary complications. Our aim was to show that submental sensitive transcutaneous electrical stimulation (SSTES) applied by VocaStim device.It can improve swallowing function in patients with neurological disorders. *Methods:* In the treatment group, 12 patients were recruited for the study (3f,65±11years) they were suffering from bulbar dysphagia. Course of disease lasted from 20 to 40 days. Swallowing was evaluated by Modified Mann Assessment of Swallowing Ability (MMASA) before and after 35 days.It is said that the patients were evaluated before and after treatment by VocaStim. Course of treatment lasted 35 days,2 times a day, 20min a times.In the control group,11 patients were recruited for the study (4f,62±11years) they were suffering from bulbar dysphagia. Course of disease lasted from 20 to 40 days. Swallowing was evaluated by Modified Mann Assessment of Swallowing Ability (MMASA)before and after 35 days. the patients were asked to perform the traditional method (Shaker, Mendelsohn,pharynx cold massage, tongue exercis), Course of treatment lasted 35 days, 2 times a day, 20min a times. *Results:* The electrical stimulations with no discomfort, and scores also increased significantly with the electrical stimulations ($p<0.05$), *Implications:* The present study demonstrated that VocaStim device is effective to use and improves pharyngeal dysphagia.

PO-0600

PEAK SYSTOLIC AND DIASTOLIC CSF VELOCITY IN THE SPINAL CANAL IN CERVICAL SPINAL CORD PATIENTS AND IN NORMAL CONTROL PARTICIPANTS

Soo-Yeon Kim*, Soo Koun Kim, Jin A Yoon, Je Sang Lee
Pusan National University Yangsan Hospital, Korea

Object The purpose of this study was to evaluate that peak CSF velocities in the spinal canal stenosis and normal control. *Methods:* Two cervical spinal cord injury (SCI) patients with spinal stenosis (2 males, level of lesion C3 and C4) and 8 healthy subjects were studied with PCMRI at the cervical spinal canal. The spatial uniformity of flow velocity in the cervical spinal canal was assessed at 25 times frames within the R-R interval. *Results:* For the normal volunteers, the CSF velocities in the subarachnoid space were relatively uniform throughout the subarachnoid space at each of the time frames. Right lateral, left lateral, and ventral mean systolic velocity were 2.251, 2.201, and 1.113cm/s respectively. Meanwhile those mean diastolic velocity were –2.235, 2.212, and -1.34cm/s respectively. In SCI with cervical spinal canal stenosis, right lateral, left lateral, and ventral mean systolic velocities were 1.515, 1.338, and 1.016cm/s, and those of mean diastolic velocities were –2.547, –3.187, and –2.054cm/s. Mean systolic velocity was lower in the patients than in the control volunteers. But Mean diastolic velocity was higher in the patients than in the control volunteers. In addition, systolic period is more dominant than diastolic period in patient with SCI within the same R-R internal. *Implications/Impacts on Rehabilitation:* Patients with SCI with spinal stenosis have tendency of dominant systolic period in the CSF flow study in the cervical spinal canal.

PO-0601

THE REHABILITATION SITUATION OF DISCHARGED PATIENTS WITH STROKE AND INFLUENCING FACTORS

Ni Zhang[1], Shuqi Yu[2], Hongfei Qiao[1], Xiaohui Lei[1], Bin Zhang[1], Ben Ma[1]
[1]Department of Rehabilitation, Second Affiliated Hospital, School of Medicine, Xi'an Jiaotong University, Xi'an 710061, Shaanxi Province, People's Republic of China, [2]Department of Rehabilitation, Second Affiliated Hospital, School of Medicine, Xi'an Jiaotong University, Xi'an 710061, Shaanxi Province, People's Republic of China

Objective: To investigate the rehabilitation situation of discharged patients with stroke in shaanxi province and explore its influencing factors. *Methods:* Totally 55 patients with stroke were chosen by means of convenience, and 15 patients among 55 patient were investigate by face to face interview. The information including the rehabilitation agencies chosen, rehabilitation, age, occupation, marital status, level of education, the cost of treatment, and the factors taken into account in the choice of rehabilitation institutions was gained. *Results:* All discharged patients with stroke persevered in self-rehabilitation training. 8 cases (53.3%) discharged patients stopped treating in the rehabilitation agencies. The primary factor noted was the cost with the constituent ratio of 40%. 6 cases (75%) discharged patients under the age of 60 persisted in rehabilitation in professional agencies. 1 case (14.28%) discharged patients over the age of 60 persisted in rehabilitation in professional agencies. *Impact on Rehabilitation:* Nearly half of discharged patients with stroke in shaanxi province stopped treating in the rehabilitation agencies. The primary factor noted was the cost. The possibility of rehabilitation in professional agencies in middle–young patients is more than that in the elderly.

PO-0602

A COMPREHENSIVE REHABILITATION SERVICE IMPROVES FUNCTIONING AND QUALITY OF LIFE IN SPINAL CORD INJURED EARTHQUAKE VICTIMS: A PROSPECTIVE COHORT STUDY

Xia Zhang[1,2,3], Chengjie Yan[1,2], Jan Reinhardt[3,4,5], Jianan Li[1,3]
[1]Department of Physical and Rehabilitation Medicine, First Affiliated Hospital of Nanjing Medical University, Nanjing, China , [2]Caring For Children Foundation, Hong Kong, China, 3.World Health Organization Liaison Sub-Committee on Rehabilitation Disaster Relief of the International Society of Physical and Rehabilitation Medicine, Assenede, Belgium, [4]Swiss Paraplegic Research, Nottwil, Switzerland, [5]Department of Health Sciences and Health Policy, University of Lucerne, Switzerland

Objective: To evaluate the effectiveness of Institutional based rehabilitation and community based rehabilitation program on spinal cord injured earthquake victims from the bio-psycho-social perspective. *Method:* Twenty-six patients suffered SCI from the Sichuan Earthquake and rehabilitated in Mianzhu County Hospital were enrolled. Three victims were lost to follow up. Data on demographic information, bio-psycho-social function were collected at 3 measurement points (2009, 2010 & 2012). The Barthel Index and Visual Analogue Scale were applied to assess the activities of daily living and pain severity respectively. The Patient Health Questionnaire-9 (PHQ-9) was used to evaluate the psychological status. The WHO-QoL and Craig Hospital Handicap Assement

Technique (CHART) were used to evaluate the quality of life. Data were analyzed with a longitudinal Tobit regression and linear mixed models. *Results:* Activities of daily living, physical health, physical independence and mobility were significantly improved over time. Pain severity was not significantly reduced over time. Cognitive Independence decreased in 2010, but no significant changes occured in 2012. Psychological health improved significantly while the PHQ-9 decreased significantly. Social relationships, occupation and social function improved significantly, but no statistical significance in Social Integration. *Implications:* The physical functioning and quality of life in spinal cord injured earthquake victims improved after the institutional based rehabilitation and community based rehabilitation. Chronic pain was highly prevalent in SCI victims and took a leading role affecting the quality of life.

PO-0603

ELECTRO-ACUPUNCTURE COMBINED WITH PHYSICAL THERAPY ON MOTOR FUNCTION OF PATIENTS WITH ACUTE STROKE

Rong Dai[1], Suping Ma[2], Fang Zhang[2]

[1]Department of Rehabilitation Medicine, First Affiliated Hospital of Kunming Medical University, [2]Department of neurology, First Affiliated Hospital of Kunming Medical University

Objective: To investigate the electro-acupuncture combined with physical therapy on motor function of patients with acute stroke. *Methods:* 60 patient s with acute stroke were randomly divided into the treatment group and control group with 30 cases in each group. The patients of the treatment group were treated with electro-acupuncture Jianyu (LI15) Quchi (LI11) Shousanli (LI10) Hegu (LI4) Huangtiao (GB30), Yanglingquan (GB34), Zusanli (ST36), Xiexi (ST41) at paralyzed side limb combined with physical therapy; and those in the control group only received physical therapy. All patient s of two groups were treated by routine medication,The motor function of all patient s was assessed t before and one month after treatment. *Results:* After treatment, the scores of Fugl-Meyer Assessment, Modified Barthel Index of all patient s in the twogroups improved obviously, but the effect of the treatment group was superior to that of the control group (p<0. 01). *Conclusion:* Electro-acupuncture combined with physical therapy is effective in promoting the recovery of motor function of patients with acute stroke.

PO-0604

CORTICAL SUBSTRATE OF BLADDER CONTROL IN SCI AND THE EFFECT OF PERIPHERAL PUDENDAL STIMULATION

Schurch Brigitte, Ulrich Mehnert, Jens Lars, Katia Zempleni, Spyros Kollias

University Hospital Lausanne, Switzerland

Aims: We investigated (*i*) the central representation of lower urinary tract (LUT) control and (*ii-iii*) the acute and short-term central neuromodulatory effect of peripheral pudendal nerve stimulation in incomplete spinal cord injured (SCI) patients using functional magnetic resonance imaging (fMRI). *Methods:* The urinary bladder of eight SCI patients has been passively filled and emptied using a catheter, to identify the neural substrate of bladder control (*i*), and with simultaneous peripheral pudendal nerve stimulation to investigate its acute central neuromodulatory effect (*ii*). To identify the potential effects of pudendal nerve stimulation treatment (*iii*), six patients underwent a 2-week training using pudendal nerve stimulation followed by another fMRI session of bladder filling. The pre- and post-training fMRI results have been compared and correlated with the patient's pre- and post-training urological status. *Implications/Impact on Rehabilitation:* Our results suggest that the central representation of bladder filling sensation is preserved in the subacute stage of incomplete SCI. However, compared to earlier data from healthy subjects, it shows decreased neural response in right prefrontal areas and increased in left prefrontal regions, indicating diminished inhibitory micturition control as well as, compensatory or decompensatory reorganization of bladder control. We also provide evidence for a neuromodulatory effect of acute pudendal nerve stimulation, which was most prominent in the right posterior insula, a brain region implicated in homeostatic interoception in human. Pudendal stimulation training also induced significant neuromodulation, predominantly signal increases, in the normal cortical network of bladder control. Correlations With the patient's urological status indicate that this neuromodulatory effect may reflect the clinical improvement following training.

PO-0605

THE TMPACT OF ELECTRICITY OF THE EXPRESSION GFAP AND SSEA-1 FOR SPINAL CORD INJURY IN RATS

Juan He, Zhonghua Wang

Department of Rehablitation, The First Hospital, Xi'an Jiaotong University Medical Collage

Objective: Study the mechanisms about the electro-acupuncture treatment at the spinal cord in injured rats by these changes of SSEA-1 and GFAP expression located at spinal cord before operations and after treatments. *Methods:* Sixty adult SD rats were divided into sham-operated rats group, modle group an EA treatment group by average and random. Then uesed BBB behavioral score and immunohistochemical detect the changes of GFAP and SSEA-1 in three groups of rats at spinal cord injury site when 3d, 7d, 14d and 28d after modeling. *Result:* 1. The BBB results shows that the treatment group is significantly superior (p<0.05) than the modle group at 7th, 14th and 28th days, what it expressed is that their scores of both the modle group and the treatment group are greatly lower than that of the control group. 2. The immunohistochemical dye of GFAP & SSEA-1 shows the results that after the EA treatment at the spinal cord injured rats, at 3th, 7th and 14th days, the numbers of the EA treatment are greatly lower than that of the modle group. There is a great difference (p<0.05) in statistics. *Impact on Rehabilitation:* 1. To clarify the mechanism of electroacupuncture on the proliferation and differentiation of astrocytes; 2. Clinical acupuncture provide the basis for the rehabilitation of patients with spinal cord injury, to make a positive exploration of the origin and differentiation of neural stem cells.

PO-0606

DEMOGRAPHICS OF SPINAL CORD INJURIES IN PAKISTAN

Farooq Azam Rathore[1], Sahibzada Nasir Mansoor[2]

[1]Combined Military Hospital and Medical College, Lahore Cantt, Pakistan, [2]Combined Military Hospital, Kohat Cantt, Pakistan

Objectives: To describe demographics of Traumatic and Non Traumatic SCI in Pakistan.Identify challenges and opportunities to improve SCI care in Pakistan. *Methods:* The research methodology comprised of electronic and manual literature search, interviews with professional colleagues managing SCI and personal experience of the authors of working at the largest spinal rehabilitation unit in Pakistan for more than five years. Electronic literature search was conducted on Medline, Google Scholar, Science Direct and OVID data bases (1960-210: English language only) with; Key words: Spinal cord injury, paraplegia, Tetraplegia, complications, Pakistan, trauma, disability and management. *Results:* Fall from height is the commonest etiology for Traumatic SCI (TSCI) followed by road traffic accidents and acts of violence. Majority of the patients are young males in their second and third decade. Pre-hospital care and evacuation from site of trauma is inadequate most of the time due to lack of trained emergency evacuation services. Complete Paraplegia is the most frequent presentation at admission. Surgical interventions are carried out in most of the cases of TSCI but

rehabilitation referrals are often delayed and multidisciplinary SCI rehabilitation is not widely available. Spinal Tuberculosis is the most common cause of NTSCI followed by transverse myelitis and degenerative spinal disorders. The complication profile of SCI patients in Pakistan is similar to the reported complications in the developed countries with notably increased incidence. Social support systems and community re-integration programs for the SCI patients are not well established and patients face social, financial and mobility barriers while attempting community re-integration. *Implications/Impact on Rehabilitation:* There is a need to establish a national trauma registry, improve pre-hospital care for SCI, improve the existing neurosurgical services, and develop multidisciplinary SCI rehabilitation and social services for SCI patients in Pakistan in Particular and South Asia in general.

PO-0607

THE REVIEW FOR THE IMAGING DIAGNOSIS AND TREATMENT OF CAVERNOUS HEMANGIOMA IN THE CNS

Hongyu Chu[1,2], Jianjun Li[1,2], Feng Gao[2]
[1]Medical College Capital Medical University, [2]China Rehabilitation Research Center

The clinical reports of cavernoushemangioma in the CNS are increasing. Because of cavernous hemangioma' s haemorrhage,oppression, damage,they lead nervous system corresponding damage, resulting in the corresponding nerve damage symptoms. With the diagnosis and treatment of cavernous hemangioma continuously research, MRI is the most valuable imaging diagnosis at present,SWI is more sensitive than the conventional MRI scanning, the lesions of the display area in SWI significantly greater than conventional MRI scanning, and SWI can show more lesions of multiple cavernous hemangiomas, has much clinical value of qualitative and quantitative diagnosis of the central nervous system cavernous hemangioma. Cavernous hemangioma patients should do the whole central nervous system MRI check to find whether other areas suffured it. At present the main treatment for the Cavernous hemangioma is to take radical surgical resection, but for asymptomatic or lighter symptoms in patients or patients with multiple lesions, if they can take conservative treatment and the conservative treatment method are still controversial.

PO-0608

OBSERVATION ON THE THERAPEUTIC EFFECT OF THE METHOD OF TONIFYING KIDNEY YANG AND PROMOTING QI ACUPUNCTURE FOR TREATING THE LIMBS DYSFUNCTION IN POST-STROKE PATIENTS

Jingyuan Deng[1], Peng Zou[1], Hongying Cui[1], Jun Feng[1], Zhonghua Wang[1], Xiaohua Wei[1], Qinglian Zheng[1], Yangxian Yang[1], Jin Qiao[1]
[1]Department of Rehabilitation Medicine, the First Affiliated Hospital of Medical College, Xi'an Jiaotong University, [2]Department of TCM, the First Affiliated Hospital of Medical College, Xi'an Jiaotong University, [3]Department of Neurology, the First Affiliated Hospital of Medical College, Xi'an Jiaotong University

Objective: Observation on the therapeutic effect of manipulation of Tonifying Kidney Yang and Promoting Qi acupuncture in the treatment of post-stroke limbs dysfunction. *Method:* The phase of post-stroke in inwards with limbs dysfunction 90 cases of random grouping, for groups of 30 cases, while in Western routine treatment combined with tonifying kidney Yang and promoting Qi needling; control groups, the first, Western routine treatment with routine acupuncture therapy group of 30 cases; the second, the pure Western routine treatment group 30 cases. *Results:* three groups' therapy Barthel index and simplified Fugl-Meyer sequelae and score are differences ($p<0.05$), and the Barthel index and simplified Fugl-Meyer sequelae score in therapy group significantly higher than those of the control groups ($p<0.05$). *Conclusion:* Tonifying kidney Yang and promoting Qi acupunctural method can significantly improve the limbs dysfunction and daily activities in post-stroke patients.

PO-0609

A RARE CASE OF NMDA RECEPTOR ANTIBODY ENCEPHALITIS (NMDAR) PRESENTING IN DISGUISE

Laurentiu Dinescu*, David Cancel, Mathew Blando
Department of Physical Medicine and Rehabilitation, Kingsbrook Jewish Medical Center, Brooklyn, New York, USA, United States

Objective: To increase awareness of an unusual clinical presentation in the Rehabilitation setting. *Method:* Case report of a 20 year old female with no past medical history, initially admitted to the Psychiatric unit with symptoms of agitation and behavioral changes. She was transferred to the Medical ICU secondary to seizures, choreoathetoid movements, tongue biting, dysautonomia and respiratory failure requiring ventilatory support. Initial brain scans, blood, CSF, cardiac and pulmonary tests were all negative. *Results:* After extensive work-up the patient was diagnosed with NMDAR, prompting further imaging to search for the presence of an underlying tumor. An ovarian teratoma was found and excised. After several rounds of intravenous steroids and immunoglobulins, she was transferred to our TBI unit. She has successfully recovered her cognitive and physical function and progressed from a totally dependent level to supervision. *Implications/Impact on Rehabilitation:* NMDAR is a rare autoimmune disorder that is often associated with antibodies formed against an ovarian teratoma, cross-reacting against NMDA receptor proteins found in the brain. Rare disorders are often difficult to correctly diagnose and appropriately treat, resulting in delays of care. These delays lead to a prolonged hospital course, with further deconditioning and increased risk of medical comorbidities. Prompt recognition and appropriate treatment could have lessened or avoided these complications. This case highlights the need for evaluation, treatment and appropriate rehabilitation services both during and after recovery from NMDAR encephalitis.

PO-0610

EFFECT ON SWALLOWING APRAXIA USING TRANSCRANIAL DIRECT CURRENT STIMULATION

Ying Yuan, Jie Wang, Dongyu Wu
Rehabilitation Medicine department Xuan Wu Hospital C.M.U

Objectives: To investigate the effect on swallowing apraxia using transcranial direct current stimulation (tDCS). *Methods:* Two single subjects with swallowing apraxia resulting from ischemic stroke participated in an A-B design study. A baseline phase was established by measuring the lingual movement, buccofacial apraxia and feeding while subjects received 3 weeks of surface electrical stimulation combined with swallowing maneuvers. The intervention phase was established by evaluating the same outcome measures while subjects received 3 weeks of tDCS treatment. *Results:* At baseline, no differences were discovered for lingual movement, buccofacial apraxia and feeding. However, after tDCS treatment, lingual movements significantly improved and buccofacial apraxia scores increased from 10 to 34 and 36 seperately, and the nasogastric tubes in patients were removed. *Conclusions:* tDCS could provide a useful means for promoting recovery of swallowing apraxia.

PO-0611

BENEFITS OF REPETITIVE FACILITATIVE EXERCISE UNDER CONTINUOUS NEUROMUSCULAR ELECTRICAL STIMULATION

FOR SEVERE UPPER-LIMB PARESIS AFTER SUBACUTE STROKE: A RANDOMIZED CONTROLLED PILOT TRIAL

Megumi Shimodozono[1,2]*, Tomokazu Noma[2], Shuji Matsumoto[1,2], Ryuji Miyata[1,2], Seiji Etoh[1,2], Kazumi Kawahira[1,2]

[1]Department of Rehabilitation and Physical Medicine, Kagoshima University Graduate School of Medical and Dental Sciences, Japan, [2]Kagoshima University Hospital Kirishima Rehabilitation Center, Japan

Objective: Repetitive facilitative exercise (RFE), a combination of high repetition and neurofacilitation, is an approach to rehabilitation of stroke-related limb impairment. The aim of the present study was to compare the efficacy of RFE under continuous surface electrical stimulation (ES) with that of RFE alone or conventional rehabilitation in subacute stroke patients. *Method:* The subjects were 27 adults (61±13 yrs, the duration after the onset of stroke 6.6±2.4 weeks; mean±SD) with severe upper-limb impairment (Fugl-Meyer Arm score [FMA] ≤20). The subjects were randomized into three groups and received treatment on a 4-week, 40 min/day, 5 days/week schedule. Those assigned to the RFE-under-ES group received 100 to 150 repetitions of standardized movements of shoulder, elbow, and wrist joints of their affected upper extremity with concurrent submotoric-continuous-ES for each corresponding musculature. The RFE group received the same exercise regimen but without ES. The control group participated in a conventional upper-limb rehabilitation program without ES. Main outcome measure was FMA which was assessed by a blinded evaluator at baseline and at 4-weeks (trial conclusion). *Results:* All 27 participants (9 in each group) completed the trial. FMA score at baseline was 9.4±5.1. At the end of treatment, the RFE-under-ES group evidenced significantly greater improvement than the control group on the FMA (p<0.01). The RFE group showed improvement compared with the control group but it was not significant. *Implications:* These results suggest that RFE under ES may be more effective than conventional rehabilitation in lessening upper-limb motor impairment during the subacute phase of stroke.

PO-0612

KNEE AND ANKLE DORSIFLEXOR MUSCLE STRENGTH AND GAIT PERFORMANCE IN PERSONS WITH LATE EFFECTS OF POLIO

Jan Lexell, Ulla-Britt Flansbjer, Christina Brogårdh*

Department of Health Sciences, Lund University, Lund, Sweden

Objective: To assess muscle strength in the knee extensors and flexors, and ankle dorsiflexors, and gait performance in persons with late effects of polio, and to determine the influence of muscle strength, sex, age, body mass index and the mean time since onset of new symptoms on gait performance. *Methods:* Ninety community-dwelling ambulant persons (47 men and 43 women; mean age 64 years SD 8) with verified late effects of polio participated in the study. Isokinetic concentric knee extensor and flexor muscle strength was measured at 60º/s and ankle dorsiflexor muscle strength at 30º/s. Gait performance was assessed by Timed "Up & Go", comfortable and fast gait speed, and 6-min walk test. *Results:* There were significant correlations between knee extensor and flexor muscle strength and gait performance (p <0.01) and between ankle dorsiflexor muscle strength and gait performance (p <0.05) for both lower limbs. Strength in the knee extensors and flexors explained 7% to 47% of the variance in gait performance whereas strength in the ankle dorsiflexors strength explained 4% to 24%. Muscle strength in the knee flexors had the largest influence on fast gait performance. Sex, age, body mass index, and time since onset of new symptoms contributed at most an additional 10 % to the variance in gait performance. *Implications for rehabilitation:* Knee extensor and flexor muscle strength, and to some extent ankle dorsiflexor muscle strength, are predictors of walking ability in persons with late effects of polio.

PO-0613

LONG-TIME FOLLOW UP OF FORMER POLIO PATIENTS: DISABILITY AND FUNCTIONAL ASSESSMENT

Linda Hou, Carin Willen, Katharina Stibrant Sunnerhagen*

Institute of Neuroscience and Physiology, Gothenburg University, Sweden

Objective: 14 to 16 years follow up of former polio patients to evaluate perceived health problem, disability, physical performance and muscle strength. *Method:* Of the 106 patients who were included in 4 years follow up study 5 patients were dead and 55 participated for muscle strength testing. Peak isometric strength was measured at a 60° knee angle during extension and flexion. Maximum isokinetic strength was measured at 60°/s during extension and flexion. Isometric endurance was measured as the time the subject was able to keep 40% of his isometric peak torque at a 60° knee angle. All results were normalized for age and gender *Results:* The mean age at this occasion was 65 years. Of the ten muscle groups assessed, 8 were not significantly altered. Two tests showed significant changes: right leg flexion at 60° knee angle had improved (p<0.001) and left leg extension at 60°/s had deteriorated (p<0.05). *Impact on Rehabilitation:* Muscle strength changes over time are not as prominent as clinically believed in patients that attend a polio clinic. It seems as the advised from the team on using assistive devices and reduce activity level might have an impact on muscle function. However, half of the patients did not participate on the second testing, this could be due to deterioration; either having an effect so that the patient did not want to participate or making the muscle test impossible.

PO-0615

HEPATIC ENCEPHALOPATHY RESEMBLING ACUTE STROKE AND CORTICOSPINAL TRACT INVOLVEMENT: CASE REPORT

Jinhuyn Kim, Joonchul Lee, Heeyoune Jung, Jongmin Lee*

Konkuk University Medical Center, Korea

Hepatic encephalopathy is a metabolic disorder of the nervous system resulted from elevated level of toxic metabolites. There have been few reports in the literature of hepatic encephalopathy with irreversible focal neurologic signs resembling acute stroke. A 50-year-old male with liver cirrhosis and esophageal varix for 3 years presented with melena and hematochezia. He was treated for varix bleeding, but had rebleeding 11 days later and developed drowsiness with left side hemiparesis. A manual muscle testing in accordance to the Medical Research Council (MRC) scale was grade II of left side body overall and Babinski sign was positive. His serum ammonia level (129.9 μg/dl) was high. Brain perfusion CT and CT angiogram did not show any evidence of vascular abnormality but MRI revealed an increase in extent of diffusion-weighted image and T2-hyperintensities with decreased apparent diffusion coefficient values in the bilateral frontoparietooccipital cortex, more severe in the right hemisphere and right parietooccipital corties. After 4 weeks treatment in rehabilitation medicine department, patient's mental status was normally recovered, but significant left side weakness (Brunnstrom recovery stage for arm III, hand V, leg III) and left side sensory deficit remained. Diffusion tensor MRI showed atrophy of the lesions and decreased volume of right corticospinal tract. In the evaluation of motor evoked potentials, left upper and lower limb showed no responses. This case demonstrates that stroke-like presentation of hepatic encephalopathy and corticospinal tract involvement without evidence of major cerebrovascular derangement.

PO-0616

NEURAL MECHANISMS OF AUDITORY-VOCAL INTEGRATION IN PATIENTS WITH TEMPORAL LOBE EPILEPSY

Weifeng Li, Hanjun Liu
Department of Rehabilitation, First Affiliated Hospital, Sun Yat-Sen University

Sensory processing of auditory feedback is an important element of the neural mechanisms controlling human vocalization. There is evidence that some patients with temporal lobe epilepsy (TLE) have difficulty in the perceptual processing of speech sounds. Neural mechanisms underlying the auditory processing disorder in TLE are poorly understood, and whether this disorder affects the auditory-vocal integration in the online monitoring of self-produced speech remains unknown. *Objective:* This study was to examine the neurophysiological processing of auditory feedback in the sensorimotor integration of voice fundamental frequency (F0) control. *Methods:* Twelve patients with TLE and twelve aged- and sex-matched healthy controls participated in the present study. Voice F0 responses and cortical event-related potentials (ERPs) were obtained from the participants who sustained a vowel phonation while hearing their voice pitch feedback unexpectedly shifted 50 or 200cents upwards. *Results:* TLE patients produced significantly larger voice F0 responses to pitch feedback perturbations than healthy controls. Significantly larger amplitudes but longer latencies of N1 and P2 components were associated with TLE patients in response to pitch feedback perturbations when compared with healthy controls. *Implications:* The present study presents the first behavioral and neurophysiological data of the abnormal auditory-vocal integration in the online monitoring of self-produced speech, which may be related to the disorders in the central auditory processing in TLE. Understanding the neural mechanisms underlying auditory-vocal integration in TLE is potentially helpful for the diagnosis and treatment of disorders in speech perception and production associated with TLE.

PO-0617

SOMATOSENSORY EVOKED POTENTIALS IN THE DIAGNOSIS OF PUDENDAL NERVE NEUROPATHY WITH A NEGATIVE PHYSICAL EXAMINATION

David Cancel[1], Laurentiu Dinescu[2], Vishal Rekhala[3], Nahid K. Nainzadeh[4]
[1]Einstein/Montefiore Medical Center,United States, [2]Kingsbrook Jewish Medical Center,United States, [3]Metropolitan Hospital,United States, [4]Mount Sinai Medical Center, United States

Objective: To demonstrate the utility of SSEP's in the diagnosis of pudendal nerve neuropathy (PNN) in the setting of negative physical examination findings. *Method:* Electrodiagnostic case report of a 30 year old male with erectile dysfunction and progressive perineal numbness for 7 years. His symptoms began after taking Finasteride for male pattern baldness. Although he stopped taking Finasteride 2 years before his EMG clinic visit, the symptoms did not improve. He had been taking Sertraline for 6 months to treat depression. He denied any other medical history. *Results:* Physical examination was unremarkable, including genitalia. There was full range of motion and strength with 2+ reflexes in all four extremities. Sensation was intact to light touch and pin prick, including the perineum. Plantar flexion response was normal; there was no clonus at the ankle. Motor and sensory nerve conduction studies of the bilateral peroneal, tibial, superficial peroneal, and sural nerves revealed normal distal latencies, amplitudes and conduction velocities. Bilateral tibial H-reflexes were within normal ranges. SSEP's of the bilateral posterior tibial nerves were within normal limits. The pudendal SSEP was significant for delayed`P1 (P40) latency and low amplitude of P1-N1. *Implications/Impact on Rehabilitation:* These electrodiagnostic findings are indicative of PNN. Although the patient complained of perineal numbness, the physical examination was unremarkable. While PNN remains a clinical diagnosis, electrophysiologic studies can reveal a neurologic disorder in the setting of a negative physical examination that would otherwise go undiagnosed or attributed to the patient's clinical depression.

PO-0618

EFFECT OF LIFESTYLE ON OXIDATIVE STRESS IN SPINAL CORD INJURED PATIENTS AND ABLE-BODIED INDIVIDUALS

Zhen Chen[1,2]*, Abdulaziz A. Al-Yahya[3], Mohamed M. Sayed-Ahmed[3], Andrei Krassioukov[1,2,4], Tania Lam[1,2]
[1]University of British Columbia, Canada,Canada, [2]International Collaboration on Repair Discoveries, Canada,Canada, [3]King Saud University, Saudi Arabia,Canada, [4]GF Strong Rehabilitation Centre, Canada

Objective: To compare the oxidative stress response between persons with spinal cord injury (SCI) and able-bodied individuals (AB), taking into account differences in physical activity levels in order to better understand the optimum training parameters (i.e. frequency, intensity) of SCI rehabilitation. *Methods:* Venous blood samples were collected from individuals with SCI (n=19) and age-, gender-, and lifestyle-matched AB subjects (n=20) in resting state. Blood samples were analyzed for level of oxidative stress through malondialdehyde (MDA) and hydrogen peroxide (H2O2), while anti-oxidant enzyme activity was represented by superoxidase dismutase (SOD) and glutathione peroxidase (GPx). Blood samples were analyzed by blinded assessors (MMS and AAA). Lifestyle was defined by regular participation in moderate physical activity (sedentary: <3X/week; active: ≥3X/week). *Results:* There were significant differences in baseline levels of GPx between SCI and AB subjects (SCI: 314.63±36.73; AB: 487.57 ±58.78; p<0.05). According to lifestyle, GPx of sedentary individuals with SCI was significantly lower than that of active AB and sedentary AB (SCI (sedentary): 258.10±42.77; AB (active): 479.22±81.28; AB (sedentary): 495.92±89.27; p<0.05), however no significant difference among active SCI, active AB and sedentary AB. The sedentary SCI group tended to have higher levels of MDA and H2O2 compared to the active and sedentary AB group. *Conclusion:* Sedentary SCI have significantly lower baseline anti-oxidative capacity and more oxidative stress compare to AB subjects. Lifestyle could be one of the important factors which affect the level of oxidative stress in SCI, and routine rehabilitation training is crucial to improve recover after SCI. These results could have implications for the optimum rehabilitation training parameters.

PO-0619

IMPROVED PRAGMATIC ENVIRONMENTS ON CEREBRAL PALSY INFLUENCING CHILDRENS SOCIAL BEHAVIOR

Chengtao Zhang, Haibin Zhang, Xiaoqian Li, Mei Liu
Rehabilitation Center for People with Disability of Zhuhai

Objective: observed through improve pragmatic environment promote the pragmatic competence of cerebral palsy children's social influence. *Method:* through daily use frequency higher ten words, emphasis on practical language environment to use language, to observe the seven cerebral palsy children's greetings, cooperation, imitation and assistance, as well as social behavior and words quantity and use. *Results:* The cerebral palsy children's greetings, cooperation, and imitate, help social behavior is significantly increased before intervention. *Conclusion:* improve pragmatic environment can promote cerebral palsy children's social competence.

PO-0620

THE EFFECTS OF DYNAMIC SUPPORTING-INDUCTION EXERCISE FOR THE ADL IN MODERATE-SEVERE HEMIPLEGIC PATIENTS SUFFERED STROKE

Keshu Cai, Guangxu Xu, Hong Hou
Department of Rehabilitation Medicine centre in the first affiliated hospital of Nanjing Medical University, Nanjing, 210029, China.

Purpose: To study the effects of dynamic supporting-induction exercise to the ADL related to the affected lower extremities supporting functioning in moderate-severe brain impaired patients suffered stroke. *Subjects and Methods:* 17 stroke patients were randomly assigned to experimental group (9 cases) and control group (8 cases). The patients in experimental group received dynamic supporting-induction exercise. Both groups accepted routine exercises. Total training time was about 2 h per day and 5~6times per week. At 0th day, 40 th day and 60th day, the patients were evaluated with Berg Balance Scale (BBS) Functional Ambulation Category scale (FAC),and Barthel Index (BI). *Results:* Before training, there were no differences between groups in BBS, FAC and BI (p>0.05). At 40th/60th day, the scores in experimental group got significant better than scores in the control group in the three items. And there were significant differences intra-group compared with 0th day in all three items at both points-in-time (p<0.01). At 40th day, there were significant differences in BBS, FAC and BI between groups (p<0.05). However, there was only difference in ADL at 60th day (p<0.05). Intra-group compared between 40th and 60th, there were no significant differences in BBS, FAC and BI in experimental group (p>0.05), but had differences in BI in control group (p<0.05). *Conclusions:* Dynamic supporting-induction exercise to the affected lower extremity can improve the balance and gait ability and ADL of the patients with moderate-severe brain impairment after stroke.

PO-0621

EFFECT OF THE RECIPROCATING GAIT ORTHOSIS (WALKABOUT ORTHOSIS) AND VENLAFAXINE IN THE TREATMENT OF THE PATIENTS WITH SPINAL CORD INJURY

Hong-Fei Qiao, Qiao-Jun Zhang, Hong-Hao Duan, Xi-Jing He
Department of rehabilitation, the Second Affiliated Hospital, Medical School of Xi-an Jiaotong University, Xi-an 710004

Objective: To observe the influence on walking ability of patient with spinal cord injury after fitting walkabout orthosis and giving venlafaxine treatment. Methods March 2010 ~ October 2012 our hospital 12 patients with the lower thoracic Spinal Cord Injury at level of T10-T12 were randomly assigned to walkabout orthosis and venlafaxine group (walkabout and venlafaxine group) and walkabout orthosis group (walkabout group),they all received intensive training (including muscle strength,cardio-respiratory function,transferring, bladder function etc.) And then, 12 cases fitting walkabout orthosis received gait walking training especially. ASIA motor scores, MBI and Time-limited walking test (including 6-min Walking Test, and Timed 10-meter Waling Test) were assessed respectively before fitting and 8 weeks after fitting orthosis. *Results:* The results demonstrated that walkabout and venlafaxine group 1 week of treatment HAMD scores were significantly lower than walkabout group, and significant difference (p<0.01).The significant difference was found between two groups according to walkabout and venlafaxine group ADL (MBI) scores higher than walkabout group, and significant difference (p<0.05). After 8 weeks, there was a significantly difference between the walkabout and venlafaxine group and walkabout group in walking ability scores (p<0.05). *Impact on Rehabilitation:* The reciprocating gait orthosis (walkabout orthosis) and venlafaxine in the treatment of the patients with the lower thoracic spinal cord injury can obviously improve walking ability of the patients and accelerate their early return to society.

PO-0622

EFFECT OF ANTIBIOTIC THERAPY ON PYURIA IN PATIENTS OF SPINAL CORD INJURY

Yan Dong
Hangzhou hospital of ZHEJIANG CARF, Hangzhou,Zhejiang, China

Object: To observe the effect of antibiotic therapy on pyuria in patients of spinal cord injury. *Methods:* 65 pyuria specimens of spinal cord injury patients were divided into a treatment group (37 specimens) and a control group (28 specimens). *Results:* The pyuria negative rate in treatment group after antimicrobial therapy was 72.97%, 46.43% in control group, the difference was significant (p<0.05). In the following month, pyuria recurrence rate of the treatment group was 74.07% and control group was 69.23%, the difference was not statistically significant (p>0.05). Incidence of urinary tract infection in treatment group was 13.51% and 10.71% in control group, the difference was not statistically significant (p> 0.05). *Impact on Rehabilitation:* Antibiotic therapy on pyuria in patients of spinal cord injury could cure pyuria in short term, but the recurrence rate and symptomatic urinary tract infection rate were similar to non-antibiotic therapy, so taking antibiotic treatment has no significant benefit.

PO-0623

ANKLE-FOOT ORTHOSIS IMPROVES GAIT PARAMETERS AND FUNCTIONAL AMBULATION IN PATIENTS WITH HEMIPLEGIA

Birol Balaban*, Serdar Kesikburun, Evren Yaşar, Arif Kenan Tan
Gülhane Military Medical Academy, Department of PM&R, Turkish Armed Forces Rehabilitation Center, Ankara, Turkey, Turkey

Objective: To investigate the effect of an ankle-foot orthosis (AFO) on functional ambulation level and temporospatial parameters of gait in patients with hemiplegia. *Method:* Records of 234 adult patients with spastic hemiplegia assessed in our gait and motion analysis laboratory between 2005 and 2012 were reviewed. The data of 24 patients who had been analyzed with and without an afo during the same session were selected for the study. Temporospatial parameters (walking speed, cadence, single support time, double support time, opposite foot contact, step time, step length) and ankle kinematics were assessed using the Vicon 512 motion analysis system. The video and file records of patients were examined to determine ambulation level of the patients according to functional ambulation classification (FAC). *Results:* A significant increase in walking speed, cadence, opposite foot contact, ankle dorsiflexion at initial contact and midswing was seen with use of an AFO on the affected side (p<0,005). Single support time, double support time, step time and step length was also improved on the hemiparetic side, but didn't reach a significant difference. FAC score of the patients improved significantly when wearing an AFO (p<0,005). *Implications/Impact on Rehabilitation:* The use of an AFO had positive effects on gait parameters and improved functional ambulation in patients with hemiplegia.

PO-0624

FUNCTIONING AND DISABILITY IN PATIENTS AFTER STROKE

Rui Sales Marques, Fernando Monteiro, Miguel Costa, Revelino Lopes, Joana Costa, Filipe Cardoso, Luís Malaia, Eduarda Afonso
Hospital de Faro, E.P.E, Portugal

Objective: The objective of the research is to characterize the stroke rehabilitation consultation patients in Hospital de Faro and search for the importance of rehabilitation in their quality of life, based on the International Classification of Functioning, Disability and Health

(ICF). *Method:* In this study, 72 patients of stroke rehabilitation consultation have been analyzed. A questionnaire was made based on ICF components. Functioning and Disability (body component, activity and participation) were searched with questions about after stroke symptoms, physical therapy/occupational therapy, speech therapy, bottulinum toxin type A, activities limitations (communication, walking, self-care, domestic work, eating, driving) and participation restriction (depression, confidence and degree of dependence). Contextual factors were searched with questions about family, friend's support and social discrimination. *Results:* Reduced strength in one side of the body was the most common symptom (92%), walking difficulties occurred in 87% of the patients, 63% had depression, 80% felt dependent only in some activities, 89% improved after physical therapy/occupational therapy, 93% after speech therapy and 96% after the use of bottulinum toxin. After the rehabilitation programme, 97% felt better in their activities and participation in the society. Family and friends support was described by 88% of patients and 12% felt discriminated by society. *Implications/Impact on Rehabilitation:* Stroke can cause important limitations in patient's life. An appropriate rehabilitation programme and treatment with botulinum toxin type A seem to have good results in these patients, decreasing their activities and participation limitations in the society.

PO-0625

EFFECTS OF THE CITICOLINE ACUPUNCTURE POINT INJECTION ON NEURAL DYSFUNCTION AFTER BRAIN TRAUMA IN RATS

Zhixue Guo, Ou Li, Chun Wang
Hangzhou hospital, Zhejiang, China

Objective: To investigate the effects of injection of citicoline into Zusanli point for rats with neural dysfunction following traumatic brain injury. *Methods:* The opened brain trauma was induced in rats by the improved Feeney method. The rats after injury were randomly divided into four groups: acupuncture point drug injection group, acupuncture point saline injection group, intraperitoneal drug injection group and control group. The rats in the acupuncture point drug or saline injection group were treated with acupuncture injection of citicoline or saline daily. The rats in the intraperitoneal drug injection group and control group were treated with intraperitonea injection of citicoline or saline daily. The treatment continued for 14days. On the 1st d, 2nd d, 4th d,6th d, 8th d, 10th d, 12th d and 14th d after injury, the alteration of neural function in rats was assessed with nervous function score, inclined board test and balance test. *Results:* The nervous function score, inclined board angle and balance test score improved more significantly in the acupuncture point drug injection group than other groups ($p<0.05$). *Conclusion:* Acupuncture point drug injection therapy showed more effective on the recovery of on neural dysfunction after traumatic brain injury.

PO-0626

EFFECTS OF ROBOT-ASSISTED UPPER LIMB EXERCISE IN SUBACUTE STROKE PATIENTS

Min Cheol Joo*, Se Eung Noh, Hyo In Park
Wonkwang University, Korea

Objective: To investigate the effects of robot-assisted arm training on motor and functional recovery of upper limb in patients with subacute stroke. *Method:* Thirty one subacute stroke patients were randomly divided into 2 groups. Robot-assisted arm training group received robot-assisted therapy using Aremeo® (Hocoma Inc, Zurich, Switzerland) for thirty min per day and five times every week during four weeks while control group received conventional arm training with same duration and frequency as robotic group. Outcome measures were used manual muscle test (MMT) for motor strength, Fugl-Meyer assessment (FMA), Manual function test (MFT) for arm function, K-Modified Brthel Index (K-MBI) for activities of daily living, mini mental state examination (MMSE) and Computerized Neuro-Cognitive Function Test software-40 (CNT-40) for cognitive function. All recruited patients underwent these evaluations before and after four weeks robot-assisted therapy. *Results:* Robot-assisted arm training on upper limb after subacute stroke showed improvement on motor strength, arm function, and activities of daily living. But all change values in terms of MMT, FMA, MFT, K-MBI exhibited a no statistically significant difference compared with conventional group ($p<0.05$, Table1). *Conclusion:* In patients with upper limb deficits after subacute stroke, Robot-assisted arm training is considered to facilitate motor and functional recovery of upper limb. But robot assisted arm training did not significantly improve motor and arm function at 4 weeks compared with conventional arm training group. Further research is required about the comparison of conventional rehabilitation therapy group and the questions about the duration, severity of stroke.

PO-0627

PLAIN ABDOMINAL RADIOGRAPHY AS AN EVALUATION METHOD OF BOWEL DYSFUNCTION IN SPINAL CORD INJURY

Min Cheol Joo*, Huyn Joon Park, Gang Keun Lee
Wonkwang University, Korea

Objective: To evaluate the plain abdominal radiographs as a method of bowel dysfunction in patients with spinal cord injury. The relationships of the bowel habits, stool forms and colon transit time are evaluated and analyzed. *Method:* A total of forty four patients with spinal cord injury were recruited. Patients were interviewed about clinical informations, constipation score and Bristol stool form scale were based on them. Total and segmental colon transit time were measured by using radio-opaque markers (Kolomark®). The presence of Megacolon or megarectum and the degree of stool retention were evaluated through the plain abdominal radiographs. Megacolon was defined as maximum colonic diameter greater than 6 cms, and megarectum as rectal diameter greater than 4 cms. The colon was devided into four or three segments and degree of stool retention was evaluated for each segments. A scoring system was applied as follows: 0=no stool, 1=small amount of stool, 2=moderate stool retention and 3=severe stool retention. The stool retention score ranged from 0 to 12 or 0 to 9, and the higher score indicated more severe stool retention. CTT has been known objective assessment in prior studys, therefore We examined the relationship between CTT and clinical aspects and plain abdominal radiography. *Results:* Total constipation scores ranged from 1 to 13, average 4.19 ± 3.11 and the Bristol stool form scale ranged from 1 to 6, average 4.13 ± 1.45. The CTT was 19.3 ± 16.17, 19.3 ± 13.45, 15.32 ± 13.15 and 52.42 ± 19.14 h in the right, left, rectosigmoid and total CTT, respectively. The number of megacolon and megarectum were 13 and 7, respectively, and the megacolon was found only at ascending colon. 4 segmental stool retention score was 2.4 ± 0.7 in the ascending colon, 0.8 ± 0.86 in the transverse colon, 1.83 ± 0.82 in the descending colon, 1.14 ± 1 in the rectosigmoid, respectively, and the total stool retention score was 6.19 ± 2.45. 3 segmental stool retention score was 2.28 ± 0.7 in the right colon, 1.8 ± 0.8 in the left colon, 1.35 ± 0.85 in the rectosigmoid,respectively, and the total stool retention score was 5.45 ± 1.83. There was statistically significant correlation between the total CTT and constipation score ($p<0.05$), but no correlation was observed between bristol stool form scale and total CTT and plain abdominal radiography. There was no statistically significant correlation between total CTT and the presence of megacolon and megarectum. There was statistically Significant correlation between the total CTT and total stool retention score on 4 segment method as well as 3 segment method ($p<0.05$). And significant correlations were observed each segmental CTTs and segmental stool retsntion score ($p<0.05$). *Conclusion:* CTT has been known objective assessment in prior studies, but has disadvantages such as a long examination time and inconvenient administration.

There was significant correlation in CTT and stool retention score. Therefore, plain abdominal radiography is usefulness as convenient and simple evaluation method of bowel dysfunction in patients with spinal cord injury.

PO-0628

EFFICIENCY OF VIRTUAL REALITY ON REHABILITATION OF MOTOR FUNCTION IN PATIENTS WITH STROKE: A SYSTEMATIC REVIEW

Yujie Yang, Yushan Yue, Jiabao Guo, Yi Zhu
Nanjing University of Chinese Medicine

Objective: To evaluate the effect of virtual reality on rehabilitation of the upper and lower extremity function in patients with stroke. *Methods:* Cochrane Central Register of Controlled Trials, PubMed, China National Knowledge Infrastructure, VIP Database for Chinese Technical Periodicals and Wanfang Data were searched for the randomized controlled trials (RCTs) of virtual reality on rehabilitation of motor function in patients with stroke from the date when databases were established to December 2012. The included studies were evaluated according to the method recommended by the Cochrane Collaboration. The extracted data were analyzed by RevMan5.0 software. Result 9 trials were included (4 trials about the upper extremity function and 5 trials about the lower extremity function). Meta-analyses showed that results were statistically significant for the upper extremity function. Compared with conventional training, the VR training increased the score of FMA and BBT (WMD=10.54, 95%CI 3.24 to 17.84; and WMD=9.29, 95%CI 5.24 to 13.34). However, the results of BBS, MMAS and Walking Speed (WMD=1.63, 95%CI -0.83 to 4.09; and WMD=0.36, 95%CI –0.01 to 0.73; and WMD=0.01, 95%CI –0.14 to 0.17) were no statistically significant for the lower extremity function. According to the Jadad Score of included studies, 7 of them are of low quality and only 2 of them are of high quality. *Implications:* An evidence based medicine report on virtual reality.

PO-0629

POST- STROKE DEPRESSION EARLY INTERVENTION ON NEUROLOGICAL REHABILITATION

Weixiang Wang
The fifth hospital in heilongjiang province

Objective: Depression after stroke in patients with early in tervention, observation of the neurologica l rehab ilitation. *Methods:* 66 patients in June 2007–2010 in June adm ittedmy Hospital patientsw ith depression according to the wishes of patients divided into treatment group 36 cases, 30 cases of the control group. All cases were routine drug treatment and rehab ilitation training. Antidepressant group were treated with fluoxetine 20 mgorally 1tmie/d, for 4 weeks. All the patients before and after 4 weeks of treatment with Hamilton depression scale assessment of depression, applications Barthel index assess -ment activities o f daily living, with neurological deficit scores of neurologic inpairment evaluation. *Results:* The total effective rate 83% (30/36), the control group was 73% (22/30), the difference was significant treatment group after 4 weeks compared with neurological deficit score the control group sign ificantly inproved, after 4 weeks treatment group Ham ilton Depression Rating Scale (Hamihion depressionscale. HAMD) 17 pointsw ere 2 cases of depression was 5% (2/36) the control group 4weeks after HAMD 17 points in 6 patients, depression was 20% (6 /30), differences were also significant (p<0.01) treatment group, no obvious adverse reactions. *Conclusion:* Early in tervention can sign ificantly mi prove depression in patients with acute stroke depressive symptoms, activities of daily living and to promo terecovery of neurologica l function.

PO-0630

THE EFFECT OF PARTIAL BODY WEIGHT-SUPPORT TREADMILL TRAINING ON BRAIN-DERIVED NEUROTROPHIC FACTOR IN RATS AFTER INCOMPLETE SPINAL CORD CONTUSION

Qinfeng Wu[1], Ya Na Cao[2], Hong Xing Wang[2], Tong Wang[2]
[1]Department of Rehabilitation Medicine, The F Affiliated Hospital of Nan Tong, Nantong 226001, China, [2]Department of Rehabilitation Medicine,The First Affiliated Hospital of Nan Jing Medical University, Nanjing 210029, China

Objective: To investigate the effect of partial body weight-supported Treadmill training on the recovery of locomotor and brain-derived neurotrophic factor (BDNF) in rats after incomplete spinal cord contusion. *Methods:* Sixty male Sprague Dawley rats were randomly divided into a control group,a training group (including subgroups which received training for 1 week,and 4 weeks) and a sham operation group.Experimental rats of the control and training groups were induced by contusion of the T10 segment using a Muhicenter Animal Spinal Cord Injury Study (MASCIS) impactor.The training group rats were given partial body weight-supported treadmill training 15min/time, twice a day for 1 week and 4 weeks. Locomotor function were evaluated with the Basso-Beattie-Bresnahan (BBB) scale at different time points.The expression BDNF in the spinal cords was detected with real-time PCR methods. *Results:* locomotor function of the training group of 4 weeks increased more significantly than in control group (p<0.05). But the effects of 1-week training were better significantly than control group (p>0.05). The expression of mRNA of BDNF in the training group of 4 weeks increased more significantly than in control group (p<0.05).However there was no Significant difference between raining group of 1 weeks than in control group (p>0.05). Implication Exercise with partial weight-support may improve locomotor and the expression of BDNF)in the spinal cords. The improvement of locomotor are correlated closely with the duration of the training and expression of BDNF.

PO-0631

EFFECTS OF CORE STRENGTH TRAINING ON SPINAL CORD INJURY PATIENTS' BALANCE ABILITY AND WALKING FUNCTION

Xinchun Dong[1,3], Shanshan Mao[2]
[1]Wuxi Tongren International Rehabilitaion Hospital, [2]Department of Rehabilitation of Beijing Sport University, [3]Graduate school of Beijing Sport University

Objective: To observe the effects of core strength training on spinal cord injury patients' balance ability and walking function. *Method:* 60 patients with SCI were randomly divided into two groups: observation group (n=30) and control group (n=30). Both groups were treated with conventional rehabilitation training. simultaneously, the observation group were treated with core strength training, such as waist and thoracic vertebra out, rotating training etc. Before and after treatment, two groups were measured by Berg balance scale (BBS); lower limb movement index (LEMS) score and Holden walking function classification evaluation criteria. *Results:* After 6 weeks treatment, two groups BBS, LEMS and Holden scores increased significantly (p<0.05), Moreover, as compared with control group, observation group increased significantly (p<0.05) after 6 weeks. *Conclusion:* Core strength training can improve the balance ability and walking function on patients with spinal cord injury

PO-0632

EFFECTS OF INDIVIDUAL COGNITIVE FUNCTION TRAINING ON STROKE PATIENTS WITH COGNITIVE DISORDER

Zunke Gong, Wei Chen, Mi Wang, Wei Li
Department of Rehabilitation Medicine, Xuzhou City Centre Hospital,Xuzhou, Jiangsu, China

Objective: To explore the value of training program on cognitive function of individual therapy for stroke patients with cognitive impairment. *Methods:* The Mini-Mental Status Examination (MMSE) scale screening of 120 stroke patients with cognitive disorder patients, randomly divided into treatment group and control group with 60 cases in each group. The gender, age, level of education were matched in the two groups. All cases were examined with Loewenstein occupational therapy cognitive assessment (LOTCA) examination. The treatment group received cognitive training individual on the basis of conventional rehabilitation. The two groups were assessed again after 2 months of treatment. *Results:* Before treatment, the total scores and the scores of sub-items of LOTCA in the two groups had no significant difference ($p > 0.05$). After treatment, the scores of LOTCA were obviously improved (improved significantly) ($p<0.01$). The scores of LOTCA of the control group also increased ($p<0.05$), but that of the treatment group were more obvious than of the control group ($p<0.05$). *Conclusion:* Individual cognitive training programs can improve post-stroke cognitive impairment of LOTCA integral, improve the cognitive level of patients. It has good clinical application value.

PO-0633

EFFECTS OF THE APPLICATION OF OREM SELF-CARE MODE ON IMPROVING ADL OF STROKE PATIENTS

Juan Jin[1], Weiwei Li[2], Youhui Gong[2], Qingfang Zhu[2], Jinyuan Niu[2]
[1]Jiangsu province people's hospital rehabilitation medicine, [2]Jiangsu ChengZe hospital rehabilitation medicine

Objective: To study the effects of the application of Orem self-care model in nursing service on improving ADL of stroke patients. *Methods:* 60 stoke patients of Rehabilitation Department were randomly assigned into control group and intervention group. Patients in both groups were given traditional routine nursing service. Additionally, Orem self-care model were applied in the patients of intervention group through the whole nursing course according the ADL evaluation (Barthel Index). A self- designed satisfaction questionnaire was given to patients of both groups when discharged. *Results:* The ability of ADL and satisfaction in both group were improved, and the improvement in intervention group was significant better than that in control group ($p<0.05$). *Conclusion:* The application of Orem self-care model in nursing service can markedly improve the ADL ability and satisfaction of stoke patients.

PO-0634

HUMAN PLURIPOTENT STEM CELL-DERIVED GLIA REPLACE ASTROCYTES IN THE ADULT MOUSE SPINAL CORD

Hong Chen[1],[1], Wei Chen[2], Baoyang Hu[2], Lixiang Ma[2], Huisheng Liu[2], Suchun Zhang[2,3]
[1]Department of Rehabilitation of Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China, [2]Waisman center, [3]Department of Neuroscience and Department of Neurology, University of Wisconsin, Madison WI

Astrocytes are integral components of the homeostatic spinal neural network as well as active participants in the pathogenesis of motor neuron diseases, including amyotrophic lateral sclerosis and spinal muscular atrophy. Hence, astrocytes are important targets for therapeutic intervention. After transplantation into the cervical spinal cord of adult severe combined immunodeficiency (SCID) mice, neural progenitors, differentiated from human embryonic stem cells (ESCs) or induced pluripotent stem cells (iPSCs) and patterned to the spinal cord fate, survived in all the grafted animals. In the first 0.5-3 months, the predominant differentiated progenies were βIII-tubulin and MAP2 expressing neurons,including some ChAT+ motor neurons. GFAP expressing astrocytes began to appear at 3 months and became the predominant population by 9 months. The grafted astrocytes formed networks among their processes, cupped endogenous neurons (including motor neurons) and their axons, and extended end feet to blood vessels. The presence of human astrocytes was accompanied by a reduced density of endogenous GFAP+ cells. The proliferation of human neural progenitors, marked by Ki67, reduced steadily and the human cells spread dorsally and longitudinally up to 9.18±0.24 mm by 9 months. These results indicate that human stem cell-derived neural progenitors survive, differentiate, and potentially integrate into the adult spinal cord. The extensive interaction between grafted astrocytes and endogenous motor neurons and replacement of host astrocytes may offer an opportunity for replacing detrimental astrocytes for protecting (motor) neurons from degeneration.

PO-0635

EFFECT OF COGNITIVE FUNCTION TRAINING AND SPEECH REHABILITATION ON MOTOR APHASIA AFTER STROKE

Yi Gao
Department of Rehabilitation, Lu Wan branch of Ruijin Hospital Affiliated to Shanghai Jiao Tong University Medicine School

Objective: To explore how cognitive function training with speech rehabilitation affect upon the motor aphasis after stroke. *Method:* Total 26 cases of in-patients hospitalized in the rehabilitation department of Ruijin Hospital Luwan Branch are randomly devided into trial group and control group with each group of 13 cases respectively. The control group are treated with regular speech therapy, while trial group are cured with personalized cognitive function training on the basis of regular speech therapy. To observe each methods' effect upon the motor aphasis after stroke, the Chinese Rehabilitation Research Center Standard Aphasia Examination (CRRCAE) and B- Trail Making Test (B-TMT) are utilized to estimate each patients' language-related cognitive function before and after the treatment. Datas are analyzed by SPSS18.0 software,and using t inspection. A p-value of less than 0.05 was considered to be statistically significant. *Result:* After 4 weeks' treatment, the trial group is superior to control group ($p<0.05$) by comparing the effect on patients' listening, repeating, speaking, reading, dictation, describing, calculating, and cognitive function abilities. *Conclusion:* The cognitive function training can facilitate the recovery of motor aphasia after stroke

PO-0636

IN VIVO EFFECT OF 5-HT7 RECEPTOR AGONIST ON INTERNEURONS OF MEDIAL FRONTAL CORTEX IN A RODENT MODEL OF PARKINSON'S DISEASE: AN ELECTROPHYSIOLOGICAL STUDY

Yanping Hui
Department of Encephalopathy, the Second Affiliated Hospital, Medical School of Xi`an Jiaotong University

Objective Investigate the activity and the effects of 5-HT7 receptor agonist of mPFC interneurons in normal and PD rats. *Methods:* After unilateral lesion of the nigrostriatal pathway in the rat by local injection of 6-hydroxydopamine (6-OHDA) into the right substantia nigra pars compacta (SNc), the firing activity of mPFC interneurons was recorded by using in vivo extracellular recordings. *Results:* We reported that systemic and local administration of 5-HT7 receptor agonist AS 19 produced excitation in the firing rate of interneurons in medial prefrontal cortex (mPFC) of normal and 6-hydroxydopamine-lesioned rats. However, cumulative dose producing excitation in the lesioned rats was lower than that of

normal rats. The local administration of AS 19, at the same dose, did not change the firing rate of the neurons in the normal rats. *Impact on Rehabilitation:* These results indicate that activity of mPFC interneurons is regulated through activation of 5-HT7 receptor by direct action, and degeneration of the nigrostriatal pathway leads to change response of the neurons to AS 19. It provide a possible therapeutic target about 5-HT7 receptor preparations.

PO-0637

BRAIN-DAMAGED PATIENTS: HEALTH NETWORK

Le Moine Francis, Dominik Lee, Camille Cortez, Christiane Abbyad
Ugecam/Chm/Fedmer, France

Established on the initiative of the University Hospital of Nice and the UGECAM Centre Hélio Marin of Vallauris, Health Network called 'Respect TC" is an organized form of collective action developed by medical professionals, in response to a need of rehabilitation of brain-damaged and stroke patients to leave the intensive care units, in the South of France. The health network's mission is to monitor and coordinate the care provided by each player medical and paramedical, and enable them to exchange knowledge in the context of a secure care and quality for these brain-damaged and stroke patients. It Consists of a focal point with a PRM Medical Coordinator, steering is provided by the medical office network assisted by a Committee medical, scientific and ethical and Families Associations. It keeps track of any adult or child, who has made an abrupt break with an earlier standard, following a central neurological injury, trauma or disease. *Objectives:* Improve the quality and safety of care, coordinate medical, medico-social and social efficiency of these patients, define a managed care type of brain-damaged patient. *Results:* On this day there is an active file of 2 thousand patients treated and followed by the network. The health system has now better know the number of brain-damaged and stroke patients, the etiologies and ensure quality of care regularly and efficiently.

PO-0638

EFFECTS OF BALANCE AND WALKING ABILITY BY DISRUPT SOMATOSENSORY AND VISUAL IN PATIENTS WITH STROKE

Yi Fu, Weihong Qiu, Zulin Dou
Department of Rehabilitation Medicine, The Third Affiliated Hospital of the Sun Yat-sen University, Guangzhou

Objective: To discuss the effects of balance and walking ability by disrupt to somatosensory and visual in patients with stroke. *Method:* 32 patients with 1 to 6 months post-stroke were randomly divided into a treatment group and a control group with 16 subjects in each. The treatment group used the Smart Equitest Balance Master balance training for disrupt the somatosensory and visual. Traditional balance training was used in the control group. Two groups received interventions 5 times per week for 20 min. Subjects were assessed by Berg balance scales test (BBS) and walking across test before and after 2 weeks of therapy. *Results:* The BBS test, the step length and velocity in the walking across test were significantly improvement than pre-treatment and control group ($p<0.05$). *Implications:* To disrupt somatosensory for balance training can significantly improve the balance in patients with stroke and improve the ability of the sensation and motor systems based on the task-oriented and significantly improve walking ability in patients with hemiplegia simultaneity.

PO-0639

THE RESEARCH OF MEMANTINE HYDROCHLORIDE ON COGNITIVE DYSFUNCTION AFTER CEREBRAL TRAUMA

Wenjuan Zhong, Ti Hu, Yanbin Xie, Bei Wang, Jun Cao, Jing Xiao, Sufeng Tu, Xiulin Ma
Department of Rehabilation of HongQiao Brain Hospital

Objective: The explorate the effect of Memantine Hydrochloride On Cognitive dysfunction After Cerebral Trauma Method Four patients with brain injury were observed in this study. two person in the early stage (fifty days after cerebral trauma), two person in the middle stage (four monthss after cerebral trauma) The MMSE score is zero when four patients on adimission. With the agreement of paients' family memebers, four patients on adimission all oral Memantine Hydrochloride, Initial dose is 5 mg,once a day, increase the dose to 10 mg, twice a day. The total course of treatment is 12 weeks, During the period of treatment, Medication therapy (nerve nutrition, circulation improvement, supporting therapy) and normal rehabiliation are given to two groups who are not accepted of Cognitive therapy, The MMSE score is evaluate when the total course of treatment is over. The score of first group is 9 and 11. the score of second group is 20 and 22. All person did not appear utoward effect. *Result:* The treatment of Memantine Hydrochloride On Cognitive dysfunction After Cerebral Trauma is effective,in addition, the effect of early stage is good than middle stage. *Impact on Rehabiliation:* The treatment of Memantine Hydrochloride On Cognitive dysfunction After Cerebral Trauma is safe and effective.

PO-0640

A CLINICAL STUDY OF AACUPUNCTURE COMBINED WITH COMPREHENSIVE REHABILITATION TREATMENT ON CEREBRAL DIFFUSE AXONAL INJURY

Jingyuan Deng[1], Xiaodong Shen[1], Yanchao Cui[1], Cuixia Shang[1], Hongying Cui[1], Qu He[1], Zhonghua Wang[1], Maode Wang[2]
[1]Department of Rehabilitation Medicine, the First Affiliated Hospital, Medical School of Xi'an Jiaotong University, [2]Department of Neurosurgery, the First Affiliated Hospital of Medical College, Xi'an Jiaotong University

Objective: To explore the clinical efficacy of the rehabilitation therapy of cerebral diffuse axonal injury (DAI) when the acupuncture was added into the treatment. *Methods:* The clinical data of 60 patients with diffuse axonal injury in our hospital since December 2007 to January 2009 were analysed. Patients were randomly assigned into two groups according to different therapeutic methods. Patients accept the routine comprehensive rehabilitation therapy was set as control group ($n=30$), the acupuncture was added to the routine treatment as the acupuncture group ($n=30$). We set 5 days a week and two weeks as one course, the simplified Fugl-Meyer score, LOTCA score and Modified Barthel index (MBI) was used to evaluated the motor recovery, cognitive function and the activities of daily living (ADL) before and after 6 courses (12 weeks) of treatment. *Results:* Patients in both groups show improvement of motor and cognitive function after treatment, the simplified Fugl-Meyer score, LOTCA score and Modified Barthel index all improved ($p<0.01$) after treatment. Meanwhile, in the acupuncture group show a significant increase in the motor and ADL function restore than the routine rehabilitation therapy, the simplified Fugl-Meyer score and Modified Barthel Index was significantly higher than the control group ($p<0.05$) after accept 60 times acupuncture in the 12 weeks. *Conclusion:* Acupuncture combined with comprehensive rehabilitation therapy in patients with diffuse axonal injury could significantly improved the restore of motor and cognitive function, improved the life quality of cerebral diffuse axonal injury patients.

PO-0641

INTERVENTIOS FOR POSTSTROKE INSOMNIA: A SYSTEMATIC REVIEW

Ke Liu[1], Yun Qu[2], Guang Chen[1], Yueqiao Huang[1]

[1]Department of Rehabilitation Medicine, Affiliated Drum Tower Hospital, Medical College of Nanjing University, Nanjing, China, [2]Department of Rehabilitation Medicine, WestChina Hospital, Sichuan University, Chengdu, China

Objectives: To determine whether any treatment for insomnia after stroke reduce the proportion of poststroke insomniacs, and to evaluate the effectiveness of treatment on the symptoms of insomnia. *Method:* We searched the Cochrane Stroke Group Trials Register (last searched January 2012), the Cochrane Central Register of Controlled Trials (The Cochrane Library Issue 1, 2012), MEDLINE (1950 to February 2012), EMBASE (1980 to February 2012), PEDro (searched March 2012), and CBM disk (1985~2012), CNKI (1985~2012) and VIP (1989~2012). The two authors independently scrutinised all titles and abstracts, excluded irrelevant references, obtained references for potentially relevant studies and extracted data. We included randomised controlled trials of any intervention in poststroke insomnia, and published in Chinese and English. *Results:* We identified 14 trials. 494 patients with poststroke insomnia of 9 trials were randomised to acupuncture or benzodiazepines. After performing a meta analysis, there were significant differences in overall response rate and PSQI (Pittsburgh sleep quality index) between groups. 4 trials randomised patients to Chinese herbs or benzodiazepines. There was no difference in insomnia between the two groups in 3 tirals except one trial. There was one trial comparing antidepressant with placebo.The trial investigated 100 patients with poststroke insomnia. There was significant difference in PSQI at follow up between the treatment and control. *Implications on rehabilitation:* The trials were too small to provide firm conclusions, and low quality.There is insufficient evidence available to guide the management of insomnia after stroke. Further trials are required.

PO-0642

THE ASSESSMENT OF COGNITIVE FUNCTION WITH THE COGNITIVE EVALUATION AND REHABILITATION APPARATUS ZM3.1 IN PATIENTS WITH CEREBRAL INFARCTION

Rongliang Hu[1,2], Zhuoming Chen[2], Yan Chen[2], Yichen Yin[2]

[1]Department of Rehabilitation, Affiliated Jiangmen Hospital of SUN YAT-SEN, [2]Department of Rehabilitation, the First Affiliated Hospital of Jinan University

Objective: To verify the validity of the Cognitive Evaluation and Rehabilitation Apparatus ZM3.1 to diagnose the cognitive impairment in patients with cerebral infarction. *Methods:* 60 patients who fulfilled with Chinese Prevention and Cure Guide of Cerebral Vascular Disease in 2005 criteria for cerebral infarction were assessed with the scales, including Mini Mental State Examination (MMSE), the Cognitive Evaluation and Rehabilitation Apparatus ZM3.1 (ZM3.1), Wechsler Adult Intelligence Scale-Revised China (WAIS-RC), were divided into normal, mild, moderate and severe categories according the cognition scores of them. Firstly statistic the amounts of normal, mild, moderate and severe categories. Taking MMSE and WAIS-RC as criterion respectively, work out the sensitivity and specificity of ZM3.1. *Results:* There are no significant differences in cognition screening of different cognitive impairment in patients with cerebral infarction with above 3 means (c2=1.99, p>0.05). Taking MMSE and WAIS-RC as criterion respectively, the sensitivity of ZM3.1 were 94.9% and 88.1%, the specificity were 95.2% and 100%. *Implications:* The Cognitive Evaluation and Rehabilitation Apparatus ZM3.1 is available in the diagnosis of cognitive impairments in patients with cerebral infarction.

PO-0643

A RANDOMIZED CONTROLLED TRIAL OF GAIT REHABILITATION AFTER HEMIPLEGIC STROKE: ROBOT-ASSISTED VERSUS CONVENTIONAL TRAINING

Ratanapat Chanubol[1]*, Parit Wongphaet[2], Napapit Chavanich[2], Lawan Panichareon[1], Cordula Werner[3]

[1]Prasat Neurological Institute, Bangkok, Thailand, [2]Ramathibodi Hospital, Mahidol University, Thailand, [3]Charite University Hospital, Berlin, Germany

Objective The purpose of this study was to evaluate the effectiveness of robotic-assisted gait training plus conventional physical therapy in subacute stroke patients. *Methods:* Sixty first-ever, non-ambulatory subacute stroke patients were randomized into experimental and control groups. The experimental group received 30 min of robotic-assisted gait training in addition to 30 min of conventional physical therapy; the control group received 60 min of conventional physical therapy. The training programs were offered on every working day for 4 weeks. Outcome measurements were Functional Ambulation Category (FAC), Barthel Index (BI), Berg Balance Scale, Resistance to Passive Movement Scale (REPAS), 10-Meter Walk test, and 6-Min Walk test. All parameters were assessed by a blinded observer at baseline, after 4 weeks of treatment, and at the 3-month follow-up examination. *Results:* The experimental group had significantly better outcomes than the control group for every parameter except REPAS after 4 weeks of treatment and at the 3-month follow-up examination. *Implications:* In severely subacute hemiplegic stroke patients, robotic-assisted gait training plus conventional physical therapy was better than conventional physical therapy alone in improving walking ability, activity of daily living, balance, gait speed, step length, and endurance, and has become an important tool in modern rehabilitation after stroke for the restoration of walking function.

PO-0644

STUDY ON SURFACE ELECTROMYOGRAPHIC ACTIVITIES OF THE SUBMENTAL MUSCLES IN POST-STROKE PATIENTS WITH DYSPHAGIA

Lingjun Xiao, Jingjing Xue, Tiebin Yan, Shaoling Wu

Sun Yat-sen Memorial Hospital,Sun Yat-sen university, Guangzhou

Objective: To investigate the swallowing function in post-stroke patients with dysphagia using surface electromyography (sEMG). *Methods:* 15 stroke patients with dysphagia, 12 stroke patients without swallowing disorders and 14 age-and gender-matched healthy controls were recuited for this study. Standardized sEMG procedure was applied to all subjects. Swallowing conditions were the following: single swallow at twice 5 ml and 10 ml of thin liquid barium and 5 ml and 10 ml of paste barium. The duration, the average amplitude of the sEMG and the peak amplitude of the submental muscle group were compared among the three groups. A three-way analysis of ariance (ANOVA) was conducted. *Results:* There were no significant different in the general data among three groups (p>0.05). Durations were significantly longer, average and peak amplitudes were significantly smaller for for the group of dysphagia patients than for those patients without dysphagia and healthy subjects for all tested volumes and consistencies (p<0.05), but were not were not significantly different between those patients without dysphagia and healthy subjects (p>0.05). *Conclusions:* It is feasible to apply sEMG for evaluating the swallowing function and to quatity the strength of swallowing muscles, sEMG might be a simple and useful tool to study and assessment swallowing function in post-stroke patients with dysphagia.

PO-0645

CHEMOKINE CCL2 AND ITS RECEPTOR CCR2 IN THE INJURED CORTEX ARE INVOLVED IN TRAUMATIC BRAIN INJURY

Su Liu, Tong Wang

Department of Rehabilitation Medicine, The 1st Affiliated Hospital of Nanjing Medical University

Objective: To explore the role of Chemokine C-C motif ligand 2-Chemokines C-C motif receptor 2 (CCL2-CCR2) signaling in rat models of traumatic brain injury (TBI). *Methods:* The cellular localization of CCL2 and CCR2 were examined by immunofluorescence double staining. The expression of CCL2 and CCR2 mRNA were detected by real-time quantitative PCR in the rat brain cortex after TBI. The effect of a selective CCR2 antagonist, RS504393 on cerebral function was checked by morris water maze testing and TUNEL staining after injury 3 days. *Results:* CCL2 is mainly colocalized with astrocytic marker GFAP and CCR2 is mainly colocalized with neuronal marker. CCL2 and CCR2 expression was increased in the injured cortex from 1 day to 10 days after TBI. The levels of CCL2 and CCR2 mRNA peaked at 3 days. Finally, injured cortex injection of RS504393 (25 μg/d) significantly attenuated TUNEL-positive cells in the injured cortex and improved cognitive function. *Impact on Rehabilitation (Conclusions):* The data suggest that CCL2-CCR2 signaling may be involved in the complex post-traumatic effects. Targeting CCL2-CCR2 signaling may be a potentially important new treatment strategy for cognitive function after TBI.

PO-0646

THE EFFECTS OF EXERCISE TRAINING ON NEURAL FUNCTION AND NEUROGENSIS IN RATS AFTER CEREBRAL INFARCTION

Lili Li, Xiquan Hu, Liying Zhang

Department of Rehabilitation Medicine, the Third Affiliated Hospital, Sun Yat-sen University, Guangzhou, China

Objective: To explore the effects of exercise training on neural function and neurogensis in the peri-infarction region in rats after cerebral infarction. *Method:* Permanent focal cerebral ischemia was induced by left middle cerebral artery occlusion (MCAO) in 65 male adult Sprague-Dawley rats using a modification of Longa's method. The rats were randomly divided into 4 groups: exercise training groups (D2 group, D4 group, D6 group) in which the rats received wheel running training every day begining at day 2, day 4 and day 6 after ischemia respectively, and the control group in which the rats could move freely in standard cages. Their neurological functions were measured at 24 h after cerebral infarction and 1 week and 2 weeks after exercise. The co-location of Ki67 and Nestin was used to observe the neurogensis in the peri-infarction regions. *Results:* The neurological severity scores in the exercise groups showed more quick declination as compared to those in control group at 1 week and 2 weeks. Moreover, the neurogensis significantly increased in exercise groups in comparison with those in control group. *Implications:* Exercise training facilitates the recovery of neural function after cerebral infarction in rats. The neurogensis may play an important role in this course.

PO-0647

AN ANALYSIS ABOUT THE COST-EFFECTIVENESS OF COMMUNITY-BASED REHABILITATION INTERVENTION ON IMPROVING OF COMPREHENSIVE FUNCTION FOR STROKE PATIENTS IN SHANGHAI, CHINA

Jianjun Yu[1], Yongshan Hu[1], Yi Wu[1], Wenhua Chen[2], Xiao Cui[3], Weibo Lu[4], Yulian Zhu[1], Qi Qi[2], Peiyu Qu[3], Xiaohua Shen[4]

[1]Department of Rehabilitation Medicine, Hua Shan Hospital, Fudan University, [2]Department of Rehabilitation Medicine, 1st people Hospital, Shanghai Jiao Tong University: 3 Department of Rehabilitation Medicine, [3]Shanghai Tian Shan Chinese Medicine Hospital, [4]Department of Rehabilitation Medicine, Shanghai Yang Pu Older Hospital

Objective: To evaluate the cost-effectiveness of community-based rehabilitation intervention on comprehensive function for stroke patients. *Design:* Prospective, single-blind, randomized, controlled, multicenter trial Setting in communities, in Shanghai,China. *Subjects:* 589 stroke patients Intervention The rehabilitation group received an additional standardized community-based intervention including rehabilitation therapy and prevention at home. The intervention was applied for 5 months *Main outcome measures:* Patients were evaluated for comprehensive function scores before intervention, at the end of 2 and 5 months respectively. Each patient's direct medical costs, direct non-medical costs, indirect costs, follow-up costs of community-based rehabilitation intervention, costs of community-based prevention and detailed buildups of every cost during the stage of 5 months were collected. Then we did cost-effective analysis. *Results:* The comprehensive function scores between rehabilitation and control group had no significant difference at the time when entried the trial. After 5 months, the comprehensive function scores of rehabilitation group improved 17.25. In comparison, the comprehensive function scores of control group improved 5.21. There was statistical difference between rehabilitation group and control group ($p<0.01$). In the rehabilitation group, with every one point improvement of comprehensive function, the direct medical costs and total costs should be expended ￥605.6, and ￥838.42 respectively. In the control group, with every one point improvement of comprehensive function, the direct medical costs and total costs should be expended ￥1247.00, and ￥1601.55 respectively. *Conclusion:* Standardized community-based rehabilitation therapy and prevention during 5 months is an effective and cheaper program to improve the comprehensive function of stroke patients in the community.

PO-0648

THE INFLUENCE OF BODY WEIGHT SUPPORT ON KINEMATIC FACTOR DURING TREADMILL WALKING IN HEALTHY SUBJECTS AND HEMIPLEGIC PATIENTS

Junya Yamada[1]*, Kei Ohtsuka[2], Eiichi Saitoh[3], Hitoshi Kagaya[3], Norihide Itoh[2], Hiroki Tanikawa[1,2], Shigeo Tanabe[2]

[1]Department of Rehabilitation, Fujita Health University Hospital,Japan, [2]Faculty of Rehabilitation, School of Health Sciences, Fujita Health University,Japan, [3]Department of Rehabilitation Medicine I, School of Medicine, Fujita Health University, Japan

Objective: Body weight support treadmill training (BWSTT) has been attracted as a gait training of hemiplegic stroke patients since early 1990s. In addition, the usefulness of this training has been frequently reported. However, the influence of the suspension during treadmill walking is controversial. In this study, we examined the influence of body weight support on the kinematic factor during treadmill walking in healthy subjects and hemiplegic patients. *Methods:* The participants were 10 healthy subjects and 10 hemiplegic patients. They were instructed to walk on the treadmill either 70% of the comfortable speed on level walking or the comfortable speed on level walking. The suspension was set at 0%, 20%, 30%, and 40% of body weight (BW). The coordination of the center of gravity was calculated by using three-dimensional motion analysis system. *Results:* Amplitude of the center of gravity in the vertical direction decreased with the increase in amount of suspension. A significant difference were observed between 0% BW and 20, 30 or 40% BW in both groups. Posterior and anterior direction also decreased with the increase in amount of suspension and showed a significant difference between 0% and 40% BW, and 0% and 30% BW in healthy subjects. However, no significant differences were shown in hemiplegic patients. Lateral direction had no significant differences irrespective of the amount of suspensions in both groups. *Implications on Rehabilitation:* We believe that this study is useful as basic data in BWSTT.

PO-0649

PROGRESSION OF MUSCLE WEAKNESS IN PERSON WITH POST-POLIO SYNDROME

Daisuke Imoto[1], Yoichiro Aoyagi[2]*, Eiichi Saitoh[2], Koshiro Sawada[2], Yukari Suzuki[3], Fumi Toda[2]

[1]Department of Rehabilitation Medicine, Fujita Health University Hospital, Japan, [2]Department of Rehabilitation Medicine, Fujita Health University School of Medicine, Japan, [3]Faculty of Rehabilitation, School of Health Science, Fujita Health University, Japan

Objective: This study is to investigate the relationship between symptoms and the onset of post-polio syndrome (PPS) from the result of our medical examination for polio survivors. *Methods:* We started medical examination for polio survivors in 2007. They are followed up every two years. The subjects in this study were 81 polio survivors who visited our medical examinations twice during 2007–2012. Mean age at first examination was 61±7 y.o. We measured the MMT and isometric strength by Hand-held dynamometer (HHD) of lower limb, gait speed, body weight, height, leg length, leg circumferences and serum CK. The definition of Halstead in 1985 was used for the diagnosis of PPS. From the results of first and second examinations, the relationship between the symptoms and the onset of PPS were investigated. *Results:* Twenty-one subjects were diagnosed as non-PPS. 80% of the non-PPS polio survivors at first examination were diagnosed as PPS in the second examination. In these cases, the rate of muscle pain and muscle weakness increased significantly in Halstead's definition. Interestingly, the progression of muscle weakness wasn't significant in weaker side of the lower limb in MMT and HHD. However, the muscle weakness in stronger side progressed significantly. Other results showed no significant changes. *Impact on Rehabilitation:* It is suggested that paying attention not only to weaker side of the lower limb, but to stronger side is very important to prevent the onset of PPS.

PO-0650

APPLICATION OF MULTI-CLASS FUZZY SUPPORT VECTOR MACHINES IN CONSONANT RECOGNITION

Zhuoming Chen[1], Jianhui Zhao[2], Weixin Ling[2]

[1]Language Disorder Center of the First Affiliated Hospital of Jinan University, [2]School of Science, South China University of Technology

Objective: Consonant recognition played an important clinical role in dysarthria assessment. However, traditional methods for constant recognition seemed not quite effective, as pronunciation of constant usually turned out to be short and unstable. The article aimed to introduce the application of multi-class fuzzy support vector machines in consonant recognition. *Method:* The present research extracted a new feature, DWTMFC-CT, from constants by using wavelet transformation to analyze constant signal in a multi-scale way. DWTMFC-CT could describe differences between similar constants more accurately, and support multi-class fuzzy support vector machine (FSVM) in consonant recognition. Specifically, two-stage algorithm was introduced to reduce the computational complexity caused by FSVM in multi-classification. *Results:* The research results suggested that the using of two-stage algorithm not only improved the training efficiency of FSVM, but also achieved better effects of constant classification. *Implications:* Traditional methods for constant recognition seemed not quite effective, while the application of multi-class fuzzy support vector machines in consonant recognition can make up for the deficiency. National 863 Science and Technology Program (No.2007AA02Z482), Guangzhou Science and Technology Program, Major Livelihood and Technological Special (No.2012Y2-00023)

PO-0651

GLOTTOGRAPH ACQUIRING METHODS AND VOCAL FOLD VIBRATION DYNAMIC DISPLAY

Zhuoming Chen

The First Affiliated Hospital Of Jinan University

Objective: This article aimed to provide an overview of glottograph acquiring methods and vocal fold vibration dynamic display. *Method:* Recent development of glottograph acquiring methods was introduced firstly, involving detailed methods and principles for each glottograph acquiring method. An analysis for the relationship between glottograph and vocal fold vibration was presented later, whereas glottograph technique could reflect vocal fold vibration directly, objectively and non-invasively. Besides, recent research findings and applications were introduced in the present article. *Results:* This article made Glottograph acquiring methods and vocal fold vibration dynamic display clear and distinct. *Implications:* The article gave a brief summary and some prospects for the field. National 863 Science and Technology Program (No.2007AA02Z482), Guangzhou Science and Technology Program, Major Livelihood and Technological Special (No.2012Y2-00023)

PO-0652

REPEATED THETA BURST MAGNETIC STIMULATION AS AN ADJUNCTIVE TREATMENT FOR VISUO-SPATIAL HEMINEGLECT IN STROKE PATIENTS

Wei Fu, Weiqun Song, Yanming Zhang, Yuanbin Yang, Su Huo, Maobin Wang

Department of Rehabilitation Medicine, Xuanwu Hospital, Capital Medical University, Beijing 100053, China

Objective: Visuo-spatial hemineglect is a frequent disability in stroke patients, characterized by abnormal biases in spatial attention, leading to severe impairments in the ability to perceive and/or explore stimuli on the contralesional side. Continuous theta burst transcranial magnetic stimulation (cTBS) is a new inhibitory brain stimulation protocol, which has the potential to induce behavioral effects outlasting stimulation. We aimed to explore whether cTBS over the left unaffected posterior parietal cortex (PPC) can induced a long-lasting improvement of visual neglect. *Methods:* Twelve patients with left-sided visual neglect attributable to right hemispheric stroke received 2 weeks of continuous theta burst transcranial magnetic stimulation (cTBS) of the left PPC. Twelve patients with left-sided visual neglect received sham cTBS. We used the cTBS protocol in which 200 bursts of high-frequency stimulation (3 pulses at 30 Hz) were applied at 5 Hz for a train of 600 pulses, including 4 trains every 15 min. The coil was placed over P5 on the left hemispheres. Twenty patients were received resting-state fMRI and DTI scanning before and after active or sham theta burst stimulation. *Results:* Two-week cTBS over left PPC significantly deceased visuo-spatial hemineglect 1-month follow-up after stimultion, and modulate the attentional network simultaneously. *Implications:* The new protocol of repeating cTBS over left PPC for two weeks may be promising for the long-lasting alleviation of neglect.

PO-0653

THE IMPORTANCE OF COMPLEX, MEDICAL REHABILITATION AND BALNEOTHERAPY IN PATIENTS WITH STROKE-INDUCED NEUROLOGICAL SEQUELAE AND OSTEOARTHRITIS

Daniel Popa[1,2], Dan Nemes[1,2]*, Elena Amaricai[1], Liliana Catan[1], Mihai Dragoi[1,2], George Puenea[1], Diana Andrei[1]

[1]"Victor Babes" University of Medicine and Pharmacy Timisoara, Romania, [2]City University and Emergency Hospital, Timisoara, Romania

Objectives: The patients with complex pathologies (osteoarthritis and neurologic pathology as result of cerebrovascular disease)

result in personal and familial issues due to the impairment of the functional status and the quality of life. To emphasize the importance of complex, medical rehabilitation and balneotherapy. in patients with stroke-induced neurological sequelae and osteoarthritis. *Material and method:* Over a 6 years period, 535 patients with residual hemiparesis and osteoarthritis underwent complex drug medical rehabilitation therapy in medical rehabilitation unit. Afterwards 215 patients (group 1) received complex treatment, including balneotherapy with sodium chloride and sulphurous mineral water and fango and 320 patients (group 2) only medical unit therapy, 14 daily sessions, every 6 months. Every 6 months they were assessed using VAS (Visual Analogue Scale for pain) and HES (scale for assessment of the patient with hemiparesis). *Results:* Significant decrease of VAS and improvement of global functional status was proven in all patients, the patients from batch 1 showing higher results than the patients from batch 2 ($p<0.005$). *Implication/Impact on Rehabilitation:* The complex medical rehabilitation therapy is important in these patients, the abidance by this complex therapy every 6 months in a specialized spa, lead to better outcomes in the decrease of pain and the improvement of functional and health status.

PO-0654

THE CLINICAL OBSERVATION OF THE NUTRITIONAL ENTERAL NUTRITIONAL SUSPENSION FOR PATIENTS WITH DYSPHAGIA AFTER STROKE

Chunqing Xie, Weihong Qiu, Guifang Wan, Huixiang Wu, Huizi Mei, Zulin Dou

Rehabilitation Department, The Third Affiliated Hospital of Sun Yat-sen University

Objective: To study the nutritional effects of (total protein fiber fructooligosaccharide,TPF-FOS) on dysphagia after stroke. *Methods:* 60 patients with dysphagia after stroke were randomly divided into 2 groups: a treatment group (30 cases) were received 14 days of tube feeding of enteral nutritional suspension and the self-homogenized meals; a control group (39 cases) were received 14 days of the self-homogenized meals. The related biochemical criterion and body nutrition index were monitored before and after treatment. *Results:* Statistically significant improvement of the level of albumin and prealbumin as well as the grip strength of the uninjured side were observed after treatment in the trial group. The differences of the level of albumin and prealbumin as well as the grip strength of the uninjured side before and after treatment were statistically significant. *Conclusions:* The enteral nutritional suspension (TPF-FOS) is helpful to improve the nutritional state and the musle strength of the stroke patients. It can accelerate the recovery of neural function.

PO-0655

INCIDENCE AND PREDICTORS OF EARLY ANKLE CONTRACTURE IN ADULTS WITH ACQUIRED BRAIN INJURY

Norhamizan Hamzah[1], Muhammad Aizuddin Bahari[2], Saini Jeffery Abdullah[3], Mazlina Mazlan[4,2]

[1]Hospital Pulau Pinang,Malaysia, [2]University Malaya Medical Centre, Malaysia, [3]KPJ Tawakkal Specialist Hospital, Malaysia, [4]University Malaya, Malaysia

Purpose: To determine the incidence and predictors of early ankle contracture in adults with acquired brain injury. *Methods:* This is a prospective cohort study of patients with moderate to severe acquired brain injury admitted to Neurosurgical Intensive Care Unit within a period of 12 months. We conducted a weekly review of ankle muscle tone and measurement of ankle maximum passive dorsiflexion motion to determine the presence of ankle contracture. The end point of this assessment is reached if i) ankle contracture has developed or ii) completed 3 months assessments post injury. Ankle contracture is defined as 2 weeks consecutive dorsiflexion angle measurement of less than 0 degree. Throughout the study period, rehabilitation therapy was provided to all patients as usual. *Results:* The study included 70 patients with 19 patients died and 5 patients lost to follow-up after hospital discharged. Out of the 46 patients, 13 patients (28%) developed ankle contracture by the end of the study period. The mean time for contracture development was 3 weeks. Presence of abnormal motor pattern was found to be a significant risk factor for the development of ankle joint contracture which include spasticity, spastic dystonia and clonus: spasticity (OR 51.67, CI 7.53-354.52, $p<0.001$), spastic dystonia (OR 27.43 CI 2.84-265.35, $p=0.004$) and clonus (OR 4.18 CI 1.33-13.19, $p=0.015$). *Implications/Impact on Rehabilitation:* Abnormal motor patterns are strongly associated with early incidence of ankle contracture amongst adult with new diagnosis of moderate to severe acquired brain injury. This is an important clinical finding towards early prevention of ankle contracture.

PO-0656

EATING AND SWALLOWING DYSFUNCTION IN PATIENTS WITH ACUTE THALAMIC HEMORRHAGE

Shinichiro Maeshima, Aiko Osawa

Saitama Medical University International Medical Center,Japan

Objectives: Thalamic hemorrhage causes a variety of neurological findings, most commonly contralateral hemianesthesia, hemiparesis, hemiataxia, aphasia, cognitive deficits, and neurobehavioral dysfunction. There are many patients who have eating and swallowing problems after stroke, especially in the acute phase. However, little is known about the relationships between thalamic hemorrhage and pattern of dysphagia. We evaluated the clinical features of swallowing function in acute thalamic hemorrhage. *Method:* A total of 112 newly diagnosed thalamic hemorrhage were included in this study; the age of subjects ranged from 43 to 91 years old. Patients referred for bedside swallowing assessment (BSA) using the Repetitive Saliva Swallowing Test and Modified Water Swallowing Test at initial evaluation. Videofluoroscopy was performed in 34 patients for determining the status of oral intake. The type of diet and outcomes were assessed on discharge. *Results:* Most patients with normal BSA were consuming a regular diet on discharge. However, what consumed the regular meal in 65 patients with abnormal BSA was very few. Fifty-nine patients were nutritionally managed with enteral feeding. Hematoma volume was related to the result of BSA and outcome of oral intake at discharge. *Implications:* Eating and swallowing dysfunction is not rare in patients with acute thalamic hemorrhage. We therefore recommend that all patients with thalamic hemorrhage should receive swallowing assessment and manage in acute stage.

PO-0657

MUSCLE ACTIVITY DURING WALKING WITH KNEE-ANKLE-FOOT ORTHOSIS IN PATIENTS AFTER STROKE

Koji Ohata[1]*, Saori Shibuta[2], Kaori Sakuma[1], Masanobu Ogaki[3], Kiminori Sato[3], Naohiro Murata[3], Mikio Sumita[3]

[1]Graduate School of Medicine, Kyoto University,Japan, [2]Kyoto University Hospital, Japan, [3]Aijinkai Rehabilitation Hospital, Japan

Objective: The success of gait rehabilitation after stroke depends on active walking exercises. However, the severe motor impairments in individuals with hemiplegia make such effective exercises impossible due to instability during stance phase of paretic limb. Knee-Ankle-Foot Orthosis (KAFO) was often used to compensate for severe weakness of low limb muscles. However, KAFO has generally been underestimated because it inhibits the normal walking pattern and also it interferes with gait training. The aim of this study was to clarify the influence for muscle activities during gait using KAFO

in individuals with hemiplegia. *Methods:* Eighteen non-ambulatory patients after stroke with severe hemiplegia were participated. They walked on a 10m walkway using KAFO with therapist help. Then, knee and ankle muscle strength tests were performed using Hand-held dynamometer. Electromyography (EMG) was measured during gait and maximum voluntary contraction. Furthermore, gait training using KAFO was performed for a month and the change of muscle strength and Functional Ambulation Category (FAC) were measured between before and after training. *Results:* All patients have severe weakness of paretic limb and lack of the obvious muscle activity during voluntary contraction was shown in eleven patients. Even if the knee extensor (RF) and plantarflexor (GAS, SOL) muscles were not activated during voluntary contraction, the EMG activities during stance phase were observed and showed significantly higher activities than those during swing phase. Muscle strength and FAC were significantly improved during KAFO training phase. *Implications/ Impact on Rehabilitation:* Gait training using KAFO can facilitate muscle activities of extensor muscles even in patients who cannot perform the voluntary contraction of lower limb.

PO-0658

INFLUENCE ON CORTICOBULBAR EXCITABILITY OF PATIENTS WITH DYSPHAGIA AFTER STROKE USING MODIFIED BALLOON DILATATION THERAPY

Xiaomei Wei, Zulin Dou, Fan Yu

Rehabiliation department of the 3rd affiliated hospital of Sun Yat-sen University

Objective: To investigate the influence of balloon dilatation therapy on corticobulbar excitability in patients with cricopharyngeal dysfunction (CPD) after stroke. *Method:* Twenty patients with dysphagia after unilateral brainstem stroke were recruited (18 male,2 female,mean age 36.8 years). The cricopharyngeal dysfunction was identified by videofluoroscopy swallowing study. Twelve of them received active balloon dilatation therapy for 4 weeks (5 days per week) and conventional therapies.Others were only received conventional swallowing training programs without dilatation. Motor evoked potentials (MEPs) of affected hyomandibular muscle group were examined using transcranial magnetic stimulation (TMS) for both hemispheres before and after therapies. *Results:* An area approximately 2-4 cm anterior and 4-8cm lateral to the cranial vertex was systematically considered as the optimal scalp site for consistently eliciting the largest MEP amplitude. MEPs were absent in 20% patients (4/20). The mean latency of MEPs induced by ipsilateral cortical stimulation (7.83±0.14 ms) has no significantly difference compared to MEPs induced by contralateral stimulation (7.60±0.20 ms) in other patients. The latencies of MEPs after treatment were significantly shorter than that before treatment in dilatation group; nevertheless, their amplitudes have no statistical difference. Implication It indicated that the modified balloon dilatation therapy on CPD may result in increasing the corticobulbar excitability to improve the swallowing function,which provided strong evidence for this new therapy.

PO-0659

THE PERFORMANCES ON TIMED UP & GO TEST AND BERG BALANCE SCALE IN PEOPLE WITH CHRONIC STROKE

Chung-Liang Lai[1,2]*, Chun-Hou Wang[3], Wan-Chun Liao[1,4], Shiuan-Yu Tseng[1,2], Kai-Ling Chang[1,4]

[1]Department of Physical Medicine and Rehabilitation, Tai-Chung Hospital Health of Department,Chinese Taipei, [2]Institute of Medicine, Chun Shan Medical University, Chinese Taipei, [3]School of Physical Therapy, Chung Shan Medical University,Chinese Taipei, [4]School of Medical Laboratory and Biotechnology, Chung Shan Medical University,Chinese Taipei

Objective: The Timed Up & Go (TUG) test is a simple and quick functional mobility and balance screening for elderly. The Berg Balance Scale (BBS) with high reliability and validity has been widely used to evaluate balance in patients with stroke.This study is to examine the performances on TUG and BSS in community-dwelling people with chronic stroke. *Method:* A total of 20 community-dwelling chronic (onset over 1 year) stroke patients who could stand up and walk with or without assistive devices were recruited.The TUG and BBS were administered by a well-trained physical therapist. The correlation analysis was conducted by Spearman correlation coefficients. *Results:* There were 11 patients with right hemiplegia and 9 patients with left hemiplegia. The average onset period was 79.2 months. The time of TUG correlated well with the total scores of the BBS ($r=-0.687$, $p< 0.01$) in subjects. *Implication:* The TUG is very convenient tool for fall risks screening in community-dwelling. Falling and results with femoral fracture is a severe injury in chronic patients with stroke. Our study showed well correlation with TUG and BBS. In the future, more samples will be collected to certify our hypothesis that TUG maybe a good screening and follow up tool in daily practice in community-dwelling chronic patients with stroke.

PO-0660

SPEECH-LANGUAGE PATHOLOGISTS PERCEPTIONS OF THE ROLE OF MULTIMODAL COMMUNICATION ASSESSMENT FOR PEOPLE WITH APHASIA

Mali Gil[1]*, Tal Lebel[2]

[1]Loewenstein Hospital - Rehabilitation Center, Israel, [2]University of Haifa, Israel

Background: Conventional intervention for people with aphasia focuses on attempts to rehabilitate their linguistic abilities. However, many individuals with severe aphasia cannot use verbal or written communication channels (Lasker, Garrett, & Fox, 2007). The Augmentative and Alternative Communication (AAC) approach, which includes a variety of tools and strategies, is designed to circumvent the linguistic disability of people with aphasia. Clinical and research evidence from recent years describes effective use of AAC aids by some individuals with aphasia. Studies have shown improvement in the quality of daily interactions with other people while using AAC aids in various settings (Johnson et al., 2008). Matching AAC aids to people with aphasia is a challenging task, especially due to the need to achieve a significant change in the approach of staff, family members, and the patients themselves (Fried-Oken, Beukelman & Hux, 2012). *Objective:* This study aimed to examine the perceptions of clinicians working in a rehabilitation hospital regarding the role of multimodal communication assessment in the process of planning intervention for people with aphasia. *Method:* Ten speech-language pathologists conducted the Multimodal Communication Screening Test for 15 people with aphasia of varying degrees of severity and classified them according to AAC-Aphasia Categories of Communicators. Clinicians attitudes about the contribution of the assessment tools to the decision-making and planning processes were examined using in-depth interviews that were recorded, transcribed, and analyzed. *Results and impact on rehabilitation:* Extensive information gathered through the interviews appeared to stimulate a rethinking process of the intervention plans for people with aphasia.

PO-0661

BRAIN ACTIVITY CHANGES IN SUBACUTE STROKE SURVIVORS AFTER VIRTUAL REALITY–ENHANCED BODY WEIGHT–SUPPORTED TREADMILL TRAINING

Xiang Xiao, Dongfeng Huang

Department of Rehabilitation Medicine, First Affiliated Hospital of Sun Yat-Sen University, Guangzhou 510080, Guangdong Province, China

Objective: The study examined the effects of virtual reality–enhanced partial body weight–supported treadmill training (VR+BWSTT) on neural networks and the relationship between motor improvement and brain excitability change in patients with subacute stroke. *Methods:* Seven patients after subcortical or cortical ischemic stroke underwent VR+BWSTT for 3 weeks. Functional MRI and 10m walk test were conducted before and after VR+BWSTT in patients. Ten normal persons were also recruited to conduct functional MRI. Pearson correlation coefficients and probabilities were computed to test for a relationship between change in walking velocity and voxel count in primary sensorimotor cortex after VR+BWSTT. *Results:* The results of gait velocity and Fugl-Meyer assessment of lower limb changed significantly after treatment ($p<0.05$). The hemiparetic subjects activated fewer voxels before and after training with voluntary dorsiflexion than control subjects in region of interests. For active movement of the paretic ankle versus rest, brain activation in ipsilesional primary sensorimotor cortex and supplementary motor area increased, contralesional primary sensorimotor cortex and ipsilesional secondary somatosensory cortices decreased after VR+BWSTT ($p<0.05$). Gait velocity had correlation with voxel counts in ipsilesional ($r=-0.807$, $p=0.028$) and contralesional ($r=-0.852$, $p=0.015$) primary sensorimotor cortex after VR+BWSTT. *Implications:* Application of VR+BWSTT is effective in establishing efficient gait function in people after subacute stroke. VR+BWSTT could induce changes in cortical networks excitability. The change in gait function induced by VR+BWSTT correlated with cortical activities.

PO-0662

EFFECTS OF ANKLE FOOT ORTHOSIS HEMIPLEGIA BIOMECHANICAL CHARACTERISTICS OF PATIENTS WITH PLANTAR

Liangkai Zhai, Yuzhong Peng, Yafeng Li
The fifth Affiliated Hospital of Zhengzhou University

0bjective: To observed the effects of using the ankle-foot orthoses biomechanical characteristics of stroke patient with hemiplegia plantar. *Methods:* 56 patients with hemiplegic stroke patients were randomly divided into observation group and the control group, 28 cases in each group. Both two groups received the same conventional rehabilitation. The observation group received ankle-foot orthoses based on standing and walking training.everyday with a continuous wear brace for a period of not less then 4 h, two groups of patients is foot drop biomechanical characteristics were evaluated before treatment and after 4 weeks of treatment. *Results:* After 4 weeks treatment of the observation group patients the foot drop biomechanical characteristics have more significantly improvement then prior treatment ($p<0.01$)and the control group have little improvement then prior treatment ($p<0.05$).the observation group biomechanical characteristic improve superior to control group ($p<0.05$). *Conclusion:* Ankle-foot orthoses to improve hemiplegic stroke patients with foot drop have good role.the foot biomechanical research has theoretical and practical significance for guiding rehabilitation program development and evaluation of the efficacy.

PO-0663

EFFECTS OF REHABILITATION ON QUALITY OF LIFE IN PATIENTS WITH SPINAL CORD INJURY OF DIFFERENT SEGMENT

Dong Wu, Wenxiu Zhu
Department of Rehabilitation Medicine, Linyi people's Hospital

Objective: To analyze the quality of life (QoL) in patients with spinal cord injury (SCI) and the effects of rehabilitation treatment on it. *Methods:* 106 patients with SCI were randomly divided into group A (C5-8, except central cord syndrome, $n=30$), group B (T1-6, $n=16$), group C (T7-12, $n=30$) and group D (L1-3, $n=30$). Specialized rehabilitation was given to each group. Modified barthel index (MBI) was used to assess ADL, the 36-Item Medical Outcomes Short-Form Health Survey (SF-36) for QoL and Self-Rating Anxiety Scale (SAS) for depression before and 3 months after the treatment. *Results:* Before rehabilitation, the sores of MBI and SF-36 inthe four groups were much lower than that of healthy people, and the scores of SAS were higher. After 3 months, the scores of MBI and SF-36 of the four groups were improved and negatively correlated with the level of injury; and the SAS scores which correlated positively with the level of injury were to lower; and significantly differences can be find compared with that before the treatment ($p<0.05$). *Conclusions:* The QoL is significantly impaired in patients with SCI, rehabilitation treatment is effective in improving it as well as ADL and depression, and the lower the injury, the more effective the rehabilitation.

PO-0664

EFFECTS OF POSTURAL CONTROL TRAINING ON UPPER LIMB SPASTICITY AND UPPER EXTREMITY FUNCTION IN PATIENTS WITH STROKE

Yuzhong Peng, Yizhao Wang, Botao Wu, Liangkai Zhai
The fifth Affliated of Zheng zhou University

Objective: To observe the influence of postural control training on upper limb spasticity and upper extremity function in patients with stroke. *Methods:* Sixty patients with stoke were randomly divided into the therapy group ($n=30$) and control group ($n=30$). Both two groups received movement therapy, the therapy group received exercise therapy based on Bobath postural control concept. Upper limb spasticity and upper extremity function of all patients were evaluated before and after 3 months of treatment. *Results:* After rehabilitation treatment upper limb spasticity and upper extremity function were significantly improved in both two groups ($p<0.05$).The therapy group were better than that of the control group ($p<0.05$). *Conclusion:* The postural control training can significantly improve upper limb spasticity and upper extremity function in stroke patients.

PO-0665

EFFECTS OF FIGURE OF "8" WORD BANDAGE IN ANKLE AND FOOT JOINT ON GAIT OF HEMIPLEGIC STROKE PATIENTS

Huaqiao Fan, Juan Juan Li, Dong Li, Ruili Zhang
The Fifth Affiliated Hospital of Zheng Zhou University

Objective: To research the influence of the "8"word bandage to the gait of Hemiplegia patients. *Methods:* 56 cases of stroke hemiplegia patients were randomly divided into the observation group and the control group in 28 cases with 28 cases. Control group were treated by movement and learning, Bobath technology primarily rehabilitation training. The observation group daily used with control group the same training method, and in walk training used elastic bandage 20 min. Two groups of patients in the treatment of all,before and after the adoption of improved Barthel index (modified Barthel index, MBI), Holden walking function classification,10 meters maxium walking velocity evaluation respectively the life ability,walking function, maximum walking speed of the patients.At the same time, footprints method and the camera analysis were taken to the gait analysis. *Result:* The observation group patients used "8"word bandage, rest ankle dorsiflexion Angle obviously improved, by the before average 8.91 +/– 6.11 degrees to 5.23 +/– 4.11 degrees,the average foot valgus Angle by 15.22 +/– 5.12 degrees to 2.52 +/– 2.34 degrees.Walk cycle swing phase ankle dorsiflexion Angle is obviously improved and the touchdown initial ankle dorsiflexion foot to follow.Step by step length,step speed obviously improved,including long step by 0.47 +– 0.18 m increased to 0.59 +– 0.12 m,pace from 0.61 +/– 0.13 m/s increased to 0.78 +/– 0.08 m/s.After treatment,the Barthel index,Holden walking function classification,10meters

walking speed of the largest in the group of the patients of the two groups were remarkably improved,compared to the before treatment.Their difference was statistically significant (p<<0.05). *Conclusion:* "8" word bandage can significantly improve ankle foot joint prolapse and introversive degree of hemiplegia patients so as to improve the gait and the walking ability.

PO-0666

DISTINCTION OF THE STROKE PATIENTS THAT CAN SHOW VOLUNTARY MAXIMUM MUSCLE STRENGTH DURING A MUSCLE STRENGTH EVALUATION

Ken Tomida[1], Genichi Tanino[1,2], Akira Suzuki[1], Shinya Sasaki[1], Keiko Okuno[1], Sayaka Nonoyama[1], Yuka Tuchimoto[1], Sayaka Okamoto[1], Abbas Orand[2], Yutaka Tomita[2], Shigeru Sonoda[1,2]

[1]Fujita Health University Nanakuri Sanatorium,Japan, [2]Fujita Memorial Nanakuri Institute Fujita Health University, Japan

For the important judgment of the effect of the treatment, proper examination of the muscle strength of the unaffected side of the stroke patients is required. However, in case of stroke patients with severe brain function paralysis and the patients with unconsciousness, there are cases that the patients can not voluntarily demonstrate their maximum muscle strength (MMS). Excluding such cases, we investigated to find those patients who could demonstrate MMS. We applied muscle torque measurement that has a high credibility for analysis together with smallest real difference percentage (SRD %) and muscle torque analysis after one week of muscle strengthening training (MTAMST) for the patients division. It is shown in preceding studies that the MTAMST and SRD % range falls between -15% and 30%. Specifying this range as an acceptable one, those stroke patients with MTAMST values within the range were recruited for further analysis and those patients outside the range were excluded. Recruiting 55 stroke patients, the muscle strength of the unaffected side of the knee extension at the time of admission and one week after were evaluated by using the regression analysis. From the result, FIM Social cognition was selected and the receiver operating characteristic (ROC) curve was found. The area under the curve was 0.808 and Youden index was 11. The stroke patients with FIM Social cognition greater than 11 could voluntarily demonstrate MMS during knee extension.

PO-0667

EFFECTS OF TRANSCRANIAL DIRECT CURRENT STIMULATION OVER POSTERIOR PERISYLVIAN REGION ON ACTION PICTURE NAMING IN APHASIA

Jie Wang, Dongyu Wu, Weiqun Song, Ying Yuan

Department of Rehabilitation Medicine, Xuanwu Hospital of Capital Medical University, Beijing, China

*Objective:*s The previous study suggested that transcranial direct current stimulation (tDCS) over posterior perisylvian region (PPR) could improve object picture naming in aphasics patients. The aim of present study was to investigate the effects of anodal tDCS over left PPR on action picture naming in aphasic patients after stroke. *Methods:* An A-B design was used in this study. Conventional language treatment coupled with sham tDCS was implemented for 2 weeks in phase A, and the language treatment coupled with tDCS for 2 weeks in phase B. 8 aphasic patients (>3 months post stroke) were enrolled in this study. An action picture naming and a verb-object structure tests were administered before and after each phase. *Results:* There was no significant change in treated and untreated items before and after phase A. The correctly named treated (mean average score from 5.750 to 14.875) and untreated items (from 5.625 to 9.625) of action picture naming were improved significantly after phase B compared with that before phase B (p<0.05). The correctly named untreated items (from 4.000 to 6.875) of verb-object structure was not changed, but that of treated items (from 4.000 to 10.875) significantly improved after phase B (p<0.05). *Conclusion:* Anodal tDCS over the left PPR coupled with language treatment can improve action picture naming and treated items have a generalizing effect on untreated items in aphasic patients. The anodal tDCS can upregulate the excitability of the impaired cortex and facilitate the language fuction.

PO-0668

APPLICATION IN VIBRATORY SPUTUM EXAMINATION IN REASONABLE TIME COMBINED WITH TIMELY SPUTUM EXCRETION IN PATIENTS WITH TRACHEOSTOMY

Jun Guo, Hong Ruan

The fifth affiliated hospital of Zhengzhou University

Objective: To investigate the effect of vibratory sputum examination in reasonable time combined with timely sputum excretion in patients with tracheostomy. *Methods:* Sixty cases of patients with tracheostomy and lung infection fed by nasogastric tube were randomly divided into the treatment group and control group. The conventional treatment and nursing care was carried out in the control group, such as oxygen inhalation, postural drainage, mechanical sputum eimilations. In addition, the treatment group was treated with sputum elimination apparatus in reasonable time and timely sputum suction, induced sputum to assist expectoration of retained secretions after stimulation. After one week treatment, platoon sputum volume, arterial blood gas analysis, lung auscultation were observed and compared. *Results:* The daily sputum volume, clinical symptoms, lung auscultation and arterial blood gas analysis changes of the treatment group is obviously superior to the control group. Incidence of gastro-esophageal reflux of the treatment group was decreased as compared with the control group. *Conclusion:* Comprehensive nursing that sputum elimination apparatus in reasonable time and timely sputum suction can effectively reduce gastro-esophageal reflux, significant improvement physical sign in the lung.

PO-0669

ANALYZE ON CHARACTERS AND OUTCOME OF TRAUMATIC BRAIN INJURY IN CHILDREN ACCEPTED REHABILITATION

Hua Yang, Xiang Chen

The 2nd Affiliated Hospital of Wenzhou Medical College

Objective: To investigate the clinical information, characters about rehabilitation, outcome of rehabilitation and its affecting factors of those children who sustained traumatic brain injury (TBI) and accept rehabilitative therapy. *Methods:* We have a Retrospective analysis of the 64 Children who were the first time admitted to the rehabilitation set. *Results:* In the sample of pediatric TBI, the main injury severity was severe,accounting for 66%.42.19% patients had consciousness disorder, but 80% of them recovered consciousness after rehabilitation.The type of limb motor dysfunction was dominated by hemiplegia (51.67%).65.63% patient initiated rehabilitation within one month after injury and average length of stay provided in rehabilitation was (33.09±25.96)d. The main treatment were hyperbaric oxygen therapy, exercise therapy and neurotrophic drugs (the ratio is 95.31%, 89.06%, and 82.81% respectively). After the first course of inpatient rehabilitation,the ability of ADL improved significantly (p<0.01)and the total effective rate was 90.63%. Injury age >3 years (p<0.05) and rehabilitation intervention time ≤35 d (p<0.05) got a good outcome in the short term, in addition,there is no statistical difference between the consciousness disorder group and the no consciousness disorder group (p>0.05), the GCS ≤8 group and the GCS >8 group (p>0.05). *Conclusion:* It is indictaed that most patients admitted were in severe

situation during acute phase and had complicated conditions. The rehabilitation intervention time was early for them,but the length of stay provided is not long,so general hospital should focus on early (acute and subacute phase)rehabilitation. Rehabilitative therapy has a positive meaning for TBI. Older age at injury and earlier rehabilitation intervention time contribute to better outcome in the short term. For pediatric TBI, it is necessary to build and improve more standardized and systemic rehabilitation and assessment system.

PO-0670

NEUROGENIC BLADDER TREATMENT BY TOLTERODINE TARTRATE

Ting Zou[1], Guangxu Xu[2], Wentong Zhang[2]

[1]Department of physiatry, Jiangsu Government Hospital, Nanjing 210024, China, [2]Department of Rehabilitation Medicine, the First Affiliated Hospital of Nanjing Medical University, Nanjing 210029, China

Objective: To evaluate tolterodine in the treatment of patients with neurogenic bladder. *Methods:* Eighty patients suffering from neurogenic bladder were treated with tolterodine for 6 weeks. The effects were evaluated mainly with urodynamic data, including maximum flow rate (Qmax), average flow rate (Qave), voiding volume (VV), female urethral syndrome score (FUSS) and quality of life (QOL). *Results:* There was statistically significant difference of urodynamics data, FUSS and QOL between the patients aged over 60 and under the age of 60 patients before treatment. There was not statistically significant difference patients aged over 60 and under the age of 60 patients before treatment after treatment. Urodynamic data (Qmax,Qave,V V) increased,while FUSS decreased significantly after 6 weeks treatment in all patients'. The total effective rate was 88.00 %. *Conclusion:* Tolterodine could be an effective treatment in patients with neurogenic bladder.

PO-0671

THE INFLUENCE OF BALANCE FUNCTION IN RECOVERY STROKE PATIENTS WITH SLING EXERCISE THERAPY

Yuan Wang

ShengJing Hospital of China Medical University

Objective: To observe the influence of balance function in stroke patients during recovery stage by training core stability with sling exercise therapy (SET). *Methods:* In our department,choose twenty stroke patients during recovery stage who had received traditional rehabilitation therapy for two to three months. Their functional progress is slow. Besides the original therapy,all these twenty patients receive SET emphasizing on core stability for one month. Evaluate the balance grade before and after SET. *Results:* The balance function progressed obviously after one month's SET. The difference has significant meaning. *Conclusion:* The balance function of recovery stroke patients could be significantly improved by using SET training core stability.

PO-0672

EFFECTIVELY MANAGING INTRACTABLE CENTRAL HYPERTHERMIA IN A STROKE PATIENT BY BROMOCRIPTINE: A CASE REPORT

Kuo Wei Yu[1], Yu Hui Huang[2,3], Chien Lin Lin[1,4], Chang Zern Hong[5], Li Wei Chou[1,4]*

[1]School of Medicine, Chung Shan Medical University, Taichung 40201, Taiwan,Chinese Taipei, [2]School of Medicine, Chung Shan Medical University, Taichung 40201, Taiwan,Chinese Taipei, [3]Department of Physical Medicine and Rehabilitation, Chung Shan Medical University Hospital, Taichung 40201, Taiwan,Chinese Taipei, [4]School of Chinese Medicine, College of Chinese Medicine, China Medical University, Taichung 40402, Taiwan, Chinese Taipei, [5]Department of Physical Therapy, Hungkuang University, Taichung 43302, Taiwan, Chinese Taipei

Objective: The characteristics of central hyperthermia included rapid onset, higher temperature, marked temperature fluctuation. The central hyperthermia had poor response to the antipyretics and the antibiotics. Although the central hyperthermia post stroke was not uncommon, the long-term central hyperthermia was rare. We report a case of prolonged central fever after intracranial hemorrhage. Before an accurate diagnosis and management of central fever was made, the patient received long-term antibiotic use and which led to pseudomembranous colitis. *Method:* The Bromocriptine was a dopamine agonist and acted at the level of the hypothalamus and the corpus striatum. The dysfunction of hypothalamus could lead to wide fluctuations in core body temperature. Thus, the bromocriptine could be used to control the central hyperthermia. The administration of bromocriptine for this patient was prescribed with 2.5 mg/day for 3 days and then increased to 5 mg/day for one month. *Results:* The fever didn't exceed 39° C after the administration of bromocriptine. One week later, the body temperature baseline was 37° C and only sometimes low grade fever with minor temperature fluctuation. After discharge to the nursing home, we followed up the patient and there was no fever one month later. *Implications/Impact on Rehabilitation:* Bromocriptine as the first choice to treat the prolonged central hyperthermia due to the effect of modification of autonomic dysfunction without side effect of baclofen including general weakness and lethargy. After the fever subsided, the patient could receive aggressive rehabilitation program.

PO-0673

THE VARIATION AND PROGRESS OF THE ASSISTANCE TO THE WALKING OF THE STROKE

Genichi Tanino[1,2], Shigeru Sonoda[1,2], Makoto Watanabe[1], Yuko Okuyama[1], Sho Sasaki[1], Hoshi Murai[1], Ken Tomida[1], Akira Suzuki[1], Kenji Kawakami[1], Hiroyuki Miyasaka[1,2], Abbas Orand[2], Yutaka Tomita[2]

[1]Fujita Health University nanakuri sanatorium,Japan, [2]Fujita Memorial Nanakuri Institute Fujita Health University,Japan

The recovery of walking function after stroke onset is one of the important goals of the rehabilitation after stroke. Previous research reports studying the progress of walking function of stroke patient's lack in providing a detailed report of the degree of assistance with the walking of the patients. In this study, we investigate this point. The target of the study was those stroke patients of the rehabilitation hospital whom at the time of admission had a Functional Independence Measure (FIM) of the walking function between 1 and 4. The patients were classified based on the point of the FIM of the walking function and the degree of the paralysis of the lower extremities. The patients' progresses were studied from the time of admission to the discharge from the hospital.By applying the motor function of the lower extremity of the paralyzed side item of Stroke Impairment Assessment Set, the patients' paralysis were classified into four groups of complete, severe, medium, and mild. Compared to other paralysis groups, the groups of the patients with complete paralysis with FIM points of 1 and 2 showed a significantly lower tendency at the time of discharge from hospital. Moreover, those patients with FIM points of 1 and 2 at the time of admission in the mild paralysis group tended to be old. Those patients in the complete paralysis group with FIM points of 3 and 4 could achieve the same FIM scores as those patients with similar FIM scores in other groups.

PO-0674

THE EFFECT OF INTENSIVE TRUNK MUSCLE AND LOWER LIMBS TRAINING WITH KINEMAFEEDBACK ON BALANCE AND MOTOR FUNCTIONING IN HEMIPLEGIC PATIENTS

Ning Zhu, Qi Ma, Xiaojun Li

Department of Rehabilitation Medicine, The affilicated Hospital of Ningxia Medicine College

Objective: To study the effect of intensive trunk muscle and lower limbs training with kinemafeedback training on balance and motor function in patients with hemiplegia after stroke. *Methods:* 80 patients were divided into feedback treatment group (40 cases)and control group (40 cases). the patients in the control group received regularly rehabilitation and intensive trunk muscle and lower limb training, and the patients in the feedback group received regularly rehabilitation and the motional feedback training. They were assessed with Trunk Control Test (TCT), Berg Balance Scale (BBS),Functional Ambulation Category (FAC). Fugl–Meyer Assessment (FMA) before and after the treatment. *Results:* The scores of TCT, BBS, FAC, and FMA improved significantly in both groups after treatment (p 0.01), and improved more in the feedback treatment group than in control group (p<0.05). *Implications:* The intensive trunk muscle and lower limb training can obviously improve balance and motor function of stroke patients, But the feedback training can Improve patients' attention and interest in training in addition, the training effect is more obvious. Study also found that as the treatment time extension, feedback group showed a better effect. And repeatedly strengthening training with clear goals, increase the feel signal from the outside stimulation, the body gradually learn how to accept and use of various sensory feedback, thus speeding up the recovery of neural function

PO-0675

EFFECTS OF SECONDARY SPASMODIC TORTICOLLIS ON BALANCE IN POST-STROKE PATIENTS WITH HEMIPLEGIA

Gang-Hua Guo, Guo-Sheng Wang, Zhe Li
The fifth affiliated hospital of Zhengzhou University

Objective: To observe the influence of secondary spasmodic torticollis on balance in post-stroke patients with hemiplegia and the effect of different types of treatment received. *Methods:* Fifty-six secondary spasmodic torticollis patients after stroke were randomly divided into three groups based on types of treatment received. The medications therapy group underwent medications and common support treatment plus rehabilitation training (n=19), the botulinum toxin group received BTX-A and common support treatment plus rehabilitation training (n=18), and the routine rehabilitation therapy group was treated with routine rehabilitation therapy (n=19). In addition, 19 cases without spasmodic torticollis served as control group were treated with routine rehabilitative treatment. Before and after 2 months therapy, balance were assessed using the Berg Balance Scale, and spasmodic torticollis were evaluated using the Tsui scale. *Results:* It was found that before treatment, the balance of control group was better than that of other three groups (p<0.05). After 2 months therapy, balance were significantly improved in all the four groups (p<0.05). Balance of the Botulinum toxin group was better than that of medications therapy group and routine rehabilitation group. After rehabilitation treatment, the Tsui scale in the medications therapy group and the Botulinum toxin group were significantly lower than that before treatment. The Tsui scale in the Botulinum toxin group showed a significant decrease compared to the medications therapy group and routine rehabilitation group. These was no significant difference of the Tsui scale before and after treatment in the control group. *Conclusion:* Spasmodic torticollis influences the recovery of balance in post-stroke patients with hemiplegia. The therapy on spasmodic torticollis can improve balance of the hemiplegia patients with spasmodic torticollis, in which BTX-A, common support treatment combined rehabilitation training shows significant curative effect.

PO-0676

THE EFFECT OF DIFFERENT FREQUENCY REHABILITATION TREATMENT ON THE COGNITIVE AND MOTOR FUNCTION AT EARLY PERIOD AFTER TRAUMATIC BRAIN INJURY

Lihong Wu, Xianming Dong, Aiping Li, Jianqiang Lin, Kun Lou
Hangzhou 128 hospital, Hangzhou, China

Objective: To observe the effect of the different frequency rehabilitation treatment on the cognitive and motor function at early period after traumatic brain injury. *Method*: 60 inpatients with traumatic brain injury were randomly divided into two groups according to the different frequency. The rehabilitation group 1 (1/d) were 38 cases and the rehabilitation group 2 (2/d) were 40 cases. Both groups were treated with internal routine treatment, rehabilitation training and acupuncture. They were treated for 2 months. The Fugl-Meyer (FMA), Functional independence measure (FIM), Mini-mental state examination (MMSE) were used to evaluate the TBI patients before and after one and two month treatment. *Result:* The FMA, FIM and MMSE of both groups were improved after treatment (p<0.01), and improved degree of rehabilitation group 2 was better than that of rehabilitation group 1 (p<0.05). *Conclusion:* Rehabilitation treatment has benefit for cognitive and motor function with TBI patients. The effectiveness of necessary frequency rehabilitation treatment in early periods was obviously improved function.

PO-0677

EFFECTS OF THE DIFFERENT PERIORDS COMPREHENSIVE REHABILITATION ON IMPROVING MOTOR FUNCTION AND ADL IN PATIENTS WITH TRAUMATIC BRAIN INJURY AND CLINICAL EVIDENCE FOR THE BEST TIME WINDOW OF REHABILITATION

Aiping Li, Xiaoming Dong, Lihong Wu, Man Xie
Hangzhou 128 hospital, Hangzhou, China

Objectives: To discuss the effect of comprehensive rehabilitation training in different periods on improving motor function and activities of daily living (ADL) in patients with traumatic brain injury (TBI). *Method:* To select 80 medium and severe TBI patients (GCS≤12) with 40 males and 40 females (average age 42.35±10.23). To divide them randomly into two teams with 40 in rehabilitation team 1 (rehabilitation started within 15 days after injury) and 30 in rehabilitation team 2 (rehabilitation started 15 days after injury) and then put them under the treatment of Low-frequency functional electrical stimulation, acupuncture therapy, exercise therapy, Occupational Therapy, logotherapy, psychotherapy, cognitive therapy and other comprehensive rehabilitation. Evaluate the Activities of Daily Living, Functional Independence Measure and Fugl—Meyery between pre-treatment and post treatment. *Result:* Comparing the status of TBI patients in two teams after one month/2 months/3 months with the that of the same patients before treatment, all key indicators improved significantly (p<0.01) with the speed of improvement after 1 month treatment the quickest. Comparing two teams, team 1 improved more significantly than team 2 (p<0.05). *Conclusion:* Comprehensive rehabilitation is beneficial for the improvement of motor function and ADL of TBI patients and the effectiveness of treatment is better within 15 days after TBI than within 15 days after TBI.

PO-0678

DYNAMIC CHANGE REGULATION AND SIGNIFICANCE OF HYPERPHOSPHORYLATED NEUROFILAMENT NF-H AS A BIOMARKER IN DIFFERENT INJURY DEGREE RATS OF SPINAL CORD INJURY

Jian Gen He[1,2], Jian Jun Li[1], De Gang Yang[1,2], Feng Gao[1]
[1]China Rehabilitation Research Centre, [2]Capital Medical University

Objectives: Although Hyperphosphorylated neurofilament NF-H has been used to assess injury degree of brain injury,but its application

in spinal cord injury is bank.This research can fill this research void *Methods:* There are four groups:control group,slight injury group,moderate injury group,severe injury group.The serum sample are collected at 15 min,12 h, 24 h, 2 days, 3 days, 5 days, 2 weeks after spinal cord injury.And BBB behavious test is carried out at 2 days, 7 days, 14 days after spinal cord injury. 14 days after spinal cord injury,spinal sections are obtained. *Results:* Analysis of variance (ANOVA) showed a significant effect of lesion severity, and post hoc analysis revealed that animals given a moderate and severe contusion showed higher levels of blood pNF-H than controls and slights. In addition, following SCI, serum pNF-H showed an initial peak of expression at 24 h and a second, usually larger, peak at 2 days. Along with the decrease of pNF-H. *Conclusion:* These findings suggest that serum levels of pNF-H immunoreactivity may be used to conveniently monitor neuronal damage and degeneration in experimental and presumably clinical situations.

PO-0679

THE EFFECT OF SELECTING EXACT ENTRY POINT THERAPY ON WALKING ABILITY OF POST-STOKE PATIENTS

Zhe Li, Xiao-Pin Sun, Gang-Hua Guo, Chen-Xia Guan, Lin Yue, Guo-Sheng Wang
The fifth affiliated hospital of Zhengzhou University

Objective: To explore the effect of selecting exact entry point therapy on walking ability of post-stoke patients. *Methods:* Sixty-eight outpatients or inpatients of post stroke were randomly assigned to the observation group (34 cases) and the control group (34 cases). Both groups received modern rehabilitation training based on the bobath concept with post-stroke hemiplegia. In addition, the observation group received intensive training of suitable entry point everyday. The patients in both groups received training 45 min per time, 2 times a day for 8 weeks. All patients were assessed with simplified Fugl-Meyer assessment (FMA), assessment on ambulation capacity (walking time for 10 m) and the ability of ADL, and footprint analysis was used to measure and record any changes in time and walking distance and to analyze improvements in gait. *Results:* Compared to those before treatment or of the control group, movement values, walking function and gait-time-distance parameters such as step length, stride width and gait speed were significantly improved in the observation group after treatment, ($p<0.05$). there were also significant differences in ADL scores ($p<0.01$) of the observation group. Compared to those before treatment, there were no significant difference in movement values, walking function and gait-time-distance parameters such as step length, stride width and gait speed in the control group (p>0.05). However, ADL scores of the control group were improved significantly after treatment ($p<0.05$). *Conclusions:* During the rehabilitation training, selecting the right entry point can quickly improve the walking ability of post-stoke patients.

PO-0680

THE EFFECT OF BALLOON DILATION IN DIFFERENT WAYS ON CRICOPHARYNGEAL ACHALASIA

Zhe Li, Gang-Hua Guo, Guo-Sheng Wang, Chen-Xia Guan, Lin Yue
The fifth affiliated hospital of Zhengzhou University

Objective: To observe the effect of balloon dilation in different ways on cricopharyngeal achalasia and its mechanisms. *Methods:* 60 cricopharyngeal achalasia patients after brain stem infarction, certifying by videofluoroscopic swallowing study (VFSS), were randomly divided into three groups: 14 F latex balloon catheter group, 14 F modified double-lumen silicone balloon catheter group and 22 F latex balloon catheter group with 20 cases respetively. All patients received multiple times classification balloon dilation per nasal or per os (per os for 22 F latex balloon catheter group). *Results:* After an average of 50 days of balloon dilation, the level of dysphagia and VFSS evaluation of all patients improved significantly. However, 14 F latex balloon catheter group and 22 F latex balloon catheter group improved more than 14 F modified double-lumen silicone balloon catheter group. Compared to that of 14 F modified double-lumen silicone balloon catheter group, the balloon circumference, balloon diameter and intracapsular pressure of 14 F latex balloon catheter group and 14 F latex balloon catheter group had been increased significantly. While there wasn,t a significant difference between 14 F latex balloon catheter group and 22 F latex balloon catheter group. *Conclusions:* The balloon dilation can significantly improve swallowing function of deglutition disorders patients with cricopharyngeal achalasia after brain stem infarction, which is related positively to balloon diameter and balloon intracapsular pressure.

PO-0681

EARLY INTERVENTION OF HIGH-RISK INFANTS

Cuixia Shang, Peng Lu, Zhe Liu
Medicine Department of Rehabilitation of Frist Affiliated Hospital of Xian Jiaotong University

Objective: To explore the interference of early intervention on the intelligence development and psychomotor development of high-risk infants. *Method:* 64 high-risk patients were randomly divided into two groups: 32 cases of control group, 32 cases of intervention group. Two groups of high-risk infants have similar general information, which are comparable. Control group have be given only conventional parenting guidance, while intervention group have be given both conventional parenting guidance and specific rehabilitation guidance, two groups evaluated the intelligence development and psychomotor development according to Bayley intelligence development scale after half a year. *Result:* Both intelligence development and psychomotor development of the intervention group were superior to that of control group, and increased difference significance gradually with the months of age. *Conclusion:* Early intervention can obviously promote the intelligence development and psychomotor development of high-risk infants and help them recover as soon as possible.

PO-0682

STUDY ON THE RISK FACTORS OF DEEP VENOUS THROMBOSIS IN DEPARTMENT OF REHABILITATION MEDICINE (HOSPITALIZED STROKE AND SPINAL CORD INJUR PATIENTS)

Ning Zhu
Department of Rehabilitation Medicine, The affilicated Hospital of Ningxia Medicine College, Yingchuan 750004 Ningxia, China

Objective: To identify the risk factors of deep venous thrombosis (DVT) in hospitalized patients with stroke and SCI, under a perspective case-control study, a better guide clinical rehabilitation. *Methods:* survey 2010.6–2012.6 meet the diagnostic criteria for patients of stroke and SCI in the rehabilitation of our hospital inpatient 204 cases, including 131 cases of stroke, 103 cases of SCI, the data collection sheet made by ourself: including personal information, past history, history of present illness and treatment, the degree of hemiplegia or paraplegia, DVT assessment scores, the vein B-ultrasound of the lower limbs. *Results:* The patients with stroke occurrence of DVT are 16 cases, 12.21%; The patients with SCI occurrence of DVT are 20 cases, 19.42%;and the order of risk factors with stroke is 1) bed ≥ 3 days, 16 cases, 100%; 2) The DVT assessment scores ≥ 2, 15 cases, 93.75%; 3) The history of hypertension, diabetes, 14 cases, 87.5%; 4) the paralysis degree of Brunnstrom I - II is 11 cases. 68.75%; ≥ III 5 cases, 31.25%; 5) Age ≥ 65, 7 cases, 43.75%; 6) Gender: Male 11 cases, female 6 cases; and the order of risk factors with SCI is 1) bed ≥ 3 days, 20 cases, 100%; 2) The DVT assessment scores ≥ 2,19 cases, 95.00%; 3) with

dehydration drugs 14 cases, 70.00%; 4) gender: male, 19 cases, 95.00%, female,1 case 5%; 5) degree of paralysis: ASIA grade A 11 cases, 55% D grade 8 cases, 40%; *Conclusions:* (1) the majority of patients with DVT are asymptomatic, the signs are not specific, and the DVT can not be diagnosed just based on the clinical manifestations. (2) Many factors can lead to stroke and SCI patients with DVT, and the most risk factors of DVT in hospitalized patients with stroke and SCI is the bed ≥ 3 days and The DVT assessment scores ≥ 2. Stroke and SCI patients with DVT are the high-risk population, we shoud pay more attention to severe paralysis;if you have not a better awareness of DVT, then furtherthe risk of complications is higher, the consequences may be more seriousß. You shoud know DVT and take the appropriate measures to avoid blind treatment.

PO-0683

WHAT FACTORS PRODUCE EFFECTS ON TRAUMATIC BRAIN INJURY REHABILITATION

Jing He

Department of Rehabilitation Medicine, West China Hospital, Sichuan University, Key Laboratory of Rehabilitation Medicine, Sichuan Province, China

Objectives: To analyze the factors that would influence traumatic brain injury (TBI) rehabilitation effects and to provide ideas for TBI rehabilitation medicine. *Methods:* From January 2009 to May 2012, the medical records of 105 in-patients with TBI were reviewed in the Department of Rehabilitation Medicine (WestChinaHospital) and we gathered the following information: [1]General information (age, gender, family, duration of disease); type of TBI; the degree of brain damage (Glasgowcoma scale, GCS) complications treatment. 2. The results of functional evaluation before and after hospitalization (about 30 days) include cognitive, speech, swallow, motor, and activities of daily living (ADL). *Results:* The more serious the brain injury, the more dysfunctions they have. The patients with intracranial hematoma who have surgery in time have better rehabilitation effects. The patients who have severe secondary damage, as well as diffuse axonal injury and primary brain stem injury, have worse rehabilitation effects. The patients with longer course of the disease have worst effects. The patients who were delayed on proper treatment have poorer rehabilitation effects. There is only 1 case with severe deep vein thrombosis and 1 case with severe epilepsy have poorer rehabilitation effects. The patients with payment disputes affect seriously their moods and sleeping habits have poorer rehabilitation effects. *Conclusions:* The factors that would influence TBI rehabilitation effects are as follows: 1. the degree of brain damage 2. proper treatment in time 3. severe secondary damage 4. long course of disease 5. Support of the family. 6. payment dispute. 7. cognitive dysfunction.

PO-0684

EFFECT OF HYPERBARIC OXYGENATION (HBO) ON UNILATERAL SPATIAL NEGLECT (USN)

Jinglong Liu, Tianlong Guo, Yu Guo

Heilongijang Province 5th Hospital Neurological Rehabilitation Center, Harbin, China

Objective: To evaluate the effect of Hyperbaric Oxygenation (HBO) on unilateral spatial neglect (USN) and basic activities of daily living (B-ADL) after stroke. *Methods:* Sequentially access 162 stroke patients with hemiplegia admitted to the HeilongjiangProvinceRehabilitationHospital, according with the following: first stroke,no aphasia,no dementia and serious system disease. The age of all was between 35 and 75, and start to accept rehabilitation within 4 weeks after stroke.By 'cross-out' test, 'digit cancellation' test, 'line-bisection', clock drawing, 'free hand drawing' test, are used to identify the unilateral spatial neglect. When 3 of the 5 tests are abnormal or more,we thought the patient had unilateral spatial neglect. They were classified upon admission as having USN (group A; n=72; 44.5% of the entire sample) or not having such disturbance (group B (control group); n=90; 55.5% of the sample). Both groups received standard rehabilitation treatment, including daily physiotherapy, occupational therapy, traditional Chinese medicine and other therapy according to individual needs. But the group A do some special exercises for USN,such as electronic stimulation, sensory stimulation and some occupational therapy to improve the attention to left side. The group A was randomly divided into two groups –group A1 (experimental group) (36) and A2 (observation group) (36). And group A1 was in Hyperbaric Oxygenation (HBO) synchronously,but group A2 not.The pressure of HBO was 0.12MP and every treatment was 100 min including 20 min for increasing pressure and 20 min for decreasing pressure.the patients do treatment 2 h per day and 6 times per week. The Modified Barthel Index (MBI) was used to assess patients' capacity in B-ADL. Assessment was done upon admission to rehabilitation and 6 weeks afterwards. *Results:* Before treatment, the patients in the experimental and observation groups (A1 and A2) scored significantly lower with MBI than those in the control group (B) (p<0. 05). After treatments, the patients in all groups scored significantly higher with MBI assessment after 6 weeks (p<0.001). However, after 6 weeks, the score with MBI assessment in the observation group (A2) was lower than the control group, but no significant difference (p>0.05), and there was no significant difference between the experimental group and the control group (p>0.05). But there was significant difference between the experimental group and the observation group (p<0.05). *Conclusion:* most USN had significant impact on the recovery of the independent living of stroke patients. The rehabilitative intervention for USN may improve ADL performance of stroke patients with USN. And with HBO, outcome maybe better. The reason maybe that because of the abroad effect of HBO on brain, metabolism of other areas in brain were also improved,and the outcome maybe a comprehensive effect.So it is better than single or local stimulation treatment for USN.

PO-0685

THE EFFECT OF CONSTRAINT-INDUCED MOVEMENT THERAPY ON UPPER EXTREMITY FUNCTION IN RECOVERING STROKE PATIENTS

Kui Li, Xi-Quan Hu, Ying-Bei Chen, Ya-Dan Zheng, Qiong Yang, Shu-Xian Zhang

Department of Rehabilitation Medicine, the Third Affiliated Hospital of Sun Yat-sen University, Guangzhou 510630, China

Objective: To study the effect of constraint-induced movement therapy (CIMT) on upper extremity function and the ADL of recovering stroke patients. *Methods:* Forty recovering stroke patients recruited and randomly divided into an intervention group and a control group. The patients in the intervention group were trained using constraint-induced movement therapy (CIMT), in which their unaffected upper extremities were immobilized by a resting splint and an arm sling no less than 90% of the waking time every day. They were forced to use their affected upper extremities for 6 h a day (of which about 1 h was devoted to task-oriented shaping training in the OT room, with use the affected upper extremity under their family's supervision in the remaining 5 h), 6 days a week, for 3 weeks. The patients in the control group were trained to use the affected upper extremity according to the neurodevelopment therapy (NDT) approach for 1 h a day, 6 days per week, for 3 weeks. Both groups were given the same usual medication and some other rehabilitation therapies. The motor function of the affected upper extremity was assessed using Wolf's motor function test (WMFT), and the ADL performance was evaluated using Modified Barthel index (MBI) before and after the treatment. *Results:* There was no significant difference between the two groups with regard to WMFT and MBI scores before the treatment (p>0.05). After three weeks of treatment, the motor function of the affected upper extremity and the ADL performance were significantly improved in both groups (p<0.001), with intervention group improving to a significantly greater extent in terms of WMFT results (p<0.05). *Implications:*

CIMT was superior to the NDT in improving upper extremity function in these stroke patients.

PO-0686

THE CLINICAL VALUE OF SURFACE ELECTROMYOGRAPHY IN PELVIC FLOOR MUSCLE DISORDERS PATIENTS

Xiang Wang, Tong Wang, Juan Jin, Li Zhou, Hui Ding
The First Affiliated Hospital With Nanjing Medical University

Objective: To explore an effective diagnose and assessment method for patients with pelvic floor muscles disorder. *Method:* select 69 subjects, and then divided into three groups: 26 subjects with spinal cord injury with pelvic floor muscles disorder, 21patient with other pelvic floor disorders, and 22 health subjects. All subjects underwent pelvic floor electromyography tests, observe pre-base line wave amplitude,coefficient of variation,fast contraction,consistent contraction and tolerated contraction, understand the activities of pelvic muscle in rest conditions;evaluate the speeds in different conditions,analyze the muscle fiber in fast activity; determine the muscle type in consistent contraction;evaluate the rest electromyography amplitude and variation after a series of muscle activities. *Results:* there was no significant difference in spinal cord group and health group of own control after one treatment.and the other group show significant difference in pre base line (from 1.72±1.9 uVto 2.84±2.4 uV), fast contraction (from 4.7 uV to 8.98 uV), consistent contraction (from 2.9±2.9 uV to 5.15±3.4 uV) *Conclusions:* pelvic floor surface electromyography evaluation is an convenience,safe,non invasive,painless evaluation method; the evaluation results can be used to evaluate patients with pelvic floor disorders.

PO-0687

EFFECT OF SENSORIMOTOR TRAINING ON STANDING BALANCE OF THE STROKE PATIENTS AT RECOVERY STAGE

Kui Li, Dong-Feng Xie, Yi Fu, Xin Li, Ying-Bei Chen, Chun-Qing Xie
Department of Rehabilitation Medicine, the Third Affiliated Hospital of Sun Yat-sen University, Guangzhou 510630, China

Objective: To study the effect of modified sensorimotor training (SMT) method on the standing balance of the stroke patients during their recovery stage. *Methods:* Eighty stroke patients at recovery stage were randomly divided into an intervention group and a control group. The intervention group was trained by modified SMT method which combined Thera-band with partial body weight support (PBWS) system, while the control group was trained only with their standing balance in the parallel bar based on the neurodevelopment therapy (NDT) method. Both groups were given the same medications as well as physical therapy, acupuncture and OT. The patients in the two groups practiced standing balance in front of a mirror daily, 30 min every day and 6 days every week for 4 weeks. The balance abilities of patients were evaluated by Berg balance scale (BBS), and their lower extremity functions were assessed by simplification Fugl-Meyer assessment (FMA). *Result:* After training, either intervention group or control group showed significant improvement in BBS and FMA ($p<0.001$), with both balance and lower extremity functions were improved more significantly in the intervention group ($p<0.01$). *Implications:* The modified SMT method was superior to the traditional NDT method in improving the standing balances of the stroke patients.

PO-0688

EFFECTS OF THE RECIPROCAL INHIBITION RESISTANCE TRAINING ON MOTOR FUNCTION RECOVERY OF STOKE PATIENTS WITH HEMIPLEGIA

Weidong Li, Hua Yuan, Xu Hu
Department of Physiotherapy and Rehabilitation, the First Affiliated Hospital of FMMU

Objective: To evaluate the effects of the reciprocal inhibition resisitance training on the motor function in stroke patients undergoing flaccid paralysis. *Method:* Fourty patients with stroke were divided into two groups: control group consisting of 21 subjects aged 45 ± 7.0 years and experimental group with 19 subjects aged 46.2 ±7.1 years. The control group underwent 4 weeks of routine therapy program: low frequency electrical stimulation, positioning, ROM exercises, strength training, etc. with a frequency of 40 min everytime, six times a week. The experiment group received 4 weeks of reciprocal inhibition resistance training besides the routine therapy program. For data collection, Upper extremities motor function was evaluated before and after treatment using Fugl-Meyer assessment (FMA) and Brunnstrom recovery staging. *Result:* After 4 weeks' therapy, the FMA and Brunnstrom recovery staging of both groups have been improved. Experiment group had greater improvement in upper extremities function than control patients (total, proximal and distal FMA, $p<0.05$; Brunnstrom staging of upper extremities, $p<0.05$). *Impact on Rehabilitation:* The results indicate that combining the routine therapy with the reciprocal inhibition resistance training showed faster recovery process from stroke and better outcome. It may due to its better influence as increasing the voluntary movement of upper extremities. Therefore it deserves better use in stroke rehabilitation.

PO-0689

EFFECT OF TRANSCRANIAL MAGNETIC STIMULATION ON UNILATERAL SPATIAL NEGLECT AND MOTOR FUNCTIONS REHABILITATION IN PATIENTS OF POST-STROKE

Yanming Zhang, Wei Fu, Jie Hu, Jiani Ma, Siwei Qu, Weiqun Song
Department of Rehabilitation Medicine, Xuanuu Hospital, Capital Medical University

Objective: Investigate transcranial magnetic stimulation on unilateral spatial neglect and motor functions rehabilitation in patients of post-stroke. *Methods:* A total of 30 post-stroke patients were divided into rTMS group (15 cases) and the control group (15 cases). Patients of rTMS group were treated behavioral therapies (visual scanning training, trunk rotation and crossover facilitation training, 15 min one time, twice a day, duration two weeks. The common training was 30 min one time, twice a day, duration two weeks.) and repetitive transcranial magnetic stimulation (the frequency of the stimulation is 0.5 Hz, 90% of rest motor threshold, 15 min one time, twice a day, duration 2 weeks.), while patients of the control group were only treated the behavioral therapies. Both of groups were measured Line cancellation test, line bisection test, clock test, simple Fugl-Meyer motor function test and modified Barther Index before and after treatment. *Results:* 1) The median of Line cancellation test scores were 8.17 (0-48.31), 31.75 (0-86.96) in the rTMS group and the control group after treatment, respectively. There was significant difference between the two groups ($p=0.007$). The median of line bisection test scores were 0.0048 (0-0.3333), 1.3333 (0-5.6667) in the two groups after treatment, respectively. There was significant difference between the two groups ($p=0.019$). The median of clock test scores were 0 (0-1), 1 (0-2) in the two groups after treatment, respectively. There was significant difference between the two groups ($p=0.003$). 2) The median of simple Fugl-Meyer motor function test scores were 36 (24-94), 21 (6-63) in the rTMS group and the control group after treatment, respectively. There was significant difference between the two groups ($p=0.001$). The median of modified Barther Index scores were 45 (30-65), 40 (10-60) in the two groups after treatment, respectively. There was significant difference between the two groups ($p=0.001$). *Conclusions:* Transcranial magnetic stimulation has significant effect in the

treatment on unilateral spatial neglect of post-stroke patients, and improvement of unilateral spatial neglect on post-stroke patients has contributed to their motor functions rehabilitation ($p<0.05$).

PO-0690

THE SELECTIVE ATTENTION IN PATIENTS WITH ACQUIRED BRAIN INJURY

Huili Zhang, Xiao-Ping Yun

Department of Rehab Evaluation, CRRC, Beijing, China

Objective: To investigate the selective attention in patients with acquired brain injury. *Methods:* Twenty-seven patients with acquired brain injury (including stroke and traumatic brain injury) and 34 normal adults who were matched in age and in years of education were tested with Stroop word-color test (SWT) to assess selective attention. The indexes include hit number (correct response number), commission number, omission number, the average reaction time and the value between reaction time obtained in the incompatible condition (the meaning of the word is not consistant with and the color of it) and neutral condition (color squares only). *Results:* The hit number of the patients was significantly less than that of the control group (p=0.000, <0.01). Errors of the omission and commission in the patient group were significantly more than the control subjects (p=0.000<0.01). The average reaction time increased obviously (p=0.000, <0.01), but the difference in reaction time among the different conditions was not more than the controls (p=0.797, >0.05). *Implications:* The selective attention was impaired in patients with acquired brain injury. The selective attention disorder will distract the performance of motor and cognition rehabilitation.

PO-0691

PREVALENCE AND RELATED FACTORS ASSOCIATED WITH INPATIENTS' POST-STROKE URINARY INCONTINENCE IN GUANGZHOU

Li Guo[1], Juan Wang[1], Li Wang[1], Wen-Zhi Cai[1]

[1]Nan fang hospital southern medical university, Guangzhou, China., [2]School of nursing southern medical university, Guangzhou, China

Objective: To evaluate the prevalence and risk factors of inpatients' post-stroke urinary incontinence (UI) in Guangzhou. Methods A self-designed questionnaire, the general informations of 723 inpatients from 10 hospitals in Guangzhouwas collected from 2010 to 2011, including general demographic information, stroke situation, past history, etc. *t*-tests and multiple logistic regressions were applied to analyze cognitive function and risk factors of UI. *Results:* The incidence of post-stroke UI during the acute phase reached 34.6%, the recovery phase 50.9% and the sequela phase 54.5%. Marital status (OR=0.403, 95% CI 0.225, 0.742), care givers (OR=3.768, 95% CI 1.704, 8.333), stroke period (OR=1.761, 95% CI 1.174, 2.642), stroke type (OR=3.005, 95% CI 1.199, 7.531), parietal lobe lesions (OR=1.549, 95% CI 1.005, 2.386), chronic cough (OR=2.025, 95% CI 1.265, 3.242), aphasia/dysarthria (OR=3.848, 95% CI 2.497, 5.931), post-stroke depress (OR=3.378, 95% CI 1.902, 6.000) were influencing factors of post-stroke UI. In the evaluation of cognitive function, patients with incontinence were more severe compared with non-incontinence group, 63.0% of the severe cognitive impairment and 57.0% of moderate cognitive impairment were with incontinence (p<<0.001). *Conclusion:* The UI prevalence ofGuangzhouinpatients' post-stroke, and many factors are related to UI. Necessary supports to patients ant their families are recommended to reduce the adverse factors and to improve bladder management.

PO-0692

INFLUENCE OF LOCAL APPLICATION OF LIDOCAINE ON PERIPHERAL NERVE CONDUCTION – A PILOT STUDY

Li-Wei Chou[1,2]*, Fang-Yin Liao[1], Yueh-Ling Hsieh[3], Mu-Jung Kao[4,5], Hsin-Shui Chen[6,7], Sui-Foon Lo[1,2], Chang-Zern Hong[8]

[1]Department of Physical Medicine and Rehabilitation, China Medical University Hospital, Taichung, Taiwan,Chinese Taipei, [2]School of Chinese Medicine, College of Chinese Medicine, China Medical University, Taichung, Taiwan,Chinese Taipei, [3]Department of Physical Therapy and Graduate Institute of Rehabilitation Science, China Medical University, Taichung, Taiwan,Chinese Taipei, [4]Department of Physical Medicine and Rehabilitation, Yangming Branch, Taipei City Hospital, Taipei, Taiwan,Chinese Taipei, [5]Department of Physical Therapy and Assistive Technology, National Yang-Ming University, Taipei, Taiwan,Chinese Taipei, [6]Department of Physical Medicine and Rehabilitation, China Medical University, Bei-Gang Hospital, Bei-Gang, Taiwan,Chinese Taipei, [7]Department of Rehabilitation Medicine, School of Medicine, College of Medicine, China Medical University, Taichung, Taiwan,Chinese Taipei, 8.Department of Physical Therapy, Hungkuang University, Taichung, Taiwan,Chinese Taipei

Objective: The aim of this study is to investigate the influence of lidocaine patch on the peripheral nerve conduction. Methods Fifteen normal volunteers without any symptom or sign of neuropathy in both upper limbs were recruited for this double blind, placebo controlled study within a period of 10 months. Either lidocaine patch or placebo patch was applied on the volar aspect of the wrist during the sleeping period. The treatment procedure was repeated for 14 consecutive days. For each objective outcome assessment, the nerve conduction test was performed and analyzed. All subjects were re-examined and electrophysiologic studies on both median and ulnar nerves were repeated 1 week, 2 weeks later. *Results:* No statistically significant changes were observed in the data of the nerve conduction studies (including distal latency, nerve conduction velocity, and amplitude of evoked potential) before and after lidocaine patch treatment except for nerve conduction velocity of distal median sensory nerve. *Implications/Impact on Rehabilitation:* The median sensory nerve conduction became faster after local application of lidocine patch for 2 weeks. It is likely that lidocaine can selectively block the smaller fibers and cause conduction measurement on the remaining larger fibers to obtain a faster conduction. However, there is no obviously change in the other nerves after lidocaine patch treatment. Further studies involving big samples and longer periods of outcome assessment are needed in the future.

PO-0693

CONGENITAL FACIAL PARALYSIS, A CASE REPORT

Emre Adiguzel[1]*, Duygu Tecer[2], Evren Yasar[1], Bilge Yılmaz[1], Mehmet Ali Taskaynatan[1], A.Kenan Tan[1]

[1]Department Of Physical Medicine & Rehabilitation, Gulhane Military Medical Academy, Turkish Military Forces Rehabilitation Center, Ankara, Turkey, Turkey, [2]Department Of Physical Medicine & Rehabilitation, Mersin University, Faculty Of Medicine, Mersin, Turkey

Introduction: The possible causes of facial nerve palsy are congenital, infectious, neoplastic, trauma or idiopathic. Congenital facial nerve palsy is a rare condition that can be seen after birth trauma and genetic disorders. Here, we report a patient with congenital facial nerve palsy. *Case Report:* A twenty year old man admitted to our hospital with inability to close right eye completely, decreased tearing and thin beards at the right side of his face. According to his history his complaints were present since childhood. He had no history of forceps-assisted delivery, prematurity or excessive birth weight. At the physical investigation nasolabial fold was disappeared, mouth was drawn to the non-affected side. He was unable to wrinkle his forehead, raise eyebrow and close right eye completely. His eye movements were normal. Electromiyographic (EMG) studies revealed severe chronic axonal injury of facial

nerve. Magnetic resonance imaging (MRI) of the brain revealed no intracranial pathology but additonal MRI studies showed the absence of parotid gland of the affected side of the face. *Conclusion:* Facial palsy is a common disease affecting patient's life, although congenital cases are rare. In the literature, there are few cases that reported facial nerve agenesis, diagnosed via incidentally during a surgical procedure for an unrelated condition. Although the facial nerve existence was demonstrated via EMG study, our case showed the possibility of facial nerve palsy due to parotid gland agenesis.

PO-0694

CHANGES OF PELVIS CONTROL WITH SUBACTUE STROKE: A COMPARISON OF BODY-WEIGHT-SUPPORT TREADMILL TRAINING COUPLED VIRTUAL REALITY SYSTEM AND OVER-GROUND TRAINING

Yurong Mao, Le Li, Na Chen, Zhenghong Chen, Dongfeng Huang

Department of Rehabilitation Medicine, the First Affiliated Hospital, Sun Yat-sen University

Objective: To compare the effects of pelvis control on walking with body-weight-support treadmill training (BWSTT) coupled Virtual Reality (VR) system and walking training on the ground with subactue stroke. Methods twenty-four patients after first stroke within 3 months were recruited BWSTT coupled VR (n=12) and conventional therapy (CT) (n=12), which can work independently with 10 meters. The treatment group received walking training with BWSTT coupled VR for 30 min, 5 days a week for three weeks. The conventional group received walking training according to the Neurodevelopment therapy (NDT) on the ground instead of BWSTT for 30 min for 5 days, three weeks. Vicon system was used in gait capture, and 3D kenimatic data of pelvis was analyzed at the beginning and the end of training. *Results:* The tilt of pelvis in sagittal plane improved significantly (Pa=0.000, Pb=0.000) after treatment, in terms of decreased amplitude of anterior peak (mean, 11.82º to 4.95 º)and increased posterior peak (mean, 6.07 º to -1.95 º) in the BWSTT+VR group. There was no significant difference at pelvis obliquity and rotation. For the CT group, there was no significant difference of pelvic peak changes after therapy. No significant difference of pelvic peak was found between BWSTT+VR and CT group after training. *Implications:* BWSTT coupled VR using for subactue stroke is beneficial in improving pelvic control, especially the retraction of pelvis and hip joint.

PO-0695

EXPRESSION AND EFFECT OF P-P38MAPK IN PARTIAL CEREBRAL TISSUES AFTER HYPOXIA-ISCHEMIA BRAIN DAMAGE IN NEONATAL ADENOSINE A2A KNOCKOUT MICE

Suwei Ren, Xiang Chen

Department of Rehabilitation,The Second Affiliated Hospital of Wenzhou Medical College

Aim: To study the expression and effect of p-p38MAPK in partial cerebral tissues after hypoxia-ischemia brain damage in neonatal adenosine A2A knockout mice. *Methods:* On basis of the modified Rice model,we made the model of hypoxia-ischemia brain damage (HIBD). A2AR knockout (A2AR (–/–),KO) and corresponding A2AR wildtype (A2AR (+/+), WT) C57/BL6 neonatal mice (7 days old) were randomized into sham-operated group (S) and model group (M); model group was divided into different subgroups: 1 day after HIBD (M1: MKO1, MWT1), 3 days after HIBD (MKO3, MWT3), 7 days after HI\ (M7, MKO7, MWT7), totally 8 groups, each group with 8 mice,and totally 64 mice. Made the cortex and hippocampal CA1 region as the study areas,using the TUNEL assay combined with light microscopy of Nissl staining to detect neuronal apoptosis,using immunohistochemistry (IHC) to detect the expression of pp38MAPK and active caspase3. At the same time, A2AR knockout and A2AR wildtype mice were taken from sham-operated group (S:SKO, SWT, n=10) and model group (M) 1 day after HIBD (M1:MKO1, MWT1, n=30) to assess the early neurological behavior. *Results:* No matter in the cortex,or in the hippocampal CA1 region, apoptotic neurons, activate caspase3 and pp38MAPK increased after HIBD, peaking at 1d after HIBD. The apoptotic neurons and the expression of active caspase3 in A2AR knockout mice were significantly more than that in the wildtype at the same point after HIBD. (p<0.01,respectively). The expression of pp38MAPK in A2AR knockout mice were significantly more than that in the wildtype at 1 day after HIBD, as well as at 3 days after HIBD. (p<0.01, respectively). The linear correlation analysis demonstrated that the expression of active caspase3 were positively correlated to the expression of pp38MAPK in neonatal mice after HIBD. (in the cortex: r=0.957, p<0.01; in the hippocampal gyrum CA1 areas: r=0.939, p<0.01). *Conclusion:* pp38MAPK might be involved in the aggravated neuron apoptosis and brain damage induced by A2AR knockout after neonatal hypoxia-ischemia brain damage.

PO-0696

DRY HEAT THERAPY FOR STROKE HEMIPLEGIA WITH UPPER-LIMB SENSORY DISORDERS

Qiang Duan, Hua Yuan, Xiang Mu

Xijing Hospital, Xi'an 710032, china

Objective: To investigate the effects of dry heat therapy on the hemiplegia patients with upper-limb sensory disorders. *Methods:* 30 stroke patients with upper-limb sensory disorders were randomly divided into a observation group (n=15) and a control group (n=15). Both groups were treated with normal limb position, kinesiotherapy, circulated compression to limbs,etc. While the observation group increased dry therapy stimulate hemiplegia upper limbs, 10 min each time, once everyday, 6 times a week. All the treatment last for 4 weeks. All patients were assessed with the Canadian neurological scale (CNS), the simplified Sensory index score (SIS), the Motricity index (MI), the Somatosensory evoked potential (SEP)and the brain diffusion tensor imaging (DTI/DTT) before and after treatment of 4 weeks,then observed the changes of their thalamocortical fasciculus. *Results:* Both groups average scores on the CNS, SIS, MI and SEP were improved (p<0.05). Compared with the control group, the change of SEP and thalamocortical fasciculus in observation group improved significantly (p<0.05). In the observation group the changes were significantly correlated with the improvements in SEP scores. *Implications:* Dry Heat therapy can improve the upper-limb sensory disorders of stroke patients,and as the recovery of neural functional impairment, the area of feeling function is rebuilted.

PO-0697

EFFECT OF UNILATERAL SPATIAL NEGLECT (USN) ON ACTIVITIES OF DAILY LIVING (ADL) AFTER STROKE

Jinglong Liu, Tianlong Guo, Yu Guo

Heilongijang Province 5th Hospital Neurological Rehabilitation Center.Harbin, China

Objective: To evaluate the effect of unilateral spatial neglect (USN) on basic activities of daily living (B-ADL) after stroke. *Methods:* 81 stroke patients with left hemiplegia admitted to the Heilongjiang Province Rehabilitation Hospital were classified upon admission as having USN (group A; n=32; 39.5% of the entire sample) or not having such disturbance (group B; n=49; 60.5% of the sample). The age of all was between 35 and 75 without aphasia and obvious dementia. By 'cross-out' test, 'digit cancellation' test, 'line-bisection', clock drawing, 'free hand drawing' test,we examined the unilateral spatial neglect. When 3 of the 5 tests are abnormal or more,we thought the patient had unilateral spatial neglect. Both groups received standard

rehabilitation treatment at most 6 weeks after stoke onset,including daily physiotherapy, occupational therapy, traditional Chinese medicine and other therapy in accord with individual needs. The Modified Barthel Index (MBI) was used to assess patients' capacity in B-ADL. Assessment was done upon admission to rehabilitation and 8 weeks afterwards. *Results:* Mean MBI scores at admission were 27.24±10.23 and 30.02±13.22 for groups A and B, respectively. At this point, the difference between the groups did not reach statistical significance (t=1.77, $p>0.05$). After 8 weeks of intensive rehabilitation treatment, the MBI scores of both groups improved significantly (t=3.71, $p<0.05$) *Conclusion:* The existence of unilateral spatial neglect affects significantly the functional outcome of stroke patients. In view of the importance of this factor there is place for an effort to develop means for quantitative evaluation of the magnitude of the unilateral spatial neglect and therapeutic means aimed specifically to improve this kind of disorder of attention.

PO-0698

EFFECT OF A2AR KNOCK OUT ON ASTROGLIAL ACTIVATION IN SVZ OF FOCAL CEREBRAL ISCHEMIA-REPERFUSION IN MICE

Pu Lou, Xiang Chen
The Second Affiliated Hospital of Wenzhou Medical College

This article nvestigates the effects of adenosine A2A receptor (A2AR) on astroglial (Ast) activation in subventricular zone (SVZ) during focal cerebral ischemia-reperfusion in mice, to provide experimental evidence for application of adenosine drugs on Stroke. Focal cerebral ischemia-reperfusion was induced by middle cerebral artery occlusion. The mice were randomly divided into Sham operated-groups (S), model-groups (M), and the model-groups were divided into A2ARgene-ko-model-groups (KO) and A2ARgene-wt-model-groups (WT). According to the time after ischemia-reperfusion, KO groups and WT groups were divided into 1d-groups, 3d-groups, 7d-groups. And Sham operated-groups (S) were divided into A2ARgene-ko-sham-groups (SKO) and A2ARgene-wt-sham -groups (SWT). Neurological behavior was assessed on mice. Brain slices were observed by 2,3,5-triphenyltetrazolium chloride (TTC) for infarction, stained HE, Nissl for general shape, and the specific markers glial fibrillary acidic protein (GFAP) of Ast was measured by Immunofluorescence. Abnormal neurological behaviors were observed in the animals of M groups, but the neurological behaviors of the rats in KO7d group were better than that in the WT3d groups ($p<0.05$), Typical cortical infarct lesions in model groups were found by TTC stainning. The expression of GFAP existed in the brain of S group, that was enhanced significantly in the M groups, besides, the expression of GFAP in the KO7d group was less than that in the KO7d group. A2ARgene-ko can mitigate handicap during acute stage of ischemia-reperfusion, regulate astroglial activation during convalescence, these maybe one of favorable factors about neuranagenesis.

PO-0699

EFFECT OF SCALP ACUPUNCTURE AND VISUAL FEEDBACK TRAINING ON BALANCE FUNCTION AND WALKING CAPACITY IN PATIENTS WITH HEMIPLEGIA

Jianwen Wang, Jing Ji, Zhonghua Li
Rehibilition Center Hospital of Gansu Province, Lanzhou, China

Purpose: To observe the effect of scalp acupuncture plus the balancer visual feedback training on balance function and walking capacity in patients with hemiplegia. *Methods:* 84 patients with postapoplectic hemiplegia were randomly divided into treatment group with scalp acupuncture plus the balancer visual feedback training, and control group with balancer visual feedback training; the groups were respectively consist of 42 patients, and both of them were based on the regular rehabilitation training. The two groups of patients were evaluated with Berg Balance Scale (BBS) and the Holden walking ability score after 5 weeks' treatment. *Results:* There were no significant difference in BBS and Holden walking ability score ($p>0.05$) between the two groups before treatment; However, the improvement of treatment group was much better than control group ($p<0.05$) after 5 weeks' treatment. *Conclusion:* The combined use of scalp acupuncture and the balancer visual feedback training has been proved to significantly facilitate the balance function and walking ability of patients with postapoplectic hemiplegia.

PO-0700

VOL 2 THE COMPARATIVE STUDY BETWEEN INDEPENDENT AMBULATION GROUP AND ORTHOTIC AMBULATION GROUP BY ACOMBINED PROTOCOL OF LOW-FREQUENCY REPETITIVE TRANSCRANIAL MEGNETIC STIMULATION AND AN INTENSIVE REHABILITATIVE PROGRAM (COMBINED PROTOCOL THERAPY) ON GAIT AND LOWER-LIMB MOTOR FAUNCTION IN PATIENTS WITH CHRONIC POST-STROKE HEMIPARESIS

Shihomi Sekiya[1], Yutaka Yoshida[1], Shigeto Watanabe[1], Yusuke Haga[1], Masaya Imai[1], Miki Kojima[1], Yoshihide Ishiduka[1], Kouichi Kawada[1], Hisaaki Mori[1], Miharu Takahashi[1], Yumi Toyama[1], Narumi Matuoka[1], Hiroaki Harashima[1], Satoshi Miyano[1], Masahiro Abo[2]
[1]Tokyo General Hospital,Japan, [2]The Jikei University School of Medicine, Japan

Purpose of the present study is to compare the effects of the combined protocol therapy for between independent ambulation group and orthotic ambulation group on gait and lower-limb motor function and upper-limb motor function in patients with chronic hemiparesis. *Participants and Methods:* The subjects were 270 patients (mean age: 61.2±12.4years, mean period from the onset of stroke: 62 months) with chronic post-stroke hemiparesis. The combined protocol therapy includes a 15-day hospitalization, 22 treatment sessions consisting of low-frequency rTMS, one-to-one training, and self exercise. The one-to-one training consisted of exercise for upper-and lower- extremity and gait function. We divided into two groups based on walking task performance. The one Group was "Mild group" (independent ambulation group: Mean age: 61.2 ±12.7 years) and the other was "Moderate group" (ambulate with a cane and/or orthosis: Mean age: 61.0± 12,0 years). Locomotor and upper-limb motor functions were evaluated before and after the combined protocol therapy. *Results:* All patients completed the protocol without any adverse effects. After completion of the protocol, the scores of the 10m walking speed, timed up-and-go test, the dynamic gait index, and the functional balance scale significantly improved in mild group and moderate group, too. In addition, the Fugl-Meyer assessment and the Wolf Motor Function Test showed significant improvements in upper-limb motor function. *Conclusions:* Our proposed combined protocol therapy including low-frequency rTMS and intensive rehabilitation is effective for not only mild group, but also moderate group after chronic stroke. Relevance We think this study is able to contribute to effective treatment protocol for the gait and lower-limb motor function of the hemiparesis after chronic stroke.

PO-0701

THE CLINICAL STUDY OF EARLY TRANSCRANIAL MAGNETIC STIMULATION COMBINED WITH REHABILITATION TRAINING IN THE TREATMENT OF SWALLOWING DISORDERS OF STROKE

Fangmei He
Xi jing hospital

Objective: Evaluating the significance of in the treatment of swallowing disorders of stroke with early combined transcranial magnetic stimulation with rehabilitation training: To Provide a new effective treatment methods for Patients with stroke swallowing disorder. *Methods:* From our hospital in 2012-2013 years admitted to Acute stroke Patients. Screening out 80 acute stroke Patients with swallowing disorder by screening test, evaluating the degree of swallowing disorder with Wa Tian swallowing abilities evaluation, dividing into treatment group 40 and control group 40 randomly. The treatment group was administrated transcranial magnetic stimulation and rehabilitation training. Rehabilitation training was divided into direct and indirect rehabilitation training. The control group was administrated rehabilitation training only. Contrasting in the swallowing function, complications (the incidence of aspiration pneumonia) and quality of life Pre-treatment and Post-treatment two weeks. Using *t*-test and x2-test for statistical analysis on the data. *Results:* Comparing the Scores of the treatment group and the control group before and after treatment respectively, there were significant differences, after treatment, comparing the scores of the treatment group and the control group, there were significant differences: There was a significant difference statistically in the therapeutic efficacy of treatment group and control group: The incidence of aspiration pneumonia in control group was significantly higher than the treatment group. *Conclusion:* Studying comparatively the two kinds of treatment of stroke patients with swallowing disorder at the same time, obtaining that two kinds of treatment methods are effective; After the treatment of swallowing disorders of stroke with early transcranial magnetic stimulation combined with rehabilitation training, the stroke patients with swallowing disorder could improve significantly in swallowing function, reduce the incidence of pneumonia and improve patient quality of life, it can be used as a routine treatment.

PO-0702

RECOVERY OF STROKE PATIENTS' GAIT IN ACUTE STAGE: ASSESSMENT OF KINEMATIC AND FMRI

Dongfeng Huang, Yurong Mao, Le Li, Xiang Xiao, Xiao Bao, Qiang Lin, Jiangli Zhao, Zhenghong Chen

Department of Rehabilitation Medicine, First Affiliated Hospital, Sun Yat-sen University

Background: Investigating detailed mutual interactions between activation maps and movement parameters and interpreting mechanism of motor recovery in acute stroke patients on evidence-base rehabilitation is crucial. Therefore, we have explored motor recovery of acute stroke patients' gait with Vicon motion capture system and fMRI, which provides a multi-parameter quantification of the performed motor task of walking. *Methods:* Two stroke patients were evaluated before and after the intervention of the rehabilitation program during acute post-stroke inpatient rehabilitation. Outcomes assessed included the GCS, NIHSS, FMA, Modified Ashworth Scale, Brunel Balance Assessment, MMSE, HADA, HAMA, Barthel Index, and SF-36. Movement parameters were gathered from Vicon Motion Capture System. BOLD fMRI and DTI were assessed. Visual detection of abnormal signal by blinded neuroradiologists was evaluated. The intervention was conventional rehabilitation program in acute stage of stroke. *Results:* Case 1 and 2 showed no change in the DTI signal over the course of the intervention. In case 1, the area of BOLD activation during movement of ankle and toes was increased after the intervention. Gait kinematics were also improved after the intervention. The clinical outcome measures showed a significant improvement. In case 2, the area of BOLD activation during movement of ankle and toes were improved slightly. Gait kinematics showed little change and clinical outcome measures were unchanged. *Conclusions:* The cases illustrate that the extent of corticospinal tract degeneration remains unchanged during acute rehabilitation. However, functional maps show changes during the acute phase of stroke. Further data is needed to define the correlation between gait kinematics and changes in functional activation maps. Differences in the responses of the two cases suggests that outcomes depend on initial extent of impairment. Grant: National Natural Science Foundation (No. 30973165), China. These two authors (DONGFENG HUANG, Yurong Mao) contributed equally to this study.

PO-0703

EFFECTS OF A2AR-KNOCK OUT ON THE EXPRESSION OF P-JNK AND NERVE CELL APOPTOSIS IN HIPPOCAMPUS CA1 OF NEWBORN MICE AFTER HYPOXIA

Hailing Fan, Xiang Chen

Yuying Childrens Hospital and the Second Affiliated Hospital of Wenzhou Medical College

Aim: To investigate the effect of adenosine A2A receptor gene knock out on relationship between continuous activation of P-JNK and expression of nerve cell apoptosis in hippocampus CA1 of newborn mice after hypoxia-ischemia brain damage and its potential mechanism. Methods Cerebral ischemia was induced hypoxia-ischemia brain damage. Adenosine A2A receptor knockout (A2ARKO) mice (n=32) and their wildtype littermates (A2ARWT) (n=32) were divided into Sham operation group, 1, 3 or 7 day after hypoxia-ischemia brain damage. A HIBD model was developed with 7-day-old neonatal mice according classical Rice-Vannucci method. Short-term neurofunctional outcomes consisted of three developmental reflexes (righting, geotaxis and cliff aversion) was assessed, the expression of P-JNK and nerve cell apoptosis in hippocampus CA1 were deteced by HE staining, Nissl staining, terminal deoxynucleotidyl transferase mediated dUTP-biotin nick-end labeling (TUNEL) staining and immunohistochemstry. *Results:* Adenosine A2A receptor could obviously reduce the neurofunctional impairments: brain organization in mice degenerated and necrosised, loss of Nissl's body; TUNEL method showed the expressions of nerve cell apoptosis in M1dWT group fewer than those inM1dKO group (p<0.01); The little expression of P-JNK existed in normal brain, and P-JNK was enhanced immediately after ischemia and reached to peak at 1d after operation; Adenosine A2A receptor could significantly decrease the expressions of P-JNK positive cells at every time point after HIBD (p<0.05); Positive correlation between the expressions of P-JNK and nerve cell apoptosis in hippocampus CA1 after HIBD in newborn mice (r=0.802 (p<0.05). *Conclusion:* Adenosine A2A receptor can attenuate the nerve cell apoptosis caused by HIBD in hippocampus CA1 of newborn mice, which may exert the protection against inhabting the continuous activation of P-JNK.

PO-0704

EFFECT OF ADENOSINE RECEPTOR A2A KNOCKOUT ON THE EXPRESSION OF CYTC IN PARTIAL CEREBRAL TISSUES AFTER HYPOXIA-ISCHEMIA BRAIN DAMAGE IN NEONATAL MICE

Suwei Ren, Xiang Chen

The Second Affiliated Hospital of Wenzhou Medical College

Adenosine A2A receptor,which role in neonatal mice after hypoxia-ischemia brain damage (HIBD) is still controversial, is an important subtype among adenosine receptors. To explore its mechanism of action contribute to the clinical treatment of neonatal hypoxia-ischemia encephalopathy (HIE). To this end,our experiment observed the effect of A2AR knockout on neurological behavior,using TUNEL assay combined with HE staining to detect neuronal apoptosis,using immunohistochemical detect the expression of activate caspase3 and cytoplasm cytc after HIBD in neonatal mice.In our study,we found that A2AR knockout damage neurobehavioral function of neonatal mice, and increase the expression of apoptotic neuron, activate caspase3, cytoplasm cytc.Among these,the difference of neuronal apoptosis between these two genetypes is significant at any time point after

HIBD in neonatal mice,as well as activate caspase3 (p<0.01).While the significant difference of cytoplasm cytc between these two genetypes were reflected at 1 d, 3 d after HIBD (p<0.01).The expression of cytoplasm cytc and neuronal apoptosis were significantly positively related,as well as,the expression of cytoplasm cytc and activate caspase3 were significantly positively related.This prompted that A2AR knockout possibly increase neuronal apoptosis by promoting cytc released into the cytoplasm after HIBD in neonatal mice.

PO-0705

PHYSICAL EXERCISE IMPROVES FUNCTIONAL RECOVERY THROUGH MITIGATION OF AUTOPHAGY, ATTENUATION OF APOPTOSIS AND ENHANCEMENT OF NEUROGENESIS AFTER MCAO IN RATS

Xiquan Hu[1], Liying Zhang[1], Jing Luo[1], Lili Li[1], Ruxun Huang[2], Zhong Pei[2]

[1]Department of Rehabilitation Medicine, the Third Affiliated Hospital, Sun Yat-sen University, Guangzhou 510630, China, [2]Department of Neurology, the First Affiliated Hospital, Sun Yat-Sen University, Guangzhou 510080, China

Objective: This study is aimed to examine the effects of physical exercise on autophagy, apoptosis and neurogenesis in the peri-infarct region in a rat model of middle cerebral artery occlusion (MCAO). *Methods:* A total of 40 adult Sprague–Dawley rats after MCAO were further randomly divided into three groups: the physical exercise group (n=15), which was given running wheel exercise every day after MCAO, the control group (n=20) and sham-operated group (n=5), which were fed in standard cages without any special training exercise. The rats were sacrificed on the 3, 7, 14 and 21 days after evaluating the neural function. And autophagy, apoptosis and neurogenesis around the peri-infarction region were checked with the specific marker LC3-II, TUNEL and Ki67. *Results:* LC3-II were evident in the peri-infarct region at 3 days after MCAO. Moreover, 44.6% of LC3-positive cells were also stained with TUNEL. The number of LC3 positive cells was significantly lower in physical exercise group than in control group at 14 and 21 days after MCAO. Suppression of autophagosomes by physical exercise was positively associated with improvement of neurological function. In addition, physical exercise significantly decreased the number of TUNEL-positive cells and increased the numbers of Ki67-positive at each time points. *Implications:* Physical exercise enhances neurological function possibly by reduction of autophagosome accumulation, attenuation of apoptosis and enhancement of neurogenesis in the peri-infarct region after MCAO in rats.

PO-0706

APHASIA AND HEMISPATIAL NEGLECT INFLUENCE ADL IN PATIENTS WITH ACUTE THALAMIC HEMORRHAGE

Aiko Osawa[1]*, Shinichiro Maeshima[1], Kenichi Ozaki[2], Izumi Kondo[2]

[1]Saitama Medical University International Medical Center,Japan, [2]National Center for Geriatrics and Gerontology, Japan

Objective: Thalamic stroke are associated with a variety of cognitive disorders such as aphasia and hemispatial neglect. However it has not been clear the relationship between these cognitive dysfunction and hematoma in patients with thalamic hemorrhage. In this study, we investigate the relationship between aphasia/hemispatial neglect and hematoma volume, lesion, and hematoma type, and the influence of cognitive dysfunction to activities of daily living (ADL). *Method:* One hundred nineteen patients with thalamic hemorrhage (77 men and 42 women) were studied. There mean age was 68.7±10.6 and mean education period was 11.4±3.2. 53 patients had right lesion and the others had left lesion. We calculated hematoma volume and subjects were divided into three group based on hematoma type. After then, we examined presence or absence of aphasia/hemispatial neglect, and the relationships between such dysfunction and hematoma volume, hematoma type, and ADL. *Results:* 60 patients had aphasia and 44 had hemispatial neglect. Although there was no relationship between hematoma type and cognitive dysfunction, hematoma volume had relation to severity of cognitive dysfunction. ADL score in patients with aphasia/neglect were lower than in patients without aphasia/neglect. *Implications:* There are no relationships between hematoma type of thalamic hemorrhage and cognitive dysfunction. However, we have to recognize that aphasia/hemispatial neglect is found frequently in a patient with acute thalamic hemorrhage and influence ADL.

PO-0707

REHABILITATION THERAPY OF A PATIENT WITH OCULOMOTOR PALSY CAUSED BY PRIMARY BRAIN STEM INJURY

Zhenlan Li, Xiaowei Chen, He Li

The first hospital of Jilin university

Objective: To observe rehabilitation effect of functional training combined with acupuncture and low frequency electrotherapy on the paretic eye of a patient who had oculomotor palsy caused by primary brain stem injury. Methods one patient who had left blepharoptosis and diplopia with oculomotor palsy by primary brain stem injury received rehabilitation treatment for 5 days. Rehabilitation treatment was applied with functional training, acupuncture and low frequency electrotherapy. Functional training: using shaping technology of CIMT (constraint-induced movement therapy) in training the paretic eye for 40 min,twice daily, including both active movement and coordination training therapy under assisted in each direction, and also ipsilateral eyelid muscle strength training. Acupuncture therapy: acupuncture points of the eye mainly about Jingming, Cuanzhu, Yangbai and Sizhukong, combination of Baihui, Fengchi, Hegu. Everyday 20 min. Low frequency electrotherapy: the electrodes were placed on the muscles around the temple and eyebrow with square wave low frequency current, 60 Hz, pulse width of 300 μs, and stimulus intensity depending on the patients' comfortable feeling. 20 min everyday. *Results:* After 5 days' treatment, the patients' left eyelid could lift higher than before, and eye cleft was enlarged, with left eye abducted partly, the symptom of diplopia was alleviated apparently, then the patient was discharged. *Implications:* Rehabilitation therapy combined with acupuncture therapy and low frequency electrotherapy was effective and it could be better treatment for the patients paretic eye's functional recovery with oculomotor palsy.

PO-0708

PITUITARY INSUFFICIENCY AND OUTCOME IN PATIENTS WITH MODERATE AND SEVERE TRAUMATIC BRAIN INJURY (TBI)

Anna Tölli[1], Charlotte Höybye[2], Bo-Michael Bellander[3], Jörgen Borg[1]*

[1]Dep. of Clinical Sciences, Danderyd Hospital, Karolinska Institutet, Sweden, [2]Dep. of Molecular Medicine and Surgery, Karolinska Institutet,Sweden, [3]Dep. of Clinical Neuroscience, Karolinska Institutet, Stockholm, Sweden

Objective: To investigate the prevalence of pituitary insufficiency and its relation to neurological and cognitive function and global outcome after moderate-severe traumatic brain injury (TBI). *Method:* Patients, aged ≥18 year, treated in Neurointensive unit after moderate or severe TBI (GCS 3-13) are included. Ten days post injury, an ACTH stimulation test (Synacthene) is performed and thyroid function (fT4, TSH and fT3) evaluated. Follow-up at 3 and 6 months postinjury includes assessment of neurological and cognitive function and of global outcome according to the Glasgow

Outcome Scale- Extended (GOSE). *Results:* Out of 84 patients, 65 were men and 19 women, 63 had a severe TBI and 21 had a moderate TBI caused by traffic accident (29), fall (47), violence in (5) or other (3). Computed tomography (CT) scan demonstrated petechial hemorrhages (65), obliteration of 3rd ventricle or basal cisterns (23), subarachnoid bleed (64), midline shift > 5 mm (31), subdural/epidural hematoma (72), brain oedema (16) and basilar skull fracture (27). Thyroid function was insufficient in 18 and cortisol response in 9 (potentially influenced by steroid treatment in 6/9 patients). An excessive response to Synacthene test was found in 28 patients. GOSE data from 65 patients at 3 and 6 months post injury did not differ (Chi-Square and Kruskal–Wallis tests) between patients with or without insufficient pituitary function or between patients with or without excessive Synacthene test response. *Implications/Impact on Rehabilitation:* Data from this ongoing study indicate that insufficient pituitary function does not affect global outcome after TBI.

PO-0709

THE EFFECT OF ANKLE STRATEGY STABILITY LIMIT TRAINING ON BALANCE AND GAIT IN RECOVERING STROKE PATIENTS

Kui Li, Yi Fu, Xin Li, Dong-Feng Xie, Ying-Bei Chen, Wei-Hong Qiu

Department of Rehabilitation Medicine, The Third Affiliated Hospital of Sun Yat-sen University, Guangzhou 510630, China

Abstract is missing

PO-0710

THE EFFECT OF RELAXATION TRAINING ON HEART RATE VARIABILITY OF POST-STROKE PATIENTS ACCOMPANIED WITH DEPRESSION

Lihua Zhang, Xia-Lin Zhang, Shu-Yan Qie, Yu Pan, Yong-Hong Ding

Department of Rehabilitation Medicine, Beijing Rehabilitation Center

Objective: Although decreased heart rate variability (HRV) has been well documented in association with depression following cardiovascular diseases, diabetes mellitus, kidney diseases and so on, less studies has been done in patients with stroke. A prospective random controlled study was carried out to assess the effects of relaxation training on HRV of post-stroke patients accompanied with depression. *Method:* 60 stroke patients accompanied with depression were enrolled and randomly accept relaxation training and routine physical therapy (experimental group), or treated with routine physical therapy only (controlled group), after 1 month, clinical effectiveness and HRV were analysis on both group. *Results:* No significant difference was found between two groups at baseline; after one month treatment, the difference between the experimental group and control group was statistically significant. *Implications on Rehabilitation:* Post-stroke is one of complications of cerebrovascular disease, and it can induce other complications or make them more serious. There had been several studies reported that there was correlation between post-stroke depression of old people and increased mortality. Relaxation training have effect not only on patients' hypertension, heart rate, breathing rate, but also on one's mental condition and explicit behavior. The long term objective of relaxation training was that body may promptly monitor a lot of control signals, then automatically relieve needless strain. Therefore, it can alleviate patients' anxiety, depressive mood, and make sleep better, and enhance patients' confidence and active consciousness of rehabilitation.

PO-0711

THE CLINICAL EFFECT OF KINESIO TAPING ON SHOULDER SUBLUXATION OF POST-STROKE PATIENTS

Xiaoying Zhang, Sheng-Zhang Ouyang, Hong-Wei Yan, Yu Pan

Dept. of Rehabilitation Medicine, Beijing Rehabilitation Center

Objective: Observe the clinical effect of kinesio taping therapy on shoulder subluxation of post-stroke.patients. *Methods:* A total of 30 post-stroke patients with shoulder subluxation were divided randomly into two groups,the experiment group and the control group. Both group received routine physical therapy, the experiment group received kinesio taping to improve the shoulder function. For evaluation of the shoulder function, We use visual analog scale (VAS) to assess the shoulder pain, the radiography measurement on anteroposterior shoulder X-ray to assess the level of subluxation,the Fugl-Meyer Assessment (FMA) to assess the upper limb function. The trentment period was 8 weeks. *Results:* After 8 weeks treatment, Both group scored significant higher on FMA and significant lower on VAS and radiography measurement compared with before treatment ($p<0.05$). Furthermore, there was a significant higher score on radiography measurement and a significant lower score on VAS in experimental group compared with the control group ($p<0.05$). Both groups had no significant difference on FMA scores ($p>0.05$). *Implications:* Kinesio taping therapy can improve the shoulder function, relieve the pain symptoms of stroke patients combined with shoulder subluxation. The kinesio taping worked through supporting for shoulder and activation of the shoulder muscles.

PO-0712

STUDY ON FACTORS AFFECTING THE FUNCTIONAL IMPROVEMENT OF STROKE PATIENTS IN KOREA

Seung Hee Ho[1]*, Hee Jung Kim[1], Ye-Soon Kim[1], Min Jin Lee[1], Dong-A Kim[2], Si-Woon Park[3]

[1]Korea National Rehabilitation Research Institute,Korea, [2]Korea National Rehabilitation Hospital, Korea, [3]Myongji St.Marys Hospital, Korea

Objective: The purpose of this study was to predict the prognosis of patients with Stroke by identifying some factors affecting functional improvements. *Method:* The retrospective study was conducted on 690 stroke patients hospitalized in the Korea national rehabilitation hospital from 2008 to 2010. The factors examined in this study included age, duration of illness, stroke type, and comorbidity. Functional level was evaluated by Korean-modified Barthel Index (K-MBI) and cognitive function level by Mini Mental State Examination (MMSE). Also, the degree of neurological damage was evaluated by Korean-National Institutes of Health stroke scale (K-NIHSS) and the degree of functional improvement by differences in K-MBI scores between admission and discharge. We used the Classification And Regression Tree (CART) algorithm to build a decision tree for predicting functional improvement. *Results:* Participants were composed of 64.6% cerebral infarction, with mean age of 61.3 years. On average, the patient had 3.1 comorbidities and 211.1 days after injury. At admission, the average MMSE score was 20.4 and the K-NIHSS score was 6.9, and also the K-MBI score was 52.5. And the mean of degree of functional improvement was 14.3 in K-MBI at discharge. 690 patients were classified into 19 subgroups through the CART. In the group with the highest degree of functional improvement (38.8), the duration of illness was shorter than 60 days, and K-MBI scores were lower than 15 at admission. *Implications/Impact on Rehabilitation:* It may be helpful in improving rehabilitation outcomes if patients can be provided with suitable rehabilitation treatments considering duration of illness, age, MBI at admission, and MMSE.

PO-0713

THE DELAY OF RECOVERY FROM PUSHER SYNDROME IS RELATED TO THE FRONTAL WHITE MATTER LESION

Hiroaki Abe[1,2]*, Takeo Kondo[1], Takanori Kochiyama[3], Yutaka Oouchida[1], Yoshimi Suzukamo[1], Shin-Ichi Izumi[1]

[1]Department of Physical Medicine and Rehabilitation, Tohoku University Graduate School of Medicine,Japan, [2]Department of Rehabilitation Medicine, Kohnan Hospital, Japan, [3]Brain Activity Imaging Center, Advanced Telecommunications Research Institute, Japan

Objective: Unilateral stroke can lead to a disorder of postural balance that manifests as a pushing away toward the paretic side. It is termed "pusher syndrome (PS)". Previously reports mentioned that PS typically involves the lesion site of posterior thalamus, posterior insula and subcortical region of post-central gyrus. Some previously reports PS has good prognosis, and the patients with right hemisphere lesions exhibited a significantly slower recovery from PS than the patients with left hemisphere lesions. However, a relationship between lesion location and the time course of recovery of PS is still unclear. Thus, this study aimed to investigate the relationships between the time course of PS and right brain lesion sites. *Methods:* We investigated 9 patients with acute ischemic right hemispheric stroke. The time course of the severity of PS was assessed using the standardized Scale for Contraversive Pushing. MRI data were obtained for the effect of ischemic lesion sites on recovery of PS, analyzed by modern voxel-based lesion-symptom mapping. *Results:* The data gave evidence for an association between the delay of recovery of PS and frontal white matter lesions (superior occiptofrontal fascicle, superior longitudinal fascicle). *Implications:* Previous studies revealed that patients with PS required longer rehabilitation to reach outcome goals than patients without PS. Our results indicate that when patients with PS have the right frontal white matter lesions, planning a long rehabilitation should be considered compare to patients with other lesions.

PO-0714

FACTORS AFFECTING THE FUNCTIONAL IMPROVEMENT OF PATIENTS WITH SPINAL CORD INJURY

Hee Jung Kim[1], Seung Hee Ho[1]*, Moon Suk Bang[2], Ye-Soon Kim[1], Bum-Suk Lee[3], Dong-A Kim[3], Min Jin Lee[1]

[1]Korea National Rehabilitation Research Institute,Korea, [2]Department of Rehabilitation Medicine, Seoul National University College of Medicine, Korea, [3]Korea National Rehabilitation Hospital, Korea

Objective: The purpose of this study was to predict the prognosis of patients with Spinal Cord Injury (SCI) by identifying some factors affecting functional improvements. *Method:* We analyzed the data of 402 SCI patients hospitalized in the Korea national rehabilitation hospital from 2007 to 2009. We looked into such variables as sociodemographic charateristics, number of days after injury, neurological impairment, and comorbidity indexes, and degree of functional improvement. The degree of functional improvement was assessed by differences in the Spinal Cord Independence Measure (SCIM) between admission and discharge. Using a data mining technique, we examined the relationship between patients' characteristics and functional improvements. *Results:* On average, the patients were 45.2 years old and had 2.5 comorbidities, and the number of days after injury was 717.7. The mean difference of SCIM scores was 12.6 (41.3 at admission, 53.9 at discharge). 402 patients were classified into 15 subgroups according to the degree of functional improvement through the CART. In the group of patients with the highest degree of functional improvement (28), the average days after injury was under 150 and their SCIM scores were under 65 at admission. In the group with the lowest the degree of functional improvement (0.6), however, the period after injury was over 639 days and their SCIM scores were over 79 at admission. As a result, the most effective predictors for functional improvement were days after injury and SCIM scores at admission. *Implications/Impact on Rehabilitation:* It is necessary to indentify the relationship between patients' characteristics and rehabilitation outcome measures for appropriate rehabilitation treatment.

PO-0715

THE STUDY ON CHARACTERISTICS OF BALANCE DYSFUNCTION IN STROKE PATIENTS BY SMART EQUITEST BALANCE MASTER

Weihong Qiu[1], Xia-Fei Lin[2], Yi Fu[1], Kui Li[1], Xin Li[1], Zu-Lin Dou[1]

[1]Department of Rehabilitation Medicine, The Third Affiliated Hospital of Sun Yat-sen University, Guangzhou 510630, Guangdong, China, [2]Department of Rehabilitation Medicine, Haikou People's Hospital,Haikou 570208, Hainan, China

Objective: To study the characteristics of balance dysfunction of stroke patients by Smart Equitest Balance Master. *Method:* Sixteen healthy peoples and thirty-two stroke patients was involved in this study. Balance function of all the three groups were evaluated by Smart Equitest Balance Master, including Sensory Organization Test (SOT), Limits of Stability (LOS) and Walk Across (WA). The index to be observed were the Weight ratio of damaged lower limbs, equilibrium score,sensory analysis score, max excursion, step length,step width, and walking speed etc. *Results:* The results of Smart Equitest Balance Master of the control group compared with the study group contained: 1. Healthy person show symmetric weight bearing and the center of gravity was in the middle line while stroke patients show obviously asymmetric weight bearing with more weight on the nonparetic limb and lower equilibrium score, smaller max excursion and slower walk speed. 2. The ability of using vision, somatosensory and vestibular information to maintain balance in stroke patients is impaired. 3. The gait disorder of stroke patients was represented as shorter step length and slower walking speed. *Implications:* Balance disorders in stroke patient were described in our study: asymmetric weight bearing with more weight on the nonparetic limb, impaired ability using sensory information to maintain balance.

PO-0716

ANALYSIS THE EFFECTIVE OF HYPERBARIC OXYGEN THERAPY IN STROKE PATIENTS WITH EARLY REHABILITATION AND NURSING

Guoxia He, Ou Qian, Ting Cai, Haiqing Xu

Rehabilitation Department of Shanghai Jinan Geriatric Hospital

Purpose: Discussion the effective of hyperbaric oxygen therapy on early stroke patients with cognitive, balance and ADL ability, and the importance of nursing intervention on the therapy. *Method:* 75 hospitalized stroke patients were divided into 2 groups, group A received conventional rehabilitation treatment and care at the same time using of hyperbaric oxygen therapy, Group B received conventional rehabilitation treatment and care. Both group A and B were assessed the MMSE, Fugl-Meyer, MBI before and after a month of treatment. *Result:* the score of MMSE, Fugl-Meyer balance, MBI of two groups were decreased than that of normal before and after treatment, Paired *t*-test showed that after rehabilitation treatment, the scores of two groups were improved significantly (p<0.01-0.05, respectively), except to the MMSE score of group B (p>0.05), *t*-test between A and B groups showed that the scores of initial evaluation of MMSE, Fugl-Meyer balance, MBI of group A and B had no significant difference (p>0.05). but the scores of end evaluation of that of group A and B had a significant difference (p<0.01-0.05). *Conclusion:* After stroke, the ability of cognitive, balance and ADL of patients were decreased, early conventional rehabilitation can improve the patients' above ability, but adding hyperbaric oxygen therapy and nursing intervention, the effect would be more pronounced.

PO-0717

FACTORS INFLUENCING DECISION MAKING REGARDING THE CHOICE OF NEUROGENIC BLADDER MANAGEMENT IN PEOPLE WITH SPINAL CORD INJURY: A QUALITATIVE STUDY

Julia Patrick Engkasan*, Chirk Jenn Ng, Wah Yun Low
University Malaya, Malaysia

Objective: To explore factors influencing the choice of bladder management method in people with spinal cord injury. *Methods:* We conducted individual interviews with 15 spinal cord injured patients with neurogenic bladder who were at different stages of making decisions about bladder drainage management. A semi structured interview guide was used and the interviews were audio-recorded, transcribed verbatim, checked and analysed using a thematic approach. *Results:* Participants' choice of bladder management was influenced by opinions of the significant others (family, peers and healthcare professionals), perceptions of treatment options, patient's ability to perform the procedure and patient's anticipated lifestyle after hospital discharge. Advice from the healthcare professionals and peers had more influences on patients' decisions compared to their families. Participants were concerned about incontinence, urinary tract infection and trauma to the genitals when choosing treatment options. For those considering intermittent catheterization, the initial experience using this method determined their final decision. Patients with paraplegia described the importance of self-confidence to perform intermittent catheterization whilst those with tetraplegia emphasized confidence in others to perform the procedure for them. Patients who anticipated active lifestyle preferred intermittent catheterization to indwelling catheterization. *Implications on Rehabilitation:* Rehabilitation professionals must be aware and explore the factors that influence the choice of bladder management in order to facilitate patient's decision-making process.

PO-0718

CARRY-OVER EFFECT IN INTEGRATED VOLITIONAL CONTROL ELECTRICAL STIMULATION OF WRIST EXTENSOR MUSCLES FOR STROKE PATIENTS

Hiroyuki Miyasaka[1,2], Chieko Usami[3], Hitomi Uematsu[1], Izumi Kondo[4], Yutaka Tomita[2], Abbas Oranenichi Tanino[1,2], Shigeru Sonoda[1,2]
[1]Fujita Health University Nanakuri Sanatorium,Japan, [2]Fujita Memorial Nanakuri Institute, Fujita Health University,Japan, [3]Tujimura Surgery Hospital, Medical Corporation Meiwa Society,Japan, [4]Hospital National Center for Geriatrics and Gerontology, Japan

Objective: Electrical stimulation therapy is used for training of the upper limbs in hemiplegic patients. It has been reported that this therapy can improve the functions of the paralyzed upper limb while suppressing spasticity. In this study, we applied integrated volitional control electrical stimulation (IVES) therapy for rehabilitation of the paralyzed upper limbs of sub-acute hemiplegic patients. Subjects: Sixteen patients with hemiparesis after stroke were included (11 males and 5 females, average age 61.3 years, average days after onset 55.0 days). Methods Our objective was to investigate the carry-over effect of this method during stroke rehabilitation patient. IVES therapy was conducted for 20 min per day for one week. To investigate the carry-over effect, we measured the active wrist dorsiflexion angles at 0, 30, 60, 90, and 120 min after daily rehabilitation sessions. *Results:* Compared to the resulted obtained before the start of rehabilitation, the active wrist dorsiflexion angles had improved. The SIAS and MAS also showed improvement. However, the differences were not significant. While active wrist dorsiflexion angles at 30, 60, 90, and 120 min after the daily sessions were decreased compared to those before rehabilitation, the active dorsiflexion angles were only significantly different for 60, 90, and 120 min. The dorsiflexion angle at one week after the start of rehabilitation was significantly improved at 90 and 120 min after daily sessions, compared with the angle at the start of rehabilitation. *Conclusion:* Our findings revealed the short-term therapeutic effects of IVES.

PO-0719

STROKE, PHYSIOTHERAPY AND PHYSICAL FUNCTION POST STROKE: WILL REGULAR EXERCISE EARLY IN STROKE REHABILITATION HAVE A POSITIVE EFFECT ON EXERCISE HABITS AND FUNCTION THREE YEARS AFTER?

Birgitta Langhammer[1,3]*, Birgitta Lindmark[2], Johan Kvalvik Stanghelle[3,4]
[1]Oslo and Akershus University College, Norway, [2]Uppsala University, Norway, [3]Sunnaas Rehabilitation Hospital, Norway, [4]University of Oslo, Norway

Background: Exercise post-stroke is a limited resource. *Objective:* to observe if physical function, personal -,instrumental activities of daily living and health related quality of life was maintained three years post stroke. *Methods:* a longitudinal randomized controlled trial Intervention Patients allocated to the intensive exercise group were scheduled to have a minimal amount of 80 h physiotherapy the first year post stroke. The regular exercise group was in charge of their own progress. Tests performed baseline, 3, 6, 12 and 36 months post stroke. *Results:* Of 75 persons with stroke at baseline, 37 were eligible for follow up tests three years post stroke, 19 (54.3%) in the intensive exercise group and 18 (45%) in the regular exercise group. All were active doing exercises, either in a community setting with an individual coach, in an exercise group or by themselves doing home exercises. Motor function improved up till six months and stabilized and was maintained on the same level up to three years post stroke in both groups. The same tendency was presented in scores Timed Up and Go, Bergs Balance Scale, Barthel Index, grip strength bilaterally, walking distance, and Health related quality of life (HRQoL). Both groups reported a higher extent of activity in all items of Instrumental Activities of Daily Living Test at 3, 6, 12 and 36 months post stroke. However, there were significant differences in several items at 12 and 36 months in favour of the regular training group. Approximately 40 % in both groups were independent while 60% relied on help from relatives or community based services three months up till three years post stroke. *Conclusion:* Persons with stroke regain and maintain motor performance, balance, mobility, PADL, IADL, walking capacity, and grip strength with regular physical training in a three year post stroke perspective. No adverse effects or increased tone was reported. Maintenance training appears to be reinforced by individuals in charge of their own progress and enhanced through motivational test.

PO-0720

EFFECTS OF INTERACTIVE FEEDBACK STRATEGIES ON STROKE PATIENTS

Yi-Hua Chen[1], Ray-Yau Wang [1], Yea-Ru Yang [1], Rai-Chi Chan [2]
[1]Department of Physical Therapy and Assistive Technology, National Yang-Ming University Taipei, Taiwan, ROC,Chinese Taipei, [2]Department of Physical Medicine and Rehabilitation, Taipei Veterans General Hospital, Taipei, Taiwan, ROC,Chinese Taipei

Objective: Pusher syndrome (PS) is characterized as actively push away from the nonhemiparetic side leading to a loss of balance and falling towards the hemiparetic side, and resulting in slower functional recovery after stroke. The objective of this study was to investigate the effects of interactive feedback strategy combining physical therapy in reducing PS and improving functional performance. *Method:* Eight subjects meeting the selection criteria were randomly assigned to the experimental or the control group. Participants in the experimental group received 20-min interactive gaming feedback strategy and participants in the control group

received 20-min conventional mirror feedback during postural training followed by 20-min general physical therapy, 3 times a week for 3 weeks. The pre- and post-treatment assessments included the severity of PS indicated by Scale for contraversive pushing (SCP) and functional performance measured by Functional Independence Measure. The balance performance and motor control were assessed by the Berg Balance Scale and Fugl-Meyer Assessment respectively. The Mann-Whitney U test was used for statistical analysis. *Results:* Our preliminary results indicate greater improvement in SCP in the interactive feedback group as compared with the mirror feedback group ($p<0.05$). However, the changes in other measures were not significantly different between groups. *Implications/Impact on Rehabilitation:* Our findings suggest that through the interactive gaming feedback strategy may at least exert superior effects in reducing PS and improving postural control in stroke patients with PS.

PO-0721

EFFECTS OF ICB ORTHOPAEDIC SOLE ON BALANCE AND WALKING FUNCTION OF STROKE PATIENTS

Zhaohua Gu, Chen Gong, Xiang Wang, Yu Luo, Tong Wang
the First Affiliated Hospital with Nanjing Medical University

Objective: To observe the effects of ICB orthopaedic sole on balance and walking function of stroke patients. *Method:* recruit 24 stroke patients being divided into two group: ICB group (n=12), control group (n=12); control group took motor relearning technique combined with core muscle groups training. Patients in ICB group wore orthopaedic sole to walking upstair and downstair and in actural activities plus control group exercises. Both groups accepted 40 min training per time, twice daily with 30 days.Measure calcaneus resting posture angles while standing, tibia rotation angles and forefoot angles of the nonaffected and affected lower extremity and scores of balance function, functional ambulation categories and 10 meters walking speed before and after the exercise sessions. *Results:* Calcaneus resting posture angles, tibia rotation angles and forefoot angles shown no changes in nonaffected side of both groups ($p>0.05$),but impoved significantly in affected side ($p<0.05$); and there were significant difference in Berg Balance Scale, FAC,and 10 meter walking speed ($p<0.05$). *Conclusions:* Combined with the treatment of ICB orthopaedic sole,walking treating can improve the hemiplegic standing capability and the balance and ambulation capacity of of stroke patients.

PO-0722

THE MODULATION OF MOTOR CONTROL IN THE PATIENTS WITH CHRONIC SPINAL CORD INJURY – A FMRI STUDY

Feng Gao[1,2,3], Jianjun Li[1,3], Chetwyn Chan[2], Hongyu Chu[1,3], Mingliang Yang[1,3], Liangjie Du[1,3]
[1]China Rehabilitation Research Center, [2]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, [3]Faculty of Rehabilitation Medicine, Capital Medical University

Objective: This study is to investigate the differences on the modulation of motor control between the normal subjects and the chronic spinal cord injury (SCI) patients. Methods Nineteen normal subjects and eighteen patients with chronic SCI (more than 1 year after injury) matched by education level, age and gender, were recruited in China Rehabilitation Research Center. Functional MRI images were collected in Beijing Xuanwu Hospital when they were conducting the repetitive movement imagery task. *Results:* Significant differences in the BOLD responses in basal ganglia (putamen, striatum), lateral cerebellum, dentate nucleus, superior parietal cortex, dorsolateral prefrontal cortex, supplementary motor area, pre-supplementary motor area and premotor area were found in the contrast between the chronic SCI group and normal group with healthy subjects. These varieties relied not only on the locations activated, also on the intensities activated during the retrieval process involving in motor control. *Implications on rehabilitation:* Lack of active movements and sensory feedback would affect the process of motor preparation which taps on the retrieval of motor program during motor control. This study is significant to explore new rehabilitation strategy for SCI patients, also helpful to understand the mechanisms of the reconsolidation and maintenance of motor memory and the role of afferent feedbacks from the peripheral, as well as the top-down modulation from the upper level, to maintain this specialized function of motor modulation.

PO-0723

BLADDER SCANNER IN SPINAL CORD INJURY PATIENTS TREATED WITH INTERMITTENT CATHETERIZATION IN APPLICATION

Jiamu Song
Jiangsu province official hospital rehabilitation medicine

Objective: Bladder scanner in patients with spinal cord injuries between intermittent catheterization, application effect. *Method:* In 8 cases of patients with spinal cord injury intermittent urethral catheterization before row. The use of bladder scanner for bladder urine determination, For patients, the best time of catheterization. *Results:* during hospitalization in patients with intermittent catheterization in 53 cases between the lines, Among 9 cases of bladder scanner measured patients urine <300 mL. Delayed urethral catheterization time point, but with a catheterization time less than 6 h; There were 21 cases of measuring urine volume in patients with >500 mL; Patients were given immediate catheterization, There were 23 cases of patients with urine volume was measured by 300~500 mL, scheduled time point for catheterization. *Conclusion:* Bladder scanners can effectively monitor intermittent catheterization before bladder urine volume.Guide line of intermittent catheterization in patients with spinal cord injury a precise point in time, avoid unnecessary catheterization, reduce the pain of patients.

PO-0724

THE EFFECTIVE OF MAGNETIC STIMULATION OF THE SACRAL NERVE ROOT CONBINED INTERMITTENT CATHETERIZATION TO HYDRONEPHROSIS OF PATIENTS WITH SPINAL CORD INJURY

Yongfeng Tian
First Affiliated Hospital of the Fourth Military Medical University, Department of Rehabilitation

Objective: To observe the efficacy of magnetic stimulation of the sacral nerve root combined with intermittent catheterization to hydrocephalus of spinal cord injuried patients. *Methods:* 30 cases of spinal cord injuried patients with hydronephrosis, were randomly divided into experimental group and control group, the two groups of patients were treated with comprehensive training including manual therapy, intermittent catheterization, bladder and bowel function training and sports training, the experimental group were given additional magnetic stimulation of the sacral nerve roots. after six weeks detected B ultrasound, intravenous urography to assessed the effect to hydronephrosis. *Results:* The two groups of patients with hydronephrosis were significantly reduced.the remission rate of hydronephrosis in the experimental group after spinal cord injury was 74.5%, significantly higher than 30.3% in controlled group. Between the two groups, the difference was significant ($p<0.01$). *Conclusion:* Magnetic stimulation of the sacral nerve roots combined with intermittent catheterization can reduced the hydronephrosis of the patients with spinal cord injury, and can significantly improve the quality of life of patients.

PO-0725

INHIBBITOR BAR RELIEVES SEVERE TOE PAIN OF PATIENTS AFTER STROKE

Izumi Kondo[1]*, Kenichi Ozaki[1], Hiroshi Matsuo[1,3], Shino Mori[1], Aiko Ohsawa[2],[1], Shinichiro Maeshima[2,3], Eiichi Saitoh[3]

[1]National Center for Geriatrics and Gerontology, Japan, [2]Saitama Medical University,Japan, [3]Fujita Health University, Japan

Objective: Severe toe pain occurs sometime with tonic toe flexion reflex during the chronic stage after stroke and often restricts the patient's ability of walking. The purpose of this study was to examine the effect of inhibiter bar for the patients with toe pain occurred with tonic toe flexion reflex after stroke. Materials and Methods Subjects were thirteen patients who were referred to the brace clinics of three hospitals, because of severe toe pain after stroke. The onset of pain was from three months to 168 months after onset of stroke. Their age was from 54 to 74 (Ave: 62.8, SD: 6.67). Nine had hemorrhagic pathology and four had cerebral infarction. Five patients were using plastic ankle foot orthosis (AFO) and eight patients were using double upright AFO with orthopaedic shoe. All of the patients were treated toe pain with inhibitor bar. Inhibitor bar was fixed at the portion between toe and MP joint on the insole of plastic AFO or orthopaedic shoe. It was made of foam rubber and was cut and carved according to the each patient's toe shape. *Results:* Within four weeks after the fixture of inhibiter bar, the toe pain completely disappeared except one patient who had also post-stroke pain. One patient, who could not walk before the treatment, recovered his ability of locomotion. *Conclusion:* This result suggested that the inhibiter bar would be an option of the treatments for the patient with severe toe pain after stroke.

PO-0726

EFFECT OF MOTOR RELEARNING PROGRAM (MRP) ON FUNCTIONS OF RHESUS

Yong Yin[1], Zhen Gu[1], Lei Pan[1], Lu Gan[1], Dongdong Qin[1], Bo Yang[1], Jin Guo[1], Xintian Hu[1], Tinghua Wang[1], Zhongtang Feng[1]

[1]Department of Physical Medicine and Rehabilitation, the fourth affiliated hospital of Kunming Medical University, [2]Kunming Institute of Zoology. CAS, [3]Neuroscience Institute of Kunming Medical University

Objective: To observe the effects of MRP (motor relearning program) on function of injured brain areas after cerebral ischemia, and explore the mechanism of MRP on recovery of cerebral ischemia. Methods Rhesus macaques had an occlusion of the M1 segment of the right middle cerebral artery (MCA) by using electrocoagulation, were then trained with MRP. The expression of NF (neurofilament protein), GFAP (glial fibrillary acidic protein), VEGF (vascular endothelial growth factor), and bFGF (basic fibroblast growth factor) were detected by immunohistochemical staining and compared between injured areas and non-injured areas. SPECT (Single-Photon Emission Computed Tomography) was used before and after MCA occlusion to semi-quantify the changes of rCBF (regional cerebral blood flow). A stroke clinical rating scale and a task-oriented neurological scale were used before and after MCA occlusion to quantify the results of a clinical neurological examination. *Results:* The expression of NF, GFAP, VEGF and bFGF in injured areas, especially precentral motor area, was significantly higher than non-injured areas. MRP has greatly improved rCBF of cerebral ischemic stroke monkeys, but cannot change the functional asymmetry of cerebral hemispheres. Moreover, MRP has greatly improved neurological function of cerebral ischemic stroke monkeys, not only promoted the recovery of motor function, but also improved the monkeys' state of consciousness, abilities to care for themselves, and balance (coordination of facial and limb muscles). However, MRP cannot improve the strength of paralysed limb's muscles, possibly because monkeys walk on all fours. *Conclusions:* MRP significantly improved the neurological deficits caused by cerebral ischemia, possibly because it promotes neuronal regeneration and/or angiogenesis in injured areas.

PO-0727

FAMILY-BASED ASSOCIATION STUDIES OF LIPID GENE POLYMORPHISMS IN INTRACEREBRAL HEMORRHAGE IN HAN CHINESE OF CHANGSHA AREA

Baoqiong Liu, Le Zhang, Hongxing Wang, Qidong Yang

Xiangya Hospital, Central South University

Objective: Lipid Gene have been implicated in development of atherosclerosis, which is an important risk factor of intracerebral hemorrhage (ICH). This study aims to assess whether the apolipoprotein AI-CIII-AIV (ApoAI-CIII-AIV), apolipoprotein B (ApoB), lipoprotein lipase (LPL), low density lipoprotein receptor (LDLR), and proprotein convertase subtilisin/kexin type 9 (PCSK9) genetic polymorphisms might contribute to ICH. *Methods:* We recruited 200 Han Chinese from 38 families with ICH. Each individual was genotyped for four single nucleotide polymorphisms (SNPs, rs12721026, rs2854116, rs45487004 and rs670) in Apo AI-CIII-AIV, two SNPs (rs1367117 and rs11279109) in ApoB, one SNP (rs320) in LPL, three SNPs (rs2569542, rs688 and rs5925) in LDLR, and two SNPs (rs11206510 and rs505151) in PCSK9. Data were analyzed using the family-based association test (FBAT) and the haplotype-based association test (HBAT). *Results:* FBAT analysis showed that one SNP rs320 within LPL conferred significant association with ICH. The T allele of rs320 was overtransmitted to individuals with ICH (Z=2.144, p=0.034). FBAT analysis to genotype data from other polymorphisms revealed no evidence for transmission disequilibrium with ICH (p>>0.05). Haplotype analysis of four SNPs within ApoAI-CIII-AIV, two SNPs within ApoB, and three SNPs within LDLR also revealed no evidence for transmission disequilibrium with ICH (p>>0.05). *Conclusions:* Our study suggests that genetic variation within LPL likely contributes to ICH. Future well designed epidemiological or functional studies would be warranted to validate this hypothesis.

PO-0728

THE STATUS AND PROGRESS OF THE RESPIRATORY REHABILITATION FOR PATIENTS WITH SPINAL CORD INJURY

Fei He, Wen-Hua Chen, Wen Zhang

Department of Rehabilitation, Shanghai First People's Hospital

Objective: Spinal cord injury (SCI) has characteristics of high incidence and morbidity. Despite from dysfunction of limb and trunk sensory, motor, urination and defecation, SCI patients (especially cervical parts) also may suffer from varying degrees of impaired respiratory function, what has serious impact on the quality of life, and brings a heavy burden to families and society. This paper tries to be reviewed about the status and progress of respiratory rehabilitation of SCI. Looking forward to summing up experience, and exploring a more reasonable implementation of respiratory rehabilitation, which will improve the quality of life and social adaptability of SCI patients. *Methods:* Accessing literature about the respiratory rehabilitation for SCI patients in the nearly 10 years from Pubmed, NEJM, VIP, CNKI Journals and some other database, and summarizing an overview of the status and progress. *Results:* Comprehensive early diagnosis, keeping the airway open and strengthening early respiratory rehabilitation are important measures for the prevention and control of respiratory complications, improving survival and reducing mortality of SCI patients. Respiratory rehabilitation includes respiratory care, knocking back and expectoration, airway humidification and atomization inhalation, traditional respiratory training (supine vocal exercises, abdominal breathing, reducing lip breathing, coughing training, squeezing thorax) and abdo-

men pressurized breathing exercises, bedside unarmed training in respiratory function, physical agents therapy etc. *Implications on Rehabilitation:* As part of the treatment of SCI patients, respiratory rehabilitation should start early, and follow a standard process. It plays an increasingly important role in the treatment of SCI. There are many things worth studying in the future.

PO-0729

FIVE YEARS FOLLOW-UP OBSERVATION ON PATIENTS WITH SPINAL CORD INJURY TREATED WITH OLFACTORY ENSHEATHING CELL TRANSPLANTATION

Xijing He[1], Haopeng Li[1], Siyue Xu[1], Pinglin Yang[1], Guoyu Wang[1], Fei Wu[1], Leilei Pei[2]

[1]NO.2 Orthopedics Department, Second Affiliated Hospital, Medical School of Xi'an Jiaotong University, [2]Statistical Learning and Research Department of Medical School of Xi'an Jiaotong University

Objective: Olfactory ensheathing cell transplantation (OECT) has been applied to treat patients with spinal cord injury (SCI). This study was to investigate the long-term curative efficacy and safety of OECT by observing the long-term alterations of sensory level (SL), muscle strength, neural function and individual self-evaluations. Methods & Materials The olfactory ensheathing cells used by this study were derived from allogeneic embryonic olfactory bulb induction. We observed 24 patients with SCI (male/female 20/4; average age 32.4 years, age range 19~45) who were treated with OECT in our hospital from September 2005 to March 2010. Neural function was evaluated based on the ASIA scores. Follow-up time ranged from 0.5 to 5.2 years, averagely was 3.2 years. Statistical analysis was done using ANOVA. *Results:* After OECT no apparent complications were found in the 24 patients. Among 11 patients with complete paralysis, 10 patients' SL moved downwards by 1-2 spinal segments, and 1 patient's SL no changed. Among 13 patients with incomplete paralysis, 11 patients' SL descended by two spinal segments, 2 patients' SL by three spinal segments and 1 of the 2 showed improvement of flexor function and emergence of thumb long extensor dorsiflexion movement (muscle strength 2 degrees). MRI showed no mass or cavity formation in the sites of OECT. 2 patients gave OECT excellent self-evaluation, 9 good, 12 poor, and 1 very poor. The rate of excellent and good self-evaluation accounted for 50%. The ASIA scores before and after OECT had not obviously difference ($p<0.05$). *Conclusion:* Though OECT is safe for SCI treatment, its long-term therapeutic effect is not ideal. This therapy still needs further observation and more exploration.

PO-0730

A COMPARATIVE STUDY ON PROPRIOCEPTION BETWEEN UNAFFECTED SIDE OF HEMIPLEGIC PATIENTS AFTER STROKE AND NORMAL LOWER LIMBS

Chaomin Ni, Jianxia Song, Ke Zhang

Dept. of Rehabilitation Medicine, The Affiliated Provincial Hospital of Anhui Medical University, hefei, 230001

Objective: To make quantitative comparision on proprioception in the lower limbs between patients with hemiplegia after stroke and normal person. *Method:* 28 hemiplegic patients after stroke and 30 normal person were measured in the lower limbs by using a computerized proprioceptive foot-board (Pro-Kin system, Tecnbody, Italy). Main outcome measures including average trace error (ATE), test't time execution (TTE) and stability index (SI). *Result:* 1) Non-affected side of hemiplegic patients after stroke and normal lower limbs were notable different on the three parameters ATE, TTE and SI ($p<0.05$); 2) Ipsilesional functional deficits of right-hemisphere damage were greater than left-hemisphere damage on ATE and TTE ($p<0.05$), except TTE ($p>0.05$) ;3) normal person had no difference between the lower two limbs on ATE, TTE and SI ($p>0.05$); 4) Moderate correlation was found between ATE and TTE ($r=-0.550$, $p=0.002$). *Conclusion:* Proprioception in the"non-affected"side lower extremity had deficits after stroke, and greater ipsilesional functional deficits after right- than left-hemisphere damage. It is very important to actively measure and treat deficits in the ipsilateral lower extremity after stroke.

PO-0731

CERVICAL SPONDYLOTIC MYELOPATHY COMPLICATED WITH PHARYNGEAL FISTULA POST ANTERIOR CERVICAL OPERATION: A CASE REPORT

Dong Wang, Jun Dong, Rajendra Gurung, Baohui Yang, Haopeng Li, Xijing He

NO.2 Orthopedics Department, Second Affiliated Hospital, Medical School of Xi'an Jiaotong University

Objective: To report one case complicated pharyngeal fistula after anterior cervical operation. *Methods:* one case of Pharyngeal fistula after anterior cervical spine surgery is described. *Results:* Nasogastric tube placement, implanting iodoform gauze dressings and electronic laryngoscope are the keys in curing of the serious sequelae. *Conclusion:* We should think of the perforation of esophageal or pharyngeal fistula if encountering acute dysphagia after the ACDF surgery and install immediate further diagnostics and therapy. Once dignosis was demonstrated, treatment such as nasogastric tube placement should be immediately given. During the treatment, absolute diet, indwelling nasogastric tube, using antibiotics, fluid infusion actively, enhanced nutritional support were the general principles.

PO-0732

COMPARISON OF THE ADL OF ELECTRICAL ACUPUNCTURAL THERAPY AND TOTAL BODY REHABILITATION BIKE ON SPINAL CORD INJURY

Quan Xing Yang

affiliated hospital of Zunyi medical college

Objective: To observe ADL of electrical acupunctural therapy and Total Body Rehabilitation Bike on spinal cord injury. *Methods:* 78 cases were randomly divided into three groups (A) 38 cases were treated with electrical acupunctural therapy; (B) 40 cases were treated with electrical acupunctural therapy and Total Body Rehabilitation Bike on spinal cord injury. *Results:* In general, The differences between group A and B were statistically significant. *Conclusion:* Electrical acupunctural therapy and Total Body Rehabilitation Bike on spinal cord injury are more effective methods on spinal cord injury.

PO-0733

APPLICATION OF ANKLE-FOOT ORTHOSES (AFOS) FOR POST-POLIO SYNDROME PATIENTS

Koshiro Sawada[1]*, Eiichi Sitoh[1], Fumi Toda[1], Motomi Yokota[2], Daisuke Imoto[3], Yukari Suzuki[2], Megumi Ozeki[2], Seiko Shibata[1]

[1]Fujita Health University, School of Medicine, Japan, [2]Fujita Health University, School of Health Science, Japan, [3]Fujita Health University Hospital, Japan

Purpose: We discussed about application of AFOs for post-polio syndrome (PPS) patients. Methods 57 AFOs prescribed for PPS patients were classified into 5 types, and application of types was discussed with MMT and gait. L: Light type, 8 cases: for mild fixation of ankle. M: Moderate type, 19 cases: for moderate fixation of

ankle, without sole at heel. H: Heavy type, 17 cases: for rigid fixation of ankle and foot, with the sole at heel. A: APS type, 8 cases: with a posterior joint for reinforced lateral stability. D: Dorsal type, 5 cases: with dorsiflexion stop by just dorsal support. *Results:* As total, 80% of AFOs were accepted in terms of daily usage. About MMT, for L: tibialis anterior was low (mean 2.0), for M: gastrocnemius was low (1.9), for H: high in proximals (gluteus maximum: 3.5, iliopsoas: 3.6) but low in distals (gastrocnemius: 1.5, tibialis anterior: 1.9), for D: entirely low, and for A: low in contralateral gluteus medius. Daily walking steps was highest in H (5,031 steps). *Discussion:* Accepted rate of orthosis was higher than previously reported. It implied our application was reasonable in clinical context. Between L and M, difference in necessity of stance support related to distal weakness patterns. In H, combination of strong proximals with weak distals, required firm support around foot in high activity. In A with single axis joint to control ankle movement, many subjects showed lateral instability during walk. D without plantar surface allowed patients' previous style of walking.

PO-0734

THE VALUE OF ALBERTA STROKE PROGRAM EARLY CT SCORE IN FUNCTIONAL OUTCOME PREDICTION IN PATIENTS WITH MIDDLE CEREBRAL ARTERY INFARCTION

Yulong Bai, Xiuming Li, Qiang He, Bei Zhang, Yi Wu, Yongshan Hu

Department of Rehabilitation Medicine, Huashan Hospital, Fudan University, Shanghai 200040, China

Objective: To assess whether the Alberta Stroke Program Early CT Score (ASPECTS) on DWI is useful for predicting functional outcome in patients with middle cerebral artery infarction. Methods A study was conducted, including the 89 patients with a diagnosis of middle cerebral artery infarction admitted for rehabilitation in the rehabilitation medicine department, from August 2010 to August 2011. 12 variables were collected with regard to the patients' medical history, including gender, age, history of hypertension, diabetes, hypercholesterolemia, smoking, metabolic syndrome, homocysteine, smoking or alcohol history, Modified Barthel index and Modified Rankin Scale. Then linear regression analysis was used to assess the potential variables. *Results:* Age, hypercholesterolemia, DWI—ASPECTS each influenced the motor function of patients who recovered. Using Cox modeling to perform multivariate regression analysis, we found that age, DWI—ASPECTS were independent predictors of recovery of motor function. *Implications:* When ASPECTS was performed to analyze early ischemic changes on DWI of patients with middle cerebral artery infarction, the results were predictive for functional outcome.

PO-0735

MACROPHAGE FOAM CELLS AND LIPID PLAQUE: A CHARACTERISTIC FEATURE OF SPINAL CORD INJURY

Kai Cao[1], Wang Xi[2], Young Wise[2], He Xijing[1], Yi Ren[2]

[1]NO.2 Orthopedics Department, Second Affiliated Hospital, Medical School of Xi'an Jiaotong University, [2]W. M. Keck Center for Collaborative Neuroscience, Rutgers, The State University of New Jersey

Macrophage activation and persistent inflammation are linked to the pathological process of spinal cord injury (SCI). However, it is not clear which factors in the injured spinal cord microenvironment result in macrophage activation which contributes to chronic inflammation. In the present study, we explored how macrophages change their phenotype and functions in response to the lesion-related factors in injured spinal cord. We identified that infiltrating bone marrow derived macrophages (CX3CR1-GFPlow/Mac-2high) migrate to the epicenter of injury, while microglia cells (CX3CR1-GFPhigh/Mac-2low) distribute to the edge of lesion site. These infiltrating bone marrow derived macrophages showed a remarkable degree of plasticity, with a switch in macrophage phenotypes from M2 to towards a distinct phenotype, Mmye, which was induced by myelin debris generated in the lesion site. There was striking defective lipid efflux in the injured spinal cord, which led to the formation of foam cells and lipid plaques in the lesion site. Interestingly, there seems to be a negative correlation between lipid accumulation and the presence of M2 macrophages. These macrophages lost the M2 phenotype, taking on Mmye characteristics, and endured in the lesion site for a long period of time. The persistence of these cells which showed a pro-inflammatory phenotype, enhanced neurotoxicity and impaired wound healing may contribute to chronic inflammation. The distinguishing feature of Mmye macrophages is very poor capacity to phagocytose apoptotic cells such as neutrophils. This lack of clearing ability may result in the undigested neutrophils releasing toxic contents and thus leading to secondary damage. In light of these finding, we propose a new concept that dysregulation of lipid efflux following macrophage phenotype switch may contribute to the pathological process of SCI. Approaches targeting reestablishment of the lipid homeostasis would be beneficial for the resolution of the inflammation.

PO-0736

STUDY ON THE EFFECTS OF BMP-2 AND ITS RECEPTOR BMPR1B INDUCED THE DIFFERENTIATION OF EMBRYONIC NEURAL STEM CELLS

Zhijian Cheng, Xijing He, Fei Wu, Jin Li

NO.2 Orthopedics Department, Second Affiliated Hospital, Medical School of Xi'an Jiaotong University

Objective: To study the effects of BMP-2 and its receptor BMPR1b on the differentiation of embryonic cerebral cortex-derived neural stem cells. *Method:* BMPR1b gene was extracted by reverse transcription polymerase chain reaction from the mouse embryonic brain. Gene recombinant technology was employed to clone BMPR1b gene to lentivirus vector to construct a recombinant lentivirus plasmid. The plasmid was transfected with two other plasmids into packaging cells HK293.The lentiviral vector- Lenti-BMPR1b-EGFP, was collected and tittered. Dissecting the cerebral cortex of mouse embryo pregnanted for 14 days for primary cultural of NSCs. Using the successfully constructed lentiviral vector, The BMPR1b-overexpressing NSCs was obtained successfully.5ng/ml BMP-2 was added to investigate the differentiation of BMPR1b-overexpressing NSCs and wild-type NSCs. Immunohistochemistry was used to identify the cell type. All the data were analyzed by the statistic. *Result:* We successfully cloned BMPR1b gene, constructed the lentivirus vectors Lenti-BMPR1b-EGFP. The differentiation of embryonic cerebral cortex-derived NSCs into astrocytes was enhanced under the presence of BMP-2 (5 ng/ml). Compared to the wild-type NSCs, the differentiation of BMPR1b-overexpressing NSCs into astrocytes increased. *Conclusion:* BMP-2 can induced differentiation of embryonic neural stem cells into astrocytes. The BMPR1b receptor may play an important role in that process.

PO-0737

PERCEIVED AND ASSESSED BALANCE IN PATIENTS WITH STROKE WITHIN 24 H AFTER DISCHARGE TO HOME

Lena Rafsten, Anna Danielsson, Katharina S Sunnerhagen

University of Gothenburg, Sweden

Question/Objective: To explore if perceived balance correlate with assessed balance. *Method:* This is part of a RCT with blinded assessors of very early supported discharge. The study is approved by the

Ethics committee and informed written consent gathered. All patients admitted to the stroke unit at the Universal hospital of Sahlgrenska in Gothenburg were screened for inclusion. In this sub study, 42 persons were included and stroke severity was scored with National Institute of Health Stroke Scale (NIHSS) at admittance to the hospital. The average time spent in the stroke unit is 11 days. Assessments were made at home within 24 h after discharge. Assessments used were Falls Efficacy Scale (FES), Berg Balance Test (BBS), Timed Up and GO (TUG).) The responses on FES were gathered prior to the objective assessments. Non-parametric analyses were performed. *Results:* Average age was 73 years, 23 men and 19 women. Stroke severity was mild; average 3 NIHSS at admittance. Self perceived balance (FES) correlated significantly ($p<0.01$) with assessed balance (BBS). However, there were no correlations between FES and TUG. *Impact on Rehabilitation:* Just after discharge, people with mild stroke seem able to judge their risk of falling in activities assessed using the BBS. The perception of risk of falling did not correlate with performance in dynamic balance as in TUG. This might be a risk for falls in the home setting and require further investigation. Clinicians should be aware of this discrepancy and consider this in the training.

PO-0738

A PRELIMINARY CLINICAL OBSERVATIONAL STUDY ON MARROW MESENCHYMAL STEM CELLS THERAPY FOR SPINAL CORD INJURY

Zonghui Wu, Kai-Qi Cui, Jing Yu, Gongwei Jia, Lehua Yu

Department of Rehabilitation Medicine and Physical Therapy, the Second Affiliated Hospital of Chongqing Medical University, N0.74 Linjiang Road, Yuzhong District, Chongqing, China.

Objective: In this study we investigated the short-time effect of the autologous marrow mesenchymal stem cells transplantation through root artery and subarachnoid space to treat patients with SCI. Method 26 SCI patients were participated. Along with one month of standard rehabilitation, 16 patients received the stem cells transplantation with autologous marrow collected from iliac bone marrow puncture, 8 cases received the transplantation through subarachnoid space; 8 cases were injected through root artery, and 10 patients were control group receiving only standard rehabilitation therapy. Sensory and motor function was assessed with ASIA classification. The degree of SCI was evaluated with International Standards for Neurological Classification of SCI. All 3 groups underwent motor and sensory function assessment pre- and post-treatment. *Results:* The root artery group had improvement in superficial, deep sensory and motor function in one month after transplantation ($p<0.01$); The subarachnoid space group only improved in motor scores ($p<0.01$); The control group had improvement in superficial sensory scores ($p<0.05$). Comparisons on the effect of different treatment showed no significant difference ($p<0.05$) in scores of superficial, deep sensory and motor functions among all groups; patients had no significant difference on scores of superficial, deep sensory and motor functions among two transplantation groups ($p>0.05$). *Implications:* Using autologous MSCs transplantation through subarachnoid space and root artery to treat patients with SCI which was first reported. Autologous marrow stem cells transplantation has short-term clinical effects for patients with SCI, and can be easily operated.

PO-0739

SCALP ACUPUNCTURE COMBINED WITH MODERN REHABILITATION THERAPY CAN AMELIORATE BODY SPASM CAUSED BY TRAUMATIC SPINAL CORD INJURY

Junjie Wang[1], Hui Fang Wang[1], Ceng Zu[1], Feng Shen[1], Qilong Hu[1], Ranran Bi[1], Gang Jiao[2], Hong Lv[2]

[1]Shanghai Sunshine rehabilitation certer,China, [2]Shanghai kaiyuan Orthopaedic hospital, China

Scalp acupuncture combined with modern rehabilitation therapy can ameliorate body spasm caused by traumatic spinal cord injury Shanghai Sunshine Rehabilitation Center--The Yangzhi Rehabilitation Hospital Wangjunjie Wanghuifang Zuceng Shenfeng Huqilong Biranran Shanghai Kaiyuan Orthopaedic Hospital Jiaogang Lvhong *Objective:* This study is to explore the new methods and new ideas in Traditional Chinese Medicine combined with west rehabilitation. The scalp acupuncture of Traditional Chinese Medicine together with western medicine rehabilitation physical therapy can be used to ease body spasm for spinal cord injury patients after traumatic,and thus improve the ability of Activity of Daily Living and the quality of life. *Mothed*: From Oct. 2009 to Oct. 2012,the authors have chosen 100 inpatients,who had been in the Shanghai Sunshine Rehabilitation Center The Yangzhi Rehabilitation Hospital and the Shanghai Kaiyuan Orthopaedic Hospital, aged (18-60y) ±0.5 years, 68 males, 32 females,and had all been clearly diagnosed spinal cord injury caused by trauma, body limb spasm, motor dysfunction,in line with the inclusion criteria.These patients were randomly divided into two groups of fifty each :the treatment group and control group.For the treatment group, the dingzhong line, dingnieqianxie-line (double side)were chosen as the therapeutic area where the needle is levelled into scalp subcutaneous points, to being hand-manipulating, so as to getting feeling of acupuncture,and to retaining the needle in it for 7 h per day, from 9 a.m. to 4 p.m. During which time,we use the modern rehabilitation therapy technologies (mainly including body motion control training for the purpose of functioning,body active activities,active and passive stretch training, appropriate rehabilitation equipment for aiding body interactive movement, physical factors such as all kinds of heat treatment etc.). For the control group, we did not use the scalp acupuncture, the rest of the rehabilitation therapy technologies as the same to the treatment group.The period of treatment is set for two months. Before and after the start of treatment detailed rehabilitation evaluation of the patients had been carried out.All the evalutions should be assessed based on the Modified Ashworth norm for spasm evalument and the Modified Barthel index 100 points norm for ADL assessment. Eventually, before and after treatment,both groups data had been statistics analysis. *Results:* The score differences of both groups before treatment were not statistically significant ($p>0.05$). After 2 months of treatment,the score differences of both groups were of clear statistical significance ($p<0.05$); The treatment group spasm degree and ADL were significantly getting better,the effects were superior to control group. *Impact on Rehabilitation:* Head-acupuncture-therapy combined with modern rehabilitation treatment technology of comprehensive has much effects on the patients with traumatic spinal cord injury of the body spasm control.This research is based on the way of Traditional Chinese Medicine and western medicine.The channels and collaterals theory of Traditional Chinese Medicine, in which suggest that the head is assemble of all Yang, and Du meridian is "the sea of the whole Yang meridians, governing the all of Yang meridians. The selected head acupuncture point area and Du meridian channels and collaterals are to control Yang-symption. On the other hand,western medicine pallial precentral gyrus in scalp projection area is corresponding with Dingnieqianxie-line. The high muscle tension after spinal cord injury suggest that Chinese medicine theory of Yin and Yang-yang Symptom, choose scalp acupuncture and Du meridian acupoints, means to control the Yang higher. Add to all kinds of rehabilitation comprehensive physical therapies,means adjust balance coordination and Yin and Yang reach to united co-ordination, keep balance movement.Thus should be able to improve the quality of ADL and develop the patients ’ability to live independently.

PO-0740

THE FUNCTIONAL OUTCOME OF DIFFERENT SWALLOWING THERAPIES FOR SUB-ACUTE STROKE PATIENTS WITH DYSPHAGIA

Yu-Chi Huang*, Ting-Yuan Liu, Chau-Peng Leong, Wei-Che Lin

Kaohsiung Chang Gung Memorial Hospital,Chinese Taipei

Objective: Dysphagia after stroke is associated with pulmonary complications and mortality. The swallowing therapy could decrease the pulmonary complications and improve the quality of life after stroke. The aim of this study is to compare the effect of different swallowing therapies in stroke patients with dysphagia. *Method:* We enrolled twenty-two patients with a single and acute hemispheric or brain stem stroke. These patients were randomly divided into 3 groups for general swallowing therapy, oropharyngeal neuromuscular electrical stimulation (NMES), and combined general and NMES therapies. Each patient received clinical assessment of food oral intake scale (FOIS), 8-point penetration-aspiration scale (PAS) and functional dysphagia scale (FDS) of videofluoroscopy before and after swallowing therapies. *Results:* No significant differences were noted in clinical characteristics including age, gender, stroke type, hemiplegic side, cognition function, and severity of stroke among these 3 groups. We found that there was significant improvement of swallowing function in FOIS of all the 3 groups. In VFS study, there were significant differences of FDS when taking soft diet and cookies in the combined general and NMES group while comparing to the other 2 groups ($p<0.05$). *Implications/Impact on Rehabilitation:* The combined traditional and NMES swallowing therapy could provide more significant improvement in swallowing function for sub-acute stroke patients with dysphagia.

PO-0741

APPLICATION OF LIDOCAINE DIAGNOSTIC INJECTION IN BOTULINUM TOXIN TYPE A INJECTION TECHNIQUES FOR STROKE PATIENTS SPASTIC EQUINOVARUS

Chenxia Guan, Ganghua Guo, Zhe Li
the 5th Affiliated Hospital of Zhengzhou University

Objective: To study the effect of lidocaine diagnostic injection in botulinum toxin type A injection techniques for stroke patients spastic equinovarus. *Method:* Forty five stroke patients were divided into 2 groups,the group ($n=25$) was applied ultrasound-guided technique for location of lidocaine diagnostic injection, after 10 min, 19 stroke patients, s muscular tension was decreased, these 19 patients (diagnostic injection group) received injection of botulinum toxin type A (BTXA) after 48 h; the other group ($n=20$, control group) was only applied ultrasound-guided technique for location of botulinum toxin type A injection. The outcome after BTXA injection was assessed by modified Ashworth scale (MAS), Fugl-Meyer assessment- lower limb (FMA-lower limb), Moter-functional independence measurement-lower limb (FIM- lower limb), and measurement of step length and velocity, at before treatment, 1 weeks, 2 weeks, 4 weeks and 8 weeks after treatment. *Result:* Compared the two groups,s scores of MAS, FMA-lower limb, FIM- lower limb, step length and velocity at 1 week, 2 weeks, 4 weeks and 8 weeks after treatment, there were no significant differences at 1 week after treatment ($p>0.05$), there were significant differences at 2 weeks, 4 weeks and 8 weeks after treatment ($p<0.05$), there were significant differences at 4 weeks and 8 weeks after treatment between diagnostic injection group and control group ($p<0.05$). *Conclusion:* Lidocaine diagnostic injection before received injection of botulinum toxin type A could shorten the period of treatment in stroke patients,and the long-term effect was better than only received ultrasound-guided technique for location of botulinum toxin type A injection in gait, activities of daily living and motor function.

PO-0742

A CLINICAL STUDY OF BWSTT ON LOWER LIMB FUNCTION OF STROKE PATIENTS

Wenhui Liu, Sen Bai, Yue Zhao, Yu Pan
Dept. of Rehabilitation Medicine, Beijing Rehabilitation Center

Objective: To observe the clinical effect of BWSTT (body weight support treadmill training) on lower limb function of stroke patients. *Methods:* 30 stroke patients in recovery period were divided randomly into two groups, the training group and the control group. Both group received routine physical therapy, the training group rercieved BWSTT (body weight support treadmill training) to improve the lower limb function,the control group received manual gait and balance training. Subjects in both group were assessed with Fugl-Meyer Assessment (FMA), 10 meters walking ability test (the speed of 10 meters walking) and Berg balance Scale (BBS) before and after 8 weeks training. *Results:* After 8 weeks training, both group scored higher on FMA, the speed of 10 meters walking and BBS than before training. ($p<0.05$). Furthermore, the scores on FMA and speed of 10 meters walking were significant higher in training group compare with the control group. Both groups had no significant difference in BBS. ($p>0.05$). *Implications:* Body-weight supported treadmill training was more effective for improving the lower limb function of stroke patients compared with the manual PT training, but there was no obvious advantage for BWSTT for improving the balance function.

PO-0743

REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION COMBINED WITH SPEECH THERAPY ON NON-FLUENT APHASIA AFTER STROKE

Rui-Xue Zhang, Wei Liu, Huilin Mo
Department of Physiotherapy and rehabilitation, Xijing Hospital, the Fourth Military Medical University, Xi'an 710032, China

Objective: To evaluate the clinical effects of low-frequency repetitive transcranial magnetic stimulation (rTMS) combined with speech therapy on non-fluent aphasia after stroke,and explore the corresponding mechanism. Methods Sixty patients with non-fluent aphasia after stroke were randomly divided into A group ($n=19$, given low-frequency rTMS on the language center of the right hemisphere), B group ($n=22$,given systematic speech therapy) and C group ($n=19$, combined low-frequency rTMS with speech therapy), All groups were trained once per day, 6 days per week for 8 weeks in addition to their standard basic treatment.The results were assessd using a Chinese aphasia battery (ABC)scoring system and the aphasia quotient (AQ) pre-therapy, after 4 weeks and 8 weeks treatment. *Result:* There was no obvious difference in the three groups before the treatment in terms of the ABC or AQ results ($p>0.05$). The scores of all three groups significantly raised after 4 weeks as well as 8 weeks ($p<0.05$). However,compared with group A and B,the rise of ABC score of group C was higher,which appears similar in AQ's change ($p<0.01$). Impacts on the Rehablitation Low-frequency repetitive magnetic stimulation combined with speech therapy has apparent effect towards the non-fluent aphasia after stroke. It may have clinical application for patients with non-fluent aphasia after stroke.

PO-0744

EFFECT OF RESPIRATORY TRAINING IN EARLY STROKE PATIENTS

Cuiqin Hu
The first affiliated hospital with Nanjing medical university

Objective: To evaluate the effect of respiratory training under the nurses' guidance in improvements of early stroke patients' respiratory function. *Methods.* 30 patients with respiratory dysfunction results from stroke underwent a comprehensive training concluding the abdominal breathing training, the respiratory muscle training, the cough training and the position drainage under the nurses' guidance. The respiratory dysfunction parameters were recorded before and after the trainings respectively to evaluate the effect of respiratory training. *Results:* 30 subjects' cardiopulmonary function and physical activity capability was greatly improved, correspondingly the rate of complications, such as pneumonia, decreased. *Conclusion:*

Respiratory trainings with nurse can help early stroke patients clear airway incretion, improve the respiratory function, prevent complications. Then the patients' ability of independent living and quality of life improve to return to the society.

PO-0745

EFFECT OF A MOTOR IMAGERY PROGRAM ON UPPER EXTREMITY FUNCTION OF CHRONIC CERVICAL SPINAL CORD INJURY PATIENTS

Young Chan Park, Hui Soo Park*, Jung Yeon Kim
Rehart hospital, Korea

Objective: To determine the effect of motor imagery training on the residual upper extremity strength and activities of daily living of chronic cervical spinal cord injury patients. *Method:* 12 ASIA A·B patients, who had more than a 12 month duration of illness and C5 or 6 motor nerve injury level, were randomly divided into an experimental group of six and a control group of six. The experimental group performed motor imagery training for five min prior to general muscle strengthening training. The control group performed general muscle strengthening training only. The training was done five times a week, 30 min per day, for four weeks in total. General muscle strengthening training consisted of a progressive resistive exercise for residual upper extremity. Motor imagery training consisted of imagining this task performance. Before and after the training, EMG activity using BTS Pocket Electromyography and Spinal Cord Independent Measure III (SCIM III) were compared and analyzed. *Results:* The residual upper extremity muscle strengths in both groups were improved after the training. The comparison of muscle strength improvement between the two groups showed a statistically significant improvement in the experimental group compared to the control group. ($p<0.05$).The SCIM III measurements showed a significant improvement on the scores of Self-care and Transfer items in the experimental group. Implication Motor imagery training was more effective than general muscle strengthening training in improving the residual upper extremity muscle strength and activities of daily living of patients with chronic cervical spinal cord injury.

PO-0746

EFFECTIVE OF REPETITIVE TRANCRANIAL MAGNETIC STIMULATION COMBINED INTERFERENCE ELECTRICAL THERAPY TO INTESTINAL FUNCTION OF PATIENTS WITH SPINAL CORD INJURY

Ning Li
Department of Rehabilitation Medicine the First Affiliated Hospital of The Fourth Military Medical University

Objective: To observe the effective of repetitive transcranial magnetic stimulation combined interference electrical therapy to intestinal function of patients with spinal cord injury. *Methods:* Randomly divided 30 patients with bowel dysfunction after spinal cord injury into experimental group and control group. All patients were given comprehensive training including anal stretch technology, diet control, exercise training, and manual therapy. The experimental group were given repetitive transcranial magnetic stimulation and interference therapy. After five weeks,detected colon emptying time (colonic transit times CTT) and changes of stool consistency as the standards for assessing the efficacy. *Results:* The colon emptying time have shortened and the stool consistency significantly improved in both groups. The efficient of the experimental group was 82.4%, significantly higher than 40.3% of the control group. The difference was significant ($p<0.01$). *Conclusion:* Repetitive transcranial magnetic stimulation combined interference electric therapy can improve the bowel function and the quality of life of patients with spinal cord injury.

PO-0747

DOCTORS ARE FROM MARS AND PATIENTS ARE FROM VENUS: DIFFERING VIEWS ABOUT SUPRAPUBIC CATHETERIZATION

Julia Patrick Engkasan*, Chirk Jenn Ng, Wah Yun Low
University Malaya, Malaysia

Objective: To compare patients' and doctors' views on suprapubic catheterization (SPC). *Methods:* This study used a descriptive qualitative design that included semi-structured interviews with 2 key-informant groups; patients with spinal cord injury and neurogenic bladder ($n=15$) and healthcare professional who were working in a spinal injury rehabilitation unit ($n=5$). An interview guide was used and the interviews were audio-recorded, transcribed verbatim, checked and analysed using a thematic approach. *Results:* The treatment priorities of doctors and patients differed. While doctors considered SPC as the most appropriate choice for those who needed long term indwelling catheterization, it was the last choice for the patients. The doctors considered SPC as a minor procedure; patients, on the other hand, were concerned about operative complications and pain. Both groups agreed that SPC was superior to transurethral indwelling catheterization as SPC could be changed at home and therefore convenient for the patients. The doctors and patients have different concerns related to SPC; doctors were more worried on preventing complications associated with urethral catheterizations such as urethritis, epididymitis and cystitis whilst patients were concerned about managing blocked catheter and urinary infections. *Implications for rehabilitation:* This study highlights the incongruence between doctors' and patients' views on suprapubic catheterization which must be addressed through effective communication strategy.

PO-0748

COMPARATIVE STUDY ON THE EFFECTS OF WORD ASSOCIATION NAVIGATION TRAINING IMPLEMENTED BY SPEECH THERAPISTS AND LAYPERSONS ON SPEECH FUNCTION IN APHASIA PATIENTS

Zhongli Jiang, Zhihui Tian, Minxing Gao, Li Sun
the First Affiliated Hospital of Nanjing Medical University, Nanjing, China

Objective: The purpose of this study was to explore the effects of word association navigation training (WANT) applied by speech therapists and laypersons improvement of speech function in patients with aphasia. *Method:* Thirty five patients with aphasia were randomly divided into speech therapist with WANT (ST-WANT, $n=9$), speech therapist with word non-association navigation training (WNNT) (ST-WNNT, $n=8$), layperson with WANT (LT-WANT, $n=9$) and layperson with WNNT (LT-WNNT, $n=9$). After baseline tests of Western Aphasia Battery (WAB) and Mini Mental Status Examination (MMSE), all the patients with aphasia received speech training for 10 consecutive days. The naming ability was evaluated with 75 pictures before and after training respectively in all the patients. *Result:* The number of correct responses of the trained words after training with WANT by ST and LT was significantly higher than that after training with WNNT by ST and LT, and the number of correct responses of the expand words after training in the group of LT-WANT was significantly higher than that after training in the group of LT-WNNT. Memory scores were positively correlation with repeating scores in all groups before training. There was significantly positive correlation between the number of correct responses after training and the repeating scores of WAB in training with WANT. *Conclusion:* WANT implemented by speech therapists and laypersons may both effectively improve the naming ability in patients with aphasia. LT is better than ST in vocabulary development ability.

PO-0749

UPPER EXTREMITY TEN DAYS AFTER FIRST OCCASION OF STROKE; PATIENT PERCIEVED STRENGTH CORRELATING TO OBJECTIVE MEASUREMENTS: A PART OF THE SALGOT STUDY

Hanna Persson*, Anna Danielsson, Katharina S Sunnerhagen
University of Gothenburg, Sweden

Objective: To investigate the patient's perception of arm and hand strength ten days after stroke onset and correlate this to objective measurements. *Method:* One hundred patients with stroke and impaired upper extremity within 3 days after onset were investigated from the Stroke Arm Longitudinal Study at the University of GOThenburg (SALGOT). Ten days after onset, the patients estimated their function in the upper extremity on the Stroke Impact Scale; items regarding the strength of the arm and grip in the hand. Upper extremity function was assessed with grip strength measurement JAMAR and the activity scale Action Research Arm Test (ARAT). The correlations were calculated. *Results:* High correlations were found between patient reported strength in the hand and grip strength (JAMAR); rho 0.86 and in the arm; rho 0.81. High correlation were also found between patient reported strength in the hand and the ARAT; rho 0.83 and in the arm; rho 0.79, all with a significant level of $p<0.01$. I*mplication/Impact on Rehabilitation:* The results from the present study indicate that only 10 days after stroke over 80% of the participated patients, can correctly evaluate their strength in impaired limb. The patients' understanding of the capacity is important for the rehabilitation and in planning for the future. Awareness of impaired function in the upper extremity is not previously described in this early stage after a stroke.

PO-0750

EFFECTS OF PHYSICAL EXERCISE ON COGNITIVE FUNCTION: ENDOTHELIAL NITRIC OXIDE SYNTHASE CONTRIBUTING TO AB ACCUMULATION IN SPONTANEOUS HYPERTENSIVE RATS

Liying Zhang[1], Xiquan Hu[1], Jing Luo[1], Lili Li[1], Ruxun Huang[2], Zhong Pei[2]
[1]Department of Rehabilitation Medicine, the Third Affiliated Hospital, Sun Yat-sen University, Guangzhou 510630, China, [2]Department of Neurology, the First Affiliated Hospital, Sun Yat-Sen University, Guangzhou 510080, China

Objective: This study is aimed to examine whether the effect of physical exercise on endothelial nitric oxide synthase (eNOS),is benefit to decrease Aβ accumulation. *Methods:* A total of 30 spontaneous hypertensive rats (SHR) were randomly divided into three groups: physical exercise hypertensive group (PE, $n=10$), which was given running wheel exercise for 3 months, sedentary hypertensive group (SED, $n=10$) and normotensive group (NC, $n=10$), which were fed in standard cages without any special training exercise. The blood pressure (BP) was monitored every week. The rats were sacrificed after Morris water maze test. The specific marker heme oxygenase -1 (HO-1), eNOS, β-site APP-cleaving enzyme 1 (BACE1)/Aβ were checked in endothelial cells, brain cortex and hippocampus. *Results:* BP in PE is much lower than that in SED ($p<0.05$), but higher than that in NC ($p<0.05$). Water maze performance in PE is better than that in SED ($p<0.05$) and a little worse than NC ($p>0.05$). Immunofluorescence analysis and western blotting in SED showed less HO-1/eNOS expression as compared to NC, however, BACE1/Aβ accumulation was significantly up-regulated in endothelial cells, brain cortex and hippocampus. After 12 weeks physical exercise, there were significant up-regulation of HO-1/eNOS expression and down-regulation of BACE1/Aβexpression in endothelial cells, brain cortex and hippocampus. *Implications:* Physical exercise decreases BP and improves cognitive function in hypertensive rats through up-regulation of HO-1/eNOS which may decrease BACE1 expression and Aβaccumulation.

PO-0751

RANDOMIZED CONTROLLED STUDY ON TREATMENT OF THE 5.12 WENCHUAN EARTHQUAKE-CAUSED SPINAL CORD INJURY USING ELECTRO-ACUPUNCTURE

Wenchun Wang[1], Jiachun Lu[2], Qian Wang[1], Rizhao Pang[1], Yu Wang[1], Juanni Zhao[1], Nianyi Sun[1], Yue Jiang[1], Anren Zhang[1]
[1]Department of Rehabilitation, Chengdu Military General Hospital, [2]Department of Rehabilitation, Chengdu Chronic Diseases Hospital

Objective: To examine and evaluate whether triple acupuncture therapy with rehabilitation training may improve the neurologic or functional recovery in the 5.12 Wenchuan earthquake-caused spinal cord injury (SCI) patients, and provide a convenient, safe and effective clinical therapy method on the treatment of SCI. *Methods:* A total of 48 Wenchuan earthquake-caused spinal cord injury patients were recruited into this study, and randomly divided into the triple acupuncture and control groups. In the triple acupuncture group, triple acupuncture therapy via electro-acupuncture device were applied to the Du Mai points, Back Shu points and key muscle motor points every day up to one month. The control group was treated with regular acupuncture therapy using same treatment. Rehabilitation therapy was also provided to the patients during acupuncture therapy. The classification, feel score and motor score of American Spinal Injury Association (ASIA), as well as Improved Bathel index scale were collected and analyzed before and after treatment at different time points. Moreover, the ASIA pin prick score, light touch score, motor score (MS), Modified Barthel Index (MBI) and Functional Comprehensive Assessment (FCA) data were also analyzed. *Results:* Our findings suggested that the patients had significant increase on ASIA pin prick score, light touch score and motor score in two groups after treatment ($p<0.05$). There were no significant differences on ASIA pin prick score, light touch score, motor score, MBI and FCA ($p>0.05$) in two groups. The pin prick score, light touch and motor scores in two groups showed increasing trend, but there was no significant differences. The MBI and FCA in the treatment group showed significant increase compared to the control, and the regression model in the treatment group is better than that of the control during long term treatment. *Conclusions:* Triple acupuncture therapy assisted with rehabilitation training may be significantly improved daily sensation, motion and complicated functions in the 5.12 Wenchuan earthquake-caused SCI patients after treatment.

PO-0752

INVESTIGATION OF PNEUMONIA INCIDENCE AND RELATED FACTOR IN CEREBRAL HEMORRHAGE AND CEREBRAL INFARCTION

Zheng-Yu Gao, Ji-Xia Wu, Miao Tuo
The Afillitated Hospital of Medical College, QingDao University

Objective: To investigate the incidence of pneumonia and compare the related factor. *Method:* Eightynine cerebral hemorrhage patients and one hundred and fiftyeight patients was selected from January 2012 to October 2012 in our department. Age, gender, time of pneumonia occurred, state of consciousness, dysphagia and fasting blood sugar were collected and analyzed. *Result:* Age,time of pneumonia and dysphagia were difference between two groups, but there were not difference in gender,state of conscious, fasting blood sugar between two groups. *Conclusion:* The patients of cerebral hemorrhage is younger, earlier pneumonia occurred, high prevalence fo dysphagia than cerebral infarction. The cause of high prevalence of dysphagia in cerebral patients may be related to the location of hemorrhage.

PO-0753

BOLD-FUNCTIONAL MRI STUDY OF THE BROCA APHASIA AFTER CEREBRAL STROKE

Weihong Qiu[1], Huixiang Wu[1], Zhuang Kang[2]
[1]Department of Rehabilitation Medicine, The Third Affiliated Hospital of Sun Yat-sen University, [2]Department of Radiology,The Third Affiliated Hospital of Sun Yat-sen University

Objective: To evaluate the brain activation in patients with Broca aphasia after cerebral stroke and to explore the mechanisms of Broca aphasia. *Methods:* Seven patients suffering from Broca aphasia after cerebral stroke and five normal middle old aged subjects were recruited in this study. All patients and subjects received block designed picture naming task fMRI. SPM8 software was used to process fMRI data. MNI coordinate and activated intensity of the brain regions were recorded.The distributions, dimensions and intensities of activations were compared and analyzed. *Results:* Visual cortex in the left or/and right hemisphere was activated, but Broca's area and other language associated areas in the left hemisphere were shown partially activated in Broca aphasic, while brain regions associated with vision,language and cognition were activated in all subjects. *Implications:* Compared with normal middle old aged controls, the activation level of language and cognitive regions declined or disappeared in patients with Broca aphasia after stroke, which suggest that the damage to the Broca's area and other language associated areas or remote effects has led to the occurrence of Broca aphasia.

PO-0754

THERAPEUTIC EFFICACY OF HYPERBARIC OXYGEN ON TRAUMATIC BRAIN INJURY IN RATS WITH PROTON MAGNETIC RESONANCE SPECTROSCOPY

Guangyu Shen, Su Liu, Xiubin Wang, Shukuen Deng
Affiliated Hospital of Nan Tong University

Objective: To evaluate the effect of hyperbaric oxygen therapy on the brain metabolic changes of hippocampus after traumatic brain injury in rats by using proton magnetic Resonance spectroscopy (1H-MRS). *Methods:* After being subjected to right traumatic brain injury successfully, Twelve rats were randomly divided into a hyperbaric oxygen group, a traumatic brain injury group,with 6 rats in each group. Six rats were received sham injury. A hyperbaric oxygen group was given hyperbaric oxygen therapy. A traumatic brain injury group and a sham-operated group were feed in normal cages. Three groups were given morris water maze assessment at 3 days, 1 week, 2 weeks after injury. The 1H-MRS was employed to detect the tissue metabolic state of hippocampus at 6 h, 24 h, 48 h, 1 week, 2 weeks after injury. *Results:* A notable decrease in cognitive function in rats after traumatic brain injury.The average scores of morris water maze testing in the hyperbaric oxygen group were significantly better than in the traumatic brain injury and sham-operated groups from the 1st week post-TBI.NAA/Cr and NAA/Ch of ipsilateral hippocampus are all decreasing in the traumatic brain injury and hyperbaric oxygen groups at 6 h, 24 h and 48 h after TBI in comparison to the pre-injury levels. Significant increase in NAA/Cr of ipsilateral hippocampus at the 1st week and 2nd week and in NAA/Ch of ipsilateral hippocampus at the 2nd week in rats after injury in the hyperbaric oxygen group. *Conclusion:* Hyperbaric oxygen therapy can improve cognitive function in rats after traumatic brain injury,and the functional enhancement may be partially attributed to the up-regulation of NAA/Cr and NAA/Ch.On rehabilitation after traumatic brain injury by hyperbaric oxygen and treatment has guiding significance.

PO-0755

THE EFFECT OF CANNABINE WIN55,212-2 IN CUPRIZONE (CPZ) INDUCED DEMYELINATION MODEL

Hongliang Liu, Jianku Mu
Department of Rehabilitation, Southwest hospital, Third Military Medical University

Objective: To explore the treatment effect of cannabine WIN55, 212-2 (WIN) in Cuprizone (CPZ) induced demyelination model in C57 BL/6 mice. *Method:* Take Six-week old male mice, The Normal group fed with normal died everyday. CPZ model fed with mixed diets containing 0.25% Cuprizone, at the second and the fourth week gave WIN55, 212-2 injection, control group get 10% DMSO injection at the same condition. Overall function of mice were observed by their weight. Characteristics of motor function was observed by Rotarod test. The function of myeline on callosal was observed by LFB and immunohistochemical staining,astrocyte was detected by GFAP staining. *Results:* The weight of WIN55, 212-2 injection group was decreased slowly than Concrol group, the rotarod test found that the motor function was weak than Normal mice, but improved than Control group. LFB was observed the demyelination was slow, the same with myelin basic protein (MBP) by immunohischemical. The expression of GFAP is widely on the Control group callosal, but the WIN55, 212-2 group is lesser than control group by immunohistochemical

PO-0756

EFFECT OF EARLY REHABILITATION INTERVENTION ON SHOULDER-HAND SYNDROME FOLLOWING STROKE

Yun Yang
Rehabilitation Medicine in Gentral Hospital in huangshi city, hubei province

Objective: Observating the treatment effect of early rehabilitation on shoulder-hand syndrome following roke. *Methods:* Treatmented 38 patients of shoulder-hand syndrome following stroke with comprehensive rehabilitation treatment measures (Including good limb position put in early stage, Centrality winding oppression finger, Active andpassive movement, Avoiding wrist flexion, Ice therapy and drug therapy) for 12 weeks. The patients were evaluated before treatment and after the whole treatment course. Upper 1imb motor function was evaluated by Simplified Fugl-Meyer Assessment (FMA), pain degree and palm swelling level was evaluated by VisualAnalogueSeale (VAS), activity of daily Iiving was evaluated by. improved Barthel index (MBI). *Implications:* After treatmenting, the upper 1imb motor of 38 patients was significant improved ($p<0.05$). The shoulder pain and palm swelling level was Significant Decreased ($p<0.01$). And the activity of daily Iiving was Obviously increased ($p<0.05$). *Conclusions:* The Curative effect was obvious of early rehabilitation intervention on shoulder-hand syndrome following stroke. The shoulder pain and Joint activity were significant improved.It was contributed to recover the shoulder function.

PO-0757

THE EFFECT OF TRADITIONAL REHABILITATION THERAPY TO AGED AND NON-AGED STROKE PATIENTS

Shasha Fan, Zishan Jia
Hebei Provincial Peoples Hospital

Objective: To explore the different effect of traditional rehabilitation therapy to aged and non-aged stroke patients in the ability of motor function and the activities of daily living (ADL) and analyze the possible reasons. *Method:* Eighty post-stroke patients were assigned to a older age-group (age³ 60, 40 patients) or a younger age- group (age <60, 40 patients). All of the patients were given traditional rehabilitation therapy for 4 weeks. Motor function was assessed using Fugl-Meyer assessment (FMA) and ADL was assessed using Barthel-index (BI). Ability of basic movement was assessed using the ability for basic movement scale (ABMS) pre-treatment and after 2 and 4 weeks of treatment. During the period of treatment, we investigated the daily activities of all the patients using daily activities questionnaire.

Results: At the 2nd and 4th week evaluations, the FMA, BI and ABMS scores in both groups had significantly increased compared with pre-treatment. The ABMS and BI scores in older age-group increased significantly less than the younger age-group at week 2 and 4. There was no significant difference between the two groups in the improvement of their FMA score. However, the ABMS score, older age-group was always significantly less than the younger's from pre-treatment to the 4th weeks. Both total and active movement time of a day of the older age-group was significantly less than the younger's, but passive and active-assistive movement time was significantly longer than the younger's. Implication To summarize the rehabilitation characteristic of aged stroke patients and propose new treatment protocols.

PO-0758

LEG FLEXOR MUSCLE ACTIVITY DURING WHOLE BODY VIBRATION IN INDIVIDUALS WITH CHRONIC STROKE

Lin Rong Liao[1,2], Gabriel Yin Fat Ng[1], Alice Yee Man Jones[3], Marco Yiu Chung Pang[1]*

[1]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, Hong Kong, China,Hong Kong, China, [2]Department of Physiotherapy, Guangdong Provincial Work Injury Rehabilitation Hospital, Guangzhou, China, Hong Kong, China, [3]School of Rehabilitation Sciences, Griffith University, Brisbane, Queensland, Australia, Hong Kong, China

Objective: To determine the influence of WBV intensity on the magnitude of contraction in tibialis anterior (TA) and biceps femoris (BF) muscles when performing different leg exercises among individuals with chronic stroke. *Method:* 32 people with chronic stroke were tested. Each subject was exposed to three WBV conditions: (1) no WBV, (2) low-intensity WBV [20Hz, peak acceleration: 0.96 unit of gravitational constant (G)], and (3) high-intensity WBV (30 Hz, 1.61 G) while performing 8 different static exercises involving upright standing, semi squat, deep squat, weight-shifted-forward, weight-shifted-backward, weight-shifted-to-the-side, forward lunge and single-leg-standing. The levels of the TA and BF muscle activity bilaterally were recorded with surface electromyography (EMG), and expressed as percentages of maximal voluntary contraction. Analysis of variance (ANOVA) was used to compare the EMG data of each muscle across the different conditions. *Results:* ANOVA revealed a significant effect of WBV intensity ($p<0.001$) in TA and BF on both sides. Post-hoc contrast analysis showed that the high-intensity protocols induced significantly higher EMG amplitude in all four leg muscles than the low-intensity protocol and control condition ($p<0.001$). Among the exercises studied, weight-shifted-backward and weight-shifted-forward exercises, when combined with high-intensity WBV, resulted in the highest EMG amplitude in TA and BF muscles, respectively. *Implications/Impact on rehabilitation:* Leg flexor muscle activity can be increased significantly by adding WBV during exercise, and higher WBV intensity is related to higher EMG amplitude. WBV therapy may thus be a useful method for strengthening lower limb flexor muscles in individuals with chronic stroke but will require further study.

PO-0759

VOL.1 CLINICAL EFFECTS OF A COMBINED PROTOCOL OF LOW-FREQUENCY REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (RTMS) AND AN INTENSIVE REHABILITATION PROGRAM ON GAIT AND LOWER-LIMB MOTOR FUNCTION IN PATIENTS WITH POSTSTROKE HEMIPARESIS

Hiroaki Harashima[1], Yutaka Yoshida[1], Shigeto Watanabe[1], Yusuke Haga[1], Masaya Imai[1], Miki Kojima[1], Yoshihide Ishiduka[1], Kouichi Kawada[1], Hisaaki Mori[1], Shihomi Sekiya[1], Miharu Takahashi[1], Yumi Toyama[1], Narumi Matuoka[1], Satoshi Miyano[1], Masahiro Abo[2]

[1]Tokyo General Hospital,Japan, [2]The Jikei University School of Medicine, Japan

Purpose: We reported effectiveness of combined protocol therapy for 132 chronic post-stroke patients at 3rd AOSPRM in June 2012. The aim of this study was to clarify the safety and feasibility of our combined protocol therapy for a large number of chronic stroke patients. This combined protocol therapy includes rTMS and intensive Physical therapy (gait training, lower limb muscle strengthening and facilitation) and Occupational therapy (upper limb facilitation, ADL training and self training). *Materials and Methods:* The subjects were 310 patients (mean age; 60.6 ± 12.8 y.o., mean period from the onset of stroke; 60.7 ± 64.6 months) with hemiparesis after stroke.The combined protocol therapy which is made of 15-day hospitalization with 22 treatment sessions with low-frequency rTMS, face to face treatment, and self training to all patients.The face to face treatment consists of both individual OT and PT. Gait and lower limb motor functions and upper-limb motor functions were evaluated on the day of admission and at the discharge similarly. *Results:* All patients completed the combined protocol therapy without any adverse effects. After the completion of the protocol, the scores of 10-meter maximum walking speed, the timed up and go test, the dynamic gait index and the functional balance scale improved statistically. In addition, Fugl-Meyer assessment and the Wolf Motor Test showed significant improvements in upper-limb motor functions, too. *Conclusion:* Our combined protocol therapy is a safe and effective approach for patients with chronic post stroke hemiparesis.

PO-0760

OLD AGE AND DIASTOLIC HYPERTENSION AS THE INDEPENDENT RISK FACTORS OF ORTHOSTATIC HYPOTENSION IN HOSPITALIZED STROKE PATIENTS

Yen Chun Chen, Ta-Sen Wei*, Wen-Yo Chen

Department of physical medicine and rehabilitation, Changhua Christian Hospital, Chinese Taipei

Objective: Orthostatic hypotension is one of the most common comorbidities among stroke patients. It could result in general weakness, dizziness and syncope, which may bring unfavorable complications such as accidental falls, angina, and recurrent stroke. This prospective study aimed to identify the risk factors of orthostatic hypotension in hospitalized stroke patients. *Method:* A total of 249 acute stroke patients (147 men), aged 69.2±11.7 years, were enrolled. Parameters measured included demographic data, medical history, Mini-Mental Status Examination (MMSE), Geriatric Depression Scale (GDS), Functional Independence Measure (FIM) scale, and blood pressure in supine and upright position (by tilt table test, TTT). The multivariate logistic regression analysis was used to identify independent risk factors of orthostatic hypotension. *Results:* Orthostatic hypotension was present in 69 (27.7%) patients. Age ≥65 (adjusted odds ratio [aOR], 1.97; $p=0.044$) and supine diastolic hypertension (aOR, 1.39; $p=0.033$) were the independent risk factors of orthostatic hypotension. Patients with diabetic medication (aOR, 1.98; $p=0.055$) and constipation (aOR, 3.10; $p=0.095$) were prone to have positive correlation with orthostatic hypotension. *Implications/Impact on Rehabilitation:* Old age and higher diastolic blood pressure were independent risk factors of orthostatic hypotension in hospitalized stroke patients. Using diabetic medication and constipation also contribute to increased risk. We recommend that hospitalized stroke patients with above risk factors should receive screening TTT especially while starting the rehabilitation training to prevent unexpected events.

PO-0761

EXPERIMENT RESEARCH OF INSTANT HYPERBARIC OXYGEN ON PERMEABILITY OF BLOOD-BRAIN BARRIER OF PERSISTENT CEREBRAL ISCHEMIC RATS

Min Yu, Zhiqiang Zhang
Shengjing Hospital of China Medical University

Objective: To observe change of permeability of blood-brain barrier at different time point by preparing rat model of persistent cerebral ischemia with instant hyperbaric oxygen therapy. *Method:* 26 healthy Wistar rats were divided randomly into 3 groups: 6 in sham-operated group, 10 incerebral ischemia group, 10 inhyperbaric oxygen group. Middle cerebral artery occlusion (MCAO) model was established by Zea-Longa with some modifications. Rats in hyperbaric oxygen group were given hyperbaric oxygen therapy (2.0 ATA, 100% oxygen for 1 h) at the same time of thread insertion. Rats in sham-operated group and cerebral ischemia group were not given hyperbaric oxygen therapy. The BBB permeability was quantitatively evaluated by extravasation of Evans blue as a marker of albumin extravasation. 2% Evans blue (2 ml/kg) was injected intravenously for 2 h before ventricular perfusion. After 4 h and 12 h, rats were sacrificed and brains were removed. The hemispheres of brain were separated and weighed accurately, then immersed into formamide at 60° for 24 h. Optical density was determined with spectrophotometry at 620 nm and Evans blue extravasation was calculated. *Results:* The average content of Evans blue in cerebral ischemia group at 4 h was 6.15±1.81 ug/g brain tissue; the content in hyperbaric oxygen group was 3.38±1.26 ug/g. There was significant difference between two groups. The average content of Evans blue in cerebral ischemia group at 12 h was 4.64±0.71 ug/g brain tissue; the content in hyperbaric oxygen group was 2.87±0.63 ug/g. There was significant difference between two groups. *Implications:* Instant hyperbaric oxygen may decrease permeability of blood-brain barrier and maintain integrity of blood-brain barrier.

PO-0762

BRAIN REORGANIZATION ASSOCIATED WITH LEG CYCLING MOTION TRAINING IN A PATIENT WITH CHRONIC STROKE

Yi-Lun Chou[1], Hsiu-I Chen[2], Sharon Chia-Ju Chen[3], Miao-Ju Hsu[1,4], Tsung-Yu Tsai[5], Jau-Hong Lin[1,4]*
[1]Department and Graduate Institute of Neurology, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan,Chinese Taipei, [2]Department of Physical Therapy, HungKuang University, Taichung, Taiwan,Chinese Taipei, [3]Department of Medical Imaging and Radiological Sciences, Kaohsiung Medical University, Kaohsiung, Taiwan,Chinese Taipei, [4]Department of Physical Therapy, Kaohsiung Medical University, Kaohsiung, Taiwan,Chinese Taipei, [5]Department of Rehabilitation Medicine, Kaohsiung Medical University Chung-Ho Memorial Hospital, Kaohsiung, Taiwan, Chinese Taipei

Objective: Leg cycling motion training is commonly used in rehabilitation to facilitate motor recovery for patients with stroke and has been proven to be effective. However, the underlying mechanism is not fully understood. The aim of this study was to investigate the change of brain activations after leg cycling motion training in a patient with chronic stroke. *Methods:* A forty-year-old female subject with mild right hemiparesis (Fugl Meyer assessment of lower limb: 29/34, Functional ambulation category: level 5) received leg cycling motion training five times a week for 4 weeks. We examined brain activations and lateralization with fMRI in the primary sensorimotor cortex (SMC), supplemental motor area (SMA), and cingulated motor area (CMA) during active ankle dorsi-flexion before and after the intervention. In addition, walking ability was assessed by 6-min and 10-m walking tests. *Results:* Walking ability improvements and brain activation changes (lateralization in SMC, SMA and CMA) were found after intervention. *Implications on Rehabilitation:* Leg cycling motion training may improve walking ability and facilitate brain reorganization in SMC, SMA and CMA for stroke patients. Future studies with more subjects and a randomized control design are suggested to further confirm the result of this case study.

PO-0763

SLEEP-DISORDERED BREATHING IN CONVALESCENT STROKE PATIENTS

Rie Kamigaichi[1], Yohei Otaka[2]*, Daisuke Matsuura[1], Akie Nakadate[1], Yohei Tomioka[1], Takeshi Kutsuna[1], Kaoru Honaga[1], Toshinari Kazuta[1], Kunitsugu Kondo[1]
[1]Tokyo Bay Rehabilitation Hospital, Chiba, Japan,Japan, [2]Keio University School of Medicine, Tokyo, Japan

Objective: It has been reported that sleep-disordered breathing (SDB) is a risk factor for stroke and may inhibit poststroke recovery. However, the prevalence of SDB in stroke patients at convalescent phase has not been well explored. In this study, we investigated the prevalence of SDB and its associated factors in convalescent stroke patients. *Methods:* We consecutively enrolled stroke patients admitted to a convalescent rehabilitation ward between August 2011 and October 2012 and investigated the frequency of SDB with a portable screening device. SDB was defined as respiratory disturbance index (RDI) of ≥5. We also investigated factors associated with SDB severity using multiple regression analysis. *Results:* We evaluated 249 patients (mean age 66.3±12.6 years, mean duration after stroke onset 49.8±29.5 days) in 416 admitted stroke patients. The types of stroke were as follows: 138 patients with ischemic stroke, 100 with intracerebral hemorrhage and 11 with subarachnoid hemorrhage. The mean RDI was 16.7±12.5 and SDB was found in 218 patients (87.5%). Multiple regression analysis revealed that SDB was significantly associated with age, body mass index and severity of paralysis. *Implication/Impact on Rehabilitation*: The majority of convalescent stroke patients had SDB. It is possible that treating SDB could improve clinical recovery in patients with stroke. Therefore, it is important to evaluate SDB in convalescent stroke patients.

PO-0764

CORRELATION STUDY AND NURSING STRATEGY BETWEEN CONSTIPATION AND COGNITIVE IMPAIRMENT AFTER STROKE

Li Wang[1], Jing-Xin Wang[1], Xiao-Mei Zhang[1], Li Guo[1,2], Xiao-Yan Sheng[1,2], Wen-Jing Cao[1,2], Wen-Zhi Cai[1,2]
[1]Nan fang hospital ·southern medical university, guangzhou, China., [2]School of nursing ·southern medical university, guangzhou, China.

Objective: To understand the status of cognitive dysfunction among new onset constipation after stroke and to explore the relationship between them. *Methods:* With a self-designed questionnaire, the general information of 723 inpatients from 10 hospitals inGuangzhouwere collected, including general demographic information, stroke situation, defecation situation and Mini-mental State Examination (MMSE) etc. *Results:* The incidence Of new-Onset constipation, cognitive dysfunction (PSCD) after stroke was respectively 34.6% and 62.4%. the rates Of constipation patients with cognitive dysfunction were higher than patients without cognitive dysfunction, and the difference in directional force ($p<0.001$), memory ($p=0.001$), attention and calculation force ($p<0.001$), reading ($p<0.001$) and expression ($p<0.001$) was statistically significant respectively ($p<0.001$), during expression is was the most relevant. the difference in the incidence of constipation among different cognitive dysfunction groups was statistically significant ($p<0.001$), and them are were positive correlation, compared with normal cognitive function, the light, medium and severe cognitive dysfunction is 1.519, 2.879, 3.064 times respectively. *Conclusion:* Medical staffs need to be alerted to the possibility that patients with impaired cognitive function may be at greater risk of constipation. The preventive and treatment measures should be emphasized in to improve patients' cognitive function.

PO-0765

SLEEP APNEA HYPOPNEA SYNDROME AND SWALLOWING DISORDERS AFTER STROKE

Lixia Zhang, Tong Wang
Jiangsu province peoples hospital rehabilitation medicine department

obstructive sleep apnea hypopnea syndrome is a high incidence after stroke, and has a serious negative effect on the functional recovery of stroke patients. Dysphagia is a higher incidence of complications after stroke, both dysphagia and OSAS have a common anatomical basis and are related with pharyngeal muscles. The occurrence of OSAS after stroke is related to swallowing disorder. therefore, dysphagia therapy to improve the ventilation function can be used as a new approach in the treatment of OSAS.

PO-0766

THE ROLE OF ARYL HYDROCARBON RECEPTOR IN EXPERIMENTAL AUTOIMMUNE NEURITIS

Ying Yin, Lehua Yu, Gongwei Jia
The Second Affiliated Hospital of Chongqing Medical University, Chongqing, China

Objective: To investigate the expression of aryl hydrocarbon receptor (AhR) in sciatic nerves of experimental autoimmune neuritis (EAN) rats, and the therapeutic benefits and mechanism of AhR water-soluble ligand VAF347. *Method:* The demyelination and accumulations of AhR+, IL-17+, Foxp3+, CD3+ and ED1+ cells in sciatic nerves of EAN rats with or without VAF347 treatment were observed. The expression of IL-17, Foxp3, IFN-γ and TGF-β1 in peripheral blood and inguinal lymph nodes were investigated by flow cytometric analysis and quantitative real-time PCR. Normal or TGF-β1 inhibited rats received CD4+T cells purified from VAF347- or PBS-treated rats after immunization to demonstrate its possible mechanism. *Results:* The clinical scores and demyelination were greatly reduced in VAF347-treated rats. The accumulations and percentages of AhR+, IL-17+, CD3+ cells in sciatic nerves were significantly decreased by VAF347, while the ED1+ and Foxp3+ cells represented higher percentage and lower accumulation. VAF347 suppressed IL-17+ cell accumulations, but improved Foxp3+ cell accumulations in peripheral blood and inguinal lymph nodes. Cells from VAF347-treated rats secreted higher amounts of TGF-β1 and Foxp3 and lower amounts of IL-17 and IFN-γ in inguinal lymph node than PBS-treated rats. Regulatory T cells from VAF347-treated rats protected normal rats from EAN, but were ineffective in rats harboring T cells unresponsive to TGF-β1. *Implications:* Foxp3+ cells induced by the activation of AhR with VAF347 may suppress the EAN inflammation process by a TGF-β1-dependent mechanism. VAF347 could be considered as a promising option in the therapy of human autoimmune-mediated neuropathies.

PO-0767

CASE REPORT: EFFECTS OF SWALLOW TRAINING ON DYSPHAGIA PATIENTS WITH TONGUE CANCER

Mei-Hui Chen, Lo-Yun Yang*, Simon F. Tang
Chang Gung Memorial Hospital, Linkou, Physical Medicine and Rehabilitation, Chinese Taipei

Objective: The Chinese said: "To Eat: The First and Foremost Priority In Life.", means "Eating" is not only satisfy the desire to physiology and to supply the nutrition, but also important in interpersonal relationship of social life. Therefore, when the person can't have normal eating from mouth cause by the organic, which is a severe problem of psychology life as well as physiology disability. This study aimed to two patients who had dysphagia and feeding problems cause by tongue cancer after glossectomy, radical neck dissection, and CCRT are improving by speech-language pathologist's swallowing rehabilitation training for six months. *Method:* We disused two tongue cancer patient who had treated by glossectomy, radical neck dissection, and CCRT. Patients undergoing glossectomy and submental resections have oral cavity and pharyngeal stage disturbance. The patient who swallowing deficits result trigeminal nerve (CN V), facial nerve (CN VII), and glossopharyngeal nerve (CNIX), provides general sensation to the posterior third of the tongue and motor function to the pharyngeal constrictors. The vagus verve (CN X), and hypoglossal nerve (CN XII) five cranial nerves are affected. Speech-language pathologist used Stretch Exercises (Isometric Neck Exercise) (M. Cl. Sc., 2007) to increased patients' neuromuscular strength and coordination, which are need for swallowing. We found the consistence change of food, which patients need, fond, and safety, convenience to get is also an important manner for effective swallowing rehabilitation training. The patients accepted once per week, total 24 times rehabilitation training. And widely used procedure is a "Videofluoroscopic Swallowing Study" assessment of swallowing function. Other evaluated the changes about the quality of life by questionnaire "Quality of Life in Swallowing Disorders". (Anna Karinne Costa Bandeira, 2008) *Results:* These two patients could drink the can of milk, and the liquid diet before therapy. After therapy, they could eat normal food, which is diversification, and convenience to get. Not only satisfy the desire to physiology and to supply the nutrition, but also let they enjoy eating. Besides, they are more active in their family relationship. By questionnaire "Quality of Life in Swallowing Disorders", we found that the effect of swallowing rehabilitation training increasing the patients' confidence of life, improving the interaction of social life. These aspects help patients could make a whole new life, and getting better quality of life. *Implications/Impact on rehabilitation:* This study confer the effect on the two young patients with tongue cancer, whose physiology and psychology clinical performances are improving by use Stretch Exercises (Isometric Neck Exercises) and consistence change of food for swallow rehabilitation training. Hope we can use these maneuver and manner extensively on head and neck patients.

PO-0768

CLINICAL OBSERVATION ON THE COMBINED REHABILITATION OF MIDDLE OR SEVERE TRAUMATIC BRAIN INJURY

Jintao Fan[1], Linying Zhang[2], Yan Zhang[1], Dongmei Suo[1], Fan Fu[1], Wei Xu[2], Xin Yang[2]
[1]TianJin Medical University General Hospital, [2]Tianjin Huanhu Hospital

Objective: In this study, we focused on the effects of combined rehabilitation on the functional disturbance including consciousness, motor function and cognition of 103 patients with Traumatic brain injury. *Methods:* The functions of all cases were evaluated before, during and after treatment to assess the degree of functional disturbance and recovers. Evaluation contents and methods according to standard methods, such as GCS, Valpar method, MMT, MBI, FIM, etc. The rehabilitation treatments include the acute period (patients were in the coma and unconsciousness) and recovery period, in 6 months during hospitalization. According to the difference of every patient, daily rehabilitation training was adopted, in proper and gradual sequence, and everyone insist on it. *Results:* Consciousness, motor function and cognition of 103 patients with Traumatic brain injury all were significantly improved after treatments. *Implications:* In the rehabilitation treatment and training, various rehabilitation technological development, just like the neurodevelopment treatment,motor relearning program, multisensory input method, lay a good foundation for the rehabilitation. And advanced by reliable equipments are guarantees to enhance effects of rehabilitation. we can get a preliminary understanding that the brain injury rehabilitation have great potential for recovery.

PO-0769

ELECTROACUPUNCTURE ENHANCES RECOVERY OF LEARNING AND MEMORY AND RESISTANCES TO APOPTOSIS IN HIPPOCAMPUS AFTER EXPERIMENTAL CEREBRAL HYPOPERFUSION

Xiaohua Han, Xiuxiu Zhao, Fang Liu, Feng Guo, Xiaolin Huang
Department of Rehabilitation Medicine, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, P.R. China

Objective: To investigate the effect of electroacupuncture (EA) on the recovery of learning and memory and its possible mechanism after experimental cerebral hypoperfustion. *Method:* Thirty adult male Sprague-Dawley rats were randomly divided into five groups: the sham-operated group, the model group (experimental cerebral hypoperfusion models of bilateral common carotid artery occlusion (2VO)), the EA group (EA on acupoints of GV20 and GV14 applied for 7 consecutive days after operation), the EA+NS (normal saline) group and the EA + H89 (a highly selective protein kinase A inhibitor) group, with 6 rats in each group. After intracerebroventricular administration of NS or H89 in the latter two groups respectively, 2VO models were established. Morris water maze task was performed from the 5th to 7th day of treatments. The expression of pCREB, Bcl-2 and Bax in hippocampus was evaluated by Western blot technique on the 7th day. *Results:* In EA group, the average latency and the expression of Bax significantly decreased and the expression of pCREB and Bcl-2 significantly increased compared with that of the model group. However in EA+ H89 group, the average latency and the expression of Bax significantly increased and the expression of pCREB and Bcl-2 significantly decreased compared with that of the EA+NS group. *Implications on rehabilitation:* Our results suggest that EA may enhance the function of learning and memory via the processes of anti-apoptosis by activation of PKA/CREB signaling pathway. The finding provides evidence to support the clinical application of EA.

PO-0770

LONG-TERM PROGNOSIS OF STROKE SURVIVORS IN A REGIONAL REHABILITATION HOSPITAL IN HONG KONG

Kwok-Pui Leung, Alvin Tam, Mandy Leung, Leonard Li*
Tung Wah Hospital, Hong Kong,Hong Kong, China

Objective: The long-term prognostic data of stroke patients who have survived in the acute phase and gone through the rehabilitation training program in Hong Kong are scarce. The data of the Tung Wah Hospital (TWH) stroke registry of a group of first-ever stroke patients at 18 months after the onset of stroke are described. *Method:* A retrospective cohort of 62 first-ever stroke patients who were admitted into TWH in the first quarter of 2010 was identified. Data on stroke recurrence, mortality at 12 and 18 months after stroke onset were described and determinants of the prognosis were analysed. *Results:* There were 38 female (61%) and 24 male (39%) patients with an overall mean age of 74. Majority suffered from ischaemic strokes (82%) and haemorrhagic strokes contributed the rest of 18 %. Mortality at 12 months was 11/62 (17.7%) and at 18 months was 15/62 (24.2%). Patients who died at 12 and 18 months were significantly older (81.6 vs 72.4, $p<0.01$), suffering from cortical strokes, and had background hypertension and atrial fibrillation. Subtype and side of stroke as well as DM were not associated with increased mortality. 7 of 62 (11%) suffered from recurrent stroke by 18 months after onset. Elder age, presence of DM, hypertension, and atrial fibrillation were significantly associated with stroke recurrence. *Implications:* The mortality and recurrence rates after stroke by 18 months were not low among stroke survivors. Prognostic determinants identified in this study may help to better manage this group of patients.

PO-0771

ENHANCEMENT OF THE POSTURAL STABILITY AND STRENGTH OF LOWER EXTREMITY AFTER ANODAL TDCS IN HEMIPLEGIC STROKE PATIENTS

Min Kyun Sohn, Young Wook Kim, Bong-Ok Kim
Department of Rehabilitation Medicine, Chungnam National University Hospital, Daejeon, South Korea, Korea

Objective: To evaluate that the anodal tDCS over the lesioned leg motor cortex can enhance the strength and postural stability of hemiplegic stroke subjects. *Material & Methods*: Eleven ambulatory hemiplegic patients were included in the study. Anodal or sham stimulation on the lesioned motor cortex of lower extremity was delivered for 10 min. The stimulation intensity was 2 mA. The experimental period was three days. The order was counter-balanced among subjects. The static postural stability with eye open and closed, and the isometric strength of hemiplegic quadriceps were measured before and after each stimulation session. Repeated measure ANOVA were used to determine the statistical significance of improvement of postural stability and strength. *Result:* There was significant improvement for overall stability index with eye open and closed after anodal tDCS ($p<0.05$). And the isometric strength of quadriceps was increased after anodal tDCS ($p<0.05$). However, the postural stability and quadriceps strength were not changed after sham stimulation. *Conclusion:* The anodal tDCS might be used in the hemiplegic stroke patient for the purpose of improvement of balance. Further study is needed to evaluate the mechanism of improvement of postural stability after tDCS.

PO-0772

HYPOTHALAMIC-PITUITARY-THYROID FUNCTION AND ITS RESPONSES TO FLUOXETINE IN POST-STROKE DEPRESSION (PSD) PATIENTS

Chunlin Gao, Jialing Wu, Linying Zhang, Wanjun Wang
Tianjin Huanhu Hospital

Objective: To investigate hypothalamic-pituitary-thyroid (HPT) axis function and its responses to fluoxetine in post-stroke depression (PSD) patients. Methods The sample was comprised of consequent hemiplegic patients after their first stroke. After HAMD scores screening at day 21, 46 subjects were divided into no-PSD stroke group (29 cases) and PSD group (20 cases). Thyroid function was determined at day 0, 1, 7, 14, 21 and 3 months, TRH stimulation test were performed at day 7, before and after fluoxetine administration. *Results:* At day 0 to 14, stroke patients presented decreased FT3 and increased serum TSH ($p<0.05$), and PSD patients presented more lower FT3, TSH levels and higher FT4 levels ($p<0.05$), hence, thyroid function in stroke patients had returned to normal. The responses to TRH in PSD patients were lower at day 7 ($p<0.05$). HAMD scores were correlated with TSH level changes and TSH0~30 after TRH stimulation in PSD group closely ($p<0.01$). A lower TSH level after TRH stimulation was found in PSD patients who took fluoxetine than PSD patients who did not ($p<0.05$). *Implications:* PSD patients presented a long and severe HPT axis function inhibition, due to TRH deficiency, which may be improved by fluoxetine.

PO-0773

CHALLENGES IN REHABILITATION OF A PATIENT WITH PRIMARY LATERAL SCLEROSIS

Raghu Maddela
Montefiore Medical Center, United States

Case Description: 53 year old Jamaican female who was admitted for work up of increasing weakness in all her extremities and dysarthria. On examination she had increased muscle tone throughout. Sensation and coordination were intact. After complete neurological workup she was diagnosed with Primary Lateral Sclerosis after other etiologies were excluded and transferred to the acute rehab floor. Patient was started on an intensive rehab program and was started on baclofen to help with her spasticity. Rehabilitation goal was directed to symptom management and psycho-social support, patient education and cooperation being key to attain maximum functional independence. *Results:* She required maximum assistance prior to the initiation of the rehab program, but after 2 weeks of therapy, she was able to ambulate 75 feet with slow ataxic gait pattern which enabled her to be discharged to home with family support. *Conclusion:* Primary Lateral Sclerosis is a group of rare, degenerative, neurological disorders that causes the degeneration of the upper motor neurons in the brain and spinal cord. While PLS may be initially confused with ALS, the lack of lower motor neuron involvement and the relatively normal life spans for these patients are important issues to differentiate the two diseases. Rehab interventions play a major role for treatment for these patients since there are limited medical options. The physiatrist should be well aware of this disorder and the need for special therapy protocols to help improve function and quality of life.

PO-0774

CHANGE IN BLOOD PRESSURE AND HEART RATE OF ACUTE BRAIN STROKE PATIENTS OF PRE-REHABILITATION TREATMENT AND POST-REHABILITATION TREATMENT

Wen-Hai Xiang
Nanxiang Hospital of Shanghai

Objective: To observe the effect of rehabilitation therapy on blood pressure and heart rate (HR) of acute brain stroke patients, further investigate the safety of rehabilitation therapy in acute brain stroke. *Methods:* 53 patients with acute stroke were recruited into this study, cerebral infarction was 37 cases, and cerebral hemorrhage was 16 cases. Measure blood pressure and heart rate before, 5 min, 10 min, 15 min after the treatment that including the bedside passive motion and the low frequency electrical stimulation. The heart rate during treatment was controlled within 110-125 times per min. *Results:* There was no significant difference between the cerebral infarction and cerebral hemorrhage patients (p>0.05). Also there was no significant difference in the low frequency electrical stimulation (p>0.05). But there was an increasing trend but less statistic significance on the blood pressure after 5 min passive motion comparing with that before treatment (p>0.05), and the blood pressure returned to that before treatment after 15 min. *Conclusion:* with a limited effects on blood pressure and heart rate,the rehabilitation treatment such as passive motion and low frequency electrical stimulation for acute brain stroke patients is safe.

PO-0775

EFFECT OF PROPRIOCEPTION DISTURBANCE ON ACTIVITIES OF DAILY LIVING (ADL) AFTER STROKE

Jinglong Liu, Tianlong Guo
Heilongijang Province 5th Hospital Neurological Rehabilitation Center.Harbin, China

Objective: To evaluate the effect of proprioception disturbance on basic activities of daily living (B-ADL) after stroke. Methods 67 stroke patients consecutively admitted to the HeilongjiangProvinceRehabilitationHospitalwere classified upon admission as having proprioception disturbance (group A; n=32; 47% of the entire sample) or not having such disturbance (group B; n=35; 53% of the sample). By 'thumb finding' test, 'heel-knee-shin' test and 'up or down' test,we examined the proprioception. When 2 of the 3 tests are abnormal or more,we thought the patient had proprioception disturnbance. Both groups received standard rehabilitation treatment including daily physiotherapy, occupational therapy, traditional Chinese medicine and other therapy in accord with individual needs. The Modified Barthel Index (MBI) was used to assess patients' capacity in B-ADL. Assessment was done upon admission to rehabilitation and 8 weeks afterwards. *Results:* Mean MBI scores at admission were 28.61±11.32 and 31.42±13.71 for groups A and B, respectively. At this point, the difference between the groups did not reach statistical significance (t=1.87, p>0.05). After 8 weeks of intensive rehabilitation treatment, the MBI scores of both groups improved significantly (t=3.11, p 43.23±10.82, group B - 62.73±15.61; p<0.05) *Conclusion:* The existence of proprioception disturbance affects significantly the functional outcome of stroke patients. In view of the importance of this factor there is place for an effort to develop means for quantitative evaluation of the magnitude of the proprioception disturbance and therapeutic means aimed specifically to restore this sensory deficit.

PO-0776

WORKING PERIOD OF WOMEN LABOUR IN CIGARETTE FACTORY AND INCIDENCE OF CARPAL TUNNEL SYNDROME: A DESCRIPTIVE STUDY

Yose Waluyo[1,2], Imam Soebadi[1,2], Meisy Adriana[1,2]*
[1]Physical and Rehabilitation Medicine Dr.Soetomo General Hospital Surabaya Indonesia,Indonesia, [2]School Of Medicine Airlangga University,Indonesia

Background: Indonesia is one of the largest tobacco market in the world. WHO has ranked indonesia third in the world for total number of smokers today with 1.051 factories that employ milions of people in Indonesia. Kretek is original cigarette from indonesia that is still manually made by man and not machine. Every labour has been given target to make thousands of cigarettes per day that force them to do a repetitive movement 8 h a day, six days a week, especially using their wrist. This condition lead them into a high risk of entrapment of the median nerve. *Method:* A descriptive study was performed to review new CTS patients (women labour) consulted from cigarette factory to P&RM Installation dr. Soetomo General Hospital during the period of january 1st, 2012 to December 31st and found that in certain period of time, there is increasing risk that they will get CTS. *Results:* During the period, 22 new CTS patients were registered. The average age is 42 years old and the average working period is 18 years 8 months. *Implication:* These data have shown us the period of women labour in cigarette factory until they get risk of CTS. P&RM has an important role not only to cure the labour when they got CTS but also to design a program to prevent CTS, such as strengthening and streching exercise before and during working time.

PO-0777

IDENTIFYING THE BEST ULTRASONOGRAPHIC PARAMETER FOR DIAGNOSING ULNAR NEUROPATHY AT THE ELBOW

Yuka Kurihara[1,2], Toshiaki Furukawa[2], Yui Ishi[3], Noboru Takanashi[4], Kozo Hanayama[5], Yoshihisa Masakado[5]
[1]Department of Rehabilitation Medicine, Shonan tobu general Hospital,Japan, [2]Department of Rehabilitation Medicine, Tokai University Hachioji Hospital,Japan, [3]Department of Clinical laboratory, Tokai University Hachioji Hospital,Japan, [4]Department of Clinical laboratory, Tokai University Hospital,Japan, [5]Department of Rehabilitation Medicine, Tokai University school of Medicine, Japan

Objective: Several ultrasonographic (US) parameters have been proposed for diagnosing ulnar neuropathy at the elbow (UNE). A recent

study reported that the cross-sectional area (CSA) and swelling ratio (SR) are good parameters for UNE diagnosis. This study aimed to determine which of these 2 parameters is most useful. *Method:* We performed US examination on 48 arms of 42 patients (10 women and 32 men) who had no history of trauma or surgery, were clinically diagnosed with UNE, and showed no evidence of radiculopathy and polyneuropathy, as indicated by either electrodiagnostic examination or magnetic resonance imaging. We evaluated the CSAs at 10 sites from the wrist to the axilla along the ulnar nerve and calculated the SRs using these CSAs. The sensitivity and specificity of each parameter was determined by analyzing a receiver operating characteristic (ROC) curve. *Results:* The largest CSA between 2 cm distal to the medial epicondyle (ME) and the ME had the largest area under the curve (AUC). Its AUC was 0.924, with a sensitivity of 62.5% and specificity of 98.3% at a cut-off value of ≤10.5 mm^2. The AUCs for the CSA at the ME and for the ME:mid-humerus SR were 0.912 and 0.837, respectively. *Implications/Impact on Rehabilitation:* Our study suggests that the largest CSA between 2 cm distal to the ME and the ME is the best US parameter for diagnosing UNE, with reasonable sensitivity and specificity.

PO-0778

TRAUMATIC BRAIN INJURY: REHABILITATION

Tatiane Lopes Teixeira De Almeida*, Lilian Falkenburg, Roberta Zanardi Ruiz Nascimento, Cristina Arruda Reis, Viviane Carolina Sales, Tatiana Pedroso, Rebeca Boltes Cecatto, Linamara Rizzo Battistella

Clinical Research Center. Institute of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objective: Offering information regarding treatment and rehabilitation of people with craniocerebral trauma sequelae. *Method:* Pubmed database search of randomized clinical trials was conducted using P.I.C.O. strategy (P.I.C.O. stands for: Patient, Intervention, Comparison and Outcome). The following MeSh terms were the search strategy: (Brain Injury or Traumatic Brain or Head Injury) and (Sensory Stimulation or Sensory Rehabilitation) and (Physical Modalities or Rehabilitation or Early Intervention) and (Cognitive Therapy or Cognitive Rehabilitation) and Virtual Reality OR Virtual Environment or Virtual Rehabilitation) and (Orthotic Devices or Lower Extremity). *Results:* Twenty one randomized trials and two systematic reviews were included. There is no specific conclusion if sensory stimulation on adult patients with traumatic brain injury (TBI) improves the conscience level. Didactic cognitive rehabilitation improves the functional performance in adults with TBI sequelae. Virtual reality use in upper limb rehabilitation is not fundamented and its application must be careful. TBI patients that used neuroprosthesis after a four-week adaptation and continually for another four weeks showed an improvement to the gait asymmetry in balance, reduction in step time and more symmetric weight discharge when compared to the use of ankle foot orthosis. *Implications/Impact on rehabilitation:* TBI patients rehabilitation should be developed by a multiprofessional team once this rehabilitation includes physical, mental, affective, and social domains.

PO-0779

LONG-TERM EFFECT OF EARLY AEROBIC TRAINING ON THE LIVING ABILITIES OF NON-ELDLY STROKE HEMIPLEGIA: A PILOT STUDY

Zun Wang[1], Hongjuan Fan[2], Sheng Wang[3], Xiang Wang[3], Lei Wang[1], Tong Wang[3]

[1]Nanjing University of Traditional Chinese Medicine,Nanjing,China., [2]The Affiliated Hospital of Jiangsu University,Zhenjiang,China., [3]The First Affiliated Hospital of Nanjing Medical University, Nanjing, China.

Objective: We studied the effect of early aerobic training on the long-term living abilities of non elderly stroke hemiplegia under 60 years old,especially their living abilities,activity level and ambulation capacity one year after intervention procedure. Methods Forty stroke hemiplegia were randomly divided into experimental group and control group.Thirty min low intensity aerobic training was performed three times a week for six weeks by patients in experimental group besides routine rehabilitation regime.The general training time and course was equal between the two groups and attention matched education and supervision were given to both groups.Adapted ergometer exercise test were performed before and after aerobic training to collect their exercise test time and peak heart rate.Besides, Modified Barthel Index, Frenchay Index and functional ambulation classification were evaluated at week 0, week 3, week 6 of aerobic training and one year after intervention. *Results:* Aerobic training resulted in significant longer exercise test time after intervetion in the experimental group after ($p<0.0$) while it remain the same in the control group ($p>0.05$). Also there was significant improvement in FAC at week 3, Barthel Index at week 6 and Frenchay Index one year after training in the experimental group when compared with the control group ($p<0.05$). *Conclusion:* Early aerobic training may have long term effect in improving living ability of stroke hemiplegia who are younger than Sixty.

PO-0780

HIGH PREVALENCE OF IMPAIRED GLUCOSE TOLERANCE AMONG UNDIABETIC STROKE SURVIORS IN CHINA AND THE EFFECT OF LOW INTENSITY ERGOMETER AEROBIC TRAINING ON IT: A PILOT STUDY

Zun Wang[1], Hongjuan Fan[2], Xiao Lu[3], Lixia Zhang[3], Lei Wang[1], Tong Wang[3]

[1]Nanjing University of Traditional Chinese Medicine, Nanjing, China, [2]The Affiliated Hospital of Jiangsu University, Zhenjiang, China, [3]The First Affiliated Hospital of Nanjing Medical University, Nanjing, China

Objective: High prevelance of impaired glucose tolerance (IGT) have been reported among post stroke survivors which is closely related with recurrent stroke or cardiovascular diseases.Little investigation on the prevelance of IGT among stroke survivors has ever been done in China. We did pilot study to explore the prevalence of IGT among non-acute Chinese stroke survivors. Besides,the hypothesis that low intensity ergometer aerobic training could ameliorate the glucose tolerance state of stroke hemiplegia was also tested. *Methods:* Nighty non-acute undiabetic stroke surviors were recruited and randomly assigned to the experimental group and control group. They were tested with Oral glucose tolerance test (OGTT) before and after rehabilitation training to collect fasting glucose and insulin level, 2 h glucose level and HOMA-IR. The low intensity aerobic training were only added to the experimental group alone three times each week.besides routine rehabilitation training procedure *Results:* Before intervention, 54 of total 90 (60%) undiabetic stroke surviors were diagnosed as IGT. Their blood glucose level at 2 h in OGTT was 8.7 mmol/L on average. No difference in the percentage of IGT and the level of 2 h blood glucose was found between two groups.After intervetion,patients in the experimental group showed significant improvement in fasting insulin level, HOMA-IR and 2 h glucose level when compared with the control group ($p<0.05$). *Inplications on rehabilitation:* 1 Preliminary findings demonstrated that as much as 60% undiabetic stroke surviors in china may be suffering from impaired glucose tolerance. 2 Low intensity ergometer aerobic training could be effectively used in improving glucose tolerance state among stroke hemiplegia.

PO-0781

THE EFFECT OF THE INEQUALITY HEIGHTS STANDING TREATMENT OF NONPARETIC LEG IN CHRONIC STAGE POSTSTROKE

Ying Hou, Fengzhen Du

Rehabilitation department of Lou Feng Hospital of Suzhou Industral Park

Objective: To evaluate the effect of the inequality heights standing treatment of nonparetic leg in chronic stage poststroke. *Methods:* 16 enrolled chronic stage poststroke patients (>12 months) were randomly divided into two groups – 8 patients in the treatment group and 8 in the control group. Assess the lower extremity movement abilities of the 16 patients with speed of walking, Berg Balance Scale and Barthel Index in 2 periods - pre-treatment, and follow-up 1 months after training. Besides both of the two groups got OT, normal PT, and electrical stimulation therapy, the control groups accepted standing exercise of paretic leg for 10 min twice per day whilst the treatment group accepted standing exercise of nonparetic leg for 10 min twice per day – standing on the nonparetic leg on the ground which was 4-8 centimeters higher than that paretic leg was on and the hip of the nonparetic leg was adducted. *Results:* The assessments with all the scales ($p<0.01$) had statistical significance. The motor function of the nonparetic leg, the transfer of the body's center of mass and the posture of the hip could be enhanced by this treatment. *Implications on rehabilitation:* The function of the nonparetic leg is one of the differences between the chronic poststoke patients and the acute or subacute poststroke patients. But the nonparetic side exercise were tended to be ignored in the rehabilitation process. A special inequality heights standing treatment were designed to help to enhance the function of the nonparetic leg, the transfer of the body's center of mass, the posture of the hip and to help the poststroke patients to walk faster and more steadily.

PO-0782

THE EFFECT OF POSTURAL STRATEGIES EXERCISES ON THE MOTOR CONTROL OF THE UPPER EXTREMITY OF CHRONIC STAGE POSTSTROKE

Ying Hou, Fengzhen Du
Rehabilitation department of Lou Feng Hospital of Suzhou Industral Park

Objective: To evaluate the effect of postural strategies exercises on the motor control of the upper extremity of chronic stage poststroke. *Methods:* 20 enrolled chronic stage poststroke patients (>12 months) were randomly divided into two groups – 10 patients in the treatment group and 10 in the control group. Assess the upper extremity movement abilities of the 20 patients with the Fugl-Meyer upper extremity Scale, Fugl-Meyer Balance Scale and Barthel Index in 2 periods - pre-treatment, and follow-up 1 months after training. Besides both of the two groups got OT and electrical stimulation therapy, the control groups accepted the normal PT 5 h per week whilst the treatment group accepted 2.5 h normal PT and 2.5 h waist rotation exercises per week. The postural strategies exercises included 2 procedures - One was the transition between forward and backward protective extension movements; the other one was the transition between the left and right protective extension movements. The transition movements should be smooth, slow and adequate. *Results:* The assessments with all the scales ($p<0.01$) had statistical significance. Appropriate treatments such as the postural strategies exercises may help the chronic stage poststroke patients to enhance their balance control and the motor function of the upper extremities. *Implications on rehabilitation:* A lot of requests from the chronic poststoke patients and their family were that if and how the poststroke patients hemiparetic upper limbs could move again. The result of this study told us that by taking advantage of the protective extension response it may be easier to get that.

PO-0783

OBSERVATION ON THERAPEUTIC EFFECTS OF TALKING MATS ON IMPROVEMENT OF COMMUNICATIVE EFFECTIVENESS IN PATIENTS WITH APHASIA

Minxing Gao, Zhiqiang Zhang
ShengJing hospital of China medical university

Objective: To explore the effects of Talking Mats as a communication tool on improvement of communicative effectiveness in patients with different severity of aphasia. *Method:* Fifteen patients with aphasia were according to different severity divided into mild group ($n=5$), moderate group ($n=5$) and severe group ($n=5$). Every patient all accepted three kind of conditions communication (unstructured communication, structured communication, Talking Mats). The topic of communication was from "entertainment and leisure" category (d920) in the "Activity and Participation" levels of ICF. We used a video camera recording the entire communication, and then used Effectiveness Framework of Functional Communication (EFFC) to assess the communicative effectiveness in patients with aphasia. *Result:* The score of participant engagement in EFFC was significantly higher during structured communication than unstructured communication in mild group. The score of participant engagement and additional relevant indications in EFFC were significantly higher during structured communication than unstructured communication in moderate group. The score of interviewer understanding and additional relevant indications in EFFC were significantly higher during structured communication than unstructured communication in severe group. The score of all items in EFFC were significantly higher during Talking Mats than unstructured communication and structured communication in all the groups. The interviewing time during Talking Mats was significantly longer than unstructured communication and structured communication in all the groups. *Conclusion:* Talking Mats as a communication tool can not only improve the communicative effectiveness in patients with different severity of aphasia but also can increase the interviewing time with patient of aphasia.

PO-0784

LOW-LEVEL LASER THERAPY WITH WRIST SPLINT IN THE TREATMENT OF CARPAL TUNNEL SYNDROME: A DOUBLE-BLINDED RANDOMIZED CONTROLLED TRIAL

Yupadee Fusakul[1]*, Thanyaporn Aranyavalai[1], Phongphitch Saensri[1], Satit Thiengwittayaporn[2]
[1]Department of Physical Medicine and Rehabilitation, Faculty of medicine vajira hosipital, University of Bangkok Metropolis, Thailand, Thailand, [2]Department of Orthopaedic Surgery, Faculty of Medicine Vajira Hospital, University of Bangkok Metropolis, Thailand

Objective: To evaluate the efficacy of low-level laser therapy in patients with mild to moderate carpal tunnel syndrome (CTS) *Method:* A total of 66 patients were randomly assigned into two groups. Group I received 15 sessions of laser therapy withwrist splint.Group II received placebo lasertherapy with wrist splint. The patients were evaluated with (1) clinical parameters which consisted of visual analogue scale (VAS), symptom severity scale (SSS), functional status scale (FSS), pinch strength and grip strength at baseline, 5-week follow-up and 12-week follow-up (2) electroneurophysiological parameters from nerve conduction studywhich were evaluated at baseline and at 12-week follow-up. *Results:* 59 patients (112 hands: unilateral CTS=6, bilateral CTS=106) completed the study ($n=56$ for each group). Improvements were significantly more pronounced in laser group than placebo group. At 5-week follow-up, there were improvements in VAS, SSS, FSS and grip strength in laser group when compared with baseline but only VAS, SSS and FSS improved in placebo group. At 12-week follow-up, all clinical parameters in laser group improved when compared with baseline whereas grip strength in placebo group did not improve significantly.A comparison between groups showed significant improvement in SSS at 5-week follow-up.The electroneurophysiological parameters were statistically different in distal motor latency (DML) between at baseline and at 12-week follow-up. *Impact on Rehabilitation:*

Laser therapy as a new conservative treatment is effective in treating mild to moderate CTS patients. It can improve symptoms, hand grip and pinch strengths, and electroneurophysiological parameters for these patients.

PO-0785

THE NEUROPROTECTION OF ELECTROACUPUNCTURE IN CEREBRAL ISCHEMIA-REPERFUSION INJURED RATS BY PI3K/AKT ACTIVATION

Jing Tao
College of Rehabilitation Medicine, Fujian University of Traditional Chinese Medicine

PI3K/Akt pathway, a critical mediator of cell survival, is suppressed in cerebral ischemia/reperfusion (I/R) injury; therefore it is a major focus in treatment of ischemic stroke. Acupuncture has long been used in China to clinically treat stroke. However, the precise mechanism of its neuroprotective activities remains largely unknown. Using a focal cerebral I/R injured rat model, in the present study we evaluated the in vivo therapeutic efficacy of electroacupuncture and investigated the underlying molecular mechanisms. We found that electroacupuncture at Quchi (LI11) and Zusanli (ST36) acupoints on the contralateral paralyzed limb significantly improved neurological deficits and cerebral infarction. In addition, electroacupuncture profoundly activated PI3K/Akt signaling in ischemic cerebral tissues. Consequently, the up-regulatory effect of electroacupuncture on PI3K/Akt activation resulted in the inhibition of cerebral cell apoptosis. Moreover, electroacupuncture increased the serum secretion levels of PI3K activators BDNF and GDNF, as well as up-regulated the anti-apoptotic Bcl-2/Bax ratio in ischemic cerebrum. Our data suggest that electroacupuncture at Quchi and Zusanli acupoints exerts neuroprotective function in ischemic stroke via activation of PI3K/Akt pathway.

PO-0786

LOW-LEVEL LASER THERAPY IN PATIENTS WITH ACUTE PERIPHERAL FACIAL NEURITIS

Xie Qi, Xin-Rong Zan, Li-Xian Chen, Xiao-Yü Lü
Rehabilitation Medicine Department, General Hospital of Guangzhou Military Command of PLA, Guangzhou, China

Objective: To assess the influence of low-intensity laser irradiation on the clinical function in patients with acute peripheral facial neuritis. *Material*: 60 patients with facial neuritis were randomly divided into drug group (control group) and assisted lasergroup (experimental group), with 30 cases in each group. All the patients in two groups received the same specification medication for 20 days. While patients in experimental group additionally treated with OMEGA-2010 semiconductor laser (UK) for 3 min on each irradiation sites daily for 20 days. The laser irradiation sites located on Preauricular region and postauricular region centered on Stylomastoid foramen. The facial nerve function evaluation was used to assess the functional changes in two groups. *Results:* We found facial nerve function scores in the two groups of patients after treatment were significantly higher than those before treatment ($p<0.05$). The facial nerve function score and overall response rate in experimental group were significantly superior to those in control group ($p<0.05$). *Implications:* Early application of low-intensity semiconductor laser may be an alternative to speed up facial normality in patients with acute peripheral facial neuritis.

PO-0787

CLINICAL TRIAL OF NEUROMUSCULAR ELECTRICAL STIMULATION ON SHOULDER SUBLUXATION AFTER STROKE

Lohindren Adorable[1,2,3], Alfie Dulap[1,2]*
[1]Sacred Heart Hospital,Philippines, [2]Southwestern University, Philippines, [3]Vicente Sotto Memorial Medical Center, Philippines, [4]Philippine Academy of Rehabilitation Medicine, Philippines

Objective: The study determined the effect of neuromuscular electrical stimulation (NMES) on shoulder subluxation, shoulder pain and arm function after stroke. *Methods:* Seventeen hemiplegic patients with shoulder subluxation were divided into three groups. Two groups were subjected to four weeks of NMES on supraspinatus (NMES-1 group) and deltoid (NMES-2 group). The third group was used as control. Each subject in NMES-1 and NMES-2 was treated five times a week, once a day for 10 min in first treatment and extended by four min each day over the first week. It lasted 30 min by beginning of second week until end of study. All groups received proprioceptive neuromuscular facilitation. Measured in each subject before and after four weeks of treatment were shoulder subluxations using anteroposterior view x-ray of the shoulder, shoulder pain using visual analogue scale (VAS) and arm function using manual muscle testing (MMT), and active and passive ranges of shoulder flexion, abduction and external rotation. In determining significant difference, Wilcoxon Signed Rank test was used for VAS and MMT results, and paired *t*-test for ROMs and shoulder subluxation with *p* value set at 0.05. *Results:* There was significant shoulder subluxation reduction in NMES-1 and 2, and significant shoulder pain reduction and improvement of arm function in NMES-2 only. There were no significant changes in control group. *Implication:* Early application of NMES on supraspinatus and deltoid should be included in stroke rehabilitation to prevent shoulder subluxation and minimize shoulder pain and loss of arm function.

PO-0788

BOTOX- A INJECTION ASSOCIATED WITH REHABILITATION TRAINING CORRECT POSTSTROKE CENTRAL FACIAL PALSY

Yuan Bin Yang
Department of rehabilitation,Xuanwu Hospital,Capital medical University,Beijing, China.

Objective: To explore whether BOTOX- A injection into the contralateral facial muscle of the palsy one associated with rehabilitation training can correct the poststroke central facial palsy and improve the dysfunction of facial muscle, hydrostomia etc, *Method:* 30 stroke patients with severe central facial palsy and hydrostomia were recruited (course 2-10 months, mean age 47).They were divided randomly into two groups: Group A - BOTOX- A injection associated with rehabilitation training; Group B - rehabilitation training only. According to the situation of facial palsy, the the contrallateral depressor anguli oris muscle, levator anguli oris muscle, zygomaticus major muscle, zygomaticus minor muscle,risorius muscle were selected to inject with BOTOX- A. in Group A. Every injection point include 5 U/0.1 ml.We evaluate the muscle strength of the palsy facial muscle, the distance of the palsy and the contrlateral angulus oris to the midline of the teeth, of the nasion to the both angulus oris between before and af ter 4 weeks. *Results:* There was significant difference between two groups for the muscle strength, the distance of the both angulus oris to the midline of the teeth and of the nasion to the both angulus oris. There was significant difference before and after 4weeks for the same values in Group A. *Implications:* Group A- BOTOX- A injection associated with rehabilitation training can correct poststroke central facial palsy and improve hydrostomia etc.

PO-0789

PULMONARY FUNCTION IN SPINAL CORD INJURY: LITERATURE REVIEW AND STUDY OF A POPULATION OF 172 PATIENTS

Francisco Simas[1,2], Carlos Rodrigues[3], Filipa Faria[1], Glória Batista[1], Paulo Nogueira[4]

[1]Centro de Medicina de Reabilitação de Alcoitão/Portuguese Navy, Portugal, [2]Portuguese Navy,Portugal, [3]Hospital Garcia de Orta, Portugal, [4]Direcção Geral da Saúde,Portugal

Objective: To review the literature on respiratory changes after SCI and characterize a population of patients with SCI who performed spirometric studies in our Center. *Methods:* "PubMed", "UpToDate" and "Medscape" were searched using SCI, respiratory function and pulmonary function test as keywords. Textbooks of reference in the field of Physical Medicine and Rehabilitation were consulted. Retrospective longitudinal cohort study of data from 344 spirometric tests of 172 patients followed at Centro de Medicina de Reabilitação de Alcoitão – Portugal, between 1997 and 2012 was performed. Inclusion criteria were: age above 18 years old, spinal cord injury and at least 2 spirometric studies with one year of interval between them. *Results:* Cohort of 126 men and 46 woman, mean age of 49, 89 years (18-85 y). Patients were divided in groups according to injury level and severity (complete/incomplete). The majority (33%) had a SCI between C1 and C5, half of them being complete lesions. The average BMI was 23, 51 and 59% were never-smokers, with 24% being current smokers. As expected, FVC was lower in high cervical complete lesions (mean 54,89) and higher in incomplete low dorsal and lumbar lesions (mean 108,05). Pulmonary function improved after rehabilitation program, which was shown by the increase in FVC in the second exam. *Impact on Rehabilitation:* Pulmonary function is compromised by most lesions of the spinal cord, and depends on the level and completeness of the injury. Rehabilitation should always contemplate respiratory programs and emphasize changes in modifiable factors in order to achieve maximum respiratory function.

PO-0790

EFFECT OF ORAL PREGABALIN ON CENTRAL NEUROPATHIC PAIN AFTER SPINAL CORD INJURY

Shaoqin Gu, Jianping Hu, Xinmei Tang
Nanjing Ruihaibo rehabilitation center

Objective: To assess the safety and efficacy of the treatment of pregabalin for central neuropathic pain after spinal cord injury. *Methods:* Twenty patients with central neuropathic pain due to spinal cord injury were randomly divided into the test group (n=10) and the control group (n=10). The test group recieved oral pregabalin 75-150 mg twice a day. The control group received routine physical therapy treatment. The primary outcome measure was visual analogue scale (VAS) in pain. The secondary outcome measures included the change in Modified Ashworth Scale of hip adductor and side effect. Additional outcome measures included Pittsburgh sleep quality index (PSQI). Two groups were observed 4 weeks.The outcome measures were assessed respectively before treatment and after treatment of 4 weeks. *Results:* The difference in VAS, Modified Ashworth Scale of hip adductor and PSQI between the test group and control group was not significant (p>0.5) before treatment. There is no difference before and after treatment in control group. The VAS in central neuropathic pain was significantly reduced in the test group after 4 weeks. In the test group the Modified Ashworth Scale of hip adductor and PSQI were improved. Dizziness and drowsiness were noted in three of the patients receiving pregabalin. *Implications:* Pregabalin can effectively relieve the central neuropathic pain after the spinal cord injury, so as to ease muscle spasm and improve sleep. The common side effects are dizziness and drowsiness.

PO-0791

EFFECTS OF SELF-PACED WALKING EXERCISE ON FUNCTIONAL STATUS IN FIRST-EVER ISCHEMIC STROKE PATIENTS

Jung-Kook Kim, Eun-Young Lee, Eun-Ha Park, Hyun-Sik Yun, Jae-Young Han, In-Sung Choi, Sam-Gyu Lee*
Chonnam National University Medical School & Hospital, Department of Physical and Rehabilitation Medicine, Research Institute of Medical Sciences, Center for Aging and Geriatrics, Regional CardioCerebroVascular Center, Korea

Objective: Home-based exercise participation depends on the motivation and willingness to recuperate from ischemic stroke. Walking exercise is usually recommended as a rehabilitative treatment to the patients who directly discharge home. We aimed to investigate whether twelve weeks self-paced walking exercise affects functional status in first-ever acute ischemic stroke patients. *Methods:* Sixty-seven first-ever acute ischemic stroke patients, who admitted to Chonnam National University Hospital and directly discharged home, were recruited. The subjects were classified into self-paced walking exercise (experimental) group (25 men, 9 women; 65.2±10.5 years) and non-exercise (control) group (17 men, 8 women; 72.3±8.2 years) according to the duration of exercise. All participants completed face-to-face assessments for the functional outcome including National Institutes of Health Stroke Scale (NIHSS), Functional Independence Measure (FIM), Mini-Mental Status Examination (MMSE) and Functional Ambulatory Category (FAC) at 7th day and 12th week after stroke onset. *Results:* 1) Experimental group exercised 6.5±1.0 days/week, 54.7±38.6 min/day. Control group exercised 0.8±1.3 days/week, 10.8±20.6 min/day. 2) At 7th day, there were no significant differences between both groups in NIHSS, MMSE and FAC, respectively. However, there was significant difference in FIM. 3) At 12th week, there were significant differences between both groups in NIHSS and MMSE. There were significant changes in NIHSS, FIM, MMSE and FAC after self-paced walking exercise in experimental group. However, there were significant changes in MMSE and FAC in control group.*Implications:* Walking exercise would be helpful in improving functional status in first-ever acute ischemic stroke patients.

PO-0792

INCIDENCE OF RECURRENT AND RESIDUAL OF CARPAL TUNNEL SYNDROME FOLLOWING OPEN CARPAL TUNNEL RELEASE

Parviz Yazdanpanah
Yasuj university of medical sciences, Iran

Carpal tunnel syndrome (CTS) is entrapment of median nerve in carpal tunnel of the wrist. In severe cases of CTS, or those refractory to conservative treatment, surgery is performed. Carpal tunnel release is one of the most commonly performed surgeries of the hand. The main aim of this study was to detect recurrent and residual of CTS following open carpal tunnel release. *Methods:* This study was performed in 105 patients that were operated in 5 months to 5 years ago in open carpal tunnel release were selected. These cases were operated in Shahid Beheshti hospital in Yasuj township in west part of Iran. The patients were evaluated by physiatrist. Assessment of carpal tunnel syndrome after open surgical release of the median nerve were be done by electrodiagnostic studies and MRI. If symptoms of CTS are maintain after surgery,this condition is residual and if symptoms are go back after months or years of surgery,this condition is recurrent. In cases of observing changes from severe to lower stages of the disease in electrodiagnostic studies, treatment was considered successful and otherwise failed. *Results:* The 58.1 % of patients had right severe CTS and 41.9 % had left severe CTS before surgery. The incidences of recurrent and residual CTS following open carpal tunnel release are 12.4% and 10.4%, respectively. *Conclusion:* The incidence of residual and recurrent rates CTS following open carpal tunnel release are high.These rates are depending to duration of severe CTS before surgery and expertise of surgeon.

PO-0793

THE EFFECTS OF ARMS·LEGS POSTURE ON SYMMETRICAL WEIGHT BEARING DURING SIT-TO-STAND TASKS IN CHRONIC STROKE PATIENTS

Jinwoo Jung[1], Hanseong Choe[2], Hwakyung Shin[2]*
[1]Kang, Hospital,Korea, [2]Daegu Catholic Univ., Geumnak-ri, Hayang-eup, Gyeongsan-si, Gyeongsangbuk-do, sKorea

Objective: The purpose of this study is to evaluate the influence of posture elements on symmetrical weight bearing during STS (sit to stand) in chronic stroke patients. *Method:* The subjects were diagnosed as stroke and 24 patients participated in this study. All of participants performed STS tasks (three foot posture (SPO; spontaneous, SYM; symmetrical, AYM; asymmetrical foot placement) × two arms posture (SA; symmetrical arm, GA; grasped arm placement). The two force plate (AMTI) were taken to measure peak of vertical ground reaction force (Peak Fz) and symmetrical ratio to peak of vertical ground reaction force, and the 3D-motion analysis system (Zebirs) was used to measure pelvic ROM (range of motion). The data were analyzed using independent *t*-test, two-way repeated ANOVA. *Result:* The result of this study were as follows: 1) Peak Fz placed more weight in paretic leg during STS. 2) A symmetrical ratio to Peak Fz was significant difference according to foot and arms posture ($p<0.05$), and had the highest AYM_GA (0.87±0.12). 3)The pelvic ROM was significant according to arms posture ($p<0.05$), and GA decreased compared to SA. *Impact on Rehabilitation:* These results showed that arms and legs posture during STS in Chronic Stroke Patients had influenced pelvic ROM, and had the highest AYM_GA. The outcome of this study is expected to be a reference for exercise or prognosis of STS in strokes patients.

PO-0794

ELECTROACUPUNCTURE PROMOTED NEUROLOGICAL FUNCTIONAL RECOVERY VIA RETINOIC ACID SIGNALING PATHWAY IN RATS AFTER CEREBRAL ISCHEMIA-REPERFUSION INJURY

Jiangcong Hong[1,2,3], Jing Tao[1,2,2], Lidian Chen[1,2,3]
[1]Subsidiary Rehabilitation Hospital of Fujian University of Traditional Chinese Medicine, [2]Subsidiary of Rehabilitation Medicine, Fujian University of Traditional Chinese Medicine, [3]Fujian University of Traditional Chinese Medicine

Neurogenesis is regulated by a number of signaling pathways, including the retinoic acid (RA) signaling, a key regulator of neurogenesis in the subventricular zone (SVZ) and hippocampus. Acupuncture has been used to treat neurologic conditions, and is known to potentially enhance cell proliferation in the neurogenic area (hippocampal dentate gyrus and the SVZ of the lateral ventricle walls) in pathological conditions, which is associated with improving brain function. However, whether or not the neuroprotective effects of electroacupuncture (EA) are mediated by regulating the RA signaling pathway remains to be determined. Using a transient middle cerebral artery occlusion (tMCAO) model, in the present study we evaluated the effect of EA on the neurological functional recovery, infarction volume and investigated the underlying molecular mechanisms. 216 SD rats were randomly divided into 3 groups: sham group, model group (ischemic rats without EA stimulation) and EA group (ischemic rats with EA stimulation on ST36 and LI11). Behavioral deficits were detected with high-resolution digital analysis of 24-h home cage video recordings. Infarction volume was determined by triphenyltetrazolium hydrochloride (TTC) staining and the expression of RA mRNA and protein were measured with RT-PCR and western blotting, respectively. We found that EA could decrease the infarction volume, promote neurological functional recovery and increase the RA mRNA and protein expression, compared with the model group. Findings of this study suggest that promoting neurological functional recovery by modulating RA expression in the postischemic brain is one of the mechanisms by which EA can be effective in the treatment of ischemic stroke.

PO-0795

THE EFFECT OF UNDERWATER TREADMILL TRAINING ON LOCOMOTIVE FUNCTIONAL RECOVERY AND NEUROPROTECTION IN RATS FOLLOWING SCI

Haiyan Lin, Wenzhan Tu, Taotao Tao, Huaixia Liu, Bo Cheng, Li Zhang, Yinping Lai, Lihua Ruan, Enmiao Zou, Songhe Jiang
The Second Affiliated Hospital of Wen zhou Medical College

Objective: The study is to determine if underwater treadmill training (UWTT) is effective on locomotive functional recovery and neuroprotection of rats following spinal cord injury (SCI). *Methods:* 25 Sprague Dawley rats were randomly divided into five groups: Sham group, Control group, Hydrotherapy (HT) group, Body weight supported treadmill training (BWST) group and Underwater treadmill training (UWTT) group, 5 rats in each group. The SCI was performed by generating a contusion of the T10 segment with the MASCIS Impactor. 1 week post-operatively, HT, BWST and UWTT, were implemented for 8 weeks. Then, the Basso, Beattie, and Bresnahan (BBB) Locomotor Rating Scale, climbing test,somatosensory evoked potential (SEP) and motion evoked potential (MEP) were used to investigate function recovery. Nissl dyeing method has been applied to study the change of Nissl body in nerve cells of the spinal cord. Immunohistochemisty technique had been used to detect changes of expression of BDNF and NT-3 in the spinal cord and type I fibromuscular cross sectional area (CSA) in gastrocnemius. *Results:* After 8 weeks training, hindlimb function improved more significantly in the UWTT group than other groups ($p<0.05$). The latencies of SEP and MEP, the expression of BDNF in three training groups were significantly higher than that in the control group ($p<0.05$), however, there was no significant difference among three training groups ($p>0.05$).The amplitude of wave of SEP and MEP,and the expression of NT-3 in UWTT group increased compared with that in BWST group ($p<0.05$). BWST and UWTT can relieve muscular wet weight loss ($p<0.05$), cross-sectional area narrow ($p<0.05$). *Implications:* In this study, UWTT that can promote locomotive functional recovery and neuroprotection,and relieve muscular atrophy, was prior of other groups, which can provide experimental evidences for the effectiveness of the mechanism of UWTT concerning regeneration and repair after SCI.

PO-0796

PRONUNCIATION TRAINING WITH ULTRASHORT WAVE THERAPY OF THYROID SURGERY CRACKED CLINICAL OBSERVATION

Yang Jin[1], Rong Jin[2], Shunmao Ma[3]
[1]Huabei oilfield general hospital rehabilitation medicine, [2]Huabei oilfield general hospital information science department, [3]Huabei oilfield general hospital general surgery

Objective: the application of modern rehabilitation medicine method, observation speech training with ultrashort wave therapy in patients with thyroid surgery rustiness of curative effect. Method clinic in our thyroid surgery in patients with cracked into the research object. According to vocal cords movement observation Sittel detection classification standard and Japan voice speech medical association sound dumb standard (GRBAS) score, will voluntarily accept treatment and not treated patients, according to the score results matched layer respectively into treatment group and control group, and each group was 30 patients. *Methods:* (1) the treatment group, stages ultrashort wave, intermediate frequency and speech training, etc. (2) compared with blank control group, regular follow-up. The patients were observed in stages voice tone quality and vocal cords movement function, comprehensive evaluation, treat-

ment effect. Results after a comprehensive rehabilitation treatment, the treatment group and control group the effective rate and cure rate were 100%, 50% and 43.3%, 10% and, respectively ($p<0.05$) after three months treatment is still not good enunciator treatment group and control group each have 3 cases (10%), and 6 patients (20%) do an operation to probe. *Conclusion:* Speech training with ultrashort wave therapy in patients with thyroid surgery rustiness curative effect is distinct, should be applied.

PO-0797

FACILITATION OF SPINAL REFLEX EXCITABILITY AND SEROTONIN RECEPTOR PLASTICITY BY EPIDURAL SPINAL CORD STIMULATION AND TREADMILL TRAINING FOLLOWING SPINAL CORD INJURY

Jiang Xu, Xiaona Zhou, Yizhao Wang, Nana Yang, Min Lu, Tao Xu, Xiaolin Huang

Department of Rehabilitation Medicine, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, P.R. China

Objective: The main objective of our present study was to investigate the effect of epidural spinal cord stimulation (ESCS) in combination with body weight-supported treadmill training (TT) on the recovery of locomotion and expression of serotonin 5-HT2A receptor and reflex components that contribute to locomotion after spinal cord injury (SCI) in rats. *Method:* Forty adult male Sprague-Dawley rats were divided randomly into four equal groups: the sham-operated group, the SCI group (untrained), the TT group and the ESCS+ TT group, with 10 rats in each group. The animals in latter three groups received midthoracic transection operation. Electrodes were placed on posterior surface of the dura to stimulate the lumbosacral spinal cord in ESCS+ TT group. Epidural stimulation with submotor threshold at L2 segment of the spinal cord was used during stepping on a moving treadmill band. The H reflex rate-depression, a quantitative assessment indicating the spinal reflex excitability was evaluated and the expression of serotonin 5-HT2Areceptor in L2 segment was detected by histochemical study after 8 weeks intervention. *Results:* Rate-depression of the tibial/plantar H-reflexes observed in ESCS+ TT group was significantly increased in amplitude compared with the SCI group. These changes were accompanied by marked upregulation expression of serotonin 5-HT2Areceptor in ESCS+ TT group which might account for the improved functions. *Implications:* These findings indicate that the ESCS in combination with treadmill training therapy is possible to be responsible for functional improvement by providing neuroplasticity below the level of the lesion.

PO-0798

THE DESIGN AND CLINICAL PRELIMINARY STUDY: A SWALLOWING DISORDER PRESSURE MEASUREMENT AND THERAPEUTIC EQUIPMENT

Zhen Feng, Liang Shuai, Ling Ling Liu

The First Affiliated Hospital Of Nanchang University

Objective: To solve pharyngeal dysphagia cricopharyngeal achalasia pressure measurement and quantitative expansion problem, the design and development of a swallowing disorder pressure measurement and therapeutic equipment become a clinical research hotspot. *Method:* The equipment consists of two parts: catheter and inflation balloon, which are made of silicagel, The device is made into three separate balloon, including two positioning balloons and one expanding balloon, the latter is located in the middle of the formers. The middle balloon is compressed for measuring the cricopharyngeal muscle tension and expanding in vertical orientation. This technology have applied to subjects (1 patient in cricopharyngeal achalasia and 1 normal subject). *Results:* Before treatment, patient in cricopharyngeal achalasia: WaTian water test V level; vedeofluoroscopic swallowing study (VFSS): cricopharyngeal achalasia; high cricopharyngeal muscle pressure. In normal subject: WaTian water test I level; VFSS: the pressure of cricopharyngeal muscle is lower than the patient in cricopharyngeal achalasia. Patient of cricopharyngeal achalasia was treated by balloon dilation after 5 days, the clinical symptoms improved significantly, WaTian water test down to I level, VFSS: basic normal: the pressure of cricopharyngeal muscle decreased obviously. *Conclusion:* Swallowing disorder pressure measurement and therapeutic equipment is reliable noninvasive, inexpensive method with low level of discomfort, the procedure is easily learned by clinicians, Apart from, it has clinical practical value.

PO-0799

THE SURVEY OF AGING LATE EFFECTS OF KOREAN POLIO SURVIVORS: PRELIMINARY STUDY BY TELEPHONE INTERVIEW

Hyun Bang[1], Jee Hyun Suh[2], Seung Yeol Lee[1], Keewon Kim[1], Se Hee Jung[1], Soong-Nang Jang[3], Soo Jeong Han[2], Wan-Ho Kim[4], Jae-Young Lim[1]

[1]Seoul National University Hospital,Korea, [2]Department of Rehabilitation Medicine, Ewha Womans University Medical Center,Korea, [3]Red Cross College of Nursing, Chung-Ang Univ,Korea, [4]National Rehabilitation Center, Korea

Objective: To perform the preliminary survey for the nationwide registry to establish the middle-aged cohort for polio survivors with late effects of poliomyelitis and functional deterioration. *Method:* Three hundred-fifteen subjects, with the average age was 51.2 ± 8.4 years, were recruited from several general hospitals, a polio welfare center, and city health centers. Patients were diagnosed by poliomyelitis or those with post-polio sequalae. The details of the study were explained to patients on the phone, and informed consents were obtained. The survey was performed by the questionnaire created fit for telephone interview, which contained questionnaires about the impairment state of paralytic limbs, gait disturbance, pain and weakness, etc. in the functional domain and other comorbidities such as diabetes mellitus, hypertension, cerebrovascular diseases, etc, past medical histories, and social economic factors in medical and psychosocial domains. *Result:* 285 subjects (90.4%) underwent late effects of poliomyelitis. Among them, 202 subjects (78.9%) complained of general weakness, newly appeared pain, and fatigue due to post polio syndrome (PPS) with average onset of 41.5 ± 11.1 years. 116 subjects (36.8%) used orthoses or walking aids and about one thirds of the subjects (35.0%) complained of gait difficulty including endurance problems. 216 subjects (68.5%) experienced one more than fall in last year. About one fourth (28.3%) had chronic diseases. 231 subjects (73.3%) had operation history and 185 operations (80.0%) were orthopedic problems. *Implications on Rehabilitation:* The results of this study provided useful information for preparing the system of evaluation to establish cohort groups for polio survivors.

PO-0800

DISCUSSION OF THE RELATIONSHIP OF PUSHER SYNDROME AND UNILATERAL SPATIAL NEGLECT SYNDROME IN RIGHT THALAMIC HEMORRHAGE PATIENT

Xiaowei Chen, Zhenlan Li

The First Hospital of Jilin University,Changchun, China

Objective: To observe the clinical manifestations and behavior characteristics of a patient with Pusher syndrome and unilateral spatial neglect's caused by right thalamic hemorrhage, and effects of behavioral therapy and visual scanning training on treatment. *Method:* Assessment of Pusher syndrome was evaluated by SCP scale. Unilateral spatial neglect syndrome was evaluated using line cancellation, letter cancellation and star cancellation, line bisection tests and graphic copy. Behavior therapy and visual scanning

training were adopted for Pusher syndrome's and unilateral spatial neglect's treatment. *Results:* 1. Assessed by SCP scale, the patient presented the typical Pusher syndrome. 2. From the line cancellation, letter cancellation, star cancellation tests pretreatment the patient showed that the numbers of completing cancellation in the left space were lower than those in the right space ($p<0.01$).The line bisection test also was showed that the marked midpoint obviously turned to the right. But graphic copy tests were showed no obvious unilateral spatial neglect. 3. After 3 weeks of treatment, the patient's Pusher syndrome was basically corrected, and the line cancellation, letter cancellation, star cancellation, line bisection and graphic copy tests were improved than pretreatment ($p<0.01$). *Implications:* With the right cerebral injury patient, especially the right thalamus, it was concluded that occurring unilateral spatial neglect and Pusher syndrome were highly relevant, and behavior therapy and visual scanning training were effective in improving the Pusher syndrome and unilateral spatial neglect syndrome, but yet needs further study for them.

PO-0801

CHARACTERISTICS OF SPASTICITY –RELATED COMPLICATIONS AFTER STROKE

Mazlina Mazlan[1]*, Elyana Jalil[1], Julia Patrick Engkasan[1], Saini Jeffery Abdullah[3], Khean Jin Goh[2]

[1]Department of Rehabilitation Medicine, Faculty of Medicine, University Malaya, Malaysia, [2]Department of Medicine, Faculty of Medicine, University Malaya, Malaysia, [3]KPJ Tawakkal Specialist, Malaysia

Objective: To describe the complications related to spasticity after first-time stroke in patients admitted to University Malaya Medical Centre, Malaysia. *Methods:* An interview was conducted on 46 patients with first-time stroke who developed spasticity at 3 months using a self-constructed descriptive questionnaire. Spasticity-related complications were documented using an extensive list provided which includes pain, gait disturbance, positioning and balance impairment, negative effect on appearance, difficulty performing activities of daily living (ADL): personal, domestic or community and difficulty donning orthosis. Patients were also allowed to add and describe other complications that were not in the list. Severity was graded using a 4-point Likert Scale ranging from 1 (mild) to 4 (very severe). *Results:* 37 patients (78.7%) complained of at least one complication related to the spasticity. Slightly more than half of the complications were rated as "moderate" (52.6%), followed by "severe" (33.6%), "mild" (8.7%) and "very severe" (5.1%). Pain associated with spasticity was the most frequent complication reported (66.7%), followed by difficulty in performing personal ADLs (61.9%) and gait disturbance (57.1%). Majority of the patients who reported pain as a complication have predominantly upper limb spasticity as compared to lower limb spasticity and 48% of them graded the pain as moderately severe. Spasms was also concomitantly reported by 14.8% of the patients who reported pain. *Conclusion:* Spasticity has significant complications even at an early stage post stroke with pain being the most frequent complication reported. The impact on long-term disability from spasticity-related complications should be monitored over time.

PO-0802

LONG THORACIC NERVE PALSY AFTER ENDOSCOPIC THORACIC SYMPATHECTOMY FOR PALMAR HYPERHIDROSIS

Emre Adiguzel*, Murat Karadeniz, Serdar Kesikburun, Umut Guzelkucuk, Evren Yasar, A.Kenan Tan

turkish military forces rehabilitation center, Turkey

Objective: To take the clinicians attention to a rare type of long thoracic nerve injury. *Method:* Treatment of palmar hyperhydrosis by endoscopic thoracic sympathectomy is a simple and safe method. Nerve paralysis after this procedure is an extremely rare complication. Here we report a 30 year-old man who developed winged scapula after endoscopic thoracic sympathectomy for palmar hyperhidrosis. A 30 year-old man had visited our hospital with pain over left posterior shoulder and left scapula. According to his history, his pain and burning sensation had started after endoscopic thoracic sympathectomy procedure five months ago. At the physical examination, winged scapula was observed, the patient had no limitation of range of motion in his left shoulder. Electromiyographic (emg) studies revealed severe subacute axonal injury of long thoracic nerve. Lanns score and 100 mm visual analog pain score (vas) for his pain were 15 and 70 mm, respectively. His pain was decreased with 300 mg daily pregabalin treatment to 30 mm in vas score. *Results:* Long thoracic nerve is an important nerve originating from cervical nerve roots. To our knowledge, this is the first documented case of long thoracic nerve palsy after endoscopic thoracic sympathectomy. Our patient showed the possibility of injuring the long thoracic nerve with this surgical procedure. Clinicians should be aware of this type of injury.

PO-0803

SPINAL CORD INJURY: REHABILITATION

Carmen Silva Figliola*, Gracinda Rodrigues Tsukimoto, Maria Cecilia Dos Santos Moreira, Marina Da Paz Takami, Simone Ferraz, Sofia Bonna Boschetti Barbosa, Tatiana Amadeo Tuacek, Thiago De Oliveira Ramos, Wagner Lopes Da Silva, Daniel Rubio, Linamara Battistella

Clinical Research Center. Institue of Physical and Rehabilitation Medicine, Lucy Montoro Institute for Rehabilitation, Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objective: Offering information regarding treatment and rehabilitation of patients suffering spinal cord injuries. *Method:* Pubmed database search of randomized clinical trials was conducted using P.I.C.O. strategy (P.I.C.O. stands for: Patient, Intervention, Comparison and Outcome). The following MeSh terms were the search strategy: (Spinal Cord Injury or Spinal Cord Trauma) AND (Outcome Assessment or Mesure, Outcome) and (Vital Capacity or Breathing Exercises). *Results:* Ten randomized trials and two systematic reviews were included. Specific tools developed for the population with tetraplegia as ASIA (American Spinal Injury Association) score and MEP recording are effective in the evaluation of the parameters of UULL function. The SCIM III (Spinal Cord Independence Measure) use is effective for measuring the independence in daily life activities and for giving support to the practice of health care professional to work with this population. Body-weight-supported treadmill gait training did not demonstrate to be superior to overground gait training, and there is no evidence that functional electrical stimulation (FES) provides more benefits in gait training. There is no evidence that FES added to the progressive resistance training promotes improvement in muscle strength. *Implications/Impact on Rehabilitation:* The use of functional scales is helpful to orientate the patient rehabilitation. Until today is not possible to confirm the benefits of associate exercise and FES.

PO-0804

SWALLOWING THERAPY APPARATUS AND TRADITIONAL BEHAVIOR THERAPY IN THE TREATMENT OF PHARYNGEAL PHASE OF DEGLUTITION DISORDERS CLINICAL COMPARISON

Xinling Kang

Anshan City soup Kong hospital rehabilitation, China

Objective: swallowing therapy instrument electrical stimulation in the treatment of stroke to the pharyngeal phase of deglutition disorders efficacy and traditional behavior therapy a clinical comparison.

Methods: 30 cases of pharyngeal phase of deglutition deglutition consciousness disorder were randomly divided into treatment group and control group, 15 cases in each group. Treatment group adopts swallowing therapy instrument electric stimulation therapy, the control group used the traditional behavior therapy in the treatment of.Before and after treatment using a depression cropland water test and evaluation. Results after four weeks treatment, two groups of patients after treatment than before swallowing ability is improved significantly, and the patients in the treatment group improved slightly better than the control group. *Conclusion:* Swallowing therapy instrument electrical stimulation in the treatment of pharyngeal phase of deglutition disorders is better than the traditional behavior therapy.

PO-0805

NEURAL REPAIR AND REHABILITATION STRATEGIES FOR SPINAL CORD INJURY; THE IMPLANTATION OF BIODEGRADABLE SCAFFOLDS AND SCHWANN CELLS

Kenta Takashima[1,2], Eri Fusaoka-Nishioka[3], Toshio Imai[3], Atsushi Nakahira[4], Masahiro Kohzuki[1], Noriko Osumi[1], Hiroshi Onodera[2]

[1]Tohoku University Graduate School of Medicine,Japan, [2]CREST,Japan, [3]KAN Research Institute,Japan, [4]Osaka Prefecture University Graduate School of Engineering, Japan

Neural repair requires bridging grafts to provide a physical substrate for directed axonal growth across the lesion gap and to allow axon to re-enter the host tissue in the appropriate location. Bioengineered scaffolds offer the potential advantage of enhancing directed axonal regeneration into lesion site in experimental spinal cord injury (SCI). In this study we fabricated biodegradable scaffolds made from poly-glycolic acid fibers (processed using special micro-braiding technique). SCI was made by bilateral transecting of the dorsal spinal cord at tenth thoracic level. To confirm whether the implantation of biodegradable scaffolds together with Schwann cells promote directed axonal regeneration after SCI, the biodegradable scaffold and Schwann cells were implanted acutely into dorsal column lesion. The scaffold + Schwann cells group showed the highest density of neurofilament-positive neurites in the SCI site and showed the best functional recovery of the hindlimbs 4 weeks after SCI. In the core region of the SCI, implantation of Schwann cells alone resulted in random axonal orientation, whereas the scaffold + Schwann cells group showed directed axonal extension along the scaffolds 4 weeks after the implantation. These results indicate that the biodegradable scaffolds together with Schwann cells can promote directed axonal regeneration after SCI. The combination of this neural tissue engineering and rehabilitation may be critical for the greatest recovery.

PO-0806

RELIABILITY AND VALIDITY OF COMMUNITY DEPRESSION STATUS PHONE SCREENING QUESTIONNAIRE

Jingsheng Zhou[1], Xingqing Zhang[1,2], Decai Tian[1,2]

[1]Beijing United Family Rehabilitation Hospital, [2]Xuanwu Hospital of Capital Medical University

Objective: The development of community depression status phone screening questionnaire (CDSQ-T) and the test on its reliability and construct validity; and investigate the correlation and consistency of CDSQ-T with Hamilton depression rating scale (HAMD), Hamilton anxiety rating scale (HAMA), self-rating depression scale (SDS) and self-rating anxiety scale (SAS). *Methods:* The initial entry pool questionnaire was developed according to the theoretical concept. The initial questionnaire was evaluated to form the second entry pool by 98 experts and 45 depressed patients. The final preparation of the questionnaire was used to test 153 outpatients with depression, 30 of who were selected for re-test one week later. The patients were tested with CDSQ-T, HAMD, HAMA, SDS and SAS by the same psychologist at the same time in our psychological examination department. The scores were compared for correlation and consistency. *Results:* Forty two items including 16 community entries were selected form initial 105 entries of the initial screening to form a community depression phone screening questionnaire. The Cronbachs coefficient test-retest score, correlation coefficient and split-half reliability coefficient were 0.906, 0.723 and 0.886, respectively. The factor analysis of three factors (depressive mood, sleep disturbance and appetite changes) suggested the good construct validity of the questionnaire. Pearson correlation analysis showed that: CDSQ-T total score and HAMD,HAMA, SDS, SAS total score were significantly correlated (r were 0.79, 0.71, 0.76, 0.72, respectively, $p<0.05$) and their corresponding regression coefficients were 0.56, 0.61, 0.91, 0.81, respectively ($p<0.05$). *Implications on Rehabilitation:* The CDSQ-T developed by stepwise selection method possesses a good reliability and validity, and has good linear correlations with the HAMD, HAMA, SDS, and SAS.

PO-0807

URODYNAMIC FINDINGS IN STROKE PATIENTS WITH URINARY INCONTINENCE

Bilge Yilmaz*, Koray Aydemir, Emre Adiguzel, Kenan Tan

Turkish Armed Forces Rehabilitation Center, Turkey

Objective: To investigate whether urodynamic study (UDS) findings were associated with the clinical characteristics (lesion laterality and gender) in stroke patients with overactive bladder (OAB) symptoms. *Method:* We retrospectively reviewed the records and urodynamic charts of 51 ischemic or hemorrhagic stroke patients with OAB symptoms. Urodynamic parameters included first sensation of bladder filling (FSBF), maximum vesical volume, maximum detrussor pressure (MDP), detrussor compliance, post-void residual volume (RV), mean flow rate, volume voided (VV) and voiding time. The clinical and urodynamic data were analyzed together. *Results:* Among the 51 patients, 34 were male and 17 were female with a mean age of 65.8±16.2 years. Thirty six patients had ischemic and 15 had hemorrhagic stroke. There was a statistically significant difference (p=0.025) at MDP between male and female patients (73.76 cm H2O, 43.12 cm H2O respectively). RV was significantly higher (p=0.010) in right hemiplegic patients (242.08 ml vs. 72.21 ml). On the contrary, VV was significantly lower (p=0.004) in right hemiplegic patients (167.57 ml vs. 402.89 ml). In addition, FSBF was delayed (p=0.045, 179.27 ml to 105.67ml), RV was increased (p=0.002, 207.82 ml to -11.20 ml) and the VV was low (p=0.048, 200.18 ml to 441 ml) in right hemiplegic male group. *Implications/ Impact on rehabilitation:* The results of this study revealed that there is a statistically significant relationship between left hemispheric brain damage and low VV, increased RV in both sexes. In addition, the MDP was increased and FSBF was delayed in the male group. These findings should be warranted with future large scale studies.

PO-0808

RETROSPECTIVE ANALYSIS OF NOSOCOMIAL URINARY TRACT INFECTIONS IN A TERTIARY REHABILITATION SETTING

Bilge Yilmaz*, Ferdi Yavuz, Emre Adiguzel, Kenan Tan

Turkish Armed Forces Rehabilitation Center, Turkey

Objective: To define the distribution and antibiotic susceptibility of nosocomial urinary tract infections (NUTIs) in patients with spinal cord injury (SCI) and brain injury. *Methods:* Patient records were retrospectively reviewed for two-year data of NUTIs of SCI and brain injured patients *Results:* The data of 324 patients were included; of which. 159 acute SCI patients, 117 chronic SCI patients and 48 brain injured patients. 189 (58.3%) infections were

asymptomatic bacteriuria (ASB) and 135 (41.6%) infections were symptomatic urinary tract infections (SUTI). In patients with acute SCI, E.coli was the most frequently isolated pathogen of SUTIs and it is followed by Pseudomonas. The most frequently isolated pathogen in ASBs of acute SCI patients was Klebsiella sp. In patients with chronic SCI and brain injury, E.coli was the most frequently isolated pathogen both at SUTIs and ASBs. There was no statistically significant difference at the rates of NUTI (ASB and SUTI) between acute and chronic SCI patients in terms of bladder drainage method. The susceptibility ratios for E. Coli was very low in both acute and chronic SCI patients using foley catheters. Although the susceptibility ratios for E. Coli was not that low in SCI patients using clean intermittent catheterization, the resistance ratios were higher than 50% for most of the uropathogens. The difference of the susceptibility ratios of uropathogens between acute and chronic SCI patients was statistically significant ($p<0.05$). *Implications/ Impact on rehabilitation:* These results revealed a blunt truth that the treatment of NUTIs will be a great challenge in near future.

PO-0809

OUTCOME ANALYSIS OF ROBOT-ASSISTED ARM REHABILITATION IN STROKE PATIENTS

Si-Woon Park*, Yoon A Park, Hyo Jin Seo, Yong Seok Lee

Myongji Choonhey Rehabilitation Hospital, Korea

Objective: We conducted a retrospective data analysis to evaluate the effectiveness of robot-assisted arm rehabilitation in stroke patients and to find clinical characteristics that are related with the outcome. *Method:* Forty-seven stroke patients participated in robot-assisted therapy during their inpatient rehabilitation in a rehabilitation hospital. Treatment session consisted of 30 to 60 min' arm exercise using the InMotion robot system 2 or 3 times a week for at least more than a month in addition to conventional rehabilitation. Outcome measures included the InMotion evaluation test (point to point), Fugl-Meyer upper extremity motor assessment (FMA) and modified Barthel index. *Results:* After robot-assisted arm rehabilitation, point to point smoothness, mean velocity, reach error and path error were significantly improved ($p<0.05$). FMA and modified Barthel index were not significantly increased after treatment. Mean FMA gain was 1.95, and 7 patients (14.9%) gained more than 4 points. In subgroup analyses, patients with severe motor impairment (initial FMA score less than 25) showed significant improvement in point to point smoothness, mean velocity, reach error and path error, while patients with less severe motor impairment (initial FMA score 25 or higher) did not. Subgroups divided by disease chronicity did not showed significant difference. *Implications:* Robot-assisted arm rehabilitation significantly improved stroke patients' arm motor performance in the task specific to the training protocol. The robot system used in this study seems to be more beneficial to those with severe motor impairment.

PO-0810

THE INFLUENCE OF COMMUNITY-BASED REHABILITATION AND EXERCISE ON STROKE SEQUELA'S MOTOR FUNCTION AND BODY MORPHOLOGY

Laiyong Hou[1], Xiuling Liu[2], Zhisen Xia[3]

[1]China-Japan friendship hospital, [2]GuanZhuang second community health service center, [3]GuanZhuang township disabled persons federation

Objective: Based on the early study to the community sequelae period stroke patients found that the patients require continuous motor function rehabilitation therapy. On the other hand, due to the lack of guidelines of fitness exercise, their body become centripetal obesity trend. This article through the group control experiment, to observe The influence of the community-based rehabilitation and exercise on stroke sequela's motor function and body morphology. *Methods:* Selected 76 stroke sequela patients which accord with a standard in GuanZhuang community. The cases were randomly divided into rehabilitation exercise group (42 cases) and control group (34 cases). The patients in rehabilitation exercise group accept rehabilitation treatment 2-3 times a week and 3-5 times fitness exercise a week with the fitness builder in the neighborhood. Every time 30-45min.There is no advise to the control group from the therapist. In the beginning and after 6 months treatment of observations were evaluated by the same doctor team.The assessment include: Fugl - Meyer Assessment (FMA), activities of daily living (ADL), body mass index (BMI), waist- hip ratio (WHR), and tricep skinfold thickness (TSF). All the evaluation results were analysed by spss 14.0. *Results:* The rehabilitation exercise group and control group have no significant difference ($p>0.05$) before the observation. It's comparable.After 6 months, the patient's assessment in control group have no change. In the rehabilitation exercise group the FMA, ADL, BM, WHR, TSF were improved ($p>0.05$) and is better than the control group ($p>0.05$). *Conclusion:* community-based rehabilitation and exercise can improve sequelae period patients motor function and ADL, especially can reduce BMI and WHR, improve TSF; So as to improve patients' body morphology, Reduce the centrality of obesity,so that reducing the risk of disease.

PO-0811

REPETITIVE TANSCRANIAL MAGNETIC STIMULATION (RTMS) IN THE TREATMENT OF CHILDREN WITH BRACHIAL PLEXUS INJURY

Ling Liu, Nong Xiao

Children's hospital of Chongqing medical university

Objective: Analysis the effect of Repetitive Tanscranial Magnetic Stimulation (rTMS) on the children with brachial plexus injury, to search for the new treatment of brachial plexus injury. *Method:* The object of this study is the children with brachial plexus injury, whose course is more than half a month, and already accept the treatment of the medicine and acupuncture therapy. All the subjects accept two course of Repetitive Tanscranial Magnetic Stimulation (rTMS) on the base of the treatment of the medicine and acupuncture therapy. Then observe the effect and security. Result plus rTMS, the effect is obviously improve than just the basic treatment both clinical symptom and the neuroelectricity electrophysiologic. At the same time, there is no one side effect happened. *Conclusion:* Therapeutic alliance of rTMS and the basic treatment (the medicine and acupuncture therapy) can obviously improve the clinical symptom on the children with brachial plexus injury, and is safety.

PO-0812

VCUG-NEGATIVE HYDRONEPHROSIS IN SCI PATIENTS WITH NEUROGENIC BLADDER

Yun-An Tsai[1,2], Shih-Fong Huang[1,2], Shuen-Chang Tang[1], Henrich Cheng[1,2]*

[1]Taipei Veterans General Hospital,Chinese Taipei, [2]National Yang Ming University, Chinese Taipei

Objective: To report the high prevalence of under detected vesicoureter reflux (VUR) by voiding cystourethral graphy (VCUG) in spinal cord injury (SCI) patients with hydronephrosis. *Method:* Medical charts of patients admitted to an SCI unit in a tertiary medical center in Taiwan from December 2011 to December 2012 were reviewed. Twenty two patients with a diagnosis of traumatic or non-traumatic spinal cord lesion resulting in symptomatic neurogenic bladder, found to have hydronephrosis or renal pelvis dilatation at either side during regular renal function evaluation. In addition to VCUG, the results of renal and bladder sonography performed with urodynamic study were recorded and compared. *Results:* Among 22 patients with hydronephrosis or renal pelvis dilatation, only 5 were

proved to have VUR by VCUG. However, in the rest 17 patients, 14 developed reversible renal pelvis dilatation or hydronephrosis after bladder infusion during pressure-flow study. There was no significant difference in the bladder compliance, capacity, and leak point pressure between VCUG-positive and VCUG-negative hydronephrosis patients. *Implications/Impact on Rehabilitation:* VCUG may not detect VUR in neurogenic bladder after SCI. We suggest that video-urodynamic study or urodynamic study with ultrasound surveillance should be the supplementary diagnostic.

PO-0813

DIAGNOSTIC UTILITY OF ELECTROPHYSIOLOGICAL EXAMINATION IN CERVICAL RADICULOPATHY

Sijing Chen, Jianan Li, Wenhong Chen, Hongxing Wang

Department of Rehabilitaiton Medicine, the First Affiliated Hospital of Nanjing Medical University

Objective: To explore the value of electrophysiology examinations in diagnosis of cervical spondylotic radiculopathy (CSR). *Method:* Standard motor and sensory nerve conductions examination were performed in median, ulnar, radial, musculocutaneous and axillary nerve to analyze distal motor latency, compound muscle action potential (CMAP) amplitude, sensory nerve conduction velocity (SNCV) and sensory nerve action potential (SNAP) amplitude. Concentric needle electromyography was used in examination of deltoid, biceps brachii, extensor digitorum and abductor digiti minimi on affected limbs to record spontaneous activities (SA), motor unit action potential (MUAP) duration and recruitment potential. 30 controls and 27 patients who suffered from radiating pain for more than 3 weeks in one upper limb and suspected as CSR were evaluated. Quantitative data were summarized as mean and standard deviation, and the differences between the groups were assessed by students-t test. Categorical data were expressed as frequency, and $\chi 2$ test was applied to identify the difference. All the statistical analyses were performed by STATA SE 12.0 and a *p*-value. *Results:* Distal motor latency, SNCV, CMAP and SNAP amplitudes, MUAP duration were identified whether they were in normal range according to the age. All the subjects in the two groups were normal. The parameters were also compared between the groups in different age periods. All the results showed no statistically significant differences. No SA was found in both groups. *Implications:* Current data indicated electrophysiological examination seems to be no value in diagnosis and localization of CSR.

PO-0814

NEURAL REPAIR AND REHABILITATION STRATEGIES FOR SPINAL CORD INJURY; THE IMPLANTATION OF BIODEGRADABLE SCAFFOLDS SEEDED WITH FETAL NEURONS

Kenta Takashima[1,2], Eri Fusaoka-Nishioka[3], Toshio Imai[3], Atsushi Nakahira[4], Masahiro Kohzuki[1], Noriko Osumi[1], Hiroshi Onodera[2]*

[1]Tohoku University Graduate School of Medicine,Japan, [2]CREST, Japan, [3]KAN Research Institute, Japan, [4]Osaka Prefecture University Graduate School of Engineering, Japan

Neural repair requires bridging grafts to provide a physical substrate for directed axonal growth across the lesion gap and to allow axon to re-enter the host tissue in the appropriate location. Bioengineered scaffolds offer the potential advantage of enhancing directed axonal regrowth into lesion site in experimental spinal cord injury (SCI). In this study we fabricated biodegradable scaffolds made from poly-glycolic acid fibers (processed using special micro-braiding technique). SCI was made by bilateral transecting of the dorsal spinal cord at tenth thoracic level. To confirm whether the implantation of biodegradable scaffolds together with Schwann cells promote directed axonal regeneration after SCI, the biodegradable scaffold and fetal neurons were implanted subacutely into dorsal column lesion. The scaffold + neurons group showed the high density of neurofilament-positive neurites in the SCI site and showed the best functional recovery of the hindlimbs 6 weeks after SCI. In the core region of the SCI, implantation of fetal neurons alone resulted in random axonal orientation, whereas the scaffold + neurons group showed directed axonal extension along the scaffolds 6 weeks after the implantation. These results indicate that the biodegradable scaffolds together with fetal neurons can promote directed axonal regeneration after SCI. The combination of this neural tissue engineering and rehabilitation may be critical for the greatest motor functional recovery.

PO-0815

STUDY OF INTERPLEURAL BOLCK VIA COSTODIAPHRAGMATIC RECESSES FOR TREATING FUNCTIONAL ABDOMINAL PAIN SYNDROME

Heping Jia, Kang Wang

Department of Pain Management, 251 Hospital of PLA

*Objective:*To explore feasibility and curative effect of interpleural block via costodiaphragmatic recesses (CDR) for treating functional abdominal pain syndrome (FAPS). *Methods:* 42 patients with FAPS were divided into two groups randomly:treatment group and control group, Control group were treated with Duloxetine, 60 mg/d, PO, 8 weeks per course of treatment;Treatment group were treated by interplural blocks via CDRs on the basis of treatment of Duloxetine, modified sterile syringe needles of 20 ml were inserted vertically by the methods of resistance lossing into CDR, the widest position of interplural space through superior borders of the ninth ribs of the affected sides in midaxillary lines, Weekly injections of 20 ml of antiphlogistic and analgetic solution were given over a four-week period,Head ends of the patients declined slightly and kept 15 min in a supine position after injections. VAS, SCL-90 and the complications of the IPB via CDR were evaluated before treatment, at 1 week and 6 months after treatment. *Result:* The patients of two groups achieved pain,depression and anxiety relief obviously after treatment,VAS and SCL-90 decreased significantly, $p<0.05$, the curative effect of treatment group was better and lasted longer than that of control group, $p<0.05$.No significant complications occurred in treatment group. *Conclusion:* The interplural block via CDRs for treating FAPS was a feasible,simple, safe,effective approach and could be provided on an outpatient basis.

PO-0816

THE EFFECTS OF WHOLE BODY VIBRATION THERAPY ON BODY FUNCTION, ACTIVITY, AND PARTICIPATION POST-STROKE: A SYSTEMATIC REVIEW

Lin Rong Liao[1,2], Meizhen Huang[1], Marco Pang[1]*

[1]The Hong Kong Polytechnic University,Hong Kong, China, [2]Guangdong Provincial Work Injury Rehabilitation Hospital, Hong Kong, China

Objective: A systematic review was undertaken to determine whether whole body vibration (WBV) therapy was effective in enhancing body function, activity, and participation compared with conventional therapy or active exercise in individuals with stroke. *Method:* An extensive search using major electronic databases (MEDLINE, CINAHL, PEDro, PubMed, PsycINFO, Science Citation Index) was conducted to identify relevant articles. The methodological quality of each selected randomized controlled trial (RCT) was rated using the PEDro scale. *Results:* Among 1,782 articles screened, nine articles (eight studies) totaling 321 subjects satisfied the selection criteria and were included in this review. Seven of these studies were RCTs whereas one was a quasi-experimental study. Methodological quality was 'excellent' for one RCT (PEDro score: 9–10), four were 'good' (score: 6–8) and two were 'fair' (score: 4–5). Three studies

(two RCTs) examined the effects of a single session of WBV. Beneficial effects on leg muscle strength, mobility, balance, and ankle spasticity were reported in one study only. Five RCTs examined the effects of a WBV program spanning 3-8 weeks. No consistent benefits on bone turnover, leg muscle strength, mobility, balance, activities of daily living, and societal participation were found. No adverse events were reported. *Implications/Impact on rehabilitation:* The systematic review shows that research on WBV in stroke patients is relatively scarce. The available evidence does not support the use of WBV in enhancing body function, activity and participation after stroke. More good-quality WBV trials are required to further investigate the therapeutic value of WBV in stroke patients.

PO-0817

THE TREATMENT OF DROPPED HEAD (KUBISAGARI DISEASE)

Hidetoshi Mano
Showa university,department of medicine,Japan

Case Diagnosis: Dropped head (Kubisagari disease) Case Description: 81 years men, in 78 years, hid head became lower gradually, and his walking ability is down and he sometimes fall down. His spinal column and spinal cord is fair in X-ray and MRI findings. In 80 years, he felled down, and broken hispelvic bones. The bed ridden time is for 8 weeks, and he was in supine position all day long. After 8 weeks, he got out of bed gradually. In spite of his muscle weakness, he can raise his head, and he can walk. *Discussion:* Dropped head is noted for a complication of ALS, myopathy, myositis, MG and Parkinson's disease. But this case is not a complication of these diseases.This is not Spasmodic torticollis and not Cervical Dystonia. This is called Kubisagari disease in Japan, and may be an original disease in Japan. The effective treatment of Kubisagari disease is not established. In another case, physical therapy, isometric neck extensor muscle exercise and walking exercise is not effective. Injection of Boturinus toxin-A of sternocleidomastoid muscle is effective, only for several weeks. In bet ridden, his head is straight. And his occipital region was in contact with a headrest, and free from gravity. In these periods, his lifting function of head recovered. Kubisagari disease may have some relevance to Japanese custom and culture. *Conclusions:* A rest cure in 8 weeks is effective for kubisagari disease.

PO-0818

THERAPTIC EFFECTS OBSERVATION OF L-CANITINE ON PROGRESSIVE MUSCULAR DYSTROPY

Qiuwei Yi, Nong Xiao
Children`s Hospital of Chongqing Medical University

Objective: To observe the theraptic effects of L-carnitine on progressive muscular dystropy (PMD) and provide directions on its clinical using. *Methods:*Collect the patients of PMD in our outpatient, Compare the creatase before and after using L-carnitine, and investigate the life quality of the patients in the first group, and observe if there is a improvement after using L-carnitine. *Result:* 1) Compare the creatase before and after using L-carnitine, it`s decreased after using, and the difference has a statistically significant. 2) Investigate the life quality before and after using L-carnitine in the first group,their was a little improvement and the difference has no statistically significant. *Conclusion:* Using L-carnitine can decrease the creatase in PMD patients,but it can not improve the life quality obviously.

PO-0819

COGNITIVE REHABILITATION CORRELATES WITH THE FUNCTIONAL CONNECTIVITY OF THE HIPPOCAMPUS IN CEREBRAL INFARCTION PATIENT

Lidian Chen
Rehabilitation hospital affiliated to fujian university of traditional Chinese medicine, Fujian, China

Background: Cognition impairment is one of the hot problems in cognitive neuroscience and rehabilitation medicine, How to alleviate cognitive impairment and to monitor the curative effect is very important in patients with cerebral infarction. *Purpose:* This study investigate how resting state functional connectivity of the hippocampus correlates with cognitive rehabilitation in cerebral infarction. *Method:* 20 patients with cognitive impairment after cerebral infarction were selected. The neuropsychological assessment (choose the Montreal Cognitive Assessment) and functional connectivity analysis (ues Functional magnetic resonance imaging) at baseline and after 4 weeks. *Result:* After cognitive rehabilitation, the significant scores increase of MoCA test items were in attention, orientation, memory, naming ability, visuospatial and executing skills. Meanwhile the datas showed an increased function connectivity of the left hippocampus with right inferior frontal gyrus, right anterior cingulate cortex, right middle frontal gyrus; increased function connectivity of the right hippocampus with left middle frontal gyrus,left inferior frontal gyrus,left superior frontal gyrus,left parietal lobe,right cerebellum posterior lobe. *Implications/Impact on Rehabilitation:* Increased resting state function connectivity of specific brain areas might reflect the occurrence of compensatory mechanisms after cognitive training.fMRI might be objective and effective tools,which useful to monitor rehabilitative strategies in cognitive impairment after cerebral infarction.

PO-0820

THE EFFECT OF GAME THERAPY ON STROKE PATIENTS WITH HEMIPLEGIA

Xiuling Liu[1], Laiyong Hou[2]
[1]Beijing chaoyang district GuanZhuang second community health service center, rehabilitation department, China, [2]China-Japan friendship hospital rehabilitation medicine department

Objective: To Observe the effects of game therapy on stroke patients with hemiplegia and the influence of the body motor function and the activities of daily living. *Method:* From 2009 to 2011, the 50 cases stroke patients were selected to the study. The patients were divide into two groups: 25 cases were in the Routine rehabilitation group, and the others in the Game add Routine rehabilitation group. Every patient receives the rehabilitation therapy from the seam therapist, Three times a week, and every time is 45 min. The patients in the Game add Routine rehabilitation group have 15 min game therapy in the treatment time. Before the therapy and after 3 month the motor function and ADL were test with Fugl-Meyer scale and the modified Barthel Index. *Result:* there were no different at the Fugl-Meyer scale and the modified Barthel Index between The two groups before the treatment ($p>0.05$). After the three months treatment, both group were improved ($p<0.05$).in addition the Game add Routine rehabilitation group get more improvement than the Routine rehabilitation group, the Fugl-Meyer scale ($p<0.05$) and the modified Barthel Index ($p<0.01$). *Implications:* Rehabilitation therapy can help stroke patients to improve their motor function and activity of daily living. Game therapy can attract the patients attentiveness, increase the participation and the compliance of the patients. So that make the result better than the normal therapy group significantly.

PO-0821

SAFETY EVALUATION OF ALLOGENEIC UMBILICAL CORD BLOOD MONONUCLEAR CELL THERAPY FOR DEGENERATIVE CONDITIONS

Wanzhang Yang[1], Yun Zhang[2], Fang Wu[1], Wei-Ping Min[3], Boris Minev[4], Min Zhang[1], Xiao-Ling Luo[2],

Famela Ramos[5], Thomas E Ichim[5], Neil H Riordan[5], Xiang Hu[2]
[1]Nanshan Affiliated Hospital of Guangdong Medical College, Shenzhen,China, [2]Shenzhen Beike Cell Engineering Research Institute, Shenzhen, China, [3]Department of Surgery, University of Western Ontario, London, Ontario,Canada, [4]Department of Medicine, Division of Neurosurgery, University of California San Diego, San Diego, CA, USA, [5]Medistem Inc, San Diego, CA, USA.

Objective: The current paradigm for cord blood transplantation is that HLA matching and immune suppression are strictly required to prevent graft versus host disease (GVHD). Immunological arguments and historical examples have been made that the use of cord blood for non-hematopoietic activities such as growth factor production,stimulation of angiogenesis, and immune modulation may not require matching or immune suppression. *Method:* 114 patients suffering from non-hematopoietic degenerative conditions were treated with non-matched,allogeneic cord blood. Doses of 1-3×107 cord blood mononuclear cells per treatment, with 4-5 treatments both intrathecal and intravenously were performed. Adverse events and hematological, immunological, and biochemical parameters were analyzed for safety evaluation. *Results:* No serious adverse effects were reported. Hematological, immunological, and biochemical parameters did not deviate from normal ranges as a result of therapy. *Implications:* The current hematology-based paradigm of need for matching and immune suppression needs to be revisited when cord blood is used for non-hematopoietic regenerative purposes in immune competent recipients.

PO-0822

GLASGOW COMA SCALE IS PREDICTOR OF FUNCTIONAL OUTCOME OF ADULT TRAUMATIC BRAIN INJURY IN REHABILITATION SETTING

Wafa Al Yazeedi
Hamad Medical Corporation, Qatar

Purpose: The objective of this study is to determineGlasgow coma scale (GCS) is a predictor of the functional outcome of inpatients rehabilitation setting after traumatic brain injury (TBI). *Method & Materials:* 43 male patients of TBI admitted in rehabilitation unit during period from June 2010 to May 2012 were included in this study. Data was collected from patient's files, maintained by medical records department. Length of stay at rehabilitation (LOSr) was dependent variable and GCS, length of stay at acute care (LOSa), functional independence measure cognitive on admission and discharge (FIMcA & FIMcD), functional independence measure motor on admission and discharge (FIMmA &FIMmD), Rancho level of Cognition on admission and discharge (RLAa & RLAd), and disability on admission and discharge (Da & Dd) were independent variables. *Results:* Demographic study and Pearson correlation were applied in this study. Age range was 17–64 years and the median is 38 years. We found GCS was negatively correlated with LOSa (-0.34), LOSr (-0.25), Da (-0.31).and Dd (-0.17) and positively correlated with RLAa (0.36), FIMCa (0.39), FIMCd (0.31), FIMmD (0.21). *Conclusion:* We observed in our study the initial GCS is strong predictor of function outcome of adult TBI of inpatients in rehabilitation setting

PO-0823

NEURAL REPAIR AND REHABILITATION STRATEGIES FOR SPINAL CORD INJURY; THE VISUALIZATION OF NEURONS IN THE BRAIN WITH PHASE-CONTRAST CT

Kenta Takashima[1,2], Masato Hoshino[3], Kentaro Uesugi[3], Naoto Yagi[3], Atsushi Nakahira[4], Masahiro Kohzuki[1], Noriko Osumi[1], Hiroshi Onodera[2]*
[1]Tohoku University Graduate School of Medicine,Japan, [2]CREST,Japan, [3]Japan Synchrotron Radiation Research Institute SPring-8, Japan, [4]Osaka Prefecture University Graduate School of Engineering, Japan

For analyses of neuronal function and brain pathology, it is important to visualize three-dimentional brain microstructures. Although computed tomography (CT) and magnetic resonance imaging (MRI) are commonly used for brain and spinal cord imaging, they could not visualize microstructures of our braided micro-scaffold. X-ray phase-contrast CT with radiant light source has great potential to reveal soft tissues and provide mass density, because the sensitivity of this method to light elements is almost 1,000 times greater than that of the present absorption-contrast X-ray CT method. Ex vivo phase-contrast X-ray CT was performed using a synchrotron radiation source to investigate brain microstructures. We report that phase tomography with the interferometer using synchrotron radiation can visualize brain microstructures. This method can visualize single large-sized neurons in brain blocks, such as cerebellar Purkinje cells and hippocampal pyramidal neurons. Phase-contrast X-ray CT may be a promising noninvasive technique for the assessment of objective response to therapeutic rehabilitation.

PO-0824

EFFECT OF PERIPHERAL NERVE STIMULATION IN UPPER LIMB MOTOR FUNCTION IN PATIENTS WITH STROKE USING TENS: A PILOT STUDY

Pui Kit Tam
Tung Wah Hospital, Hong Kong, China

Background: Several clinical trials found that Peripheral nerve stimulation (PNS) may improve upper limb function in post-stroke patients. However the parameters used in these studies could only be carried out by expensive, sophisticated nuerostimulators limiting their use in clinical practice. *Objective:* To test whether delivering PNS by portable neurostimulator normally used for transcutaneous electrical nerve stimulation (TENS) could improve pinch strength and function of the affected upper limb in post-stroke patients. *Design:* Pilot study with randomized-controlled design. *Method:* 12 patients with subacute stroke were randomly assigned into two groups (n=6 per group). The intervention (TENS) group received a single 2 h session of PNS to the median and ulnar nerve of the affected upper limb while control group received sham stimulation for 2 h. Pinch strength and Jebsen-Taylor Hand Function Test (JTHFT) of the affected hand were measured before and immediately after the simulation. *Results:* Median age of the subjects was 77 years (25-75%interquartile range 56-82) and the median time since stroke onset was 36 days (interquartile range 25-39). Pinch strength increased after stimulation in the TENS group while that in the control group decreased and the difference is statistically significant (p-value =0.036). There was no statistically significant difference for JTHFT for both groups. *Conclusion:* Peripheral nerve stimulation using portable neurostimulator might improve pinch strength of the affected hand in patients with subacute stroke and is potentially a cheaper, more readily available alternative for PNS.

PO-0825

EFFECT OF ANKLE-FOOT ORTHOSIS ON TRUNK MOTION AND WALKING CAPACITY OF HEMIPARETIC STROKE

Guangqing Xu[1], Yue Lan[1], Dongfeng Huang[1]
Department of Rehabilitation Medicine, The First Affiliated Hospital of Sun Yat-sen University, Guangzhou, Guangdong 510630, China

Objective: Restoration of both normal movement of the pelvis and centre of mass is a primary goal of walking rehabilitation in post-stroke patients because these movements are essential components of effective gait. The aim of this study is to quantitatively analyze the effect of ankle-foot orthosis on walking ability, and to investigate the correlation between improvements in trunk motion and

walking capacity. *Methods:* The total study sample comprised 20 stroke patients with hemiparesis. Walking speed, centre of mass displacement, and pelvic movements were examined in post-stroke hemiparetic patients with and without ankle-foot orthosis using three-dimensional motion analysis. *Results:* Using ankle-foot orthosis improved walking speed, pelvic rotation and tilt, and lateral and vertical displacements of the centre of mass ($p<0.01$). Moreover, the gait asymmetry index was significantly decreased ($p<0.01$), and the Functional Ambulation Categories score improved significantly when patients used an ankle-foot orthosis ($p<0.05$). There was significant correlation between improvements in walking capacity and the displacement of the centre of mass in both vertical and lateral directions ($p<0.01$). *Conclusions:* Using ankle-foot orthosis improves walking capacity by improving the stability and concordant of the trunk in hemiplegic patients. The improvement in walking capacity from using an ankle-foot orthosis may be attributed to its prevention of foot drop and compensation for the instability of the ankle joint.

PO-0826

ESTABLISHMENT OF A METHOD FOR IDENTIFYING THE LANGUAGE-DOMINANT HEMISPHERE BY NEAR INFRA-RED SPECTROSCOPY: NIRS

Masayuki Yamada[1], Kikuo Ohta[1], Megumi Suzuki[1], Akiko Maeda[2], Eiich Saitoh[3]

[1]Faculty of Rehabilitation, School of Health Sciences, Fujita Health University, Japan, [2]Department of Rehabilitation, Fujita Health University Hospital, Japan, [3]Department of Rehabilitation Medicine I School of Medicine, Fujita Health University, Japan

Objective: In general, the left hemisphere of the brain is dominant for language in at least 90% of right-handed persons and 40 to 70% of left-handed persons. In this study, a method was investigated for identifying the language-dominant hemisphere of left-handed persons by near infra-red spectroscopy: NIRS. *Methods:* 1) Subjects: 30 healthy right-handed persons and 10 healthy left-handed persons. 2) Experimental Methods: The Oxy-Hb levels were measured using NIRS (ETG-4000) while the subjects 1) solved word recall tasks, 2) writing sentences, 3) read sentences silently, and 4) solved mental calculation tasks. The subjects were given 30 seconds to do each task, taking 3-min rests among them. *Results:* Changes in Oxy-Hb levels were little different between the right and left hemispheres while the subjects solved word recall tasks and read sentences silently, but were significantly different while they wrote sentences and carried out mental calculations. *Implications:* In this study, the brain activation task of writing sentences increased the Oxy-Hb levels, but the increase may have reflected the movements of the fingers and arms. The task was difficult to identify the language-dominant hemisphere of left-handed persons who were trained to use the right hand. Mental calculation was found to be likely effective for identifying the language-dominant hemisphere of left-handed persons. *Conclusions:* The investigation of brain activation tasks for identifying the language-dominant hemisphere using NIRS showed that mental calculation tasks was likely effective for identifying the hemisphere of left handed persons.

PO-0827

SPINAL ACCESSORY NERVE PALSY AFTER CERVICAL LYMPHADENECTOMY: A CASE REPORT

Ümüt Güzelküçük, Yasin Demir, Evren Yaşar, Bilge Yılmaz, A.kenan Tan

Turkish armed forces rehabilitation center, Turkey

The spinal accessory nerve provides motor innervation of the trapezius and sternocleidomastoid muscles. Spinal accessory nerve palsy mostly can occur after surgery procedurs of the neck region, especially due to neck dissection for tumors. The other reasons are trauma, fractures of the jugular foramina and skull base tumors. Palsy of the nerve can be determined by weakness of the shoulder elevation and abduction and trapezius muscle atrophy. A 22-year-old male admitted to a hospital with sore throat, fever, consciousness, nausea, vomitting. Examination revealed generalized lymphoadenopathy, hepatosplenomegaly. After cervical lymphadenectomy; tuberculosis meningitis was diagnosed. Two months later he applied to our clinic and his shoulder abduction muscle strength was 4/5, he had atrophy at the upper part of the trapezius muscle. The needle electromyography showed left spinal accessory nerve subacute-chronic partial axonal degeneration with denervation potentials. The aim of this case report is to consider spinal accessory nerve palsy after minimal invasive surgery procedurs like cervical lymphadenectomy.

PO-0828

INTER-INDIVIDUAL VARIABILITY OF THE EFFECTS OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION ON MOTOR FUNCTION IN STROKE PATIENTS

Genji Abe[1], Yutaka Oouchida[1]*, Takayuki Mori[1], Sumie Uchino[1], Eizaburo Suzuki[1], Naoki Aizu[1], Zhi-Ming Tang[1], Mayumi Nagai[1], Yudai Suzuki[1], Shin-Ichi Izumi[1,2]

[1]Department of Physical Medicine and Rehabilitation, Tohoku University Graduate School of Medicine,Japan, [2]Department of Physical Medicine and Rehabilitation, Tohoku University Graduate School of Biomedical Engineering, Japan

Objective: To examine the inter-individual variability of the effects of four stimulus patterns of repetitive transcranial magnetic stimulation (rTMS) on motor function. *Methods:* Seven chronic stroke patients with severe to mild hemiparesis were given four stimulus patterns in separate days: 1Hz rTMS and continuous theta burst stimulation over the hand area in primary motor cortex in intact hemisphere, and 5 Hz rTMS and intermittent theta burst stimulation over the one in lesioned hemisphere. To evaluate the effects of each stimulus pattern on motor function, we measured the maximum extension angles and the maximum flexion angles, and calculated the correlation between the change of extension angles and the change of flexion angles, while patients performed maximum finger open-close cyclic movements before and after stimulations. *Results:* Each patient had a different pattern of the effects of four stimulus patterns. A strong negative correlation ($r=-0.73$, $p<0.01$) was found between the change of extension angles and the change of flexion angles. *Implication on Rehabilitation:* The effects of a stimulus pattern on motor function were varied over patients. Using the rTMS as a therapeutic approach in stroke patients, we should select the most effective pattern of stimulation that improves patient's impairment.

PO-0829

THE CHARACTERISTIC OF COGNITIVE FUNCTION IN THE ACUTE STAGE OF PATIENTS WITH TRAUMATIC BRAIN INJURY (ANALYSIS OF 100 CASES)

Yi Zhang, Yilin Yang, Qiujing Yao, Changchun Yang, Hui Wang, Fengji Zhang

Changzhou first peoples hospital, Jiangsu, China

Objectives: to explore the characteristic of cognitive function in acute stage of patients with traumatic brain injury. *Methods:* We use aphasia screening test and the Loewenstein Occupational therapy cognitive assessment battery (LOTCA) to assess the cognition function in 100 acute-stage patients with traumatic brain injury and analyze the characteristic. *Results:* (1) The total scores and sub-item scores of LOTCA except object recognition, shape recognition,

overlapping figure, object constancy and praxis are lower than those in normal group. (2) The scores of orientation, visuomotor organization, thinking orientation and attention in severe TBI patients are lower than those in mild and moderate TBI patients. But there is no difference in perception between the mild, moderate and severe TBI patients. (3) The scores of thinking orientation and visiomotor organization in right hemisphere injured patients is lower than those in left hemisphere injured patients. The bilateral injured patients got lower total scores and sub-item scores except perception are lower than those in unilateral injured patients. *Implications:* All the TBI patients have some degree of cognitive dysfunction. The severe TBI patients and bilateral hemisphere injured patients have profound cognitive problem. The characteristic of cognitive dysfunction of left and right hemisphere injured patients is different.

PO-0830

STUDY OF P300 IN TREATMENT OF MILD VASCULAR COGNITIVE IMPAIRMENT WITH DONEPEZIL

Qixiu Zhu, Yunxia Liu
Qingdao university medical school affiliated hospital

Objective: To study the differences of cognitive scale and auditory event-related potential P300 on mild vascular cognitive impairment patients before and after treatment of donepezil, then further explore the application value of P300 inearly treating vascular cognitive impairment patients. *Methods:* A total of 56 patients (randomly divided into treatment group and control group) with mild vascular cognitive impairment and 30 healthy volunteers without cognitive deficits were recruited in this study. There were 30 cases in treatment group taking 5 mg of donepezil daily for 3 months and 26 cases in the control group were treated with vitamin C 10 mg, 3 times a day. Each patient was respectively detected by auditory-P300 and scored every item of MMSE and MoCA scale before and after 12 weeks treatment. *Results:* The P300 latency in patients was longer than that in normal group before treatment, while the amplitude was lower ($p<0.05$), and the latency was significant different ($p<0.01$). The Cognitive Assessment Scale scores of MMSE, MoCA and ADL (Barther Index) in V-MCI group were lower than normal group, while in the respects of name and speech had no significant differences ($p>0.05$). Age was high positive correlation with the P300 latency ($p<0.05$), years of education was negative correlation with it ($p<0.05$). After the treatment of donepezil the P300 latency in V-MCI group was shorten, the amplitude was heighten ($p<0.05$), the cognitive scale scores were raisen ($p<0.05$) and each indicator was more obvious in the treatment group ($p<0.05$). Moreover, the scores of visual space, executive ability and delayed recall increased immensely after treatment ($p<0.01$). *Conclusion:* Donepezil can improve and defer the early cognitive dysfunction of the mild vascular cognitive impairment patients, increase the capacity of visual space, executive ability and delayed recall.P300 can objectively reflect the early cognitive function in the V-MCI and more sensitive than the Cognitive Assessment Scale.

PO-0831

AN EMG BIOFEEDBACK AND PATTERN RECOGNITION BASED VR SYSTEM FOR HAND AND WRIST REHABILITATION FOR THE PATIENTS AFTER STROKE

Di Ao, Rong Song
School of Engineering, Sun Yet-sen University, Guangzhou, Guang Dong, P. R. China

Objective: To promote the rehabilitation process of hand and wrist for the patients after stroke and help them back to normal activities of daily life (wrist flexion/extension, wrist pronation/ supination, hand grasp), a novel multi-DOF and multi-joint system which integrates electromyography (EMG) biofeedback and pattern recognition was designed for upper-extreme rehabilitation. *Methods:* The system was constructed with three main modules. 1) The visual feedback module: the training task of The VR game was shooting the target by a cannon and the game can be controlled by both the kinematic and EMG signals during the motions of wrist and hand, which was on the screen in front of the patients. 2) The signal capture module: a photoelectric encoder was utilized to capture the kinematic data during external and internal rotation of wrist, and the EMG signals from the pieces of muscle in upper limb which control the motions above were recorded after a custom-made EMG amplifier. 3) The control module: The actual angle of wrist rotation angle could control the rotation angle of a cannon in the game, and after processed, the EMG signal of hand -grasping motion was used to indicate the initial velocity of the missile and whether fire or not of the cannon, respectively, while the EMG signal of wrist-flexion/extension acted as the switch between them by phase detection theory. In the meanwhile, the muscle fatigue was detected by the EMG signal timely *Implication:* The system possessed the great potential values for medical rehabilitation for the post-stroke individuals.

PO-0832

ALTERED DEFAULT MODE AND AFFECTIVE NETWORK CONNECTIVITY IN STROKE PATIENTS WITH AND WITHOUT DYSPHAGIA

Shasha Li, Zhenxing Ma, Muke Zhou, Dong Zhou, Chengqi He
West China Hospital, Sichuan University, Chengdu, China

Objective: Increasing neuroimaging studies in stroke patients provides substantial evidence for the involvement of a widespread set of specific cortical and subcortical regions underlie the processing of control of swallowing. Little is known, however, about the changes in the functional architecture of the default mode network (DMN) and the affective network (AN) in swallowing stroke patients. To do this, unbiased seeds functional connectivity analysis used for detecting the connectivity patterns of these resting-state networks. *Method:* We measured resting-state functional magnetic resonance imaging (fMRI) in swallowing stroke patients with ($n=12$) and without dysphagia ($n=12$). *Results:* The functional connectivity pattern of the DMN and the AN in stroke patients without dysphagia showed approximate intact with healthy controls. In contrast, stroke patients with dysphagia showed wide impairments of functional connectivity in both the DMN and the AN. *Implications:* These findings suggested that brain activity was impaired only in motor network, but also in the DMN refereed to emotional state and self-related mental and in the AN related to affective arousal and regulation. Our study may contribute to the understanding of neuropathophysiological mechanism of psychosocial function impairments in dysphagic stroke patients

PO-0833

A CLINICAL OBSERVATION ABOUT THE EFFICIENCY OF THE ACUPUNCTURE COMBINED WITH BIOFEEDBACK TREATMENT ON POSTOPERATIVE CHILDREN SUFFERING FROM BRACHIAL PLEXUS NERVE INJURY

Lina Wang, Jing Gao
Maternity and Child Care Hospital of Huai'an City of Jiangsu Province

Objective: To study the effects of acupuncture combined with biofeedback treatment on the limb function and the change of electromyography (EMG) for postoperative children suffering from brachial plexus nerve injury after treatment. *Methods:* 40 postoperative children with brachial plexus nerve injury were randomly divided into treatment group and control group, 20 cases in each group. The control children were treated with rehabilitation therapy, such as manipulation, occupational therapy. While additional acupuncture

combined with biofeedback treatment was used by the treatment group. The limb function and the change of EMG of two groups' children were observed before and after treating. *Results:* Both the limb function and the EMG of two groups' children showed different improved ($p<0.05$) after treatment, but the treatment group was significantly better than the control group ($p<0.05$). *Impact on rehabilitation:* It has significant effect on limb function and EMG for postoperative children suffering from brachial plexus nerve injury, and acupuncture combined with biofeedback can be applied in clinic.

PO-0834

ANKLE CONTROL TRAINING ON THE GAIT OF HEMIPLEGIC PATIENTS INFLUENCE

Dong Hua, Xiaodong Feng, Bin Zhang, Jianming Xi, Qiaojun Li
The first hospital of Henan University of Traditional Chinese Medicine rehabilitation center

Objective: Observation of ankle control training on the gait of hemiplegic patients influence. *Methods:* 52 cases of stroke patients were randomly divided into two groups,were taken for routine rehabilitation training, the treatment group further ankle control training. Using Fugl-Meyer to lower extremity motor function of hemiplegic gait score, Brunnstrom score, Barthel score were before training, after the assessment. Results after 8 weeks of rehabilitation after treatment than before treatment, two groups of patients were obviously improved ($p<0.05$), but the treatment group improved significantly better than control group ($p<0.05$). *Conclusion:* Ankle control training on the gait of hemiplegic patients improved to have apparent stimulative effect.

PO-0835

UROLOGICAL INTERVENTIONS WITHOUT ANAESTHESIA IN SPINAL CORD INJURED PATIENTS

Koray Erten*, Ümüt Güzelküçük, Bilge Yılmaz, Arif Kenan Tan
Tsk Rehabilitation Center Ankara Turkey, Turkey

Hypothesis/aims of study: Urological complications due to bladder or urethral pathology were shown in upper spinal cord injured patients.In these patients, below of the lesion pain sensation is generally absent due to loss of sensation. Nevertheless, autonomic dysreflexia may occur in T6 and above injured patients while performing urological interventions. In this study we try to show that if interventions without anaesthesia have effect on frequency of autonomic dysreflexia or not. S*tudy design, materials and methods:* Between May 2007 and January 2012 97 patients which have urethral stricture in 13, bladder stone in 27, Botox TYPE A injection in 15 and vesicostomy in 1 anterior external urethroplasty in 1, 1 and cystoscopy 40 patients requiring small urological operation were performed interventions without anaesthesia. All the operations were made in operating room without anaesthesia but with monitoring the patients. *Results:* Autonomic dysreflexia was developed in only 1 patient who have bladder stone, and improved with intervention by anaesthetist. Otherwise no therapeutic intervention was required. Interpretation of results Patients requiring urological intervention with spinal cord injury due to urological complications, intervention without anaesthesia is reliable but rarely autonomic dysreflexia may develop. *Concluding message:* Patients requiring urological intervention with spinal cord injury due to urological complications, intervention without anaesthesia is reliable but rarely autonomic dysreflexia may develop. Careful monitoring is required but anaesthesia is not necessary.

PO-0836

ADL GRADING NURSING PATHWAYS APPLICATION EFFECT IN PATIENTS WITH STROKE OF REHABILITATION AREA

Lixia Zhao, Zhuo Wang, Li Li, Guofang Bai, Yali Geng
Shijiazhuang Center Hospital, China

Objective: Research ADL grading nursing pathways application effect in patients with stroke of rehabilitation area. *Methods:* 100 patients with stroke were divided into the research group and the control group, Two groups of patients adopt the same rehabilitation therapy method, Control group process regular care according to the doctors orders care level. Research group used daily life activities ability scale (improve Bathel index) rating scores determine ADL grading care level, The ADL intensive care (<20 points), the ADL Level 1 care (20-40 points), the ADL Level 2 care (40-60 points), the ADL Level 3 care (>60 points). Different levels give different care, After one month, Contrasting between the two groups was evaluated by daily life activities ability scale the ADL in two groups of the patients. *Result:* The improved Bathel index test score of the research group and the control group after treatment were higher than before treatment, Difference have statistical significance ($p<0.01$): The research group apparently rise comparing with control group, Difference have statistical significance ($p<0.01$). *Conclusion:* Implementation of ADL rehabilitation care grading can observably improve daily life activities abilities of patients and improve patients quality of life.

PO-0837

THE COMPREHENSIVE REHABILITATION EFFECT ON MODERATE AND SEVERE TRAUMATIC BRAIN INJURY PATIENTS IN TRAUMATIC BRAIN INJURY UNIT

Wei Xu, Linying Zhang
The Rehablitation Department,Huanhu Hospital, Tianjin

Objective: To observe the comprehensive rehabilitation effect on moderate and severe traumatic brain injury patients in traumatic brain injury (TBI) unit. *Methods:* 135 moderate and severe traumatic brain injury patients were divided into TBI group and common ward group randomly. The normalized rehabilitation therapy were performanced for 68 patients in TBI group, include promoting the recovery of consciousness in coma stage and promoting the motor, sensory, congnitive and memory function recovery in recovery stage. The 67 patients in common ward group received the regularly neurosurgery treatment. The GCS coma scale, Fugl-Meyer motor scale, Fugl-Meyer balance scale and congnitive function scores were evaluated pre and after treatment. *Results:* The GCS coma scale, Fugl-Meyer motor scale, Fugl-Meyer balance scale and congnitive function scores for TBI group improved more than those of common ward group. *Implication:* The comprehensive rehabilitation in TBI unit can effectively improve the motor and congnitive function for moderate and severe traumatic brain injury patients.

PO-0838

APPLICATION OF SEMG ON STROKE HEMIPLEGIA PATIENTS

Zengxin Sun[1], Y Y[1], Z J[1], G D[2], B Z[3]
[1]Peoples Hospital of Hebei Province, [2]Special Care Hospital of Hebei Province, [3]Hebei Normal University Institute of Physical Education

Objective: The purpose of this study was to describe the discharge rule of stroke patients trunk muscles include ES (Erector Spinae), EA (obliquus externus abdominis), RA (rectus abdominis).In this study we used the sEMG (MEGAWIN) during sling exercise training. *Method:* 20 stroke hemiplegia patients and 10 age-matched healthy elderly individuals took part in this study. They all take the same action test, include supine decubitus both keens sling, single keen sling, injured keen sling. injured lateral decubitus sling, uninjured lateral decubitus sling. *Results:* (1) The MA values of the stroke were significantly lower than the matched healthy elderly ($p<0.01$) in all action. (2) supine decubitus both keens sling, the MA of injured ES is higher than uninjured side ($p<0.05$), and the main contraction muscles of controls is ES, no significant interaction in both sides ($p>0.05$). (3) injured lateral decubitus sling, uninjured side RA and EA take the motion overmuch ($p<0.05$), in normal the injury side RA, EA is the main contraction muscles. *Implication:* This test offered the objective according for the using of the sing exercise training on clinical. But the influential factors of the sEMG, the difference of intersubject is obviously, sample size is small. To find the precise rule need large sample research.

PO-0839

EFFECT OF SLING EXERCISE TRAINING ON WALKING ABILITY OF STROKE HEMIPLEGIA PATIENTS

Zengxin Sun[1], Yanning Yan[1], Zishan Ja[1], Guoying Du[2], Bin Zhao[3]

[1]Peoples Hospital of Hebei Province, [2]Special Care Hospital of Hebei Province, [3]Hebei Normal University Institute of Physical Education

Objective: The objectives of this study were to determine the effect of sling exercise training on walking ability of stroke hemiplegia patients. *Method:* This study selected 40 stroke patients the course over 6 months as the research object, they randomly divided into group and conventional training group according to the motion functions. Sling exercise training group for sling exercise training, traditional training group performed the traditional trunk muscle training. Evaluation indicators: 10 mmaximum walking distance. *Results:* Sling exercise therapy is superior to the traditional training group in improve 10 meters maximum walking distance ($p<0.05$). Implication Sling exercise training is effective in rehabilitation of stroke patients. Compared with traditional training, sling exercise training is more effective in the same training period. It can effective improve walk ability.

PO-0840

RELIABILITY AND VALIDITY OF REVISED EC301 CALCULATION AND NUMBER PROCESSING BATTERY IN CHINESE VERSION

Xin Zhang, Xiaoping Yun, Huazhen Guo, Huili Zhang, Mingming Gao

Department of rehabilitive evaluation of China Rehabilitation Research Center

Objective: To analyze the reliability and validity of Revised EC301 Calculation and Number Processing Battery in Chinese version (EC301-CR); To establish diagnostic criteria by EC301-CR for acalculia in order to provide an effective assessment tool clinically. *Methods:*The items of EC301 were adjusted. 103 patients with acquired brain injury and 37 normal controls were randomly selected. 24 normal controls randomly selected were retested 6 weeks latter. *Results:* The Cronbachs coefficient, the split-half reliability and the retest reliability coefficients were 0.907, 0.744, and 0.965, respectively. The correlation coefficient within subscales was more than the correlation coefficient between subscales. 4 first-order factors were extracted which accounted for 69.359% of the accumulated variance, which were mental calculation, number transcoding, written calculation and approximation, and understanding of numbers. Control data (n=37) showed that the P10 of EC301-CR was 222.6. *Implications:* The critical value of acalculia is 222.6 in EC301-CR test. Psychometric properties analysis shows that EC301-CR is a reliable and validated instrument for acalculia.

PO-0841

NEUROPLASTICITY AND FUNCTIONAL IMPROVEMENT IN SPINAL CORD INJURY REHABILITATION

Thais Raquel Martins Filippo, Daniel Gustavo Goroso, Talita Justino Dos Santos, Marta Imamura, Linamara Rizzo Battistella*

Clinical Research Center. Institue of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objective: to review the literature to assess the current rehabilitation programs in spinal cord injury and their potential to promote functional improvements and neuronal plasticity. *Method:* Pubmed Database search of randomized clinical trials was conducted using the search strategy P.I.C.O. structure (P.I.C.O. stands for: Patient, Intervention, Comparison and Outcome). Our search strategy was: “Spinal Cord Injury" and "Rehabilitation" and "Neuronal Plasticity". After the search, we reviewed only abstracts related to Therapy/Broad to identify the studies that investigated spinal cord injury rehabilitation under the sight of neuronal plasticity. Subsequently, full-text articles were assessed to evaluate the potential of different rehabilitation programs to promote functional improvements and neuroplasticity. *Results:* Initially 62 articles were found, of which 0 were categorized as Therapy/Narrow, were then categorized 22 the articles Therapy/Broad. Ten studies were then excluded: 1 do not comprise functional rehabilitation programs and other 9 do not evaluate neuroplasticity outcomes. Most studies suggest treadmill as exercise provides a number of important benefits after spinal cord injury in clinical studies and animal models. Most studies tried to identify the timing, type, and quantity of exercise interventions and which exercises can be used to maximize functional improvements by strengthening synaptic connections appropriate. *Implications/Impact on rehabilitation:* Only few studies evaluated neuronal plasticity in spinal cord injury (SCI) rehabilitation. The knowledge gained in brain plasticity following SCI needs to be linked with what we know about promoting intrinsic recovery processes and how this can boost neurobiological and rehabilitation strategies. Future studies should investigate both aspects in SCI rehabilitation.

PO-0842

CHARCOT-MARIE-TOOTH DISEASE TYPE 4C IN KOREA

In-Sung Choi, Hyo-Jeong Seon, Hyun-Sik Yun, Jae-Young Han, Sam-Gyu Lee*

Chonnam National University Medical School & Hospital, Department of Physical and Rehabilitation Medicine, Research Institute of Medical Sciences, Center for Aging and Geriatrics, Regional CardioCerebroVascular Center, Korea

Objective: Charcot-Marie-Tooth disease (CMT) is the most common hereditary motor and sensory neuropathy. It is caused by mutations in genes that encode proteins composing the myelin or the axon. According to the clinical presentation and the compartment of the nervous system affected by the disease, CMT is subdivided into many subtypes. Among these subtypes, CMT type 4C is characterized by early-onset demyelinating peripheral neuropathy frequently associated with scoliosis, and has an autosomal recessive inheritance pattern. The causative gene of CMT type 4C is SH3TC2 (KIAA1985) on chromosome 5q32. CMT type 4C has remained unreported in Korea. Here we report a case of a Korean woman with CMT type 4C. *Case Report:* A 53-year-old woman visited our electrodiagnosis laboratory complaining of motor weakness

of bilateral ankle dorsiflexors. She showed steppage gait and both pes cavus, but could walk independently without any assistive device. Her symptom began in her twenties and showed gradual deterioration. On manual muscle test, bilateral ankle dorsiflexors and evertors were zero. Atrophy of bilateral peroneal and tibialis anterior muscles was observed. She underwent lumbar operation due to herniated nucleus pulposus 7 years ago and total thyroidectomy due to papillary thyroid cancer 1 year ago. Electrodiagnostic studies displayed peripheral polyneuropathy with combined demyelinating features and axonal loss in all extremities. Clinical and electrophysiological findings were suggestive of hereditary motor and sensory neuropathy. We conducted genetic study and could identify the SH3TC2 mutation in the patient. *Implications:* We report the first CMT type 4C patient in Korea.

PO-0843

KINETIC PARAMETER ESTIMATION OF UPPER-EXTREMITY MOTOR FUNCTION AFTER STROKE DURING GRIPPING FORCE CONTROL

Yu Ye, Rong Song
Kinetic Parameter Estimation Of Upper- Extremity Motor Function After Stroke During Gripping Force Control

Objective: The objective of this study is to investigate outcome measures of motor disorder on the motor control performance for subjects after stroke by gripping control task at different force level. *Methods:* 4 chronic strokes and 7 healthy controls were recruited to conduct a grip task at four force levels, 25% 50% 75% 100% of maximal gripping force. A customized system captured kinetics to describe gripping force in three dimensions during the task. Kinetic parameters including maximal gripping force, target value deviation and the ratio of target value deviation were analyzed between stroke group and control group. *Results:* The maximal gripping force in control group was significantly larger than the affected side of stroke group (p=0.0328), while the difference between control group and the unaffected side of stroke group was not significant (p=0.0759). Target value deviation ratio was calculated, to find the affected side of stroke group had the largest value, then the unaffected side, while the control group had the smallest value at all force levels. Moreover, there was a significantly larger ratio in the affected side of stroke group compared with the control group at three force levels (25% p=0.00813; 50% p=0.002085; 75% p=0.00295). A strongly negative correlation was observed between upper-extremity Fugl-Meyer scores and ratio of target value deviation at 50% maximal gripping force (r=-0.65319, p=0.0746). *Implications:* The analysis in this study may serve as an objective assessment of upper-extremity motor function for clinical evaluation of persons after stroke.

PO-0844

PERIPHERALLY INSERTED CENTRAL CATHETER AND MIDLINE CATHETER: A GUIDE FOR PATIENTS WITH SPINAL CORD INJURY

Sonia Cremascoli, Grazia Ruggieri, Gabriella Fizzotti, Tiziana Fusco, Anna Compostini, Caterina Pistarini
Salvatore Maugeri Foundation, Italy

Objective: To assess how the use of the Peripherally Inserted Central Catheter (PICC) and the Midline Catheter can improve the management of care and therapy in patients with spinal cord injury (SCI), during their recovery period in Spinal Unit. *Method:* We considered 10 SCI patients with different levels of SCI, admitted to the Spinal Unit of the Salvatore Maugeri Foundation in Pavia in 2012: 7 with PICC; 3 with Midline. The choice of using PICC or Midline followed evaluation criteria such as: extension of intravenous therapy; types of drug infusions; difficulty in finding peripheral veins; type of administered therapy. We asked to 10 nurses of our Spinal Unit staff and to these patients to answer to two quality questionnaires about the use of PICC and Midline. *Results:* Our patients found the placement of the PICC and/or Midline advantageous because it reduces the number of venipunctures which are necessary for the continuity of therapeutic infusion. Furthermore, considering the Visual Analogic Scale (VAS) for the evaluation of the pain, the positioning of the catheter caused pain with an average intensity. For the nursing staff it is advantageous because it reduces service time even taking into account the seriated controls. *Implications/ Impact on Rehabilitation:* The implementation of this protocol, developed in collaboration with the Anesthesiologists and Intensivists, has enabled us to optimize the timing, the quality of care and management of SCI patients.

PO-0845

THE MODULATION OF VENLAFAXINE ON CORTICAL ACTIVATION OF LANGUAGE AREA IN HEALTHY SUBJECTS WITH FMRI STUDY

Qi Xie[1], Yan Liu[2], Xue-Zhu Song[2], Jun Wang[3], Li-Xin Han[3], Chun-Yong Li[2]
[1]Department of Rehabilitation Medicine, General Hospital of Guangzhou Military Command of PLA; Guangzhou; China., 2.Neurology Department; General Hospital of Guangzhou Military Command of PLA; Guangzhou; China., [3]MRI Department; General Hospital of Guangzhou Military Command of PLA; Guangzhou; China

Rationale Previous studies have shown that selective serotonin reuptake inhibitors (SSRIs), activators of the cortex, apparently improved language functional recovery after brain damage rather than simply affective disorders. *Objective:* Our aim was to determine whether venlafaxine (an agonist of both norepinephrine and 5-hydroxytryptamine) could modulate language cortex function. *Methods:* A double-blind, crossover, randomized design was used to compare two 7-days treatment sessions with either venlafaxine (75 mg per day) or placebo. A functional magnetic resonance imaging experiment and two language function tests were performed on 8 healthy males (mean age, 28.25±3.15 years) at the end of each session, i.e., study entry, after venlafaxine and after placebo (days 0, 7, and 18). Hyperactivation (venlafaxine minus placebo > 0) or hypoactivation (placebo minus venlafaxine > 0) by venlaxafine was assessed on the basis of the activation-baseline contrast. *Results:* The naming score (p<0.001) and spontaneous language fluency (P score were positively correlated, and 4)By contrast, we observed hypoactivation in the temporo-parieto-occipital region in venlafaxine session (after venlafaxine). This improvement may be related to increased phonics-related output in the frontal language cortex of the dominant hemisphere. *Conclusion:* Compared to placebo, venlafaxine for 7 days significantly improved scores on language tests, enhanced activation of the superior part of Broca's area (BA 44/45) posterior to the gyrus frontalis medius of the dominant hemisphere and the premotor area (BA 6), and attenuated activation of the temporo-parieto-occipital area (BA 39/19) in the dominant hemisphere, and the pre-frontal cortex (BA 9/10). The activation in fMRI of the posterior gyrus frontalis medius of the dominant hemisphere was positively correlated with enhanced performance of picture naming. This suggested that venlafaxine could promote language production at the level of word, probably by upregulating the output of phone-related language cortex in the dominant hemisphere.

PO-0846

THE PATTERN OF CLINICAL AND EMG RECOVERY OVER SIX MONTHS IN A PATIENT WITH AXONAL POLYNEUROPATHY

Haitao Zhang*, Murry Brandstater
Loma Linda University Medical Center, Department of Physical Medicine and Rehabilitation,United States

Objective: Follow up the progression of drug induced axonal polyneuropathy over six month period with a 12-week course of aggressive physical therapy. *Method:* Clinical and electrodiagnostic evaluations were performed on a patient who was diagnosed with polyneuropathy after Bortezomib (Valcade) was administer for multiple myeloma at two, four and six months after symptoms started. The clinical evaluation include muscle strength, sensory and deep tendon reflex testings. Electrodiagnostic evaluation includes nerve conduction studies of upper and lower limbs, electromyography of selected upper and lower limb muscles. *Results:* Clinically patients motor strength showed improvement after a 12-week course of physical therapy was given. However the sensory and deep tendon reflex testing showed no significant improvement. Electrodiagnostically, the nerve conduction studies showed no change in conduction velocities or amplitudes in involved peripheral nerves. CMAP amplitudes of affected muscles also did not improve over six month period. *Implications/Impact on Rehabilitation:* It has been well documented that Bortezomib commonly used in treating multiple myeloma could cause polyneuropathy with electrodiagnostic abnormalities. However it is unclear to what degree the clinical features and the neuropathic changes are reversible over time, or whether symptom improvement correlates with electrodiagnostic findings. We are able to demonstrate in this case that the electrodiagnostic findings in axonal polyneuropathy induced by Bortezomib did not change although the clinical muscle strength improved.

PO-0847

STROKE REHAB PILL

Moisés Henriques[1,2]

[1]Naval Medical Centre, Portugal,Portugal, [2]North Lisbon Hospital Centre - Santa Maria Hospital, Portugal,Portugal

Objective: Stroke remains the leading cause of adult disability worldwide. The standard comprehensive stroke rehabilitation programs can reduce disability, but their effectiveness is limited. Adult brain responds to injury with considerable functional plasticity; certain drugs appear to influence neuroplasticity and the possibility of augmenting recovery after stroke using them is attractive. This study aims to clarify the role of pharmacological enhancement of stroke rehabilitation. *Method:* The expression “"stroke" AND "rehabilitation" AND ("pharmacological" AND ("enhancement" OR "augmentation"))” was searched on PubMed, PEDro and Cochrane; then the relevant articles were analyzed. *Results:* Levels of specific neurotransmitters may affect the rate and degree of recovery following stroke; drugs that can modulate those levels include Levodopa, acetylcolinesterase inhibitors and selective serotonin reuptake inhibitors. The clinical evidence regarding benefits of pharmacological enhancement of stroke rehabilitation is still weak because the findings of some studies were not confirmed by others and all of them presented several limitations, including small sample sizes. Routine clinical use is not universally recommended considering the heterogeneity of the stroke subjects and concerns regarding safety of some drugs. Despite that, the positive effect on the primary outcome measure along with the absence and low rate of severe and minor adverse events, respectively, suggest that there is scope for benefit from pharmacological augmentation in stroke rehabilitation. *Implications/Impact on rehabilitation:* The approach of pharmacological enhancement of stroke rehabilitation applied as add-on-treatment to conventional rehabilitation therapies seems to be effective, but large randomized controlled trials are needed; a few are indeed ongoing or planned.

PO-0848

EFFECTS OF CONSTRAIN-INDUCED MOVEMENT THERAPY ON BRUNSTROM STAGE OF UPPER LIMBS IN STROKE PATIENTS

Zehui Gong, Yiliang Wang, Qiang Guo, Baozhu Long, Fang Yang, Longhua Wu, Shijun Hou, Chaorong Zhou

Central Hospital of Chongqing Three Gorges, China

Objective: To discuss the effects of constrain-induced movement therapy on Brunstrom stage of upper limbs in stroke patients. *Methods:* Selected 88 patients with stroke, Randomly divided into test group and control group, each group has 44 people. Using constrain-induced movement therapy in the test group, conventional nerve rehabilitation treatment technique in the control group; Make evaluation for functiona at hospital admission within 24 h, 8 weeks and 16 weeks. *Results:* Compared with the control group, The proportion of patients whose upper limb shoulder-arm function in the metaphase evaluation reached the stage BrunstromV~VI within 1 months and over 6 months in the test group increased significantly, the difference was statistically significant ($p<0.05$); In the final assessment, proportion of patients whose upper limb shoulder-arm function reached the stage BrunstromV~VI increased significantly too; upper hand function had the same result. *Implications:* constrain-induced movement therapy can promote stroke patients with lower limb function enhancement, which is better than that of neural rehabilitation treatment technique. It can promote the long course of stroke patients recover quickly too, while in the long term efficacy, the effect it reflects isn’t obvious advantage in a short course in patients.

PO-0849

FUNCTION OF MONTREAL COGNITIVE ASSESSMENT CHINESE VERSION IN DEMENTIA

Gongwei Jia, Lingchuan Niu, Lehua Yu, Ying Yin, Lang Jia, Ruogu Zhao

Department of Rehabilitation Medicine and Physical Therapy, The Second Affiliated Hospital of Chonging Medical University, China

Objective: To assess the differential function of MoCA between AD and VD. *Methods:* Two groups of volunteers participated in the study of Chinese version of MoCA translated by Wang wei. One group was 32 patients with AD, the other group was 28 patients with VD. All the subjects were assessed with MoCA, the results were analyzed. *Results:* There was no significant difference of the rate of match with diagnosis between AD and VD patients ($p>0.05$). There was significant difference of visuospatial/executive, attention, delayed recall as well as MoCA results between AD and VD patients ($p<0.05$). *Implication:* Chinese version of MoCA can differentiate between AD and VD.

PO-0850

EFFECTS OF STROKE REHABILITATION ON INCIDENCE OF POST-STROKE DEPRESSION: A POPULATION-BASED COHORT STUDY

Wen-Hsuan Hou

Taipei Medical University Hospital,Chinese Taipei

Objectives: To investigate the effects of rehabilitation intervention within the first 3 months following stroke admission on the incidence of post-stroke depression (PSD). *Methods:* This population-based cohort study examined claim data of a random sample of 1 million insured people registered in 2000 in Taiwan. Between 2000 and 2005, a total of 7,677 patients were admitted as first-time stroke patients. Of them, 1,285 (16.7%) received a rehabilitation regimen within the first 3 months of stroke admission. The other 87.3% patients belonged to the control group. All study subjects were followed to the end of 2009 to observe any possible episodes of depression onset. A Cox proportional hazard model was used to estimate the relative risk of PSD in relation to the receipt of rehabilitation. *Results:* Over a 10-year follow-up, 75 (5.8%) patients with rehabilitation and 566 (8.7%) controls developed PSD, representing incidence densities of 11.3 and 18.5 per 1,000 person-years, respectively. After controlling for potential confounders, rehabilitation was found to significantly reduce the risk of PSD with a hazard ratio (HR) of 0.57 (95% confidence

interval (CI)=0.45-0.73). The effect was greater for men (HR=0.52, 95% CI=0.37-0.71), especially for elderly men (HR=0.45), than for women (HR=0.69, 95% CI=0.47-1.02). *Implications/Impact on Rehabilitation:* Stroke rehabilitation intervention in the first 3 months of stroke admission may significantly reduce the risk of PSD. We recommend that clinicians inform stroke patients and their families or care givers of the effectiveness of timely rehabilitation programs, and that health policy makers consider setting clinical guidelines that make rehabilitation mandatory.

PO-0851

A PILOT STUDY: THE EFFICIENCY OF BALANCE TRAINING USING THE NINTENDO WII FIT ON ADULTS WITH CHRONIC STROKE IN A COMMUNITY REHABILITATION SETTING

Joyce Tse[1]*, Eric W.C. Tam[2], L.K Hung[3]

[1]SAHK,Hong Kong, [2]Interdisciplinary Division of Biomedical Engineering, The Hong Kong Polytechnic University,Hong Kong,[3]Department of Orthopaedics & Traumatology, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong, China

Objective: To investigate the efficiency of balance training using the Nintendo Wii Fit on adults with chronic stroke in a community rehabilitation setting. *Methods:* Six stroke patients from a community rehabilitation day center were recruited and randomly assigned to either control or experimental group. Both group participants underwent 10 sessions conventional rehabilitation training for stroke for about 2 h per session, twice weekly for 7 to 10 weeks. Experimental group received 15-min Wii Fit training while control group received 15-min wobble disc training. The functional balance performance was assessed by the Berg Balance Scale (BBS) and the mean velocity of the center of pressure (COP) measured by pressure mat was assessed before and after the intervention. *Results:* The BBS score increased significantly by the Wilcoxon signed rank test (p=0.027) after the training in both groups, but no significant between-group difference was found between the two interventions. No significant change in COP velocity was reported in both groups. *Implication on rehabilitation:* Nintendo Wii Fit as a rehabilitation tool can provide comparable training effect as conventional balance training of wobble disc. The results of this study suggest the potential effectiveness of utilizing the Nintendo Wii Fit as an alternative treatment in balance training. As the frequency of task-specific training can be increased without increasing manpower for supervision, Wii Fit training is more cost effective than the conventional labour-intensive training.

PO-0852

TOP-DOWN MODULATION OF UNILATERAL NEGLECT WITH MULTIPLE SESSIONS OF TBS OF DORSOLATERAL PREFRONTAL CORTEX

Wei Fu, Weiqun Song, Yanming Zhang, Lin Liu, Maobin Wang

Department of Rehabilitation Medicine, Xuanwu Hospital, Capital Medical University, Beijing 10053, China

Background and Purpose: The dorsolateral prefrontal cortex (DLPFC) is important for the integration of cognitive functions, including spatial attention function. Based on some evidence that transcranial theta burst magnetic stimulation can induce significant effects on DLPFC-related cognitive function, we aimed to investigate whether left DLFPC iTBS is associated with modulation of neglect. *Methods:* Two patients with left-sided visual neglect attributable to right hemispheric stroke received 2 weeks of intermittent theta burst transcranial magnetic stimulation (iTBS) of the left DLPFC. We used the iTBS protocol in which 10 bursts of high-frequency stimulation (3 pulses at 30 Hz) were applied at 5 Hz every 10 s for a train of 600 pulses, including 2 trains every 15 min. The coil was placed 5 cm anterior from the hand motor area on the left hemispheres. *Results:* Two-week iTBS over left DLPFC significantly deceased visuo-spatial hemineglect, and generated positive affect simultaneously. *Conclusions:* The new protocol of repeating iTBS over left DLPFC for two weeks may be promising for the long-lasting alleviation of neglect. This study further supports the involvement of the prefrontal cortex in the neural network associated with neglect, and also provides initial evidence for a potential brain stimulation site for neglect treatment.

PO-0853

STUDY THE APPLICATION OF RATIONAL-EMOTIVE BEHAVIOR THERAPY IN WORK-RELATED INJURIES MINERS MOOD DISORDERS

Taojie Liu, Kai Zhang, Mingjun Wang, Bin Hu, Qinfang Lu, Jinya Wen, Pu Xu

Pds Mine General Hospital, China

Objective: To explore the effect of the rational emotive behavior therapy (REBT) on mood, cognition and motor function in the work-related injuries miners with mood disorders. *Methods:* 102 patients were randomly divided into control group and experimental group. Both groups were given deanxit for 8 weeks, and the experimental group received REBT additionally. Hamilton Rating Scale for Depression (HAMD),Loewenstein occupational therapy cognitive assessment (LOTCA) and Fugl-Meyer were evaluated before and after treatment. *Results:* The data were analysised by repeated measures analysis of variance. HAMD:there were significant differences in different time between two groups (p<0.05), and the experimental group scores were lower than the control group. The score at different time in same group had significant difference (p<0.05). LOTCA:there were significant differences in the 8th and 16th week between two groups (p<0.05),and the experimental group scores were higher than the control group.The score at different time in same group had significant difference (p<0.05). Fugl-Meyer: there were significant differences in different time between two groups (p<0.05), and the experimental group scores were higher than the control group. The score at different time in same group had significant difference (p<0.05). The therapy and the time had interaction (p<0.05). It means the change tendency of HAMD, LOTCA and Fugl-Meyer had some difference between two groups. *Conclusion:* REBT combined with antidepressants could be better and more quickly to improve the depressive symptoms than only with antidepressants.It further improve cognitive function and motor function.

PO-0854

CLINICAL OBSERVATION OF ACUPUNCTURE WITH DIFFERENT POINTS COMBINATION ON UROSCHESIS AFTER SPINAL CORD INJURY

Lin Wang

the Affiliated Hospital of Qingdao University Medical College, China

Objective: To compare the effects of different points on uroschesis after spinal cord injury and search for a better method of treatment. *Methods:* 40 patients were randomly divided into nearby point group and routine acupuncture group. The former group included Shèn shū, Páng guāng shū and Bái huán shū. We puncture this group deep with long needles and then carry on electroacupuncture with low frequency strong stimulation. The posterior group received routine electroacupuncture treatment. Two groups were given continuous treatment for fifteen times. *Results:* There were great significant differences of the residualurine volume after the treatment comparing the nearby point group with the routine acupuncture group. (p<0.05). *Conclusion:* The effectiveness of electroacupuncture with Shèn shū, Páng guāng shū and Bái huán shū on uroschesis after spinal cord injury is better than routine acupuncture group. *Implications on Rehabilitation:* The acupuncture method can improve bladder

volume of uroschesis patients after spinal cord injury as well as alleviate the symptoms effectively and improve the quality of life.

PO-0855

WHEN AN APPARENT BENIGN CERVICOBRACHIALGY IS A CHIARI MALFORMATION - A CASE REPORT

Cátia Galvão*, Joana Paula
Department of Physical Medicine and Rehabilitation, Hospital de Curry Cabral, Lisbon, Portugal

Objective: Chiari malformations are a heterogeneous group of disorders defined by anatomic abnormalities of the cerebellum, brainstem, and craniocervical junction, with downward displacement of the cerebellum into the spinal canal, often associated with spinal cord cavitations (i.e. syringomyelia). Chiari type I (CM-I) is characterized by cerebellar tonsils that are displaced below the level of the foramen magnum. Clinical manifestations of CM-I are often insidious and are related with elevated intracranial pressure, cranial neuropathies, brainstem compression, myelophaty, cerebellar dysfunction, pain (mainly neck pain and occipital headache) and syringomyelia. Diagnosis is based on MRI. Descompressive surgery is indicated on symptomatic cases. *Method/Results:* This is a case report of a female patient, 24 years old. For a long a time, the patient demonstrated a bilateral cervicobrachialgy with paresthesias and the occipital headache increased with valsava manoeuvres. Physical Examination: Cervical painful contracture and hiperalgesia on the arms bilaterally. The patient tried Kinesitherapy, Mesotherapy and took oral analgesics but the symptoms prevailed. Later, having made a MRI the result was: low-lying cerebellar tonsils displaced below the level of foramen magnum with cervical syringomyelia. The patient was then submitted to surgery and the clinical evolution was good despite the mild cervical pain. *Implications/Impact on rehabilitation:* careful observation is an important step to avoid eventual misleading rehabilitation treatments that delay the surgery. In post-operative, patients need rehabilitation for cervical flexibility and posture. In some cases, the rehabilitation can be chronic and the symptoms may remain or get worse, despite the surgery.

PO-0856

EARLY MOVEMENT TO PROMOTE THE RECOVERY OF NERVE INJURY AFTER CEREBRAL ISCHEMIA

Yi Wang
Capital University of Physical Education and Sports, China

Purpose: Research in early brain variation findings of ascorbic acid in the process of cerebral ischemia based on treadmill exercise intervention focal cerebral ischemia animal models, the use of in vivo microdialysis techniqueand online electrochemical analysis techniques, dynamic monitoring of the impact of the movement of early hippocampal ascorbic acid concentration in cerebral ischemia, investigated the link between the change of the ascorbic acid with hippocampal nerve cell damage and brain cognitive dysfunction. *Method:* In this study, in vivo brain microdialysis technology and online electrochemical analysis techniques vivo analysis of dynamic brain ascorbic acid as the core, to rats as experimental subjects, prepared through the line tied focal cerebral ischemia as cerebral ischemia modelearly to ischemia aerobic treadmill exercise as a means of exercise intervention, hippocampal nerve function area as the target detection area, exploring the impact of exercise on cerebral ischemia the early hippocampus ascorbic acid changes. *Result:* Focal cerebral ischemia early hippocampal region ascorbic acid concentrations were significantly increased, the early movement ischemia reduced ischemia in hippocampal brain region ascorbic acid level rise. Histological identification of early movement to reduce the extent of ischemic nerve injury in hippocampus after ischemia. Exercise group of neurological function after ischemia ischemic animals than not sport. *Conclusion:* Early movement after cerebral ischemia can reduce the area of ischemia in hippocampal brain nerve injury to promote the recovery of neurological function after missing points, potential mechanisms for small-molecule antioxidant in the brain after ischemia.

PO-0857

THE EFFECTS OF MOTOR IMAGERY THERAPY ON THE UPPER LIMB MOTOR FUNCTION IN HEMIPLEGIC STROKE PATIENTS OF EARLY STAGE

Le Hua Yu[1], Qiao Fu[1,2], Wenyuan Chen[2], Jincheng Yu[2], Zeye He[2], Xianchang Cao[2]
[1]Department of Rehabilitation Medicine and Physical Therapy The Second Affiliated hospital, Chongqing Medical University, Chongqing, 400010,China, [2]Rehabilitation Center, Hainan Provincial People's Hospital, Haikou, 570311, China

Objective: To investigate the effects of motor imagery therapy on the upper limb motor function and activity of daily living (ADL) in hemiplegic stroke patients of early stage. *Method:* Used the randomly case control study. After assessed by kinesthetic and visual imagery questionnaire (KVIQ), 42 patients with hemiplegic stroke were randomly subdivided into two groups: an experimental group (n=23) and a control group (n=19). All patients were assessed with Fugl-Meyer assessment (FMA) and Modified Bathel Index (MBI) before and after 8 weeks treatment. All patients were treated with the routine rehabilitation training. In the experimental group patients were treated with motor imagery meanwhile. *Result:* In the same group after 8 weeks treatment the scores of FMA and MBI were significantly improved compared with before treatment, there was statistical difference (p<0.01). After 8 weeks treatment, there were statistical differences between the two groups, the scores of FMA and MBI in the experimental group were significantly increased compared with the control group (p<0.01). Implitations Motor imagery therapy significantly improves the upper limb motor function and ADL in the patients with hemiplegic stroke in early stage.

PO-0858

EFFECT OF DIFFERENT ATMOSPHERE ABSOLUTE HYPERBARIC OXYGEN ON PERIHEMATOMAL EDEMA AND EXPRESSION OF AQUAPORIN-4 IN RATS WITH INTRACEREBRAL HEMORRHAGE

Hongling Li, Yuyan Chen, Gang Huang
The second hospital of HeBei Medical University, Shijiazhuang, China.

Objective: To study the effect of different atmosphere absolute (ATA) hyperbaric oxygen (HBO) on perihematomal edema and expression of aquaporin4 in rats with intracerebral hemorrhage (ICH). *Methods:* The collagenase induced method was used to set up the rat models.A total of 90 male SD rats with experimental intracerebral hemorrhage were randomly divided as control group (n=18),ICH with oxygen treatment (1.0ATA) group (n=18) and ICH with HBO therapy group (n=54). The rats in the HBO therapy group were again divided as ICH with 1.8ATA HBO therapy, ICH with 2.0ATA HBO therapy and ICH with 2.2ATA HBO therapy, with 18 rats in each. The oxygen treatment was administered postoperation 24h, by using 90% oxygen at different ATA in a steady pressure for 60 min,once daily. Rats were sacrificed by decapition at the time points of 1 d, 3 d, 5 d. Each time point had 6 rats. The water content of the brain tissue was measured by dry-wet method, the expression of AQP4 was detected by immunohistochemical staining. *Results:* The brain water content and AQP4 level in the perihematomal area in 1.0ATA oxygen treatment showed no significant difference as compared with that in control group at days 1, 3 and 5 post-ICH (p>0.05). HBO

therapy significantly reduced the brain water content and AQP4 level in the perihematomal area compared with control group and 1.0ATA oxygen treatment at days1, 3 and 5 post-ICH ($p<0.05$), however, the effect of HBO with 2.0ATA was superior to that 1.8ATA and 2.2ATA at days 3 and 5 post-ICH ($p< 0.05$). *Conclusion:* HBO therapy can decrease the brain water content and AQP4 level in the perihematomal area.The effect of HBO with 2.0ATA was superior to that 1.8ATA and 2.2ATA.

PO-0859

CLINICAL STUDY OF MIRROR THERAPY IN BRAIN PLASTICITY CHANGES BEFORE AND AFTER THE REHABILITATION OF STROKE PATIENTS WITH HEMIPLEGIA AND ANALYZED BY DIFFUSION TENSOR IMAGING

Xiaoyu Zhang
China Rehabilitation Research Center

Objective: Use mirror therapy treatment of stroke patients with hemiplegia, application of diffusion tensor imaging analysis of brain plasticity changes in patients before and after rehabilitation. *Methods:* 60 cases elderly stroke patients with hemiplegia were collected in February 2011 to January 2012 inour hospital and divided into three groups. I group of 20 patients, ages 45 to 54 years old, II group of 20 patients, aged 55 to 64 years old, group III 20 cases, aged 65 to 75 years old. All the patients were treated by mirror and rehabilitation therapy, 6 weeks of continuous treatment. NIHSS evaluated neurological function before and after treatment; FMA evaluated upper limb motor function. *Results:* FA value was (0.43 ± 0.09), (0.40 ± 0.05), (0.33 ± 0.07) in the group of I, II, III, significantly lower than the corresponding side of the normal brain tissue FA values ($p<0.05$). After 6 months of mirror therapy, FA value was (0.48 ± 0.04), (0.44 ± 0.02), (0.40 ± 0.05) in the group of I, II, III, was significantly higher than before treatment ($p<0.05$). FA values decreased with increasing age, the FMA score after treatment in each group significantly higher than before treatment ($p<0.01$). CST divided into two grades through DTT. NIHSS score in same group same CST grading of patients after six weeks of treatment was significantly lower than before treatment ($p<0.05$). NIHSS score in the second grade of CST was significantly higher than first grade of CST. *Conclusion:* DTT can be visually appearing infarction lesion and walking between the rows of the fiber bundle, determination of the nerve damage, combination of mirror therapy conducive to the rehabilitation of patients.

PO-0860

THE OBSERVATION OF THE REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (RTMS) TREATMENT CURATIVE EFFECT ON THE COGNITIVE IMPAIRMENT BY STROKE

Chunhua Zhao
Liaoning Thrombus Treatment Center of Integrated Chinese and Westen Medicine,Shenyang,China

Objective: Observe the curative effect of the repetitive transcranial magnetic stimulation (rTMS) to cognitive impairment by stroke. *Method:* Three steps to selected patients.1. Confirmed ischemic stroke by Transcranial CT or MRI, 2. After the mini-mental state examination (MMSE), screening score value < 27 points 3. Used the Loewenstein Occupational Therapy Cognitive Assessment (LOTCA) confirmed the cognitive impairment. *Result:* After treatment, the two groups of patients' LOTCA and MMSE score were increased ($p<0.05$). thinking ability, attention, directional force of both group all had improved in evidence ($p<0.05$). However, spatial perception aspects have no obvious difference, so there was not statistically significance. *Implication:* Repetitive transcranial magnetic stimulation (rTMS) can effectively improve the cognitive function of patients with stroke

PO-0861

CIRCADIAN RHYTHM SLEEP DISORDER: A CASE REPORT

Fajie Ma, David Palma, Paul Pipia, Sanjeev Agarwal
SUNY Downstate Medical Center, United States

Patient: 73 year old male. *Case:* The patient with PMH of HTN, HLD, Dementia and left thalamic stroke in 2003 that required an EVD (external ventricular drain), was admitted with a 5 day history of left sided weakness. CT head was unremarkable, TTE showed EF of 70% and no thrombus, and MRI Brain revealed new right Coranaradiata infarction. Next morning, the patient was found to be unresponsive on rehabilitation unit. The code team almost shocked the patient when patient finally opened his eyes and vital signs were WNL. CT scan revealed no acute changes were noted. A diagnosis of Circadian Rhythm Sleep Disorder was made in consultation with neurology team. The patient was started on Modafinil 100 mg orally at 6 am to prevent daytime sleeping. The patient's symptoms improved and was discharged to a sub-acute rehabilitation facility for further rehab. *Discussion*: Circadian rhythm sleep disorders involve sleep-wake cycle. The human has a master circadian clock in a control center of the brain known as the suprachiasmatic nucleus. The primary circadian rhythm that this body clock controls is the sleep-wake cycle. People with circadian rhythm disorders are unable to sleep and wake at the times required for required for normal work, school, and social needs. They are generally able to get enough sleep if allowed to sleep and wake at the times dictated by their body clocks. Unless they also have another sleep disorder, their sleep is of normal quality. *Conclusion:* Excessive sleepiness is one of the manifestations of irregular sleep-wake rhythm type of circadian rhythm sleep disorder. This type of sleep disorder may be seen in association with neurological disorders such as dementia and in children with mental retardation. If not properly addressed and treated, it may hinder the rehabilitation course and prevent patient from being optimized for therapy.

PO-0862

THE CLINICAL OBSERVATION OF BLOODLETTING COMBINED THE ADENOSYLCOBALAMIN TREATMENT AFTER STROKE NUMBNESS

Zhenjie Xu
The Rehabilitation Division of Chongqing Three Gorges Central Hospital, China

Objective: to observe the bloodletting therapy combined with adenosine cobalt amine treatment the clinical curative effect of numbness after stroke. *Methods:* by random method, 72 patients included in the standard of cerebral stroke patients were randomly divided into A, B, C three groups, A group of 25 cases, using blood-letting combined with muscle injection of adenosine cobalt amine treatment; B group of 23 cases, adopting the bloodletting therapy; 24 cases of group C with muscle injection of adenosine, cobalt amine treatment. *Results:* three groups of sensory disturbance scores after treatment, daily life activities ability score, sensory evaluation and improve the integral improved level comparison, group A compared with B, C are two groups of curative effect is obvious, group B compared with group C curative effect significantly, explain bloodletting therapy is effective muscle injection of adenosine cobalt amine, two kinds of therapies share effect is more obvious. *Conclusion:* bloodletting therapy is adenosine cobalt amine can more effectively improve muscle numbness symptoms in patients with cerebral apoplexy.

PO-0863

THE EFFECT OF CONSTRAINED-INDUCED APHASIA THERAPY ON LANGUAGE RECOVERY AND BRAIN FUNCTIONAL REORGNIZATION IN BROCA'S APHASIC WITH STROKE

Hui-Xiang Wu[1],[1], Wei-Hong Qiu[1], Zhuang Kang[2], Qing-Lu Yang[1]

[1]Department of Rehabilitation Medicine, The Third Affiliated Hospital of Sun Yat-sen University,China, [2]Department of Radiology, The Third Affiliated Hospital of Sun Yat-sen University, China

Objective: To observe the difference of neural activity between the before and after Constrained-Induced Aphasia Therapy (CIAT),and to reveal the impact of CIAT on neural plasticity of chronic Broca's aphasia. *Method:* Two chronic aphasics (12 months after stroke) who had no improvement after standard language therapy were selected to receive CIAT over two weeks#Before and after CIAT,they received fMRI and language function examination with Chinese Rehabilitation Research Center Aphasia Examination (CRRCAE), Western Aphasia Battery (WAB), and Boston Diagnostic Aphasia Examination (BDAE). *Results:* In case of useless after conventional language training,chronic aphasics could improve communication by CIAT. After CIAT, fMRI showed increased activation in the left inferior frontal gyrus in two patients,and an enhanced activation in the left hemisphere and reduced activation in the right hemisphere in one of them. *Implications:* CIAT can improve communication ability by Changing patterns of learned non-use.Brain functional reorgnization produced by CIAT associates with up- regulation of the left inferior frontal gyrus or motivating the frontal lobe and temporal lobe,even in the whole language networks to activity. There is great potential for improvement when the brain has spontaneously adopted a suboptimalreorganization strategy after stroke.

PO-0864

INTEREST AND TOLERANCE OF BOTULINUM TOXIN FOR THE TREATMENT OF SPASTICITY IN PATIENTS WITH AMYOTROPHIC LATERAL SCLEROSIS (ALS)

Kosta Vassilev

Assistance Publique Hopitaux de Paris, France

Introduction: Spasticity is a frequent disabling symptom in patients with ALS. Before botulinum toxin, its treatment only associated physiotherapy and oral medication. *Méthods*: 45 patients suffering from ALS with either paraparesia (n=10) or tetraparesia (n=25) were referred to the Physical Rehabilitation Medicine department for disabling spasticity. Some patients walked independently (n=4), some required human or technical help for ambulation (n=38), some were unable to walk (n=3). Their medical charts were retrospectively analyzed to determine the efficacy, tolerance and side-effects of botulinum toxin therapy. *Results:* 39 patients received botulinum toxin injections in lower limbs in order to improve ambulation (n=36), sitting or nursing (n=3). In 16 patients, a motor bloc of rectus femoris muscle was performed; 5 of these 16 patients were considered as uneligible for botulinum toxin therapy. Twenty-one patients were satisfied with the treatment that was continued; 18 patients stopped botulinum toxin therapy after the first injection because of lack of improvement or progression of disease; 1 patient experienced a transient respiratory worsening. *Discussion/ Conclusion:* Botulinum toxin therapy provided relief of spasticity in more than half of our patients. Only one patient had respiratory side-effects. No study has been reported about the efficacy and tolerance of toxin therapy in spasticity management of ALS patients. This treatment is used to treat hypersialorrhea, without severe side effect. Nevertheless, the treatment should be started with low doses. As ALS patients often suffer from severe motor loss, motor bloc of the nerve of rectus femoris muscle should be performed before botulinum toxin injections.

PO-0865

EFFECT OF GAIT TRAINING FOR WALKING PATTERN AND WALKING ABILITY IN HEMIPARETIC POST-ISCHEMIC-STROKE PATIENT: RHYTHMIC AUDITORY STIMULATION VS CONVENTIONAL PROGRAM

Yenni Limyati[1]*, Widjajalaksmi Kusumaningsih[2], Hadyana Sukandar[3], Marietta Shanti[4], Ira Mistivani[2]

[1]Skills Laboratorium Department, Faculty of Medicine Universitas Kristen Maranatha Bandung- Indonesia, [2]Physical Medicine and Rehabilitation Department, Faculty of Medicine Universitas Indonesia Jakarta-Indonesia, [3]Community Medicine Department, Faculty of Medicine Universitas Padjadjaran Bandung- Indonesia, [4]Physical Medicine and Rehabilitation Department, Faculty of Medicine Padjajaran University Bandung- Indonesia

Objectives: To compare the effect of RAS to conventional gait training for improving walking pattern (cadence, stride length, step length paretic side, step length non paretic side and step width) and walking ability (velocity and walking distance) in hemiparetic post-ischemic-stroke patients. *Methods:* Twenty-three hemiparetic post-ischemic-stroke patients were divided randomly into two groups: experimental group that got RAS gait training and control group that got conventional gait training. Pre- to post test after a period of two weeks (3x/week) of gait training were performed in a 10-meter-walk test to assess walking pattern and a 2-min-walk test to assess walking ability. *Results:* Pre- to post test measurements revealed a statistically significant (p<0.05) improving walking pattern and walking ability for the RAS group. Yet, compared to conventional group, the latter results showed clinically better improvement but not statistically significant (p>0.05). The improvements were 56.9% for velocity and 57.6% for walking distance in RAS group compared to 22.4% of velocity and 21.7% of walking distance in control group (p<0.05). *Conclusions:* RAS gait training more improve walking pattern and walking ability than conventional gait training in hemiparetic post-ischemic-stroke patients. Implication for Rehabilitation RAS gait training should be new protocol for stroke patients especially in Indonesia. The program are simple, easy, safety that improving walking pattern and ability stroke patients.

PO-0866

AEROBIC EXERCISE TRAINING DURING PREGNANCY REDUCES DEPRESSIVE SYMPTOMS IN PRIMIGRAVID WOMEN: A RANDOMISED TRIAL

Robinson Ramirez Velez

Manuela Beltran University, Colombia

Introduction: Research has shown that exercise can decrease depressive symptoms, yet an optimal exercise program for treating depression has not been established. Objetive To determine the effects of aerobic exercise training on depressive symptoms in primigravid women. *Materials and methods:* This was a randomized, simple-blinded, controlled clinical trial of 80 healthy primigravid women between 16 and 20 weeks gestation. The training group (n=40) took part in aerobic exercise at an intensity of 50-65% of their maximum heart rate for 60 min, three times a week for 16 weeks. The control group (n=40) undertook their usual physical activity. One day before beginning the exercise program and immediately after the 3-month exercise period finished, all women were assessed for symptoms of depression by the Center for Epidemiological Studies-Depression Scale (CES-D). *Results:* 74

women completed the study. Three participants in the experimental group and three in the control group withdrew from the study before the 3-month assessment. In all cases the withdrawals were due to reasons unrelated to the intervention. Experimental participants received on average 28.9 out of 36 (SD 3.2) sessions over the 3 months. No adverse events occurred during or after the exercise in any participant. After the 3-month intervention, the experimental group reduced their depressive symptoms on the CES-D questionnaire by 4 points (95% CI 1 to 7) more than the control group. *Conclusions*: The results showed that exercise programs were effective in decreasing depressive symptoms among clinically depressed individuals and individuals with depression resulting from mental illness.

PO-0867

INTERACTIVE VIRTUAL REHABILITATION USING REHABMASTER® FOR FUNCTIONAL UPPER EXTREMITY DEFICIT AFTER STROKE

Joon-Ho Shin[1], Hyungpil Cho[2], Do Hyun Yoon[2], Sang Won Kong[2], Kyung Soo Lee[2], Seungyoung Choi[2], Seong Ho Jang[2]

[1]National Rehabilitation Center,Korea, [2]Department of Rehabilitation Medicine, Hanyang University College of Medicine, Korea

Purpose: To assess usability and clinical efficacy of RehabMaster® in upper extremity rehabilitation in patients with stroke. *Methods:* RehabMaster® is composed of a personal computer system with 60 inch monitor and a depth camera. Participants with unilateral upper limb dysfunction secondary to first-ever strokes were recruited and randomly assigned to the "occupational therapy (OT) only group" (conventional OT for 20 min) or "RehabMaster® + OT group" (training with RehabMaster® for 20 min plus conventional OT for 20min) for 10 sessions over two weeks. The primary outcome was measured by using Fugl-Meyer assessment (FMA), and secondary outcomes measurement was the modified Barthel index (MBI), Medical Research Council score (MRCS), and the passive range of motion (ROM) of affected upper extremity. All tests were administered at the baseline (T0), 5th (T5), 10th (T10), and the last session (T25). *Results:* RehabMaster ® + OT group revealed better FMA improvement than OT only group, although it was not statistically significant (p=0.07). Improvement in MBI (p=0.16) was not significantly different between two groups. However, the increment of MBI score was greater in the RehabMaster ® + OT group (11.6 ± 6.5) than in the OT only group (7.7 ± 4.6). There were no significant difference between the groups in terms of MRCS and ROM of affected upper extremity. *Conclusion:* This study showed that RehabMaster ® is a feasible and safe rehabilitative tool to enhance motor functions in stroke patients with various recovery phases.

PO-0868

SPINAL CORD INJURY AND PRESSURE ULCERS

Leticia Rivero González[1]*, Sara Estévez Sarmiento[1], Rosa Sánchez Hernández[2], Jesús Sánchez Enriquez[1], Enrique Bárbara Bataller[1], José Luís Méndez[1]

[1]Medicina Física y Rehabilitación Hospital Insular de Gran Canaria,Spain, [2]Endocrinología Hospital Insular de Gran Canaria,Spain

Introduction and objectives: Pressure ulcers are a healthcare quality indicator, which deserves a special attention in patients with Spinal Cord Injury (SCI). The objective is to analyze risk factors as well as to evaluate direct costs. *Materials and Methods:* Descriptive retrospective study, and risk factor analysis for the development of pressure ulcers and the resulting costs. Nutritional status and albumin is evaluated. Costs established by 512 euros/day by admission in SCI Unit, 1051.62 euros by standard plastic surgery and 328.96 by an imaging test were applied. *Results:* 25 pressure ulcer cases, 96% men, 34 years old of average age. 52% smokers; 23 diabetics and 11.5% COPD. 88% of the patients were paraplegic. The average hemoglobin was 12.6 (10.2-16) and the average albumin was 3.6g/dl (2.8-4.5g/dl) having hypoalbuminemia 23%. 13 patients used urinary catheterization, 8 intermittent catheterization and 2 condom catheter. 815 of the patients had fecal incontinence. The most frequent location for pressure ulcers was ischial, followed by sacral. The changes in global costs vary according to the pressure ulcer location (higher costs in sacral ulcers) and the infections. The average stay in hospital is of 43 days. In the groups of patients in whom the average stay is of 60 days the costs vary between 35000 and 60000 euros. The average cost of stage IV pressure ulcers is of 23.167 euros. *Conclusions:* The pressure ulcers are a healthcare quality indicator. It is essential to detect the avoidable risk factors, like hypoalbuminemia. The admissions in hospital by pressure ulcers in SCI patients generated a cost of 579.173 euros between the years 2005-2010, specially conditioned by the length of hospital stay.

PO-0869

STUDY OF EFFECT OF ULTRASONIC PERMEATE NON-STEROIDAL ANTI-INFLAMMATORY EMULGEL ON POST-STROKE SHOULDER PAIN

Baoyun Huang

Guangdong Province Work Injury Rehabilitation Hospital, China

Objective: It is to assess the curative effect of Ultrasonic permeate Non-steroidal anti-inflammatory Emulgel on post-stroke shoulder pain. *Methods:* 30 patients with post-stroke shoulder pain were treated with Ultrasonic permeate Non-steroidal anti-inflammatory Emulgel for 20 days. Visual Analogue Scale (VAS) and Range of Motion (ROM) of shoulder were evaluated before and at completion of training to investigate the changes of shoulder pain. *Results:* All 30 patients completed the treatment and following-up for 3 months with no side effects. Total effective rates of 2-week and 3-month were 85% and 82% respectively. Compared to indexes before treatment, there was significant reduction in VAS, and increasing in ROM. Neither age, sex, nor other- treated, duration of symptoms affected outcome success, compared with those who had no improvement in symptoms. *Implications:* Ultrasonic permeate Non-steroidal anti-inflammatory Emulgel should be recommeded as one of the most important treatment in the management of post-stroke shoulder pain.

PO-0870

THE PSYCHOLOGICAL SITUATION OF STROKE PATIENTS AND THEIR RELATIVES

Aicui Lin

Nanjing First Hospital, Nanjing Medical University, China

Background: Stroke patients often develop depression because of low activities of daily living. *Objective:* To evaluate the psychological situation of stroke patients and their relatives. *Method:*Twenty-two patients (15 male and 7 female, 60.7±14.9 years old) were evaluated by self-rating depression scale (SDS) at the first time just 3 weeks after the occurrence of the stroke to get a score of depression. The second evaluation was made after 3 weeks of physical therapy and occupational therapy. Twenty-two relatives of the patients (7 male and 15 female, 53.8±10.3 years old) were evaluated just 3 weeks after the occurrence of the patients' stroke. None of the patients and their relatives accepted psychology therapy during the 3 weeks' rehabilitation. *Results:* According to the SDS score, before the physical and occupational therapy, there was no significant difference between the patients and their relatives (50.7±16.6 & 45.7±12.2, p=0.261). After the physical and occupational therapy, there was no significant difference between the two times of evaluation (50.7±16.6 & 47.1±13.4, p=0.423). There was no relation between the SDS score and age, SDS score and sexual distinction. *Conclusion:* Depression appeared among patients and their relatives after the occurrence of stroke. Physical and occupational therapy did not effectively help patients overcome

the depression. Psychological intervention need to be executed to help stroke patients and their relatives.

PO-0871

MECHANISM AND EFFECT OF LOW-FREQUENCY REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION ON STROKE PATIENTS WITH NONFLUENT APHASIA

Xue Yan Hu[1], Tong Zhang[1], Li Xu Liu[1], Ling Yu Yang[1], Qian Pei[1]

[1]Chinese Rehabilitation Research Center,[2]Capital Medical University School of Rehabilitation Medicine

Objective: The purpose of this study is to explore the effect and mechanism of low-frequency (1 Hz) repetitive Transcranial Magnetic Stimulation (rTMS)to right Broca's homologue in stroke patients with nonfluent aphasia. *Methods:* 30 selected inpatients were randomly divided into three groups: rTMS group (1 Hz), sham group and control group. All the patients were given routine drug treatment and language training.The rTMS group received 10 days of rTMS treatment. The Western Aphasia Battery (WAB) was used to evaluate the language function at the following time:before intervention, after rTMS treatment and 2 months after rTMS treatment. *Results:* Compared with sham group and control group after rTMS treatment, the WAB score of rTMS group was statistically improved, and the WAB score of sham group had no significant difference compared with control group. After 2 months of rTMS treatment, the WAB score of rTMS group was statistically improved compared with control group,and auditory comprehension of rTMS group was improved compared with sham group, repeating of sham group was statistically improved compared with control group. *Conclusion:* Low-frequency rTMS applied to right language homologues in nonfluent aphasia can yield significant improvements in language function. We supposed low-frequency rTMS decrease interhemispheric inhibition of the lesioned hemisphere and improve language function in patients with poststroke aphasia,and may have modulated activity in the remaining left and right hemisphere language neural network after two months.

PO-0872

PARTIAL BODY WEIGHT-SUPPORTED TREADMILL TRAINING FOR GAIT RESTORATION IN PATIENTS WITH HEMIPLEGIA: EVALUATION USING MOTOR-EVOKED POTENTIALS

Mowaffak Saad*, Noha El-Sawy, Ibrahim Ibrahim, Hamdy Koryem

University of Alexandris, Faculty of Medicine, Egypt

Background: Partial body weight support treadmill training (PBWST) is a task-oriented gait rehabilitation protocol for hemiplegic/paretic patients. Motor-evoked potentials (MEP) induced by transcranial magnetic stimulation and recorded from target lower limb muscles may be used to assess the post-rehabilitation effects. Aim of the work Assessment of the effects of PBWST on the MEPs recorded from target lower limb muscles in chronic post-stroke hemiparetics. *Methods:* Thirty five patients with post-stroke chronic hemiparesis were randomly allocated to one of 2 groups; PBWST group and conventional rehabilitation group. Initial evaluation included recording the MEP parameters from the quadriceps, tibialis anterior and gastrocnemius muscles. Functional assessment included Fugel-Meyer assessment (FMA) and functional ambulation category as well as Standing Balance Test. Endpoint evaluation using the same methods was obtained by the completion of 8 weeks of rehabilitation at a frequency of 3 times/week. *Results:* Study groups have shown significant post rehabilitation improvement of most of the recorded MEP parameters. The magnitude of post-rehabilitation change in the PBWST group was generally larger than in the other group. Post-rehabilitation tibialis anterior MEP latency was significant predictor of post-rehabilitation of FMA co-ordination subset in PBWST group. Pre- and post-rehabilitation latency and amplitude of the quadriceps MEP were significant predictor of FMA co-ordination subset in the conventional rehabilitation group. *Conclusion:* MEPs parameters can monitor rehabilitation effects of PBWST at the neurophysiological level. The magnitude of PBWST post-rehabilitation effects was generally higher. MEP parameters can be used as predictors of functional outcome.

PO-0873

COMPARISON EFFICACY OF TRIAMCINOLONE AND WRIST SPLINT IN SEVERE CARPAL TUNNEL SYNDROME IN PREGNANCY

Parviz Yazdanpanah

Yasuj University of Medical Sciences, Iran

Objective: Carpal tunnel syndrome (CTS) is entrapment of median nerve in carpal tunnel of the wrist. The main aim of this study was to compare the effectiveness of steroid injection and wrist splint in severe carpal tunnel syndrome in pregnancy. The cases were selected among pregnant women who referred to OB&GYN clinic in Yasuj city in south- west of Iran. *Method:* This study is a randomized clinical trial which was accomplished from December 2010 to June 2012 at S.Mofateh clinic on 28 pregnant women. Standard electrodiagnostic techniques were performed on the women who had clinical symptoms of CTS in their hands, with positive Tinel and/or Phalen tests, for rule in /or out of CTS. The patients with severe CTS were randomly divided in 2 groups including triamcinolone injection (40 mg) and wrist splint in night for 6 weeks. Electrophysiologic parameters of median and ulnar nerveswere recorded before and 2 months after the steroid injection and wrist splint. In cases of observing changes from severe to lower stages of the disease in electrodiagnostic studies, treatment was considered successful and otherwise failed. *Results:* Effectiveness of triamcinolone injection and wrist splint were 85.7% and 90.9%, respectively. There was no significant difference between treatments by steroid injection and wrist splint (p=0.157).Also no correlation was observed between severe carpal tunnel syndrome and number of pregnancy. *Implications:* Using triamcinolone or wrist splint are effective methods for treatment of severe CTS in pregnancy and therefore recommended instead of carpal tunnel release surgery.

PO-0874

EFFICACY OF 8 CASES URINARY INCONTINENCE AFTER STROKE TREATED BY EAR BEANS WITH DIALECTICAL NURSING

Yong Kai Shuai

Rehabilitation department of Qi Jiang hospital of traditional Chinese medicine

Objective: To observe the efficacy of urinary incontinence after stroke treated by ear beans with dialectical nursing care. *Method:* 8 cases urinary incontinence after stroke were treated byAuricular point treatment, unilateral acupoints, both sides of the rotation, 2 times a week, and gave the correct dialectical nursing care. *Result:* 5 cases' symptom were cured and 3 cases' symptom was improved. *Conclusion:* Auricular point beans with dialectical nursing could improve the body function and promote the patients' rehabilitationand quality of life.

PO-0875

CLINICAL OBSERVATION OF 76 CASES STROKE SPASM BY SOFTENING LIVER AND RELAXATION TENDON SOUP WITH MOXIBUSTION

Kun Peng Yang
Rehabilitation department of Qi Jiang hospital of traditional Chinese medicine

Objective: To observe the efficacy of stroke spasm by synthesize therapy. *Method:* 76 Spasm patients were randomly divided into two groups. Treatment group was treated by Softening liver relaxation tendon soup and moxibustion combined with exercise therapy. Control group was treated byexercise therapy. The treatment period is10 days, 2 days rest between two periods. Observe curative effect after the four periods. *Result:* The total effective rate of treatment group is 94.5% and that of control group is 81.3%. The difference of two groups has statistically significant ($p<0.05$) *Conclusion:* The combination of two therapy was safe and effective.

PO-0876

EFFICACY OF ACUPUNCTURE AND MESSAGE WITH THE WEIGHT LOSS GAIT TRAINING FOR LOWER LIMB DYSFUNCTION AFTER STROKE HEMIPLEGIC

Kun Peng Yang Yi Wen Bo,Liu Ji ping
Rehabilitation department of Qi Jiang hospital of traditional Chinese medicine

Objective: To observe efficacy of traditional therapy and modern rehabilitation therapy for lower limb dysfunction after stroke hemiplegic. *Method:* 60 patients were randomly divided into two groups. Observation group was treated by Acupuncture, Message and the weight loss gait training. Control group was treated by Acupuncture and Message. *Result:* Motor function score, walking functional classification, muscle strength of observation group were improved significantly, which were better than that of control group. *Conclusion:* The traditional treatment and rehabilitation therapy for stroke hemiplegic lower extremity function can improve the recovery of lower limb function and improve quality of life.

PO-0877

POSTURAL STABILITY AND BALANCE TRAINING PROGRAM IN HEMIPARETIC STROKE PATIENTS

Aziz Alfeeli[1], Shothour Alghunaim[2], Ayyoub Baqer[3], Mohieldin Ahmed[4]
[1]Physical Medicine and Rehabilitation Departments, Ministry of Health, Kuwait,Kuwait, [2]Amiri Hospital, Ministry of Health, Kuwait,Kuwait, [3]Al-Razi Hospital,Ministry of Health, Kuwait,Kuwait, [4]Al-Farwania Hospital, Ministry of Health, Kuwait, Kuwait

Objectives To compare Berg balance scale (BBS) score and limits of stability (LOS) between stroke patients and control group; to evaluate the effects of balance training program on hemiplegic stroke patients; and to correlate BBS score and reaction time (RT) in hemiparetic stroke patients. Setting Balance clinic, physical medicine and rehabilitation hospital, Kuwait. *Materials and Methods:* A total of 36 ambulatory hemiplegic stroke patients and 34 age-matched healthy individuals as control group were recruited in this study. All patients and healthy individuals were evaluated by the BBS score and LOS test. *Results:* There was significant decreased BBS score, significant increased RT (sec), decreased MVL (deg/sec), significant decreased EPE (%), significant decreased MXE (%) and significant decreased directional control (DCL) (%) in stroke patients compared to results of control group ($p<0.01$). Moreover, there was significant increased BBS, significant decreased RT, significant increased MVL (deg/sec), significant increased EPE (%) and significant increased MXE (%) after training compared to results before training in stroke patients ($p<0.01$).However, no significant difference of DCL (%) after training compared to results before training in stroke patients ($p>0.05$). BBS score was a direct significant correlation with RT ($r=0.941$, $p<0.01$) in stroke patients. *Conclusion:* There were significantly worse in BBS score and parameters of LOS test in stroke patients. Moreover, significant enhancement of BBS score and some parameters of LOS test after training in stroke patients were found.

PO-0878

AGE IMPACT ON REHABILITATION OUTCOMES IN POST-STROKE PATIENTS

Maria Panagiota Panourgia
Salvatore Maugeri Foundation, Italy

Objective: Stroke is a leading cause of disability and as a result of the increasing of life-span, older people have a greater incidence and prevalence of stroke, thus is important to examine the outcomes in terms of functional disability and neurological conditions after a 2 months of intensive neuro-rehabilitation treatment. *Method:* We selected stroke (ischemic or hemorrhagic) affected patients, admitted from an acute ward (Intensive Care, Stroke Unit) and with Glascow Coma Scale ≥12. To define the performances in activities of daily living at admission, Barthel Index (BI) has been considered. We used the National Institutes of Health Stroke Scale (NIHSS) to evaluate neurological status and Functional Independence Measure (FIMTM) to assess functional disability. *Results:* 122 patients have been selected (age range 20-89 years). Age has been dichotomized using a cut off value corresponding to 65 years (n ≥ 65 years=76 patients; n < 65=46 patients). Patients ≥65 y.o. at admission and at discharge ($p=0.07$). Elderly patients were more independent at admission (< 65 y.o. median BI =65, ≥65 y.o median BI =85) even thaw this difference was not statistically significant ($p>0.05$). Regarding FIM scale, younger patients became significantly more independent after hospitalization period ($p<0.05$). *Implications/ Impact on rehabilitation:* Although younger patients seem to better recuperate in terms of functional disability, older patients have a better outcome in their neurological conditions. Consequently, older patients may cope better after a rehabilitation treatment.

PO-0879

RESULTS OF A REHABILITATION PROGRAM FOR PATIENTS AFTER VIRAL ENCEPHALITIS

Zoltán Dénes*, Zsuzsanna Barta, Gábor Fazekas
National Institute for Medical Rehabilitation, Hungary

Objective: to describe the results of a rehabilitation program for patients with viral encephalitis. *Method:* Retrospective cohort study at our Rehabilitation Unit for Brain Injury from January 2000 through April 2011. *Results:* During an 11-year period, 13 patients were involved in a rehabilitation program following viral encephalitis. The most frequent pathogen agent (5/13) was the herpes simplex virus, while in 8 cases the pathogenic agent could not been detected. The mean age of patients was 38 (15-65) years, the average length of stay on our rehabilitation unit 71 days (7-175). At the time of admission the main symptoms were: severe cognitive deficit (5 cases), hemiparesis (3), tetraparesis (2), paraparesis (1), ataxia (2). Our rehabilitation program was multidisciplinary team activity for multifunctional problems. During the rehabilitation treatment post-encephalitic epilepsy was observed in 3 cases. Of our 13 patients eight had good recovery on a functional level, but three were transferred on to acute wards (neurology, psychiatry, and an epilepsy center). Mean follow up was 5,7 years after the infection. 5 patients live independently and have jobs, 2 are independent with minimal assistance, while 6 remained completely dependent. *Impact on rehabilitation:* Viral encephalitis is a rare disease, but long time rehabilitation is usually necessary after the acute care. Problems in cognitive functions constitute the most frequent residual deficits which, in turn, could prevent independence.

PO-0880

FOREIGN ACCENT SYNDROME: NEURAL BASES AND SPEECH THERAPY

Valeria Pingue[1], Paolo Vitali[2], Maria Leonilde Dichiarante[1], Caterina Pistarini[1]

[1]Salvatore Maugeri Fundation,Italy, [2]National Neurological Institute C. Mondino, Italy

Objective: This study presents neuroradiological results and speech therapy evaluation conducted in a single patient with the aim of searching for clues which may assist to design neuroscience-driven therapies. We present the case of a 49-year old Italian native speaker woman with a left hemisphere brain stroke who developed French accent. *Method:* Magnetic resonance imaging showed in the left hemisphere three cortico-subcortical areas of gliosis, after ischemic infarct in the MCA territory, in the caudal pars of precentral gyrus (mouth motor area), in superior temporal gyrus, and in caudate head. The patient was submitted to evaluation of language and cognitive functions by administration of the Italian version of the protocol Aachener Aphasie Test (AAT), a series of tests to highlight any deficiencies in praxis, calculation, non-verbal intelligence (Progressive Matrices Raven, standard version), access to the lexicon (Testing Production of Words, words of Free Association Test) and to evaluation of dysarthria (Robertson Dysarthria Profile). Based on evidence of assessments, the patient underwent speech therapy focused on dysarthria. *Results:* The control performed one year after the acute, the patient showed improvement in all parameters deficit and persistent joint disorder only under stress. *Impact on rehabilitation:* The results from this study provide targets for further investigation and some clues to design therapeutic interventions in FAS.

PO-0881

CLINICAL AND RADIOLOGICAL CORRELATES OF POST –TRAUMATIC AMNESIA IN MODERATE TO SEVERE TRAUMATIC BRAIN INJURY DURNG INPATIENT REHABILITATION

Karen Chua[1], Lishya Liauw[2], Wilson Cj Low[3], Tchoyoson Lim[2]

[1]Tan Tock Seng Hospital Rehabilitation Centre, Republic of Singapore, [2]Department of Neuroradiology, National Neuroscience Institute, Republic of Singapore, [3]Clinical Research Unit, Tan Tock Seng Hospital, Republic of Singapore

Objectives: Post traumatic amnesia (PTA) duration in traumatic brain injury (TBI) survivors is regarded as an important measure of severity and long-term outcome. We sought to determine acute injury, radiological and rehabilitation factors associated with duration and emergence from PTA during inpatient rehabilitation. *Materials and Methods:* Data from an inpatient rehabilitation unit functional database spanning 4 years was analysed. First-day CT brain scans were reviewed by an independent radiologist. The 12 point Westmead PTA scale (WPTAS) and Functional Independence Measure (FIM) scale were scored. *Results:* Altogether, data from 168 TBI inpatients were analysed. (140 males (83.3%), mean age 48.1 years (SD 20.0), mean TBI duration 31.4 days (SD 28.1). Sixty-five patients (45.8%) emerged from PTA during rehabilitation and their PTA duration was significantly shorter (36.1 days (SD 22.4) compared to those who did not emerge. (61.7 days, SD (40.8). ($p<0.0001$)PTA emergence at discharge was significantly correlated with age (OR 0.95 $p=0.003$), admission PTA score (OR 1.22, $p<0.05$), admission cognition FIM (OR 1.12, $p<0.001$), and admission motor FIM score (OR 0.96, $p=0.007$). Radiological variables were not associated with PTA emergence.Multivariate linear regression modeling showed significant correlations of admission motor FIM motor (OR -0.006, $p<0.05$), acute length of stay (OR -0.02, $p<0.001$), presence of tracheostomy (OR -0.21, $p< 0.03$) and subarachnoid haemorrhage (OR -0.24, $p<0.05$) with PTA duration. Impact Injury and functional variables, more than radiological features were predictive of PTA outcome and duration.

PO-0882

NEUROPSYCHIATRIC DEFICITS IN PATIENTS WITH NEUROLOGICAL DISORDERS

Antje Dr. Büttner-Teleaga

[1]Albert-Ludwigs-University Freiburg,Germany, [2]University Witten-Herdecke, Germany

Introduction: Apart from a multitude of physical complaints, neurological disorders can also lead to various kinds of neuropsychiatric deficits like psychological and cognitive changes or reduced Quality of Life (QoL). In such cases, mental health, mood, attention, vigilance and/or memory may be affected as well as the actual mental and/or cognitive processes themselves. Important factors in this can be the severity of the disorder on one hand, and the duration of prior therapy on other hand. *Methods:* The study was carried out involving two groups of randomly selected persons, neurology patients and healthy participants. All patients were selected according to their clinical diagnosis (ICD-10). So far, data have been gathered more than 50 healthy persons (42 male; 9 female) and around 150 neurological patients (101 male; 47 female) (with various neurological clinical pictures) using different tests to research the mental and cognitive status. *Findings:* Testing of mental and cognitive achievements and of QoL revealed highly significant differences between healthy persons and neurological patients ($p<0.001$). Analysis of the degree of severity showed for neurology patients no significant differences between mild and severe ($p>0.050$). *Discussion:* The study revealed that patients with neurological diseases (strokes, cerebrovascular diseases, brain traumas, brain tumors etc.) show problems and deficits concerning in different areas of mental and cognitive achievements. In contrast, the degree of severity of the disorders (neurology patients) was not relevant.

PO-0883

THE INTERDEPENDENCE OF RECOVERY IN SPEECH DISORDERS AND THE LOCOMOTOR-FUNCTIONAL STATUS IN PATIENTS AFTER A CEREBROVASCULAR INSULT

Biljana Vukovic[1], Slavisa Jankovic[2], Ivan Dimitrijevic[3]

[1]Pension and invalidity insurance fund, Belgrade, branch department Novi Sad, Serbia, [2]Secretariat of health care – city of Belgrade, Serbia, [3]KCS Belgrade, Serbia

Cerebrovascular disseases, due to their frequency, morbidity, related mortality and invalidity, represent a serious sociomedical problem. The treatment and rehabilitation of these patients is a complex, multidimensional problem which demands an interdisciplinary approach. Guided by the principles of developmental neurology and neurorestauration, our goal was to make a connection and determine the level of interdependency of speed, quality and quantity of the recovery of the motor and speech fuctions. Having in mind the complexity of the syndrome conditioned by the damage done to the CNS, it was necessary to include all patients, in the maximum possible scope, in the therapeutical i.e physicorehabilitational procedures, speech therapy etc., so that they would get the adequate level of stimulation. Because such a situation ensued, it wasn't possible to form groups, so the results were evalueted within the groups themselves during the treatment and rehabilitation, which averagely took 74.8 days. We compared the results from the beginning of the treatment, one month after the start and the results at the end of the treatment. We followed a number of parameters: FIM test, Motor pattern test with the aim of assessing the neurological deficit, as well as the functional-communicational profile (BDAE) – the degree of speech deficit etc. After summarizing the results we observed a statistically significant interdependency of speed and quality-quantity of recovery, which were measured as the degrees

of correction and reeducation of motor patterns and the improvement of the functional status in relation to the degree of recovery of the function of speech.

PO-0884

TROPICAL SPASTIC PARAPARESIS: A CASE REPORT

Fajie Ma[1], Anatoly Shnayder[1], Getahun Kifle[2], Sanjeev Agarwal[1]

[1]SUNY Downstate Medical Center,United States, [2]Kings County Medical Center, United States

Patient: 23 year old female. *Case:* The patient with PMH of Asthma and Gestational Diabetes was admitted with a 6 months history of back pain, bilateral lower extremity weakness, stiffness and incontinence of bladder. Her gait progressively worsened requiring the use of cane. The neurological examination was positive for Right arm drift, increased tone in bilateral lower extremities, MMT 5/5 in the left UE and 4/5 in the right UE and 3+ DTR in bilateral LE with upgoing planters. Patient was unable to walk without support. The MRI of whole spine with/without contrast was unremarkable. MRI Brain with contrast revealed heterogeneous T1 hypointense signal and enhancement within the medulla but were nonspecific. Serum ANA – Qual was positive, Anti RNP positive, Anti – Sc1-70 positive, HTLV-I/HTLV-II reactive, Vit B12 WNL, CSF slightly increased protein. The patient was started on PO Baclofen and pain medication with improvement in Spasticity. *Discussion:* Tropical Spastic Paraparesis is a rare myelopathic disorder associated with HTLV-I/HTLV-II infections. It is characterized by an insidious onset of slowly progressive weakness and spasticity of one or both legs, together with hyperreflexia, ankle clonus, extensor plantar responses, and low back pain. Other features include, detrusor instability leading to nocturia, urinary frequency, incontinence, and minor sensory changes, especially paresthesias and loss of vibration sense. Cognitive function is unaffected and there is no upper limb involvement. *Conclusion:* Spasticity is one of the manifestations of tropical spastic paraparesis. If not properly addressed and treated it may hinder the rehabilitation course and prevent the patient from being optimized for therapy.

PO-0885

CHANGES OF EEG INDUCED BY USING BRAIN-COMPUTER INTERFACE (BCI) COMBINED WITH FUNCTIONAL ELECTRICAL STIMULATION (FES) ON PATIENTS WITH STOKE

Cheng Kou[1], Zheng Yan[1,2], Xiaogang Chen[1,2], Yanfei Lin[1,2], Xiaoxie Liu[1], Sheng Bi[1]

[1]Center of rehabilitation medicine, Chinese PLA General Hospital, Beijing 100853,China, [2]Department of Biomedical Engineering,Medical School, Tsinghua University, Beijing, 100084, China

Objective: To study the plasticity of brain motor system after stoke by analyzing the changes of EEG induced by using brain computer interface combined with functional electrical stimulation (BCI-FES) and single functional electrical stimulation (FES). *Methods:* Four stroke patients were randomly assigned to BCI-FES group and FES group. Two of the patients in the BCI - FES group training, after 5 months elution period participated again the FESgroup training. The daily training was forty min, continuously training twenty days as a period. Before and after each training cycle, the EEG signals were collected by 64 channels EEG system which was made by Neuroscan company. The event-related synchronization (ERS) and event-related desynchronization (ERD) of mu rhythm during motion imagery were analyzed to find the changes of EEG influenced by BCI-FES andFEStraining. *Results:* BCI-FES training and singleFEStraining all make a patient's ERD of motion imagery shifting to damaged hemisphere. *Conclusion:* BCI-FES training and single FEStraining all influenced the plasticity of brain. BCI -FEStraining, as a new kind of rehabilitation training methods, still need further study and improvement.

PO-0886

PSYCHOSIS FOLLOWING TRAUMATIC BRAIN DAMAGE-THE COURS OF REHABILITATION

Judith Rochberg*, Nechama Raphaeli, Naomi Geva

loewenstein rehabilitation hospital, raanana Israel

Objective: Descriptive studies have analyzed case studies of psychotic disorder due to traumatic brain injury (PD-TBI) reported in psychiatry and neurology journals. Recent epidemiological studies from number of different countries, including the Unites States, Taiwan, Denmark and Sweden, all report significantly elevated levels of TBI in persons with psychotic disorder. Most persons with PD-TBI improve in presentation, with antipsychotics the most efficacious medications. Unfortunately, long-term course cannot be determined and there is evidence that for many, PD-TBI has a chronic course.In our lecture we like to suggest that alongside with medications, rehabilitation therapies (cognitive and emotional) improve significantly the cognitive, vocational and emotional functioning of these persons. *Method:* Following the results of neuropsychological assessment and emotional evaluation, a rehabilitation program was planned, perforemed and monitored according to the patient's variable states. The rehabilitation program included cognitive training (oriented towards her deficits in executive functions) and psychotherapy alongside medication. *Results:* In our case study we will describe the successfu refunctioning of a woman, 34 years old, who developed psychosis after sustaining TBI. The improvement was evidenced in daily life, in work and even as a mother to her new born daughter. *Implications:* The importance of planning a comprehensive rehabilitation program in PC-TBI,with emphasis on cognitive and emotional deficits.

PO-0887

EFFECT OF ESTROGEN ON THE C-FOS EXPRESSION IN THE AMYGDALE OF POSTSTROKE DEPRESSION RATS

Hong Fan[1], Bei Shao[2], Hong Wang[2], Yuanshao Lin[2]

[1]Rehabilitation Center of Shaoxing Peoples Hospital of Zhejiang Province, Zhejiang Province Traditional Chinese Medicine, [2]Department of Neurology,the First Affiliated Hospital of Wenzhou Medical College,

Objective: To study the efect of estrogen on the c-fos expression in the amygdale of poststroke depression (PSD) rats. *Method:* 30 Female Sprague Dawley rats were randomly divided into control group, PSD group and estrogen group according to the scores of Open-Field test. All rats were bilaterally ovariectomized, 7 days later the rats of PSD group and estrogen group were duplicated into focal ischemia by means of middle cerebral artery occlusion. After another 7 days the two groups were received isolated feed and restraint stress for 14 days. Then the rats in estrogen group were implanted 17β-estradiol capsules subcutaneously for a week,which produced circulating concentrations of E2 within the range observed during the diestrous phase of the estrous cycle. After that the behavioral evaluation were done with Open-Field test, then all rats were sacrificed and the brain were taken, the c-fos positive cell in the amygdale were detected by S-P immunohistochemical assay. *Results:* The spontaneous behavior of the PSD rats decreased significantly compared with the control group ($p<0.05$), and the number of c-fos positive cell in the amygdale of PSD rats were higher than those in the control group ($p<0.05$).The spontaneous behavior of the estrogen group increased significantly compared with the PSD group ($p<0.05$),and the number of c-fos positive cell in the amygdale of the estrogen group were lower than those in the PSD group ($p<0.01$). *Implications:* The effect of the estrogen on the PSD rats may be related to the reduced expression of c-fos gene.

PO-0888

TREATMENT OF HEMIPLEGIC SHPULDER PAIN WITH KINESIO TAPING

Erkan Kaya[1], Alparslan Bayram Çarli[1], Cengiz Kaplan[2], Selahattin Özyürek[3], Mehmet Zeki Kiralp[4]

[1]Department of Physical Medicine and Rehabilitation, Military Hospital. Bursa. Turkey, [2]Deparment of Neurology, Military Hospital, Bursa, Turkey, [3]Deparment of Orthopedics, Military Hospital, Aksaz, Turkey, [4]Department of Physical Medicine and Rehabilitation, Gülhane Military Medical Academy, Haydarpaşa Training Hospital, İstanbul, Turkey

Objective: Shoulder pain is a serious problem in hemiplegic patients with an incidence of 16-72%. Although shoulder pain is frequently encountered in hemiplegic patients thetreatment are still controversial. The purpose of this poster is to present the effect of kinesio taping with hemiplegic shoulder pain. *Methods:* We presented here three cases with hemiplegic shoulder pain. we used kinesio taping method for treatment. we taped them 3 times (Baseline, 3th day, 7th day). we assed shpukder pain with Visual Analog Scale. *Results:* All of three cases reported decreased pain after kinesio taping. No side effect was seen. *Implications:* Hemiplegic shoulder pain affects the function of the upper extremity, worsens quality of life and may mask motor recovery, the complications of the upper extremity should be well-known and treated in the early stages in hemiplegic patients. Kinesio taping is an effective alternative method for treating hemiplegic shoulder pain.

PO-0889

PREVALENCE AND RISK FACTORS OF FALLS IN KOREAN POLIO SURVIVORS: COMPARISON WITH COMMUNITY INDWELLING ELDERLY

Seung Yeol Lee[1], Hyun Bang[1], Jee Hyun Suh[2], Keewon Kim[1], Se Hee Jung[1], Soong-Nang Jang[3], Soo Jeong Han[2], Wan-Ho Kim[4], Jae-Young Lim[1]*

[1]Department of Rehabilitation Medicine, Seoul National University College of Medicine, Seul National University Bundang Hospital,Korea, [2]Department of Rehabilitation Medicine, Ewha Womans University Medical Center,Korea, [3]Red Cross College of Nursing, Chung-Ang Univ,Korea, [4]National Rehabilitation Center, Korea

Objectives: Falls and fall-related injury are significant health issue among polio survivors. The purpose of this study is to determine the prevalence, consequences and factors associated with falls in Korean polio survivors. *Methods:* Total 310 polio survivors participated in this study. All participants completed a questionnaire including fall history, symptoms related postpolio syndrome and other information through telephone interview. Eighty among all participants visited our clinic for additional physical measurements and tests. *Results:* Of the 310 respondents, 69.4% reported at least one fall in the past year. Forty percent of fallers experienced at least one fall during one month. Most falls occurred during ambulation (77.1%), in the outside (69.3%) and by slipping down (33.3%). Sixty-two percent of fallers had any injuries by falls, and fracture by falls was 18.6% of all fall-related injury. Compared with community dwelling elderly, Prevalence of fall and incidence of fracture by fall was much higher in polio survivors (69.4% vs 13.0%, 21.8% vs 14.9%, respectively). Female and old age, and the presence of symptoms related to postpolio syndrome were not significant factors associated with falls. Muscle strength of knee extensor and balance confidence were significant factors associated with falls. *Conclusion:*The risk factors, prevalence and consequences associated with falls in Korean polio survivors are quite different from general Korean elderly. Fall prevention strategies need to be focused considering specific fall mechanisms of polio survivors.

PO-0890

IATROGEN CUSHING, COMPLICATION OF MYASTHENIA GRAVIS – CASE STUDY

Floares Laura*, Gilda Mologhianu, Sarah Adriana Nica, Dan Moldoveanu, Mariana Cojocaru, Toma Vasilescu

Rehabilitation National Institute Bucharest, Romania

Myasthenia gravis is a neuromuscular disorder consisting in a decreasing of the numbers of the acetylcholine receptors available at the postsynaptic muscular membrane due to an immune attack mediated by antibodies. Therefore, although acetylcoline is released normally, it produces small potentials of terminal plate which can lose its power to trigger potentials of muscular action. Highly relevant is the case of a young 28 years old women, economist known with Little Disease (infantile encephalopathy disabling) with spastic tetraparesis, multiple tenectomies, Myastenia gravis, iatrogen Cushing, organic depressive syndrome, which is hospitalized in our clinic on 10/01/2012, to initiate recovery treatment of the decreased muscle strength in upper and lower limbs, muscle fatigue after a light activity, shearing and difficult walk. *Objective:* Prevention of complications of the basic disease, prevention and treatment of associated diseases, improvement of neuro-mioartrokinethic apparatus, depression improvement, ADL improvement, socio-professional reinsertion. *Methods:* 1. preventive measures; 2. Medications; 3. Physical and kinetic treatment. *Results:* During hospitalization slowly reveals a favorable evolution with improved HAMD score (20-18), and improving functionality (FIM - 3); *Implications/Impact on rehabilitation:* The particularity of this case reveals from the asociations of Little desease, myastenia gravis and iatrogen Cushing syndrome to a young woman with normal intelect and with posibilities of socio-profesional reinsertion. the therapy of this pacient includes permanent rehabilitation, each level in specific evolutionary stages.

PO-0891

THE EFFECTS OF BMP4 AND NOGGIN ON THE ABNORMAL PROLIFERATION OF DENTATE GYRUS GRANULAR CELLS IN THE RAT MODEL OF TEMPORAL LOBE EPILEPSY INDUCED BY KAINIC ACID

Qing Yin

Third Military Medical University, Chongqing, China

Objective: To approach the relationship between the epilepsy pathogenesis and proliferation, migration and distribution of the neural stem cells. *Method:* hippocampus injury animal model induced by KA intracerebroventricular (I.C.V.) injection was used in this study. We observed the expression of nestin and BMP4 in DG of hippocampus by in-situ hybridization, immunohistochemistry and cell culture, etc. Meanwhile, we detected the neuron loss in the hippocampus of adult rats within 1 day to 30 days after KA I.C.V. injection and disclosed the relationship between the number of BrdU labeled cells in DG of hippocampus and the expression of noggin. *Results:* 1. Adult rats given KA I.C.V injection induced SE, the neuron loss in the hippocampal CA3 and CA4 areas of the injection side was notable throughout the whole experimental observation phase; otherwise, few cells lost in the opposite side. 2. Adult rats given KA I.C.V injection, the nestin positive cells in the DG sub-granular zone were abnormally proliferated and migrated, and those newly born neurons mainly located in the dentate hilus. At the same time, we observed that BMP4 mRNA positive cells increased significantly in this area. 3. Adult rats given KA I.C.V injection, the DG granule cells in the hippocampus were abnormally proliferated, and those newly born neurons mainly located in the DG sub-granular zone. Meanwhile, we observed that noggin mRNA

positive cells distributed in the hippocampal DG hilus, sub-granule layer, CA3, and CA1 areas. The noggin mRNA positive cells in the hippocampus increased 3 days post lesion, while decreased 7 days post-lesion. *Implications/Impact on rehabilitation:* All of these results indicate that KA-lesioned hippocampus promote the DG granule cells abnormally to proliferate and migrate, and those newly born neurons mainly locate in the hippocampus DG hilus area. This may be related to over-expression of BMP4 and the fluctuation of the noggin expression in the hippocampus.

PO-0892

THE REHABLITATION POTENTIAL OF HTE POST-STROKE PATIENTS WITH PSYCHOORGANIC SYNDROME

Biljana Vukovic[1], Slavisa Jankovic[2], Ivan Dimitrijevic[3]

[1]Pension and invalidity insurance fund, Belgrade, branch department Novi Sad, Serbia, [2]Secretariat of health care – city of Belgrade, Serbia, [3]KCS Belgrade, Serbia

Stroke is defined as a cerebrovasular accident characterized by loss of motor control control,altered sensation, cognitive or language impairment and diseqilibrium or coma etc. To successfully participate in complex rehabilitation programme, a patient must be capable of following commands and learning, in other word a patient must be a subject ruther then the object of rehabilitation. With aim to find out relevant factors that may have influence on the recovery dynamics of post-stroke patients with psychoorganic syndrome, we designed this rethrospective study.If we are acquainted with the complexity of stroke syndrome, we know that all the patients must have a similar but in some way individual treatment and team approach. So, it was impracticable to create separate groups of patients. We followed all data of all the patients at the beginning and at the end of treatment. All of data was analyzed in order to quantify the effects of treatment and to find out how treatment influenced on improvement of the cognitive functioning throughout changing of MMSE and vice-versa. In that term we statisticaly processed following data:FIM,Barthel index,Rankin scale,test of motor patterns to look foword on neurological deficit, MMSE and its impact on recovery level globally etc. After the evaluation of treatment results it is noticed a statistical difference at the end of the treatment for all the patients in term of most observed parameters specialy within satisfactory functional recovery, as well as better cognitive functioning improvement of them and thet is the final and indispensable goal of rehabilitation.

PO-0893

DISTRIBUTION AND EXPRESSION PATTERN OF CANNABINOID RECEPTORS CB1 AND CB2 IN BRAIN OF SD RATS

Yongtao Wu, Hongliang Liu

Southwest hospital, China

Objective: The aim of this study was to investigate the distribution of two types of cannabinoid receptors CB1 and CB2 inthe whole brain. *Methods:* Immunohistochemical method was used to demonstrate the expression of CB1 and CB2 receptors in different regions of adult rat brain. Immunofluorescence staining was used to examine the cell types. Adjacent sections was used to study the co-expression of two types of receptor in the one cell. *Results:* 1. Cannabinoid receptors CB1and CB2 are widely expressed in the brain. The two types of receptors are similarly distributed in most brain regions, but there is certain difference of the same receptor in different brain regions. The similar distribution may suggest that they are involved in some pathophysiological processes. Differences in the number and staining parts of cannabinoid receptor-positive cells in different brains suggest that the two receptors in the brain may play different roles., 2. The major cell type positive to CB1 cannabinoid receptors are neurons in the brain, and oligodendrocytes and astrocytes are more lesser. The major cell types of CB2 are neurons and oligodendrocytes, and astrocytes are more less. The co-expression of two types of receptor is observed in the same cell. The results indicate that cannabinoids in the brain can act on various types of cells, especially on oligodendrocyte, which maybe play an important role in the brain. *Implications:* Cannabinoid now is mainly used for refractory diseases, Further study on the positive cell types of cannabinoid receptors in the brain will be helpful in profound understanding on through which cells cannabinoid functions, and will provide the targets for the treatment of demyelinating disease at the same time.

PO-0894

BLADDER MANAGEMENT METHOD IN SPINAL CORD INJURIES, DO PATIENTS FOLLOW PHYSICIANS INSTRUCTIONS?

Marta Torres[1]*, Filipe Morais[2], Inês Lucas[2], Ana Rita Almeida[1], Fátima Gandarez[3], Paulo Margalho[2], Jorge Laíns[2]

[1]CHUC,Portugal, [2]CMRRC-RP,Portugal, [3]HIDP, Portugal

Objective: To evaluate if patients maintain intermittent catheterizations after discharge home, if bladder management method influences the frequency of urinary tract infections (UTI) and if workplace conditions influence the preferred bladder management method. *Method:* Retrospective analysis of clinical records regarding demographics, injury, functional assessment at admittance and discharge, bladder management method at discharge and urodynamics data (EUD) from spinal cord injured patients (SCI). Patients were later contacted by telephone and asked about their current bladder management method, number of UTI in the previous year and workplace conditions. *Results:* Sample of thirty-six patients. None of our patients is currently employed. At discharge, 44.4% performed self-intermittent catheterizations and 22.3% intermittent-catheterizations by a third party. Five patients (21%) dropped the intermittent catheterizations. Current bladder management methods were significantly different between paraplegics and high quadriplegics. We found a positive and statistically significant correlation between FIM and SCIM and bladder management method. There were no significant differences in number of UTI in the past year across bladder management methods. *Impact on rehabilitation:* It seems likely that economic factors play an important role in altering bladder management method. Patients who were doing intermittent catheterizations did not have a lower incidence of UTI, which raises concerns about the quality of the catheterization technique and the need for retraining. Also, a significant percentage of patients were unable to state the number of UTI they suffered the previous year. An effort should be made towards educating our patients and their caregivers on urinary tract complications and long-term consequences.

PO-0895

RARE FORMS OF GUILLAIN-BARRÉ SYNDROME, FOLLOW-UP AFTER DISCHARGE

Marta Torres[1]*, Ana Rita Almeida[2], Filipe Morais[2], Inês Lucas[2], Filipe Carvalho[2], Jorge Laíns[2]

[1]CHUC,Portugal, [2]CMRRC-RP, Portugal

Objective: To find possible differences between functional prognosis in patients with axonal variants of Guillain Barré Syndrome (GBS) and assess the impact of the sequelae in their professional and personal life. *Method:* Sample consisting of 9 patients diagnosed with axonal variants of SGB. Demographic, diagnostic and treatment data and functionality scales (Barthel Score (BS)), Hughes functional grading scale for GBS (GBS), overall disability sum score (ODSS) were collected, at admission and discharge. Later on, up-to-date data was collected telephonically and patients were also asked about maintenance of the rehabilitation program and the presence of sequelae such as fatigue and pain. Statistical analysis was performed with SPSS 20.0. *Results:* In our sample 5 individuals had been diagnosed with

acute motor axonal neuropathy (AMAN) and 4 with acute motor and sensory axonal neuropathy (AMAN). Only one subject remains professionally active. In our sample, 44,4% of individuals describes significant complaints of fatigue. Five patients referred pain, two of which described as moderate and three as intense. We found no statistically difference between SGB groups, regarding length of hospitalization, BS results, ODSS results, pain or fatigue complaints. We found a significant correlation between functional scales. *Impact on rehabilitation:* Patients experienced a slow and incomplete recovery and most reported complaints of significant pain and fatigue, which interfered with their activities, regardless of the subtype presented. So, an effort should be made to integrate fatigue and pain management strategies in the rehabilitation program. Professional retraining should also be a goal as to elevate the employment rate.

PO-0896

ACUTE STROKE: REHABILITATION

Thais Amanda Rodrigues, Tatiana Simões Andrade E Silva, Ana Paula De Carvalho Andrade Esotico, Daniela Heyn, Higor Kaoru Naki, Linamara Rizzo Battistella
Clinical Research Center. Institute of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objective: Provide information about rehabilitation treatment of stroke in the acute phase. *Method:* A multidisciplinary team elaborated 11 questions related to stroke and movement, postural balance, orthotic devices, task performance, exercise therapy self-care, muscle hypertonia, constraint induced movement therapy, and transcranial magnetic stimulation. The final data of the research were in July 2011 and the Pubmed Database was used as a source of research for the use of articles. The search strategy was made in the PICO format (Patient, Intervention, Comparison and Outcome). *Results:* 40 articles were selected. Early passive motion in acute phase stroke patients may result in a future gain of independence in basic activities of daily life. Specific training of trunk control does not provide better results in functional recovery when compared to conventional rehabilitation, however it improves the hemineglegence and sit-to-stand balance. Use of lower, but not upper, limbs orthosis prevents muscular shortenings. An immediate physical therapy program based in task/function-oriented exercises is effective in the patient functional recovery. Constraint-induced movement therapy provides better functional results in post-stroke acute patients, however this improvement is not always and not in all functional items greater than the attained in conventional therapy. Transcranial magnetic stimulation of 1–10 Hz with 1000 pulses, 5 to 10 consecutive days over the affected and the unaffected motor cortex showed to be an additional instrument for the starting of neurological rehabilitation on four to six-week post-stroke patients. *Implications/Impact on rehabilitation:* Start the rehabilitation process early in acute phase stroke patients provides better response.

PO-0897

CHRONIC STROKE: REHABILITATION

Thais Tavares Terranova*, Fabio Marcon Alfieri, Munique Dias De Almeida, Denise Vianna Machado Ayres, Sissi Farrardo Da Cruz, Mariana Vita Milazzotto, Denise Rodrigues Tsukimoto, Linamara Rizzo Battistella
Clinical Research Center. Institue of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objective: The purpose of this directive is to expose the different types of treatment typically used in the rehabilitation of post-stroke patients in chronic phase. *Method:* Pubmed Database search of randomized clinical trials was conducted using the search strategy P.I.C.O. structure (Patient, Intervention, Comparison and Outcome). As keywords were used: stroke AND exercise therapy AND upper extremity; stroke AND restraint induced therapy; stroke AND exercise therapy AND upper extremity. After analyzing this material, articles regarding the questions were selected and the evidences that fundament the directives of this document were established. *Results:* The constraint-induced movement therapy when associated with the restraint of the unaffected upper limb for 80% to 90% during two to six h of intensive repetitive and standardized training is recommended for the functional recovery of the upper limb affected by chronic stroke, impacting in the improvement of the activities of daily life. The use of virtual reality in sixty-min sessions, four to five times a week for four to five weeks, is capable of improving upper limbs amplitude of movement and upper limb function in patients with chronic stroke sequelae. The strength training is effective in the functional improvement of patients with chronic stroke when performed in circuit format with aerobic training and daily life simulation activities. *Implications on Rehabilitation:* Based on the above, the rehabilitation process is fundamental in minimizing the impact of cerebral lesion on the patient's quality of life. The changes in muscle tone, strength, movement amplitude, activities of daily life must be considered.

PO-0898

THE ROLE OF MINIMAL INVASIVE SPLIT LAMINOTOMY AND ALTERNATIVE PARASPLIT APPROACHES IN SURGICAL REMOVAL OF INTRAMEDULLARY PATHOLOGIES ALLOWING EARLY REHABILITATION AND PREVENT LATE SPINAL CORD INJURIES

Peter Banczerowski[1,2]*, Robert Veres[3], Janos Vajda[1]
[1]National Institute of Neurosurgery, Budapest, Hungary, [2]Semmelweis University Faculty of Medicine, Department of Neurosurgery, Budapest, Hungary, [3]Military Hospital, Neurosurgical Department, Budapest, Hungary

Objective: Multilevel laminectomy to open the spinal canal carries the risk of spinal deformities and instability. With the aim of preserving and reconstructing the mechanically relevant posterior structures the authors developed a novel minimal invasive multilevel spinous process splitting and distraction laminotomy approach and the additional rescue parasplit technique. *Method:* These novel techniques was used in 61 adult patients with midline located intramedullary pathologies of the cervical, thoracic and thoraco-lumbar spine. The patients were followed with regular MRI, CT scans, fluoroscopy and neurological examinations. *Results:* The approach used did not affect the extent of resection or neurological outcome. The incidence of postoperative local pain was lower, within acceptable limits (VAS: 2 to 5), and early mobilization and rehabilitation was allowed. The average length of hospital stay was 6.8 days. Average follow-up was 49 months. The postoperative follow-up CT scans demonstrated bony healing between the osteotomized faces. Instability and deformity was detected in none of the patients on the flexion - extension lateral radiographs during the follow up period. Implication These surgical approaches suitable for exploring and removing different intramedullary pathologies, help in preventing damage to crucial posterior stabilizers of the spine. Its major advantage is that unnecessary exposure and tissue trauma is reduced, and structures not directly involved in the pathologic process are preserved. In contrast to conventional spinal canal approaches, leaves the muscle attachments on the spinous processes intact. Allow early rehabilitation. Prevent the formation of postlaminectomy deformities, and consequential late spinal cord injuries.

PO-0899

THE IMMEDIATE EFFECTS OF TORSO WEIGHTING ON BALANCE AND FUNCTIONAL MEASURES OF PEOPLE WITH PARKISNSONS DISEASE

Rolando Lazaro[1], Gail Widener[1], Mihaela Tanasescu[2]
[1]Samuel Merritt University,United States, [2]Touro University International, United States

Purpose/Hypothesis: The decline in postural control and functional mobility are related to negative health outcomes in people with Parkinson's disease (PD). Effective treatments that enhance balance and movement can improve quality of life in this population. The addition of small weights to the torso has been used to increase postural stability and functional performance in persons with movement dysfunctions. Its effectiveness has not been documented in persons with PD. The purpose of the study was to determine if small weights applied on the torso have immediate effects on balance and mobility in people with PD. Subjects: Forty-two subjects (18 female, 24 male) with PD participated in the study. *Methods and Materials:* This was a randomized, double-blind clinical trial. The subjects were randomly assigned to a no weight (NW), fixed weight (FW), and variable weight (VW) placement group. Outcome measures included the Modified Clinical Test of Sensory Interaction in Balance (mCTSIB), Tinetti Performance Oriented Mobility Assessment (POMA), Timed Up and Go (TUG), modified Timed Up and Go (mTUG), Functional Reach Test (FRT), 360° turns, ten meter walk and lower extremity strength. These measures were performed at baseline and after random group assignment. Analysis of Covariance (ANCOVA) was used to determine if statistically significant differences in the outcome measures existed across groups. Post hoc pairwise comparisons were performed as appropriate to identify the group that demonstrated the most significant improvement in a particular measure. *Results:* The VW group showed significant improvement in the ten meter walk compared with the NW group (p=0.039) and the FW group (p=0.008). *Conclusions:* In a sample of participants with Parkinson's disease,placing weights on the torso in a strategic manner (variable weight placement) improved their ability to walk ten meters. Clinical Significance: For torso weighting to be effective, the weights must be strategically placed in response to the directional balance loss. The findings support existing literature on the positive effects of torso weighting onbalance and mobility in other neuromuscular conditions. More research is needed to determine the long term effects of this intervention.

PO-0900

A SYSTEMATIC REVIEW OF AUGMENTATIVE AND ALTERNATIVE COMMUNICATION INTERVENTIONS FOR PEOPLE WITH APHASIA

Szu-Han Kay Chen[1], Katya Hill[1,2]*
[1]University of Pittsburgh, Pittsburgh,United States, [2]Shanghai University of Traditional Chinese Medicine, Shanghai, China

Objective: The purpose of this review is to compare the results of studies investigation AAC intervention and people with aphasia (PWA). Nearly one third of individuals suffering a stroke have aphasia and face communication difficulties. Augmentative and alternative communication (AAC) intervention is used to improve the expressive communication disorders experienced by PWA. *Method:* Qualifying studies were reviewed in terms of a priori determined appraisal criteria, and summarized. Studies were divided based on the research designs, the level of evidence, the technologies used as an AAC intervention, and the outcome measures. *Results:* The results were discussed in terms of the intervention methods used, AAC system components, and the treatment protocols. A critical appraisal of the topic indicates that the evidence is not strong enough to determine treatment effectiveness of AAC interventions used for PWA. However, we found that overall improvement to communication and quality of life were the main outcomes expected from AAC interventions. *Implications/Impact on Rehabilitation:* The high heterogeneity of the PWA and the lack of consensus on the definition of aphasia across studies may have contributed to the limited results. Secondly, AAC research requires investigators to manipulate both the treatment strategies and the AAC technology components. Internal validity is threatened when we are uncertain whether the treatment condition made a difference to the outcome. The numerous components of an AAC system required a systematic approach to selecting variables for treatment. Finally, the ICF model warrants consideration to ensure a comprehensive AAC intervention is not only disorder-oriented but social-oriented.

PO-0901

THE CONTRIBUTION OF THE MNS TO APHASIA

Wenli Chen
Nan Jing Medical University, China

Mirror neurons are a specific class of neurons that are activated and discharge both during observation of the same or similar motor act performed by another individual and during the execution of a motor act. These neurons were first identified in the ventral premotor cortex (PMv; area F5) and later on in the inferior parietal lobule (areas PF and PFG) of monkey brain. Ample evidence demonstrates that mirror neurons also exist in humans. Neuroimaging and repetitive transcranial magnetic stimulation (rTMS) data suggest that the system governing both speech and gesture is located in Broca's area. The presented data support the hypothesis that speech and gesture movements are integrated by the same control system in order to produce a unique message. In this article, we discuss the observation and execution of the integration of hand and verbal actions as an approach for systematic training in the rehabilitation of patients with aphasia following stroke. We present the results of some preliminary studies to test this concept. Gesture and verbal training has the potential to improve communication by increasing spoken word retrieval of trained words and hand motor-control system is involved in higher order cognition. So we firmly believe that this action observation/execution matching system could be of significant benefit in aphasia therapy after stroke.

PO-0902

GAIT APRAXIA IN BILATERAL ANTERIOR CEREBRAL ARTERY INFARCTION

Fernanda Martins*, Liliana Lourenço Jorge
Institute of Physical Medicine and Rehabilitation - University of Sao Paulo School of Medicine, Brazil

Objective: Gait apraxia or frontal lobe ataxia is an established although rare clinical entity considering patients with anterior cerebral artery (ACA) infarction represented only 1.3% of patients with ischemic stroke. The study aimed reviews this pathology and report here a case of a patient with bifrontal infarction who showed changes in the affected motor function during rehabilitative management. *Case Description:* A 26-year-old female presented occlusion of the anterior cerebral artery (ACA) caused during a neurosurgery to correct aneurism with subarachnoid hemorrhage. She presented frontal lobe ataxia characterized by poorly control of truncal motion, impaired postural responses and abasia even though simple leg movements were present while seated or lying. She started rehabilitation 11 months after lesion because of social problems and could be observed functional improvement. *Results:* Due to an anomaly within the anterior cerebral artery system, the patient infarction was on the supplementary motor regions of both hemispheres. She presented with gait apraxia that not be attributed to paresis or other neurologic deficits. *Conclusion:* Disorders of gait caused by frontal lobe lesions had complexity clinical presentation even presents a progressive impairment. The rehabilitation program for these patients could be individualized for better results and this case report might demonstrate that.

PO-0903

A HISTORY OF UNEMPLOYMENT INFLUENCES LONG-TERM FUNCTIONING AND HEALTH RELATED QUALITY OF LIFE AFTER SEVERE TRAUMATIC BRAIN INJURY

Trandur Ulfarsson*, Åsa Lundgren-Nilsson, Christian Blomstrand, Michael Nilsson
Institute of Neuroscience and Physiology, University of Gothenburg, Sweden

Objective: The consequences of pre-morbid factors in adults with traumatic brain injury have not been widely addressed. We sought to determine whether being unemployed or on sick leave before injury influences long-term health-related quality of life and functioning in patients with severe traumatic brain injury. Subjects: The subjects were 51 consecutive patients, age 16–65 years, with severe traumatic brain injury who were admitted to Sahlgrenska University Hospital, Gothenburg, from 1999 to 2002. *Methods:* The patients were assessed once, 2–10 years after trauma. Data from the time of injury were combined into a prognostic model of traumatic brain injury to adjust for injury severity. Outcome measures included the Short Form-36 Health Survey, the Glasgow Outcome Scale–Extended, and a self-report questionnaire specifically designed for this study. Data on sick leave and unemployment were gathered from the Swedish social insurance agency. *Results:* A history of unemployment before injury was associated with alcohol/drug abuse and predicted a worse global outcome as shown by multivariate analyses. A history of sick leave/unemployment before injury predicted a lower health-related quality of life. *Conclusion:* These results should be considered when refining outcome predictions and optimizing rehabilitation interventions for patients with severe traumatic brain injury.

PO-0904

RETROPERITONEAL SCHWANNOMA MIMICKING LYMPHANGIOMA

In-Sung Choi, Hyo-Jeong Seon, Hyun-Sik Yun, Jae-Young Han, Sam-Gyu Lee*
Chonnam National University Medical School & Hospital, Department of Physical and Rehabilitation Medicine, Research Institute of Medical Sciences, Center for Aging and Geriatrics, Regional CardioCerebroVascular Center, Korea

Objective: Primary tumors of the retroperitoneal space are uncommon. Schwannoma can be rarely seen in the retroperitoneal space. Schwannoma is well encapsulated and contains cells that are identical to Schwann cells from the peripheral nerve. Retroperitoneal cystic masses are usually associated with lymphangioma or hematoma. We report a rare case of retroperitoneal Schwannoma mimicking lymphangioma. *Case Report:* A 53-year-old female complained of a renal mass incidentally detected on health check-up. Abdominopelvic computed tomography (CT) was performed and it displayed a 4×2.7 cm-sized retroperitoneal septated cystic mass just posterior to the cecum. Preoperative diagnosis was lymphangioma. Mass excision and incidental appendectomy were performed for pathological diagnosis and treatment. The mass was enveloped with nerve sheath and it was carefully removed. Pathological diagnosis was Schwannoma. On immunohistochemistry, S-100 protein was positive. Actin, desmin, C-Kit and CD34 were negative. After the surgery, motor weakness of right hip flexor and knee extensor and pain of right medial thigh and medial leg occurred. Electrodiagnostic study revealed right complete femoral neuropathy. Rehabilitative management has been performed for the functional improvement and pain control. *Implication:* Retroperitoneal space is a rare location for Schwannoma. Schwannoma with cystic degeneration may be confused with lymphangioma, which appears as fluid-filled unilocular or multilocular cystic masses. Schwannoma should be included in the diagnostic checklist of retroperitoneal cystic mass.

PO-0905

RESEARCH ON THE CORRELATION OF TCM SYNDROME BETWEEN VASCULAR COGNITIVE IMPAIRMENT AND STROKE

Yali Niu, Yan Zhang
Tianjin Medical University General Hospital

Objective: Explore the syndrome distribution of vascular cognitive impairment (VCI) post-stroke and the syndrome correlation of it with stroke of TCM. *Methods:* Use single center, prospective cohort study. Select the stroke patients, record the relevant information, screen VCI patients, differentiate the VCI syndrome of Traditional Chinese Medicine (TCM) and analyze them statistically. *Results:* The study internalized 411 cases of patients with acute cerebrovascular disease and 82 cases of patients with VCI diagnosed in them. After $\chi 2$ test and Logistic regression analysis, the patients with stroke TCM syndrome of wind and phlegm excess with VCI patients were more than patients with stroke syndrome of wind and phlegm excess without VCI. The stroke syndrome does not affect VCI syndrome in TCM. Conclusion The deficiency syndrome of VCI is most, which provide the theory base for intervention of VCI in TCM. The pathogenesy of this kind of disease is based on the physical characteristics of the elderly and has its own independent mechanism.

PO-0906

THE EFFECT OF ROBOT-ASSISTED LOKOMOTOR TRAINING ON GAIT RECOVERY

Dongmei Suo, Fan Fu, Jintao Fan, Haijie Liu
The rehabilitation department of the General Hospital of Tianjin Medical University, China

Increasing evidence shows that robot-assisted treadmill training (RAGT) may have positive effect on gait training. The aim of this study is to review the effectiveness of RAGT on patient after brain injury, stroke and spinal cord injury. Outcomes reveal that RAGT is a useful approach which can improve the walking ability of patient, and decrease the time of face to face training. However, previous studies may be affected a small simple size or an insufficient placebo control. Therefore, well-designed randomized controlled trials are needed.

PO-0907

THE EFFECT OF SWALLOWING TRAINING COMBINED WITH SWALLOWING APPARATUS TREATMENT ON DYSPHAGIA PATIENTS AFTER STROKE

Liyun Guo, Xiaohong Xing, Luping Wang, Zeli Tian, Fei Wang, Lina Cheng
Peace Hospital attached to Changzhi Medical College

Objective: To study the effect of swallowing training combined with the treatment of swallowing apparatus (PHYSIOMED vocaSTIM-Master) on dysphagia following stroke. *Methods:* 66 dysphagia patients after stroke were divided into 3 groups at random: swallowing training group (named group 1), swallowing apparatus group (group 2) and comprehensive rehabilitative treatment group (group 3). All the groups received the same basic therapy. Feeding swallowing training was performed on the patients in group 1, once a day for 4 weeks. The PHYSIOMED vocaSTIM-Master were used in group 2, once a day for 4 weeks. The patients in group 3 were accepted both of swallowing training and the treatment of vocaSTIM-Master. SSA (the standardized swallowing assessment, SSA) were used to assess the swallow function before treatment and at the week 1, 2, 3, 4 after treatment. VFSS (the videofluoroscophic swallowing study, VFSS) were used before treatment and at the week 4 after treatment. *Results:* The SSA scores of group 3 at every timing after treatment were significantly lower than that of the other two groups at the same timing after treatment ($p<0.05$). The VFSS scores of group 3 were significantly higher than that of the other two groups at the fourth week after treatment ($p<0.05$). *Conclusion:* The effect of feeding swallowing training combined with the treatment of vocaSTIM-Master was much better for dysphagia patients after stroke than that of swallowing training

or vocaSTIM-Master respectively. The comprehensive treatment is in favour of the recover of dysphagia patients after stroke.

PO-0908

THE INFULENCE OF ACUPUNCTURE THERAPY ON FACIAL PARALYSIS RECOVERY AFTER ACUTE STROKE

Chunxiao Wan, Sheng Bi
Chinese PLA General Hospital

Objective: To investigate the effects of comprehensive therapy on the recovery of facial nerve function. *Materials and Methods:* 60 patients with post-stroke facial nerve injury were divided into two groups: Group A (control group) was administered a simple conventional medication, and Group B underwent acupuncture by total considered therapy and was administered a simple conventional medication. Thirty patients were enrolled in each group. The Portmann modified clinical symptom score, intracranial hemodynamics, and electrophysiological parameters were analyzed before and after treatment. *Results:*Thirty days later, the clinical symptom score in Group B increased significantly compared with that in the control group (Group B, 17.0 ±2. 5; Group A, 13.0 ±2. 0; p<0. 01). Group B showed significant improvements in middle cerebral artery blood flow [Group B, (90 ± 17) cm/s; Group A, (52 ± 15) cm/s ; p<0. 01], facial nerve conductivity [Group B, latency of the ipsilateral orbicularis muscle, (3. 35 ± 0. 67) ms; Group A (3. 95 ±0. 58) ms; p<0.01]. *Conclusion:* The results indicate that the total considered therapy improved the recovery of post-stroke facial nerve function and that this improvement was related to the increase in intracranial blood.

PO-0909

EFFECTS OF SPINAL CORAL INJURY DEPRESSION ON THE RECOVERY OF ADL AND THE QUALITY OF LIFE

Diwen Xia, Linlin Shan, Pubing Cha
Department of Rehabilitation Medicine, Shenzhen Second Peoples Hospital, Shenzhen 518039, China

Objective: To explore the effects of Spinal Coral Injury depression on the recovery of ADL and the quality of life and the effectiveness of Paroxetine in treatment of depression. *Methods:* sixty-two Spinal Coral Injury depression cases were randomly divided into observation group (n=32) and control group (n=30), and they were all subjected to rehabilitation therapy, at the same time the patients in the observation group accepted anti-depresssive therapy. All of cases were evaluated according to Self-Rating Depression Scale (SDS), ADL and life satisfaction index A (LSIA) before and after treatment. Results after treatment the scores of SDS in observation group were lower after treatment than before treatment (p < 0.01) and those in control group (p < 0.05). The ADL and LSIA in observation group were higher than those in control group (p < 0.05, p < 0.01). Conclusion Anti-depresssive therapy may be helpful to ADL of Spinal Coral Injury depression and improve the quality of life.

PO-0910

STUDY OF THEORY OF MIND IN AUTISTIC, HEARING LOSS, AND NORMAL HEARING CHILDREN

Sheida Bavandi
Babol university of medical sciences, Iran

Study of theory of mind in autistic, hearing loss, and normal hearing children Bavandi Sheida*, Tajik, Sima *Background:* Autistic children have deficits in communicative skills which can be due to lack of theory of mind. Theory of mind is the ability to attribute mental states to others and to use them in predicting and explaining the behaviour of others. This ability has been attested to be impaired in children with hearing loss. The purpose of this study was to survey of theory of mind ability in 3 groups: autistic, hearing loss and normal hearing children. *Method:* In this descriptive analysis study, 30 children with sensory-neural hearing loss, 32 autistic children and 30 normal hearing children (7-11 years old) who met the inclusion criteria for the study were recruited. Persian version of ToM test (Qamarani, 2006) was used to assess mind-reading ability. *Results:* To examine the differences between 3 groups ANOVA test was performed and indicated significant differences between 3 groups (p= 0/031). In the next stage by use of Bonferoni test, significant differences between hearing loss and normal group (p=0/028) and between autistic and normal group (0/004) was showed, but no significant differences between autistic and hearing loss group (p = 0/475). Also normal children were better than 2 other groups in theory of mind scores. *Conclusion:* The study indicating that theory of mind ability in hearing loss children is not better than autistic children, and it can be due to deprivation of access to conversation about other's mental states which delays performance of this group on theory of mind measures. Because by observing others and engaging in conversations, children come to construct representations of mental states.

PO-0911

THE STUDY OF THE IMPROVEMENT MINT POPSICLES STIMULATION EFFICACY IN PATIENTS WITH DYSPHAGIA AFTER STROKE

Yan Li, Fen Yang, Hui Zhang, Jing Fu, Moli Wang, Yanan Ren, Qian Lei, Chengcheng Zi
Department of Rehabilitation, Second Affiliated Hospital, School of Medicine, Xi'an Jiaotong University, Xi'an 710004, Shaanxi Province, the People's Republic of China

Objective: To investigate the improvement mint popsicles stimulation efficacy in patients with dysphagia after stroke. *Methods:* 40 cases of poststroke dysphagia patients were randomly divided into a treatment group and control group, each group of 20 patients. The patients in the control group were treatment whit the conventional drug, catheter balloon dilatation therapy,swallowing electrical stimulation and using conventional ice cotton balls to stimulation pharynx therapy ;The patients in the treatment group were treatment whit the method in the control group and improved mint the Popsicle ice stimulate pharynx. Treatment of patients in both groups taken sitting or semisitting position in the two h after the meal or half an hour before the meal. *Results:* The treatment group in Japan wow Tianjun Fu drinking water test evaluation method is significant difference from control group (p<0.05). *Conclusion:* The modified mint popsicles stimulate significant efficacy in post-stroke patients with dysphagia.

PO-0912

THE INFLUENCE OF HAND FUNCTION RECOVERY FROM ISCHEMIC STROKE BY TRADITIONAL CHINESE MEDICINE FUMIGATION

Chunhua Zhao
Liaoning Thrombus Treatment Center of Integrated Chinese and Westen Medicine.Shenyang, China.

Objective: Explore the influence of hand function recovery from ischemic stroke by Traditional Chinese medicine fumigation. *Result:* There is not seen statistically significant differences between two groups, has a good form comparability. After one period treatment, the hand function rating of the experimental group was increased by compared with control group. Have a statistics difference. *Implications:* The result showed that base on the Physical therapy and functional electrical stimulation, the traditional Chinese medicine fumigation improve the functional recovery from stroke successfully

PO-0913

OBSERVATION ON THE CLINICAL EFFECT OF FACIAL NEURITIS TREATED WITH PRICK-ACUPUNCTURE PLUS CONVENTIONAL ACUPUNCTURE

Yong Zhang[1], Lingzhi Sun[1,2]
[1]The rehabilitation department of Tianjin Medical University General Hospital,China, [2]China Academy of traditional Chinese Medicine

Objective: Observe the clinical effect of prick-acupuncture plus conventional acupuncture on acute facial neuritis, Explore the mechanism of acupuncture therapy for facial neuritis to search for more effective treatment. *Methods:* The eighty cases of qualified inpatient were randomly divided into two groups: the treatment group (40 cases), treated with prick-acupuncture plus conventional acupuncture; while the control group (40 cases) only treated with conventional acupuncture. According to the House - Brackmann (H - B) facial nerve grading systems which were recommended by the fifth International Symposium of Facial Neurosurgery, the evaluation lasted four weeks. *Results:* The H – B scoring which is based on the symptoms between before and after treatment is significantly different in each group (P. *Implications:* Using prick-acupuncture plus conventional acupuncture can improve the efficacy of facial neuritis. It also can improve the cure rate of facial neuritis.

PO-0914

1 CASES: EFFECT OF HYPERBARIC OXYGEN THERAPY AS AN ADJUVANT METHOD ON CEREBELLAR HEMORRHAGE CAUSED BY CEREBROVASCULAR MALFORMATION

Hui Jiang, Jie Huang, Liwan Wang
Department of Hyperbaric Oxygen of Rehabilitation Medicine Center Chinese PLA General Hospital, China

Objective: Summarizing effect of hyperbaric oxygen therapy as an adjuvant method on cerebellar hemorrhage caused by cerebrovascular malformation in 1 case. *Method:* It was reviewed retrospectively that a patient suffered with cerebellar hemorrhage was treated with hyperbaric oxygen. A 26-year-old man was hospitalized due to headaches, dizziness, unconsciousness 2 h. He showed sudden headache, dizziness without any cause in the onset morning and had a slurred speech after defecation himself consciously. Then he was unconscious after going to emergency department. neurological examination: patient was in coma, his physiological reflex was impairment and pathological sign was positive. And neck stiffness was positive. Emergency brain CT examination showed cerebellum hemorrhage in left hemispheres and vermis with rupturing into ventricles. Impression cerebellar hemorrhage caused by vascular malformation rupturing into ventricles. The patient was accepted resection of cerebellar hematoma and cerebral vascular malformations in the day after admission. After operation the patient was suffered lethargy although could obey commands with his hands. Head CT in the next day showed change of cerebellar hemorrhage after operation. Then the emergence of stress ulcer and gastrointestinal bleeding occurred so that some active treatment was executed such as intracranial infections, dehydration, resistance to infection, bleeding, acid suppression, rehydration and supporting treatment. HBO therapy began from the 10th day after operation. HBO pressure setting: inhaling pure oxygen in 30 min with 2.5ATA 2 times and taking an interval 10 min with inhaling compressed air between 2 times. one time per day, 10 times for 1 courses, a total of 3 courses of treatment. Necessary drugs were used in symptomatic treatment and to control blood pressure at the same time. *Result:* The patients recovered after treatment, *Conclusion:* As the patient's vital signs was stable HBO therapy early intervention of cerebral hemorrhage was more valuable because of promoting healing of illness.

PO-0915

1 CASE: HYPERBARIC OXYGEN THERAPY AS A ADJUVANT TREATMENT FOR PARAPLEGIA AFTER THORACIC VERTEBRAE TUMOR OPERATION

Hui Jiang, Jie Huang, Liwan Wang
Department of Hyperbaric Oxygen of Rehabilitation Medicine Center Chinese PLA General Hospital, China

Objective: Analyzing the effect of Hyperbaric oxygen adjuvant therapy on paraplegia after thoracic vertebrae tumor operation in 1 case. *Method:* It was reviewed retrospectively that a patient suffered with paraplegia after thoracic vertebrae tumor operation was treated with hyperbaric oxygen. A 26-year-old man was admitted because of the thoracic lesions in 5 years with abdominal and the double lower limb numbness in 3 months. The patient had the back and neck discomfort 5 years ago and then was examined in the local hospital. The examination revealed there was a small space-occupying lesion located on upper thoracic, which was not treated afterwards. 2 months ago the patient felt abdomen and double lower limb numbness, which was heavier in the right side particularly but did not affect the movement. Subsequently the symptoms became more serious, then the patient was hospitalized. Neurological examination: limb activity and muscle strength was normal. Somatic following manubrium sternum and double lower limbs skin superficial sensory loss, but deep feeling was normal. In MRI examination it was suggested that there was an occupying lesion in rich blood supply of 2nd thoracic vertebral attachments (laminae and spinous), which invaded the surrounding tissue and compress spinal cord, The impression was tumor. The patient was accepted thoracic tumor excision of tumor and decompression and bone graft with posterior approach vertebral pedicle internal fixation through posterior approach under general anesthesia. Surgical pathology report: osteoblastoma (2nd thoracic vertebral accessories). After operation patient's double limb muscle strength levels were grade 0 to 1. Then HBO therapy began from the 7th day after operation. HBO pressure setting: Increasing pressure in 15min and decreasing pressure in 20 min, inhaling pure oxygen in 30 min with 2.0ATA 2 times and taking an interval 10 min with inhaling compressed air between 2 times. one time per day, 10 times for 1 courses, a total of 3 courses of treatment. Necessary drugs and rehabilitation training were used to improve neuromuscular function. After 4 courses of treatment, patient's lower limb muscle strength was grade 3 and defecation function was normal. *Result:* Patient condition improved markedly after the end of treatment. *Conclusion:* Hyperbaric oxygen therapy should be actively involved as early as possible in order to improve treatment efficiency and cure rates after the spinal operation.

PO-0916

EFFECTS OF HYPERBARIC OXYGEN THERAPY ON SUPEROXIDE DISMUTASE (SOD), C-REACTIVE PROTEIN (CRP), SIALIC ACID (SA) IN SERUM RELATED TO PATIENT STRESS REACTION

Hui Jiang[1], Yaping Tian[2], Liwan Wang[1]
[1]Department of Hyperbaric Oxygen of Rehabilitation Medicine Center Chinese PLA General Hospital,China, [2]Department of Biochemistry Chinese PLA General Hospital, China

Objective: Analyzing levels of serum superoxide dismutase (SOD), c-reactive protein (CRP), and sialic acid (SA) in serum, which were acknowledged as stress related indexes, before and after hyperbaric oxygen therapy. And researching the bodys stress and inflammatory status change through hyperbaric oxygen therapy. *Method:* With a retrospective study, SOD, CRP and SA in serum of 60 cases which

were accepted hyperbaric oxygen therapy were analyzed before and after hyperbaric oxygen therapy respectively from May 2011 to May 2012. Then absolute value changes and the ratios of indexes change were compared between before and after therapy. Pressure setting: inhaling pure oxygen in 30min with 2.0ATA 2 times and taking an interval 10 min with inhaling compressed air between 2 times. Then patients went out from the chamber after decompression. *Result:* After therapy, SOD level in serum was significantly increased, while CRP, SA levels were significantly lower than before. In the compare of the indexes change ratio between male and female, SOD levels in men and women were increased after treatment, but the level raised more obviously in women. CRP, SA levels were decreased both in men and women after treatment, but declining levels in men were stronger than in women. *Conclusion:* Hyperbaric oxygen therapy combined with antioxidant free radical treatment did not increase the inflammatory response in general with enhancing the free radical scavenging ability, but could alleviate inflammation by improving hypoxia, cell metabolism, which was conducive to the recovery of related diseases.

PO-0917

ELECTROPHYSIOLOGICALLY SILENT CARPAL TUNNEL SYNDROME: IS SURGERY THE ONLY ANSWER? - A CASE SERIES

Rajesh Pramanik[1,2]*, Mohit Kataruka[1], Rathindranath Haldar[1,2]

[1]Indian association Of Physical Medicine & Rehabilitation,India, [2]Indian Rehabilitation Forum, India

Objective: To find out clinical and electrophysiological improvement due to conservative care including local infiltration of methylprednisolone in electro-physiologically silent carpal tunnel syndrome. Inclusion criteria 1.clinically confirmed electro-physiologically silent CTS. 2. Waiting time of surgery more than 2 months.3. Age ≥18 yr. Exclusion criteria 1 Consent not given 2.Contraindication of local injection like bleeding diathesis etc. 3.Contraindication of steroid like poorly controlled diabetes mellitus 4. Rheumatoid arthritis, Pregnancy, acromegaly, tophaceous gout. Methodology 16 hands of patients, who fulfilled the above criteria, have been included in the study after ethical committee clearance.Initially patients have been assessed clinically and electro physiologically and injection methylprednisolone given aseptically. They are also advice to use static wrist hand orthosis, nerve gliding exercise, vit B12. Follow up of symptoms and repeat electro physiological study have been done at 2, 4 and 8 weeks post intervention. *Results:* Data were analysed by statistica version 6 and Graph Pad prism version 5 software. Age was normally distributed as per Shapiro-Wilk test. Comparative analysis by Friedman variance showed a statistically significant ($p<0.001$) improvement of Phalen score and VAS of pain. Interestingly Dunn's multiple comparison test revealed immediate improvement of VAS due to injection with sustained effect up to 2 months. On the other hand phalen score actually improved with statistical significance ($p<0.05$) after 2nd week of conservative care.Interestingly motor amplitude of median nerve were improved statistically ($p<0.001$) especially after 2nd week of conservative management as per Dunn's multiple comparison test. But neither motor nor sensory latency of median nerve were improved as per the analysis. Sensory amplitude of nerve was improved with lower statistical significance ($p=0.008$). Implication Although the series is small with short follow up period, it is evident that conservative rehabilitation regimen has some minimal role even in electro-physiologically silent CTS.

PO-0918

A NEW HYPOTYPE OF DEPRESSION: SUBTHRESHOLD DEPRESSION

Chao Dong, Wenchun Wang, Qian Wang, Rizhao Pang, Anren Zhang

General Hospital of Chengdu Military Region of Chinese peoples Liberation Army

People's living pressure has been gradually increasing because of the development of economy of our society in recent years, and occurrence of depression has also been an important problem. In the public, many people have syndromes of depression that do not fit the diagnosis standards of occurrence of depression, which were called subthreshold depression.

PO-0919

RELIABILITY OF FOUR MOTOR FUNCTION TEST ON ASSESSING THE UPPER EXTREMITIES MOTOR FUNCTION OF STROKE PATIENTS

Cheng Kou, Xiaoxie Liu, Sheng Bi

Center of rehabilitation medicine, Chinese PLA General Hospital, China

Objective: To investigate the test-retest reliability and interrater reliability of the Fugl-Meyer, the Wolf motor function test (WMFT), BOX-BLOCK TEST (BBT), Nine-Hole Peg Test for assessing upper limb motor function in stroke patients. *Methods:* Eighteen post-stroke patients participated in the study. Each patient was assessed twice with U-FMA, WMFT, BBT, Nine-Hole Peg Test within two h. Two raters recorded each session separately, the test-retest reliability was detectioned by analyzing the assessment results among different sessions, the interrater reliability was identified by analyzing the assessment results among different raters. *Results:* The intraclass correlation coefficients (ICC) were 0.988 for test-retest reliability and 0.959 for interater reliability of U-FMA. The ICC were 0.996 for test-retest reliability and 1.000 for interater reliability of WMFT by time mean. The ICC were 0.393 for test-retest reliability and 1.000 for interater reliability of WMFT by time median. The ICC were 0.989 for test-retest reliability and 0.977 for interater reliability of WMFT by score mean. The ICC were 0.975 for test-retest reliability of affected hand counts with BBT and 0.982 of the difference counts between affected hand and good hand.The ICC were 0.937 for test-retest reliability and 1.000 for interater reliability of affected hand Nine-Hole Peg Test. The ICC were 0.936 for test-retest reliability and 1.000 for interater reliability of the difference between affected hand and good hand by Nine-Hole Peg Test. *Conclusion:* The U-FMA, WMFT, BBT, Nine-Hole Peg Test are reliable on assessing upper extremities motor function of stroke patients.

PO-0920

CRITERION VALIDITY AND CORRELATION OF THREE MOTOR FUNCTION TESTS ON ASSESSING THE UPPER EXTREMITIES

Cheng Kou, Xiaoxie Liu, Sheng Bi

Center of rehabilitation medicine, Chinese PLA General Hospital, China

Objective: To investigate the criterion validity of the Wolf motor function test (WMFT), BOX-BLOCK TEST (BBT), Nine-Hole Peg Test for assessing upper limb motor function in stroke patients with hemiplegia. The upper extremities motor function test of Fugl-Meyer movement assessment has been taken as criterion. The correlation between the total time of WMFT and the total score of WMFT,the correlation between the counts of BBT and the total scores of WMFT and the correlation between the time of Nine-Hole Peg Test and the total time of WMFT have also been analyzed. *Methods:* Twenty-one stroke patients participated in the study. Patients were assessed once with WMFT, BBT, Nine-Hole Peg Test, U-FMA by one rater.All the four tests was assessed on the same day for each patient. For each patient,the total time of WMFT, the total score of WMFT, the counts of BBT, the time of Nine-Hole Peg Test,the sore of U-FMA were recorded.The Spearman correlation was used to analyse the criterion validity and the correlation. *Results:* The total score of the

WMFT and U-FMA score were related ($p<0.01$, r=0.9071).The BBT counts and U-FMA score were related ($p<0.01$, r=0.6703).The time of Nine-Hole Peg Test and U-FMA score were not related ($p>0.05$). The total time of the WMFT and U-FMA score were not related ($p>0.05$). The total time of the WMFT and the total score of the WMFT were not related ($p>0.05$). The BBT counts and the total score of the WMFT were related ($p<0.01$, r=0.6936).The time of Nine-Hole Peg Test and the performance total time of WMFT were related ($p<0.01$, r=0.7035). *Conclusion:* The WMFT scoring record and the BBT counts record are instruments with adequate criterion validity.There is a positive correlation between the BBT counts and the total score of the WMFT. The time of Nine-Hole Peg Test and the total time of WMFT were also found having a positive correlation.

PO-0921

PROGRESS OF STEM CELL TRANSPLANTATION FOR THE TREATMENT OF SPINAL CORD INJURY IN CLINICAL APPLICATIONS

Fangyuan Chen, Lixin Zhang, Zhiqiang Zhang
Shengjing Hospital Affiliated To China Medical University, China

This review aims to provide an overview about the current clinical application of stem cell transplantation for spinal cord injury (SCI). *Method:* We reviewed stem cell types, transplantation ways, number, assessment methods, clinical security by picking out the relevant literatures about stem cell transplantation for the treatment of spinal cord injury clinically in recent years. *Result:* Many clinical trials showed that stem cell transplantation on SCI was safe and effective. The patients had sensory and motor improvement to some extent. *Implications:* The research is still in its infancy about stem cell transplantation for treatment of SCI in the clinical application. There are still many issues that need further observation and to be solved, and need stronger support of the basis of experimental studies. But its clinical application is infinitely attractive. Many clinical studies have proved that stem cell transplantation for treatment of SCI has clinical effects and better security to some certain. These data are promising but the theory is not so convincing because of small sample and short observation time and follow-up time. Future research efforts need to focus on alternative, more easily accessible stem cell sources that can not cause ethical concerns and tumor formation. The clinical effects still need further study of the large sample and the observation of long-term efficacy.

PO-0922

THE RELIABILITY AND VALIDITY OF CHINESE VERSION OF QUALITY OF LIFE AFTER TRAUMATIC BRAIN INJURY (QOLIBRI) FOR EVALUATING PATIENTS WITH BRAIN TRAUMA

Yang Yu, Linying Zhang, Enhe Liang
Tianjin Huanhu Hospital,China

Objective: To study the reliability and validity of the Chinese version of QOLIBRI (quality of life after traumatic brain injury). *Methods:* A total of 83 participants with traumatic brain injury were evaluated by the Chinese version of QOLIBRI. The reliability was examined by test-retest method and internal consistency was measured with Cronbach's α coefficient. The validity was examined by the correlations those were observed between the Chinese version of QOLIBRI to HADS, SF-36 and GOSE. The results were analyzed using Spearman's correlation coefficient, respectively. *Results:* 43 participants' data were integrity. Test–retest reliability of QOLIBRI subscales was stable with scores ranging from 0.912 to 0.996 ($p<0.001$). The Cronbach's α coefficient of subscales was passable with scores ranging from 0.506 to 0.915 ($p<0.001$). The score of QOLIBRI was negatively correlated to HADS score, moderate correlated to GOSE score and positively correlated to SF36 score. *Conclusions:* The Chinese version of QOLIBRI has good reliability and validity.

PO-0923

EFFECT OF REHABILITATION WITH EARLY OCCUPATIONAL THERAPY ON CAUSED BY STROKE

Xianbing Cheng, Yifang Cen, Jingliang Tian
Department of Rehabilitation Medicine, the First Affiliated Hospital of Zunyi Medicine, Guizhou 563003, China

Objective: To observe the efect of early occupational therapy intervention on caused by stroke. *Methods:* A total of 92 patients with caused by stroke were randomly divided into a treatment group (46 cases) and a control group (46 cases). The cases of the control group were treated by routine clinical treatment plus positioning on the bed, passive joint motion, bridging movement, facilitation techniques, balance training in sitting and standing positions, gait training immediately after the patients'conditions got stable. The patients in the treatment group were treated with activities of daily living (ADL)training in addition to the interventions employed in the control group. *Results:* Effect of the treatment group are superior to that of the control group as reflected by the scores with Fugl-Meyer scale and Barthel Index ($p<0.01$). *Conclusion:* Early use of activities of daily living training in addition to movement therapy can effectively improve the motor function and ADL performance of stroke patients

PO-0924

THE EFFECT OF QI-SUPPLEMENTING TREATMENT COMBINED WITH REHABILITATION ON THE QUALITY OF LIFE OF POST STROKE FATIGUE PATIENTS WITH QI DEFICIENCY ISCHEMIC

Youhua Guo, Hongxia Chen, Zhifei Wang
Department of Rehabilitation of Guangdong Provincial Hospital of TCM, Guangzhou, 510006, China

Objective: To study the clinical effect of Qi -supplementing treatment combined with Rehabilitation on the quality of life of post stroke fatigue patients with Qi deficiency ischemic stroke. *Methods:* 90 patients with Qi deficiency ischemic stroke were randomly divided into 3 groups, Each group has 30 patients. The treatment group was treated with oral decoction of Qi -supplementing Chinese medicine and rehabilitation. The western medicine control group was treated with Chinese medicine placebo, western medicne and rehabilitation. The blank control group was treated with Chinese medicine placebo and rehabilitation. All groups were evaluated with SS-QOL and FSS before and 4 weeks after treatment. *Results:* After treatment, the assessment score of SS-QOL and FSS were significantly improved than those of before treatment, especially in the treatment group. There was significant difference before and after treatment ($p<0.05$). After 4 weeks treatment, There was significant difference between the treatment group and western medicine control group, the treatment group and blank control group in the assessment score of the two scales ($p<0.05$). While There was no significant difference between western medicine control group and blank control group in the assessment score of SS-QOL and FSS ($p>0.05$). *Impact on Rehabilitation:* Qi -supplementing Chinese medicine had good effect on improving the quality of life of patients with Qi deficiency ischemic stroke, and there has a positive correlation with the improvement in fatigue conditions.

PO-0925

CLINICAL RESEARCH OF ABDOMINAL ACUPUNCTURE TREATMENT OF PATIENTS WITH POST STROKE FATIGUE

Hongxia Chen, Minfeng He, Youhua Guo

Department of Rehabilitation of Guangdong Provincial Hospital of TCM, Guangzhou, China

Objective: To investigate the clinical effect of abdominal acupuncture treatment on patients with post stroke fatigue. *Methods:* 60 patients met the inclusion criteria were randomly divided into treatment group and control group, 30 cases in each. The control group was received rehabilitation training plus TCM differential treatment (Buyanghuanwu decoction addition and subtraction). The treatment group was received abdominal acupuncture treatment plus the treatment given to the control group. The acupuncture points were Zhongwan (CV12), Xiawan (CV10), Qihai (CV6), Guanyuan (CV4), Daheng (SP15), Huaroumen (ST24) and Wailing (ST26). The duration of treatment: six times a week, a total of 4 weeks. The fatigue severity scale (FSS) and energy part of stroke-specific quality of life scale (the SS-QQL) were evaluated before and after treatment. SPSS14.0 statistical software was used for data analysis. *Results:* The score of FSS and SS-QQL of treatment group was higher than that of the control group. There were statistically significant differences between two groups before and after treatment ($p<0.01$).

Table 1. FSS score of two groups before and after treatment

Group	Before treatment	After treatment
Treatment	51.63±6.06	36.70±6.99[1,2]
Control	52.43±4.77	42.37±7.06[1)]

Compared with before treatment,[1]$p<0.01$: Compared with control group, [2]$p<0.01$.

Table 2. SS-QQL score of two groups before and after treatment

Group	Before treatment	After treatment
Treatment	4.47±1.33	11.07±1.89[1,2]
Control	4.67±1.34	9.37±2.52[1]

Compared with before treatment, [1]$p<0.01$: Compared with control group, [2]$p<0.01$. *Impact on Rehabilitation:* The abdominal acupuncture therapy can improve the fatigue of stroke patients. So it may improve the dysfunction of stroke.

PO-0926

STUDY ON STANDARDIZED TESTS OF ACALCULIA IN PATIENTS WITH BRAIN INJURY

Hui Pang[1], Xiao-Ping Yun[2], Hua-Zhen Guo[2]

[1]Department of Rehabilitation Medicine,Beijing Massage Hospital,China, [2]Capital Medical University School of Rehabili tation Medicine, the Department of Rehabilitation Eval uation, Beijing Charit y Hospi tal,China Rehabilitation Research Center

Objective: To investigate errors and mechanism of acalculia in patient s with brain injury. *Methods:* Forty patient s with brain injury and forty-eight normal adult s who were matched in age and years of education were tested with EC301 standardized battery. Patient s were divided into the lef t-brain damaged (LBD) group (n=20), right-brain damaged (RBD) group (n=9) and bilateral brain damaged (BBD) group (n=11). The data of all subject s were statistical analyzed. *Results:* Both total scores and scores of 27 out of 31 items were remarkable lower in patient s than those in the normal cont rol group ($p<0.05$). The total scores and items'scores for number sequences, numerical t ranscodings were significantly lower in LBD group than those in RBD group ($p<0.05$).Total scores and each items' score did not significantly differ between BBD group and LBD group, or between BBD group and RBD group ($p>0.05$). *Implications:* The abilities of number processing and calculation are impaired in patient s with brain injury. There is either association or dissociation in terms of performance of acalculia and aphasia in LBD patients. Visuospatial impairment is related to performance of acalculia in RBD patients.

PO-0927

TREATMENT WITH BOTULINUM TOXIN IN PARKINSON DISEASE PREVENTION OF THE PRESSURE SORES IN A PATIENT WHO DEVELOP FLEXION CONTRACTURE OF THE HANDS

Amra Saric

Dalhousie university, Department of Medicine, Division of PM&R, Canada

Objective: To determine the benefit of Botulinum Toxin treatment in a patient with Parkinson disease who developed flexion contractures of the hands and pressure sores. *Background:* Parkinson disease is one of the most common neurological disorders affecting approximately 1% of individuals older than 60 years. The most common initial symptoms are tremors, rigidity and bradykinesia. Other symptoms may include dystonia, postural instability, dysphagia, autonomic dysfunction, depression and dementia. *Methods:* This case reports describes a 70 year old male who was diagnosed at age of 64, with rapid deterioration in his overall function, particularly cognitive deterioration. The patient resides at nursing home, is non-ambulatory and requires total care. He has had increased tone especially affecting hands, left greater than right. This caused difficulties in hygiene, skin maceration and ulceration, pain and discomfort. His fingers were flexed at the MCP, PIP, and DIP joints. Pressure sores (stage II) were present on the radial surface between index finger and thumb. The patient had a trial with soft splint with no significant improvement. The patient received 300 units of Botulinum Toxin type A, divided between flexor digitorum superficialis, flexor digitorum profundus and lumbricals bilaterally. *Results:* The patient had clinically meaningful improvement, the pressure sores were healed, and hands could be easily opened and cleaned. *Conclusion:* The treatment had significant impact on patient care and quality of life and Botulinum Toxin Type A should be considered as an option in treatment of pressure sores caused by increased tone.

PO-0928

CONTRAST RESEARCH ON EFFECT OF TUINA (CHINESE TRADITIONAL MEDICINE MASSAGE) AND CHIROPRACTIC ON BALANCE AND BASIC ACTIVITIES OF DAILY LIVING (B-ADL) AFTER STROKE

Jianzhuo Yang, Jinglong Liu, Tianlong Guo, Yu Guo

Heilongjiang Province Rehabilitation Hospital, Harbi, China

Objective Contrast research on Effect of Tuina (Chinese traditional medicine massage) and Chiropractic on balance and basic activities of daily living (B-ADL) after stroke.To evaluate outcome of two different treatments. *Methods:* 60 patients with problem of balance were recruited to this study. Inclusion criteria: first-event stroke, no ill-controlled serious underlying systemic disease, no aphasia, no dementia, no subarachnoid hemorrhage (SAH) and 4 weeks after onset. The score of Fugl-Meyer balance assessment were no more than 6. The patients were randomly divided into two groups: group A (n=30 age: 57.67±10.26) and group B (n=30 age: 59.27±7.85). Both groups do following treatment: daily physiotherapy, occupational therapy, and other therapy according to individual needs. Patients in the group A received traditional Chinese medicine massage (Tuina), but group B do the treatment of Chiropractic The subjects received 30 min daily treatments of Tuina and Chiropractic, 6 times per week. The Modified Barthel Index (MBI) and Fugl-Meyer balance assessment was respectively used to assess patients' capacity in B-ADL and balance. Assessment was done upon admission to rehabilitation and 6 weeks afterwards. SPSS12.0was used for statistic *Results:* After 6 weeks, performance in the entire patient group increased (paired samples t-test: t=32.44, $p<0.001$). At that time, the differ-

ence in Fugl-Meyer balance assessment scores of 2 groups was not significant (independence samples *t*-test: t=1.378, $p>0.05$), but MBI was (t=2.384, $p<0.05$). *Conclusion:* Standard rehabilitation treatment including measures of both Tuina and Chiropractic has a beneficial effect on the functional capacity of stroke patients with problem of balance and outcome is similar. But in B-ADL, Tuina maybe better.

PO-0929

REHABILITATION TREATMENT TO SPINAL CORD INJURY PATIENTS WITH BLADDER FUNCTION

Ju Yang, Tieliu Cao
Kunshan Hospital of Rehabilitation in jiangsu province, China

Spinal cord injury cause bladder dysfunction, through the urine flow mechanics inspection, intermittent catheterization, go with pelvic floor muscle stimulus, acupuncture and other measures, to avoid complications, regulate the bladder function, improve the situation to urinate.

PO-0930

EFFECTS OF CLUSTER NEEDLING OF SCALP ACUPUNCTURE COMBINED WITH REHABILITATION TECHNIQUE ON FORELIMB MOTOR FUNCTIONIN RATS AFTER FOCAL CEREBRAL ISCHEMIA ANDRESEARCH FOR RELATED MECHANISM

Yan Wang, Qiang Tang, Lu Wen Zhu, Hongguang Liu, Chunyan Zhang
Heilongjiang university of Chinese medicine in the 2nd affiliated hospital, China

Objective: To observe the effects of cluster needling of scalp point (CNSP) combined with task-oriented training on forelimb motor function and expression of GAP-43, SYN, GFAP, Vim, S100β in cerebral ischemia area of rats after cerebral infarction. *Methods:* Endothelin-1 (ET-1) was used to induce focal cerebral ischemia model in rats with forelimb dysfunction. The rats were randomly divided into 6 groups: sham operation group, model group, CNSP group, task-oriented training group, treadmill running group and CNSP combined with task-oriented training group. On the 3rd, 7th, 14th, 21st day after modeling, motor function of rats were evaluated by net screen test and forelimb grasping success rate and Immunohistochemistry staining was used to observed the expression of GAP-43, SYN, GFAP, Vim, S100β in cortical ischemia lesions of the rats in each group. *Results:* 1. The result of the net screen test and forelimb grasping success rate indicated that motor function of rats in CNSP combined with task-oriented training group was more superior than the result in other groups ($p<0.05$). 2.The expression of GAP-43, SYN, GFAP, Vim, S100β in CNSP combined with task-oriented training group was more superior than in other groups ($p<0.05$). *Conclusion:* CNSP combined with task-oriented training can improve the forelimb motor function of rats after focal cerebral ischemia, and facilitate the expression of GAP-43, SYN, GFAP, S100β, Vim. It may be a mechanism of CNSP combined with task-oriented training facilitating the recovery of forelimb motor function in rats after focal cerebral ischemia.

PO-0931

660NM RED LIGHT PROMOTE FUNCTIONAL REHABILITATION OF SCIATIC NERVE IN RAT AFTER CRUSH INJURY

Yang Zhao, Song Li, Nong Xiao
Rehabilitation Department of Children's Hospital of Chongqing University of Medical Science, China

Objective: To study the treatment of 660 nm red light on sciatic nerve in rat after crush injury, exploring the best treatment mode and provide perspective basis for clinical application. *Methods:* 45 adult male Sprague-Dawley rats were divided into two groups: control and red light therapy, and then rats in red light therapy group were divided into four based on different parameters:Low 1 (L1), Low 2 (L2), High 1 (H1), and High 2 (H2). All rats were suffered by crush injury on right sciatic nerve. In Experimental groups, rats were continuously received irradiation of 660 nm red light for 21 days under different parameters. During the irradiation, we observed the Compound Muscle Action Potentials (CMAP), including latency (LAT), amplitude (AMP) and nerve conductive velocity (NCV). Stepping ability of rats was evaluated by SciaticFunctional Index (SFI). Assessment of histology on myelin sheath was assayed by semithin section. *Results:* After 21 days of continuous treatment, compared with control, the differences of LAT and AMP in each experimental group were no significant. After 21 days of continuous treatment, compared with control, the difference of NCV in H1 was statistically significant. After 21 days of continuous treatment, compared with control, the differences of SFI in group L2 and H1 were statistically significant. After 21 days irradiation, compared with control,the form of myelin sheath in L2 was significantly improved. *Conclusion:* Irradiation of red light could promote recovery of sciatic nerve injury and improve stepping ability of rats.

PO-0932

REPORT THE CASE WITH HEMIPLEGIC PATIENTS WITH DYSPHAGIA

Tieliu Cao, Ju Yang
Kunshan Hospital of Rehabilitation in jiangsu province, China

In a case of hemiplegia patients with dysphagia use fiberoptic endoscopic examination to assess swallowing, and then use the balloon technology, improve the function of speech deglutition, remove of gastric fistula finally, recovery of automatic feeding capacity.

PO-0933

EFFECTS OF CHINESE TRADITIONAL MASSAGE ON SHOULDER PAIN IN THE RESTORATION OF SHOULDER SUBLUXATION

Jianzhuo Yang, Jinglong Liu, Tianlong Guo, Yu Guo
Heilongjiang Province Rehabilitation Hospital, Harbin, China

Objective: In the restoration place to observe the effects of Chinese Traditional Massage on shoulder pain caused by subluxation and motor function recovery of the upper extremities in patients with hemiplegia after stroke. *Methods:* 60 hemiplegic patients after stoke with shoulder pain related to shoulder subluxation and functional disorder were randomly divided into two groups. The age of patients was between 35 and 75 and without any serious illness. Both of the groups were treated with Chinese Traditional Massage and usual rehabilitation including physiotherapy, occupational therapy, but without acupuncture. All patients were treated with therapy on the shoulder at most 6 weeks after onset. When making massage treatment,one of groups was in the place of restoration, but the other not. The recovery of the patient's shoulder pain, and movement function of upper extremities were assessed with short form McGill pain questionnaire and Fugl-Meyer assessment of upper extremity before and 6weeks after treatment. *Results:* The shoulder subluxation, shoulder pain and movement function of the upper extremities were improved after treatment with both groups. And the assessment of the restoration group showed better effect ($p<0.01$). The score of MPQ in the treatment group was significantly lower than that in the control group ($p<0.01$), while the score of FMA was higher ($p<0.05$). *Conclusion:* Chinese Traditional Massage on shoulder

pain caused by subluxation in the restoration place can facilitate the recovery of shoulder subluxation,shoulder pain and motor function of the upper extremities after hemiplegia after stroke.

PO-0934

CHANGES OF THE PULMONARY FUNCTION IN PATIENTS WITH SPINAL CORD INJURY (SCI)

Xianbing Cheng, Yuzhi Li, Xidong Chen, Xiang Huang, Zhuyue Xie

Department of Rehabilitation Medicine, the First Affiliated Hospital of zunyi Medicine, guizhou 563003, China

Objective: To investigate the features and influencing factors associated with pulmonary functionin Subjects with spinal cord injury (SCI). *Methods:* The pulmonary function data of 44 patients obtained by spirometry,including 24 at cervical and 20 at thoracolumbar level were analyzed.The values of vital capacity (VC), forced vital capacity (FVC), maximal voluntary ventilation (MVV), forced expiratory volume (FEVl 0) expressed as percentage of those of the normal subjects (VC%, FVC%, MVV%, FEV% respectively) were obtained and compared between cervical and thoracolumbar spinal cord injuries by independent—samples t-tests, then the multivariable stepwise regression analysis was perform ed to study the relationship between such factors as age, gender, duration of SCI, body weigh index (BMI), the level of lesion (cervical or thoracolumbar injury), motor/sensory index score and ASIA (America Spinal Injury Association)impairment scale and the pulmonary function parameters including VC, FVC, MVV an FEV. *Results:* VC%, FVC%, MVV%, FEV% decreased in all the subjects with cervical and thoracolumba spinal cord injuries, and were lower in patients with cervical injuries than those with thoracolumbar spinal cord injury significantly. The multivariable stepwise regression analysis showed that the common powerful influencing parameterst the VC, FVC, MVV, FEV were the level of lesion, gender and the motor index score. *Conclusion:* The SCI patients demonstrated ventilation impairment, especially those with spinal cord injuries at the cervical level, and the moto index score of ASIA was one of the main factors related to the pulmonary function of SCI patients.

PO-0935

THE EFFECT OF COGNITIVE TRAINING ON MOTOR AND EXECUTIVE FUNCTION OF PATIENTS WITH BASAL GANGLIA STROKE

Liang Tian, Xiangming Ye, Juebao Li, Liang Zhou, Genying Zhu, Ting Yang

Department of Rehabilitation Medicine, Zhejiang Provincial People's Hospital, China

Objective: To explore the effect of cognitive training on motor and executive function of patients with basal ganglia stroke. *Methods:* 30 patients with basal ganglia stroke were randomly divided into the experimental group and control group. In addition to the standard rehabilitation training, the experimental group still received 2 months of cognitive function training, and the control group only received the standard rehabilitation training. The executive function, motor function and the Activities of daily living in all subjects were tested by use of TOH, WCST, Stroop-3 and FMA, BBS, MBI, MWS before and at the end of treatment. *Results:* After two months of training, executive function of the experimental group had increased and better than the control group significantly. Motor function and ADL of the two groups were both increased significantly, but the range of the increased significantly greater than the control group. *Implications:* Cognition function training could improving the executive function, motor function and the ability of ADL of patients with basal ganglia stroke.

PO-0936

THE EFFICACY OF BIODEX BALANCE SYSTEM TRAINING FOR BALANCE AND WALKING FUNCTION REHABILITATION AFTER BRAIN INJURY

Cuihuan Pan

Department of Rehabilitation,The Second Affiliated Hospital of Guangzhou Medical College, Guangzhou 510260, China

Objective: To evaluate the efficacy of Biodex Balance System (BBS) training for balance and walking function rehabilitation after brain injury. *Methods:* 150 patients with balance and walking dysfunction after brain injury were divided into control group and treatment group randomly. The treatment group received BBS training and traditional gait training for 6 weeks, while the control group was just treated by traditional gait training. All patients were measured by Fugl-Meyer Balance Scale, Berg Balance Scale, Modified Barthel Index and Holden Walking Functional Classification before and at the endpoint of treatment respectively. *Results:* The scores of Fugl-Meyer Balance Scale, Berg Balance Scale, Modified Barthel Index and Holden Walking Functional Classification improved in both groups after treatment ($p<0.01$), And scores of treatment group improved more than control group ($p<0.05$). *Conclusion:* BBS training combined with traditional gait training could rehabilitate the balance and walking function more effective, and improve the activities of daily living of patients with balance and walking dysfunction after brain injury.

PO-0937

STUDY OF DYSLIPEMIA IN THE SPINAL CORD INJURIED PATIENT

Renzo R Franco Ginocchio, Marta Supervia P. Marco, R Polo, R Luis Ledesma

Spinal cord Injury Unit, Department of Rehabilitation Medicine, Miguel Servet Universitary Hospital, Zaragoza, Spain

Objective: To describe the relation between pattern of dyslipemia and spinal cord injuried patient. *Method:* orty-one patients spinal cord injuried patients with a first hospital admission, a cholesterol and triglicerids measure while were hospitalized, and again after one year measurement, were admitted to this investigation. Analyze the overall cholesterol pattern lipid in the selected spinal cord injuried patients SPSS was used for statistic analysis *Results:* We find a Pearson correlation index of: 0,55; with a p-value <0.001. We find a overall difference between first total cholesterol measure and year total cholesterol mean of: -25.707 with a CI 95%: -37.281 to -14.134. We find 4 patterns of cholesterol levels in spinal cord injuried patients, in the measured period time: 26% with a normal total cholesterol level, over one-year develop a high total cholesterol level (>=200 mg/dl). 33% with a normal total cholesterol level, over one-year hold the normal total level of cholesterol. 24% with a high total cholesterol level, over one-year hold the same high total level of cholesterol 10% with a high total cholesterol level, over one-year reduce the total level of cholesterol *Impact on Rehabilitation:* There is a average correlation index, between Spinal cord injuried patients and development of high cholesterol levels, we are working on enlarge our sample of patients.

PO-0938

EPISODE OF AUTONOMIC DYSREFLEXIA SECONDARY TO SUMATRIPTAN IN TREATMENT FOR MIGRAINE HEADACHE

Sandip Patel[1,2], Robert Kent[1,2], Samantha Mendelson[1,2]

[1]University of South Florida, Tampa, FL,United States, [2]James A Haley VA Hospital, Tampa, FL, United States

Introduction: Autonomic dysreflexia (AD) is a syndrome affecting persons with spinal cord injury (SCI) at the T6 level or above caused by various noxious/non-noxious stimuli triggering a reflex sympathetic response uninhibited by supraspinal centers. A case of AD following administration of Sumatriptan for a migraine headache is presented. *Case Presentation:* Patient is a 26 y/o male with C4 ASIA A SCI; history of migraine headaches. Inpatient rehabilitation stay significant for recurrent migraine headaches and urinary tract infections. Unremarkable cardiac history/EKG confirmed, and Sumatriptan 6 mg SC x1 ordered for a migraine episode. After administering medication, patient complained of severe neck pain and stiffness, worsening headache and diaphoresis. BP increased from 93/51 to 130/80, HR 56. AD protocol initiated, and bladder distension, bowel impaction, or visible physical noxious stimuli all ruled out. Multiple doses of Nitroglycerine 2% ointment applied, and BP and HR returned to baseline. On further monitoring, vital signs remained stable, symptoms gradually resolved. *Discussion*: Reported side effects of Sumatriptan include dystonia and generalized muscle pain, all seemingly served as triggers for AD. Serious risks of arrhythmia, hypertensive crisis, and cardiac arrest more commonly reported in those with cardiovascular disease. In the setting of high SCI and lack of cardiac history, patient's high blood pressure and bradycardia due solely to medication side effects unlikely. *Conclusion:* Careful precaution when using medications like Sumatriptan with potential musculoskeletal side effects should be taken in patients with high SCI, as they may have the potential of causing AD.

PO-0939

EVEN A SMALL ACOUSTIC TUMOR COULD CAUSE GAIT INSTABILITY

Min Yin[1,2], Kazuo Ishikawa[2]

[1]Department of Otolaryngology, The First Affiliated Hospital of Nanjing Medical University,China, [2]Department of Sensory Medicine, Akita University School of Medicine, China

*Objective:*s To confirm whether detailed gait analysis by the use of tactile sensor could show instability of gait performance in patients with small acoustic neuroma who have seemingly normal gait. *Methods:* Twenty two patients (7 male and 15 female, 40 ~ 64 years old) with small acoustic tumor (AT), and 9 healthy controls with age and weight matched were enrolled in this study. Small AN is defined when its longest diameter was less than 20 mm from the porus acoustics on MRI and had no compression to the brainstem. Each subject was asked to walk 8 meters straightly with tactile sensor with eyes open and closed. Gait parameters of stance, swing, double supports, stability and average length of trajectories of center of force during stance were recorded and compared. *Results:* No significant change in the stability of trajectories of center of force was detected whether with or without visual cue. No obvious change in gait parameters was recognized with visual due condition between the two groups. The values of coefficient of variation (CV) of gait phase were significantly greater in stance and swing in AT group than normal. When compared between patients with canal paraesis (CP) and those with normal caloric response, patients with CP showed greater CV values in gait phase related parameters under gait with eyes closed. *Conclusion:* Patients with small AT may show seemingly normal gait, however, their vestibular deficit could be detected by proper use of gait analysis, especially under gait with visual deprivation. The superior vestibular nerve system may play an important role for gait phase stability.

PO-0940

THE EFFECT OF DEVELOPING STROKE SPECIALIST VISITS TO OUTPATIENT ON THE MOVEMENT FUNCTION OF THE PATIENTS

Xiao Liu Li, Jing Zhao, Jing Cao, Xiaoyan Xing, Yue Zhang, Yan Zhou, Huanyin Li, Yingfeng Weng

Shanghai Minhang District Center Hospital,Shanghai, China.

Objective: To study the effect of developing stroke specialist visits to outpatient on the movement function of the patients. *Methods:* Rehabilitation and neurological department of internal medicine in our hospital opened jointly after stroke specialist visits to outpatient, clinic time is every Thursday afternoon; inform patients after they are discharged from the hospital, in 1 weeks, 1 months, 3 months, 6 months to the special disease clinic on telephone, give them rehabilitation evaluation, rehabilitation triage according to the evaluation. To observe the patients movement function and activities of daily living and quality of life impact. *Results:* The patients' ability of activities of daily living (p>0.05) and movement function (p>0.05) were improved by the stroke specialist outpatient clinic visit. *Conclusions:* Establishment of clinic visits can improve the patients' ability of activities of daily living, reduce the rate of disability.

PO-0941

THE CLINICAL RESEARCH OF THE EFFECTION ON ISCHEMIC STROKE BY TRADITIONAL CHINESE AND WESTERN MEDICINE COMBINED WITH EARLY REHABILITATION

Rui Qi

Yueyang Hospital of integrated Traditional Chinese and Western Medicine, Shanghai University of Traditional Chinese Medicine of rehabilitation department, China

Purpose: To observe the clinical effect with comprehensive rehabilitation therapy of patients with cerebral infarction. *Method:* 353 patients with cerebral infarction were randomly divided into rehabilitation group and control group. Rehabilitation group adopted the comprehensive rehabilitation treatment, and control group mainly used the drug therapy. Evaluated the patients with improved Barthel Index (BI) evaluation, neural function defect scale and Fugl - Meyer movement function score (FMA). *Results:* After three weeks of treatment, the results of patients in two groups improved in BI evaluation, nerve function defect degree score and FMA, and the differences had statistical significance. By comparison of comprehensive rehabilitation group and control group, the differences of BI increasing value before and after treatment, of nerve function defect score decreasing value before and after treatment, of upper limbs FMA increasing value had statistical significance, while the difference of lower limbs FMA increase score before and after treatment didn't have statistically significant. *Conclusion:* The improvement was more obvious of Cerebral Infarction patients who were in comprehensive rehabilitation group than who were in control group, in aspects of activities of daily life abilities, nerve function defection, and upper limb movement function ore control, so comprehensive rehabilitation therapy can significantly improve the clinical effect of the patients with cerebral infarction and reduce morbidity.

PO-0942

THE EFFECT OF PHYSICAL THERAPY ON THE KNEE JOINT IN PATIENTS WITH OSTEOPOROSIS CAUSED BY HEMIPLEGIA AFTER STROKE

Xiao Liu Li, Yue Zhang, Xiaoyan Xing, Jing Cao, Guojun Du, Yan Zhou

Shanghai Minhang District Center Hospital,Shanghai, China.

*Objective:*To study the effect of physical therapy on the knee joint in patients with osteoporosis caused by hemiplegia after stroke. *Methods:* Select 120 the knee joint in patients with osteoporosis caused by hemiplegia after stroke in our hospital, randomly divided them into experimental group and control group with 60 cases in

each group; The experimental group were treated by exercise therapy and magnetic therapy, ultrasonic therapy; The control group were treated by exercise therapy. To assess the patients with ipsilateral knee joint by dual energy X ray bone mineral density and VAS pain scores before the treatments and 3-6 months after treatments. *Results:* Two groups of VAS score comparison, the experimental group was superior to the control group, with statistical significance ($p<0.05$); the experimental group patients with knee bone mineral density values than the control group with significant difference ($p<0.05$). *Conclusions:* Significant improvement in treatment of physical therapy on the knee joint in patients with osteoporosis caused by hemiplegia after stroke.

PO-0943

THE CORRELATION CAREGIVERS VARIABLE AND REHABILITION EFFECTIVENSS OF PATIENTS WITH STROKE

Qiaojun Zhang, Haifeng Yuan, Zhongheng Wu, Bin Zhang, Hui Zhang

Department of rehabilition medicine, the Second Affiliated Hospital of Xian Jiaotong University,Xi'an, China

Introduction: Cross-cultural differences could influence the relationship between caregiving and rehabilition outcomes in stroke patients survivors between different societies. *Objective:* To investigate the impact of caregiver factors on rehabilition effectiveness among stroke patients admitted to department of rehabilition medicine. *Methods:* Using retrospective study method. Patients admitted for stroke rehabilition to all department of rehabilition medicine of second affiliated hospital of Xi'an Jiaotong University in existence from 2010.1 to 2012.12. Inclusion criteria: first admission for stroke; Course of disease 14-60days. Assessed: 1) demographic characteristics; socioeconomic status; caregiver availability;relation to patient; caregiver level of education; 2) clinical profile of patients using the Charlson Co-Morbidity index (CCMI); 3) length of stay and time to admission; 4) Function status at admission and discharge based on BI; 5) admission and discharge BI were then used to calculate rehabilition effectiveness (REs). All data analysis was run using SPSS 17.0. Mixed logistic regression identified independent predictors of caregiver availability and identity; Mixed Poisson modeling identified independent predictors of caregiver number; Mixed linear regression identified the predictors of Res. The significance value was set at $p<0.05$. *Results:* In our cohort, primary caregivers had 34.2% depended on accompany (look after a patient), 38.2%on spouses and 27.6 %, on first-degree relatives. Independent factors associated with caregiver availability and number included: age >60 years, female, being married, higher socioeconomic status, and higher level of education (all $p<0.05$).Having non-child non-parent relatives and accompany as primary caregiver were associated with lower Res, compared to spouse. Having accompany as primary caregiver was associated with lower REs compared to spouse. *Conclusion:* There in high dependence on accompany as caregiver for stroke patients, Stroke Res declined with decreased relatedness between caregiver and patient,and Res was poorer in patients with accompany as caregivers.

PO-0944

THE REHABILITATIVE EFFECT ON DYSPHAGIA AFTER MEDULLA OBLONGATA INFARCTION IN STROKE UNIT

Hong Tu Wang, Lin-Yiing Zhang, Yu-Juan Guo

Tianjin Huanhu Hospital,Department of Rehabilitation Medicine, China

Objective: To observe the effect of VitalStim electrical stimulation combined with acupuncture treatment on dysphagia after medulla oblongata infarction in stroke unit *Methods:* Forty-five patients with dysphagia after medulla oblongata infarction were divided into the experiment group (23 instroke unit) and control group (22 ingeneral ward). Both the two groups were treated by VitalStim electrical stimulation and acupuncture. *Results:* After treatment, there was more efficient in the experiment group than the control group ($p<0.01$). The beginning time of the intervention in the experiment group is sooner than the control group ($p<0.01$). *Conclusions:* The early rehabilitation intervention in stroke unit could improve dysphagia after medulla oblongata infarction significantly.

PO-0945

THE ELECTRIC NEEDLE HAND YANG MERIDIAN FUNCTIONAL BRAIN IMAGING PET-CT RESEARCH

Xianzhong Meng[1], Jun Zhang[1], Chang Rex[1], Chin-Ling Lee[1], Hongyan Chuang[1], Wei Da[1]

[1]Shanghai Pudong New Area Peoples Hospital Department of Rehabilitation (Shanghai 201200),China, [2]General Hospital of Heilongjiang Land Reclamation Bureau (Heilongjiang Harbin 150088), China

Objective: This article uses the advanced technology of PET-CT, observed hand Yangming two single points EA stimulation, brain metabolism changes, derived stimulus Hegu, Qu pool two points cause brain metabolism in the corresponding region of the cerebral cortex, Brodmann enhancedand the weakened changes and know the specific circumstances of the two points of cerebral metabolic reaction zone. The findings for our understanding of the cortical regions of the brain have different functions in the physiological state of the two points, reveal Meridian - the related and Meridian effect of the central brain mechanism, providing visibility theoretical basis. *Method:* Experimental select six healthy right-handed subjects (3 men, 3 women), the right side of the electro-acupuncture Hoku. Two weeks the electric needle six healthy right-handed subjects the right side Quchi, then repeated the previous experiment. Experimental injection of tracer 18F-FDG (18 fluorine-labeled deoxyglucose) observation the two acupoints a total of 12 cases of normal human acupuncture ago, the changes of brain metabolism and brain function imaging by PET-CT. SPM (statistical parametric mapping) software processing experimental data, obtained with significant changes in brain metabolism visibility image. ($p<0.01$) *Results:* EA stimulation the right-gu caused prefrontal cortex, the primary auditory cortex, the third level of the joint area, the premotor cortex, the somatosensory association area enhancement of 18F-FDG; the electroacupuncture stimulation right Quchi caused the prefrontal cortex, the primary auditory cortex, the third level of the joint area, the premotor cortex, somatosensory association areas, the primary visual feelings areas enhanced 18F-FDG; *Conclusion:* The right Quchi of electroacupuncture stimulation caused the prefrontal cortex, the primary auditory cortex, the third level of the joint area, the premotor cortex, somatosensory association areas, primary visual feel 18F-FDG enhanced; Quchi for visual disease may have a positive role;, somatosensory, auditory, mental activities, visual control balance, language and contralateral manually; movement of the primary somatosensory role.

PO-0946

STUDY ON EVENT RELATED POTENTIAL N400 BEFORE AND AFTER SPEECH THERAPY IN CHINESE APHASIA PATIENTS

Liang Zhou, Xiangming Ye, Juebao Li, Wanshun Wen

Zhejiang Provincial People's Hospital, China

Objective: To investigate the feature of event related potential N400 before and after speech therapy in Chinese aphasia patients. *Methods:* Twenty Chinese aphasia patients received speech therapy for 12 weeks. Speech function was evaluated with Western Aphasia Battery (WAB), and the latency and amplitude of N400 was monitored before and after speech therapy. *Results:* All the sub-items and aphasia quotient (AQ) of WAB after therapy were significantly

higher than before therapy. N400 latency was shorter and N400 amplitude was lower after therapy than before therapy. The latency and amplitude of N400 significantly correlated to the score of Aphasia Quotient (AQ) in the difference before and after speech therapy. *Conclusion:* Event related potential N400 could reflect the improvement of speech function before and after speech therapy and it is a valuable index for evaluating the recovery of language function in Chinese aphasia patients.

PO-0947

ANALYSIS OF 80 CASES OF CEREBRAL APOPLEXY PATIENTS WITH ANKLE INTENSIVE REHABILITATION TRAINING EFFECT

Yan Zhou, Xiaoliu Li, Jingshan Shao, Jing Zhao, Yue Zhang, Xiaoyan Xing, Jing Cao, Guojun Du
Shanghai Minhang District Center Hospital,Shanghai, China.

Objective: Study the cerebral apoplexy patients with ankle intensive rehabilitation training effect. *Methods:* 80 cases of cerebral apoplexy patients with foot drop were divided into treatment group and control group; The 40 cases in treatment group were treated with rehabilitation treatment combined with ankle joint training, the 40 cases in the control group treated with routine rehabilitation therapy, treat for 1-3 months. *Results:* There is no difference between two groups of patients with ankle dorsiflexion ability before treatment; After treatment for 1 to 3 months, the effect of the treatment group was significantly higher than that of control group ($p<0.01$); Two groups of Fugl-Meyer and ADL evaluation compared with significant difference ($p<0.01$). *Conclusions:*Ankle joint reinforced training for improving stroke patients with ankle dorsiflexion had good effect.

PO-0948

BLADDER FUNCTION EVALUATION AND APPLICATION IN SPINAL CORD INJURY PATIENTS

Ying Zhang, Jing-Gang Du
Tianjin union medicine centre, China

Objective: To evaluate bladder function and the its application by urodynamic test in spinal cord injury patients *Methods:* Urodynamic tests were performed in 72 spinal cord injury patients whose surgery was conducted in Tianjin Union Medicine Centre between 2005 to 2009 at the time of 1-month, 3-month,6-month and 2-year after the injury. The urodynamic tests included amount of residual urine, volume and compliance of bladder, detrusor muscle-extermal sphincter coordination, detrusor reflex,etc. The ASIA was used for evaluating the severity and the level of spinal injury, the blood test of BUN and Cyst C was used for estimating kidney function, the modified Ashworth scale was used to evaluate the muscle tone, Barthal Index was used for the capability of daily activity. *Results:* The urodynamic tests results were statistically different for different period after the injury except the result between the 6-month and the 2-year after injury ($p>0.05$) The volume and compliance of 6-monthe after injury were related with the final kidney function, muscle tone, and the capability of daily activity ($p<0.05$) in the group injured under the lumber-sacral level, Whereas the detrusor muscle-external sphincter coordination were related with those factors in the group injured above the lumber-sacral level. *Implications:* The bladder function gets stabilized after 6 months after injury. The volume and compliance could be used for predicting the kidney function and the capability of daily acitivity for the patients injured under the lumber-sacral level, the detrusor muscle-external sphincter coordination could be used for the prediction in patients injured above the lumber-sacral level.

PO-0949

EXERCISE THERAPY DOWNREGULATES THE OVEREXPRESSION OF TLR4, TLR2, MYD88, AND NF-KB AFTER CEREBRAL ISCHEMIA IN RATS

Yuewen Ma, Man He, Lin Qiang
Department of Rehabilitation Medicine, The First Affiliated Hospital, China Medical University, Shenyang, Liaoning, PR China

Objective: Toll-like receptor 2 (TLR2) and Toll-like receptor 4 (TLR4) are considered to mediate the inflammatory reaction of cerebral ischemia injury, and exercise can inhibit the activity of the Toll-like receptor signaling pathway in the peripheral blood of humans. Although physical exercise has been demonstrated to be neuroprotective in both clinical and laboratory settings, the underlying mechanism remains unclear. To clarify this critical issue, this study investigated the effects of treadmill training on the recovery of neurological function and the expression of TLR2 and TLR4 and their main downstream targets, nuclear factor-kappa B (NF-κB) and myeloid differentiation factor 88 (MyD88), in the ischemic rat brain after middle cerebral artery occlusion-reperfusion (MCAo/R). *Method:* Rats were divided into 7 groups: sham control without MCAo/R and 5, 9, and 16 days post-ischemic exercise or non-exercise. The neurological function and infarct volume were measured, and RT-PCR and Western blotting were used to detect the expression of TLR2, TLR4, NF-κB, and MyD88 in ischemic brain tissue. *Results:* Treadmill training promoted functional recovery and reduced the overexpression of TLR2, TLR4, NF-κB, and MyD88 in rat brain tissue after ischemia. *Implications:* The results may have implications for understanding the mechanism of exercise therapy after brain ischemia and indicating new therapeutic strategies for the pharmacological modulation of TLR signaling.

PO-0950

THE EFFICACY OF DONEPEZIL COMBINED WITH LANGUAGE DISORDER ZM2.1 FOR POST-STROKE APHASIA

Yan Chen, Cuihuan Pan, Zhuo Gong, Xuan Wang, Jie Fang
Department of Rehabilitation,The Second Affiliated Hospital of Guangzhou Medical College, Guangzhou 510260, China

0bjective To evaluate the efficacy of donepezil combined with language disorder ZM2.1 for post-stroke aphasia (PSA). *Methods:* Sixty patients with PSA were divided into treatment group and control group randomly. The treatment group received treatment of donepezil hydrochloride (5 mg/d) combined with language disorder ZM2.1 for 4 weeks, while the control group was just treated by language disorder ZM2.1. All patients were measured by Chinese Rehabilitation Research Center Standard Aphasia Examination (CRRCAE) before and at the endpoint of treatment respectively. *Results:* The scores of auditory comprehension, repetition, naming, deaconing and reading all increased in both groups after treatment (p<0.05). And the noun- naming ability of treatment group improved more than control group (p<0.05). *Conclusion:* Language function of PSA could be improved by rehabilitation treatment of language disorder ZM2.1, And donepezil combined with language disorder ZM2.1 could have more efficacy in noun-naming ability.

PO-0951

APPLICATION OF CANADIAN OCCUPATIONAL PERFORMANCE MEASURE (COPM) TO STROKE SURVIVORS

Xiuming Chen, Ying Liu, Guorong Wei, Yonghui Hou, Xiang He, Yongbo Jiao, Ying Wang, Huizhen Zhang
Centre of Rehabilitation Medicine, Shijiazhuang Central Hospital, China

Objective: To explore the usefulness of COPM for patients After stroke. *Methods:* 60 participants were divided into two groups according to their Fugl Mayer assessment scores (FM scores). 29 ingroup A with FM scores above 40 and 31 ingroup B with FM scores less than 39. Then apply COPM before and after one month treatment cycle. *Results:* There were significantly differences in self care and vocational domain of COPM between two groups ($p<0.05$). People with better motor function are more likely to work on vocational domain while the ones with less FM scores have more desire on self care domain. There was no statistic difference in Leisure domain between group A and B. *Implications:* COPM has been widely used in occupational therapy. This study shows that COPM helps therapists understand patients desire and results in a more appropriate therapy to the patients' need.

PO-0952

LATERAL ANTEBRACHIAL CUTANEOUS NEUROPATHY, A CASE REPORT

Duygu Tecer[1], Arda Yilmaz[2], Gunsah Sahin[1], Ozlem Bolgen Cimen[1], Nurgul Arinci Incel[1], Mehmet Taskaynatan[3]
[1]Mersin University, Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Mersin, Turkey, [2]Mersin University, Faculty of Medicine, Department of Neurology, Mersin, Turkey, [3]Gulhane Military Medical Academy, Department of Physical Medicine and Rehabilitation, Ankara, Turkey

Introduction: Compression neuropathy of the lateral antebrachial cutaneous nerve is an infrequent clinical entrapment syndrome. We present a case of lateral antebrachial cutaneous nerve injury, which occurs after a splinting. *Case:* A 44-year-old male patient fell 3 months ago and than a forearm splint was applied because of a soft tissue injury. Numbness and pain on the anterolateral aspect of right forearm were started 20 days following splint application and were not relieved after splint removal. On physical examination, minimal tenderness and swelling were detected at the anterolateral aspect side of right forearm. Biceps, coracobrachialis, and brachialis muscle strengths were normal. Plain radiographs of the arm and forearm showed no abnormality. Right forearm MRI showed subcutaneous edema. Electromyography showed no differences between the SNAP amplitudes of right and left superficial radial nerves and median sensory nerve of the first digits. However SNAP amplitude of the right lateral antebrachial cutaneous nerve was significantly (60%) lower than the contralateral side. A Conservative treatment regimen including physical therapy and pregabalin 300 mg/day was started. Eventually the dysesthesia reduced. *Result:* Compression neuropathy of the lateral antebrachial cutaneous nerve is a rare disorder and generally improves with conservative treatments. It is important to rule out other conditions like lateral epicondylitis, biceps strain, cervical radiculopathy, and brachial plexopathy that may produce similar symptoms.

PO-0953

THE EFFECT OF LOW-FREQUENCY REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION WITH DIFFERENT INTENSITIES ON UPPER LIMB FUNCTION IN PATIENTS WITH CEREBRAL INFARCTION

Ying Shen, Chunlei Shan
Rehabilitation Medicine Center, First Affiliated Hospital of Nanjing Medical University, Nanjing, China

Objective: To compare the effect of low-frequency repetitive transcranial magnetic stimulation (rTMS) with different intensities on the upper limb function in patients with cerebral infarction. *Methods:* Forty patients with cerebral infarction were randomly assigned to four groups that received 30% (n=10), 60% (n=10), 90% (n=10) motor threshold (MT) rTMS (0.5Hz) and sham rTMS (n=10) on the primary motor cortex of the unaffected hemisphere for 20 days. At the same time, all patients were administrated with standard rehabilitation therapy. Upper limb function was evaluated both before and after the above treatments using the Fugl-Meyer Assessment (FMA), motoricity index (MI) and Hong Kong edition of functional test for the hemiplegic upper extremity (FTHUE-HK). The excitability of motor cortex of the affected hemisphere was also evaluated with motor evoked potential (MEP) cortical latency and central motor conduction time (CMCT). *Results:* Compared with the baseline and the other three groups, the 90% MT group had statistically significant improvement of upper limb function scores, MEP cortical latency and CMCT after the treatments. *Implications:* The intensity of rTMS has significant impact on the treatment outcomes. 90% MT rTMS (0.5Hz) showed the best treatment effect to promote the recovery of upper limb function and improve the excitability of motor cortex of the affected hemisphere.

PO-0954

HYPERACTIVITY OF THE FRONTOPARIETAL NETWORK DECREASES THE EXCITABILITY OF THE CONTRALATERAL HOMOLOGOUS CORTEX

Xiaofei He[1], Yue Lan[2], Guangqing Xu[1], Shihui Xin[3], Hongyan Zhou[3], Cunzhou Shen[3], Dongfeng Huang[1], Zhong Pei[3]
[1]Department of Rehabilitation Medicine, The First Affiliated Hospital, Sun Yat-sen University, Guangzhou, China, [2]Department of Rehabilitation Medicine, The Third Affiliated Hospital, Sun Yat-sen University, Guangzhou, China, [3]Department of Neurology, The First Affiliated Hospital, Sun Yat-sen University, Guangzhou, China

Background: Brain injury to the dorsal frontoparietal networks (FPNs) including the posterior parietal cortex (PPC) and dorsolateral prefrontal cortex (DLPFC) commonly cause spatial neglect. However, the interaction of these different regions in spatial attention is unclear. *Method:* Sixty healthy subjects were divided into two groups, a frontal group and a parietal group, in accordance with sex for the DLPFC and PPC stimuli studies, respectively. The Attention Network Test (ANT) was then examined following intermittent theta burst stimulation (iTBS) to the left or right FPNs. *Results:* During ANT task, all subjects tolerated each conditioning iTBS without any obvious iTBS-related side effects. Subjects receiving real-right-PPC iTBS showed significant enhancement in both alerting and orienting indices compared with those receiving either sham-right-PPC iTBS or real-left-PPC iTBS. Moreover, subjects exposed to the real right DLPFC iTBS exhibited significant improvement in both alerting and resolving conflict indices compared with those exposed to either the sham-right-DLPFC or real-left-DLPFC conditioning. Interestingly, compared with subjects exposed to the sham-left-PPC stimuli, subjects exposed to the real-left-PPC iTBS had significant deficit in the orienting index. *Implication:* The present study not only supports the prevalence of right dorsal FPNs in the different components of spatial attention, but also indicates the model of inter-hemispheric competition in the spatial orienting attention. Neglect is one of the most common symptoms after brain damage,elucidating the mechanism resulting in visuospatial attention deficit is crucial for its rehabilitation. *Keywords:* Spatial attention; Frontoparietal networks; Theta burst stimulation; Facilitation; Competition.

PO-0955

VITAMIN D LEVELS AND NEUROREHABILTATION OUTCOME

Barry Jordan
Burke Rehabilitation Hospital, United States

Objective: To determine if vitamin D levels on admission to an acute neurorehabilitation service correlated with functional outcome. *Methods:* A retrospective chart review of 414 consecutive patients admitted to an acute neurorehabilitation unit was conducted. Vitamin D levels were measured on admission and classified as deficient *Results:* The mean vitamin D level among this cohort of patients was 22.4 ng/ml. Sixty four (15%) patients were considered deficient, whereas 259 (63%) were insufficient and 91 (22%) were sufficient. Vitamin D levels weakly, but significantly correlated with age; r=0.16 (p=0.001) and admission GOAT; r=0.127 (p=0.028). Deficient patients were significantly younger (56 vs. 63 years) (p=0.003) than those patients who displayed sufficient levels of vitamin D. There were no statistically significant differences between deficient and sufficient patients on admission total FIM, admission MMSE, admission SAC, and admission GOAT scores. Similarly, there were no significant differences between FIM efficiency, discharge total FIM and discharge motor FIM. However, a statistically significant, but likely clinically insignificant difference in discharge cognitive FIM was noted in the deficient group compared to the sufficient group (26.83 vs. 24.80, respectively). *Implications/Impact on rehabilitation:* Vitamin D levels did not influence functional outcome in a cohort of patients admitted to a neurorehabiltation service.

PO-0956

EFFECT OF GAIT TRIGGERED FUNCTIONAL ELECTRICAL STIMULATION ON FOOT DROP PATIENTS AFTER STROKE/

Cuihua Liu, Pande Zhang, Xiaochuan Rong, Chuke Lin, Guien Li, Hongyan Deng
Rehabilitation Department in the First People's Hospital of Foshan City,guangdong, China

Objectives: To observe the effect of functional electrical stimulation combined with rehabilitation therapy being applied to patients with foot drop after stroke. *Methods:* 57 stroke subjects with foot drop randomly into therapy group (n=30) and control group (n=27), ages of both group are 58.8±11.8 y, 58.8±11.8 y, courses of disease are 35.9±21.4 d and 32.7±16.9 d. The `control group received routine medical treatment and regular rehabilitation therapy, while the therapy group combined regular treatment with electrical stimulation on common peroneal nerve and tibialis anterior muscle of affected side by using XFT-2001 Low-frequency electrical pulse stimulator twice a day. One time only used exercise mode as neuromuscular electrical stimulation (NEMS) on affected tibialis anterior muscle for 20 min; the other time received both NMES and 15~20 min' walking training, 5~6 days a week,4 weeks in total. Before treatment, used XFT-2001P neuromuscular locator to find sensitive points,then placed electrodes on suitable positions. Evaluated lower limbs' motor function (assessed by Fugl-Meyer lower limbs scale) and walking function (assessed by Step Test, Maximum Walking Speed, Up and Down Stair Test) before treatment,2 weeks after treatment and 4 weeks after treatment. *Results:* No significant differences were found for baseline data of each group before treatment. After 4 weeks' treatment, there were significant differences on improving their motor function, walking function, ability of transfer and going up and down stair in both groups compared to pretreatment (p<0.05).*Conclusion:* Rehabilitation therapy can improve motor function of affected low limbs, walking function and transfer ability as well as up and down stairs ability. Combined functional electrical stimulation with rehabilitation therapy had remarkable improvement on stroke subjects. It is considered to be a safe and effective training method because of little side effect.

PO-0957

SHEAR STRESS INHIBITS ENDOTHELIAL APOPTOSIS IN STROKE

Shan Tian, Yongshan Hu, Yi Wu, Yulong Bai, Jie Jia, Yulian Zhu
Department of Rehabilitation, Huashan Hospital, Fudan University, Shanghai 200040, China

Objective: Laminar shear stress (LS),as an important force generated by cerebral blood flow (CBF), mainly acts on brain microvascular endothelial cells (BMECs). Our previous studies have showed that exercise therapy increases blood perfusion in ischemic brain penumbra. We studied whether LS was a protective factor in this process. *Method:* Ischemic rat BMECs were induced by oxygen/glucose deprivation (OGD) and LS (1±0.05 dynes/cm^2 vs. 0 dynes/cm^2) was offered by parallel-plate flow chamber.PE Annexin V/7-AAD, JC-1 and Hoechst 33258 staining were used to observe the membranous, mitochondrial and nuclear dysfunction in apoptosis. Real-time PCR and western blot were also adopted to test the mRNA and protein expressions of Tie-2, Bcl-2 and Akt which were respectively related to maintain membranous, mitochondrial and nuclear normal. *Results:* Appropriately increased LS inhibited apoptosis of ischemic rBMECs.Tie-2, Akt and Bcl-2, at least in part, attenuated a series of apoptotic events of membranous, mitochondrial and nuclear dysfunctions. *Implications/Impact on rehabilitation:* Exercise therapy could restore the blood flow to promote LS for endothelial survival and should be recommended as an excellent therapeutic strategy for ischemic stroke.

PO-0958

A COMPARATIVE STUDY OF ELECTRO-ACUPUNCTURE BILATERAL HEGU (LI4) AND CARBAMAZEPINE IN NEUROPATHIC PAIN WITH SPINAL CORD INJURY

Gen Ying Zhu, Xiang Ming Ye, Jue Bao Li, Liang Zhou, Wan Shun Wen, Liang Tian, Ting Yang
Zhejiang Provincial People's Hospital, China

Objective: To explore the efficacy of electro-acupuncture bilateral HeGu (LI4) in neuropathic pain with spinal cord injury and compared with carbamazepine.
Method: 32 patients with neuropathic pain with spinal cord injury (T3-T10, ASIA A scale) were randomly divided into two groups and each group has 16 patients. And the McGill pain questionnaire scores have no significant difference in two groups. The experimental group received electro-acupuncture bilateral HeGu (intermittent waveform, 30 min each time, once a day) while comparison group received carbamazepine 200 mg qd. Respectively using McGill pain questionnaire before treatment, 1 week after treatment, 2 weeks after treatment and 4 weeks after treatment. *Results:* 1 week after treatment, there was significant reduction of McGill pain questionnaire score in experimental group (p<0.05), and have significant difference compared with the comparison group. The McGill pain questionnaire score of 2 weeks and 4 weeks after treatment of experimental group have significant decline compared with the score evaluated before treatment (p<0.05). However, there was no significant difference compared with the comparison group. *Implications:* Electro-acupuncture bilateral LI4 for neuropathic pain with spinal cord injury have a certain efficacy, and the short-term efficacy was better than carbamazepine, while the long-term efficacy have no significant difference compared with carbamazepine. To neuropathic pain with spinal cord injury, electro-acupuncture could be a considerable choice. Meanwhile, the mechanism needs more research.

PO-0959

MODULATORY EFFECTS OF CONTINUOUS THETA BURST STIMULATION OVER DORSOLATERAL PREFRONTAL CORTEX ON VISUOSPATIAL ATTENTION

Xiaofei He[1], Yue Lan[2], Guangqing Xu[1]
[1]Department of Rehabilitation Medicine, The First Affiliated Hospital, Sun Yat-sen University, Guangzhou, China, [2]Department of Rehabilitation Medicine, The Third Affiliated Hospital, Sun Yat-sen University, Guangzhou, China

Objective: To probe the modulatory effects of continuous theta burst stimulation over the dorsolateral prefrontal cortex on visuospatial attention using Attention Network Test paradigm in healthy human subjects. *Methods:* The Attention Network Test (ANT) was used to test fourty healthy subjects following the continuous theta burst stimulation (cTBS) to the left or right dorsolateral prefrontal cortex. The Attention Network Test provided measures for three different components of visual attention: alerting, orienting and executive control. *Results:* During this task, subjects with real left-DLPFC cTBS showed significant improvement in network effect indices compared with the shams on the alerting and conflict, and significant deficit on the orienting. Moreover, compared with the sham cTBS condition, the real right-DLPFC cTBS resulted in significant decreases in the efficiency of the alerting and conflict, and significant increase in the orienting index. Furthermore, there were significant differences in the alerting, orienting and conflict effect indices between in the real left-DLPFC and in the right. *Conclusions:* These results suggest that the right DLPFC plays a pivotal role in the alerting and executive control process. In addition, the present study supports the model of inter-hemispheric rivalry between two hemispheres for visuospatial attention.

PO-0960

RELATIONSHIP OF GLAZER PELVIC FLOOR MUSCLE SURFACE ELECTROMYOGRAPHY AND ITEMS OF BOWEL FUNCTION BASIC DATA SET FOR PATIENTS WITH SPINAL CORD INJURY

Fang Cong[1,2], Jian-Jun Li[1,2], Hong-Jun Zhou[1,2], Ying Zheng[1,2], Xin Lin[1,2], Qiong Wu[1,2], Long Jin[1,2], Yao Cui[1,2]
[1]China Rehabilitation Research Center, [2]Capital Medical University School of Rehabilitation Medicine, China

Objective: To identify the relationship of pelvic floor muscle surface electromyography (s-EMG) variables and the items of the International Bowel Function Basic spinal cord injured (SCI) Data Set in patients with SCI. *Methods:* 180 SCI patients (no gastrointestinal or anal sphincter dysfunction unrelated to SCI and no surgical procedures on the gastrointestinal tract) were divided into 4 groups according to the International Standards for Neurological Classification of SCI (American Spinal Injury Association, ASIA). Patients with the impairment scale ofASIAA, B, C or D were classified into group A (n=63), B (n=31), C (n=38) or D (n=48) respectively. Testing was performed on 180 SCI subjects utilizing s-EMG equipment, an inserted anal sensor electrode, and the Glazer protocol. Questionnaire of the items in the International Bowel Function Basic SCI Data Set was conducted. The relationships between the values of pelvic muscle s-EMG variables and the questionnaire findings were analyzed by SPSS 13.0. *Results:* The values of pelvic muscle s-EMG variables (mean and maximum s-EMG values in flick/tonic/endurance contractions) were significantly correlated with awareness of the need to defecate, major defecation method, average time required for defecation, frequency of fecal incontinence, need to wear pad or plug (p<0.05), as well as the impairment scale of ASIA (p<0.01). *Implications:* Glazer pelvic floor muscle s-EMG protocol (a non-invasive convenient real-time quantitative assessment) and questionnaire of the International Bowel Function Basic SCI Data Set are useful complementary methods for the choice of hydrotherapy types in patients with SCI.

PO-0961

EFFECT OF HBO THERAPY ON EXPRESSION OF INOS IN SPINAL CORD INJURED RATS AND THERAPEUTIC EVALUATION

Lei Xue
Department of Hyperbaric Oxyge Therapy, Nan fang Hospital, Southern Medical University, Guanzhou 510515, China

Objective: To explore the effects and therapeutic evaluation on inducible Nitric Oxide Synthase (iNOS) activity expression at the early stage of hyperbaric oxygen therapy for acute spinal cord injury in rats. *Methods:* 70 rats were randomly divided into treatment group (including four sub-groups) and the control group (including three sub-groups),The rats in the treatment group and a control group of rats were made from T8-T9 model of acute spinal cord injury with the modified Allen methods. Four subgroups of the treatment group respectively at 2 h after injury, 4 h, 6 h, 8 h began to be treated by hyperbaric oxygen. 7 times after hyperbaric oxygen therapy, using combined behavioral score (CBS) and evoked potential evaluation of rat limb function, taken with diazo colorimetric determination for iNOS expression, with nitrate reductase method for the determination of content of nitric oxide (NO). *Results:* compared with the control group and other treatment of subgroup, HBO-8 h group rat motor function recovered well, iNOS expression and NO production was significantly reduced, the differences were statistically significant (p<0.05). *Conclusion:* Compared to after injury 2 h, 4 h, 6 h. acute spinal cord injury in rats 8 h began hyperbaric oxygen,Which has A more visible role in reducing the synthesis of iNOS and promote motor function recovery.

PO-0962

POSTISCHEMIC WHEEL RUNNING INCREASES SDF-1A/CXCR4 EXPRESSION IN ADULT SPRAGUE-DAWLEY RATS AFTER STROKE

Jie Fang[1], Xiquan Hu[2]
[1]The Second Affiliated Hospital of Guangzhou Medical University, China, [2]The Third Affiliated Hospital of Sun Yat-sen University, China

Purpose: To examine the postischemic wheel ruuning exercise might enhance mRNA expression of SDF-1α/CXCR4 and improve the neural function. *Material and methods:* Sixty-four adult Sprague-Dawley rats,weight 230-250g, 3-month-old were provided by Guangdong Medical Laboratory Animal Center. A cortical infarct was induced in the rats by ligating the left middle cerebral artery to the striatal branches, after which animals were house in either standard or wheelrunning excise everyday and allowed to survie for three weeks. The neurological severity scores (NSS) was used for evaluating the neural function at 3rd, 7th, 14th, 21th day,and to observed the gene expression of SDF-1α/CXCR4 with cerebral infarction at each time points.e were studied by RT-PCR. *Results:* The RT-PCR results show that the gene expression of SDF-1α/CXCR4 inexercise group and control group were significantly higher than sham group (p<0.05). The expression of SDF-1α in exercise group were significantly higher than control group at 14 d. The expression of CXCR4 in exercise group were significantly higher than control group at 21 d, and the neurological severity scores in the running group were declined more quickly compare to control group from 7 th day after ischemic. *Conclusions:* Wheel running exercise can promote the recovery of neurological function in adult rats with cerebral infarction. Exercise training can improve the gene expression of SDF-1α/CXCR4 inadult rats with cerebral infarction,affecting the neural stem cells migration and survival to promoting endogenous neural stem cells improve neurological damage after cerebral infarction.

PO-0963

INTRATHECAL BACLOFEN (ITB) THERAPY TO SEVERE SPASTICITY

Yasutaka Takagi[1], Aki Nakanami[2], Kenji Kagechika[3], Xiao Ying Shang[4]*

[1]Dept. of Orthopaedic Surgery, Tonami General Hospital, Tonami,Japan, [2]Dept. of Rehabilitation Mdicine, Tonami General Hospital, Tonami,Japan, [3]Dept. of Rehabilitation Mdicine, Kanazawa Medical University, Uchinada,Japan, [4]Dept. of Rehabilitation Mdicine, Heilongjiang, Heilongjiang Hospital, China

Purpose To determine the outcome of intrathecal baclofen (ITB) therapy in patients with severe spasticity. *Objects and methods:* The baclofen of 50 µg was administered to 25 patients who had severe spasticity due to 23 spinal cord injury, 1 cerebral infarction, 1 hereditary spastic paraplegia in lumbar puncture as a schooling injection, and the pump burial operation were performed to 18 patients. The change of the spasticity was evaluated by the Ashworth score points. *Results:* The improvement of the spasticity was remarkably admitted in all cases, and the pain from the spasticity disappeared. The pain was reduced by adjusting the amount of the medicine without the exacerbation of the spasticity. Two catheter-related complications were found. Additional operations of the exchange of the catheter were needed. The improvement of the spasticity was recovered of additional operations. *Conclusions:* In Japan, 25 cases have been clinically examined since 2002, and remarkable clinical effects were proved. And since April 2006, 788 cases have been implanted of a programmable subcutaneous pump by the end of December 2012. The spasticity of the pain who doesn't obtain the improvement by the taking treatment is improved enough, and the reduction of the pain is seen, and the ITB therapeutic effect is expected that the improvement of patient and family's QOL can be attempted from theexperience of these series.

PO-0964

EFFECTS OF DIFFERENT INTENSITIES OF LOWER LIMB TRAINING ON WALKING RECOVERY IN STROKE PATIENTS

Nana Feng, Qiang Wang
The Affiliated Hospital of Medical College, Qingdao University,China

Objective: To probe into the effects of different intensities of lower limb training on the recovery of walking function in stroke patients. *Methods:* Thirty three stroke patients keeping with enrolling criterion were randomly divided into 3 groups: group A (including twelve cases), group B (including eleven cases), and group C (including 10 cases). All patients received lower limb training on basis of regular rehabilitation therapy. Each group received rehabilitation training for 40 min, 80 min and 120 min a day respectively, five days per week, lasting 4 weeks. Walking function was assessed by Fugl-Meyer assessment (FMA), Holden functional ambulation category (FAC) and timed up and go test (TUGT), which were carried out before treatment, two-weeks and four-weeks after treatment. *Results:* For each group, there exists a significant difference in FMA, FAC and TUGT between pretreatment and four-weeks after treatment (p<0.05). The FAC improvement is more significant in group C than that in group A after two weeks of treatment (p<0.05). After four weeks, the improvement of FAC is more significant in group C than that in group B and group B than that in group A (p<0.05), the shortening of TUGT has a significant difference in group C than that in group B and group A (p<0.05). There were no significant differences of FAC among the three groups (p>0.05). *Implications:* Intensive training can accelerate the recovery of walking function of patients with stroke, and promote their abilities to participate in daily activities.

PO-0965

EARLY EXERCISE IMPROVES CEREBRAL HEMODYNAMICS IN ISCHEMIC RATS

Yongshan Hu, Shan Tian, Yi Wu, Yulong Bai, Jie Jia, Yulian Zhu
Department of Rehabilitation, Huashan Hospital, Fudan University, Shanghai 200040, China

Objective: This study examined whether early exercise could improve motor performance and cerebral blood flow (CBF) in ischemic rats. Furthermore, brain microvascular endothelial cells (BMECs) accepted the mechanical force of CBF directly. In order to study whether CBF was just the direct factor for motor function recovery, we investigated the apoptosis of ischemic rat BMECs (rBMECs) under flow intervention in vitro. *Method:* Adult male rats with ischemic injury caused by middle cerebral artery occlusion (MCAO) were trained to run on treadmill at 12 m/min and 0° slope for 3 days, 30 min per day. Motor function was measured by behavioral score as well as CBF was detected with laser speckle imaging (LSI).In addition, ischemic rBMECs were induced by oxygen/glucose deprivation (OGD) and the apoptosis responses to elevated CBF (1±0.05 dynes/cm^2 vs. 0 dynes/cm^2) were evaluated by PE Annexin V/7-AAD and Hoechst 33258/PI staining. *Results:* Our results suggested that exercise training with an improvement of neurobehavioral function enhanced CBF to reduce rBMECs apoptosis. *Implications/Impact on rehabilitation:* With the proposal of the concept of very early initiated physical rehabilitation (VEIPR) in plenty of stroke units, early exercise has been confirmed beneficial on neurological recovery. Our studies demonstrated that cerebral hemodynamics might be one of the underlying protective mechanism of VEIPR.

PO-0966

A NEW TECHNIQUE OF REHABILITATION TRAINING BASED ON MOTOR IMAGINE USING BRAIN COMPUTER INTERFACE-FUNC TIONAL ELECTRIC STIMULATION SYSTEM AND ITS EFFECT ON PLASTICITY OF BRAIN OF A STROKE PATIENT

Xiaoxie Liu[1], Sheng Bi[1], Xiaorong Gao[2], Zhi Yang[3], Zheng Yan[2], Cheng Kou[1], Lin Ma[4], Shangkai Gao[2]
[1]Rehabilitation Medicine Center, Chinese PLA General Hospital, China, [2]Department of Bio-medical Engineering, Tsinghua University School of Medicine, China, [3]Institute of psychology, Chinese Academy of Sciences, China, [4]Radiology Department, Chinese PLA General Hospital, China

Objective: To study the feasibility of brain computer interface combined with functional electric stimulation (BCI-FES) applied to a patient with stroke as a new rehabilitation training system and to explore its mechanism. *Method:* The participant was a 40 years old man with severe left-hand paralysis after stroke. He received 4 weeks training with BCI-FES system based on motor imagine. The motor function of upper limb was assessed and fMRI examination was conducted pre- and after training. *Result:* Maximum grasp-relax speed of affected hand increased by 24.7% after training. When motion task was executed the activations in primary motor area (M1) and supplement motor area (SMA) of ipsilateral hemisphere were observed with fMRI after training, and contralateral activations in M1 and premotor cortex (PMC) decreasedi n addition. When motor imagine task was executed, the activations transferred to bilateral SMA and ipsilateral posterior parietal after BCI training. *Implications/Impact on rehabilitation:* BCI-FES is a new technique of rehabilitation therapy. We successfully proved its feasibility for stroke survivor. And we demonstrate the mechanism of functional recovery by using BCI-FES was to promote the plasticity of central nervous system.

PO-0967

ANALGESIC EFFECT ON PIZHEN FOR TREATMENT OF CERVICAL SPONDY-LOTIC RADICULOPATHY

Derong Feng, Yina Ou, Fen Zhu
Shenzhen Baoan Hospital, China

Objective: To compare the clinical efficacy of Pizhen with acupuncture in treating cervical spondy-lotic radiculopathy. *Methods:* Eighty

qualified subjects were randomly allocated to treatment and control groups, 40 cases each. They were treated with Pizhen and conventional acupuncture, respectively. The short-form of McGill pain questionnaire (SF-MPQ) was observed before and after treatment. *Results:* The PRI, PPI, VAS score decreased significantly in both groups after treatment as compared with before (p<0.05). *Conclusions:* Pizhen is superior to acupuncture in treating cervical spondy-lotic radiculopathy.It is benefit for rehabilitation of cervical spondy-lotic radiculopathy.

PO-0968

RESEARCH OF MAGNETIC-PULSE INCREASING THERAPEUTIC EFFICACY OF PERIPHERAL FACIAL PARALYSIS

Huajun Cheng, Derong Feng, Qingru Xu
Baoan hospital of Shenzhen,China

Objective: Observation of magnetic-pulse increasing therapeutic efficacy of peripheral facial paralysis. *Methods:* In this study, 60 cases of patients with acute peripheral facial paralysis, were randomly divided into two groups, Observation group were given magnetic pulse combined with conventional treatment (prednisolone, acupuncture and ultrashort), but control group were given conventional treatment only. House-Brackmann (HB) were observed. *Results:* After 3 weeks of treatment, it was 41 cases that restored grade II for neurological function in affected side. There are 25 cases in the observation group, accounting for 83%. But there are 16 cases in the control group, accounting for 53%.There was a very significant difference in two groups (x2=4.93, p<0.05). *Conclusion:* Effect of pulsed magnetic and conventional treatment of peripheral facial paralysis in early stage is superior to conventional therapy alone.

PO-0969

EFFECTS OF TREADMILL TRAINING VERSUS CONVENTIONAL GAIT TRAINING IN SUBACUTE POSTSTROKE SUBJECTS

Xiaobing Wang[1], Ailan Lu[2], Wei Lan[1], Ping Tao[1]
[1]Jinhua Polytechnic College,China, [2]Jinhua Central Hospital,China

Objective: A major goal in the rehabilitation of stroke patients is to restore gait and walking ability. Most of the studies demonstrated positive results with treadmill walking training, especially with body weight supported (BWS), for poststroke patients. However, some researchers questioned the effects of treadmill training. The purpose of the study was to explore any different effects between treadmill training and conventional gait training in balance and functional mobility by observing a subacute poststroke subject. *Method:* 24 subjects who had suffered hemiplegia were selected for the study. A single system A-B-C design was used. The study lasted for 3 weeks with 5 sessions followed by a 2-days' washing-off in each week. The patients received (A) physiotherapy and conventional walking training in 1st week, (B) physiotherapy and BWS treadmill training in 2nd week, (C) physiotherapy and non-structured treadmill training in 3rd week. Outcome measures used were balance ability (functional reach test) and motor ability (timed "up and go" test), which were taken before the first and after the last session of each phase. *Results:* There was more improvement in functional mobility during the BWS treadmill training phase than those of the 2 phases. *Implications:*Treadmill training appeared to be superior to conventional gait training and non-structured treadmill training on functional mobility.

PO-0970

CARDIOVASCULAR PARAMETER CHANGES DURING URODYNAMICS IN INDIVIDUALS WITH SPINAL CORD INJURY

Nan Liu[1], Renee Fougere[2], Mouwang Zhou[1], Andrei Krassioukov[2]
[1]Department of Rehabilitation Medicine, Peking University Third Hospital, Beijing, China, [2]International Collaboration on Repair Discoveries (ICORD), Department of Medicine, University of British Columbia, Canada

Objective: To analyze blood pressure (BP) changes during urodynamics in individuals with spinal cord injury (SCI) who were susceptible to autonomic dysreflexia (AD). *Methods:* A retrospective chart review of individuals with SCI in the outpatient clinic who could potentially develop an episode of AD was undertaken. Data regarding age, sex, date of urodynamic examination, time since injury, injury level, ASIA impairment scale (AIS), BP and pulse rate at baseline and during urodynamics were collected, in addition to any symptoms or signs of AD. *Results:* A total of 78 individuals with SCI (76 above T6, 2 at T7) were examined in the clinic during a two year time period with BP monitoring. The mean age was 47.2±14.2 years. The majority of individuals had cervical SCI (76.9%, from C1 to C8). The mean duration of injury was 121.8±149.1 months. During urodynamics, a total of 49 (62.8%) individuals presented with an elevated systolic BP by more than 20 mmHg which met the criteria of AD diagnosis. Individuals who were greater than 5 years post SCI and had cervical SCI or who had documented detrusor sphincter dysynergia (DSD) and low bladder compliance presented with higher incidences of AD during urodynamics. *Implications:* AD occurred not only in individuals with injury above the T6 level, but also in a two individuals at the T7 level. Individuals with cervical SCI, DSD, poorly compliant bladder, or long duration after injury (greater than 5 years) are at an increased risk of experiencing AD during urodynamics.

PO-0971

EFFICACY OF LOW FREQUENCY ELECTRICAL STIMULATION ON THE CONVALESCENT STROKE PATIENTS HAND FUNCTION

Xiangjiang Rong
Capital University Of Physical Education and Sports, China

Objective: In this study, convalescent stroke patients using low frequency electrical stimulation therapy on the basis of conventional rehabilitation, aimed at to explore low frequency electrical stimulation in improving the role in hand function in patients with stroke recovery period. *Method:* Hospitalized in BeijingGeriatricHospitaland met the inclusion criteria, 20 subjects were randomly divided into experimental and control groups. The control group received conventional rehabilitation therapy (such as joint activities in training, strength training, drafting training), occupational therapy, activities of daily living training, every 40 min, five times a week, four weeks for a course, eight weeks of treatment. In addition to conventional rehabilitation to accept the same as the control group, the experimental group, increasing low-frequency electrical stimulation therapy, each 15 min, 5 times a week, four weeks for a course, eight weeks of treatment. Hand function of the control group and the experimental group scored both before and after the start of the experiment. *Result:* Experimental group and a control group of patients in the experimental flac function scores were significantly higher than before treatment, but the score of the experimental group were significantly higher than that in the control group. *Impact on Rehabilitation:* Better promote the comprehensive utilization of low-frequency electrical stimulation therapy on the basis of conventional rehabilitation convalescent recovery of hand function in patients with stroke.

PO-0972

COMPARISON OF CARDIOVASCULAR PARAMETER CHANGES DURING URODYNAMICS AND CYCTOSCOPY IN INDIVIDUALS WITH SPINAL CORD INJURY

Nan Liu[1], Renee Fougere[2], Mouwang Zhou[1], Andrei Krassioukov[2]

[1]Department of Rehabilitation Medicine, Peking University Third Hospital, Beijing, China, [2]International Collaboration on Repair Discoveries (ICORD), Department of Medicine, University of British Columbia, Canada

Objective: To compare blood pressure (BP) and pulse rate (PR) changes in individuals with spinal cord injury (SCI) undergoing urodynamics and cystoscopy. *Methods:* A retrospective chart review of individuals with SCI who had continuous BP and PR monitoring during urodynamics and cystoscopy in the outpatient clinic was undertaken. Data regarding age, sex, date of two examinations, duration of SCI, injury level, ASIA impairment scale, lower urinary tract function and urodynamic parameters were collected. Cardiovascular parameters collected were BP and PR at baseline and during two separate examinations. Signs and symptoms of autonomic dysreflexia (AD) were also collected. *Results:* A total of 21 SCI individuals underwent both urodynamics and cystoscopy examination during a one year time period with BP monitoring. The mean age was 49.4±11.2 years. The majority of individuals had cervical SCI (85.7%, from C1 to C8). The mean duration of injury was 200.3±191.3 months. There was a statistically significant increase (p=0.039) in systolic BP change during cystoscopy (67.1±33.8 mmHg) in comprarision with urodynamics examination (51.8±21.8 mmHg). However, there were no significant differences in diastolic BP change, mean arterial pressure or PR change between the two examinations. *Implications:* Urodynamics and cystoscopy examinations resulted in the development of AD in individuals injured at or above the T6 spinal segment. Cystoscopy, which predominantly involves stimulation of the urethra and distension of the bladder, was a more potent stimulus in provoking an AD episode compared to urodynamics, which involves only bladder distention.

PO-0973

A CASE REPORT OF UMBILICAL CORD BLOOD MONONUCLEAR CELL THERAPY FOR SPINAL CORD INJURY

Guilan Lu, Haihui Li, Zhiwen Zeng

Hainan Provincial Nong Ken Hospital, Haikou, Hainan, 570005,China

1, General Information: Mr. Chen, a 46 years old patient, male, had got admission on March 25, 2008 because of his mobility impaired for 32 days after a car accident. No special medical history. After the car accident, the patient had head and neck ache, mobility impaired, incontinence of urine and feces, no unconsciousness, and was immediately sent to the local hospital for his treatment. Cervical spine MRI showed spinal cord injury in cervical vertebrae 3-4 (C3-4) level and compression fracture in cervical vertebrae 4. After some treatments, including cervical anterior decompression, C4 corpectomy, postoperative dehydration, blood circulation promotion by removing blood stasis, nerve nourishing, and so on, the patient's condition had little improvements. The symptoms of mobility impaired and incontinence still remained. Physical examinations on admission: vital signs of patient were stable and patient is conscious. There were tenderness and percussion pain in spinous process and paravertebral space of C3-6. The proximal muscle strength of double upper limbs was grade III, while the distal muscle strength was grade II. Function of finger group was poor, and palmar opposition and digital opposition were disabled. Amyotrophia in dorsal extensor of thumb, thenar, hypothenar and interosseous muscles could be seen. Right lower limb muscle strength was grade II, while left lower limb muscle strength was grade III. And the muscle tension of limbs was slightly low. Hypoesthesia in deep and superficial sensation could be seen below the level of C3. The symptoms of hyporeflexia in abdominal reflex, cremasteric reflex and anal reflex also could be seen obviously. Babinski's signs were positive in both sides. The sitting balance of patient was grade I. Medical examinations on admission: Brain MRI showed spinal cord injury at the level of C4. Cervical CT showed the vertebral fracture and postoperative changes in C4 and intervertebral disc protrusions among C3-4, C4-5, C5-6, and C6-7. B-ultrasonic showed the residual urine volume was 153ml. Function evaluations: American Spinal Injury Association (ASIA) score was C and Barthel index was 10. Diagnosis: spinal cord injury (C3-4). Treatment schedule: The patient was treated by one course of umbilical cord blood mononuclear cell (UCBMC) transplantation (including 3 times of lumbar puncture and 1 times of intravenous infusion) combined with rehabilitation training, physical therapy and acupuncture therapy. After UCBMC transplantation treatment, the patient got obvious improvements. Patient can hold things with both hands, and also can walk independently 150 meters. The symptoms of incontinence of urine and feces are disappeared. And the proximal muscle strength of double upper limbs is grade V-, while the distal muscle strength is grade IV +.

PO-0974

THE RELATIONSHIP BETWEEN FIVE TIME SIT-TO-STAND TEST AND FALL IN PATIENTS WITH SPINAL CORD INJURY

Qiaojun Zhang, Hongfei Qiao, Bin Zhang, Xiaohui Lei, Ben Ma, Yaofeng Li

Department of rehabilition medicine, the Second Affiliated Hospital of Xian Jiaotong University, Xi'an, China

Introduction: Patients with spinal cord injury (SCI) are at risk of fall and secondary injury.Impairments of balance control and lower extremity muscle strength are accounted as major intrinsic factors inducing fall. These impairments can be assessed by using the five times sit-to-stand test (FTSST). *Objective:* To investigate the correlation between incidence of fall and FTSST in patients with SCI. *Methods:* Subjects were 17 faller and 26 non-faller patients with SCI who were able to walk independently with and without assistive devices. The subjects were assessed their balance and lower extremity muscle strength using FTSST. The correlation between fall and FTSST was analyzed using the Spearman's correlation Coefficient. *Results:* The average time of FTSST was 10.2 and 21.3 seconds for faller and non faller groups, respectively. There was fair correlation between fall and the finding of FTSST (=-0.67, p<0.001). *Conclusion:* Fair correlation between FTSST and fall may be explained by variety of causes related to fall. The fair correlation also indicated the plausibility of using the to indicate fall risk in patients with SCI. The results indicated that FTSST can be used as a fall risk assessment index in patients with SCI.However further study is needed to identity appropriate cut off score, sensitivity and specificity of using the test to indicate fall risk.

PO-0975

THE STUDY ON THE INFLUENCE OF A2-HS GLYCOPROTEIN METABOLISM ON NEUROGENIC HETEROTOPIC OSSIFICATION AFTER SPINAL CORD INJURY

Liwei Dong, Jing Zhang

the Third Hospital of Hebei Medical University, China

Objective: To explore the relationship between the α2-HS glycoprotein metabolism and the occurrence of neurogenic heterotopic ossification so as to identify the influence of α2-HS glycoprotein metabolism on the neurogenic heterotopic ossification after SCI. *Methods:* Seventy-five cases of paraplegic patients after SCI were enrolled in the rehabilitation department of the third hospital of Hebei medical university from January in 2011 to January in 2012. According to the results of high-frequency ultrasound on the bilateral hip joint, the enrolled patients were divided into group A and group B. Furthermore, the 28 cases in group A were divided into mature group and immature group according to the mature degree of neurogenic heterotopic ossification in basis of the result of high-frequency ultrasound. The venous blood specimens were taken from each enrolled patient, and then the level of α2-HS glycoprotein

were detected by double antibody sandwich method. The data were processed by statistical software of SPSS 13.0. *Results:* 1)The level of α2-HS glycoprotein in group A was obviously lower than group B. 2) There was no significant difference of α2-HS glycoprotein between the mature group and immature group. *Conclusion:* The decrease of serum α2-HS glycoprotein level could induce the of neurogenic heterotopic ossification after spinal cord injury, but there was no correlation between mature degree of neurogenic heterotopic ossification and serum α2-HS glycoprotein level.

PO-0976

EFFECTIVE PSYCHOLOGICAL INTERVENTION AFTER STROKE:DIFFERENCES BETWEEN PATIENT WITH AND WITHOUT POST-STROKE DEPRESSION

Hui Zhang, Jing Fu, Fangyuan Guo, Yanping Hui, Feng Yang

Department of rehabilition medicine, the Second Affiliated Hospital of Xian Jiaotong University, Xi'an, China

Introduction: Post-stroke depression (PSD) is a common complication of stroke and can negatively influence recovery outcomes if left untreated. PSD is a heterogeneous group witch can range from having only depressive symptoms to those having a clinical diagnosis of major depressive disorder as defined by CCMD.The distinction among the different groups within PSD is not clear. In this study, PSD is defined as either major depressive disorder or adjustment disorder, according to CCMD. Obiective To compare the characteristics of stroke patients who reported having depressive symptoms and diagnosed with PSD with those that do not have PSD. To determine the factors associated with the presence of PSD. *Methods:* This study is a secondary analysis of the data from which screens for and treats PSD at department of rehabilition medicine. Psychological assessment using SCL-90, SDS and SAS. To compare the characteristics of the two groups, *t*-tests and chi-square test for independence were used. Logistic regression was used to determine the factors that were associated with the presence of PSD. All data analysis was run using SPSS 13.0 and the significance value was set at $p<0.05$. *Results:* Patients who had both depressive symptoms and PSD had lower functional ability and higher depression scores compared to those who had only depressive symptoms. Functional ability and depression scores were associated with presence of PSD. *Conclusion:* SCL-90, SDS and SAS are effective screening tool that enables clinicinas to pick out patients that might have any mood issues. Future research can examine whether patients with only depressive symptoms and those with PSD differ in terms of prognosis and treatment outcomes, in addition to functional ability. If they do differ, it might be of clinical use to differentiate them for treatment purposes. The current findings suggest that it might be useful to differentiate people with PSD from those who have only depressive symptoms using the Psychological Intervention programme's two-step assessment process. The Psychological Intervention programme also provides a good model for the timely identification of PSD in a rehabilitation setting.

PO-0977

THE PREVENTION AND REHABILITATION OF THE BLOOD PRESSURE FLUCTUATION OF THE PATIENTS WITH A SPINAL CORD INJURY

Danhe Shi, Fang Xiang, Changqing Shi

Heping Hospital of Changzhi medical college, China

Objective: To explore the effect of prevention and rehabilitation of the blood pressure fluctuation in the patients with a spinal cord injury (SCI). *Methods:* Since 1995, the cases with SCI which were injured above the sixth chest, were divided into two groups with 264 cases in the prophase group and 240 in the later period group. The main methods of treatments in the prophase group included turn over on time, clean the skin, train patients' micturition and defecation, control infection, make the passive activity of the joint, train the activities of daily living (ADL), transfer training and proprioceptive neuromuscular facilitation (PNF) rehabilitation therapy. In the later period group, the additional eights measures were added in the prophase group, included monitor patients blood pressure, take hypotensor carefully, supply suitable fluid in the early morning and at night, reduce sodiums loss and maintain the balance of dielectric, train by the uprising bed early, control infection effectively, administer urination and shit intentinonally, take cardiopulmonary function training. The number and rang of three changes about blood pressure, which was risen suddenly, fallen and the fall of the blood pressure out of control, were researched in the two group by the retrospective analysis study. *Results:* In the prophase group, the result showed that there were 63 cases with elevated blood pressure anomaly, 18 cases with abnormal reduced blood pressure, 35 cases with the continuing fall of the blood pressure, respectively. In the later group, the study indicated that were 16 cases, 4 cases and 7 cases, respectively. The research showed that elevated blood pressure fluctuations was 110 + 90/60 ± 16 mmHg, low blood pressure fluctuations was 60 ± 10/40 ± 7 mmHg and buck difficult control range was 200 + 11/110 ± 10 mmHg in the prophase group, respectively. In the later group, it was 20 ± 18/10 ± 9 mmHg, 15 ± 8/10 ± 7 mmHg, 90 + 11/70 ± 10 mmHg, respectively. *Conclusion:* Eight prevention measures of preventing blood pressure fluctuations could slow effectively the blood pressure emergency of patients with SCI.

PO-0978

THE EFFECTS OF WALKING ABILITY IN PATIENTS WITH UNILATERAL SPATIAL NEGLECT AFTER STROKE

Juebao Li, Xiangming Ye, Wanshun Wen, Liang Zhou, Liang Tian, Genying Zhu, Chaomin Ni

Department of Rehabilitation, Zhejiang Provincial People's Hospital, China

Objective: In order to study the effects of walking ability in patients with unilateral spatial neglect after stroke. *Method:* 80 patients with unilateral spatial neglect (USN) who suffered from acute stroke were randomly divided into two groupes: 40 cases in the early rehabilitation group,40 cases in the control group. Patients in the rehabilitation group were given clinical treatment and regularly physical therapy and speech therapy and so on. While those in control group were given clinical treatment, and the evaluation was done in pre-treatment and post 6 months respectively.Severity of unilateral spatial neglect was assessed with Shenckenberg text. Walking ability was assessed with Holden's functional ambulance classification.The evaluation was done in pre-treatment and post-6-monthe respectively. *Result:* The walking ability in each groups rised had a significant difference ($p<0.05$),the process of scores in the rehabilitation group were obviously superior to that in the control group. ($p<0.05$). *Implications:* Early rehabilitation training on patients with acute stroke may obviously improve their walking ability. There is corelation between the level of unilateral spatial neglect and the walking ability.

PO-0979

BENEFITS OF TREATMENT WITH BOTULINUM TOXIN IN NON-AMBULATORY MULTIPLE SCLEROSIS PATIENTS

Neus Ticó-Falguera, Griselda Sirvent-Batalla*, Pablo Peret-Hernandez, Georgia Romero-Culleres, Montserrat Abenoza-Guardiola

Department of Physical Medicine & Rehabilitation. Xarxa Assistencial Universitaria Althaia, Manresa, Spain

Objective: To evaluate the benefits obtained after the treatment of spasticity with Botulinum Neurotoxin A without complexing pro-

teins (BONTA) in non-ambulatory patients diagnosed of secondarily progressive multiple sclerosis (MS) that depend on wheelchair for ambulation and require assistance for basic activities of the daily living (ADLs). *Method:* 5 patients (4 female, 1 male), with an average age of 50,4 years (47-57) and an average 11.2 years (6-25) since the MS onset, which are non-ambulant for at least the last 5 years. 400 MU of BONTA were injected bilaterally in the lower limbs, targeting the adductors, semitendinosus and semimembranosus muscles. To assess the results the following tests were used: Penn Spasm Frequency Scale, Hygiene Index, Disability Assessment Scale, and Visual Analogue Scale for patient and caregiver to assess difficulty in care management. *Results:* All patients reduced the number of spasms in lower limbs, improved scores in the hygiene index, and found an improved function in ADLs such as placing of bladder catheters, dressing of the lower body, and transfer capacities. Energetic cost in taking care of patients by caregivers also reduced. Two patients required less assistance by their caregivers after treatment. *Implications/Impact on rehabilitation:* Lower limb spasticity treatment in non-ambulatory patients with severe disability allows for an improvement in both the patients and the caregivers quality of life.

PO-0980

THE DEVELOPMENT OF GUIDELINES FOR THE GUILLAIN-BARRÉ SYNDROME REHABILITATION TREATMENT: A FRAMEWORK OF THE SCIENTIFIC PRODUCTION AND ITS RELATION WITH THE PRACTICE ON THE REHABILITATION OF THIS POPULATION

Chennyfer Dobbins Paes Da Rosa
Institute of Physical Medicine and Rehabilitation, University of Sao Paul, Brazil

Objective: To develop guidelines for the rehabilitation treatment of Guillain-Barré Syndrome (GBS). This study is inserted in the project of the Clinical Research Center – Institute of Physical Medicine and Rehabilitation, to build a general guideline for rehabilitation *Methods:* First, we've formulate 10 questions about the rehabilitation treatment of GBS, trying to cover all fields. Our searches were performed in the Medline database. For each seeking was used the search strategy PICO (Patient/population, Intervention, Comparison, Outcome). We've selected the found papers according their scientific relevance, pertinence to the subject researched and a maximum of 20 year for the article production. We used the JADAD scale to classify the paper methodological quality. *Results:* We've encountered a total of 989 papers, from which only 20 responded to all our criteria. The questions whose searches returned with no results were about the use of orthoses devices for lower and upper limbs, the assistive technology indication and the use of Functional Electrical Stimulation (FES). The medical procedures in the acute phase of GBS present greater quantity of controlled studies and with higher quality. Few articles were found about physical rehabilitation and functional recover. *Implication/Conclusion:* There are few researches about the rehabilitation treatment of patients with GBS currently. Some areas which are relevant in the daily practice present a scientific production lack. Therefore, this guideline indicates the necessity to encourage the development of new studies related to GBS rehabilitation treatment, to prove effectiveness and guide the practice actions.

PO-0981

EFFECTS OF INTENSIVE-SWIMMING TRAINING ON THE EXPRESSIONS OF PROTEINKINASE A AFTER CEREBRAL ISCHEMLA-REPERFUSION IN RATS

Qiang Wang[1], Yuyang Wang[3], Yixi Lun[3], Yue Liu[2], Peipei Wang[4], Zhenyan Zhang[1]
[1]Deprtment of the First Rehabilitation Medicine, The Affiliated Hospital of Qingdao University Medical College,China, [2]Deprtment of Rehabilitation Medicine, the Peoples Hospital of Jining City, [3]the Qingdao University Medical College,China, [4]Deprtment of Rehabilitation Medicine, the Central Hospital of Qingdao City, China

Obiective: To observe the effects of intensive-swimming training at different intensities on the neurological function and the expressions of proteinkinase A after cerebral ischemla-reperfusion in rats. *Methods:* The intraluminal thread method was applied to cause left middle cerebral artery occlusion (MACO) for 2 h before reperfusion. 120 male model SD rats were randomly divided into training group 1 (swimming for 5 min once a day), training group 2 (swimming for 10 min once a day), training group 3 (swimming for 20 min once a day) and control group (no training), and 30 rats each group. Another 30 rats assined to the sham-operation group were subject to no MCAO and no training, Above the five groups were randomly divided into three groups of 3th, 7th and 14th d, and 10 rats each group. Neurological function was evaluated by Menies scores and forebimb placing. Expressions of proteinkinase A were detected by immunohistochemistry. Expressions of PKA-mRNA were detected by RT-PCR. *Results:* The differences of Menies scores and forebimb placing at same time points between sham-operation group and contronl group were statistically significant (p<0.05). The rates of positive cells and the expressions of mRNA about proteinkinase A in all training groups were higher than those in controls at the 3th, 7th and 14th d after swimming training (p<0.05), especially in training group 3. *Conclusions:* Exercise training can promote the recovement of sensory and motor function, and the more intensive the training, the better the effects.

PO-0982

EFFECTS OF INTENSIVE TRAINING ON THE EXPRESSIONS OF SEMAPHORIN 3A AND ITS RECEPTOR NEUROPILIN-1 IN RATS AFTER FOCAL CEREBRAL ISCHEMIA

Qiang Wang[4], Pingping Meng[4], Ping Zhao[4], Yue Liu[2], Peipei Wang[3], Zhenyan Zhang[1]
[1]the Qingdao University Medical College, [2]Deprtment of Rehabilitation Medicine, the First Peoples Hospital of Jining City,China, [3]Deprtment of Rehabilitation Medicine, the Central Hospital of Qingdao City,China, [4]Deprtment of the First Rehabilitation Medicine,The Affiliated Hospital of Qingdao University Medical College, China

Obiective: To observe the effects of swimming training at different intensities on the the mRNA expressions of Semaphorin 3A and Neuropilin-1 in Rats after focal cerebral ischemia. *Methods:* The intraluminal thread method was applied to cause left middle cerebral artery occlusion (MACO) for 2 h before reperfusion. 60 male model SD rats were randomly divided into training group 1 (swimming for 5 min once a day), training group 2 (swimming for 10 min once a day), training group 3 (swimming for 10 min twice a day) and control group (no training), and 15 rats each group. Another 15 rats assined to the sham-operation group were subject to no MCAO and no training, Above the five groups were randomly divided into three groups of 3th, 7th and 14th d, and 5 rats each group. Neurological function was evaluated by Zausinger scores. Expressions of Sema3A and NRP-1 were detected by RT-PCR. *Results:* The differences of Zausinger scores at same time points between sham-operation group and contronl group were statistically significant (p<0.05). The levels of the expressions of Sema3A-mRNA and NRP-1-mRNA in all training groups were lower than those in controls at the 3th, 7th and 14th d after swimming training (p<0.05), and the decrease of the expressions of Sema3A-mRNA and NRP-1-mRNA in training group 3 was more obvious compared with other training groups (p<0.05). *Conclusions:* Exercise training can promote the recovement of sensory and motor function, and the more intensive the training, the better the effects.

PO-0983

EFFECTIVENESS OF TASK-ORIENTED TRAINING ASSOCIATED WITH FUNCTIONAL ELECTRICAL STIMULATION FOR IMPROVING QUALITY OF LIFE AND FUNCTIONALITY IN HEMIPLEGIC STROKE PATIENTS AFTER CHEMICAL BLOCKADE

Ana Carolina Barros[1,2], Celso Vilella Matos[1,2]*, Heloise Borges[1,2], Therezinha Chamlian[1,2]

[1]Universidade Federal de São Paulo/Unifesp,Brazil, [2]AACD - Lar Escola, Brazil

Introduction: The involvement of the upper limbs post Stroke is one of the most common and disabling disorders. The task-oriented training has demonstrated gains in motor relearning. The FES is another technique used with in principle improves muscle contraction, muscle strength and decreased spasticity. These techniques have proven effective in improving pain and function, but their combined use is still unknown. *Objective:* To determine the effectiveness of TOT associated with FES to improve shoulder pain, quality of life and functionality in hemiparesis after stroke undergoing chemical neuromuscular blockade. *Methods:* A randomized controlled clinical trial, conducted in AACD-LESF, with 25 hemiparetic undergoing chemical blockage in upper limb dysfunction after stroke. The experimental group (n=13) conducted TOT EEF control group (n=12) did TOT EEFplacebo. Data of shoulder pain, function and quality of life were collected by a blinded evaluator. *Results:* Presented significant difference in the improvement of shoulder pain by VAS during passive flexion (p=0.002) in the experimental group. In MIF was no statistical difference between the variables of self care (p=0.001) and total FIM (p=0.001) during periods of reviews of both groups. In the SF-36 Pain domain differ between periods of ratings. *Conclusion:* There was improvement in pain in the experimental group and few repercussions for quality of life and function when compared between the two groups.

PO-0984

RELIABILITY AND VALIDITY OF THE CHINESE VERSION OF THE REPETITIVE BEHAVIOR SCALE-REVISED (RBS-R) IN CHILDREN WITH AUTISM

Zhimei Jiang, Jingya Li, Lanmin Guo, Shiling Zhi

The 3rd AffIliated Hospital of Jiamusi University;Children Neural Rehabilitation Laboratory of Jiamusi University,China

Objective: To explore the applicability of Chinese version of the Repetitive Behavior Scale-Revised (RBS-R) to children with autism. *Methods:* Totally 104 subjects with childhood autism were assessed with the Repetitive Behavior Scale-Revised (RBS-R). Forty subjects's RBS-R were filled by fathers and mothers separately, 2-4 weeks later 30 subjects of these parents's checklist were filled by their parents again to test inter-rater reliability and test-retest reliability. All children were assessed with the Autism Behavior Checklist (ABC), Childhood Autism Rating Scale (CARS) to test the criterion validity of the (RBS-R). *Result:* The inter-rater reliability (ICC) of the six factors were 0.73-0.9 and test-retest reliability (ICC) of the five factors were 0.74-0.91. The Cronbach's alpha coefficients of internal consistency of the six factors and the total scale were 0.49-0.78. The six factors of Repetitive Behavior Scale-Revised were positively correlated respectively with the corresponding factors of ABC, CARS (r= 0.31-0.69, p<0.001). Confirmatory factor analysis confirmed construct validity of the RBS-R ($\chi 2$/df= 2.01, GFI= 0.681, NFI= 0.596, CFI=0.681, RMSEA=0.063). *Conclusion:* The Chinese version of Repetitive Behavior Scale-Revised has good reliability and validity. The results confirm the utility of the RBS-R as a measure of repetitive behaviors in young Chinese children with autism and the further revising should be needed.

PO-0985

EFFECTS OF EARLY JOINT BEARING ON THE MOTOR RECOVERY IN STROKE PATIENTS WITH HEMIPLEGIA

Peishun Chen, Zhen Huang, Yu Min

PanYu' Central Hospital, Guangzhou, China

Objectives: To study the effects of early joint bearing on the motor recovery and the effective methods of compositive rehabilitation therapy in patients with hemiplegia after stroke. *Methods:* One hundred and seventeen patients with the early recovery (the life body advertises for the steady empress for 1-2 weeks) of stroke were randomly divided into two groups, treatment group (68 cases) and control group (49 cases). All patients were given routine rehabilitation. Patients in the treatment group were moved to the tilt table that made the joints of the lower extremities to be compressed. The control group was only given the routine treatment. The two groups were evaluated with Fugl-Meyer motor assessment (FMA) and the index number of ADL Barthel assessment pre- and post-treatment. Datas were compared with u test to analyse the statistically difference between the two groups. *Results:* After two months treatment, statistically significant differences were found in the scores of FMA (u=2.79>2.58, p<0.01)and the index number of Barthel (u=7.21>2.58, p<0.01) between two groups. *Conclusions:* Early joint bearing in combinated with routine rehabilitation is more effective than only routine rehabilitation.

PO-0986

EFFECTIVENESS OF ELECTROACUPUNCTURE COMBINES WITH REHABILITATION EXERCISES ON SWALLOWING FUNCTION OF STROKE PATIENTS WITH DYSPHAGIA

Zhen Huang

PanYu's Central Hospital, Guangzhou, China

Objective: To observe the therapeutic effect of electroacupuncture combines with rehabilitation exercises on swallowing function and cerebral perfusion in stroke patients with dysphagia. *Methods:* Sixty-two patients with stroke were randomly divided into treatment (n=32) and control (n=30) groups. The treatment group received electroacupuncture, rehabilitation exercises and conventional medical treatment, While the control group received only rehabilitation exercises and conventional medical treatment. They were treated once a day, 12 times a course, for 2 course. Water drinking test, stethocatharsis scores and swallowing fluorography were used before and after treatment for assessment of swallowing function. Single photon emission computed tomography (SPECT) was also applied to each patient to observe the status of cerebral perfusion before and after treatment. *Results:* The swallowing function and cerebral perfusion in treatment group showed better effects after treatment when compared with the control group. Comparing the total efficiency between groups, treatment group was 96.88% and control group was 66.67% with the significance between groups. *Conclusion:* This study indicates that electroacupuncture combined with rehabilitation exercises showed better effect in the stroke patients with dysphagia and could improve the brain perfusion.

PO-0987

AN OBSERVATION OF THE THERAPEUTIC EFFECT OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION ON PATIENTS WITH FACIAL PALSY AFTER STROKE

Ying Shen, Zhifei Yin

Rehabilitation Medicine Center, First Affiliated Hospital of Nanjing Medical University, Nanjing, China

Objective: To observe the effect of repetitive transcranial magnetic stimulation (rTMS) on patients with facial palsy after stroke. *Methods:* Forty patients were randomly assigned to the rTMS group (n=20) and the control group (n=20). The rTMS group was treated with rTMS (1 Hz, 0.6 T, 20 min) on affected side before the tragus for 20 days. The control group received low frequency electric stimulation (5-15 mA, 20 min) for 20 days. The treatment effectiveness was evaluated before and at the 10th and 20th day of treatments using the House-Brackmann grading system (HBGS). *Results:* Compared with the baseline grade, the grade of HBGS at the 10th and 20th day of treatment was reduced significantly for both rTMS (p<0.05) and control (p<0.05) groups. Compared with the control group, the HBGS grade in the rTMS group was significantly lower at both 10th (p<0.05) and 20th (p<0.05) day of treatment. *Implications:* rTMS provides a new and effective treatment modality for patients with facial palsy after stroke.

PO-0988

MAGNETIC RESONANCE IMAGING STRUCTURAL CHANGES ARE INFLUENCING FUNCTIONAL OUTCOME AFTER ADULT TRAUMATIC BRAIN INJURY

Wafa Al Yazeedi*, Azar Naveen, Loganathan Venkatacahalam
Hamad Medical Corporation, Qatar

Objective: This study is to determine the magnetic resonance imaging (MRI) structural changes would influence the functional outcome of inpatients after traumatic brain injury (TBI). *Method:* 45 male adult patients of TBI admitted in rehabilitation unit (RU) during period from June 2010 to May 2012, where female were not included because of frequient number and underwent MRI investigation after admission in RU and before discharge. The structural changes of MRI like cerebellum and others were obtained from reports written by radiologists. The functional outcome qauality measures of Length of stay of acute care (LOSa), Functional independence measure of cognitive and motor on admission and discharge (FIMcA, FIMcD, FIMmA, FIMmD) and Rancho level of Cognition were analyzed with their correlation between them. *Results:* The age range was between 17 and 64 years and the median was 38 years. FIMcA was significant negatively correlated to LOSa, (r=-0.39, p=0.004). FIMcA. MRI change in Subcortical on discharge was significant negatively correlated with FIMcA (r=-0.42, p=0.002). Corpus callosum on discharge was also positively correlate (r=0.22, p=0.067 with FIMcD. Cerebellum on admission MRI change was negatively associated (r=-0.47, p=0.000) with FIMmD. Ventricle on admission change is negative correlated with FIMmD (r=-0.288, p=0.031). MRI structural changes like basal ganglia, cortical brain stem were not statistically significant correlated with FIMcA, FIMcD,FIMmA and FIMmD. *Impact in Rehabilitation:* Admission and discharge MRI had influence on cognitive and locomotor functions. Further study is needed about other outcome measure with higher number.

PO-0989

ABSTRACT - INCREASING NICE COMPLIANCE IN MULTIPLE SCLEROSIS AND COGNITION: A SERVICE EVALUATION

Dawn Reeve[1]*, Charlotte Gayson[1], Talal Stephan[2]
[1]Nottinghamshire Healthcare NHS trust,United Kingdom, [2]Sherwood Forest Hospitals NHS Trust, United Kingdom

Background: The Chatsworth Rehabilitation Centre Chatsworth Rehabilitation Centre is a 16 bed unit for patients with a physical disability due to a neurological diagnosis. It has a large outpatient group with a total of 868 patients under the care of the Consultant in Rehabilitation Medicine. Multiple Sclerosis (MS) is the largest client group, constituting 248/868 patients. Clinical Psychology is provided 0.4 wte by a Consultant Clinical Neuropsychologist provided by Nottinghamshire Healthcare NHS Trust for inpatients only. A 0.6 wte Assistant Psychologist was provided for 10 months by Nottinghamshire Healthcare NHS Trust during the course of this service evaluation. Background to Multiple Sclerosis & Cognition Multiple Sclerosis is a chronic, demyelinating, neurological condition of the central nervous system estimated to affect approximately 100,000 people these in the UK (MS Trust, 2012). The disease onset is mostly between 20–40 years of age. It is estimated that around 40-60% of those affected by MS experience cognitive difficulties, including memory, attention processing speed and dysexecutive problems (Rao et al., 1991). In addition to this, MS is also known to effect the ability to plan, co-ordinate, multi-task, make decisions and causes chronic fatigue. The impact of cognitive impairment on the daily life of individuals with MS has been demonstrated by research studies. Rao et al., (1991) concluded that cognitively impaired individuals with MS were less likely to have jobs, engaged in fewer social activities, experienced more difficulty in performing routine household tasks and displayed greater psychopathology than cognitively intact patients. Amato et al., (1995) conducted a study assessing cognitive functioning and its impact on a patient's everyday life using 50 individuals diagnosed with MS and 70 matched controls. It was concluded that cognitive dysfunction appears to be a predictor of handicap in everyday life, even with those in the beginning stages of MS.

PO-0990

ARGINASE I PARTICIPATE THE PROMOTIVE EFFECT OF DB-CAMP ON AXON REGENERATION AND MOTOR FUNCTION RECOVERY IN RATS WITH CEREBRAL ISCHEMIA-REPERFUSION

Lingchuan Niu, Yan Chen, Shengshan Liu, Changqing Li
Department of Rehabilitation, the Second Affiliated Hospital, Chongqing Medical University, 76 Linjiang Road, Chongqing 400010, China

There is no effective axon regeneration in adult mammalian with central nervous system injure. This study is designed to investigate the effects of db-cAMP and NOHA (Arginase I inhibitor) on axon regeneration and recovery of motor function in adult rats with middle cerebral artery ischemia-reperfusion. Compare to ischemia group, Longa score in db-cAMP group was decreased significantly at 14 days after surgery, and GAP-43 mRNA expression in db-cAMP group was enhanced significantly at 7 and 14 days, and RhoA mRNA expression in db-cAMP group was decreased significantly at different time pionts (p<0.05). Compare to db-cAMP group, Longa score in db-cAMP+NOHA group was increased significantly at 14 days, and GAP-43 mRNA expression in db-cAMP+NOHA group was decreased significantly at 7 and 14 days, and RhoA mRNA expression in db-cAMP+NOHA group was enhanced significantly at different time pionts (p<0.05). These findings show that: 1) db-cAMP promotes axon regeneration and recovery of motor function, that is attributed to inhibiting RhoA signal pathway and activating (Arginase I. 2) NOHA blocks the promotive effect of db-cAMP on axon regeneration, that is associated with Arginase I deactivating RhoA signal pathway.

PO-0991

POSTER - INCREASING NICE COMPLIANCE IN MULTIPLE SCLEROSIS AND COGNITION: A SERVICE EVALUATION

Dawn Reeve[1]*, Charlotte Gayson[1], Talal Stephan[2]
[1]Nottinghamshire Healthcare NHS trust,United Kingdom, [2]Sherwood Forest Hospitals NHS Trust, United Kingdom

Method: Sample 41 MS patients, 15 Male/26 Female, with an age range of 26–73, M=55.2. Inpatient and outpatient samples were used consisting of both relapsing-remitting and secondary progressive

types. Inpatients were recruited through consecutive admissions and outpatients were chosen at random. *Measures*: · Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) =standardised psychometric test chosen because it is less fatiguing than alternative tests and has age-related norms. 5 cognitive domains are measured – Memory, Attention, Visuospatial/constructional, Language and Executive function. (Randolph, 1998). · Multiple Sclerosis Quality Living Dial (MSQL) =to elicit the patient's perception of their cognition (Innervate, 2010). · Expanded Disability Status Scale (EDSS) =providing a measure of the current disability level, completed by the Consultant Physician in Rehabilitation Medicine (Kurtzke, 1983). Upon completion, individuals were asked to evaluate the service and their experience of the assessment and advice. Intervention cognitive rehabilitation advice was provided individually to each patient, face to face or through the post. This consisted of written feedback on their assessment and a cognitive rehabilitation advice leaflet developed for the evaluation. Patients were guided to the most relevant section according to their test results. *Results:* Increase in the Service: The % of patients receiving a cognitive assessment and rehabilitation service on the ward had risen by 71% to 82.75% after 4 months of the service evaluation. Plus, the service was offered to 20% of MS outpatients who would not have previously received these services.

PO-0992

BOTULINUM TOXIN EXTERNAL URETHRAL SPHINCTER INJECTION GUIDED BY ULTRASOUND FOR TREATMENT OF LOWER URINARY TRACT DYSFUNCTION

Weixin Yang, Min Su, Dawei Zhang, Hongjun Zhu, Qingmei Chen

Department of Rehabilitation, the First Affiliated Hospital of Soochow University, Suzhou, Jiangsu, China

Purpose This study investigates the effectiveness of botulinum toxin injection to the external urethral sphincter guided by ultrasound in the treatment of various types of lower urinary tract dysfunction. *Materials and Methods:* A total of 22 patients with urinary retention were caused by neurological dysfunction. The botulinum toxin (100 u) was injected into external urethral sphincter respectively in three different sites guided by ultrasound. Clinical effects and urodynamic parameters were compared at baseline and after treatment. *Results:* The 18 men and 4 women had various types of lower urinary tract dysfunction including detrusor sphincter dyssynergia (DSD) in 7, nonrelaxing urethral sphincter in 5, and detrusor underactivity in 10. After treatment, the urinary function and urodynamic parameters in each group improved significantly compared with the baseline ($p<0.05$), and at 4 week up to a maximum efficacy. 3 (43%) patients with DSD had an excellent result and had 3 (43%) significant improvement; the nonrelaxing sphincter group had 3 (60%) and 2 (40%) respectively and the detrusor underactivity group had 5 (50%) and 3 (30%) respectively. There was no obvious side effects occurred in patients. *Implications/Impact on Rehabilitation:* The botulinum A toxin injection guided by ultrasound can accurately locate the external urethral sphincter. It is a simple and repeatability method for the treatment of lower urinary tract dysfunction.

PO-0993

THE CONTRIBUTION OF KINEMATICS IN THE ASSESSMENT OF UPPER-LIMB MOTOR RECOVERY AFTER STROKE

Liesjet Van Dokkum[1], Denis Mottet[1], Jérome Froger[1,2], Jacques Pelissier[1,2]*, Julien Metrot[1], Isabelle Laffont[1,2]

Movement to Health, EuroMov, Montpellier-1 University, Montpellier, France, [2]Federation of PMR. Academic Hospital Montpellier-Nîmes, France

Background: Kinematic assessment of upper-limb motor recovery after stroke may be related to clinical scores while being more sensitive and reliable than clinical evaluation alone. *Objective:* To identify the potential of kinematics in assessing upper-limb recovery early post-stroke. *Methods:* 13 post-stroke patients were evaluated with a) the Fugl-Meyer Assessment (FMA) and b) kinematic analysis, once a week over 6 weeks and at 3 months. All were included within a month post-stroke. A reach-to-grasp task was performed and compared with healthy controls. The link between clinical and kinematic data was identified by multidimensional linear regression. *Results:* The FMA-score was significantly negatively correlated to movement time (beta -0.97 ±0.09, $p=0.000$), and positively to movement irregularity (beta 0.30 ±0.09, $p=0.002$). These two variables accounted for 63.4% of FMA variability. Contrarily, most kinematics were sensitive to change over time and distinguished between movements of paretic, non-paretic and healthy control limbs, to know: movement time, distance, directness, smoothness, mean and maximum velocity of the hand. *Discussion and Conclusion:* Our results validated the relevance of kinematics to assess recovery of reaching movements post-stroke and confirmed its link to the FMA-score. Kinematics could provide more accurate real-time indicators of patients' recovery than clinical scores alone, although it remains challenging to establish the universality of the reaching model in relation to motor recovery after stroke.

PO-0994

STUDY OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION WITH DIFFERENT LOW-FREQUENCIES FOR UPPER LIMBS FUNCTION IN THE PATIENTS WITH CEREBRAL INFARCTION

Zhifei Yin, Chunlei Shan

the First Affiliated Hospital of Nanjing Medical University, China

Objective: To compare the effects of different low-frequencies in repetitive transcranial magnetic stimulation (rTMS) for upper limb function in patients with cerebral infarction. *Methods:* Thirty patients were randomly assigned to three groups, 0.25 Hz group ($n=10$), 0.5 Hz group ($n=10$) and 1 Hz group ($n=10$), each group receivied rTMS treatment on the unaffected hemisphere for 4 weeks respectively. All patients were also treated with conventional rehabilitation training. The measurements for assessing were performed at pre-rTMS and post-rTMS (Post 1: After 2 weeks treatment; Post 2: After 4 weeks treatment). The indexs (i.e. the MEP cortical latency, CMCT, MI and FMA in the affected brain area.) were evaluated at pre-rTMS, Post 1 and Post 2. *Result:* At Post 1, only CMCT of the 0.25 Hz and the 0.5 Hz groupwere significantly shorter than the 1Hz group ($p<0.05$). At Post 2, The MEP cortical latency and CMCT of the 3 groups reduced after the treatment. The 2 indices of the 0.25 Hz and the 0.5 Hz group were shorter than the 1 Hz group, and the effect of the 0.25 Hz was statistically significant than that of the 0.5 Hz. 2) At Post 1, the 0.25 Hz and 0.5 Hz groups exhibited significantly higher MI score compared with the 1 Hz group ($p<0.05$), but no siginficant differences were found between the 0.25 Hz and 0.5 Hz groups ($p>0.05$). FMA were not statistically different among the three groups ($p>0.05$). At Post 2, all indices in the 0.25 Hz and 0.5 Hz groups were better than the 1Hz group ($p<0.05$), but no statistical significance was observed except for a higher MI score compared with the 0.5 Hz group ($p>0.05$). *Conclusion:* It was demonstrated that low-frequency rTMS with 0.25 Hz was more effect than with 0.5 Hz and 1 Hz on the unaffected hemisphere enhance motor function and training effect of paretic hand in patients after stroke. Implication These findings will probably be pertinent to the design and optimization of neurorehabilitative strategies for stroke.

PO-0995

THE EFFECTS OF PERSONALIZED DRINKING PLAN ON DRINKING COMPLIANCE OF PATIENTS WITH INTERMITTENT CATHETERIZATION

Shiqiong Zhu, Yan Ai, Fang Tang, Yangmei Liang

Sichuan academy of medical sciences •Sichuan province peoples hospital Rehabilitation center, China

Objective: To explore method for improving drinking compliance of patients with intermittent catheterization. *Methods:* Patients in our center (from January 2011 to October 2012) were divided into two groups randomly (51 intreating group and55 incontrol group). Personalized drinking plan and conventional drinking plan were applied to the two groups respectively for one week. Then the percentage of residual urine accounts for normal bladder capacity for the two groups were compared using the Statistical Package for the Social Sciences (SPSS) software (version 17.0). *Results:* The difference of the percentage of residual urine accounts for normal bladder capacity between the two groups was statistically significant ($p<0.05$). *Conclusion:* Personalized drinking plan can remarkably improve drinking compliance of patients with intermittent catheterization.

PO-0996

THE APPLICATION OF CLINICAL PATHWAY OF HEALTH EDUCATION IN THE CARE OF PATIENTS WITH NEUROGENIC BLADDER

Yan Ai, Shiqiong Zhu, Changtao Liu, Fang Tang
Sichuan academy of medical sciences •Sichuan province peoples hospital Rehabilitation center, China

Objective: To explore effective method for health education in patients with neurogenic bladder. *Methods:* According to evidence-based medicine and experience of clinical practice, clinical path of health education was designed. Patients in the trial group were given clinical path of health education, while the control group were given conventional health education. Then the health knowledge, nursing satisfaction, as well as the self-care ability for the two groups were compared using the Statistical Package for the Social Sciences (SPSS) software (version 17.0). The measurement data was expressed as frequency and ranked data was compared using rank sum test. *Results:* the difference of health knowledge, nursing satisfaction, as well as the self-care ability between the two groups was statistically significant ($p<0.05$). *Conclusions:* The application of clinical pathway of health education in the care of patients with neurogenic bladder, can increase their health knowledge and nursing satisfaction as well as improving activities of daily living.

PO-0997

THE PROPER CHOICE OF ARM SLING FOR HEMIPLEGIC AND HEMIPARETIC PATIENTS

Taegyun Kim, Minho Chun*, Sookjoung Lee, Jinhwa Yi
Asan Medical Center, Korea

Objective: Many kinds of arm slings are used for stroke patients. The arm slings are largely divided into two types; one type which supports both arm and forearm (Kenny-Howard, KH) and which supports only arm (Extension, EXT). There is no proper indication of arm sling for stroke patients. study was designed to determine the proper arm sling for stroke patients according to the motor recovery state. *Method:* Stroke patients within 3 months from onset were enrolled. They were randomly assigned to wear either KH or EXT type sling. Patients were categorized as hemiparetic or hemiplegic. Patients wore arm slings for more than six h a day. The vertical distance (VD), horizontal distance (HD) and joint distance (JD) of the shoulders on the plain AP views were measured initially and after 3 weeks. To quantify their satisfaction, patient filled in questionnairesr. *Result:* Twenty four hemiplegic and 21 hemiparetic patients were included. There were no significant differences between the groups on baseline evaluation. After 3 weeks, all patients showed improvement in VD, HD and JD. In hemiplegic patients, changes of VD were improved significantly in patients wearing KH type. There were no significant differences among parameters in hemiparetic group. Satisfaction was significantly higher in hemiplegic group with KH arm slings. In hemiparetic group, EXT type was preferred. *Conclusion:* This study showed that KH type was more appropriate than EXT type in hemiplegic patients in. Patients preferred EXT sling in hemiparetic group. Therefore, we recommend applying these arm slings according to motor power.

PO-0998

THE EFFECT OF VIRTUAL REALITY ON COGNITIVE FUNCTION IN PATIENTS WITH BRAIN TUMOR

Taegyun Kim
Asan Medical Center, Korea

Virtual reality (VR) allows patients to interact with a multisensory simulated environment and receive "real-time" feedback. The aim of this study was to investigate whether the VR helps on the recovery of cognitive function in patients with brain tumor. *Methods:* Sixteen patients were recruited. All patients were randomly assigned to VR group (n=8) or control group (n=8). Both VR training and computer-based cognitive rehabilitation program were given to the VR group. The virtual reality was given 30 min for 3 times a week and computer-based cognitive rehabilitation program was given 30 min for 2 times a week for the total of three weeks. The control group was given only the computer-based cognitive rehabilitation programs. The VR was done using the VR system (IREX system®128, Vivid group, Toronto, Canada). To measure the difference, computerized neuropsychological tests were given. The Korean version of Mini-Mental Status Examination (K-MMSE), Korean-Modified Barthel index (K-MBI) were also used. *Results:* There were no significant differences in baseline characteristics. The VR group showed improvement in the K-MMSE, visual and auditory continuous performance tests (CPT), forward and backward digit span tests, forward visual span test (VST), visual and verbal learning tests, trail-making test, and K-MBI. The VR group showed significant changes in visual CPT and forward VST after rehabilitation than control group. *Conclusion:* Our findings suggest that when virtual reality training combined with computer-based cognitive rehabilitation were given. virtual reality may bring additional benefits. Virtual reality should also be considered when treating brain tumor patients who have cognitive impairment.

PO-0999

TREADMILL TRAINING ALLEVIATES MUSCLE DENERVATION AFTER SPINAL CORD INJURY BY UPREGULATING THE EXPRESSION OF BDNF

Hongxing Wang, Wenhong Chen, Sijing Chen, Tong Wang, Jianan Li
the First Affiliated Hospital of Nanjing Medical University, China

Objective: To determine the effect and mechanism of exercise training on muscle denervation after spinal cord injury. *Methods:* Adult female SD rats with moderate spinal cord contusion at T9 by NYU impactor received 4-week treadmill training starting from 1 week post-operation. BBB scores, motor nerve condution and Needle EMG were performed pre-operation and at 1, 3 and 5 weeks post-operation. Immunohistochemistry was used to quantity the expression of BDNF. *Results:* All experimental animals exhibited a gradual improvement in hindlimb locomotor function during the 5-week recovery period. The training group showed significantly improved hindlimb performance compared to the control group ($p<0.05$). The mean compound muscle action potential (CMAP) amplitude recorded from gastrocnemius muscle decreased significantly at 1 week post-injury, but increased gradually after training till the end of study. The CMAP latency and duration had no significant change in control or training animals at any time-points. Spontaneous discharges were recognized in tibial anterior and gastrocnemius muscles by needle EMG on 1 week after SCI. The number of discharges rapidly increased in sedentary animals week by week and

became stable at 4 weeks after SCI. However, spontaneous potentials did not increase on the third week and were reduced from the fourth week in training animals. The strong immunostaining of BDNF in the lumbar spinal cord was observed in the cytoplasm of neurons or glial cells from the ventral horn. The gray values of training group was greater significantly than control group ($p<0.05$). Implication Exercise training may reduce the denervation of muscles after spinal cord injury by inducing the expression of BDNF.

PO-1000

CAN ANTERIOR-POSTERIOR WEIGHT SHIFTING ABILITY INFLUENCE WALKING IN POST-STROKE HEMIPLEGIC PATIENTS?

Deog-Young Kim[1]*, Jong Bum Park[1], Na El Ahn[2]

[1]Department and Research Institute of Rehabilitation Medicine, Yonsei University College of Medicine,Korea, [2]Research Institute of Rehabilitation Medicine, Yonsei University College of Medicine,Korea*

Objective: To investigate whether anterior-posterior (AP) weight shifting ability in standing posture can influence the walking ability and temporospatial, kinematic, kinetic parameters of gait analysis in post-stroke ambulatory hemiplegic patients. *Method:* 83 first-ever stroke patients who could walk independently (FAC ≥3) were enrolled. They were classified into 2 groups (good AP shifting ability (good AP) group, poor AP shifting ability (poor AP) group) according to their AP shifting ability based on values of normal healthy persons assessed by F-scan system (Tekscan Inc). Demographic data, Functional independence measure (FIM) locomotion score, Fugl-Meyer assessment (FMA), self-selected walking speed (SSWS), maximum safe walking speed (MSWS), Functional ambulation categories (FAC) were assessed. The temporospatial, kinematic, kinetic data of subjects were obtained through 3 dimensional analyzer with force plate. Their parameters were compared between two groups by SPSS 20.0. *Results:* As compared with good AP group, poor AP group showed lower FIM locomotion score, FMA of affected lower limbs, and shorter trajectory length, lower anterior pressure significantly ($p<0.05$). The asymmetric step length ratio, and index were significantly higher at poor AP group compared to good AP group ($p<0.05$). The cadence, walking speed, affected maximal hip flexion generation at stance phase, maximal hip extension generation at pre-swing phase were also lower in poor AP group than good AP group ($p<0.05$). The AP shifting ability was significantly correlated with FIM locomotion score, FMA-lower extremities, anterior pressure, walking speed, stride length, asymmetric step length ratio and index, affected maximal ankle dorsiflexion moment at stance phase. ($p<0.01$). *Implications/Impact on rehabilitation:* AP shifting ability may be one of quantifiable markers of impaired walking ability (especially step length asymmetry) in post-stroke ambulatory hemiplegic patients.

PO-1001

ROBOTIC-ASSISTED VERSUS CONVENTIONAL GAIT TRAINING ON LOCOMOTOR RECOVERY IN SUBACUTE STROKE

Deog-Young Kim[1]*, Jong Bum Park[1], So Young Joo[1], Na Kyung Kang[2], Na El Ahn[2]

[1]Department and Research Institute of Rehabilitation Medicine, Yonsei University College of Medicine,Korea, [2]Research Institute of Rehabilitation Medicine, Yonsei University College of Medicine, Korea*

Objective: To investigate the effects of 4weeks robot-assisted gait training (RAGT) on motor recovery of lower extremities and walking ability compared with the conventional gait training in subacute post-stroke non-ambulatory hemiplegic patients. *Method:* 76 first-ever stroke patients who could not walk independently - FAC. The independent walking ability (FAC≥3), Functional Ambulation Category (FAC), Motricity index (MI), Fugl-Meyer assessment (FMA), Modified Barthel Index (MBI), Medical Research Council (MRC) for each lower extremity muscles were assessed before, during 2weeks, and after training. And the independent walking ability were followed till 3 months. *Results:* Baseline characteristics were not significantly different between 2 groups at baseline# After training, RAGT group could significantly walk independently more frequently than conventional gait training group. *Conclusion:* The RAGT may be effective to facilitate motor recovery of affected lower extremities, and to regain the independent walking ability in the subacute post-stoke non-ambulatory hemiplegic patients. This study was supported by a faculty research grant of Yonsei University College of Medicine for 2012#6-2012-0024.

PO-1002

INVESTIGATION OF DISSOCIATION IN IMPROVEMENT AMONG COGNITION AND MOTOR SCORES BY TREATMENT OF IDIOPATHIC NORMAL PRESSURE HYDROCEPHALUS: INPH

Asuka Hirano, Akiko Maeda, Megumi Suzuki, Hiroyuki Kato, Miho Hayashi, Kikuo Ota*

Fujita Health University, Japan

Introduction: In Japan, the Guidelines for management of idiopathic normal pressure hydrocephalus :iNPH are used to diagnose and assess the effects of shunt operation. Motor and cognitive scores of the tap test have been helpful for assessing the effects of rehabilitation, but the scores are frequently mutually dissociating among several items. In this study, improvement in scores was compared among each items, and dissociation of the scores was investigated. *Subjects and methods:* Subjects were Seven iNPH patients. The age was 73.6±4.6 years on average. All subjects were evaluated before and after the tap test and V-P shunt, respectively. The evaluated 6 tests were as follows, Timed Up & Go test:TUG, 10 m Walk Test: 10MWT, Mini Mental State Examination:MMSE, Frontal Assessment Battery at Bedside: FAB, Trail making test: TMT and digit span task. *Results:* Five out of 7 showed significant improvement in TUG (average 25.6 to 15.5 sec) and 10MWT (average 23.1 to 19.6 sec) after V-P shunt operation. TMT scores were difficult to evaluate in 2 out of 7, but others were improved significantly. Some patients showed improvement in scores related to motor and attentiveness, particularly in TUG and TMT for 4 weeks after V-P shunt operation. *Discussion:* Improvement was observed in motor scores for patients who had serious functional degradations before the treatment, but only slightly in almost normal walking speed patients. As the TMT and TUG scores continued improving 4 weeks after V-P shunt, postoperative rehabilitation should be maintained according to the motor and cognitive evaluation results.

PO-1003

DEJERINE-ROUSSY SYNDROME

Lucrecia Mendoza González

Rehabilitation Departure, Cabueñes Hospital, Spain

Objective: This syndrome is characterized by complete contralateral facial, brachial and crural sensory involvement, as well as central neuropathic pain. We present the impact of rehabilitation treatment in this pure sensory stroke. *Method:* A 55 year old patient suffering from right thalamic haemorrhage due to hypertension. Examination showed no cognitive impairment or motor disorders. His left hand was ataxic. Hyperpathia and allodynia in the left hemisphere. Hypoaesthesia and hypoalgesia with loss of arthrokinetic and vibratory sensitivity of the left limbs. Proprioceptive impairment conditioning sensory hemiataxia and difficulty walking independently. *Results:* Treatment was started with occupational and physical therapy to retrain coordination, gait and balance. Analgesia with pregabalin, oxycodone-naloxone and tramadol-paracetamol. The treatment response was excellent and in a month he had achieved full control of

neuropathic pain and full restoration of sleep at night. Bipedal stance was secure with visual reinforcement patterns, postural strategies, physical reconditioning and help using a walking stick. Improving gait pattern, extradomiciliary safety and autonomy. *Impact on Rehabilitation:* Clinical symptoms of pain of thalamic origin are the prototype of neuropathic pain in supratentorial pathology and yet the patient was referred to our clinic without analgesic treatment. Additionally, sensory ataxia deprives the patient of knowledge of his position in space, of the progress of a movement made, of the status of muscle contraction and of the finer details of the walking surface. This constitutes a major risk factor for falls and disability. Our assessment is essential as rehabilitation physicians in an integrated treatment approach for these patients.

PO-1004

STUDY OF FMRI IN ACUPUNCTURE DIFFERENT DEPTH AT KI3 IN PATIENTS WITH MILD COGNITIVE IMPAIRMENT

Shangjie Chen, Derong Fe, Qiongyu Xu, Maosheng Xu, Wende Yang

Baoan Hospital, Southern Medical University, China

Objective: In this study, we aimed to investigate effects of acupuncture by observing the influence on brain functional activation of deep acupuncture (DA) and shallow acupuncture (SA) at Taixi (KI3) acupoint in patients with mild cognitive impairment (MCI). *Methods:* Twelve subjects with MCI were enrolled in this research. fMRI technology with a fusion of resting state and task state was used. For both the DA and SA runs, an acupuncture needle was inserted in KI3 acupoint on the right leg. Magnetic resonance imaging data were collected from a 3T MR scanner. After each scan, the subjects were asked to quantify on a 10-point scale to self-rate the intensities of the deqi sensations they had felt during the stimulation. The brain cognitive functional activation of the patients with MCI during acupuncture at KI3 acupoint was analysised using SPM5 software. *Results:* A statistical analysis found significantly difference between DA and SA groups in regard to the intensity of these sensations. When DA and SA were compared in MCI patients, active areas were gyrus frontalis medialis, gyrus frontalis medius, gyrus frontalis inferior, postcentral gyrus, inferior parietal lobule, limbic lobe, superior temporal gyrus, inferior temporal gyrus. *Conclusion:* The present study demonstrates that there was regulation of cognitive functions acupuncture KI3 acupoint in patients with MCI, and acupuncture at different depth of KI3 acupoint can exert different modulatory effects on the reorganizations of brain function. The heterogeneous modulation patterns between two conditions may relate to the functional specific modulatory effects of acupuncture. The result help us to employ KI3 to rehabilitation of MCI.

PO-1005

DISCUSSION ON FOREST ENCEPHALITIS PARALYSIS SEQUELAE COMBINED WITH MASSAGE PNF METHOD APPLICATION

Fukui Yao

Land Reclamation Bureau General Hospital of Heilongjiang Province

Objective: rehabilitation techniques applied to paralysis of the value of forest encephalitis. *Methods:* the method of promoting the application of traditional Chinese medicine massage combined with proprioceptive neuromuscular paralysis (PNF) treatment of forest encephalitis patients. *Results:* massage combined with PNF in the treatment of forest encephalitis paralysis symptoms got obvious curative effect. *Conclusion:* the curative effect of forest encephalitis sequela of excellent paralysis massage combined with PNF method. Worthy of promotion.

PO-1006

A FAVORABLE OUTCOME OF COMPLEX SURGICAL, PHARMACOLOGICAL AND REHABILITATION TREATMENT OF A PATIENT WITH LOCKED - IN SYNDROME DUE TO POST-TRAUMATIC VERTEBROBASILAR ARTERY OCCLUSION

Yuri Marchuk[1], Nathania Liem[1], Lisa Halley[1,2], Igor Gaisinsky[1,2]

[1]Windsor Regional Rehabilitation Hospital,Canada, [2]Hotel Dieu Grace Hospital, Canada

Objectives: One of the most devastating consequences of vertebrobasilar artery occlusion is locked-in syndrome, often associated with unfavorable clinical outcome. The objective of this study is to present and discuss the clinical management and outcome of a 34-year-old previously healthy female who developed locked - in syndrome following traumatic vertebral artery dissection. *Methods:* Patient underwent emergency stent assisted angioplasty of the vertebrobasilar arteries following antiplatelet/anticoagulation therapy to reperfuse the affected region. CT, MRI/MRA and Angiography studies were used during diagnostic evaluation and treatment. Complex, multifaceted, intensive rehabilitation program was initiated immediately following surgery in the acute care setting and continued at rehabilitation facility. *Results:* Eighteen months after the accident patient was able to ambulate independently without gait aids, using an ankle-foot orthotic only for long distance ambulation. She lives independently in an apartment, continues to be active, well motivated and plans to return to work in the near future. *Implication/Impact on rehabilitation:* Traumatic vertebrobasilar artery occlusion is increasingly recognized as a common cause of stroke in young patients. There is growing evidence that early diagnosis and complex differential treatment can lead to significantly improved outcome. Identification and treatment of these conditions prior to the development of irreversible cerebral ischemia should be priority and demand a high degree of alertness in patients with high-risk mechanism and injury pattern. This case illustrated a perfect combination of early diagnostic and surgical intervention followed by complex, multidisciplinary, intensive rehabilitation treatment, which led to significant recovery and excellent long term neurological outcome.

PO-1007

THE PRELIMINARY STUDY OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION COMBINED WITH HYPERBARIC OXYGEN THERAPY IN PATIENTS WITH ISCHEMIC STROKE

Liling Cui, Guozhi Huang, Kangling Wang, Zhong Yang, Rong Guo

Department of Rehabilitation Medicine, Zhujiang Hospital, Southern Medical University, China

Objective: To study the effects of repetitive transcranial magnetic stimulation (rTMS) combined with hyperbaric oxygen (HBO) therapy on neurological functional recovery of patients after ischemic stroke, and to discuss its mechanism. *Method:* 45 stroke patients were randomly divided into control group, rTMS group, rTMS & HBO group, each group of 15 patients. Patients of treatment groups received 1 Hz rTMS to inhibit the unaffected hemisphere and 3 Hz rTMS to stimulate the affected hemisphere, or combined with HBO therapy, 14 daily sessions. The National Institute of Health Stroke Scale (NIHSS) and the Barthel Index (BI) were checked serially on the 1st day, 14th day and 30th day. *Results:* After treatment, the neurological functional scores improved obviously in rTMS group and rTMS&HBO group ($p<0.01$). On the 1st and 14th day, no sig-

nificant difference was found in scores of NIHSS and BI among the three groups (p>0.05). On the 30th day, the neurological functional scores of rTMS & HBO group improved significantly compared with control group (p<0.05), rTMS & HBO group showed more obvious improvement than rTMS group in BI scores (p<0.05), no significant difference was found in scores of NIHSS and BI between rTMS group and control group (p>0.05). *Implications:* To patients with ischemic stroke, rTMS combined with HBO therapy can improve neurological function more significantly than rTMS therapy. In half a month after treatment, the improvement was more pronounced.

PO-1008

THREE-DIMENSIONAL KINEMATIC MOTION ANALSIS OF DOOR HANDLING TASK IN PEOPLE WITH MILD AND MODERATE STROKE

Eun Joo Kim[1]*, Jung Ah Lee[2], Pil Woo Hwang[2]
[1]Korea National Rehabilitation Center,Korea, [2]Korea National Rehabilitation Research Institute, Korea

Objective: Three-dimensional kinematic analysis of the upper *extremity* in people with mild and moderate stroke has rarely been investigated in research. Door handling movements vary in terms of their task goals and constraints. This study aimed to quantify one of the useful upper extremity movements to evaluate motor control abilities between the groups of people with mild and moderate arm impairments performing a door handling task. *Methods*: Twenty-one healthy participants and twenty-one with chronic stroke patients (9 mild stroke and 12 moderate stroke) were recruited for this study. Stroke patients were divided into 2 groups based on FMA scores of 58-65 (mild arm) and 38-57 (moderate arm). The door handle turning movements including the pronation and supination phases were measured using the 3 D motion analysis. *Results*: The number of movement units, total and phase of movement time, hand of peak velocity, percent of peak velocity, peak angular velocity of elbow discriminated between healthy participants and those with stroke as well as between those with moderate versus mild upper limb stroke patients. In addition, reaction time, phase of inter-joint coordination and arm motion functions discriminated between those with moderate and mild upper limbs of stroke patients. *Implications*: Three-dimensional kinematic analysis in this study was a useful tool for assessing the upper extremity function in different subgroups of people with stroke during the door handling task. These kinematic variables may help us understand the arm movements in door handling and assist stroke patients in upper extremity rehabilitation.

PO-1009

FUNCTIONAL MAGNETIC RESONANCE IMAGING STUDY OF THE VERB GENERATION TASK DIFFERENCE IN CHINESE AND UYGHUR LANGUAGES

Yanling Xi[1], Hai Xia Huang[1], Xiao Ning Zhang[1], Jian Wang[1], Tuerhong Tuerxun[1], Jun Ran Zhang[2], Chun Hui Jiang[1], Kuerbannaimu Kaheman[1]
[1]The First Affiliation Hospital of Xinjiang Medical University, Urumqi, China., [2]Sichuan University, Chengdu, China

Purpose To observe the activated region of the brain cortices as a pattern of verb generation of both Uyghur and Chinese languages in which the healthy volunteers were in examination condition using the blood oxygenation level dependent functional magnetic resonance imaging (BOLD-fMRI), then the cortical networks of Uyghur or Chinese words processing in the cerebral cortices were elucidated. *Method:* In the present study, a total of thirty right handed volunteers (fifteen are native speakers of Han Chinese, and fifteen are native speakers of Uyghur) were recruited and compared when they were assessed verb generation task in the studies. *Results:* The different activation regions during the verb generation in Uyghur and Han Chinese groups were left inteferior temporal gyrus (BA37), inferior parietal lobule, fusiform gyrus, parahippocampal gyrus and right superior temporal gyrus (BA38).The left inteferior temporal gyrus (BA37), inferior parietal lobule, fusiform gyrus, parahippocampal gyrus in Uyghur group were markedly seen positive activations, while those regions in Han Chinese group were weaker compared to Uyghur group, and it was significant differences (p<0.05); Whereas, the right superior temporal gyrus (BA38) in Han Chinese group was markedly seen a positive activation, while that region in Uyghur group was not seen an activation, and it was significant differences (p<0.05). *Implications:* These results showed that the activation regions during verb generation in Uyghur and Han Chinese are different, and right hemisphere participate dominantly in Han Chinese words processing than in Uyghur Uyghur words processing.

PO-1010

EFFECTS OF FUNCTIONAL ELECTRICAL STIMULATION ASSISTED WALKING DEVICE FOR GAIT TEMPORAL-SPATIAL PARAMETERS IN STROKE PATIENTS

Dianhuai Meng, Wenchao Yi, Zhaohua Gu, Xiang Wang, Yu Luo, Jianan Li
First Affiliated Hospital of Nanjing Medical University, Nanjing, China

Objective: To observe the effects of FES-AWD for gait temporal-spatial parameters in stroke patients, and provide theoretical basis for clinical therapy. *Method:* Based on routine medical treatment and rehabilitation therapy, 9 stroke patients with foot drop received FES-AWD (GYKF-I) on affected side twice a day, 20 min for a time, 5 days per week, and the total time is 4 weeks. All patients received 3-D gait analysis both with and without GYKF-I for three times: before treatment, one week late and four weeks late. *Result:* (1) There was no significant difference between free walk and walk with GYKF-I (Power off). (2) In all three times visits, contrasting to free walk, walk with GYKF-I (Power on) can significantly improve gait temporal-spatial parameters of the stroke patients. *Conclusion:* FES-AWD can instantly improve stroke patient's gait, and it has no psychological or physiological influence on patients.

PO-1011

THE EFFECT OF COGNITIVE BEHAVIORAL THERAPY ON PSYCHIATRIC REHABILITATION IN PATIENTS WITH CASTRATION RESISTANT PROSTATE CANCER

Ran Pang, Xin-Yao Zhou, Jian-Xin Lu, Ya-Qiang Zhang
Guang An Men Hospital, China Academy of Chinese Medical Science

Objective: To evaluate the effect of cognitive behavioral therapy (CBT) on psychiatric rehabilitation in patients with castration resistant prostate cancer (CRPC). *Method:* 52 patients with CRPC were randomly allocated to either a 4-week CBT or usual care (control group). Participants in CBT group received a face-to-face psycho-education weekly and guided relaxation and paced-breathing exercises daily. Patients' psychological well-being was evaluated at baseline, post-treatment and 3-months follow-up respectively using Memorial Anxiety Scale for Prostate Cancer (MAX-PC) and Hospital and Depression Scales (HADS). *Results:* Patients' demographic didn't have significant difference between 2 groups. After treatment the scores of MAX-PC and HADS dropped from 30.7±4.8 to 24.5±4.8 (p±3.9 to 15.8±4.3 (p<0.001). *Implications/ Impact on rehabilitation:* It is reported that one-third patients with prostate cancer met the criteria of anxiety disorder. With disease progressing to CRPC, majority of patients present psychological disorder. However, most clinical doctors fail to recognize them, which result in these problems being remained and even deterio-

rated. Our study is first one to focus on psychiatric rehabilitation in patients with CRPC. Results indicate that CBT has significant effect on reducing patients' anxiety and boosting their positive mood. The potential mechanism is that CBT might alter autonomic arousal and influence neuro-endocrine activity, which improve CRPC-related psychological disorder.

PO-1012

ELECTRICAL STIMULATION GUIDANCE WAS FOR LOCATION OF TARGETING MUSCLES OR MOTOR POINTS OF TARGETING MUSCLES IN BOTULINUM TOXIN INJECTION?

Weixin Yang, Min Su, Hongjun Zhu, Qingmei Chen
Department of Rehabilitation, the First Affiliated Hospital of Soochow University, Suzhou,Jiangsu,China, 215006, China

Objective: The objective of the study is designed to evaluate the clinical value of electrical stimulation guidance for location of motor points in the treatment of muscle spasticity. *Methods:* 1. 8 hind legs from 4 rabbits were stimulated the lower end of the biceps femoris (N1), the nerve endings intensive distribution zone (N2) and its nerve branches (N3), to observe the electrical stimulation of the reaction. 2. 20 cases hemiplegia patients with lower limbs spasticity were selected. Through the ultrasonic view, observed the needle position and the reactions of different parts of the gastrocnemius and soleus muscle for electrical stimulation. *Results:* In animal experiments, compared with group N2 (8/8) and N3 (8/8), the sensitivity of group N1 (2/8) was lower to electrical stimulation ($p<0.05$). In patients experiments, the accuracy of electrical stimulation in the medial gastrocnemius muscle (92.5%), the lateral gastrocnemius (85.0%), soleus (78.3%). Compared with other parts, the sensitivity to electrical stimulation was higher ($p<0.05$) in the nerve endings intensive distribution zone. When the needle tip touching nerve branch, could caused muscle strong contraction. Electrical stimulation at the junction of the soleus and gastrocnemius caused some patients muscle co-contraction. *Implications/Impact on Rehabilitation:* The essence of the electrical stimulation of the positioning of botulinum toxin injection was target muscle rather than the target muscle motor points. Some motor points were not reasonable at the injection sites.

PO-1013

EFFECT OF MOTOR IMAGINARY THERAPY COMBINED WITH ELECTROMYOGRAPHIC BIOFEEDBACK THERAPY ON ANKLE DORSIFLEXION IN HEMIPLEGIC PATIENTS AFTER STROKE

Xiangming Ye, Jue-Bao Li, Liang Zhou, Wanshun Wen
Zhejiang Provincial People's Hospital, China

Objective: To explore the effect of motor imaginary therapy combined with electromyographic biofeedback therapy on ankle dorsiflexion in hemiplegic patients after stroke. *Method:* Forty-nine hemiplegic patients were divided into interventional group (IG) and control group (CG). Common rehabilitation therapy was used in both EG and CG. Motor imaginary therapy combined with electromyographic biofeedback therapy were used in IG, but weren't used in CG. Both two groups were assessed by using FMA, BBS, FAC and MBI at admission and after two months. *Results:* After two months, patients in both EG and CG scored significantly better in FMA, BBS, FAC and MBI, and proportion of patients who could walk independently also increased significantly in both two groups, but patients in EG improved more significantly compared with CG. *Implications:* Motor imaginary therapy combined with electromyographic biofeedback therapy had good effect on improving ankle dorsiflexion in hemiplegic patients after stroke.

PO-1014

EFFECTS OF TAI CHI ON BALANCE AND FALL PREVENTION IN PARKINSON'S DISEASE

Qiang Gao[1,2,3], Yonghong Yang[1,2,3], Qingchuan Wei[1,2], Min Guan[1,2], Chengqi He[1,2,3]
[1]Department of Rehabilitation Medicine, West China Hospital, Sichuan University,China, [2]Province Key Laboratory of Rehabilitation Medicine, Chengdu, Sichuan Province,China, [3]Institute of Disaster Management and Reconstruction, Sichuan University-Hong Kong Polytechnic University

Objective: To examine the effect of Tai Chi on balance and functional mobility in people with Parkinson's disease (PD), also to determine whether falls could be reduced by the Tai Chi exercise. *Methods:* Patients were randomly assigned to one of two groups: Tai Chi (TC) group or control group. The TC group received 24-form Yang style Tai Chi Exercise for 60 min each time, three times a week and lasted for 12 weeks. The control group received the usual care from their medical practitioner. Berg Balance Scale, UPDRS, Timed Up and Go were measured at the beginning and the end of the intervention. Occurrences of falls were measured after 6 months' follow-up. *Results:* The TC group improved more than the control group on the Berg Balance Scale (p<0.05), but there were no difference on UPDRS scores and Timed Up and Go (p>0.05). During the 6-month follow-up, only 8 (21.6%) of 37 patients fell in the TC group compared with 19 (48.7%) of 39 patients fell in the control group (p<0.05), and the average times of falls were 0.30±0.62 inTC group compared with 0.64±0.74 incontrol group (p<0.05). *Implications:* The Tai Chi exercise could improve the Berg Balance Scale scores, and decrease fall risks in PD patients. Tai Chi exercise maybe an effective intervention for PD patients in the communities.

PO-1015

IMPROVE INTERMITTENT CATHETERIZATION METHODS IN SPINAL CORD INJURY TO NEUROGENIC BLADDER RECOVERY OF REALIZE

Liqun Guo, Jin Bai
Zhengzhou central hospital rehabilitation medicine, China

Objective: The observation is about the intermittent catheterization between improvement methods in spinal cord injury to neurogenic bladder in recovery application effect. *Methods:* Spinal cord injury urinary retention were randomly divided into the observation group and the control group, 24 cases were the observation group with the improved intermittent catheterization, the control group with bladder function training, intermittent catheterization, bladder function training treatment. 2 months after analysis of two groups of patients recover automatic micturition time, residual urine, and bladder capacity. *Results:* The observation group restoration of spontaneous micturition significantly earlier than the control group, residual urine volume less than the control group, bladder capacity recovery or close to normal. *Conclusion:* The improvement of intermittent catheterization can make the patients recover quickly automatic micturition function, bladder capacity recovery or close to normal, and reduce the amount of residual urine which is worth clinical promotion use.

PO-1016

LONG - TERM BENEFITS OF PARTIAL BODY WEIGHT SUPPORT TREADMILL TRAINING IN SEQUELA OF STROKE: A 2-YEAR FOLLOW-UP

Xiang Li, Xiao-Qiang Zhang, Ya-Nan Gao, Chun-Mei Li

Department of Rehabilitation,Beijing Geriatric Hospital, China

Objectives: To evaluate the long-term benefits of partial body weight support treadmill training (PBWSTT) in sequela of stroke. *Methods:* 18 patients with stable stroke (hemiplegic limbs Brunstroms' scale ≥ III) exceed 12 months after the onset were divided into PBWSTT group (n=8) and control group (n=10) randomly. Routine rehabilitation were used in the control group, and the PBWSTT group received PBWSTT in addition. They were assessed with Modified Ashworth Scale (MAS), Functional Ambulation Category (FAC), Fugl- Meyer Assessment (FMA), and the Functional Independence Measurement (FIM) before, 8 weeks after the treatment, one year follow and 2 years follow. *Results:* Two years after the intervention, the improvements in the motor function of lower extremities, walking ability and ADL in the training group were maintained, and there was no reduction in above function and ability in the control group. Compared with before the treatment there were still significant differences for both function and ability in two groups (p<0.05). And, significant between-group differences were found in the motor function of lower extremities, walking ability and ADL (p<0.05). *Impact on Rehabilitation:* The results indicate that there is a long-term benefit of PBWSTT in sequela of stroke. This implies that PBWSTT could be an effective training method to improve and maintain the motor function of lower extremities, walking ability and ADL of stroke in a long-term perspective.

PO-1017

RECTAL DIAMETER AND AREA BY ULTRASONOGRAPHY IN NEUROGENIC BOWEL OF SPINAL CORD INJURY

Jeong Hwan Seo[1], Gi-Wook Kim[1]*, Myoung-Hwan Ko[1], Sung-Hee Park[1], Chul-Gyu Song[1], See-Hyun Park[1]

[1]Chonbuk National University Medical School,Korea, [2]Chonbuk National University Medical School,Korea, [3]School of Electronics and Information Engineering, Korea

Objective: To determine the efficacy of ultrasonography as an supportive parameter in measuring the transverse diameter and area of the rectum from each type of neurogenic bowel in spinal cord injury (SCI) patients. *Method:* Twenty-six SCI patients (12 patients with spastic bowel and 14 patients with flaccid bowel) participated in this study. We divided the patients into type of neurogenic bowel (spastic bowel: patients with supraconal lesions and recovery state of spinal shock – the presence bulbocavernosus reflex or ice water test of bladder; flaccid bowel: patients with infraconal/caudal lesions or spinal shock state – absence of bulbocavernosus reflex and ice water test) and checked Korean version of Neurogenic Bowel Dysfunction score (K-NBD) in all SCI patients. We evaluated each diameter and area of the rectum before defecation (within 2 h) and after defecation (within 1 h) and compared rectal diameter and area between two groups. *Results:* In patients with spastic bowel, both mean rectal diameter, area and change % of rectal area were significantly decreased after defecation (p<0.05). On the other hand, patients with flaccid bowel showed an increasing tendency in change % of rectal area after defecation (p>0.05). There were a positive correlation between the diameter and area of a rectum and some NBD sub scores in SCI patients. *Conclusion:* We measured the diameter and area of the rectum using ultrasonography before and after defecation of the patients with spinal cord injury for the first time. As we show in this study, ultrasonography could be an supportive tool in evaluating the neurogenic bowel of the SCI patients.

PO-1018

BRAIN NERVOUS DEVELOPMENT AND NEURORESTORATOLOG OF CHILDREN WITH CEREBRAL PALSY BY ACUPUNCTURE

Zhenhuan Liu

The Affiliated Nanhai Maternity and Children Hospital of Guangzhou University of Traditional Chinese Medicine, Foshan, Guangdong, China. 528200

Objective: To investigate action and value of acupuncture in Cerebral Palsy rehabilitation. *Methods:* 200 spasm Cerebral Palsy patients from 1 to 7 years old were randomly divided into two groups. Acupuncture with rehabilitation-training group: 100 patients were treated with head acupuncture and body acupuncture and rehabilitation-training; Rehabilitation-training group: 100 patients were treated with physical therapy. A comparison between these two groups are done with a 3-month treatment applied the Gross Motor Function Measure (GMFM) and Beijing Gesell to evaluation the effects of the two groups, also applied to the method of atrophy in computed tomography (CT) scan and magnetic resonance imaging (MRI) scan skull recovery normal rate. *Results:* The effective rate of Acupuncture with rehabilitation-training group is 87%, obviously higher than the Rehabilitation-training group with an effective rate of 55%. The total effective rate acupuncture and rehabilitation-training group were obvious higher than that treated simple with rehabilitation-training group. After treatment the development quotient value and GMFM of rehabilitation-training + acupuncture group were higher than that of rehabilitation group (p<0.01). In acupuncture and rehabilitation-training group, improvement rate of brain dysphasia, brain atrophy in skull CT/MRI and recovery normal rate of skull were higher than that of rehabilitation group (p<0.01). *Conclusions:* Acupuncture can obviously increase cerebral blood flow and improve cerebral cell metabolism, promote partial or complete compensation of cerebral function and the restoration and function of plasticity of cerebral tissue in children with cerebral palsy.

PO-1019

THE EFFECT OF CORE STABILITY TRAINING ON BALANCE FUNCTION IN CHILDREN WITH CEREBRAL PALSY

Tiancong Chen[1,2], Yanli Lin[1], Peifeng Cheng[1], Jian Zhang[1], Pengjiang Li[1], Xiang Chen[2]

[1]Peoples Hospital of Wenzhou Lucheng District of Zhejiang province of China, [2]Wenzhou Medical College

Objective: To observe the effect of Core Stability Training on children with cerebral palsy. *Methods:* Fifty cases of children with cerebral palsy were randomly divided into two groups: control group were treated with traditional rehabilitation therapy; experimental group were treated with traditional rehabilitation therapy plus core stability training. All patients were assessed with balance function through Biodex Balance System. *Results:* The results showed that significant difference was found on balance function between the two groups after twelve weeks (p<0.05). *Conclusion:* The conventional rehabilitation plus core stability training has significant effectiveness on balance function, which indicating that the core stability therapy based on conventional rehabilitation is an effective rehabilitation approach for cerebral palsy children.

PO-1020

THE CLINICAL OBSERVATION OF THE CURATIVE EFFECT OF CHILDHOOD AUTISM TREATED BY VIBROACOUSTIC THERAPY

Zhenhuan Liu

Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine CHINA

Objective: To study the curative effect of childhood autism according to observe the improving of attention, social communication, and emotional treated by vibroacoustic therapy. *Methods:* 30 cases of childhood autism were treated by vibroacoustic therapy for 30-35

min, six times a week and run for three weeks, then rest for 7-10 days, 60 times for a period of treatment. Analyse the behavior development, musical development and emotional development of childhood autism before and after vibroacoustic thetapy. *Result:* We found that the behavior development, musical development and emotional development of childhood autism is obviously discrepancy before and after the vibroacoustic therapy. $p<0.05$ and most of the children is impoved after the treatment Clusion Vibroacoustic therapy can obviously improve the behavior development, musical development and emotional development of childhood autism.

PO-1021

CHILDREN AND ADOLESCENCE WITH EPILEPSY: A PROSPECTIVE, OPEN-LABEL,SINGLE-CENTER LONG-TERM FOLLOW UP STUDY

Xuefei Feng, Nong Xiao
Department of Neurological Rehabilitation, Childrens Hospital of ChongqingMedicalUniversity,Chongqing, China

Purpose To investigate the long-term retention rate of Levetiraceram (LEV) in Chinese children and adolescence with epilepsy, and to evaluate the withdrawal reasons of Levetiractam. *Methods:* A prospective, open-label,single-center, long-term follow up study in patients (≤18 years) with epilepsy, who Receive mono-or combination therapy with LEV. The doses of LEV were ranged from 10mg/day to 60 mg/day. Documenting the seizure frequency and side effects monthly. *Results:* 218 patients (males 126) were enrolled in this investigation. The retention rates of 12-month-old, 24-month-old, 36-month-old, and 48-month-old patients respectively are 82.1%, 64.7%, 56.4% and 43.6%, respectively. The predominant reasons for withdrawal were lack of efficacy (41.5%). adverse effects (12.2%), follow-up loss (13.0%), subjective misunderstand (13.8%) and lack of money (7.3%). The Cox regression analyzed that the seizure frequency from baseline and course of epilepsy were associated with treatment failure. in addition, 44 (21.2%) patients got seizure freedom,and 153 (72.2%) patients got seizure reduction of ≥50%. 92 patients were found at least one side effect in this research. The most common side effects we observed were irritability (51.1%), somnolence (31.5%), abnormal behavior (14.2%), anorexia (18.5%), somnipathy (16.3%) and learning disability (18.5%). Patients had at least one serious adverse event. Conclusion our study. demonstrated that LEV had higher long-term retention rate in Chinese children and adolescence with epilepsy.

PO-1022

THE INFLUENCE OF THE CHARACTER AND THE EMOTIONAL FACTORS OF THE PARENTS ON THE DIAGNOSIS OF AUTISM

Suping Qi[1], Bingbing Yin[2]
[1]Department of Rehabilitation,The second affiliated hospital of Dalian Medical University,Dalian,China, [2]Department of Rehabilitation,Dalian Children's Hospital,Dalian, China

Objective: To investigate the influence of character tendency and emotional factors of parents on the diagnosis of autism. *Methods:* The general dates of 60 patients with autism were collected, Eysenck personality questionnaire (EPQ) and Self-reporting Inventory (SCL-90) were filled in by father or mother whose child was with autism under the same professional guidance, and autism diagnosis scale (CARS) was completed by the same medical personnel with the parents'help. SPSS software was used to analyze the data. *Results:* There was no correlation between autism diagnosis scale scores of CARS and the characters of the parents whose children were with autism ($p>0.05$); there was significant correlation between the score of somatic symptoms, forced body symptoms, depression symptoms and anxiety symptoms of autism parents' emotional factors and autism diagnosis scale scores of CARS scored ($p < 0.05$). *Implications:* There was significant correlation between parents'emotional factors and diagnosis of autism.

PO-1023

EFFECTS OF QUALITY OF LIFE OF AUTISTIC DISORDER CHILDREN

Zhenhuan Liu, Qiaoling Xie
Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine

Objective: To investigate quality of life in Autistic Disorder children. *Method:* PedsQL4.0 was used to measure quality of life of 200 children with Autistic Disorder and 120 normal children. *Results:* The quality of life of Autistic Disorder group was lower than normal group in the scores of physical functioning were (62.30±25.05), emotional functioning were (53.57±26.69), social functioning were (44.63±27.91), and school functioning (38.69±30.60). The totals cores of PedsQL were (49.86±23.32), with the difference being significant (90.16±13.32, 79.09±19.56, 86.39±15.45, 82.75±16.03, 85.23±14.2, $p<0.01$). *Conclusion:* Children with autistic disorder took grievous influence on quality of life.

PO-1024

CEREBRALPALSY WHEELCHAIR MODIFICATION

Enda Zhang
Anshan Tanggangzi Hospital, Anshan, China

The wheelchair is important auxiliary tool for patient with cerebral palsy, the right wheelchair can not only serve as a patient transport, expanding the scope of activities in patients with cerebral palsy. It can also help patients to maintain the correct posture, contribute to the rehabilitaition training. Choosing wheelchair should pay attention to the length of the seat armrest, width, height and length, the height of the backrest and the pedal height above the ground. Cerebral palsy patients and families should be in the professional guidance for patients to choose a wheelchair, to ensure that patients get wheelchairs to receive the correct posture. It is difficult to buy more appropriate wheelchair, but wheelchair modification for children with cerebral palsy is necessary.

PO-1025

BIRTH WEIGHT AND MODE OF DELIVERY IN RELATION WITH OBSTETRIC BRACHIAL PLEXUS PALSY: AN OLD PROBLEM REVISITED AGAIN

Teuta Osmani-Vllasolli[1], Ardiana Murtezani[1], Valbona Krasniqi[1], Bukurije Rama[1], Lendita Kryeziu[2]
[1]University Clinical Center of Kosovo/Physical Medicine and Rehabilitation Clinic, Albania, [2]University Clinical Center of Kosovo/ Gynecologic and Obstetric Clinic, Albania

Objective methods: Of delivery, and birth weight were examined to determine their role in the occurrence of obstetric brachial plexus palsy. *Methods:* We reviewed the medical records of all live-born singleton infants with brachial plexus palsy in singleton-term deliveries from January 2005 to December 2008, in our hospital; the Neonatology Department, at the Gynecologic and Obstetric Clinic, in Prishtina, Kosovo. A case control study design was used to analyze 106 cases and 212 controls by univariable analysis. *Results:* Birth weight was shown to be a significant risk factor regardless of which method of delivery was used. A high birth weight infants, over 4000 g had 2.69 times (95% CI 2.0 - 3.6) the risk of incurring a brachial plexus injury compared with normal size infants under 4000 g. We have also found a significant increase in the frequency of brachial plexus palsy in infants with birth weight over 4000 g in vacuum ex-

traction (OR=2.3, 95% CI 1.1 - 15.5) and breech delivery (OR=13.5, 95% CI 0.5 - 175.5). The analysis of this birth trauma in newborns with normal birth-weight by mode of delivery, vacuum extraction (OR=5.4, 95% CI 1.6 - 17.7) and breech delivery (OR=6.3, 95% CI 1.3 - 31.8), remained significantly associated with the brachial plexus palsy. *Implications/Impact in rehabilitation:* Our study findings suggest that obstetric brachial plexus palsy has causes in high birth weight of infants in addition with mode of delivery. Delivery by cesarean section was associated with a significant protective effect.

PO-1026

MEASUREMENTS OF QUALITY OF LIFE FOR CHILDREN WITH CEREBRAL PALSY

Zhenhuan Liu, Ruiping Wan

Nanhai Affiliated Maternity And Children's Hospital of Guangzhou University of Traditional Chinese Medicine, Guangdong, China.

Aim: The purpose of this article is to detect common measurements of quality of life (QOL) for children with cerebral palsy (CP). *Method:* To review literatures which attempted to assess QOL in individuals with CP in MEDLINE. *Result:* Five measurements met the inclusion criteria, including PedsQL Generic Core Scales and Cerebral Palsy Module, CHQ, KIDSCEEN, PODCI and CP-QOL. *Conclusion:* Five instruments consist of generic and condition-specific version. Considering development of children both self and proxy report are available. All have acceptable clinical utility. However, further study should be given to comfirm their reliability and validity in assessing QOL of children with CP. There are some drawbacks using these instruments, including confusion of QOL, function and participation, failure to reflex real QOL for children, weak agreement between self and proxy report on social function and psychosocial domains.

PO-1027

THE CLINICAL RESEARCH OF EARLY INTERVENTION TO CEREBRAL SUB-HEALTH INFANTS BY TRADITIONAL CHINESE MEDICINE

Zhenhuan Liu, Jiangying Ding

Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine CHINA

Objective: To observe the effect of early intervention to cerebral sub-health infants by TCM (Traditional Chinese Medicine). *Methods:* 60 cases cerebral sub-health infants aged 2 m-6 m with moderate to severe brain damage in perinatal period were early intervened mainly by our TCM, assisted by physical therapy, audiovisual stimulus and early education. The course of the intervention was 3 months. The DQ of Gesell were compared before intervention, 3 months and 18 months after intervention. *Results:* 3 months and 18 months after the intervention, the DQ of the infants were increased compared with the DQ before the intervention. And the difference is significant for statistics ($p<0.001$). 18 months after the intervention, the DQ of 45 cases were higher than 70. *Conclusion:* The intervention by TCM can reduce the probability of the occurrence of cerebral palsy, mental retardation and other sequelae which were caused by perinatal brain damage, and promote the development of movement, cognitive, language, social and other functions. And its mechanism may be related to the promotion of brain development, promoting damaged neuronal repair.

PO-1028

THE EFFECTS OF WATER-BASED EXERCISE ON RESPIRATORY FUNCTION IN CHILDREN WITH SPASTIC DIPLEGIC CEREBRAL PALSY

Hwa-Kyung Shin

Catholic University of Daegu, Korea

Purpose: We investigated to evaluate the effectiveness of water-based exercise (WE) program on respiratory functions for children with spastic diplegic cerebral palsy (CP). *Methods:* Fourteen children with spastic diplegic CP were randomly assigned, to either the experimental group (EG, $n=7$), or the control group (CG, $n=7$). Respiratory function was measured by a spirometer, a CardioTouch 3000S (Bionet, Seoul, Korea) at a chair-sitting posture. Forced vital capacity (FVC), forced expiratory volume at one second (FEV1), peak expiratory flow (PEF) were measured. The intervention program will last 8 weeks, with three 40 min sessions per week (24 training session). The usual care and the addition of a WE program, were compared in the CG and EG, respectively. *Results:* The EG showed a significant increase in the FVC, FEV1, PEF after training ($p<0.05$), whereas there was no significant difference in the CP after training. In the EG, FVC increased significantly, compared to the control group ($p<0.05$), but not FEV and PEF. *Implication/Impact on rehabilitation:* These findings suggest that WE program have an effect on the respiratory function in children with spastic diplegic CP.

PO-1029

CLINICAL OBSERVATION ON EFFECT OF COMBINE TRADITIONAL CHINESE MEDICINE AND WESTERN REHABILITATION ON NEURODEVELOPMENT OF INFANTS WITH HIBD

Zhenhuan Liu, Jiekuai Chen

Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine CHINA

Objective: To evaluate and analyse the effection of neurodevelopment of the infants with perinatal HIBD treated by children scalp acupuncture combined with Bobath training. *Methods:* 50 cases, which have had HIBD during perinatal period, were below 12 months old when they began to accept the treatment of children scalp acupuncture combined with Bobath training, had completed 4 months' treatment, had full medical record, were collected. Among of them, 28 cases were full term infant, 22 cases were premature infant. 9 cases were up to Brain Damage syndrome (BDS), 22 cases were up to early Cerebral Palsy (CP), 36 cases were up to Delayed Motor and Mental Development,14 cases were up to Microcephaly and 1 case was up to Epilepsy when the treatment started. And then to compare and analyse the Gesell develop quotient (DQ) and the result of head iconography. *Results:* As a whole, after treatment, social adaptiveness DQ, gross motor DQ and fine movement DQ, language DQ, social intercourse DQ hand have significantly improved ($p<0.01$). By observing the head iconography,among the 27 cases with broadening of anterior interhemispheric fissure, 10 cases were found better and 17 recovered after the treatment. The recovery rate was 62.9%. 32 cases with broadening of fissuracerebrilateralis, 12 cases were found better and 20 recovered after the treatment. The recovery rate was 62.5%. 41 cases with broadening of subatachnoid space on frontal lobe, parietal lobe, temporal lobe, 13 cases were found better and 28 recovered after the treatment. The recovery rate was 68.2%. 4cases with agenesis of corpus callosum, 2 cases were found better but 2 cases were not. 11 cases with periventricular leukomalacia (PVL) and 1 case with necrotic and atrophic of parencephalon, 1 case with expansion of Mega cisterna magna all of them were found without improve undergo the treatment. 7 cases with necrotic of frontal or parietal lobe and 2 cases with necrotic of the basal ganglia, all of them were improved undergo the treatment. 4 cases with Delayed Myelination, 3 cases were found better and 1 recovered after the treatment. The recovery rate was 25%. *Conclusion:* The treatment of children scalp acupuncture combined with Bobath training has the effect that significantly promote the neurodevelopment of the infants with HIBD. The manifestations were as follow: 1) The treatment significantly promotes the improvement of intelligence, language and motion ability of the infants. 2) It can promote the development of frontal lobe and parietal lobe.

PO-1030

THE RECOVERY AND FUNCTIONAL WALKING OUTCOMES IN CHILDREN POST-POLIOMYELITIS: OVER 7 YEARS OUTBREAK IN INDONESIA

Rizky Kusuma Wardhani
perdosri, Indonesia

Introduction: Since 1995, Indonesia had been free from polio until the first imported polio virus outbreak reported in West Java in March 2005, then spread to the several region in Indonesia. Those polio cases affected mostly children under 5 years of age. Rehabilitation intervension have been given until 2009, including Banten province, though encountered some difficulties to give sufficient treatment because of geography and sosio-economic condition. The main impact of disability for most patients is in mobility-related activities. This study aimed to evaluate the recovery and functional walking outcomes in children post-poliomyelitis. *Methods:* A cross sectional study was performed in 35 children aged 7 to 17 years after 7 years onset of poliomyelitis at Lebak and Serang regency, Banten province. Recovery from paralysis was observed from the gait pattern. Functional walking ability was measured by the Gillette FAQ and modified WeeFIM. *Results:* Good recovery was seen in 11 children, especially in children with unilateral paralysis at the onset (38.9%). The median score of Gillette FAQ is 9 (1-10), and 71,4% children were able to walk through community (score 8-10). Twenty five children were independent in walking (total score of modified WeeFIM: 25-35). Paralysis at the the onset associated with the Gillette FAQ and modified WeeFIM score (p<0,05), but this association was not found in age, sex, orthoses, and parental education. *Implications:* The importance of rehabilitation and interdisciplinary approach is emphasized, in which impairment as well as disability aspects should be considered in treatment and intervention programs.

PO-1031

EFFECT OF LOW-INTENSITY PULSED ULTRASOUND ON EXTRACELLULAR MATRIX AND MAPKS SIGNALING PATHWAYS IN EARLY AND MEDIUM TERM OF RABBIT KNEE OSTEOARTHRITIS MODEL

Xueping Li
Dept. of Rehabilitation, Nanjing First Hospital, Nanjing Medical University, China

Objective: We established a rabbit osteoarthritis model by anterior cruciate ligament transaction and observed the articular cartilage repair effect of low-intensity pulsed ultrasound irradiation. *Method:* Thirty-six healthy New Zealand rabbits were randomized into early control group, early osteoarthritis group, early treatment group, medium-term control group, medium-term osteoarthritis group and medium-term treatment group. Animals in early control group and medium-term control group underwent articular capsulotomy surgery, and those in other four groups underwent anterior cruciate ligament transaction. In early osteoarthritis group and early treatment group, rabbits received low-intensity pulsed ultrasound irradiation 3 days after surgery, while in medium-term osteoarthritis group and medium-term treatment group irradiation received at the beginning of the fifth week after surgery. However, ultrasound irradiation of early osteoarthritis group and medium-term osteoarthritis group was no output. Six weeks after irradiation, the rabbits were sacrificed and pathologic changes in the articular surface of femoral condyle were assessed. Also, expression of type II collagen, proteoglycan, phophorylated extracellular signal-regulated kinase1/2 and p38 of the articular cartilage was measured by Western blot. *Result:* 1. Histopathological Observations and Mankin Scores: 2. The expression of type II collagen, proteoglycan with western blot analysis: In comparison with EC group, the expression of type II collagen and proteoglycan in EO and ET groups both decreased, but that in ET group is significantly higher than in EO group (p<0.05); In comparison with MC group, the expression of both in MO and MT groups are decreased (p<0.05), and no difference was found between those in MO and MT group (p>0.05). 3. The expression of p-ERK1/2 and p-p38 with western blot analysis: In comparison with EC group, the expression of p-ERK1/2 and p-p38 in EO group were significantly increased (p<0.05), and no difference in EC group (p>0.05). In comparison with EO group, the expression of p-ERK1/2 and p-p38 in ET group was significantly decreased (p<0.05). While in comparison with MC group, the expression of p-ERK1/2 and p-p38 in MO and MT groups was significantly increased (p<0.05). *Conclusion:* Low-intensity pulsed ultrasound intervention is beneficial to articular cartilage repair by abating damage of extracellular matrix in early term of osteoarthritis and extracellular signal-regulated kinase1/2 and p38 signaling pathway was involved.

PO-1032

SCALP ACUPUNCTURE THERAPY OF CHILDREN WITH AUTISM

Zhenhuan Liu, Nuo Li
Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine CHINA

Objective: Assessing the efficacy scalp acupuncture therapy for autism of children. *Methods:* We selected the 70 cases of autism children followed the random number method to divide the cases scalp acupuncture therapy group (30 cases) and structured control group (40 cases). The treated group with activating brain and opening orifices scalp acupuncture therapy, nordoff-robbins therapy and structured teaching, the control group with Nordoff-Robbins therapy and. We used the Clancy Autism Behavior Scale, Childhood Autism Behavior Scale, Autism Behavior Checklist, Gesell Development scale to assess the result before and after treatment, and adopted the blind method to evaluate the results. *Results:* 1. In the same treatment time, the therapy group is better than the control group. 2. Comparing among the treatment group, the older group and younger group, there have significant difference in ABC score, CARS score and social adjustment score. The result cues that the improvement of autism-like after with the treatment of activating brain and opening orifices scalp acupuncture therapy, no matter age. 3. Compared before and after treatment in therapy group, there have significant difference in Language score. The result cues that activating brain and opening orifices scalp acupuncture therapy can significantly improve language function in autism children. *Conclusions:* Activating brain and opening orifices scalp acupuncture therapy can significantly improve the therapeutic effect, be better to improve the autism-like of children and raise the IQ level and language ability.

PO-1033

VALIDITY AND RELIABILITY OF THE GILETTE FUNCTIONAL ASSESSMENT QUESTIONNAIRE TO MEASURE FUNCTIONAL WALKING ABILITY IN CHILDREN POST-POLIOMYELITIS

Rizky Kusuma Wardhani[1], Luh K Wahyuni[1], Lestaria Aryanti[2], Aria Kekalih[3]
[1]Department of Physical Medicine and Rehabilitation Cipto Mangunkusumo National General Hospital, Jakarta,Indonesia, [2]Department of Physical Medicine and Rehabilitation, Fatmawati General Hospital, Jakarta,Indonesia, [3]Department of Community Medicine, Indonesian University, Jakarta, Indonesia

Objective: To examine validity and reliability of Gillette Functional Assessment Questionnaire (FAQ) in Indonesian language translation. *Methods:* A cross sectional study was performed in 35 children post poliomyelitis, aged 7 to 17 years at Lebak and Serang regency. The Gillette FAQ was administered by observations and four rater

through video records to determine the functional walking level of the child, and the interrater reliability of the Gillette FAQ was calculated. External validity was determined by comparing score between the Gillette FAQ and a commonly used modified WeeFIM as a functional ability instrument. *Results:* Good interrater reliability among a researcher and 4 interraters was demonstrated, with high levels of consistency (kappa=1). External validity comparing Gillette FAQ with modified WeeFIM- mobility subscale resulted a good correlation with the power of correlation 0,994 (p=0.001). The equation's formula to predict score of modified WeeFIM was 3.13 + (3.23 x score of Gillette FAQ). *Implications:* Gillette FAQ is a reliable and a valid tool which is simple and easy to use for measuring functional walking ability in children with poliomyelitis.

PO-1034

CASE REPORT: THE DEVELOPMENT OF A GIRL WITH 47,XX+13 /45 X MOSAICISM

Haowei Tang[1], Sufen Liao[1]*, Jyunsian Li[2], Chungche Lin[1], Tasen Wei[1]

[1]Department of Physical Medicine and Rehabilitation, Changhua Christian hospital,Chinese Taipei, [2]Department of Physical Therapy, Department of Physical Medicine and Rehabilitation, Changhua Christian hospital, Chinese Taipei

Objective: The aim of this case report is to describe a 3-year-old girl with mosaicism of trisomy 13 and 45, X with developmental delay and few dysmorphic features. *Method:* Her development was assessed using the Denver Developmental Screening Test (DDST), Peabody Developmental Motor Scales (PDMS-2), and Bayley Scales of Infant Development (BSID-II). *Results:* The child had a short neck, low-set ears, polydactyly, growth retardation, atrial septal defect, hydronephrosis, sensorineural hearing loss, and developmental delay (DD). Her height was consistently below the 1st percentile, and her bodyweight remained between the 3rd and 5th percentile. The DQs ranged from 0.6 to 1.1 at 10 months, with the highest value in the social-personal subscale and the lowest in gross motor. The DQs were from 0.75 to 0.88 at 16 months. At 31-32 months, the gross motor quotient was 79 (8th percentile), the fine motor quotient was 82 (12th percentile), and the motor quotient was 78 (7th percentile) by PDMS-2. The BSID-II intelligence age was 17 months. The DQ of the BSID-II language subscale was 0.36, and the behavior rating scale was within the normal range. *Implications/Impact on rehabilitation:* This is the only case report of global development in a girl with mosaicism of trisomy 13 and 45, X. The child's DQs dropped with growth, and language and mental development were significantly delayed after 30 months. In the future, precise intelligence and language tests should be performed to evaluate her cognitive and language ability.

PO-1035

CLINICAL RESEARCH ON INTELLIGENCE SEVEN NEEDLE THERAPY TREATED INFANTS WITH BRAIN DAMAGE SYNDROME

Zhenhuan Liu, Jiekuai Chen

Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine CHINA

Objective: Employ intelligence seven needle treatment for infants with perinatal brain damage syndrome as early intervention, com pared with the control group, observe the influence of the infants of neural development after this therapy. *Methods:* A randomized controlled trial was conducted. 64 infants with BDS were selected, randomly divided into two groups, experimental group and control group. Both the groups received the routine early intervention for get well, moreover, the experimental group received the treatment of intelligence seven needle adding. Before and after the treatment designed, the Bayley Scales. *Results:* 1. After the treatment, group of experimental has a significant superiority in improving the score reach normalization in Mental Development Index (MDI) by BSID compared with the control group (p<0.05), 2. The children development quotients (DQ) of experimental group has a significant superiority in improving the DQ of social adaptation by Gesell Developmental Scales com pared with the control group (p <0.01), and gross motor function, linguistic and social intercourse tested by Gesell Developmental Scales com pared with the control group (p<0.05). *Conclusion:* The developmental level of the intelligence, motion function, linguistic competence and social intercourse can be promoted by treating the infants with perinatal brain damage syndrome by intelligence seven needle therapy, intelligence seven needle therapy can better the brain blood supply and promote the growth of Frontal lobe and parietal lobe.

PO-1036

A STUDY OF BURDEN AND STRESS IN CAREGIVERS OF CHILDREN WITH CEREBRAL PALSY

R Sardana[1], S L Yadav[1], U Singh[1], S Wadhwa[1], G Handa[1], M Mehta[2], R M Pandey[3]

[1]Departments of Physical Medicine & Rehabilitation All India Institute of Medical Sciences, New Delhi-110029. India,India, [2]Departments of Physical All India Institute of Medical Sciences, New Delhi-110029. India,India, [3]Departments of Biostatistics All India Institute of Medical Sciences, New Delhi-110029 India

Objective: Impaired motor function is the hallmark of the Cerebral Palsy (CP); many of these CP children experiences sensory, communicative, intellectual impairments and may have complex limitations in self-care functions and possibly long term dependence. So the caregivers need to spend on average 12-15 h every day in caring of such children and which in turn become burdensome and may impact the physical, psychological, social and financial wellbeing of caregivers. The purpose of this study is to assess the burden and stress among caregivers. Methodology The study sample consisted of 65 primary caregivers of children with Cerebral Palsy aged 6 months to 10 years. The scales were used, DAS (Depression, Anxiety and Stress) scale and Family burden scale. Data were collected by questionnaires. Descriptive statistics and multiple regressions were used for data analysis. *Results:* Among caregivers the mothers experienced more stress than fathers; gender of the child was not found to have any effect on caregivers. Caregivers with high education level & family income were found to have less, while increase in total duration of caregiving, caregivers experienced more burden and stress. The associated speech disturbance, seizures or mental retardation were found to have more burden and stress on the caregivers. *Implications/Impact on Rehabilitation:* The caregivers of children with CP felt that burden and stress are multifaceted. So it's recommended that healthcare professionals should provide focused interventions to increase the caregiver's skill in providing care and coping with stress, so that caregivers can effectively and efficiently care the children with Cerebral Palsy.

PO-1037

FACTORS ASSOCIATED WITH PARTICIPATION IN CHILDREN WITH CEREBRAL PALSY

Chia-Ling Chen[1,2], Chung-Yao Chen[3,4], I-Shu Liu[2], Chia-Ying Chung[1,4], Hsieh-Ching Chen[5], I-Hsuan Shen[6], Ching-Yi Wu[6,4], Alice May–Kuen Wong[1,4]

[1]Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital, Linkou, Taiwan,Chinese Taipei, [2]Graduate Institute of Early Intervention, Chang Gung University, Taiwan,Chinese Taipei, [3]Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital, Keelung, Taiwan,Chinese Taipei, 4.School of Medicine, College of Medicine, Chang Gung University,Chinese Taipei, [5]Department of Industrial Engineering and Management, Chaoyang University of Technology, Taiwan,Chinese Taipei,

[6]*Department of Occupational Therapy, Chang Gung University, Taiwan,Chinese Taipei*

Objectives: The aim of this study was to identify the factors associated with the participation in children with cerebral palsy (CP). *Methods:* A total of 54 children (2-6 years) with CP and 6 factors were identified, including age, sex, CP subtypes, gross motor function classification system (GMFCS) levels, bimanual fine motor function (BFMF), and Modified Ashworth Scale. Participation was assessed by Assessment of Preschool Children's Participation (APCP) consists of diversity and intensity scores in the areas of play, skill development, active physical recreation, social, and total areas. The factors were measured at baseline and APCP were measured at 6-month later (follow-up). *Results:* The regression analyses showed that the GMFCS level was a robust predictor of diversity and intensity scores in all areas. The age was also a predictor for the diversity scores in the skill development areas. *Implication and Impact on Rehabilitation:* These findings suggest that GMFCS level may play a dominant role in determining the participation in children with CP. These data may allow clinicians anticipate the participation and provide the treatment planning for children with CP.

PO-1038

HALLERMANN-STREIFF SYNDROME: CASE REPORT

Lucrecia Mendoza
Rehabilitacion Department, Cabueñes Hospital, Gijon, Asturias, Spain, Spain

Objective: Hallerman-Streiff syndrome is a rare genetic disorder of unknown cause that comprises multiple craniofacial malformations. About 150 cases have been recorded worldwide. This work seeks to highlight this particular syndrome and report its management within our specialism. *Methods:* A 3-year-old child referred to our clinic for respiratory disorders due to cranial-mandibulofacial dysmorphia. She presents all the typical features of this syndrome: brachycephaly, bird facies with hypoplastic mandible, dental abnormalities, beak-shaped nose, microphthalmia, congenital cataracts, optic atrophy, hypotrichosis, and harmonic dwarfism. Motor and mental development is appropriate for her age. At respiratory level she presents sleep apnoea requiring nocturnal BIPAP with bronchiectasis and recurrent pneumonia. Given the clinical findings, respiratory rehabilitation treatment is presented as an adjunct to pharmacological therapy. Respiratory retraining techniques and muscle training aim to permeabilize the airways, decrease the risk of infection and improve respiratory dynamics and lung function. *Results:* In two months, there has been improvement in managing secretions with disappearance of the acute respiratory symptoms and discontinuation of the pharmacotherapy. Currently one year of evolution without respiratory exacerbations. She still attends regular review examinations in our service in order to evaluate her neuro-orthopaedic and psychomotor development. *Impact on Rehabilitation:* As this is a rare disease a functional assessment is essential to set the objectives of a comprehensive rehabilitation program tailored to the needs of the patient at each stage of development and to coordinate between the various specialists to ensure an approach aiming at holistic development in the social and family environment.

PO-1039

OBSERVE THE AFFECT IN THE TREATMENT EFFECT OF CHILDHOOD AUTISM WITH THE NUTRITIONAL MEDICINE IN NEURO

Jiujun[1] Qiu[1], Jianhua Gong[1], Shuying Lai[1], Dong Li[2]
[1]*Department of Children's Health Section, Shen Zhen Luo Hu Maternal and Child Health Hospital,China,* [2]*Department of Clinical Pharmacy Research, The Second Medical College of Jinan University, Shenzhen Peoples Hospital, China*

Objective: to observe the the affect of the clinical effect with the nutritional medicine in neuro (mouse nerve growth factor, mNGF) treating on the 2-6 years old autistic children. *Methods:* the observation group (30 cases of the 2-6 years old autistic children), give the therapy with comprehensive rehabilitation and the nutritional medicine in neuro one-three courses of treatment, choose the control group 30 cases, only to give comprehensive rehabilitation. Assess the efficacy of the obeservation group according to the scores changes of autism behavior checklist (ABC) and childhood autism rating scale (CARS) before and after treatment. *Results:* 1, After treatment the three autism core symptoms of the obeservation group have varying degree improved, the spirit, speech and sensory function almost go better. 2, After treatment the score of ABC and CARS of obeservation group are significantly lower than the before, the difference are significant, indicating that the comprehensive rehabilitation and the the nutritional medicine in neuro for autistic children have apparent curative effect: 3, After treatment, the decrease estent of the ABC and CARS scores of the observation grouare are better than the control group, the difference are significant, indicating that the nutritional medicine in neuro and the comprehensive rehabilitation can improve the efficacy of the childhood autism. 4. All baby have no obvious side effects. *Implications/Impact on rehabilitation:* The nutritional medicine in neuro have synergy effect with traditional autism therapy method, is worthy to be popularized and further research.

PO-1040

STUDY ON RELIABILITY AND VALIDITY OF THE CHINESE VERSION OF THE QUALITY OF UPPER EXTREMITY SKILLS TEST IN CHILDREN WITH SPASTIC CEREBRAL PALSY

Zhimei Jiang, Peng Liu, Jinghua Tang, Lei Xu, Fuxiang Song, Mengying Dai, Qifeng Sun
Prevention,treatment and rehabilitation center for child cerebral palsy in Heilongjiang province, China

Objective: To investigate the reliability and validity of the Chinese version of the quality of upper extremity skills test for children in order to guide the clinical practice. *Methods:* The English version of the QUEST was translated into Chinese.70 children with spastic cerebral palsy were recruited as paticipanes, 30 of which were recruit for the test-retest reliability, with a interval of 2 weeks and 30 of which were selected for interscorer reliability. Parallel validity was analyzed by calculating the correlations between different raw scores of QUEST and PDMS-FM of 50 children. *Results:* Different raw scores of QUEST possess excellent test-retest and interscorer reliablities (ICC>0.90).Good parallel validity (Pearson r=0.717-0.921) was found between different raw scores of QUEST and PDMS-FM *Conclusion:* Reliability and validity of Chinese version of QUEST was determined in this study.It can be used as an effective measuring tool to evaluate upper extremity skills for children with spastic cerebral palsy.

PO-1041

THE APPLICATION OF SENSORY PROFILE IN ASSESSING THE CURATIVE EFFECT FOR CHILDREN WITH AUTISM

Jiantao Nie, Zhuoming Chen
The First Affiliated Hospital Of Jinan University, China

Objective: To introduce a valid assessment tool to evaluate the therapeutic effect for autistic children. *Method:* In the present study, a 5 y 4 m male autistic child, previously without any drug therapy, was trained and observed for more than 2 years. Clinical observations for the child included: poor development of expressive language with limited sentence frame like only using two-word utterance as well as lacking of interrogation and conjunction; poor

story comprehension; 150-word perception; failure to develop peer relationships, especially deficiency in social cognition and skills though with strong desire for communication; flat facial expression; absence in make-believe play or social imitative play; lacking interest in toys or games; disliking tooth-brushing; strong desire for food. And no significant repeated patterns of stereotypic behavior were found. To assess therapeutic effect, sensory profile was used to analyze the individual development of the autistic child before-and-after training. *Results:* Sixteen of the twenty-three test items were significantly improved, including sensory seeking, low endurance/tone, oral sensory sensitivity, inattention/distractibility, poor registration, sedentary, fine motor/perceptual, visual processing, vestibular processing, touch processing, oral sensory processing, sensory processing related to endurance/tone, modulation related to body position and movement, emotional/social response, behavioral outcomes of sensory processing, thresholds for response. While four items were decreased, including emotional reactive, auditory processing, modulation of movement affecting activity level, modulation of sensory input affecting emotional responses. Other three items showed no significant difference, including sensory sensitivity, multisensory processing, modulation of visual input affecting emotional response and activity level. The result was identical with the autistic child's clinical manifestation, behavior observation and imaging examination. *Implications:* The pre-experiment indicated that it is worth while to further explore the effect of sensory profile and its usage in evaluating the curative effect for children with autism.

PO-1042

QUALITY OF LIFE OF AUTISTIC DISORDER CHILDREN OF PARENTS

Zhenhuan Liu
Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine CHINA

Objective: To investigate quality of life in parents of Autistic Disorder children. *Method:* SF-36 was used to measure parent's quality of life of 90 children with Autistic Disorder and 120 normal children. *Results:* The quality of life of patients in normal children was higher than in Autistic Disorder group in Physical (90.84±11.46), Role-Physical (54.22±42.10), Bodily Pain (72.36±23.40),General Health (67.53±21.20),Vitality (60.14±25.00),Social Functioning (71.95±26.60), Role-Emotional (53.38±41.70), and Mental Health (67.23±20.00) with the difference being significant (96.16±13.32, 90.09±19.56, 89.53±24.80, 92.92±20.20, 86.39±15.45, 95.63±25.40, 22.2±30.282.75±12.03, 91.75±16.03, $p<0.01$). The quality of life of patients in normal children High functioning Intelligence group was higher than in Autistic Disorder group. The quality of life of patients in low functioning Intelligence group are worse than High functioning Intelligence group. *Conclusion:* Children with Autistic Disorder took grievous influence on parent's quality of life. Compared with High functioning Intelligence group, the low functioning Intelligence Children's Parents quality of life were even worse.

PO-1043

BEHAVIORAL PROBLEMS AND ITS INFLUENCING FACTORS IN 322 CHILDREN WITH CEREBRAL PALSY

Wenyu Yu, Tao WANG, Bang-Hui LI, Nong XIAO
Department of Rehabilitation, Children's Hospital of Chongqing University of Medical Science

Objective: To explore the effects of group sand play on the behavior of cerebral palsy (CP) children with behavioral problems. *Methods:* Ninety children with CP aged 3-5 with behavioral problems were selected, after those with mental retardation had been excluded through the Peabodypicture vocabulary test (PPVL). Their behavioral problems were diagnosed using Achenbach's child behavior check list (CBCL). The children were randomly divided into an experimental group and a control group with 45 cases in each. The experimental group received 10 weeks of sand play treatment in addition to routine rehabilitation. The controls received only routine rehabilitation. *Results:* After treatment, the social withdrawal, depression, aggression and disruptive behavior scores of the 3-years olds in the experimental group were significantly lower than before treatment and significantly lower than those of the controls. For the 4 and 5 year-old boys the results were similar in terms of social withdrawal, depression, immaturity, sexual behavior, aggression and delinquent behavior. For the 4 and 5 year-old girls the scores for depression, somatic complaints, social withdrawal, compulsion, aggression, and hyperactivity showed similar significant improvements. *Conclusion:* Group sand play can improve the behavior and promote the mental health of CP children.

PO-1044

CLINICAL STUDY OF CHINESE MASSAGE COMBINED WITH MUSIC THERAPY IN TREATMENT OF CEREBRAL PALSY

Zhenhuan Liu
Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine CHINA

Objective: Clinical observation of traditional chinese massage combined with music therapy to improve lower limbs' range of motion (ROM) and to reduce score of composite spasticity scale (CSS) in children with cerebral palsy (CP). *Methods:* Traditional chinese massage was performed to children with CP, such as to attack vital points of DU meridian, to tonify qi of kidney and slpeen, pinching massage, footplate massage, and segmental massage. Background music was played at the same time. Course of treatment was 30 days. ROM of ankle-joint and hip-joint, score of CSS was measures before and after the treatment. *Results:* 286 children with CP paticipated. 106 cases showed significant effect (37.40%), 172 cases showed progress (59.16%), and 8 cases had no-effect (2.84%). Significant improvement were found after treatment for ROM of ankle-joint (bofore: 105.64±12.66; after: 76.58±9.89), and ROM of hip-joint (bofore: 119.89±25.47; after: 158.99±18.66) ($p<0.01$). Score of CSS was significantly lower after treatment (before: 12.39±2.56; after: 7.069±2.97) ($p<0.01$). *Conclusion:* Traditional chinese massage combined music therapy can regulate qi and blood, solute muslce contracture and spasm, so as to rectify scissors gait and talipes, to improve gross motor function of children with CP. It is a therapy of convenience, economy and benefit.

PO-1045

THE STUDY ON QUALITY OF LIFE OF CHILDREN WITH CEREBRAL PALSY

Zhenhuan Liu
Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine CHINA

Objective: To study the quality of life of children with cerebral palsy. *Methods:* With the PedsQL4.0, 113 children with cerebral palsy were studied, and 52 children with common illness and 314 normal children were also studied and compared. With the PedsQL of school functioning, the children of these three groups who had been to school or kindergarten were also studied and compared. *Result:* The score of physiology functioning, communication functioning and total score of PedsQL in children with cerebral palsy were lower than those in the children with common illness and normal children. The difference has statistic significance. The score of emotional functioning in children with cerebral palsy was only lower than that in the normal children, the difference has statistic significance. The score of school functioning in children with cerebral palsy was significant lower than that in children with common illness and normal children ($p<0.01$). *Conclusion:* The

quality of life of children with cerebral palsy is much lower than children with common illness and normal children. The illness has sever effect on the school functioning of children with cerebral palsy. Therefore, the whole improve of quality of life is the goal for the rehabilitation of children with cerebral palsy.

PO-1046

REHABILITATION THERAPY FOR ENHANCING ATTENTION IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVE DISORDER: A SYSTEMATIC REVIEW

Jiajia Ye, Shizhon Wang
Department of Rehabilitation Assessment, Rehabilitation Hospital, Fujian University of Traditional Chinese Medicine, China

Content: Attention deficit hyperactive disorder has a high prevalence in children under the age of 18 years. Among three subtypes, the attention was the most common one. The golden intervention was to combine the medicine and non-medicine treatments. Behavior management played a vital role in developing attention. *Objective:* The aim of this systematic review was to summarize research studies of non- pharmaceutical interventions and give a foundational knowledge for further research. *Method:* Four databases (Biomedical, PsycInfo, Pubmed and Medline) were searched from 2004 to 2012. Studies focused on attention subtype in children under 18years with non- pharmaceutical interventions. *Implications:* Therapeutic interventions including yoga, meta-cognitive therapy and cognitive behavior therapy were considered as effective training tool for children with attention subtype in attention deficit hyperactive disorder.

PO-1047

589 CASES OF CHILDREN AT RISK HIGH-RISK FACTORS OF THE STATISTICS AND ANALYSIS OF THE RESULTS OF SCREENING IN NANTONG

Yufei Ni
Children rehabilitation medicine center, Nantong Maternity and Child Health Hospital, Jiangsu, China

Objective: Monitoring 589 cases of cerebral palsy high-risk in Nantong high risk factors of the screening method and screening of the analysis. *Methods:* To high-risk outpatient service has cerebral palsy children of high-risk risk factors, and using the particular statistical analysis of the questionnaire screening. *Results*: In cerebral palsy high-risk macrosomia, Cord around Neck, premature delivery and low birth weight occupy the three risk factors, including the incidence of cerebral palsy is as high as 7.0%, Children with cerebral palsy in the three risk factors is premature delivery and low birth weight (34.1%), Neonatal hypoxia ischemic encephalopathy (24.4%), Cord around Neck (22.0%). *Conclusion:* High-risk children are at higher risk of cerebral palsy children happened, of this section should be to strengthen the monitoring, children strive to accomplish early screening and early diagnosis and early treatment.

PO-1048

A REHABILITATION CURATIVE EFFECT OBSERVATION ON SELF-MADE RESPIRATORY TRAINING BELT AND DU MERIDIAN MASSAGE TO FLACCID CHILDREN WITH CEREBRAL PALSY TRUNK MUSCLE WEAKNESS

Wang Junjie*, Wang Huifang, Zhai Hua
Shanghai Sunshine rehabilitation certer, China

Objective: To develop the ability of the children who were suffering from flaccid cerebral palsy to sitting balance and the ability to life independently, so as to reduce the burden of their family,we suggest that the self-made respiratory training belt should be used together with Du meridian massage and general physical therapy, to improve the trunk muscle weakness of these children. *Methods:* The first author herself had diagnosed of whom 120 children had been diagnosed clearly cerebral palsy (flaccid), from the June 2008 to the June 2012. All aged 2-12 years (±0.5), they were randomly divided into the treatment group of sixty cases and the control group of sixty cases. According to the principle of electric breathing vest based on the size of the measurement individual (with measuring bust along the third lib level and epigastrium along the twelfth lib level to every choice children), were all given to breathing training,Du meridian massage,general rehabilitation therapy (including all kinds of physical therapies). On the contrary,the control group had received only general rehabilitation therapy (including all kinds of physical therapies). Stage goals were set according to different age groups before and after treatment,thus detailed evaluation of sitting balance,abdominal muscle strength,upper back muscle,children's ADL, gross motor and fine motor, etc.had been carried out. *Results:* Before the treatment,the score differences of both groups were of no statistical significance ($p>0.05$). Six months after the treatment,the score differences of both groups were of clear statistical significance ($p<0.05$).The treatment group trunk muscle and children's ADL scores were significantly higher than those in the control group. Impact on rehabilitatipon: The self-made respiratory training belt and Du meridian massage therapy have much effect on the children patients, to improve flaccid of cerebral palsy trunk muscle weakness, develop the patient's ability to sitting balance and the ability to live independently. This innovativeness of this study is based on the principle of German respiratory training vest to self-made respiratory training belt, be given breathing training and the Du meridian massage, along with general rehabilitation therapy methods, Our new method can obviously improve the intercostal muscle, abdominal muscle, and all kinds of the group of torso muscle strength, and can increase the depth of the breath, promoted the pulmonary circulation and systemic circulation efficiency, and can improve brain oxygen, thus making children with cerebral palsy to develop their abilities in gross motor, fine motor,sitting balance, and children's ADL. In addition, this method is not only individual,economical and practical, but also convenient to use.We believe that it conforms to the situation in China and should be popularized.

PO-1049

CLINICAL EFFECT OF ELECTRO-ACUPUNCTURE COMBINED WITH HYPERBARIC OXYGEN FOR THERAPY OF CEREBRAL PALSY

Zhonghua Wang, Juan He, Bo Yang
Department of Rehablitation, the First Hospital, Xi'an Jiaotong University Medical Collage, China

Objective: To observe the treatment effect of electro-acupuncture combined with hyperbaric oxygen for cerebral palsy. *Methods:* 90 cases of cerebral palsy were randomly divided into two groups, in which the control group (45 cases) was treated with drugs and kinesitherapy; while the treatment group received electro-acupuncture combined with hyperbaric oxygen additionally. All patients were evaluated by activity daily life and comprehensive function assessment for cerebral palsy before and after treatment. *Results:* After 3 months treatment, activity daily life, movement ability of comprehensive function and total effective rates of treatment groups were better than control group ($p<0.05$); The children of the treatment group was also significantly higher efficiency ($p<0.05$). *Conclusion:* Electro acupuncture combined with hyperbaric oxygen is a better treatment method of cerebral palsy.

PO-1050

OSTEOMYELITIS AND DESTRUCTION OF THE ATLAS AND AXIS IN A 4-WEEK OLD INFANT: HOW CAN WE MOBILIZE AND REHABILITATE?

Peter Banczerowski[1,2]*, Gábor Czigléczky[1,2], Zoltán Papp[1]
[1]National Institute of Neurosurgery, Budapest, Hungary, Hungary, China, [2]Semmelweis University Faculty of Medicine, Department of Neurosurgery, Budapest, Hungary, Hungary, China

Objective: Cervical vertebral osteomyelitis involving the atlas and axis in childhood is distinctly unusual that could lead rapidly to devastation of vertebral body. Only a few reports have been published before and no case of osteomyelitis destruating the atlas and dens axis at the same time has been previously reported an early age. *Methods:* We report an unique case of a 4-week old child with multiple abscess that penetrated cervical structures and destruated vertebrae C1-C2. Retropharyngeal and thoracic abscesses were surgically removed and the therapy was completed with antibiotics. The child was positioned in a specific fixation device for 8 weeks. The follow-up examination was prepared with MRI, CT scans and functional X-ray diagnostics. *Results:* The functional examination revealed no significant instability of cervical spine after 2 months. He was allowed to evolve the motion function and walk independently carefully. Under 3-year follow-up period, the boy presented no signs of neurological deficit and painless, but limited range of neck movements, that are hypothetically possible through the remnants of the bony elements of C1-2 and the connective massive scar tissue formation after the inflammation. The child's development was undisturbed and closed up to his contemporaries with continuous fiziotherapy. Implication C1-2 osteomyelitis is a very rare entity even in children. There is limited experience with treatment and rehabilitation, but temporary immobilization of the neck, surgical debridement, antibiotic treatment and continuous fiziotherapy are advised. Under the follow-up will be decided the measurement of instability, the reconstitution of the affected bones and ligaments, and necessity of surgical stabilization.

PO-1051

THE CLINICAL OBSERVATION OF THE CHILDREN WITH AUTISM WITH THE COMPREHENSIVE REHABILITATION

Jianhua Gong, Jiujun Qiu, Dongmei Chen, Junjie Yang
Department of Children's Health Section, Shen Zhen Luo Hu Maternal and Child Health Hospital, China

Objective: To observe the impact on symptoms, ratings and cerebral electrophysiological of the children with childhood autism with comprehensive rehabilitation. *Method:* 36 2-6 year-old children with autism, given speech training, multi-sensory training, meridian balancing therapy, transcranial magnetic stimulation treatment, the treatment of cerebral ultrasound scanand brain nutrition treatment all 3 months, compare the main symptoms autism, the score of autism behavior checklist (ABC) and childhood autism rating scale (CARS), brainstem auditory evoked potential results before and after treatment. *Results:* 1.After treatment the main autism's symptoms have warying degree improved, the level of body functions and activities and participation have varying degrees improved else; 2. The ABC scales and CARS Scale was significantly reduced ; 3. The waves' incubation period and the hearing threshold from the brainstem auditory evoked potential of children with childhood autism is almost go better. These indicated that comprehensive rehabilitation therapy can improve the brain dysfunction and symptoms of children with childhood autism, reduce illness and promote rehabilitation. *Implications/Impact on rehabilitation:* The comprehensive rehabilitation major role in the brain of children, training children's spirit, speech and sensory, improve the abnormal behavior, which is a useful complement to traditional autism therapy.

PO-1052

RISK FACTORS OF CEREBRAL PARALYSIS INFANTS COMPLICATED WITH EPILEPSY

Guilan Peng, Hushuxiang, Liyinlan, Wangyangdan, Caishuying
Department of Neurological Rehabilitation, Xiamen Maternity and Child Health Care Hospital, Fujian, Xiamen 361003, China

Objective: To investigate the clinical characteristics and the risk factors of cerebral palsy (CP) complicated epilepsy. *Methods:* The 522 children with CP (92 cases complicated with epilepsy and 430 cases non-complicated with epilepsy) were studied retrospectively, including the high risk factors and iconography. The clinical onset of epilepsy, paralysis of the type and level of mental development were also analyzed in 92 cases complicated with epilepsy. *Results:* The incidence of 522 cases of children with cerebral palsy with epilepsy was 17.6%. The study demonstrated that the risk factors of CP complicated with epilepsy were low birth weight ($\chi2=6.564$, $p<0.05$) and intracranial hemorrhage ($\chi2=11.797$, $p<0.05$).There was no statistically significant difference between the two groups in preterm delivery, asphyxia, and pathologic jaundice. The imaging findings showed the encephalomalacia ($\chi2=5.250$, $p<0.05$) and brain structure deformity ($\chi2=14.020$, $p<0.05$) were predictive risk factor for epilepsy, while there was no statistically differences between Cerebral hypoplasia and ventriculomegaly ($p>0.05$). The onset of type of epilepsy is the most common tonic-clonic seizures (44.5%), myoclonic seizures in second place (28.3%), followed by focal seizures (15.3%), infantile spasms (10.8%), one patients without typical attack (1.1%). Ninety-seven point seven percent of children with CP complicated with epilepsy had different degrees of mental retardation. The highest incidence of epilepsy was quadriplegia (61.9%). *Conclusion:* Epilepsy is a common complication of cerebral palsy, its imajor seizure types were tonic-clonic seizures and myoclonic seizure. Low birth weight, intracranial hemorrhage were risk factors for cerebral palsy with epilepsy. Encephalomalacia and brain structures deformity probably increased the incidence of epilepsy, which was not be ignored. The cerebral palsy children complicated with epilepsy had higher incidence rate of mental retardation. The quadriplegia was easily complicated with epilepsy.

PO-1053

REMIND TO MOVE - A COMPARISON OF ITS EFFECTS OF IN UPPER LIMB FUNCTIONS WITH FORCED USE IN CHILDREN WITH HEMIPLEGIC CEREBRAL PALSY: A PILOT STUDY

An Qin Dong, Nai Kuen Fong*, Louisa Wong
Hong Kong Polytechnic University, Hong Kong

Background: "Remind to move" treatment was found to be useful in promoting awareness of the hemiplegic side and improving the initiation of movements against nonuse of the hemiplegic arm after stroke or unilateral cerebral palsy. *Objective:* To investigate the effects of sensory cueing treatment with repetitive upper limb (UL) tasks practice on hemiplegic arm functions in children with unilateral cerebral palsy (CP) in a pilot study. Methodology: This is a single-blinded randomized cross-over study with repeated measurement design. Twelve students with unilateral CP aged 6 to 18 years (mean age 13.08±4.44 years, 7 males and 5 females) were recruited by convenience sampling from a special school for children with physical disabilities in Hong Kong. The participants were randomly assigned into two groups by matched pairs and underwent two 3-week training. The students in the experimental group were required to undergo a 3-week 'sensory cueing treatment' followed by a 3-week 'sham treatment', whereas those students in the waiting group completed the 3-week 'sham treatment' first, then followed by the 'sensory cueing treatment'. There was a 3-week washout period between the two training phases. During the experimental treatment, children were required to wear a sensory cueing wristwatch which was activated and promoted them to do predetermined exercise on the hemiplegic UL for 6 h daily, 5 days per week, for 3 weeks. During the sham treatment, children were also asked to move their limbs as much as possible and the movements were recorded by the

device. All participants were required to complete 5 h conventional individual occupational therapy in the whole study, which included splinting, muscle strengthening, passive stretching, and functional training on unilateral and bimanual UL tasks with daily home exercise. Outcome measures: Assessments of UL efficiency, functional hand use, and UL impairments were carried out at 4 measurement occasions: O1-baseline (the day before treatment), O2-posttest 1 (the day after first training phase), O3-pretest 2 (the day before second training phase), and O4-posttest 2 (the day after second training phase). *Results:* Sensory cueing treatment with repetitive UL tasks practice was effective for improving the functional hand use and arm impairment on the hemiplegic UL in children with unilateral CP. Apart from UL efficiency, both the functional hand use and arm impairment improved significantly, and the effects were maintained for 6 weeks after a 3-week sensory cueing intervention. The gains of functional hand use as revealed by the School Functional Assessment physical tasks (p=0.028) and Caregiver Functional Use Survey (p=0.028). The limb impairments improved in active range of motion of shoulder flexion (p=0.015) and wrist extension (p=0.002). *Conclusion:* Sensory cueing treatment has a positive effect on hemiplegic UL functions and actual hand use in children with unilateral CP. Further research with a large scale randomized controlled trial with comparison to forced use is recommended.

PO-1054

STUDY ON THE EFFECT OF CONDUCTIVE EDUCATION COMBINED WITH CHINESE MASSAGE IN GMFM,ADL AND IQ OF PRESCHOOL AND PRIMARY CHILDREN

Jiulai Tang, De Wu, Xiaoyan Xu, Li Yang, Xiaosong Bu, Keyin Tian, Fuli Lv

Peadiatric Neurology and Rehabilitation Center, the First Hospital of Anhui Medical University Hefei city, Anhui province 230022, China

Objective: To study the effect of the conductive education Combined with Chinese massage for gross motor function (GMF), daily life activities ability (ADL) and intelligence quotient (IQ) of the preschool and primary children with spastic cerebral palsy (CP). *Methods:* 186 hospitalized children with spastic CP from 48 months to 72 months were treated by conductive education Combined with Chinese massage for six months, every child received training by conductive education for 4 h and Chinese massage for 2 h everyday,5 days in a week and from 2006 to 2012.All children were tested by gross motor function scale 88 items (GMFM-88), ADL Scale and Weches preschool and primary scale of intelligence (meanwhile, Combined with assess by a assessing group). comparing the their scores before and after treatment. *Results:* GMFM-88 scores, ADL scores and IQ after treatment were higher than those before treatment (t respectively=15.301, 11.585, 2.277, p< 0.01, p<0.01 and p<0.05, respectively),significant statistics was demonstrated. *Conclusion:* The conductive education Combined with Chinese massage was demonstrated to improve the gross motor function, daily life activities ability and intelligence quotient of the preschool and primary children with spastic cerebral palsy.

PO-1055

OBSERVATION OF EFFECT ON NEURAL DEVELOPMENT ON MASSAGE OF TONGDUXINGNAO AND YISHENJIANPI IN THE BRAIN DAMAGE IN PRETERM INFANTS

Zhenhuan Liu

Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine CHINA

Objective: The effects of the two groups is compared to see whether there are superiority in early intervention of brain damage in preterm infants with the Massage of Tongduxingnao and Yishenjianpi. Whether to further established the important position of traditional Chinese medicine in the early intervention of brain damage in premature infants. *Methods:* 82 infants with Brain demage in preterm infants were selected, randomly divided into two groups. The experimental group received the treatment of Massage of Tongduxingnao and Yishenjianpi combined with routine intervention. The control group received Massage of Sensory Stimulation combined with routine intervention. The Gross Motor Function Measure, Bayley scales of infant development II (MDI, PDI) and the Gesell Developmental Scales were tested before, right after and 3 months after the treatment designed. *Results:* The children's development quotients (DQ) and GMFM (A, B) areas in both groups are improved. The experimental group has a significant superiority in improving the DQ of gross motor function by Gesell Developmental Scales and GMFM (B area)compared with the control group (p<0.05), but no discrepancy in the others. After the treatment,the score of experimental group reach normalization in Mental Development Index (MDI) and Psychomotor Development Index (PDI) by BSID is higher compared with the control group (p>0.05). *Conclusion:* The Massage of Tongduxingnao and Yishenjianpi and the Massage of Sensory Stimulation can promote the developmental level of the intelligence and gross motor function,and The Massage of Tongduxingnao and Yishenjianpi has a significant superiority in improving the DQ of gross motor function and sitting position (B area of GMFM)

PO-1056

EVALUATION OF THE IMPROVEMENT IN FUNCTIONAL INDEPENDENCE IN POST OPERATIVE CEREBRAL PALSY CHILDREN

Navneet Singh, Santhosh Mathagi, Deepika Sharma

cmc&h, India

Background: Cerebral palsy leads to secondary musculoskeletal problems. Children with cerebral palsy received soft tissue surgical release with post-operative management of Physiotherapy and Occupational Therapy with Orthosis. *Methods:* The study is a cohort study. FIM scale assesses physical and cognitive ability. Preoperative evaluation was done on 45 children in the PMR OPD for a period of two months. These children underwent soft tissue surgical release. Post operatively Physical and Occupational therapy were given to these patients each for an hour per day. Post 6 weeks, evaluation on the previously evaluated children was done using FIM score. *Results:* Transfers showed 7.7% improvement that initially were able to do less than 25% of the task, after receiving surgery got improved in transfer by two levels. There is one level improvement in children who received surgery. Children who received physiotherapy with surgery showed improvement by five levels. 31.6% of them became modified independent where a device like walking stick is used for completing the task but they required no physical help. 19.2 % of children after surgery were able to do more than 75% of task that included mobility. *Implications on Rehabilitation:* The study showed in addition to Surgery if Physical and Occupational therapy is also provided, then there is better improvement in Mobility and Self-care. It is necessary to know that the brain damage due to cerebral palsy cannot be reversed and that the treatment of cerebral palsy mainly focuses on maximizing individual potential and enhancing their independence.

PO-1057

A PRELIMINARY STUDY OF THE COST-EFFECT EVALUATION ON REHABILITATION IN PATIENTS WITH ADOLESCENT IDIOPATHIC SCOLIOSIS

Qing Du[1], Xuan Zhou[1], Huan Wang[1], Li Zhao[2], Ting Chen[2], Nan Chen[1], Shuxin Zhang[1], Tijiang Lu[1],

Chenhui Pan[1], Weiwei Deng[1], Peijie Chen[3]
[1]Department of Rehabilitation, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine,China, [2]Department of Pediatric Orthopedic, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine,China, [3]Department of Kinesiology, Shanghai University of Sport, China

Objective: To evaluate the expense of rehabilitation in patients with adolescent idiopathic socliosis (AIS) through the cost-effect analysis. *Method:* Twenty-four subjects were divided into two groups according to their management: the rehabilitation group received exercise, manipulation and brace; the operative group received surgery. All the subjects were assessed with a Chinese version of the Scoliosis Research Society-22 (SRS-22) health-related quality-of-life (HRQL) questionnaire before and after treatment. At the end of the 6th month, the cost was investigated. *Results:* At the end of the 6th month, self-image/appearance and mental health for the rehabilitation group were better than before treatment, and self-image/appearance and satisfaction with management were better for the rehabilitation group than for the operative group. The self-image scores were improved 1 point, the total direct medical costs of the rehabilitation group and the operative group were ¥14 561.07 and ¥74 776.44 respectively. *Implications/Impact on Rehabilitation:* Rehabilitation is an economical and effective medical strategy for AIS patients.

PO-1058

THE EFFECT OF VIBROACOUSTIC THERAPY WITH FIVE ELEMENTS MUSIC ON MUSCLE TONE OF CHLIDREN WITH CEREBRAL PALSY

Zhenhuan Liu, Lihong Zhang
Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine CHINA

Objective: This research uses a series of clinical treatment, to observe the curative effect of vibroacoustic therapy with Five Elements Music on the muscle tone of children with cerebral palsy (CP). *Methods:* This research uses a case-control study of the experimental design method. 90 cases of spastic CP were randomly divided into three group, 30 cases in each group, named commen therapy group, listening group and vibroacoustic group. Commen group were treated by physical therapy, massage and hydrotherapy by chinese medicine. Listening group were treated by listening to the Jiao Music and the tharepy as commen group. Vibroacoustic group were treated by vibroacoustic therapy with the Jiao Music and the therapy as commen group. Listening group and vibroacoustic group were treated for 30 min, 20 days as a period of treatment. We scale muscle tone and the ROM of hips, knees and ankle before and after treatment. *Results:* 90 children participated in all. There were no significant differences in children's age and gender, as well as the muscle tone and ROM in lower limbs. After 20 days treatment, the muscle tone of the children in listening group and vibroacoustic group decrease ($p<0.05$). Only the ROM of the children in vibroacoustic group improved ($p<0.05$). Clusion Listening to the Jiao music of Five Elements and vibroacoustic therapy with Jiao music can decrease the muscle tone in lower limbs of the chlidren with spastic cerebral palsy. And vibroacoustic therapy with Five Elements Music can also improve the ROM of lower limbs.

PO-1059

WEAR ANKLE FOOT ORTHOSES (AFO) AND ELASTIC BELT TYPE LOWER LIMB GAIT TRAINING USING ROTARY BRACE WEIGHT LOSS OBSERVATION OF THE PRESCHOOL CHILDREN WITH CEREBRAL PALSY WALKING FUNCTION

Jingjing Cheng
Chongqing three gorges children sorting children rehabilitation center hospital, China

Objective: to investigate the wear ankle foot orthoses (AFO) and elastic tape of lower limb rotation brace using weight loss instrument to learn before a curative effect observation of children with cerebral palsy gait training. *Methods:* 60 cases older (age 3 or higher) cerebral palsy were divided into treatment group and control group, treatment group was wearing an ankle foot orthoses (AFO) and elastic tape of lower limb rotation brace apparatus using weight loss weight loss under training, combined with the comprehensive rehabilitation exercise treatment. Control group exercise comprehensive rehabilitation treatment. Assess gross motor score (GMFM) of the two in standing and walking, and walking ability (WA), (WE) and functional walking walking efficiency grade (FAC, movement function classification (GMFCS) etc. Results show that the treatment group after treatment gait improvement obviously, obviously improve the motor ability: GMFM and walking ability (WA), (WE) and functional walking walking efficiency rating (FAC GMFCS increased significantly, compared with before treatment difference was statistically significant. While the control group have also improved, but not as the treatment group improved significantly. *Conclusions:* type spasm cerebral palsy in comprehensive rehabilitation exercise treatment combined with worn under a variety of simple orthoses weight training can effectively improve and enhance the gait in children with cerebral palsy and movement ability.

PO-1060

EFFECTS OF BOTULINUM TOXIN ON REDUCING THE CO-CONTRACTION OF ANTAGONISTS IN BIRTH BRACHIAL PLEXUS PALSY

Yong Beom Shin[1], Myung Jun Shin[1], Jae Hyeok Chang[1], Young Sun Cha[1], Sung Hwa Ko[1], Soo-Yeon Kim[2], Hyun-Yoon Ko[2]
[1]Department of Rehabilitation Medicine, Pusan National University School of Medicine and Biomedical Research Institute, Pusan National University Hospital, Busan, Korea, [2]Department of Rehabilitation Medicine, Pusan National University School of Medicine and Research Institute for Convergence of Biomedical Science and Technology, Pusan National University Yangsan Hospital, Korea

Objective: To investigate effects of botulinum toxin A (BTA) in patients with birth brachial plexus palsy (BBPP) by reducing the abnormal co-contraction of the antagonist muscles. *Method:* The records of 15 consecutive outpatients with acquired BBPP were reviewed for treatment with BTA. Four patients met the inclusion criteria. These patients had electromyographic evidences of major co-contraction in biceps-triceps and lateral deltoid-pectoralis. The Medical Research Council Muscle Grading System (MRC), the Modified Gilbert Shoulder Evaluation Scale and the root mean square (RMS) value of motor unit action potentials were compared before and after BTA injection on co-contracted antagonist muscles (triceps brachii and pectoralis major). *Results:* All patients except one in the oldest patient (13 years and 5 months) demonstrated functional improvement in MRC and the Modified Gilbert scales. The positive changes of RMS values were observed in all patients. *Implications:* Results in our series suggest that local BTA injections can be beneficial for controlling the harmful co-contraction of antagonist muscles in children with BBPP, except for those with limited PROM. This retrospective study points to effects of BTA on antagonist muscles, yet future prospective studies are warranted to clarify the effects of BTA in patients with BBPP.

PO-1061

EFFECTS OF EARLY INTELLIGENCE INTERVENTION ON INTELLIGENCE DEVELOPMENT OF INFANTS WITH HIGH RISK FOR CEREBRAL PALSY

Wenjuan Chen
Affiliated children's hospital of chongqing medical university, China

Objective: To study the influence of early intelligence intervention on intelligence development of infants with high risk for cerebral palsy (CP). *Method:* 102 infants with high risk of cerebral palsy were randomly divided into two groups: 51 cases in the intervention groupd and 51 cases in the control group; Cases in control group were taken hyperbaric oxygen therapy and hydrotherapy. Cases in intervention group were added intelligence intervention on the basis of hyperbaric oxygen therapy and hydrotherapy, All the infants had evaluated there intelligence when they were 1 year old. *Result:* Gesell score of intervention group was the result is significantly higher than that of the control group ($p<0.05$) *Conclusion:* Early intelligence intervention on the infants with high risk for cerebral palsy can effectively improve the intelligence development and reduce the incidence of sequela.

PO-1062

CLINICAL RESEARCH ON IMPROVING THE BRAIN MICROCIRCULATION OF CHILDREN WITH CEREBRAL PALSY BY ACUPUNCTURE

Zhenhuan Liu
Nanhai Affiliated Maternity & Children's Hospital of Guangzhou University of Chinese Medicine CHINA

Objective: To investigate the therapeutic action and value of acupuncture in Cerebral Palsy rehabilitation. *Methods:* 150 spasm Cerebral Palsy patients from 1.5 to 7 years old are randomly divided into three groups. Acupuncture group (group A): 50 patients are treated with head acupuncture and body acupuncture; Rehabilitation-training group (group B): 50 patients are treated with physical therapy of Bobath and Vojta methods. Acupuncture add rehabilitation-training group (group C): In this group 50 patients are investigated. *Results:* The total effective rate of group A and group C are obvious higher than that in group B. After treatment the DQ value of group A and group C are higher than that in group B ($p<0.01$). The improve rates of CT brain dysphasia and atrophy in group A and C are significantly higher than that in group B (p<0.05–0.01).The recover to normal rates of ECT brain blood stream in group A and C are obviously higher than that in group B (p<0.01).The results of TCD after therapy are better than those before therapy in group A [PI: 1.19±0.19 and 1.10±0.16; VP: (132.92±17.14) cm/s and (139.63±14.64) cm/s] and group C [PI: 1.18±0.24 and 0.91±0.19; VP: (131.84±15.93) cm/s and (139.68±15.66) cm/s] ($p<0.01$). *Conclusions:* Acupuncture can obviously increase cerebral circulation, improve cerebral cell metabolism, promote partial or complete compensation of cerebral function and the restoration and function of plasticity of cerebral tissue in children with cerebral palsy.

PO-1063

COMPARATIVE STUDY TRADITIONAL REHABILITATION AND TRADITIONAL REHABILITATION WITH ADDITIONAL MICROCURRENT THERAPY IN INFANTS WITH CONGENITAL MUSCULAR TORTICOLLIS INVOLVING ENTIRE STERNOCLEIDOMASTOID MUSCLE

Dong Rak Kwon
Daegu Catholic University Medical Center, Korea

Objective: To compare the therapeutic effects of traditional rehabilitation (TR) and TR with additional microcurrent therapy (MT) in infants with congenital muscular torticollis (CMT). *Design:* Infants (n=24) with entire CMT involvement were enrolled. Group 1 included 12 infants who received TR alone and group 2 included 12 infants who received TR with additional MT. One physiatrist assessed the passive cervical rotation range of motion (PCRROM), while the other physiatrist performed ultrasonography and sonoelastography. The thickness, cross-sectional area (CSA), and red pixel intensity (RPI) on colour histograms of the affected sternocleidomastoid muscle were measured at pre-treatment and at 3 months post-treatment. *Results:* The mean treatment duration (6.5 months) in group 1 was significantly longer than that (2.8 months) in group 2. The mean PCRROM (106.5°) in group 2 was significantly larger than that in group 1 (85.3°), and the thickness, CSA, and RPI (8.0 mm, 102.5 mm^2, 128.3) of the affected sternocleidomastoid muscle in group 2 were smaller than those (9.8 mm, 123.1 mm^2, 142.0) in group 1 at 3 months post-treatment, respectively. *Conclusions:* Our results suggest that TR with additional MT may be more effective than TR alone for the treatment of CMT of the entire SCM muscle.

PO-1064

INFRA-LOW FREQUENCY TRANSCRANIAL MAGNETIC STIMULATION EFFECTIVELY

Lin Du, Junyan Feng, Huiyi Jiang, Bing Wang, Wei Wang, Feiyong Jia
Department of Pediactrics, Second Part of First Hospital of Jilin University, China

Objective: To investigate the efficacy of infra-low frequency transcranial magnetic stimulation (ILF-TMS) treatment on intelligence structure and motor function in patients with spastic cerebral palsy. *Methods:* 75 spastic cerebral palsy patients were randomly divided into two groups: conventional rehabilitation control group and ILF-TMS treatment group, and healthy control group was established at the same time. In conventional rehabilitaion control group, patients were treated with conventional rehabilitation treatment; children in ILF-TMS treatment group were treated with ILF-TMS in addition to conventional rehabilitation treatment. Neurotransmitter in the brain was recorded with encephalofluctuograph (EFG) before and after ILF-TMS treatment. Gross Motor Function Measure (GMFM), Fine Motor Function Measure (FMFM) and Gesell development scale (GDS) were used to comprehensively evaluate the intelligence structure and motor function in patients with spastic cerebral palsy. *Results:* Relative power of γ-aminobutyric acid (GABA) in spastic cerebral palsy was lower than that in healthy controls and was increased significantly after ILF-TMS treatment for 3 months. The relative power of glutamate (Glu) in spastic cerebral palsy was higher than that in healthy controls and was reduced significantly after ILF-TMS treatment for 3 months. After 3 months training period there were significant improvements on the GMFM (dimension B, dimension C and dimension D), FMFM (dimension A and dimension B) and GDS (gross motor DA and gross motor DQ) in the ILF-TMS treatment group when compared to conventional rehabilitation control group. *Implications:* These findings indicate that GMFM is an sensitive indicator to assess the treatment efficacy in children with spastic cerebral palsy and ILF-TMS treatment maybe improve the intelligence structure and motor function through regulating neurotransmitters in brain.

PO-1065

BEHAVIORAL AND PSYCHOLOGICAL CHARACTERISTICS OF AUTISM IN TODDLERS ASSESSED BY MULTIPLE CLINICAL SCALES

Feiyong Jia, Bing Wang, Huiyi Jiang, Lin Du, Honghua Li, Wei Wang, Junyan Feng
Department of Pediactrics, Second Part of First Hospital of Jilin University, China

Objective: To analyze the behavioral and psychological characteristics of autistic toddlers by using Autism Behavior Checklist (ABC), Childhood Autism Rating Scale (CARS) and Modified Checklist for Autism in Toddlers Revised (M-CHAT-R), and to

compare the diagnostic value of these three scales. *Methods:* 20 autistic toddlers were tested with ABC, CARS and M-CHAT-R, 20 normal non-autism toddlers were also tested as control. *Results:* Among these 20 cases in the autistic group, the scores with ABC were as follows: 3 cases got no less than 68 points, 10 cases got less than 53 points, and the rest 7 cases got points between 68 and 53; the scoring with CARS turned out to be: 5 cases got no less than 37 points, 7 cases got less than 30 points, the rest 8 cases got points between 37 and 30; 19 cases were diagnosed to be positive with M-CHAT-R, and the positive diagnostic rates were 50%, 65% and 95% respectively. Meanwhile, no positive case was diagnosed in the control groups with ABC, CARS and M-CHAT-R. The three groups of data showed significant differences comparing with the control group. *Implications:* Although ABC and CARS have low positive diagnostic rate to childhood autism, they are helpful to analyze the clinical features of autism, providing theoretical basis for diagnosis, judging prognosis and efficacy. M-CHAT-R has a high positive diagnostic rate to childhood autism, for this reason, it can be helpful for early diagnosis and treatment as a routine screening tool.

PO-1066

EFFECT OF MOTOR-ASSISTED MOTOMED MOVEMENT THERAPY ON SPASTICITY CONTROL IN CHILDREN WITH SPASTIC CEREBRAL PALSY

Jing Gao, Bin Zhao, Quan-Quan Zhang

Department of Child Rehabilitation, Huaian Maternal and Child Health Care Hospital, Huaian, China 223002

Objective: To investigate the effect of motor-assisted MOTOmed movement therapy on spasticity control in children with spastic cerebral palsy (CP). *Method:* 54 spastic CP children were randomly divided into the treatment group (n=28) and control group (n=26). All children were treated with Bobath therapy, massage and cerebral circulation therapy, while those of the treatment group were added motor-assisted MOTOmed movement therapy with MOTOmed. The Modified Ashworth Scale was performed to evaluate the muscle tone of the lower limbs, and other clinical evaluation which included the range of passive joint movement. *Results:* The lower extremity function of all children in two groups were improved (p<0.05) and the effect of the treatment group were superior to those of the control group (P. *Impact on Rehabilitation:* The motor-assisted MOTOmed movement therapy can decrease the muscle tone and improve the range of joint movement of children with cerebral palsy.

PO-1067

DELIVERING REHABILITATION SERVICES FOR CHILDREN WITH CEREBRAL PALSY IN THE REMOTE NORTHERN TERRITORY, AUSTRALIA

James Rice

Womens and Childrens Health Network, Australia

Objective: To describe the profile of children with cerebral palsy (CP) and their access to a visiting rehabilitation service in The Northern Territory, one of the most remote regions of the western world. *Method:* Cross-sectional study of children resident in the Northern Territory with cerebral palsy who attended a specialist rehabilitation clinic. Each child was assessed for motor function, hip status and access to rehabilitation interventions. *Results:* One hundred children with CP were assessed (median age 8.8 years; range 1.7-18.8); 47% were indigenous. Sixty-seven percent had bilateral limb involvement; 86% were spastic; 11% were dyskinetic; 2% ataxic and 1% hypotonic. Distribution by Gross Motor Function Classification System (GMFCS) levels was (Level) I - 26%; II – 26%; III – 7%; IV - 13%; V – 28%. Bimanual function of children over four years was classified using the Manual Ability Classification System: (Level) 1- 27%, 2- 25%; 3 – 13%; 4 – 12%; 5 – 23%. Fifty-six percent of the clinical population was enrolled in a hip surveillance program; 39% had previously received Botulinum toxin injections; 28% had received orthopaedic surgery. There were no significant differences between indigenous and non-indigenous children in motor profiles. *Implications:* Effective service delivery has been provided to children with CP living in a remote area of Australia via a collaborative multidisciplinary model. Indigenous children were less likely to have received rehabilitation interventions including prescription of orthoses, treatment with botulinum toxin or orthopaedic surgery. Despite a lack of total population estimate, distribution by motor topography and tone pattern is similar to other Australian state CP populations.

PO-1068

DEMOGRAPHICAL AND CLINICAL CHARACTERISTICS OF TURKISH CHILDREN WITH LUMBAR SPINA BIFIDA

Yasemin Ulus[1]*, Berna Tander[1], Yesim Akyol[1], Aykan Ulus[2], Burak Tander[3], Omer Kuru[1]

[1]Department of Physical Medicine and Rehabilitation, Medical Faculty, Ondokuz Mayis University,Turkey, [2]Department of Nuerosurgery, Medical Faculty, Ondokuz Mayis University,Turkey, [3]Department of Paediatric Surgery, Medical Faculty, Ondokuz Mayis University, Turkey

Objective: The aims of this study were the determination of the demographical and clinical characteristics of Turkish children with spina bifida (SB), and the evaluation of the impacts of the clinical features on ambulation and functional status. *Method:* Fifty-four children with SB were included in the study. The Functional Independence Measure for Children (WeeFIM), range of motion in lower extremities, muscle tone and muscle strength of lower extremities in all children; and ambulation level of the children older than 36 months were evaluated. Chi-square test and univariate analyses of variance were used for statistical analysis. *Results:* There were significant differences between the non-ambulant and functional ambulant children older than 36 months in terms of muscle strength and muscle tone (p<0.001). While no significant effects of the muscle strength and muscle tone on WeeFIM scores were found (p>0.05), contracture was found to be effective on WeeFIM motor (p= 0.001) and WeeFIM cognitive-total (p<0.001) scores, by univariate analyses of variance. In children older than 36 months, significant effect of ambulatory status on WeeFIM cognitive (p=0.019), and WeeFIM motor-total (p<0.001) scores were found. *Implications/ Impact on Rehabilitation:* Muscle strength and muscle tone of lower extremities may be important for ambulation of children with SB. Ambulatory status and contractures may be important determinants for functional abilities of these children.

PO-1069

DATABSE OF FUNCTIONAL SKILLS EVALUATED WITH USING PEDIATRIC EVALUATION OF DISBILITY INVENTORY (PEDI) FOR CHILDREN WITH CEREBRAL PALSY

Izumi Kondo[1], Kenichi Ozaki[1], Shino Mori[1], Aiko Ohsawa[2],[1], Keiko Onogi[3], Eiichi Saitoh[3], Yoshimi Asagai[4]

[1]National Center for Geriatrics and Gerontology,Japan, [2]Saitama Medical University,Japan, [3]Fujita Health University,Japan, [4]Shinano Medical and Welfare Center, Japan

Backgrounds and aims: The scaled score of PEDI (Pediatric Evaluation of Disability Inventory) calculated with using Rasch analysis, has not yet reported for the children with handicaps. Therefore, to make a database for children with cerebral palsy (CP), we should know the difference of the acquisition order of functional skills of normal children and children with CP. Subjects 605 children (306 boy, 301 girl) with CP participated in this study from the 44 institute of children with motor impairments. The average of participants was 8 years and 1 month. GMFCS (Gross Motor Function Clas-

sification System) was level I for 52, II for 72, III for 61, IV for 176, and V for 144. *Methods:* Rasch analysis was performed with using Winsteps ver.3.62.1 (Linacure JM, Wimsteps Com). Obtained scores in this study were compared to the scores calculated from the data of 412 normal lived in USA. *Results:* In the domain of social function, there were few items that the large difference was observed between both groups. As for the domain of mobility, the scaled score of many items from children with CP were larger than that of normal children. In the domain of self-care, large difference was observed in the skills with easier difficulty. *Conclusion:* It was suggested from the results of this study that scaled score was different according to the characteristic of the sample for which Rasch analysis was performed we should use the score calculated from the sample with CP when we try to make their database.

PO-1070

EFFECTS OF COMPUTER GAMES UNITED OCCUPATIONAL THERAPY ON FINE MOTOR FUNCTION OF CHILDREN WITH SPASTIC CEREBRAL PALSY

Meng Wang[1], Lei Wang[1], Yi Zhu[1], Yi Huang Gu[1], Li Hua Zhang[2], Jing Hua Tang[2]

[1]Nanjing University of Chinese Medicine,China, [2]The Third Affiliated Hospital of Jiamusi University, China

Objective: To explore the effects of computer game united occupational therapy on the fine motor function of children with spastic cerebral palsy. *Methods:* 22 patients with spastic quadriplegia cerebral palsy were divided randomly into control group (n=11) and computer game group (n=11). The control group received routine occupational therapy and the computer game group received computer game treatment in addition. Peabody Developmental Motor Scale-2 (PDMS-2) concluding fine motor quotient (FMQ), grasp capacity index, capacity index of visual-motor integration were accessed. *Results:* There was a significantly improvement in both groups after treatment (p<0.001),and the computer game group improved more (p<0.05). Conc1usion Computer game can improve the efficacy of the routine occupational therapy on the fine motor function of children with spastic cerebral palsy.

PO-1071

ACTIVE SPORTS TRAINING IN INFANTS AND YOUNG CHILDREN THE EFFECT OF CEREBRAL PALSY REHABILITATION

Wenjuan Wang

Kunming childrens hospital rehabilitation department

Objective: This paper mainly discusses active sports training in infants and young children the effect of cerebral palsy treatment effect. *Methods:* Choose twenty cases of eight months to 3 years old of children with cerebral palsy, rehabilitation therapy to follow the law of infant motor development in neural development science and technology is given priority to, the more promote through manipulation and active training, restrain manipulation and passive training, an ounce of prevention is worth a good movement function as the main target. *Results:* the display can promote children with cp sports consciousness, improve the movement function to establish or improve, so as to promote the improvement of daily living skills. *Conclusions:* active sports training can effectively promote the motion perception, and children in sports with different sensory information to promote the ability of feeling identity, cultivate a temper of the will and, therefore, value active sports training is to establish or improve the ability of children limb function key.

PO-1072

WHAT MADE CHILDREN WITH DISABILITIES ACTIVE DURING REHABILITATION TREATMENT SESSIONS? --- AN OBSERVATIONAL CROSS-SECTIONAL STUDY

Guorong Wei[1], Fengying He[2], Xiang He[3], Zhijie Yu[4]

[1]China and international division, Hongkong society for rehabilitation, [2]Pediatric rehabilitation department, Shijiazhuang mental health centre,China, [3]Rehabilitation department, Shijiazhuang central hospital,China, 4.Medical and nursing department,Shantou childrens welfare institute, China

Objective: Explore factors that contribute to the active participation of children in rehabilitation sessions. *Methods:* Participants were 37 children with disabilities from the age of 2-5 years old. Informed consent was provided by the parents/caregivers and treating therapists. A typical rehabilitation session of the child was recorded on video. Each video clip was evaluated for the following: 1.) percentage of treatment time that the child was attentive to the activities, 2.) frequencies of activities initiated by child, 3.) frequencies of the therapist responses to the child, 4.) frequencies of instructive verbal communication by the therapist, 5.) frequencies of descriptive verbal communication by the therapist. *Results:* Therapy sessions with decreased responses to the child's verbal and non verbal cues contained an increased percentage of therapists "doing" the activities with poor attending by the child (80% of the time). Multivariate regression analysis showed that the therapy sessions with descriptive language that waited for initiation by the child rather than interruptive was associated with the child's active engagement (p<0.05). *Implications:* Child being active participant in therapy is valued by various professionals. In this pilot study, a correlation between the child's level of active engagement and the character of the adult's communication content and response to the child's verbal/non-verbal cues was demonstrated. Therefore, therapist must not only treat specific impairments, but do so in a creative and resourceful manner that engages the children and maintains their attention and interests. Factors impact on the engagement of the child during the therapy sessions are explored and discussed in this paper.

PO-1073

A PRELIMINARY TRIAL OF COMBINATIONAL INTERVENTION OF BEHAVIORAL MODIFICATION AND ORAL BUMETANIDE THERAPY FOR AUTISM

Feiyong Jia, Honghua Li, Huiyi Jiang, Lin Du, Wei Wang, Bing Wang, Junyan Feng

Department of Pediactrics, First Hospital of Jilin University, China

Objective: To investigate the effects of rehabilitation training and oral bumetanide on the aspects of the social interaction, verbal and nonverbal communication, interests and behavior of newly diagnosed children with autism, and seek a new treatment for the therapy of the children with autism. *Methods:* 60 cases with newly diagnosed autism were divided into two groups: control group (28 cases) and treatment group (32 cases). The control group was only undergone rehabilitation training; the bumetanide was orally administrated at the dose of 0.5 mg, twice a day to the treatment group in addition to rehabilitation training. The assessment of ABC, CARS and CGI was performed at the time points before and at the end of the 3rd month after the initiation of treatment, and laboratory tests such as blood routine test, urine routine test, liver function test, renal function test, blood electrolytes, blood glucose and ECG were examined in the treatment group. *Results:* After three months of the treatment,

the differences of total scores of ABC between the two groups were statistically significant ($p<0.05$). During the three months follow-up, abnormality was not found in the laboratory data of the treatment group. *Implication:* The effect of rehabilitation training combined with bumetanide therapy is better than simple rehabilitation training in the treatment of children with autism.

PO-1074

EFFECT OF MASSAGE APPLYING TO IMPROVE THE FEEDING BEHAVIOUR ON AUTISTIC CHILDREN

Lishan Chen, Huichang Zhou, Pande Zhang
The First People's Hospital of Foshan, Foshan, Guangdong 528000, China

Objective: Disturbance of feeding behaviour are universal among autistic children. This study aimed to observe effect of massage applying to improve the feeding behaviour on autistic children. *Methods:* 40 children with autism were randomly assigned to control group (n=20) and massage group (n=20). In the control group, children received conventional speech therapy. While in the massage group, children received both massage and conventional speech therapy. Both groups were assessed by questionnaire related to children's diet and scale of oral function. *Results:* Bad feeding behaviors such as picky eating, partial eating, refuse to eat, eating without swallow and lack of chewing were significantly improved after treatment in the massage group ($p<0.05$). *Conclusions:* Massage had great significant to improve the feeding behaviour on autistic children.

PO-1075

EFFECT OF PREMIUM WITH SPEECH THERAPY AND MASSAGE WITH SPEECH THERAPY ON AUTISTIC CHILDREN

Huichang Zhou, Pande Zhang, Lishan Chen
The First Hospital of Foshan, China

Objective: This study aimed to observe the effect of speech therapy on autistic children with two methods*:* premium and massage. *Methods*: 31 children with autism were randomly assigned to premium group (n=15) and massage group (n=16). In the premium group, children did well could get reward when receiving conventional speech therapy. While in the massage group, children received both massage and conventional speech therapy. Both groups were assessed by CRRC edition of Sign-Significate relations (S-S) and scale of oral function. *Results*: Both groups had significantly improved after treatment in cognition, oral expression, attitude of daily communication and organs of speech ($p<0.05$). The premium group was better in improving the attitude of daily communication ($p<0.05$) while the massage group was better than the premium group in improving organs of speech ($p<0.01$). Children in the massage group improved syllable such as [b] [m] [p] while 81.3% of them improved syllable such as [d] [t] [l]. *Conclusions*: Both premium and massage combined with speech therapy have different effects on improving autistic children's language skill.

PO-1076

COGNITIVE IMPAIRMENT INDUCED BY THE LATE RATHER THAN EARLY PRENATAL EXPOSURE TO STRESS IN RATS

Moxian Chen[1,1,1], Lijuan Ao[1], Qi Li[2], A Rudd John[3], Mcalonan Grainne[2]
[1]Department of Rehabilitation and Physiotherapy, Kun Ming Medical College, Kunming, Yunnan Province, China 650000, [2]Brain Imaging & Behavioural Neuroscience Group (BIBNS), Department of Psychiatry, University of Hong Kong, Hong Kong, [3]School of Biomedical Sciences, Faculty of Medicine, Chinese University of Hong Kong, Shatin, N.T., Hong Kong Special Administrative Region (S.A.R.), China

Objectives: Epidemiological studies have indicated that children exposed to maternal psychosocial stress during the prenatal life can increase a high incidence of psychiatry disease, such as depression, schizophrenia and autism. But investigating the human prenatal stress on the children have some difficult. By using animal models, environmental exposure can be strictly controlled. However, sensitive period of prenatal stress and gender different on offspring are seldom being researched. In the present studies we tested the hypothesis that the time of exposure of restraint stress in pregnant rats may differentiate behavior in adulthood. *Method:* There were two prenatal stress (PS) groups and one control group in this experiment. In control group the pregnant females were left undisturbed throughout the pregnancy and PS groups were suffered restrain stress during the pregnancy:the early PS groups received stress stimuli on gestation day 9-14 (GD9-14) or on GD15-21of the later PS groups. The adulthood offspring from each group would be tested on the novel object test (NOT) In NOT, the time the rat 'interacting' with sample object and novel object, a difference score and a discrimination ratio would be analyzed. *Results:* The female and male offspring from the late PS models were both showed less interesting and less explored behavior on the novel object. Implicated Cognitive impairments induced by late prenatal exposure to stress induce which was common in some psychiatry disease such as depression and autism. Thus prevention of stress during the late prenatal period may reduce cognitive deficits in some psychiatric disorders.

PO-1077

HIPPOTHERAPY ON GROSS MOTOR FUNCTION IN A CHILD WITH HYPOTONIC QUADRIPLEGIC CEREBRAL PALSY: A 6-YEAR FOLLOW-UP CASE REPORT

Shu-Ya Chan[1], Yueh-Ling Hsieh[1], Hong-Ji Luo[2], Chen-Chia Yang[3]*
[1]Department of Physical Therapy, Graduate Institute of Rehabilitation Science, China Medical University, Taiwan,Chinese Taipei, [2]Department of Physical Therapy and Assistive Technology,National Yang-Ming University,Chinese Taipei, [3]Department of Physical Medicine and Rehabilitation, Taichung Tzu Chi General Hospital,Chinese Taipei

Objective: Hippotherapy is used to improve gross motor function in children with cerebral palsy (CP). However, the therapeutic effects of hippotherapy using specific position and its longitudinal improvements in children of hypotonic CP have not been thoroughly examined. *Method:* A 5-year-old girl with quadriplegic CP was noted to have generalized hypotonia and global delay in development before intervention. There was sustained improvement in gross motor function after 72-month hippotherapy. She received a 15-min intervention twice a week for six year with four treatment positions being used, sitting backwards for the first 3 months, prone propped position for the next 21 months, then sitting forwards for the 48 months. Gross motor function was measured using Gross Motor Function Measure (GMFM-88), and certain functional GMFM items evaluated on the horseback (GMFM-h) with positions of prone, prone propped, sitting forwards and sitting backwards. *Results:* After 6-year hipppotherapy, her GMFM scores increased in dimensions A (from 21 to 42) and B (from 0 to 21). The increment percentage of total GMFM-h scores also achieved 80% after hippotherapy.

Implications/Impact on Rehabilitation: According to the results of this 6-year follow-up, we suggest that hippotherapy might enhance and maintain the gross motor performance and functional ability in quadriplegic hypotonic CP with appropriate treatment position.

PO-1078

EFFECTS OF ACUPUNCTURE COMBINED WITH SITTING TRAINING IN CEREBRAL PALSY WITH PARAFUNCTIONAL SITTING POSITION

Hongyun Zhang, Fei Du
Rehabilitation Department, Children's Hospital of Chongqing Medical University,China

Objective: To investigate the clinical effect of acupuncture combined with sitting training in cerebral palsy (CP) with parafunctional sitting position. *Methods:* 120 Parafunctional Sitting cases were randomly divided into two groups equally, both groups treated by the way of sitting training, the needling group treated by acupuncture additionally. Sitting functional points in Gross motor function measure 88 (GMFM88) of prior and post treatment were observed after treatment for 4 weeks in the two groups. *Results:* Compared to the control group, the total effective rate was higher in the needling group. Sitting functional points in the two groups were significantly improved as compared with those before treatment ($p<0.01$). After treatment, The needling group surpassed the control group in the score ($p<0.05$),and the spastic and hypotonic CP also surpassed other types in the score in the needling group ($p<0.05$). *Conclusions:* The results of acupuncture combined with sitting training were better than sitting training alone for cerebral palsy children with parafunctional sitting position, especially to the types of spastic and hypotonic CP.

PO-1079

MANAGEMENT EXPERIENCE AND DISCUSSION OF THE WORK OF REHABILITATION OF CHILDREN WITH CEREBRAL PALSY

Yan Yang
Rehabilitation Hospital of Wuxi,China

Cerebral palsy, referred to as cerebral palsy, mainly in the central movement disorders disabling disease, a month before birth and after birth, developmental stages of non-progressive brain damage caused by the syndrome. With the development of national health care, the perinatal mortality decline actually was an upward trend in the incidence of cerebral palsy. Average incidence of cerebral palsy ‰ dysfunction in patients with life-long existence, currently there is no effective treatment methods has brought tremendous mental stress and economic burden to patients and their families and society, therefore, the treatment of cerebral palsy rehabilitation medicine problems and hot spots; our Cerebral Palsy starting point is not high, around the mode varies, how to regulate the management efforts to improve the efficacy of Cerebral Palsy has become currently pressing problem.

PO-1080

45 CASES OF PREMATURE BIRTH, LOW BIRTH WEIGHT BEFORE AND AFTER HYPERBARIC OXYGEN THERAPY RETINAL FUNDUS OBSERVATION

Yanli Yang, Gaogui Huang, Yun Liu, Yan Zhang
Kunming Childrens Hospital, Rehabilitation Center, Kunming,China

Objective: To observe the premature birth, low birth weight in infants and young children before and after hyperbaric oxygen treatment of retinal changes in the fundus. *Methods:* 45 cases of premature birth, low birth weight in infants and young children before and after hyperbaric oxygen therapy for retinal undus observation and follow-up. *Results:* In 45 cases does not appear Retinopathy of prematurity (ROP) after hyperbaric oxygen therapy. *Conclusions:* remature, low birth weight children with hyperbaric oxygen therapy, such as strict enforcement of "the treatment of premature infants with retinopathy of oxygen and Prevention Guide" is safe and feasible, and hyperbaric oxygen therapy may lead to ROP.

PO-1081

ROLE OF DENVER II AND DDEVELOPMENT QUOTIENTS IN THE MANAGEMENT OF SEVERAL PEDIATRIC DEVELOPMENTAL AND BEHAVIORAL DISORDERS

Titi Sularyo*, Bernie Endyarni, Tri Lestari, Tirza Ediva Tamin
Cipto Mangunkusumo Hospital, Indonesia

Background: Autism Spectrum Disorder (ASD) and Attention Deficit and Hyperactivity Disorder (ADHD) are nowdays becoming more and more frequently found. Parents are worried of the possibility that their children suffer from them. Growth and Development Clinics (GDC) should be able to deliver professional services. Thus a practical, applicable, objective, valid, reliable, and able to measure development quotient (DQ) values instrument is needed. *Objective:* To find out whether the Denver II instrument and DQ values can be used in the management of children with ASD and ADHD. *Methods:* A study was carried out on cases of children with ASD, multysystem development disorder (MSDD), pervasive development disorder-not otherwise specified (PDD-NOS), and attention deficit and hyperactivity disorder (ADHD), consisting of history taking, physical examination, establishing diagnosis, therapy, evaluation, and follow up. The Denver II instrument was used and DQ values in all development streams established. The study was done at the GDC of Hermina Depok Hospital in July 2008 – June 2009. *Results:* It revealed that result of the Denver II as seen on the filled Denver II from showed "typical" features related to kind of disorder as far as category of DQ value, dissociation, global delayed development (GDD) as well as abnormality of the test behavior were concerned. It also revealed that establishing the diagnoses by the use of the Denver II and DQ values gave exactly the same diagnoses as when using the conventional way by the expert. *Implication/Impact on Rehabilitation:* The Denver II instrument with DQ values can be used in the management of ASD and ADHD cases.

PO-1082

CHANGES IN CHILDREN WITH TRAUMATIC BRAIN INJURY AFTER THERASUIT METHOD INTENSIVE PROGRAM: A CASE REPORT

Beihua Zhang
Shanghai Rehabilitation Center Yangzhi Hospital, China

Objective: Therasuit Method Intensive Program is an intensive individualized therapy program that accelerates functional progress.The program is a holistic approach to treatment for those with neurological disorders like Cerebral Palsy, Developmental Delays, and Traumatic Brain Injuries.This program now is popular in USA,York and North Yorkshire,but no use in China. It is focus on repetition of gross motor movements training the child's brain to make these movements automatic.The purpose of this study is to investigate the gross motor changes in children with traumatic brain injury after Therasuit Method Intensive Program. *Method:* One child who diagnosis with traumatic brain injury attend this study.We give him a three-week program of daily one-on-one training, 3-h a day, 5 days a week.It consists of three components: the Universal Exercise Unit, the Therasuit, and the "Spider" Exercise Cage.Before and after this program,the child need to accept the assessment of Gross Motor Function Measure. *Results:* The subject demonstrated improvements on standing and walking,running and jumping goal

areas of GMFM.It shows 3%-5% improvements on these two dimensions after this program. *Impact on Rehabilitation:* Therasuit Method Intensive Program can help children with traumatic brain injury focus on a particular functional skill,promoting motor learning and motor planning,accelerating getting hold of core stability and movement ability.

PO-1083

STROMAL CELL-DERIVED FACTOR-1 TO THE INFLUENCE OF ENDOGENOUS NEURAL STEM CELLS IN CEREBRAL TISSUE OF NEONATAL RATS WITH HYPOXIC-ISCHEMIC BRAIN DAMAGE

Lihua Zhang, Yehuan Wu, Xiaojie Li, Zhimei Jiang
Jiamusi university, third affiliated hospital, China

Objective: TO examine the expression of Stromal cell-derived factor-1 (SDF-1) and endogenous neural stem cells (NSCs) in cerebral tissue of neonatal rats with hypoxic-ischemic brain damage in each time point and to discuss the relationship between them. *Methods:* 72 seven-age's SD rats were randomly divided into the control group with only 36 and the model group with the rest. A rat model of hypoxic-ischemic brain damage was established by clipping left cephalic artery refering to Rice method; the control group were only cut the center skin of cervical part open, segregated but not clipped left cephalic artery. The control group and the model group respectively in 3 h, 1 d, 3 d, 7 d, 10 d, 14 d six time point only 6 will be put to death two h before BrdU intraperitoneal injection, HE used to observe changes in brain tissue staining and immunohistochemical staining to observe the hippocampus SDF-1 and BrdU expression. *Results:* HIBD group SDF-1 expression in 1 d began to rise significantly, 3 d peak, to 7 d slightly a little lower. There is significant difference within the group ($p<0.05$). Among Each time point groups, there was statistically significant ($p<0.05$). In each time point the control group there was no significant difference ($p>0.05$). BrdU expression in 1 d is very few, in 3d heighten, 7 d began to decline, 14 d less.The ratio of the IOD of positive cell of BrdU and SDF-1 expression is the maximum on the third day about. *Conclusion:* SDF-1 may attract endogenous neural stem cells to repair brain injury, and in the 3 d around to a greater degree.

PO-1084

VALIDATION OF THE PEDSQL FOR USE IN CHILDREN WITH CEREBRAL PALSY IN TURKEY

Sehim Kutlay[1]*, Melek Sezgin[2], Atilla Halil Elhan[3], Birkan Tur[1], Derya Oztuna[3], Nihal Koc[1], Alan Tennant[4], Ayse Adile Kucukdeveci[1], [1]
[1]Ankara University, Faculty of Medicine,Department of PMR, Ankara, Turkey, [2]Mersin University, Faculty of Medicine,Department of PMR, Mersin, Turkey, [3]Ankara University, Faculty of Medicine, Department of Biostatistics, Ankara, Turkey, [4]University of Leeds, Faculty of Medicine and Health, The General Infirmary at Leeds, Leeds, UK

Objective: There is an increasing interest in assesment of health-related quality of life (HRQoL) of children with cerebral palsy (CP). Pediatric Quality of Life Inventory (PedsQL) is a generic core instrument with disease- specific modules. The 35-item PedsQL 3.0 CP Module was designed to measure HRQoL dimensions specific to CP. It includes 7 scales: daily activities (DA), school activities (SA), movement&balance (MB), pain&hurt (PH), fatique (F), eating activities (EA), speech&communication (SC). This study was planned with aim of testing reliability and validity of Turkish version of PedsQL 3.0 CP Module in children with CP. *Methods:* 511 children were assessed. Reliability was tested by internal consistency and person separation index (PSI); internal construct validity by Rasch analysis, external construct validity by correlation with Gross Motor Classification and WeeFIMR. *Results:* Reliabilities of 7 scales were good with Cronbach's alphas between 0.66 and 0.96; PSI between 0.672 and 0.943 for CP group. In Rasch analysis, for each scale, items showing disordered thresholds were rescored; then testlets were created to overcome local dependency. Internal construct validity of unidimensional 7 scales were good with mean item fit (SD) of -0.107 (1.149), 0.119 (0.818), 0.232 (1.069), -0.442 (0.672), 0.221 (0.554), -0.091 (0.606) and -0.333 (1.476) for DA, SA, MB, PH, F, EA and SC, respectively. There was no differential item functioning. External construct validity of instrument was confirmed by expected moderate to high corralations with WeeFIMR and Gross Motor Classification (Spearman's r 0.35 - 0.89). *Impact on Rehabilitation:* Turkish version of PedsQL 3.0 CP Module is reliable, valid and avaliable for use in clinical setting to evaluate HRQoL of children with CP.

PO-1085

CLINICAL RESEARCH OF THE TREATMENT EFFECT OF NEUROMUSCULAR ACTIVATION TECHNOLOGY FOR THE CHILDREN WITH CEREBRAL PALSY

Banghui Li
The children's hospital of Chongqing medical university, China

Objects: To explore the nerve muscle activation technology to improve the effect of treatment for the cerebral palsy children, provide the reasonable, standard and effective rehabilitation treatment Method for cerebral palsy. *Methods:* exanimate 3-D gait analysis inspection and GMFM evaluation before treatment for the cerebral palsy children with abnormal gait, poor ability and executes some instructions, determine the cause abnormal gait muscle problem and design program of training for 1 to 2 months, check again after assessment. *Results:* (1) the Step length increased compared to it before long a treatment, and the step wide is smaller than before treatment, statistically significant difference ($p<0.05$); (2) the total support time, double support time is increased before treatment, but the statistics no significant difference ($p>0.05$); (3) the swing time and single support time have no significant changes; (4) GMFM score more improved obviously than before treatment ($p<0.05$). *Conclusion:* Nerve muscle activation technology can be to improve the walking ability of cerebral palsy children in a comparatively short time.

PO-1086

CLINICAL STUDY OF WALKING DISORDER CHARACTERISTICS FOR THE 3-4 YEARS OLD CHILDREN WITH SPASTIC CEREBRAL PALSY

Yuxia Chen
The children's hospital of Chongqing medical university, China

Objects: The aim of study was to analysis the key link of abnormal gait characteristics by 3-4 aged children with spastic cerebral palsy, to provide reliable experimental results for a more targeted rehabilitation treatment. *Methods:* Choose and compared to the gait parameters between the abnormal to normal children. The gait parameters such as step length, step wide, step speed, stride length, support-time, swing-time and movement track for ankle, knee, hip joint of the children that 3–4 years old aged with spastic diplegic cerebral palsy (the total 30, 15 male and 15 female, the height between 90 + 5 cm, the weight between 13 ± 2 kg) by three dimensional gait analysis system. *Results:* Find step length of 3–4 old aged children with spastic diplegic cerebral palsy were significantly shorter, the step speed were slow down, the stride length were slower and the support-time were prolonged, the swing-time were shorten than the normal children group; The range of motion of hip, knee, ankle joints obviously less than the normal children. It was compared with the topic development children, statistically

significant difference, $p<0.05$. *Conclusions:* Through this research found that the space-time parameters of the children with spastic cerebral palsy were behind and exist abnormal movement pattern compared to than the normal children, so it need to correct and remodel the movement pattern specially.

PO-1087

THE ROLE OF HOMER 1A IN INCREASING LOCOMOTOR ACTIVITY AND NON-SELECTIVE ATTENTION, AND IMPAIRING LEARNING AND MEMORY ABILITIES

Lei Yang[2], Qin Hong[1], Min Zhang[2], Xiao Liu[2], Xiao-Qin Pan[2], Mei Guo[2], Li Fei[2], Xi-Rong Guo[1,2], Mei-Ling Tong[1,2], Xia Chi[1,2]

[1]Department of Pediatrics, Nanjing Maternity and Child Health Hospital of Nanjing Medical University,China, [2]Institute of Pediatrics of Nanjing Medical University, China

Objective: To investigate the possible role of Homer 1a in the etiology and pathogenesis of attention deficit hyperactivity disorder (ADHD). *Method:* We divided 32 rats into four groups. The rats in the RNAi-MPH group were given the lentiviral vector containing Homer1a-specific miRNA (Homer1a-RNAi-LV) by intracerebroventricular injection, and 7 days later they were given three daily doses of methylphenidate (MPH) by intragastric gavage. The RNAi-SAL group was given Homer1a-RNAi-LV and saline later. The NC-MPH group was given the negative control lentiviral vector (NC-LV) and MPH later. The NC-SAL group was given NC-LV and saline later. *Results:* Rats that were given Homer1aRNAi exhibited increased locomotor activity and non-selective attention, and impaired learning and memory abilities, which is in line with the behavioral findings of animal models of ADHD. However, MPH ameliorated these abnormal behaviors. *Implications:* All findings indicated that Homer1amay play an important role in the etiology and pathogenesis of ADHD.

PO-1088

EFFECTS OF BRACE CONTROL IN DYSKINETIC CEREBRAL PALSY OF MOTOR ABILITY

Maoqun Ran, Nong Xiao, Yongping Ren, Ling Liu, Hongyun Zhang

Children's hospital of chongqing medical university, China

Objective: To investigate the clinical effect of Brace Control in Dyskinetic Cerebral Palsy of Motor Ability. *Methods:* Thirty Dyskinetic Cerebral Palsy cases were all treated by brace control, unarmed position control, gait and S-E-T training 3 months, A Part points in Gross motor function measure 88 (GMFM88) and Video were observed before and after treatment. *Results:* A part average points were significantly improved as compared with those before treatment ($p<0.01$). Video showed after treatment less involuntary movements, more stable head and neck trunk, better life skills. The patients with epilepsy, cognitive impairment and injury in the basal ganglia had less progress. The kinds of chorea-athetoid and dystonic had more progress than athetoid-spastic ($p<0.01$). *Conclusions:* After the treatment of Brace Control, the posture and motor ability had improved in Dyskinetic Cerebral Palsy; there were some influence to the progress about motor ability like epilepsy, cognitive impairment, injury in the basal ganglia and different kinds.

PO-1089

SENSORY INTEGRATION DEVELOPMENT OF PRESCHOOL CHILDREN AND BEHAVIOR PROBLEMS

Yachun Xie[1], Xiao Liu[2], Lei Yang[3], Min Zhang[3], Qin Hong[1], Xiling Li[1], Xirong Guo[1,3], Meiling Tong[1,3], Xia Chi[1,3]

[1]Department of Pediatrics, Nanjing Maternity and Child Health Hospital,China, [2]Nursing School of Nanjing Medical University, China, [3]Institute of Pediatrics of Nanjing Medical University, China

Objective: To analyze the relationship between sensory integration development of preschool children and behavior problems. *Methods:* A cross-sectional survey with stratify cluster random sampling was performed. 668 children aged 4-6 years from 6 kindergartens of Nanjingcity were selected. Their parents completed Child Sensory Integration Scale and Conner's Parent Symptom Questionnaire, and their teachers completed Teacher Rating Scale. *Results:* (1) The prevalence of sensory integrative dysfunction (SID) in preschool children was 20.1%, and it was 22.3% in boy, 17.8% in girl. No significant difference was found in the prevalence of SID children with different genders ($\chi2=2.156$, $p=0.148$). (2) The scores of behavior problems, learning problem, hyperactivity-impulsivity, hyperactivity index in SID by PSQ were significantly higher than control. (3) The scores of impaired concentration, hyperactivity index in SID by TRS were significantly higher than control. *Implications:* The prevalence of SID is higher in the preschool children population. There was close relationship between SID and behavior problems, and SID would affect children's psychological healthy development. Therefore, the early detection and nonage intervention of children with SID is very important.

PO-1090

RELATED RISK FACTORS COMPARATIVE STUDY OF CEREBRAL PALSY CHILDREN WITH DIFFERENT MODE OF PARTURITION

Jing Gao, Bin Zhao

Department of Child Rehabilitation, Huaian Maternal and Child Health Care Hospital, Huaian, China 223002

Objective: To investigate the status of childhood cerebral palsy (CP) in north of Jiangsu province between different modes of parturition. *Method*: Investigated pregnancy information of the parents with CP children, term of children, risk factors of pregnancy and etc. The risk factors were compared between different modes of parturition of CP children. *Results:* 25 cases are eutocia (54.3%), 21 cases are cesarean (45.7%). Minority pregnant women taking folic acid supplements, account for 26.1% and 45.0% respectively, 47.6% of cesarean pregnant women in pregnancy used drugs and 33.3% for the CP children with natural labor About one-third of the pregnant women were exposure on the electromagnetic radiation. There were more pollution facilities around the cesarean section pregnant women's house than that of eutocia pregnant women ($p<0.05$). 50% of the CP children were born with abnormal gestational weeks in both kinds of parturition. *Implications on Rehabilitation:* Women with prematurity, no taking folic acid, taking medicine in pregnancy, exposure to electromagnetic radiation, existing pollution facilities around the house may cause to cesarean, and then may be the risk factors of CP children.

PO-1091

EFFECT OF PLAY THERAPY ON CHILDREN WITH SPASTIC CEREBRAL PALSY

Yabei Fan, Ying Shen, Yuxia Wu

Jiangsu province hospital, China

Objective: To investigate the effect of play therapy on children with spastic cerebral palsy. *Method:* Four spastic CP children have been received routine rehabilitation therapy (Bobath technique, tuina therapy, Physical factor treatment) at the other institution above one year. Four children were treated with play therapy when they came into our department. Play therapy refers to the movement of the game by way of training muscular strength, reducing muscle tension, learning action steps, grasping balance and so on. During the play treatment, light hand contact and try best to guide the children

participation more actively. The modified MMT was performed to evaluate the muscle strength of quadriceps femoris, tibialis anterior, and other clinical evaluations were performed to assess the motor function with gross motor function measure (GMFM). *Results:* The muscle strength of quadriceps femoris increased from 2+-3+ grades to 4–5 grades and the tibialis anterior increased from 1–2- grades to 3–4 grades, there was significant difference with muscle strength ($p<0.05$). There was also significant improvement in the score of GMFM. *Implications:* The play therapy for children with spastic cerebral palsy can improve the muscle strength, as well as the motor function of lower extremities. By the way, the CP children participate the treatment easier and improve the movement function during a happy treatment.

PO-1092

INFLUENCE OF INFRA-LOW-FREQUENCY TRANSCRANIAL MAGNETIC STIMULATION ON MOTOR FUNCTION IN CHILDREN WITH SPASTIC CEREBRAL PALSY

Feiyong Jia, Junyan Feng, Lin Du, Huiyi Jiang, Bing Wang, Honghua Li, Wei Wang
Department of Pediactrics, Second Part of First Hospital of Jilin University, China

Objective: To investigate the effects of infra-low-frequency transcranial magnetic stimulation on motor function in children with spastic cerebral palsy. *Methods:* The children with spastic cerebral palsy were randomly divided into two groups, control group and treatment group. The control group only accepted conventional comprehensive rehabilitation and the treatment group accepted infra-low-frequency transcranial magnetic stimulation during comprehensive rehabilitative training,evaluating children with gross motor function measure (GMFM) and fine motor function measure (FMFM) after the first month and the third month,comparing the difference of improvement in motor function between two groups, to observe the effects of infra-low-frequency transcranial magnetic stimulation. *Results:* The improvement of sitting,crawling and kneeling area with GMFM in the treatment group was better than the control group after treatment with three months. The improvement of joint active ability of limbs,grasping ability, operating ability with FMFM in the treatment group was better than the control group after treatment with three months. *Implication:* Infra-low-frequency transcranial magnetic stimulation can effectively improve the motor function of children with spastic cerebral palsy.

PO-1093

THE EFFECT OF EARLY INTERVENTION ON NSCS DIFFERENTIATION OF DENTATE GYRUS

Lihua Zhang, Qinggang Xin, Shiling Zhang
The third affiliated hospital of jiamusi university, China

Objective: To study the impact of early intervention on differentiation of neural stem cells (NSCs) in brain damage rats after HIBD (Hypoxic-ischemic brain injury). *Methods:* Totally 75 SD (Sprague Dawley) rats aged 7 days were randomly divided into two groups: HIBD model (n=50) and sham-operated (n=25). 50 HIBD model was produced with Rice method, and randomly divided into HIBD group (n=25) and early intervention group (n=25). HIBD group and sham-operated group are normally feed, intervention group are dealed with early intervention, 5 rats were killed at 1 day, 7 days, 14 days, 21 days and 28 days after operation in each group.Each rat was injected with BrdU into its abdominal cavity to mark new cells before killed. Double staining immunofluorescence was used to detect the co-expression of bromodeoxyuridine (BrdU) with neuronal nuclei antigen (NeuN) or glia fibrillary acidic protein (GFAP) in the Dentate gyrus (DG) at different time points. *Result:* (1) BrdU/NeuN and BrdU/GFAP double staining cells were observed in all 3 groups. (2) In the HIBD and intervention groups, at 14, 21 and 28 days after the surgery, the number of BrdU/NeuN and BrdU/GFAP double-stained cells increased in the DG compared with the sham-operated group ($p<0.01$). (3) Obviously more BrdU/NeuN and BrdU/GFAP double-stained cells were found in the early intervention group than that in the HIBD group at 14, 21 and 28 days ($p<0.01$). Implication Our results indicate that the brain damae caused by HIBD can induce the differentiation of endogenous NSCs: Early intervention can increase the differentiation of endogenous NSCs.

PO-1094

DEVELOPMEMT OF THE FINE MOTORIC IN THE CHILDREN 2-3 YEARS OLDER TROUGH THE PLAY

Jasna Milenovic, Sanja Ciprovac, Stanislava Pavlovic, Natasa Milenovic*, Budimir Popovic
Kindergarden, Serbia

Objective: At the age 2-3 children learn to identify, recognize and named different basic shapes. During the play children developed and strength musculoskeletal system, improve basic movement, coordination, eye-hand" and stimulated development of both hemisphere of the brain. *Methods:* In the project was participated 38 children (girls 24 and boys 14), age 20-32 (average 26, 84) months. Children were educated about different basic shapes (circle, triangle and square) trough the play "learning shape". After that each child made its individual work- making in collage technique "carpet of shape" from learned basic shapes in 3 min period. *Results:* Making "carpet of shape" children used from 16 to 43 shapes (average 26,7). We could not find statistically significant correlation between sex and number of used elements (r=0.03; p=0,896) and age and number of used elements (r=0,23; p=0.337). The most common used shape was circle 10,10 (from 3 to 21), less common used was square 8,74 (from 0 to 9) and the least common used was triangle 7,89 (from 0 to 8) which was statistically significant (for triangle r=0.696; p=0.001 and for square r=0.539; p=0.017). There were not statistically significance between use of different kind of shape and age (circle r=0.1541; p=0.529, square r=-0.0092; p=0.970 and triangle r=0.2543; p=0,293). *Implication on Rehabilitation:* Activities were pleasant and interesting for children Usage round shape object can stimulated development of fine motoric abilities, children curiosity and new perception experiences, connecting motoric and cognitive child function, giving the possibility to detect and correct problems in their development.

PO-1095

THE RESEARCH PROGRESS OF EPIDEMIOLOGICAL STUDY OF CEREBRAL PALSY

Ling Xu, Lin Sang, Fengming Xiao
Jinan children hospital of Shandong Procince, China

The epidemiologic study can help to find the etiological clues of cerebral palsy and provide the evidence, so it also is beneficial to establish the control network.The prevalence rate of cerebral palsy may be affected by biological factors, diagnostic codediagnostic code, the level of diagnosis.These factors are associated with diversity of the prevalence rate. Risk factors for prenatal are the most common,for example low birth weight and low gestational age. Cerebral palsy of premature infants are most based on spastic type,while full-term infants with cerebral palsy mainly manifested as non spastic type,and their motor disorders more easily seriously.

PO-1096

THE QUALITY OF LIFE AND ITS INFLUENCING FACTORS FOR MOTHERS OF CHILDREN WITH CEREBRAL PALSY

Xia Huang

Zhejiang Civil Rehabilitation Center, Hangzhou 310016, China

Objective: This study aims to analyze the quality of life (QOL) of mothers of children with cerebral palsy and its influencingfactors. *Methods:* The quality of life was assessed in 123 mothers and children with cerebral palsy using the Medical Outcomes Study 36-item Short Form Health Survey (SF-36) and basic questionnaire. Main methods used include questionnaire and interview.The influencing factors of quality of life were analyzed withn *t*-test and one way ANOVA, and multiple regression analysis was used to choose the main influencing factors. *Results:* Scores on all items of the SF-36 for mothers of children with cerebral palsy were much lower, including role emotional, general health, vitality of the lowest scores, respectively 55.28, 60.49 and 65.26. Correlation analysis showed general health, role physical and role emotional were positively correlated with the children's age: all domains except bodily pain were negatively correlated with the children's condition: social function was positively correlated with mothers' age: general health, role emotional, social function, and mental health were negatively correlated with mothers' education level ($p<0.05$). Univariate analysis showed that the children's age, children's condition, mothers' education level, mothers' vocation, and fathers' vocation affected mothers' quality of life ($p<0.05$). Multivariate regressionmanalysis (Pin=0.05, Pout=0.10) showed m children's age and fathers' vocation were statistically significant ($p<0.05$). *Impact on Rehabilitation:* The quality of life of mothers of children with cerebral palsy was mainly influenced by the children's age, children's condition, mothers' education level, mothers' vocation, and fathers' vocation. We should take effective measures to improve the quality of life of mothers of children with cerebral palsy and improve rehabilitation efficacy of children with cerebral palsy.

PO-1097

EFFICACY OF EARLY INTERVENTION IN CHILDREN WITH GROSS MOTOR DEVELOPMENTAL DELAY

Chung-Yuan Wang

Department of Physical Medicine & Rehabilitation, Pingtung Christian Hospital, Taiwan, R.O.C, Chinese Taipei

Objective: Early intervention to the children with developmental delay was deeply believed. And Peabody Developmental Gross Motor Scale (PDMS-GM) was widely used as an evaluative measure. However, there was limited literature studying on its implication. The aim of this study was to examine the efficacy of early intervention via PDMS-GM. *Method:* In Taiwan, there are 45 child developmental evaluation centers chosen by national health promotion bureau. The re-evaluation must not take place within one year. Three hundred children were brought to our center in 2012. After excluding incomplete data, fresh cases and cases aged over 6 years old, 76 cases were included. We classified them into three groups under previous PDMS-GM score. Those whose PDMS-GM percentile score below 8 was classified as group one, percentile score 8 to 16 as group two, and percentile score over 16 as group there. In our hospital, only group one has the chance to receive physical therapy once or twice per week. *Results:* In group one, 22/29 remained their percentile score below 8, but their age equivalents score got mild improved. Parental questionnaires also showed the contribution. In group two, 5/14 had their percentile score below 8. In group three, 4/33 dropped their percentile score below 8, while 11/33 turned their percentile score 8-16. *Implications/Impact on Rehabilitation:* Early intervention did help. However, the efficacy was not obvious in PDMS (percentile score), especial in severe cases. The frequency of physical therapy might also an important factor to improve the efficacy. Child who was borderline developmental delay should be followed more often.

PO-1098

A CLINIMETRIC REVIEW OF SITTING BALANCE MEASURES FOR CHILDREN WITH CEREBRAL PALSY

Benjamin Bañas[1], Edward James Gorgon[2]*

[1]Alternative Learning Resource School - Philippines, [2]Department of Physical Therapy, College of Allied Medical Professions, University of the Philippines Manila, Philippines

Objective: To synthesize research evidence on the validity, reliability, and clinical utility of sitting balance measures for children with cerebral palsy (CP). *Method:* A systematic review of nine peer-reviewed electronic databases was conducted in August 2012. Methodological quality of studies was assessed using the Consensus-based Standards for the Selection of Health Measurement Instruments while data were extracted using the CanChild Outcome Measures Rating Form. The two authors independently examined titles and abstracts for eligibility, and independently appraised all included studies. *Results:* The search yielded eight measures supported by 12 studies: Level of Sitting Scale (LSS), Pediatric Reach Test (PRT), Seated Postural Control Measure (SPCM), Segmental Assessment of Trunk Control (SATCo), Sitting Assessment for Children with Neuromotor Dysfunction (SACND), Sitting Assessment Scale (SAS), Trunk Control Measurement Scale (TCMS), and Trunk Impairment Scale (TIS). Overall, the measures had evidence for clinical utility, however, evidence for validity and reliability varied. Six measures were supported by at least one validity study (LSS, PRT, SACND, SATCo, SPCM, TCMS). All measures have been investigated for reliability in at least one study, but only the SACND, TCMS, and TIS had multiple reliability studies. Responsiveness to change has been explored for the LSS and SPCM only. *Implications/Impact on Rehabilitation:* Most existing measures have acceptable overall utility in the assessment of sitting balance in children with CP. Lack of robust evidence for any of the measures, however, suggests the need for more research to further support overall utility and identify superior measures for use in clinical and research practice.

PO-1099

THE ROLE OF PHYSIATRIST IN MANAGEMENT OF CHIDREN WITH RETT SYNDROME

Kathirithamby Dona Rani[1], Yuxi Chen[1]

[1]Albert Einstein College of Medicine Pediatric Physiatrist, Montefiore Medical Center,United States, [2]Department of Rehabilitation Medicine, Montefiore Medical Center, United States

Objective: Discuss the role of the physiatrist in evaluation and best care of children with Rett syndrome. Rett syndrome is a neuro developmental disorder and one of the most severe childhood diseases. In majority of patients the peculiar clinical manifestations of this disorder arise from mutation in a gene for MECP2 located in chromosome Xq 28. MECP2 is most concentrated in the brain rendering it more sensitive to abnormal MECP2. Affected patients initially have a period of normal development followed by loss of speech, and purposeful hand function, onset of stereotypic hand movements and motor dysfunction including gait abnormalities. Additional clinical features include deceleration of head growth, respiratory and cardiac abnormalities, bone mineral deficits, epilepsy and autonomic dysfunction. *Method:* The Rett center at Montefiore Medical Center of the Albert Einstein College of Medicine utilizes a multi-disciplinary approach in evaluation and management of Rett patients. Over ten subspecialties participate in the center. The physiatrist is a key member of this team in managing motor dysfunction and resultant effects which include: oromotor dysfunction, communication deficits, abnormal muscle tone and sequele, Scoliosis, gait abnormalities, Functional deficits and impact on the quality of child and family life. The physiatrist establishes functional goals and coordinates therapeutic intervention, prescribes adaptive devices, orthoses, scoliosis management, spasticity management, as well as transitioning of care to adulthood. *Results:* Children with Rett syndrome and families have access to comprehensive ongoing and goal oriented services. *Impact on Rehabilitation:* Opportunity to promote research e.g.: communication and gait abnormalities in Rett Syndrome.

PO-1100

PRESSING AURICULAR ACUPOINTS FOR TREATING CHILD ANOREXIA

Meihua Li

Pressing auricular acupoints for treating child anorexia, China

Object: The research aim to introduce a characteristic treatment of pressing auricular acupoints for treating child anorexia (disorders of digestive function). It provided a new way of safe, effective and good compliance of patients without drugs. *Method:* 160 cases were chosen with child anorexia syndrome from the Rehabilitation Department of Heilongjiang Province No.5 Hospital in July 2011 to June 2012, aged 2-10 year old children. The cases were divided into 80 cases for auricular therapy treatment group (for experimental group) and 80 cases for herb tea treatment group (for control group) in 2 weeks' treatments. We observed the symptom effects, and the improvements in clinical symptom scores for statistical analysis to evaluate after the treatments. *Result:* After the treatments, clinical symptoms such as appetite, food intake, weight got improved, and fatigue, abdominal distension and other appearance were significantly reduced in both groups. The curative effect of disease and syndrome scores were better than before ($p<0.05$). The total efficiency of experimental group was 91.03%, and it was 90.90% in control group. There was no statistically significant difference between experimental group and control group, and not any obvious side effects were found as well. *Conclusion:* Pressing auricular acupoints for treating child anorexia had obviously effects on clinical symptoms nearly like taking herb tea.But it had a lot of significantly advantage, such like lower treatment costs, easy handling but without medical side effects.

PO-1101

RETROSPECTIVE ANALYSIS OF PERIPHERAL NEUROPATHY IN CHILDREN WITH CEREBRAL PALSY

Qin-Rong Huang, Nong Xiao

Department of Neurological Rehabilitation, Childrens Hospital of Chongqing Medical University, Chongqing, China

Objective: To study the characteristics of Peripheral neuropathy in children with cerebral palsy and explore its possible pathogenesis. *Method:* Collecting the data of 140 cerebral palsy children who were diagnosed in the Department of Neurological Rehabilitation in Childrens Hospital of Chongqing Medical University from July 2008 to January 2013, including the symptoms and signs of nervous system, Peripheral nerve electrophysiology results and brain magnetic resonance imaging. *Results:* 1.106 of 140 children had abnormal Peripheral nerve conduction function results, yet only 57 children showed weaken or disappeared of tendinous reflex with the corresponding muscle tone decreased. 2.The abnormal rate of F-wave or H-reflex was 70.0% which was higher than other items. 3.The abnormal rate of compound muscle action potential (CMAP) and sensory nerve action potential (SNAP) (CMAP22.1%, SNAP37.1%)was higher than Nerve conduction velocity (MCV,SCV) delay and distal motor latency (DML) (MCV3.6%, SCV1.4%, MDML2.1%). 4. 108 of 140 children had abnormal MRI (77.1%), delay of Brain white matter myelinization was demonstrated in 44 children (31.4%),and 22 (15.7%) were periventricular leukomalacia. 5.The delay of Brain white matter myelinization and periventricular leukomalacia has correlation with Nerve conduction velocity (MCV, SCV) delay. *Conclusions:* The abnormal rate of peripheral nerve conduction function is high in Children with cerebral palsy, yet typical clinical manifestations are not typical, and its easier to be misdiagnosed. F-wave and H-reflex may be the sensitive items to find Peripheral neuropathy in children with cerebral palsy. Peripheral neuropathy may locate in the proximal end of peripheral nerve or Spinal cord ventral horn.Axonal degeneration is more often seen than myelinization. The children with Brain white matter myelinization delay and periventricular leukomalacia may have problems with peripheral nerve myelinization.

PO-1102

A STUDY ON THE INFLUENTIAL FACTORS RELATED SEVER DEGREE OF CHILDREN WITH TRANSIENT TIC DISORDER IN CHONGQING AREA

Xueqin Hou, Yi Zhang, Nong Xiao

Children's Hospital of ChongQing University of Medical Science, China

Objective: To investigate the sever degree of the children with transient tic disorder, survey the crucial factors of the sever degree. *Method:* 288 cases diagnosed transient tic disorder were measured with severity through Yale Global Tic Severity Scale (YGTSS) from March 2010 to October 2012. All the children were examined with EEG,and were assessed social adaptation ability by Achenbach child behavior scale and the existence of family problem by family environment scale. personal data were collected including sexual distinction, age, source, foster men's culture degree, time playing video games or watching TV daily, the interval time from first time to visit, multiple regression analysis and logistic regression analysis were done. *Results:* 54 cases's EEG were abnormal, ratios of boys to girls was 69:31, ratio of urban and rural areas was 56:44, The results from multiple linear regression analys is showed that t were the most important factors related with foster men's culture degree,sex,the time playing video games or watching TV daily, the severity degree was affected by the the interval time from first time to visit (R2=0.836, $p<0.001$). The results from logistic regression analysis YGTSSshowed that foster men's higher culture degree, longer time playing video games or watching TV daily and the existence of home problem were the risk factors (OR=4.0256), and the shorter interval time from first time to visit and residencein rural areas were the protective factors (OR=0.2896). *Implications:* To help the parents reducing childrens psychological pressure, and to shorten time playing video games or watching TV daily can ease the symptoms of Tourette syndrome, psychological therapy would treat transient tic disorder efficaciously.

PO-1103

GAIT EVALUATION IN CEREBRAL PALSY PATIENTS: THE COMBINATION OF WEST AND EAST REHABILITATION

Shuyun Jiang[1], Yan Yu[1], Min Shen[2], Bin Huang[1], Zeping Li[2]

[1]Gait Lab,Yueyang Hospital,Shanghai,China, [2]Occupational Rehabilitation Training Center, Shanghai, China

Objective: In China,most of the cerebral palsy patients undergo the multi-rehabilitation therapy, which include modern and Chinese traditional therapies. They are physicalt herapy,occupational therapy, Massage and Accupuncture. This study is focus on to use gait analysis to evaluate the result of the combinational therapy. *Method:* Gait analysis was performed before and 2 monthes after multi-rehabilitation therapy intervention, as well as clinical evaluations. 10 cerebarl pasly patients were enrolled, 6 male,4 female. The patients can walk independently. All the data collection and interpretation undertake in the Gait Lab of Yueyang Hospital. *Results:* All the 10 patients' initial gait parameters and clinical data suggested increasing spasticity,especially in gastrocnemius. The gait data showed ankle extension was highter, foot pressure was asymmetric. After two monthes intervented with multi-rehabilitation therapy, 3 times a week, gastrocnemius spasticity was improved,foot pressure and contact area became more symmetric bilaterally. Figure1. comparison in angles of ankle Fig. 2. comparison in pressure of foot. *Implications:* In China,traditional Chinese medicine therapy is considered as important as modern PMR therapy for the handicapped persons. This study demonstrates the reduction in spasticity and improvement in foot contact with using the combinational therapy and gait analysis evaluation in cerebral pasly patients. Now more

and more patients with walking disorder,especially cerebral palsy patients,club foot, trauma associated with the car accident could benefit from the high-tech to provide evidence,which could optimize in making decision for diagnosis and treament appropriately.

PO-1104

BOTULINUM TOXIN A THERAPY IN COMBINATION WITH REHABILITATION TREATMENT FOR CHILDREN WITH TORTION DYSTONIA DUE TO ENCEPHALITIS

Su-Zhen Fang, Jian Shi

Department of Pedicatrics, Zhujiang Hospital, Southern Medical University, Guangzhou, Guangdong

Objective: To explore the effectiveness of the Botulinum toxin A (BTXA) therapy in combination with Rehabilitation treatment for children with tortion dystonia due to encephalitis. *Methods:* The BTXA intramuscular injection therapy and rehabilitation treatment were carried out at 11 children with tortion dystonia due to encephalitis, to realize the objective of inhibiting abnormal muscular activity, correcting posture and regaining normal movement. The process of BTXA therapy was under ketamine-imidazole-induced basic anaesthesia and EMG guidance with individualized principles based on the results of evaluations of clinical Biomechanical Analysis, Barry–Albright Dystonia Scale (BADs), Clinical global impression (CGI) et al. The total BTXA doses were within 20 U/kg (≤500 IU). Within the follow up period time of 24 months, those whose dystonia again blocked movement programm had another BTXA therapy at interval of more than 3m. The results of a prospective open study were analyzed. *Result:* There were 24 times of BTXA therapy for all the children-1 for 5, 2 for 1, 3 for 3, 4 for 2. All children showed significant functional improvement in movement, 6 regained all basic momement without dystonia. 5 could walk independently with mild dystonia (3 had mild hemiplegia and 2 had athetoid) at the end of the follow-up period of 2 years. Implication The treatment of BTXA intramuscular injection in combination with Rehabilitation based upon individualized principles may be effective option for children with tortion dystonia due to encephalitis, and may well change them long term prognosis.

PO-1105

BOTULINUM TOXIN TYPE A THERAPY IN COMBINATION WITH REHABILITATION INTERVENTION IN INHIBITING SYMMETRICAL TONIC NECK REFLEX AND IMPROVING MOTOR FUNCTIONS IN CHILDREN WITH SPASTIC DIPLEGIC CEREBRAL PALSY

Su-Zhen Fang, Jian Shi, Xiao-Ying Zou, Li-Hui Liu

Department of Pedicatrics, Zhujiang Hospital, Southern Medical University, Guangzhou, Guangdong, 510282, China

Objective: To investigate the effectiveness of botulinum toxin type A (BTXA) therapy in combination with rehabiliation intervention in inhibiting symmetrical tonic neck reflex (STNR) and improving motor functions in children with spastic diplegic cerebral palsy (CP). *Methods:* 47 children of 18-48 months-old who showed "bunny"-hop on floor for locomotion, were enrolled in this prospective open study. They received Chinese BTXA intramuscular injection with electromyogram (EMG) guidance at the state of ketamine induced basic anaesthesia. The muscles for injection usually included bilateral splenius capitis, trapezius, teres major, Iliopsoas, adductors, hamstrings, and triceps surae. The total dosage was 18-20 U/kg (≤ 400 U) for every session. Concurrent rehabilitation intervention was intensified both in hospital and family. Within the follow up period time of 2 years, another BTXA therapy at interval of more than 3 m should be operated when spasticity again blocked movement programm. Evaluated STNR by visual biomechanical analysis, muscle tone by the Modified Ashworth Scale (MAS) and motor ability by Gross Motor Function Measure (GMFM). All results were expressed as mean±S.E. Paired *t*-test which we chose as the statistical analysis was carried out by using SPSS 11.5. *Results:* Statistical analysis showed that all the indexes turned to be much better 2 years later, including STNR ($p<0.01$), GMFM ($p<0.01$), muscle tones of neck/shoulder/humeral muscles, adductors, iliopsoas ($p<0.01$), except tones of hamstrings and plantar ($p>0.05$). *Implication:* CBTXA injection therapy in combination with rehabilitation intervention in inhibiting STNR were rewarding in spastic diplegic children with long term prognosis in motor fucntions.

PO-1106

FOLLOW UP OF PARTICIPATION IN CHILDREN WITH CEREBRAL PALSY OF DIFFERENT MOTOR SEVERITIES

Chia-Ling Chen[1,2], Katie P. Wu[1,3], Mei-Chung Liou[2], Wen-Yu Liu[4], Chia-Ying Chung[1,3], Chung-Yao Chen[3,5], I-Hsuan Shen[6], Ching-Yi Wu[6]

[1]Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital, Linkou, Taiwan,Chinese Taipei, [2]Graduate Institute of Early Intervention, Chang Gung University, Taiwan,Chinese Taipei, [3]School of Medicine, College of Medicine, Chang Gung University, Taiwan,Chinese Taipei, [4]Department of Physical Therapy, Chang Gung University, Taiwan,Chinese Taipei, [5]Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital, Keelung, Taiwan,Chinese Taipei, [6]Department of Occupational Therapy, Chang Gung University, Taiwan, Chinese Taipei

Objectives: The aim of this study is to longitudinal follow up the change in participation of various areas in preschool children with cerebral palsy (CP). *Methods:* A total of 54 children with CP (1- 6 years) were classified into 2 groups: Gross Motor Function Classification System (GMFCS) levels I-III and levels IV-V. Participation was assessed by Assessment of Preschool Children's Participation (APCP) consists of diversity and intensity scores in the areas of play, skill development, active physical recreation, social, and total areas at baseline and 6-month later (follow-up). *Results:* At baseline and follow-up, children with GMFCS levels I-III had greater diversity and intensity scores in all areas than those with GMFCS levels IV-V ($p<0.05$). At follow-up, the diversity and intensity scores in all areas improved in both groups ($p<0.05$). However, there were no significant difference in the improvement of diversity and intensity scores in all areas except play areas between both groups. Implication and *Impact on Rehabilitation:* The study demonstrated the participation diversity and intensity varied in children with CP of different motor severities. Furthermore, the participation in all areas improved in children with different motor severities.

PO-1107

THE OBSERVATION OF CURATIVE EFFECT OF THE SCALP ACUPUNCTURE TREATMENT ON RANGE OF MOTION AND MUSCLE TONE FOR CHILDREN WITH SPASTIC CEREBRAL PALSY

Cai-Xia Zhang, Jing Gao

Department of Child Rehabilitation, Huaian Maternal and Child Health Care Hospital, Huaian, China 223002, China

Objective: To observe the effects of scalp acupuncture treatment on range of motion and muscle tension for children with spastic cerebral palsy. *Method:* 52 children with spastic cerebral palsy were randomly divided into the treatment group and control group, 24 cases in treatment group, 28 cases in control group. The control children were treated with comprehensive rehabilitation therapy, such as exercise therapy, occupational therapy, speech therapy, physiotherapy and manipulation. While additional scalp acupuncture treatment was used by the treatment group. Pretreatment and

posttreatment measuring the change of muscle tension in children's gastrocnemius and hamstrings using modified Ashworth Scale, the change of hip joint, knee joint and ankle joint passive range of motion with angle gauge. *Results:* Two groups showed different improved (p<0.01-0.001) in observation indexes after treatment, but the treatment group is better than the control group (p<0.05). *Impact on Rehabilitation:* The scalp acupuncture treatment can better improve the range of motion and anti-spasm and decrease muscle tone for children with spastic cerebral palsy.

PO-1108

RELATIONSHIPS BETWEEN MOTOR CONTROL STRATEGIES AND FINE MOTOR ABILITY IN CHILDREN WITH UNILATERAL CEREBRAL PALSY: A PILOT STUDY

Lin-Ju Kang[1], Chia-Ling Chen[1,2], Hsieh-Ching Chen[3], Ching-Yi Wu[4], I-Hsuan Shen[4], Wen-Yu Liu[5]

[1]Graduate Institute of Early Intervention, College of Medicine, Chang Gung University, 259 Wen-Hwa 1st Rd, Kwei-Shan, Tao-Yuan 333, Taiwan,Chinese Taipei, [2]Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital, 5 Fu-Hsing St. Kwei-Shan, Tao-Yuan 333, Taiwan,Chinese Taipei, [3]Department of Industrial Engineering & Management, National Taipei University of Technology, Chung-hsiao E. Rd., Sec. 3, Taipei 106, Taiwan,Chinese Taipei, [4]Graduate Institute and Department of Occupational Therapy, College of Medicine, Chang Gung University, 259 Wen-Hwa 1st Rd, Kwei-Shan, Tao-Yuan 333,Taiwan,Chinese Taipei, 5.Department of Physical Therapy, College of Medicine, Chang Gung University, 259 Wen-Hwa 1st Rd., Kwei-Shan, Tao-Yuan 333,Taiwan,Chinese Taipei

Objective: To explore the relationships between motor control strategies and fine motor ability of the more affected arm in children with unilateral cerebral palsy (CP). *Method:* Thirty children with spastic unilateral CP aged 6-12 years (Mean=8.6 years; SD=1.8 years), classified as bimanual fine motor function (BFMF) levels I and II, were included. Motor control strategies were measured by kinematic variables of reaching movement: reaction time (RT), normalized movement time (nMT), normalized movement unit (nMU), and peak velocity (PV). Fine motor ability was measured by the Peabody Developmental Motor Scale-2nd edition (PDMS-2)- grasping (PDMS-G) and visual motor integration (PDMS-V) subscales. Pearson product moment correlation coefficient (r) was used to examine the associations between reaching kinematics and fine motor ability. *Results:* Among the reaching kinematics examined, RT (r=-0.65), nMU (r=-0.48), and PV (r=0.56) were significantly associated with the PDMS-G (p values hildren with CP who had faster reaction (measured by RT) and smoother movement (measured by nMU) with a higher impulse at movement initiation (measured by PV) might also demonstrated better grasping skills (measured by PDMS-G), such as reach-to-grasp, releasing, and object manipulation. In contrast, none of the kinematic variables were found to be significantly associated with the PDMS-V. *Implications/Impact on rehabilitation:* Kinematic characteristics (e.g. RT, nMU, and PV) may be used as a potential biomarker to probe the therapeutic effectiveness for grasping ability in children with unilateral CP.

PO-1109

THE EFFECTS OF CUSTOM-MADE RIGID FOOT ORTHOSIS IN CHILDREN OVER SIX WITH PES PLANUS

Bong-Ok Kim, Soo-Kyung Bok, Eun-Geol Sim, Jun-Ho Lim, So-Young Ahn*

Chung-Nam University Hospital, Korea

Objective: To identify the effect of custom-made rigid foot orthosis (RFO) in children over six with pes planus. *Method:* Medical record of 100 children (mean age 11.0±2.61) were reviewed prospectively who had been diagnosed as pes planus, fitted with RFO and had more than two consecutive radiologic studies. The Resting calcaneal stance position (RCSP), anteroposterior talocalcaneal angles (APTCA), lateral talocalcaneal angles (LTTCA), the lateral talometatarsal angles (LTTMA) and the calcaneal pitch (CP) of both feet were measured to evaluate the foot alignment. After diagnosis, children were fitted with a pair of RFO and recommended to walk with heel strike and reciprocal arm swing to normalize gait pattern. The follow up clinical evaluation with radiologic study was done after 12-18 months, after 24 month after application of RFO. Post hoc analysis were used to test for significant differences of radiologic indicators and RCSP. *Result:* With RFO, all radiologic indicators changed toward corrective direction exceps LTTCA. The RCSP of 3rdstudy revealed highly significant improvement compared with 2ndexam and also baseline study. *Conclusion:* This study showed that radiologic indicators improved significantly after 24month of application of RFO. The prospective long term evaluation with radiographic study would be necessary to confirm the therapeutic effect of RFO and determine the optimal duration of wear in children with pes planus.

PO-1110

SPEECH INTELLIGIBILITY AND VOWEL SPACE AREA IN MANDARIN-SPEAKING CHILDREN WITH CEREBRAL PALSY

Xiaojie Li, Qing Du

Department of Rehabilitation, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, China

Objective: The purpose of this study was to test the relationship between vowel space area, and speech intelligibility in Mandarin-speaking children with cerebral palsy. *Method:* Participants (CP; 86 male, 52 female, from 36 to 72-month-old) were audio recorded as they repeated prolongation of each of the three point vowels /i/, /a/, and /u/ time times, and took the Huang zooming-Han zhijue Test as a Speech intelligibility test. *Results:* There was a significantly relationship between vowel space area, and speech intelligibility, but the value of relationship was not high. *Implications/Impact on rehabilitation:* The results of this study provide preliminary support for relationship between vowel space area, and speech intelligibility in Mandarin-speaking children with CP. ST should pay attention to vowel space area, and do more study to analyze the specific relationship between vowel space area, and speech intelligibility.

PO-1111

A CLINICAL OBSERVATION ABOUT THE EFFICIENCY OF THE MASSOTHERAPY TREATMENT ON CHILDREN WITH SPASTIC CEREBRAL PALSY

Bin Zhao, Jing Gao, Li-Na Wang

Department of Child Rehabilitation, Huaian Maternal and Child Health Care Hospital, Huaian, China 223002

Objective: To make a comparison analysis between simple conventional rehabilitation therapy and conventional rehabilitation therapy combined with massotherapy on children with spastic cerebral palsy, in order to investigate the effect of massotherapy for the treatment of children with spastic cerebral palsy. *Methods:* 40 cases of children with spastic cerebral palsy were randomly divided into the control group and treatment group, 20 cases in each group. The control children were treated with conventional rehabilitation therapy, while additional massotherapy treatment was used by the treatment group. Pretreatment and after 3 three treatments (1 month is 1 treatment) evaluating the range of motion, adductor muscle tension and gross motor function respectively, comparing the change of range of motion, adductor muscle tension and gross motor function before and after treatment on two groups of children. *Results:* Two groups showed different improved (p<0.05) in above observation indexes after treat-

ment, but the treatment group is better than the control group ($p<0.05$). *Impact on Rehabilitation:* The massage therapy can obviously improve the range of motion and reduce muscle tension and improve the gross motor function for children with spastic cerebral palsy.

PO-1112

THE EFFECTS OF MANIPULATION MANEUVER ON THE ANGLE OF TIBIAL TORSION AND WALKING FUNCTION OF CHILDREN WITH CEREBRAL PALSY

Yan Yu

Yueyang Hospital of Integrated Traditional Chinese and Western Medicine,Shanghai University of Traditional Chinese Medicine, China

Objective: To investigate the effects of massage manipulation on the angle of tibial torsion and walking function of children with cerebral palsy. *Methods:* 20 children with cerebral palsy on tibial torsion deformity were given massage manipulation therapy for 2 months. Before and after massage manipulation therapy, patients were tested by three-dimensional gait analysis system. The angle of tibial torsion and walking function was assessed with the joint movement angle and spatial and temporal parameters from three-dimensional gait analysis. *Results:* After massage manipulation therapy, most of children with cerebral palsy whose angle of tibial torsion was significantly corrected compared with the parameters before the therapy. Their walking function was also improved according to the walking time parameters before and after. And the others, though the angle tibial torsion was not corrected significantly, their walking function was improved. *Implications:* Massage Manipulation has positive significance to improve the angle of tibial torsion and walking function of children with cerebral palsy.

PO-1113

EFFECT OF BOTULINUM TOXIN TYPE A INJECTION COMBINE BIOFEEDBACK THERAPY ON MOTOR FUNCTION IN CHILDREN WITH SPASTIC CEREBRAL PALSY

Xiaoyan Yang[1], Qing Du[1], Peijie Chen[2], Xuan Zhou[1], Li Zhao[3], Nan Chen[1], Zheng Yu[4], Yanjuan Zhang[4], Shuxin Zhang[1], Jinfen Luan[1], Xiaojie Li[1], Chenhui Pan[1], Tijiang Lu[1]

[1]Department of Rehabilitation, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine,China, [2]Department of Kinesiology, Shanghai University of Sport,China, [3]Department of Pediatric Orthopedic, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine,China, [4]Shanghai Yangpu District Disabled Person's Federation, China

Objective: To investigate the effect of lower limb botulinum toxin-A (BTX-A) injection combine biofeedback therapy on motor function in children with spastic cerebral palsy. *Method*: 31 spastic cerebral palsy children were divided into observation group (15 cases) and control groups (16 cases), respectively. All cases were given systematic rehabilitation therapy for 3 months. The observation group was injected with BTX-A at baseline, 1 day after BTX-A injection they received biofeedback therapy and other rehabilitation. Modified Ashworth scale (MAS), composite spasticity scale (CSS), passive range of ankle motion (PROM) and muscle strength of tibialis anterior were assessed at baseline, 3 days,7 days, 2 weeks, 1 and 3 months after therapy; Gross Motor Function Measure-88 and walking velocity at baseline, 3 months. *Results:* All children showed significant decrease in spasticity (MAS, CSS, PROM) and improve in muscle strength, GMFM, walking velocity, and the difference of children in observation group was earlier than control group. Statistically significant difference between observation and control groups was observed for MAS, CSS, PROM and muscle strength of tibialis anterior ($p<0.01$). Statistically significant difference between observation and control groups was observed for GMFM-88, stand and walking function scores, walking velocity ($p<0.05$). *Implications/Impact on Rehabilitation:* BTX-A injection combined with biofeedback therapy can quickly and effectively improve lower extremity motor function in children with spastic cerebral palsy.

PO-1114

GAIT ANALYSIS IN THE DUCHENNE MUSCULAR DYSTROPHY CHILDREN AT SELF-SELECTED SPEEDS

Nan Chen[1], Qing Du[1], Xiaoqing Liu[1], Xie Wu[2], Xihua Li[3], Xuan Zhou[1], Shuxin Zhang[1], Xiaoyan Yang[1]

[1]Department of Rehabilitation, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine,China, [2]Department of Kinesiology, Shanghai University of Sport,China, [3]Children's Hospital of Fudan University, China

Objective: The aim of this study is to investigate the abnormal gait characteristics in the Duchenne Muscular Dystrophy (DMD) children. *Method:* Ten DMD children and ten age-matched normal children were recruited to participate in this study. The participants performed five trials of walking at self-selected speed, gait kinematics and foot pressure data were collected with VICON motion capture system and Medilogic system simultaneously. *Results:* The results showed DMD children having significantly shorter step length, greater step width and maximum coronal COG displacement compared to normal children. DMD children took longer double support phases and shorter terminal swing phase, and demonstrated less hip maximum extension and greater hip maximum flexion, greater knee flexion in swing phase and great ankle plantar flexion at initial contact compared to normal children. DMD children have less maximum foot pressure and more anterior and lateral of maximum pressure location. *Implications/Impact on rehabilitation:* The gait phase proportions were effective on gait assessment for DMD. The pathological gait in DMD children may due to the weakness of extremity extensor and the secondary clubfoot among part DMD individuals.

PO-1115

FUNCTIONAL ELECTRICAL STIMULATION ON THE TRUNK CONTROL ABILITY IN CHILDREN WITH CEREBRAL PALSY

Xiaoyan Yang, Qing Du, Xuan Zhou, Shuxin Zhang, Xiaojie Li, Nan Chen

Department of Rehabilitation, Xin Hua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine, China

Objective: To investigate the effect of functional electrical stimulation on the trunk control ability in children with cerebral palsy. *Method:* 16 cerebral palsy, aged 8-35 months, were divided into observation group (8 cases) and control groups (8 cases), respectively. All cases were given systematic rehabilitation therapy for 3 months. The observation group received functional electrical stimulation on the trunk muscle and other rehabilitation. Modified Ashworth scale (MAS), muscle strength of the back and abdominal muscle were assessed at baseline, 1 and 3 months after therapy; Gross Motor Function Measure-88 and surface EMG detection. at baseline, 3 months. *Results:* All children were improved in muscle strength, GMFM-88, GMFM-B, the RMS value of rectus abdominis, external oblique muscle, erector spinae after treatment ($p<0.05$). And the the observation group was better than the control group. There was statistical significance ($p<0.05$). *Implications/Impact on Rehabilitation:* Functional electrical stimulation combine with the traditional rehabilitation can quickly and effectively improve the control of trunk muscle of cerebral palsy.

PO-1116

EPIDEMIOLOGIC CHARACTERISTICS OF CHILDREN WITH PLEXUS BRACHIAL PARALYSIS

Nerimane Abazi[1], Ardiana Murtezani[1], Zana Ibrahimi[2], Myrvete Paçarada[3], Agim Berisha[4], Kimete Hyseni[5]

[1]Physical Medicine and Rehabilitation Clinic, University Clinical Center of Kosovo,Albania, [2]Department of Pharmacy, Faculty of Medicine, University of Kosovo2.,Albania, [3]Gynecologic and Obstetric Clinic, University Clinical Center of Kosovo3,Albania, [4]Department of Plastic and Reconstructive Surgery, University Clinical Center of Kosovo [4],Albania, [5]Trillium Health Centre Careers, Toronto, Canada, Albania

Objective: Brachial plexus paralysis (BPP) in the newborn is the result of injury to all or a portion of the nerves of plexus brachial during the act of childbirth. The most frequent cause is the lateral pull of the babys head or arm during the act of birth. The aim of this study was to analyze the frequency of cases with BPP by gender, type, side and the next birth. *Material and methods:* This study is a retrospective sample of 84 cases with BPP conducted at the University Clinical Center of Kosovo. The disease was confirmed by performing physical examination, neurological examination, and radiography. *Results:* The majority of subjects on this study were male, with Erb-Duchene type. A greater number of the subjects had sustained injuries to the right side, a total of 70.23% of cases. At the first birth there is the most frequent BPP. *Implications/Impact on Rehabilitation:* In the treatment of BPP physical therapy has an irreplaceable role in reducing physical disability, and deformities of the affected limb. The rehabilitation process is long-term. Starting as soon as posible, in a continuous way, planed and organised in the rehabilitation team, patients can be very successful in achieving optimal and successful recovery.

PO-1117

EFFICACY OF CONSTRAINT-INDUCED MOVEMENT THERAPY AND ELECTRICAL STIMULATION ON HAND MUSCLE RECRUITMENT OF CHILDREN WITH HEMIPLEGIC CEREBRAL PALSY

Kaishou Xu, Lu He, Jianning Mai

Guangzhou Women and Childrens Medical Center, China

Objective: To compare the efficacy on muscle recruitment and coordination of constraint therapy, constraint therapy plus electrical stimulation, and occupational therapy, to treat the hand dysfunction. *Method:* Sixty-eight children with hemiplegic cerebral palsy were randomly allocated to constraint therapy, constraint therapy plus electrical stimulation, and occupational therapy group. Three groups received two weeks of treatment. All participants were measured at baseline an results. When grasping maximally used by involved hand, root mean square of both hands, integrated electromyography and co-contraction ratio of involved hand changed significantly at each follow-up session for all children, as well as reducing in integrated electromyography of noninvolved hand after six months of treatment ($p<0.05$). Constraint-induced movement therapy plus electrical stimulation group showed greater rate of improvement in integrated electromyography of involved wrist extensors, and co-contraction ratio than other two groups at three and six months, as well as improving in root mean square of involved wrist extensors than occupational therapy group ($p<0.05$). When grasping maximally used by noninvolved hand, all children changed significantly in root mean square of both involved hand and wrist extensors of noninvolved hand from baseline to each follow-up session, as well as reducing in integrated electromyography of wrist extensors of involved hand after six months of treatment for constraint-induced movement therapy plus electrical stimulation group ($p<0.05$). *Conclusion:* Constraint therapy plus electrical stimulation is likely to be best in strengthening recruitment and coordination of involved arm, and isolated movement control ability of bimanual hand in children with hemiplegic cerebral palsy.

PO-1118

THE MAIN SPASMODIC MUSCLES INVOLVED IN POSTURAL CONTROL IN CHILDREN WITH TORSION DYSTONIA DUE TO ENCEPHALITIS

Su-Zhen Fang, Xiao-Ying Zou, Jian Shi, Li-Hui Liu

Department of Pedicatrics, Zhujiang Hospital, Southern Medical University, Guangzhou, Guangdong, China

Objesctive: Recognizing the main spasmodic muscles involved in postural control in children with torsion dystonia due to encephalitis, to provide valuable reference for Botulinum toxin A (BTXA) therapy. *Methods:* 11 children with torsion dystonia due to encephalitis received the evaluations of clinical Biomechanical Analysis, BarryAlbright Dystonia Scale performed at waking state and electromyographic (EMG) examination at the state of ketamine-imidazole-induced basic anaesthesia. They were classified by three types of torsion styles---5 with similar to hemidystonia, 4 with Asymmetrical tonic neck reflex (ATNR), 2 with symmetrical tonic neck reflex (STNR). Recognizing the main spasmodic muscles which were defined as most commonly involved muslces in postural control, acting most specifically in torsion direction and showing greater EMG activation than normal. *Results:* Trapezius, teres major, splenius capitis, levator scapulae were the most commonly involved in head/neck hyperextention, shoulder girdle elevation, and humeral extension/adduction in all children. Ipsilateral eobliquus externus abdominis and bilateral Iliopsoas were responsible for the rotation and bending of trunk and pelvis in 4 with hemidystonia and 2 with ANTR. The children with STNR had symmetrical spasmodic adductors, hamstrings, triceps surae, posterior tibial muscle. There were obvious different among the children with ATNR in distribution of spasmodic muscles with more unpredictable and individual, such as triceps brachii in combination with biceps brachii, major pectoral, scalenus, supraspinatus et.al. *Implication:* The distribution of spasmodic muscles involved in postural control in children with torsion dystonia caused by encephalitis was individual, but somewhat regular.

PO-1119

PREDICTIVE VALIDITY OF GENERAL MOVEMENTS FOR CEREBRAL PALSY IN CLINICAL PRACTISE

Lin Du, Ning Li, Huiyi Jiang, Bing Wang, Junyan Feng, Feiyong Jia

Department of Pediactrics, Second Part of First Hospital of Jilin University

Objective: To evaluate the predictive validity of general movements for cerebral palsy in clinical practise. *Methods:* The study population consisted of 49 term and preterm infants at low or high risk of developing neurological dysfunction. One or two video recordings were taken at postterm 9-20weeks for the detction of fidgety movements and prediction of cerebral palsy (CP). The diagnosis of CP was determined at 12 months according to the diagnostic criteria of CP. All infants who presented absence of fidgety movements or had abnormal fidgety movements underwent an early physiotherapy program, and were followed up for gross motor function measurement until 12 months. Sensitivity, specificity of GMs assessment for predicting CP were caculated. *Results:* 16 infants were with abnormal GMs (12 with absence of fidgety movements and 4 with abnormal fidgety movements).The sensitivity of GMs with regard to later CP was 87% and the specificity was 96%. *Implications:* Our study indicates that the GMs assessment setting strongly predicts the development of CP. The work supports the results of previous studies and contributes to the validation of GMs. Furthermore, it

has demonstrated that gross motor function can be ameliorated if infants with nervous system impairment receive physiotherapy program as early as possible.

PO-1120

THE EFFECT OF SEAT SURFACE INCLINATION AND TARGET SIZE ON ARM REACHING MOVEMENT

Yunjeong Jeong, Hwakyung Shin
Graduate School of Health and Medical Science, Catholic University of Daegu,Korea

The purpose of this study was to examine the effect of seat surface inclination and target size on forward reaching efficiency. The subjects were 31 children, 16 children with spastic bilateral cerebral palsy (CP) and 15 typically developing (TD) children. The children performed a static sitting and a forward reaching task for three targets with different sizes (2, 8, or 16 cm) while sitting in one of three conditions: a horizontal seat surface, a seat surface tilted forward 15 degrees, and a seat surface tilted backward 15 degrees. Sensing acceleration in 3 axes ('ZSTAR3') were used to analyze the movement of the arm. Our results show that children with unilateral spastic CP were better at reaching at the seat surface tilted backward 15 degrees, compared to the other seat surfaces. In addition, children with unilateral spastic CP were better at reaching for bigger targets. On the other hand, children with TD were better at the seat surface tilted forward 15 degrees, rather than the seat surface tilted backward 15 degrees. For TD the target size did not have a statistically significant difference. Therefore, seat inclination and target size affect the quality of reaching movements in children with unilateral spastic CP. Our results suggest considering a proper seat surface inclination and target size during arm reaching training in children with unilateral spastic CP.

PO-1121

THE INFLUENCE OF THE LIVING ASSISTIVE TECHNOLOGY ON QUALITY OF LIFE IN THE CHILDREN WITH CEREBRAL PALSY

Fang Shi[1], Long Wang[2], Na Peng[1]
[1]Resource Center of Beijing assistant technology, Beijing, China., [2]China Rehabilitation Research Center, Beijing, China.

Objective: To explore the effects of living assistive technology on activities of daily life (ADL) in the children with cerebral palsy, in order to provide evidence for more effective rehabilitation therapy for clinical applications, family and society. *Methods:* 60 children with cerebral palsy were adopted in this experimental research method. Those children were randomly divided equally into two groups: intervention group and control group. children in the control group were treated with routine rehabilitation training, while those in intervention group received living assistive technology training in addition to routine rehabilitation training. All children were assessed by using scale before and after intervention periods. The evaluating item is: evaluation of cerebral palsy daily activities (CRRC).Analysis was performed using the statistical package of social science (SPSS), version 17.0. Statistical significance was set below the level of 5%.Measurement data were analyzed with descriptive, *t*-test, chi-square test, rank sum test, linear correlation. *Results:* (1) The information of ADL scores of the two groups children had no significant difference when sampled, so the two groups have comparability ($p>0.05$). (2) The ADL scores both in the two groups had a statistically significant difference after three month rehabilitation separately ($p<0.05$). (3) After three month rehabilitation, compared to the control group, the intervention group had a statistically significant difference in the ADL scores ($p<0.05$). *Implications:* The use of living assistive technology has a positive impact on enhancing the quality of life for children.

PO-1122

EFFICACY OF EXTRACORPOREAL FOCUSED SHOCK WAVES THERAPY IN PATIENTS WITH CHRONIC PAIN DUE TO ENTHESOPATHY

Carmen Palladino*, Silvestro Miranda, Margherita Gioia, Francesca Gimigliano, Giovanni Iolascon, Raffaele Gimigliano
Second University of Naples, Naples, Italy

Objectives: This pilot study is aimed to evaluate the efficacy of Focused Shock Waves Therapy in reducing chronic pain due to enthesopathy. *Methods:* We recruited 70 patients suffering from chronic pain in the upper limbs, lower limbs and pubic chronic pain. All the patients included were previously treated with drug therapy without achieving significant results in terms of improvement in pain symptoms. We excluded all patients with chronic pain of neuropathic origin. We evaluated all patients using the "Brief Pain Inventory" (BPI) before (T0) and after 4 treatments (T1) and the Visual Analogic Scale (VAS) at each treatment. The treatment was carried out with shock waves generated by a focal, electrohydraulic principle. The energy was applied in several sessions over a range between 0.13 and 0.56 mJ/mm², without application of local anesthetics. *Results:* Among the 70 patients (33 M and 37 F, mean age 51.7) there were 17 with trochanteric bursitis, 17 with plantar fasciitis, 12 with subacromial impingement syndrome, 10 with epicondylitis, 5 with pubic pain, 2 with patellar tendinopathy, 3 with calcific tendonitis and 4 with chronic myositis. The mean of the pain severity and pain interference index at T0 was 7.85 and 7.06 respectively, while at T1 was 1.27 and 0.89; the mean VAS at T0 was 7.94 and at T1 it was 1.16. *Implications/Impact on Rehabilitation:* In our study we found a significant reduction of chronic pain and a significant improvement in the quality of life after four treatments with Shock Waves.

PO-1123

THE CLINICAL OBSERVATION OF INTRA-ARTICULAR INJECTION OF SODIUM HYALURONATE IN TREATMENT OF OSTEOARTHRITIS OF THE KNEE WITH GINGER MOXIBUSTION METHOD

Yiliang Wang, Zhenjie Xu, Fang Yang
The Rehabilitation Division of Chongqing Three Gorges Central Hospital

Objective: To observe the clinical therapeutic effect of ginger-partitioned moxibustion combined with intra-articular injection of sodium hyaluronate in the treatment of knee osteoarthritis. *Methods:* 83 patients who met the diagnostic criteria were randomly divided into treatment group and control group, treatment group with ginger moxibustion combined with intra-articular injection of sodium hyaluronate in the treatment, the control group only with intra-articular injection of sodium hyaluronate in the treatment, 4 weeks after the treatment, the therapeutic effect was evaluated. *Results:* The treatment group of 43 cases, 8 cases of clinical control, 88 cases markedly effective, effective 10 cases, invalid 3 cases, the total efficiency of 90.7%; control group of 40 cases, 2 cases of clinical control, 17 cases markedly effective, effective 12 cases, invalid 9 cases, the total efficiency of 82.5%. *Conclusion:* Ginger-separated Moxibustion for treatment of knee osteoarthritis with simple operation, less side effects, safe and effective, worthy of promotion.

PO-1124

CORE STABILITY EXERCISE VERSUS GENERAL EXERCISE FOR CHRONIC LOW BACK PAIN: A META-ANALYSIS OF THE RANDOMIZED CLINICAL TRIALS

Xueqiang Wang[1], Jiejiao Zheng[2], Zhuowei Yu[1], Jing Liu[1], Peijie Chen[1]
[1]Shanghai University of Sport, Shanghai, China, [2]Huadong Hospital Affiliated to Fudan University, Shanghai, China

Objective: To determine the effects of core stability exercise or general exercise for patients with chronic low back pain. *Methods:* Published articles manuscripts from 1970 to October 2011 were identified by using electronic searches. Two reviewers independently selected relevant Randomized controlled trials. And RCTs only about core stability exercise versus general exercise for treatment of patients with chronic LBP were identified in this systematic review. Data were extracted independently by the same two review authors who conducted the selection of studies. *Results:* From the 28 potentially relevant trials, a total of 5 trials, involving 414 participants, were included. The pooling revealed that core stability exercise was better than general exercise for pain [MD (95% CI)=-1.29 (-2.47, -0.11), p=0.003], disability [MD (95% CI)=-7.14 (-11.64, -2.65), p=0.002] at short-term follow-up. And there was no significant difference between core stability exercise and general exercise in reducing pain at 6 months [MD (95% CI)=-0.50 (-1.36, 0.36), p=0.26] and 12 months [MD (95% CI)=-0.32 (-0.87, 0.23), p=0.25]. *Implications:* Compared with general exercise, core stability exercise could decrease pain and may improve physical function in patients with chronic low back pain at short-term. But no significant difference was found for pain at long-term follow-up between core stability exercise and general exercise.

PO-1125

EFFECT OF LOW FREQUENCY TRANSCRANIAL MAGNETIC STIMULATION OVER CONTRALATERAL PREFRONTAL CORTEX IN INTRACTABLE NEUROPATHIC PAIN

Jae-Young Han, Jung-Kook Kim, Byoung-Yup Kim, Hyun-Sik Yun, In-Sung Choi, Sam-Gyu Lee*
Chonnam National University Medical School & Hospital, Department of Physical and Rehabilitation Medicine, Research Institute of Medical Sciences, Center for Aging and Geriatrics, Regional CardioCerebroVascular Center, Korea

Objective: Phantom limb pain may be difficult to treat and usually intractable to conventional treatments. Repetitive transcranial magnetic stimulation (rTMS) has been used for the treatment of intractable neuropathic pain. We report a case of PLP treated with low frequency rTMS over contralateral prefrontal cortex. *Case Report:* A 36-year-old man complained of chronic intractable pain. He underwent right transfemoral amputation due to osteosarcoma 8 years ago and open reduction and internal fixation due to right femur neck fracture 5 years ago. He had had PLP of right toes like picking up with pincers and severe mechanical allodynia over right hemibody. He had taken zolpidem and alprazolam as required and 25 mg pentanyl patch. Pethidine HCl (200 mg) was injected intravenously 4~5 times a week. Despite the pharmacological treatment, Visual Analogue Scale (VAS) was 90~100 (maximum 100). While continuing the pharmacological treatment, we applied 1 Hz neuronavigation-guided rTMS over left primary motor cortex. He was stimulated at 1 Hz, 80% of motor threshold, 600 stimuli/day, 5 days a week, for 2 weeks. There was no significant change of pain. After rTMS-free period for 1 week, we applied 1 Hz neuronavigation-guided rTMS over left prefrontal cortex for 2 weeks. Stimulation protocol was same but location of stimulation. After then, he reported a pain relief. VAS decreased from 100 to 2O. Frequency of pethidine HCl injection decreased and half-dose of pentanyl patch was used for pain control. *Implications:* Low frequency rTMS applied over contralateral prefrontal cortex may ameliorate intractable neuropathic pain.

PO-1126

THE STUDY OF SHOULDER PAIN AFTER STROKE

Tao Li
The third hospital of Peking university, China

Objective: To find the reason of shoulder pain after stroke. *Method:* 126 hospitalized stroke patients with shoulder pain in our department were included. There were 50 female patients and 76 male patients. The average age was 67.5 (from 45 to 86). All the patients were examed by ultrasound on their painful shoulder. *Results:* From the outcome of the ultrasound we found that 25 patients (19.9%) suffered from rotator cuff injury, 34 patients (27.0%) suffered from bursitis of shoulder, 27 patients (21.4%) suffered from tendinitis, 13 patients (10.3%) suffered from tendon calcification and 27 patients (21.4%) were normal. *Impact on Rehabilitation:* There were different reasons causing shoulder pain after stroke. We should confirm the reason of shoulder pain before rehabilitation or treatment for the stroke patients. Furthermore, ultrasound is a reliable method for the diagnosis of shoulder pain.

PO-1127

INVESTIGATION ON CIRCADIAN BIOMARKERS IN FIBROMYALGIA PATIENTS

Jiunn-Horng Kang[1,2]*, Shih-Ching Chen[1,2], Chaur-Jong Hu[3]
[1]Department of Pyysical Medicine and Rehabilitation,School of Medicine, College of Medicine, Taipei Medical University,Chinese Taipei, [2]Department of Physical Medicine and Rehabilitation, Taipei Medical University Hospital,Chinese Taipei, [3]Department of Neurology, Shung Ho Hospital, Chinese Taipei

Background: Circadian dys-regulation has been suggested to be associated with pathophysiology of daytime fatigue and impaired sleep in fibromyalgia patients. Nevertheless, the association with circadian dys-regulation and pain is still unknown. This study aims to explore the association among the pain, sleep, and circadian biomarkers markers in fibromyalgia patients. *Material & Methods:* Fibromyalgia impact questionnaire (FIQ), Pittsburgh Sleep Quality Index (PSQI), Becker anxiety and depression inventory were obtained in 24 fibromyalgia a patients. The venous blood was obtained at 9-10 am and 4-5 pm to study the diurnal changes. The visual analog scale (VAS) to pain and pressure pain threshold (PPT) was measured prior to blood drawing. The serum level of serotonin and substance P, circadian biomarkers and regulation protein including cortisol, PER, CRY, CLOCK were measured. *Results:* The level of circadian biomarkers, substance P, serotonin were not associated with the level of pain and PPT in fibromyalgia patients. However, the diurnal change of CRY protein was significantly correlated with the change of PPT. Furthermore, the change of CLOCK protein was significantly correlated with the change of serotonin and cortisol. *Conclusion:* We found the dynamics of some circadian biomarkers were correlated with the level of pain sensitization. These findings may indicate the complex dynamic interaction between circadian rhythm and pain in fibromyalgia patients.

PO-1128

LONGITUDINAL EVALUATION OF THE BACK PAIN SCHOOL BY APPLYING THE APPLICATION OF ROLAND MORRIS QUESTIONNAIRE

Tatiana Domingues Pedroso
Fundação Faculdade de Medicina, Brazil

Objective: To analyze quantitatively the response to treatment of patients with chronic low back pain treated by “Back Pain School”

of IMREA HC FMUSP - LUCY MONTORO Umarizal from June 2010 to April 2012 using the questionnaire validated Roland-Morris (RM) and subjective evaluation of the Occupational Therapy Service. Methodology The initial sample was comprised of 73 medical records of patients referred and evaluated for Back Pain School and 34 patients completed the program. Some data on these patients were collected, such as clinical diagnoses and social demographic data (gender, age, education, occupation) and also the attendance to the treatment second and sixth month after the initial assessment. *Results:* We found that individuals who completed the School Program showed improvement in the areas of the Roland-Morris Questionnaire, and general health status based on the subjective assessment by the patient, after attending the Back Pain School where they received several guidelines from a multidisciplinary team on techniques of energy conservation, joint protection and ergonomics in Activities of Daily Living, within one week. *Impact on Rehabilitation:* The participants also experienced the Postural Dancing with the Occupational Therapy Service, in order to stimulate the proper posture through body awareness, and developing an attitude of attention and observation of the person in relation to themselves and the group. Other areas such as quality of life, emotional and mental health need to be further evaluated.

PO-1129

SOMATOSENSORIAL REEDUCATION FOR THE TREATMENT OF CHRONIC PAIN: A PAEDIATRIC CASE REPORT

Merce Avellanet*, Lidia Rodrigo, Blanca Zeballos
Hospital N. Sra. Meritxell, Andorra

It has been suggested that chronic pain may cause cortex distorsion. Allegedly, abnormalities in movement patterns and corporal scheme may lead to changes in cerebral cortex. Moreover, those patients are not aware of their dynamic and static discoordination. Somatosensorial re-education, by means of mirror neurons stimulation, improves patient comprehension of pain mechanisms. This approach enables patient to pain self-management. We present the case of a 12 year-old girl, with knee pain after a fall two years before. She was diagnosed of a postcontusional patellar tendonitis. Since she did not notice any improvement after a 3-month course of conservative treatment, she underwent a MRI. It showed a mild bone oedema on the internal femoral condyle. The pain did not yet improve despite a variety of different therapeutic conservative options. On first evaluation, right knee did not present swelling nor other pathological signs except moderate femoropatellar pain. Visual Analogic Scale (VAS): 5. Moderate functional limitation was observed as well as a change in gait pattern. At that point, a diagnosis of chronic pain was done. *Intervention*: the patient followed 4 sessions of somatosensorial re-education, once a week at our PMR department. Moreover, the patient continued to practicing our outpatient exercise program. VAS was the main outcome measure. *Results:* progressive improvement was observed. At the end of the four weeks she was asymptomatic, with VAS score 0. *Conclusion:* Somatosensorial education should be considered in the therapeutic approach of chronic pain, even in the paediatric population. Our case suggests that somatosensorial re-education may also be a very cost-effective therapeutic option.

PO-1130

EVALUATING PATIENTS WITH MYOFASCIAL PAIN SYNDROME OF ABDOMINAL WALL

Yoon-Tae Kim*, Jung-Soo Lee, Hiun-Suk Chae
Catholic university Uijeongbu ST. Marys Hospital,Korea

Objective: We analyzed patients with abdominal pain, referred to physiatrists by gastroenterologists, and determined the clinical features of patients with myofascial pain syndrome of abdominal wall muscles. *Method:* A retrospective chart review was performed on 101 consecutive patients who referred by gastroenterologists for last 3 years duration. Myofascial pain syndrome of abdominal wall was defined as characteristics of myofascial trigger points within the taut band in a muscle. The clinical features and outcomes of myofascial pain syndrome of abdominal wall were analyzed. *Results:* Twenty-eight of 101 patients with abdominal pain were identified as myofascial pain syndrome of abdominal wall muscles. The average age was 54 years, 82% were female, and the average duration of symptoms was 8 months. The average pain perception threshold was 3.7 kg/cm^2 on a myofascial trigger point checked by pressure algometer, and the average pain score was 5 by the 10 degree of visual analog scale. Conservative treatment including medications such as analgesics and muscle relaxants, physical modalities, stretching exercises, or spray and stretching technique resulted in some or complete pain relief in 75% of the patients. *Implications/ Impact on rehabilitation:* Evaluating the patients for myofascial pain syndrome is an important and relatively simple method of diagnosing abdominal pain. Defining of myofascial pain syndrome of abdominal wall could lead to an accurate diagnosis and effective treatment of patients with abdominal pain of undetermined etiology.

PO-1131

EFFECTS OF NEUROMOBILIZATION MANEUVER ON CLINICAL AND ELECTROPHYSIOLOGICAL STUDIRES IN PATIENTS WITH CARPAL TUNNEL SYNDROME

Ghadam Ali Talebi, Mir Ali Eteraf Oskouei*, Seyed Kazem Shakouri
Tabriz University of Medical Sciences, Iran

Objective: The aim of this study was to investigate the effectiveness of neuromobilization maneuver when combined with the routine physiotherapy in patients with carpal tunnel syndrome (CTS) by the means of subjective, physical, and electrophysiological studies. *Method:* In this randomized clinical trial study, 20 patients with CTS (32 hands) were assigned into two groups; treatment and control group. In both groups, the patients received the routine physiotherapy including the rest splint, TENS, and therapeutic ultrasound for 4 weeks. In addition to the routine physiotherapy, the patients in the treatment group received the neuromobilization maneuver. The symptoms severity scale, visual analogue scale, functional status scale, Phalen's sign, median nerve tension test, and median nerve distal sensory and motor latency were assessed. *Results:* There was a significant improvement in symptoms severity scale, visual analogue scale, median nerve tension test, and Phalen's sing in both groups ($p<0.05$). However, the functional status scale and median nerve distal motor latency were significantly improved only in the treatment group who received the neuromobilization maneuver in combination with the routine physiotherapy. The median nerve tension test and functional status scale in the treatment group were significantly improved ($p<0.05$) relative to the control group. *Implications/Impact on rehabilitation:* Neuromobilization maneuver in combination with the routine physiotherapy improves some clinical findings more effectively compared to the routine physiotherapy. Therefore, this combination can be used as a preferable and effectiveness non-invasive treatment for patients with CTS.

PO-1132

A SINGLE-CENTER RANDOMIZED CONTROLLED TRIAL OF LOCAL METHYLCOBALAMIN INJECTION FOR SUBACUTE HERPETIC NEURALGIA

Gang Xu, Zhong-Wei Lv, Yan Feng, Wei-Zhen Tang, Gang (Xiao) Xu
Department of Rehabilitation Medicine, Affiliated Tenth Peoples Hospital of Tongji University, Shanghai, China

Objective: This study explored the efficacy of local methylcobalamin injection in relieving pain and improving the quality of life among subjects with subacute herpetic neuralgia. *Method:* A single-center, randomized controlled trial of local methylcobalamin injection was performed. Ninety-eight subjects (age, ≥50 years) with the overall pain ≥4 were enrolled. Subjects were randomized to receive local methylcobalamin injection (n=33), oral methylcobalamin (n=33) or subcutaneous 1.0% lidocaine injection (n=32) for 4 weeks. The worst pain severity, global impression of change, other categorized pain and interference with activities of daily living and quality of life were assessed. *Results:* Time per group interaction, different group difference and effect on overall pain at each follow-up point were statistically significant (p<0.001) among groups. In the injected methylcobalamin group, the overall pain (p<0.05), continuous spontaneous pain (p<0.05), paroxysmal pain (p<0.05) and allodynia (p<0.05) revealed a significant effect at each follow-up point as compared to the other groups. Twenty subjects achieved pain reduction ≥50%, 24 perceived worst pain ≤3, 24 stopped using analgesics at endpoint; activities of daily living, quality of life improved significantly as compared to the other groups (p<0.001). Although both of the other groups showed a significant response after 14-day treatment (p<0.001) compared to the baseline, oral methylcobalamin did not provide any significantly pain relief (p>0.05). Implication Local methylcobalamin injection was not only efficacious in relieving pain, but also appears to be tolerable and safer choice of treatment for subacute herpetic neuralgia.

PO-1133

THE EFFECTIVENESS OF PROGRESSIVE RESISTANCE STRENGTH TRAINING ON THE RECOVERY FROM WORK-RELATED NECK AND SHOULDER PAIN: A RANDOMIZED CONTROLLED TRIAL

Ding Yu
Sun Yat-sen Memorial Hospital, Sun Yat-sen University, Guangzhou, Guangdong Province, China

Objective: To compare the effects of progressive resistance strength training on the recovery from work-related neck and shoulder pain. *Methods:* All participants reported consistent neck and shoulder pain related to computer use for more than 3 months in the past year and no severe trauma or serious pathology. Participants were randomly divided into 2 intervention groups and a control group. Participants in the progressive resistance strength training group performed the resistance training as 30%, 50 % and 70% of the maximal strength of cervical muscle group, every intensity for 2 weeks. In the resistance strength training group, participants executed training as 50% of the maximal strength for 6 weeks. The participants were requested to exercise 10 min one time, at least 5 times per week. The visual analogue scale (VAS), Neck disability index (NDI), cervical post extension and lateral flexion muscle strength, cervical joint range of motion and pressure pain threshold (PPT) on neck and shoulder were assessed before and after 2 weeks', 4 weeks',6 weeks' intervention. *Results:* A total of 42 potential participants were recruited initially, up to now a smaller group of individuals (n=34) completed 6 weeks' intervention and assessments. Post intervention, average pain and NDI scores were reduced significantly more in the progressive resistance strength training group than in the other 2 groups. *Conclusions:* Six weeks of progressive resistance strength training produced more favorable outcomes in reducing pain and improving cervical function in patients with work-related neck and shoulder pain.

PO-1134

THE CLINICAL OBSERVATION OF REHABILITATION CARE OF MINIMALLY INVASIVE TREATMENT OF 63 CASES WITH LUMBAR DISC HERNIATION

Xiaoqin Zhou
The Rehabilitation Division of Chongqing Three Gorges Central Hospital, China

Objective: To evaluate the efficacy of minimally invasive interventional treatment of lumbar disc herniation under C-arm. *Methods:* 63 patients with lumbar disc herniation using the minimally invasive treatment, strengthen basic care, psychological care, postoperative guidance and rehabilitation. *Results:* 46 cases were cured,9 cases with significant effect, 5 cases of effective, 3 cases invalid, the cure rate was 73.0%, the total effective rate of 95.2%. *Conclusion:* The minimally invasive treatment of lumbar disc disease, with the meticulous care and rehabilitation, the cure rate is high, with few complications.

PO-1135

SUPRASCAPULAR NERVE BLOCK (SSNB) VS TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION (TENS) IN HEMIPLEGIC POST STROKE SHOULDER PAIN WITH ADHESIVE CAPSULITIS

Ali Raza Qureshi*, Khalil Ahmed, Saeed Bin Ayaz Qureshi
AFIRM Rawalpindi Pakistan

Objective: Resilient shoulder pain due to adhesive capsulitis is very disquieting for post stroke cases. The Quality of life is further deteriorated. NSAIDS are avoided due to vascular pathology ie Diabetes, Hypertension. Suprascapular nerve gives 90% nerve supply to shoulder. Its nerve block can be an effective way of pain relief.The Objective of this study is to compare the efficacy of two interventions i.e suprascapular nerve block vs TENS in relieve of Hemiplegic Post Stroke shoulder pain with adhesive capsulitis. *Methods:* A Randomized control trial was carried out at Out/indoor patients in the Department of Armed Forces Institute of Rehabilitation Medicine. 20 patients were included in the study. Two intervention groups were made. Baseline NRS pain score and shoulder goniometry on passive Range of motion (Flexion Abduction) was noted for both groups. Group A were injected 2 ml 1 % bupivacaine at Suprascapular notch via posterior approach via 10 cc syringe with negative aspiration with landmarks clinically of involved side. The Group B was applied Sun (TENS) at affected shoulder 5 days a week for four weeks. Pain relief was compared with 10 point Numeric rating Scale (NRS) of pain and ROM was calculated with goniometry after 4 weeks Demographic data including age, education, and occupation type of stoke, duration, hemiplegic shoulder side and was recorded. No side effects were noted in either of the intervention groups. Data analysis was done by SPSS V 19. *Results:* All patients were males.Ages were older than 50 years (81%). Right dominant side was involved in 14 patients and left in 6 patients. 17 patients had ischemic stroke and 3 hemorrhagic respectively. Ten Group A patients were subjected to Suprascapular Nerve Block (SSNB) and other ten to TENS application. There were significant improvements of NRS Pain Score at the 4th week in the SSNB group and TENS group with mean decreasing NRS Pain Scores of 4.7 +/- 2.3 and 6.2 +/- 2.8.Range of motion (ROM) outcome of the SSNB group and TENS group, was (Flexion increase) 20.0 +/- 6.3 and 19.4 +/- 10.4 and Abduction increase was 15.2 +/- 11.3 and 14.6 +/- 12.5, respectively. SSNB produced a faster and better relief of pain than TENS but there was no significant difference for restoration of ROM in both groups. There was no complication like pneumothorax observed during the present study.
Discussion: Adhesive capsulitis (AC) is a comparatively common musculoskeletal disease manifesting as chronic pain and progressive stiffness of the shoulder. The most common non-central, musculoskeletal etiologies of hemiplegic shoulder pain include adhesive capsulitis, subluxation and rotator cuff pathologies, and other multiple contributing factors. Adhesive capsulitis was the common root cause of hemiplegic shoulder pain. (HSP) after a radiological correlation and MRI examination in patients of stroke. The pathophysiology

of AC involves regional inflammatory and fibrotic change over the capsule of the gleno humeral joint. AC is self-limiting but, a disease course lasting for 1 to 2 years is not uncommon. This condition is managed with comprehensive rehabilitation plan incorporating oral analgesic, short term NSAIDs along with occupational therapy, physiotherapy (TENS, Ultrasound),Exercises and injection procedures. Commonly used injections are SSNBs with a posterior approach using 1 % Bupivacaine and intra articular or sub acromial steroid injections.

PO-1136

CLINICAL OBSERVATION OF SHOCK WAVE IN THE TREATMENT OF PERIARTHRITIS OF SHOULDER

Yan Wang
Wuhan University Zhongnan Hospital Rehabilitation, China

Objective: Extracorporeal shock wave therapy on periarthritis of shoulder. *Method:* Observation of case 61, male 26, female 35 people. Aged 22~74 years old. Were randomly divided into two groups, shock wave treatment observation group 31 people, intermediate frequency treatment observation group 30. Before treatment, after giving pain score, activity of shoulder joint, activities of daily living (ADL) evaluation. Patients when treated with exposure of the shoulder, the affected area coated with a coupling agent, the shock wave on the surface of the affected area sensitive point. Treatment of power 8-14 kv, treatment frequency of 120 times per min, the impact of the number of 800-2000 times. Once a day, each time 1~2 asore point shock treatment. *Results:* Evaluation by improved constant-Marley method for evaluation of shoulder joint movement (Pain/Rom/ADL) Shock wave groups before treatment score: 1963/31=63.32 After treatment with total score: 2600/31=83.87 Margin: 20.55 points. The if group before treatment total score: 62.99 after treatment with total score: 74.97 Margin: 12 points. *Implications/Impact on rehabilitation:* High intensity focused shock waves, stimulating the activation of osteoblastic cells and mesenchymal cells, Improve blood oxygen function, accelerate microcirculation. Mechanical wave stimulation with penetration, adhesion lysis organizations, improve local blood circulation. Shock wave biological effects and physiological effect, obvious inhibition of pain.

PO-1137

THE RELATION BETWEEN MOVEMENT AND STANDING POSITION BALANCE (THE 3RD REPORT)

Hiroshi Nobori
TEIKYO University of Science, Japan

Objective: A purpose of this study is to inspect how"pleasant movement" and "unpleasant movement" affect th estanding position balance of the person. *Method:* We imposed tusk movement for 16 subjects and inspectedstanding balance,before and after movement. The tusk movement to appoint assumed it three typical movement of "pleasant movement" and"unpleasant movement". The examination index assumed it,1) total trace length, 2)circumference area, 3) power spectrum X, Y, Z. *Results:* By the comparison before and after the tusk movement of "pleasant movement", we accepted the average of 23.3% reduction with total trace length and the average of 22.5% shortening with circumference area, before movement later. The meaningful change was not accepted in power spectrum. By the comparison before and after the tusk movement of "unpleasant movement", we accepted an almost completely opposite result in all indexes. *Implications:* The meaningful change was not accepted in tusk movement by the comparison by the power spectrum area ratio. However, we showed a characteristic tendency. We admitted the tendency to decrease of the area ratio at big frequency band 2-10 Hz, and admitted the tendency to increase of the area ratio at small frequency band 0.02-0.2 Hz by the standing position balance inspection that we performed after "pleasant movement" in all of power spectrum. *Impact on Rehabilitation:* This study suggested that "pleasant movement" reduced both the total trace head and the circumference area. And it contributed to improve to standing position balance.

PO-1138

TNF-A CONTRIBUTES TO HYPEREXCITABILITY OF DRG NEURONS VIA INCREASED CURRENTS OF SODIUM CHANNELS FOLLOWING MOTOR FIBER INJURY

Xi Chen[1], Rui Ping Pang[2], Zu Lin Dou[1], Xian Guo Liu[2]
[1]Department of Rehabilitation Medicine, the Third Affiliated Hospital, Sun Yat-sen University, Guangzhou,China, [2]Pain Research Center, Zhongshan Medical School of Sun Yat-Sen University, Guangzhou, China

Object: The ectopic discharges observed in uninjured dorsal root ganglion (DRG) neurons following various lesions of spinal nerves have been attributed to functional alterations of voltage-gated sodium channels (VGSCs). Such mechanisms may be important for the development of neuropathic pain. VGSCs can be divided into Tetrodotoxin-sensitive (TTX-S) and Tetrodotoxin-resistant (TTX-R, including Nav1.8 and Nav1.9) subtypes. In the present study, the functional changes of DRGs following selective lumbar 5 ventral root transection (L5-VRT) were examined at electrophysiological level to investigate the possible mechanisms underlying the motor nerve injury induced neuropathic pain. *Methods:* L4 and L5 DRG neurons of rats were dissociated using enzyme digestion. DRG neurons were examined by whole-cell patch-clamp recordings. The concentrations of TNF-α in Cerebrospinal fluid (CSF) and DRGs were assayed with ELISA, and then the corresponding concentration of TNF-α were added into medium to investigate its effect on cultured neurons. *Results:* L5-VRT decreased the thresholds of action potentials and increased the firing rate in uninjured DRG neurons (7 d after operation, $p<0.001$). ELISA analysis revealed that the concentration of TNF-α is significantly increased at 3 d and 7 d after L5-VRT in Cerebrospinal fluid (CSF) and in DRG tissue ($p<0.001$). TTX-S and Nav1.8 currents increased in DRG neurons cultured with medium containing rrTNF (100 pg/ml) ($p<0.05$), which is comparable to the level of TNF-α in CSF of L5-VRT rats. *Implications:* TNF-α may increase excitability of primary afferent neurons via increased currents of sodium channels following motor fiber injury, thus contribute to the mechanisms of neuropathic pain.

PO-1139

THE EFFECT OF MIRROR THERAPY IN STROKE PATIENTS WHO DEVELOPED COMPLEX REGIONAL PAIN SYNDROME TYPE I

Secil Vural, Güldal F Nakipoglu Yuzer, Sibel Demir Özbudak, Nese Ozgirgin*
Ankara Physical Medicine and Rehabilitation Training and Research Hospital,Ankara, Turkey

Objective: The aim of study is to investigate the effect of mirror therapy (MT) on stroke patient who developed CRPS type 1. *Method:* 30 patients with CRPS type 1 because of cerebrovascular disease were added to study. The patients were randomly divided as the MT group ($n=15$) and the control group ($n=15$). In addition to conventional rehabilitation program the MT group for the upper extremity went on a MT protocol was performed 5 days a week for 4 week. The clinical evaluations was made before and after treatment: active and passive range of motion measurements of wrist, measurements of pain (Visual Analog Scale-VAS-), the measurements of motor (Brunnstrom scale-BS-) and functional (Functional Independence Measure-FIM-, Frencay Arm Test-FAT- and Fugl

Meyer Scale-FMS-) outcome. *Results:* At the end of the therapy in the control group active flexion and extension ranges were increased, a significant increase were found in motor FIM and total FIM scores and VAS score levels were significantly increased. At the end of the treatment in the MT group hand BS, passive flexion and extension, active flexion and extension range of motions, FAT scores, motor FIM, total FIM, FMS scores of hand and wrist, increased significantly and VAS levels were significantly decreased. In the MT group with compared to control group the passive flexion, active flexion and extension, the FAT, motor FIM, cognitive FIM, total FIM scores, wrist and hand FMS and VAS are statistically found to be better respond to treatment. *Implications/Impact of Rehabilitation:* As a result of study added MT to neuropsychological therapy is effective in CRPS type 1 patients with stroke.

PO-1140

THE TRIAL OF LOW-FREQUENCY PULSED ELECTROMAGNETIC FIELD ON PAIN IN OSTEOPOROSIS

Xinshu Xia, Xiaohong Li
Department of Physical Medicine and Rehabilitation, The First Affiliated Hospital, Chongqing University of Medical Sciences,China

Objective: In order to study the effect of low-frequency pulsed electromagnetic field on the pain in osteoporosis. *Methods:* 20 postmenopausal women suffering from pain, who were diagnosed as osteoporosis according to the WHO standard, mean age was 65.2 (range 50-79), were included in this trial. These patients suffered from osteoporotic pain at least 6 months, and the mean course of disease was 5.12 years. 4 patients had osteoporotic fracture. All patients only received the low-frequency pulsed electromagnetic field therapy with ZH-21 osteoporosis treatment system (Power ≤ 2000 VA; Pulsed Frequency: 1-100 Hz; Magnetic Induction: 0-100 Gs with pulsed frequency 1-50 Hz, 0-75 Gs with pulsed frequency 51-100 Hz). A total of 20-30 managements, with 30-40 min at a time and once per day, were given to the patients. The VAS and the bone mineral density were tested in the post-therapy period compared to pre-therapy. *Results:* The VAS was 5.85±1.53 pre-therapy, and significantly decreased to 3.25±0.79 in the post-therapy period. No significant difference was found in the bone mineral density between the pre-therapy and post-therapy. *Implications:* Our study demonstrated that ZH-21 osteoporosis treatment system can release the osteoporotic pain, and have no adverse side effect. But no significant difference was found in the bone mineral density, which related to the short observation time, etc.

PO-1141

ESTABLISHMENT OF A TIGHT BEHAVIORAL INPATIENT PROGRAM, IN THE MANAGEMENT OF COMPLEX REGIONAL PAIN SYNDROME

Hagay Amir, Andrea Book, Itzhak Ziv-Ner
Sheba, Medical Center, Israel

Objective: Complex Regional Pain Syndrome (CRPS) is a growing entity in post physical trauma patients. It is initiated by a minor trauma, and develops within weeks to a chronic pain syndrome that is usually not controlled by the most potent of pain management tools. The patients and their families suffer from debilitating pain that prevents them from any normal activities. This condition frustrates their caregivers and their health providers. The objective is to identify the patients with rehabilitation potential and provide them with a behavioral management program to return to daily activities. *Method:* A multi-disciplinary treatment team was assembled, headed by a rehabilitation physician, and a rehabilitation psychologist, with a specialized nurse, a physical therapist, an occupational therapist and a social worker. Weekly meetings were set for education of the CRPS team and for the personnel in their departments. *Results:* After initial psychological tests to ascertain compatibility, a three week intensive treatment plan with set goals, "rewards and punishments" is designed for the patient and a contract is signed with him. Weekly treatment discussion sessions with the patient and the entire team are set to discuss and establish the new goals. *Implications/Impact on Rehabilitation:* Most CRPS patients are treated all over the world in pain clinics by pain specialists. This is a pioneering rehabilitative approach, which aims to distract the focus away from the pain and improve daily function as the patients learn to cope and function with their condition.

PO-1142

CHARACTERISTICS AND CORRELATES OF CHRONIC PAIN AMONG SPINAL CORD INJURYED VICTIMS FROM THE 2008 WENCHUAN EARTHQUAKE

Huacong Wen[1,2], Jan Dietrich Reinhardt[3,4,5], Michael Baumberger[3,6], Xia Zhang[1,2,3], James E Gosney[3], Jianan Li[1,3]
[1]The First Affiliated Hospital of Nanjing Medical University, Nanjing, China, [2]Caring For Children Foundation, Hong Kong, China, [3]International Society of Physical and Rehabilitation Medicine (ISPRM) – Committee for Rehabilitation Disaster Relief, [4]Swiss Paraplegic Research, Nottwil, Switzerland, [5]University of Lucerne, Department of Health Sciences and Health Policy, Lucerne, Switzerland, [6]Swiss Paraplegic Centre, Nottwil, Switzerland

Objective: We aimed to examine pain and treatment conditions of earthquake victims with spinal cord injury. *Methods:* Twenty-six patients who sustained SCI from the 2008 Wenchuan earthquake were enrolled. Three patients were lost to follow up. We collected data on pain severity, quality of life and social participation at 3 measurement points. Pain severity was measured with the VAS, quality of life with the WHO-QoL, and social participation with the CHART-SF. At a fourth measurement we assessed current pain (VAS), pain location, pain pattern, onset time of pain, pain duration, pain descriptors, aggravating and alleviating factors, and pain treatment conditions. Data were descriptively analyzed. Pain determinants were analyzed with a longitudinal Tobit regression. *Results:* Chronic pain was highly prevalent. Most patients reported pain since onset. Pain severity was not significantly reduced over time. Prevalence of neuropathic pain was almost twice as high as that of nociceptive pain. Apart from educational level we found no significant pain determinants. Depression, quality of life and social participation scores were highly correlated with pain at the first two measurement points but no longer at the third point. Most patients regarded pain as normal condition after SCI or were afraid of medication dependency and did not seek treatment. *Implications:* Pain is an important problem in earthquake victims with SCI. Information of patients on the availability of different treatment options is highly recommended. Non-pharmacological interventions seems preferable, particularly in a low-resourced setting and when patients are afraid of developing drug dependency.

PO-1143

EFECT OF IMPROVED JOINT MOBILIZATION COMBINED WITH MANUAL MASSAGE ON SCAPULOHUMERAL PERIARTHRITIS

Yonghong Wang, Zhi Hou, Hui Liang
Department of Physical Medicine and Rehabilitation. PLA 187 Hospital, Haikou, China

Objective: To evaluate clinical efect of improved joint mobilization combined with manual massage on scapulohumeral periarthritis. *Method:* Ninety patients with scapulohumeral periarthritis were randomly divided into improved joint mobilization group (n=48) and control group (n=42): Patients in the control group received manual massage, physical factors and functional exercise. Patients

in the mobilization group received the therapy as in the control group added with improved shoulder joint mobilization. Each patient underwent a course of treatment (6 d). Pain and functional assessment were carried out pre- and post-treatment according to the Short Form McGill Pain Questionaire (sF-MPQ) and range of motion (ROM). *Result:* All the 90 patients were analyzed in the result. In the control group, pain, range of motion (range of motion, ROM) scores post-treatment were significantly different with pre- treatment ($p<0.05$), In joint mobilization group, there was a significant difference in pain and ROM scores post-treatment with pre-treatment ($p<0.01$); Post-treatment pain, ROM score of joint mobilization group compared with the control group were significantly different ($p<0.05$). *Implications on Rehabilitation:* Improved shoulder joint mobilization combined with manual massage and functional exercise on scapulohumeral periarthritis, is a combination of Chinese and Western medicine theory, effect inside and outside joint capsule, active and passive movement techniques, can relieve pain, loosen adhesions, increase shoulder range of motion, and shorten the course of treatment, improve therapeutic effect. Also is a effective method for the treatment of shoulder joint dysfunction after shoulder injury.

PO-1144

EFFECTIVENESS OF WET-CUPPING THERAPY COMPARED WITH DRY-CUPPING THERAPY IN A RAT MODEL OF COMPLETE FREUND'S ADJUVANT-INDUCED PAIN

Imam Subadi[1], Hening Laswati Putra[1], Aboe Amar Joesoef[2]*

[1]Department of Physical Medicine and Rehabilitation School of Medicine Airlangga University Surabaya-Indonesia,Indonesia, [2]Department of Neurology School of Medicine Airlangga University Surabaya-Indonesia, Indonesia

Objectives: To distinguish the effectiveness of wet cupping than dry cupping in reducing pain. *Background:* Although was known thousands years ago by mankind, cupping therapy flared up in big cities in Indonesia recently. Very minimal empirical study of cupping has been conducted. *Method:* Randomized controlled trial post test only. Thirty two male Rattus norvegicus, Wistar, 250-350 gram, aged 3 months was divided 4 groups. Group 1 (n=8): negative control, group 2 (n=8): positive control, group 3 (n=8): dry cupping, and group 4 (n=8): wet cupping. Animal model of pain was one hundred microliter of Complete Freund's Adjuvant was injected into the plantar surface of the left hind paw of group 2, 3,and 4. Intervention: dry-cupping: negative pressure (- 200 mmHg), wet-cupping: 10 punctures before negative pressure (- 200 mmHg). Both negative pressure for 5 min. Main outcome measure: reaction time pain threshold in second, 24 h after intervention. Analysis data with statistics: Oneway Anova, SPSS 17. *Result:* There are no significant differences in reaction time pain threshold between negative control and positive control. Dry-cupping therapy had significant increase in reaction time pain threshold (95%, means difference =5.0, $p<0.05$) than positive control. Wet-cupping had significant increase in reaction time pain threshold ([95% confidence interval (CI), mean difference=12.2, $p<0.05$) than positive control. *Conclusion:* Cupping therapy reduce inflammatory pain in a rat model and Wet-cupping therapy was more effective in reducing pain than dry cupping therapy. Impact of Rehabilitation Cupping therapy can be used as alternative therapy in pain relieve.

PO-1145

PROBABLE MECHANISMS OF DRY NEEDLING IN PAIN CONTROL

Chang-Zern Hong

[1]Department of Physical Medicine and Rehabilitation, University of California Irvine, Irvine, California, USA.,United States, [2]Department of Physical Therapy, Hung-Kuang University, Sha-Lu, Tai-Chung, TAIWAN, United States

Objective: To discuss the probable mechanism of dry needling. *Method:* Dry needling for pain control include traditional acupuncture, dry needling with multiple insertions, dry needling with electrical stimulation, superficial needling, and Fu's subcutaneous needling, etc. The site of treatment can be at the pain region (direct needling) or far away from the pain region (remote needling). *Results:* Based on our research and clinical practice, "multiple insertion technique" usually provides the best and fast effects for pain control. To perform this procedure, the needle should be moved in-and-out into different directions to elicit painful sensation and local twitch responses. This technique is similar to that used for myofascial trigger point (MTrP) injection, originally described by Travell and Bobb. Both techniques probably have similar mechanism for pain control. The descending pain inhibitory system is probably involved in the mechanism of immediate pain relief after multiple needle insertion. Either hyperstimulation analgesia for general pain control or disruption of "MTrP" circuit for myofascial pain control is actually via the descending inhibitory system. *Implications/Impact on Rehabilitation:* It has been suggested that eliciting LTRs (feeling similar to "De-Qui" effect in acupuncture) during needling is essential to obtain an immediate and complete pain relief. Eliciting an LTR indicates that a sensitive locus (nociceptor) is encountered by the needle tip. It appears that, after a sensitive locus is encountered by the tiny needle tip, and an LTR is elicited, the irritability of this sensitive locus (nociceptors) can be suppressed.

PO-1146

CLINICAL EXPERIENCE IN TREATING LUMBAR DISK PROLAPSE BY COMPREHENSIVE TEATMENT THEREPY

Yunqiong Shi, Pei Pei, Jun Dai

Hubei Huangshi Central Hospital

Objective: To observe the clinical effect of comprehensive therapy on Lumbar Disk Prolapse (LDP). *Methods:* Sixty cases patient were randomly divided into two groups, The control group (n=30) were treated with yaobitong capsule. The patients in the observation group (n=30) were treated with comprehensive therapy including pelvic traction, once a day for 30 min. electroacupuncture, whose points used were: Ashipoint,shenshu (BL57), Dachangshu (BL25), Xiaochangshu (BL27), Huantiao (GB30), Yinmeng (BL37), Yanglingquan (GB34), Chenshan (BL57) WEIzhong (BL40), Xuanzhong (GB39), then continued with G-6805 electric needle treating device,once a day for 30 min. TDP backing and cupping. Plus rehabilitation training. During the acute stage, patients were asked to lie on hard wood board bed,after the pain released patients did exercises by bending the waist backward to strengthen it. After ten days therapy,the clinical effect were analysed. *Results:* The total effective rate in observation group was 90%. It was significantly higher than the control group which was 60%. *Implications:* In the comprehensive therapy,the traction force can expand the lumbar disk compressed due to the protrusion of the nucleus,allowing recovery of the nucleus pulposus. The TDP backing and cupping and the electroacupuncture can improve local blood circulation,removing the pain-causing materials and reducing the degree of pain, and provide beneficial heat,remove or reduce the inflammation around the nerve roots. Lying on hard wood board bed and doing exercises by bending the waist backward can increase the strength of the waist and back and prevent further growth in extrusion. The comprehensive therapy is a good therapy for Lumbar Disk Prolapse.

PO-1147

THE RETROSPECTIVE STUDY OF 115 CASES OF SPINAL CORD STIMULATION THERAPY

Linqiu Zhou

Jefferson Medical College, United States

Objective: To evaluate the efficacy and complications of spinal cord stimulation (SCS) therapy. *Method:* A retrospective chart review

of 115patients (65 male, 50 female, ages 18-83, average 52) from 5/2005 to 11/2011. After the successful SCS trial, all patients underwent permanent SCS implantation with percutaneous SCS lead for their chronic pain syndromes. Pain rating scale, functional level, and status of narcotic medication were assessed. Complications such as infection, lead migration, battery site pain were also recorded. Patients followed up from 4 months to 6 years. *Results:* One patients deceased from natural cause. 109 of 114 patients (97 %) received from 50% to 90% of pain reduction; decrease of pain medications. 80% of these 109 patients resumed their normal vocational activity or physical activities. There was no acute infection. However, one patient developed epidural infection one and half years later after his dental procedure. He was treated conservatively without removal of SCS. The SCS leads migration occurred in two patients and required revised. Three patients experienced temporary leg (transient neuropathic pain) which resolved within 1 to 2 weeks after oral steroid therapy. Three patients developed pain at the battery site and required the battery revision. *Conclusions:* In the selected patients, the spinal SCS therapy can apply significant pain reduction in the chronic patients and improve patient's functional and vocational activity and decrease the patient's narcotic medications. Careful surgical skills including needle insertion lead anchoring, restrict sterile technique can prevent lead migration, infection and battery site pain.

PO-1148

EFFICACY OF NERVE BLOCK COMBINED WITH ULTRASHORT WAVE AND MEDIUM FREQUENCY ELECTROCHERAPY ON PATIENTS WITH CERVICOGENIC HEADACHE

Zhaoyang Li, Ling Li, Li Liang, Yan. Long
Department of Physical Therapy and Rehabilitation Medicine, No.421 Hospital of the People´s Liberation Army

Objective: To investigate the efficacy of neural blockade combined with ultrashort wave and medium frequency multimodality treatment on acute cervicogenic headache (CEH). *Methods:* Sixty patients with CEH were randomly divided into 2 groups (n=30). Patients in the treatment group were treated with occipital neural blockade, and followed by ultrashort wave and medium frequency multimodality treatment on next day. while only occipital neural blockade was use in the control group. *Result:* As compared to that in the control group, the pain degree (numeric rating scales) was significantly decreased in the treatment group (p<0.05). The effective power and total effective rate were elevated while the relapse rate obviously decreased in the treatment group with significant differences (p<0.05). *Conclusions:* Neural blockade combined with ultrashort wave and medium frequency multimodality treatment can effectively alleviate headache, relieve symptoms, and lower the relapse rate of cervicogenic headache.

PO-1149

EFFECT OF WHOLE BODY VIBRATION ON WALKING ABILITY OF BURN PATIENTS

Jun Wang, Guo Xing Zhang, Wen Xia Hong, Si Wen Liu, Dan Tang
Effect of whole body vibration on walking ability of burn patients

Objective: To explore the effect of whole body vibration on walking ability of burn patients. *Methods:* 60 burn patients were assigned randomly to observation group (30 cases) and control group (30 cases). Both groups received regular rehabilitation treatment for 4 weeks, including strength training, range of motion training, balance training, orthoses application, physical factors therapy and rehabilitation education. In addition, observation group received whole body vibration training. Training method is to use of German Galileo vibration equipment, stimulating musculoskeletal and circulation systems through high frequency vertical vibration produce hypergravity to strengthen and restore patients' function. Different vibration frequency (from 12-17 Hz) were use according to patients' situation, 3 sets per session, 3 min one set, one session per day, total 5 sessions per week. Outcome variables included muscle strength, range of motion, pain, balance and walking ability before and after four weeks treatment. Measurement method included Biodex mluti-joint isokinetic training and testing system, visual analogue scale, Fugl-Meyer balance scale and six min walk test. *Results:* after four weeks treatment, the improvement of function were obvious, and observation group is better than control group with statistical significance (p<0.01). *Conclusions:* whole body vibration can improve walking ability effectively for burn patients

PO-1150

PATIENT PERCEPTION OF PAIN VERSUS OBSERVED PAIN BEHAVIOR DURING A STANDARDIZED ELECTRODIAGNOSTIC TEST

Josh Verson, Andrew Haig*, Danielle Sandella, Karen Yamakawa, Zachary London
University of Michigan, United States

Objective: Clinicians who care about patient experience during procedures often use their observations of pain behavior to judge the level of discomfort. Electromography (EMG) is one Physiatrist and Neurologist procedure that causes discomfort. The purpose of this project is to study the differences in observed pain and actual patient report of pain during a standardized, extensive EMG procedure. *Method:* The population comprised 60 persons, 55.0% male and 85.0% white with a mean age of 63.7±7.9 years. This study included three groups of individuals--asymptomatic volunteers (n=25, 41.7%), patients with vascular claudication (n=7, 11.7%), and patients with neurogenic claudication (n=28, 46.7%). Subjects underwent same EMG protocol, which includes needle examination of 6 leg muscles, paraspinal mapping of the back, motor, sensory, and 2 H-wave nerve conduction studies in the leg. Using a 0-10 viusal analog pain scale, patients rated the amount of pain they perceived during EMG while research assistant observers recorded the amount of pain they observed during the procedure. *Results:* Observers significantly underrated the pain compared to the subjects (3.17±2.23 vs. 4.38±2.01, t=-4.577, df=59, p<0.001). The correlation analysis showed significant association between the perceived pain respectively with the McGill Pain Index (r=0.288, [p=0.026), Pain Disability Index (r=0.314, p=0.014), and Quebec Back Pain Disability Scale (r=0.290. p=0.030). The perceived pain however, was not found to be significantly (p >0.05) related to Tampa fear of movement/ (re)injury or Center for Epidemiologic Studies Depression Scale or VAS or SF-36. *Implications/Impact on Rehabilitation:* Understanding the differences between perceived pain and the observation of pain is essential if clinicians are to minimize discomfort during procedures. This study demonstrated that observers appear to rate the pain of persons undergoing electrodiagnostic testing lower than the persons being tested do. Compassionate clinicians should understand that they do not fully understand patient pain during procedures and may need to directly ask about discomfort.

PO-1151

THE STUDY OF INTRAOPERATIVE EXCITATION OF VAGUS NERVE AND ITS RISK FACTORS IN RADIOFREQUENCY THERMOCOAGULATION OF GASSERIAN GANGLIONS

Heping Jia, Kang Wang
Department of Pain Management,251 Hospital of PLA, China

Objective: To study intraoperative excitation of vagus nerve (IO-EVN) and its risk factors in radiofrequency thermocoagulation of Gasserian ganglion. *Methods:* 385 patients of primary trigeminal neuralgia in our department were enrolled into this study. Oculocardiac reflexes were examined before operations,Continuous electro-

cardiogram, heart rate changes, and systemic blood pressure were monitored during the procedure of oval foramen puncture under DSA guidance, electrode needle stimulation, and lesion production; Non-conditional Logistic regression was to analyze risk factors of IOEVN; Hospital Anxiety and Depression Scales (HADS) were applied to diagnose depression or anxiety, the relation between anxiety/depression and IOEVN was analysed. *Results:* Oculocardiac reflexes were postive in 28 patients before the operations, 21 patients developed bradycardia, and 6 patients developed arterial hypotension among them during the operations,what were called IOEVN. Non-conditional Logistic regression analysis showed depression was the related risk factor,18 patients with IOEVN accounted for 72% of 25 depression ones,and 3 patients with IOEVN accounted for 15% of 20 patients with depression and anxiety. *Conclusion:* A few patients (5.45%) with primary trigeminal neuralgia showed as IOEVN during radiofrequency thermocoagulation of Gasserian ganglion. Depression was the related risk factor, Oculocardiac reflexe and HADS were better methods for evaluating IOEVN,which provided basis for preventing and treating IOEVN.

PO-1152

A RANDOMIZED CONTROLLED TRIAL OF COGNITIVE BEHAVIORAL THERAPY ON PATIENTS OF CHRONIC PAIN WITH DEPRESSION

Liming Ou[1], Chunyan Zhu[2], Qingshan Geng[3]

[1]Guangdong General Hospital China, [2]Guangzhou, China., [3]Guangzhou Medical University,Guangzhou,China, [4]Department of Health of Guangdong Province,Guangzhou, China.

Background: Over 30% people in the world suffer from chronic pain and over 30% of them accompany with depression. The common methods with pills and physical factors can not both relieve their pain and improve their mental disorder effectively. *Objective:* This study explored the clinical effect of cognitive behavioral therapy (CBT) on patients of chronic pain with depression disorder. *Methods:* Data were obtained from the outpatient department of rehabilitation medicine, Guangdong General Hospital, Guangzhou. A total of 120 outpatients with chronic pain and depression were randomly divided into control group (pills & physical therapy) and cognitive behavioral therapy group (pills & physical therapy & CBT) with each 60 cases to receive a four weeks treatment. All cases were evaluated with VAS and SDS before and after the treatment. *Results:* Four weeks after the treatment, the mean scores of VAS and SDS of 2 groups decreased significantly than before ($p<0.001$). Among them, VAS scores from 6.40±0.669 to 4.50±0.701 in control group and from 6.43±0.673 to 2.95±0.910 in CBT group; SDS scores from 46.08±3.846 to 44.03±3.565 in control group and from 46.35±3.982 to 46.35±3.982 in CBT group. Meanwhile, the mean scores of VAS and SDS of the CBT group were significantly lower than those of the control group after the treatment ($p<0.001$). *Implications on Rehabilitation:* CBT can not only relieve the pain strength of chronic pain patients, but also remove their depression symptoms effectively. It is worth to apply CBT in the treatment of chronic pain patients so as to gain a psychosomatic rehabilitation.

PO-1153

THE CLINICAL OBSERVATION OF MASSAGE MANIPULATION COMBINED WITH ACUPUNCTURE ON LUMBAR DISC HERNIATION TREATMENT

Tianlong Guo

Fifth Hospital of Heilongjiang Province,Harbin 150000, Heilongjiang, China

Objective: The research was to introduce a characteristic treatment of Traditional Chinese Medicine (TCM) on Lumbar Disc Herniation (LDH) by observing 91 eligible qualified patients of LDH. The therapy was a combination of acupuncture and massage manipulation to strengthen the therapeutic effect. It provided a new way of treating LDH with safe, effective, standardized manipulation, and also quantitative indicators and good compliance of patients without drugs. *Method:* 91 patients were chosen from Hei Longjiang Province No.5 Hospital Rehabilitation Department from March 2011 to March 2012. All the cases accepted the treatments of massage manipulation and acupuncture 7days a course. After 3 courses' treatments, the cases took an assessment of clinic curative effect. *Results:* All through 91 cases of patients finished the whole process of the treatments, the effective power was 93.4%. Compared with the symptoms before treatment, pain level score and locomotor activity score improved remarkably ($p<0.01$). Lumbar activity function score got improved ($p<0.05$). Affected side elevation test of straight leg and sitting position touch toes and neck flexion sign score *Implications:* Acupuncture and massage combined with together could improve the LDH partial pathological change. Removed the demic adaptation and compensation potential, then achieved the goal of LDH treatment The new method had benefits of safety, no adverse reaction, relieving the patients' pains maximatily. It provided a new way for non- pharmacotherapy on LDH treatment.

PO-1154

EFFECT OF DRY NEEDLING DIAMETER ON MUSCLE PAIN

Gang Wang, Qian Gao

Chinese PLA General Hospital

Objective: While evidence supports efficacy of dry needling in treating musculoskeletal pain, it is unclear which needling method is most effective. This study aims to determine the effects of diameter of needle on muscle pain. *Method:* Volunteers ($n=38$) with myofascial pain syndrome affecting neck or back muscles with at least 3 months' duration of pain. Subjects were assigned randomly to three groups, namely control group ($n=9$), thin needling group (diameter of 0.5 mm, $n=11$) and thick needling group (diameter of 1.2 mm, $n=18$). All patients pronation on a treatment couch, received infiltration anaesthesia with 0.25% lidocaine. Control group rested for 15 min. The other groups received twenty piece of needling at the maximum tender point typically located on the trigger point and retained in place for 15 min. Treatment efficacy was measured with the visual analog scale (VAS) for neck or back pain and Short-Form 36 (SF-36) Health Survey, at pretreatment,and posttreatment on days 1, 14, 28. *Results:* VAS scores for posttreatment on days 14 and 28 decreased compared with pretreatment scores in thick needling group; SF-36 scores on days 28 increased compared with pretreatment scores in thick needling group; VAS scores and SF-36 scores on days 1,14 and 28 indicated no significant difference compared with pretreatment scores between the control group and thin needling group. *Implications:* The diameter of needle is important for the relief of muscle pain. In terms of VAS and SF-36 scores, master single test therapy with thick needling was found to be more effective than master single test therapy with thin needing.

PO-1155

THE EFFICACY OF HYPERBARIC OXYGEN THERAPY IN THE MANAGEMENT OF CHRONIC FATIGUE SYNDROME

Selim Akarsu[1], Levent Tekin[1], Alparslan Bayram Çarlı[2], Fatih Tok[3], Hakan Ay[4], Mehmet Zeki Kıralp[1]

[1]Gülhane Military Medical Academy Haydarpaşa Training Hospital, Department of Physical and Rehabilitation Medicine, İstanbul, Turkey, [2]Bursa Military Hospital, Department of Physical and Rehabilitation Medicine, Bursa, Turkey, [3]İskenderun Military Hospital, Physical Medicine And Rehabilitation Service, İskenderun, Turkey, [4]Gülhane Military Medical Academy Haydarpaşa Training Hospital, Department of Undersea And Hyperbaric Medicine, İstanbul, Turkey

Objective: Chronic fatigue syndrome (CFS) is a chronic disease with social components that ensue secondary to the incapacity of the person to fulfill their work, social and family responsibilities. Currently, there is no consensus regarding its treatment. The aim of this study was to determine the efficacy of HBO2 therapy in CFS. *Method:* Sixteen patients included in the study were diagnosed with CFS according to the Fukuda criteria. Patients received 15 HBO2 therapy sessions in three weeks. Patients were evaluated before treatment and after completion of the 15 sessions. Fatigue was assessed by using a visual analog fatigue scale (VAFS), Fatigue Severity Scale (FSS) and Fatigue Quality of Life Score (FQLS) were used to assess the severity of fatigue and life quality. Resuts: HBO2 therapy was well tolerated with no complications. After treatment, patients were found to have improved with respect to VAFS, FSS and FQLS (all $p<0.005$). *Implications/Impact on rehabilitation:* We may imply that HBO2 therapy decreases the severity of symptoms and increases the life quality of CFS patients. It may be a new treatment modality for the management of CFS whereby, however, further studies with larger sample sizes and control groups are definitely awaited.

PO-1156

THE COMBINATION OF NEEDLE ACUPUNCTURE WITH SOFTLASER THERAPY IN THE TREATMENT OF CHRONIC LOW BACK PAIN: A PRELIMINARY STUDY

Evren Atabas
ZPRM, Germany

Objective: In Germany needle acupuncture has become quite popular in the recent years as treatment modality for chronic low back pain. It is even financed by the social health insurance system. Softlaser therapy is not so popular in Germany. Scientific reports on the efficiency of laser therapy show contrary results. Our goal was to investigate what effect could be achieved by needle acupuncture in the combination of softlaser treatment on patients with chronic low back pain. *Method:* So far ten subjects (mean age 57,34 ± 15,02) with chronic low back pain were treated in this pilot study. 10 sessions of acupuncture/lasertherapy were planned with 2 each week. Before treatment a pain and life quality questionnaire (German version of Short Questionnaire Pain-Pain Research Group-University of Wisconsin Madison Medical School) was filled out by the patient. This evaluation was repeated after the fifth and tenth session. Included acupoints were B 23, 24, 25, 26 and Du 20. For lasertherapy a Photonic 500 (Reimers and Janssen, Germany) with the power of 500 mW/810 nm was used. The laser beam scanned the lower back. The data was analysed using 1-way ANOVA. Inclusion criteria included chronic low pain for over 6 months. Exclusion criteria included operation, pregnancy, neuromuscular and neurological disorders, muscle atrophy, radiculopathy. *Results:* After 10 treatment session pain evaluation showed a non-significant VAS decrease so far from 6.1±1.9 to 5.3±2.7. *Implications/Impact on rehabilitation:* Acupuncture in combination with lasertherapy seems to reduce pain on low back pain patients. More patients are recruited right now so the final results are still pending. If there should be a significant outcome further studies should be initiated in order to compare acupuncture with acupuncture/laser.

PO-1157

CLINICAL OBSERVATION OF THE EFFECT OF BRACHIAL PLEXUS BLOCK THERAPY FOR SHOULDER-HAND SYNDROME AFTER STROKE

Xiang Dong Xie
Yangzhou YiHe rehabilitation hospital

Summary *Objective:* To explore the curative effect of brachial plexus block for post-stroke shoulder-hand syndrome. *Methods:* 42 stroke patients with shoulder-hand syndrome were randomly divided into two groups, each group include 21 patients.Treatment group receive the brachial plexus block with 0.5% lidocainetherapy. The control group are given traditional treatments for shoulder pain, such as oral analgesics, local physiotherapy, acupuncture and so on. Two groups also receive the same functional exercises.Visual analog scale (VAS) is used to evaluate the shoulder pain. *Results:* The curative rate of treatment group (38.1%) was significantly higher than the control group (4.8%) ($p<0.001$), and the available rate of treatment group (95.2%) was markedly above that of treatment group (47.1%) ($p<0.001$); After the treatment, VAS score of treatment group was significantly lower the control group ($p<0.001$); The VAS score of treatment group was greatly reduced after treatment ($p<0.001$). *Implication:* The therapy of brachial plexus block for shoulder-hand syndrome, can safely and effectively ending shoulder hand pain, and does not affect the patients limb movement, can also block the limb sympathetic and favorable limb functional recovery.

PO-1158

SPINAL CORD STIMULATION FOR PREDOMINANT LOW BACK PAIN IN FAILED BACK SURGERY SYNDROME: DESIGN AND INITIAL ENROLLMENT OF AN INTERNATIONAL MULTICENTER RANDOMIZED CONTROLLED TRIAL (PROMISE STUDY)

Mehul Desai[1], Philippe Rigoard[2], Richard North[3], [8], Rod Taylor[5], Lieven Annemans[6], Christine Greening[6], Ye Tan[6], Carine Van Den Abeele[7], Jane Shipley[8], Krishna Kumar[9]
[1]George Washington University Hospital,United States, [2]Poitiers University Hospital,United States, [3]Johns Hopkins University,United States, [4]Peninsula Medical School, University of Exeter,United States, [5]Interuniversity Centre for Health Economics Research, Ghent University,United States, [6]Medtronic Neuromodulation,United States, [7]Medtronic International Trading Sàrl,United States, [8]The Neuromodulation Foundation, Inc.,United States, 9.Regina General Hospital, University of Saskatchewan, United States

Objective: Randomized controlled trials (RCT) have shown spinal cord stimulation (SCS) to be effective for failed back surgery syndrome (FBSS) patients with radicular pain, but we lack RCT data for predominant low back pain. The PROMISE RCT will compare the effectiveness of SCS plus optimal medical management (OMM) versus OMM alone in FBSS patients with predominant low back pain. *Method:* In accord with an IRB-approved protocol, subjects will be recruited in a total of approximately 30 centers in Canada, Europe, and the United States for 1:1 randomization to SCS + OMM or OMM alone. Each individualized OMM treatment plan will exclude intrathecal drug delivery, peripheral nerve stimulation, back surgery related to original pain, and experimental therapies. SCS subjects who pass trial stimulation will receive a neurostimulation system using the Specify® 565 lead (Medtronic Inc.). Evaluations will occur at 1, 3, 6, 9, 12, 18, and 24 months post-randomization. The primary outcome will be an intention-to-treat analysis of the percent of subjects with ≥50% reduction in low back pain at 6 months, when subjects may change treatment groups. Additional outcomes will be changes in low back and leg pain, functional capacity, quality of life, and patient satisfaction. Health care utilization data will support a cost-consequences study and development of a long-term economic model. *Results:* As of 11 February 2013, 7 patients were enrolled. *Implications/Impact:* PROMISE will provide evidence of effectiveness of SCS using a multi-column array for predominant low back pain in FBSS.

PO-1159

PAIN RELIEF THROUGH CHIROPRACTIC TREATMENT IN COMBINATION WITH FOOT ORTHOTICS

Hung-Chun Huang
Taiwan chiropractic association,Chinese Taipei

Objective: reduce pain both in knees and lower back. Foot orthotics is usually used by podiatrists and physical therapists to relieve foot pain and spinal treatment by chiropractors to relieve back pain. *Method:* Chiropractic treatment with focus on anatomy traits maps in combination with foot orthotics was applied over a five year period on 30 patients between 16 and 65 years old with scoliosis and subsequent lower back pain and pronated feet. Each patient was treated weekly over a period of six months and with continual biannual check ups. *Results:* All patients improved their postures and spinal alignment. Most patients reported reduced lower back, foot, and knee pain. Physical ability also improved from 3 to 6 months. Continued use of foot orthotics after final treatment also helped to maintain proper gait motion that supports alignment, posture, and reduced pain. *Implications/Impact on Rehabilitation:* This longitudinal study suggests that a combination of chiropractic treatment with focus on anatomy traits maps in combination with foot orthotics show better long term results than individual treatment methods.

PO-1160

CLINICAL EFFECT OBSERVATION OF ACUPOINT CATGUT EMBEDDING ON FIBROMYALGIA SYNDROME

Aisong Guo, Guang-Yu Shen, Yu-Ming Hu, Zhen-Jie Zhu, Wei-Guan Chen, Li Sun
Affiliated hospital of Nantong University

Object To evaluate the clinical effect of acupoint catgut embedding on Fibromyalgia Syndrome (FMS). *Methods:* 60 cases with FMS were randomly assigned to the medicine group (n=30) and the catgut embedding group (n=30). The medicine group received Fluoxetine treatment, and, acupoint catgut embedding was used in the patients of the catgut embedding group. Clinical effect was evaluated respectively by counting the number of pain-point, Visual Analogue Scale (VAS), Fibromyalgia Impact Questionnaire (FIQ). *Results:* After 30 days' treatment, the total effective rate (86.7%) with experimental group was better than that (53.3%) in medicine group (p<0.05). The number of pain-point, VAS and FIQ were decreased in both groups (p<0.05), while, the catgut embedding group were significantly super to the medicine group (p<0.05). *Conclusion:* Acupoint catgut embedding is supposed to improve the clinical effect without side effects, so it is worthy of clinical application.

PO-1161

THE EFFECTS OF ESTABLISHING THE STANDARDIZED PAIN MANAGEMENT SYSTEM IN THE PERIOPERATIVE PERIOD OF TOTAL KNEE ARTHROPLASTY

Lingyan Cheng, Weili WANG, Yanan LI, Dong FAN
First Ward of Orthopaedic Department, First Affiliated Hospital of the General Hospital of People's Liberation Army, China

Objective: To improve the level of pain management in the perioperative period of total knee arthroplasty, make patients taken joint functional training as early as possible. *Methods:* The pain management system was established and a standardized pain management procedures was developed and implemented. The statistical results before and after the implementation was compared. *Results:* The scores of knowledge of pain, assessment of pain and analgesic drug knowledge after establishment of the standardized pain management system were higher than before, the difference were statistically significant (p<0.05). The score of postoperative pain was decreased, the time of getting out of bed, and the flexion angle of the replacement knee ≥90° was shorten, and the satisfaction of pain control was raised all of, the difference were statistically significant (p<0.05). *Conclusion:* The standardized pain management system can improve the level of pain management, promote the pain control quality and make the patients feel satisfact, and also promote the joint function of the patients early.

PO-1162

CLINICAL STUDY ON EFFECT OF COMBINED ULTRASONIC AND COGNITIVE BEHAVIOR THERAPY TO THE PATIENTS WITH TEMPOROMANDIBULAR DISORDERS

Guiying Zhao
The first affiliated hospital of zhejiang university, China

Objective: To determine effect of combined ultrasonic and cognitive behavior therapy to the young adults with temporomandibular disorders (TMD). *Methods:* Seventy young adults with TMD were eligible for randomized controlled clinical trial to clarify the research question from January 2010 to January 2012. The patients were allocated randomly with either ultrasonic therapy alone or combined it with cognitive behavior therapy, with thirty –five patients in each group and followed up for two months. Tenderness of the temporomandibular joints and maximum opening between edges of the anterior teeth were measured to evaluate treatment effects. *Results:* At one and two month after treatments the effective rates for control group and treatment group were 75.8%, 78.2%, 68%, 81% respectively. *Impact on Rehabilitation:* Effect of ultrasonic therapy of TMD was limited. But effect of combined ultrasonic and cognitive behavior therapy was superior with statistical significance.

PO-1163

LONG TERM EFFECT OF ACTIVE MOVEMENT THERAPY FOR PROLAPSE OF LUMBAR INTERVERTEBRAL DISC

Xiaoli Wu
Department of rehabilitation medicine The peoples hospital of hainan province, China

Objective: to investigate the long term effect of the active movement therapy for prolapse of lumbar intervertebral disc. *Methods:* sixty cases acute prolapse of lumbar intervertebral disc were randomly divided into two groups: treatment group and control group, and each group contains 30 patients, both group was treated with methods including dehydration, physiotherapy treatment, traction and other conservative treatment for six weeks, in the treatment group active movement therapy was started at third week twice daily, and lasted for 1 year. two groups of cases were compared after six weeks and a year. Results after 6 weeks, no significant difference (p>0.05) was shown between two groups. After 1 year the cure rate of treatment group was significantly higher than that of control group, and the recurrence rate is lower than that in control group (p<0.05). *Implications:* Active movement therapy after symptoms and signs of prolapse of lumbar intervertebral disc were released can consolidate curative effect, reduce the recurrence, and have a good forward curative effect, is worthy to be popularized.

PO-1164

THE SEARCH OF REHABILITATION TREATMENT PLAN FOR CIVIL FLIGHT ATTENDANTS WITH LOW BACK PAIN

Boxin Zhang, Ruoqian Min
Civil Aviation General Hospital,China

Objective: The working schedule of civil flight attendants is irregular and busy. To search an optimized rehabilitation treatment plan for civil flight attendants with low back pain. *Method:* With a self-designed questionnaire, 80 civil flight attendants (17 males, 63 females) were grouped randomly into control group (n=28), group

A (with treatments once a week, n=25), group B (with treatments once in two weeks, n=27)). Treatments were intermediate-frequency electro-therapy, high-frequency electro-therapy and lumbar traction. VAS and BPI were taken to show the difference in baseline, after 1 month and 3 months. *Results:* 1) VAS indicated that after 3 months, a significant effect of relieving pain was observed only in group A. 2) Same as VAS, flight attendants in group A from BPI reported that there was a significant improvement in pain relieving after 3 months. No changes reported in group B and control group. 3) From BPI, the general influence of pain decreased only in group A with 3 month-treatments. While group A reported that the influence of pain on their normal work (one item in BPI) was alleviated significantly after 1 month. *Implications:* For flight attendants with low back pain, the treatment frequency is suggested once a week with 3 months.

PO-1165

PERIARTHRITIS OF SHOULDER WITH ULTRASOUND-GUIDED

Sheng Bi[1], Jun LI[2], Yu-Kun LUO[3], Yue-Xiang WANG[3], Fu-Gen WANG[2]

[1]Department of Physical Therapy of PLA General Hospital,China, [2]The Department of Rehabilitation Medicine of PLA General Hospital,China, [3]Department of Ultrasound Diagnosis of PLA General Hospital,Beijing 100853, China

Objective: To investigate the clinical effects of frozen shoulder treated by ultrasound-guided injection. *Methods:* Thirty-three patients received this treatment with ultrasound guided injection of triamcinolone acetonide 40 mg, 2% lidocaine 5 ml. VAS and Constant & Murley were used to assess before treatment, and review within 7-14 days after treatment. Four cases were dropped out, and completed a full assessment of 29 cases. Paired t-test was used for statistical analysis, significance level was p were treated by intention to treat *Results:* After ultrasound-guided injection for frozen shoulder, VAS decreased from 6.8±1.9 to 3.5±2.3 (p<0.01); Constant & Murley shoulder function score increased from 33.7±12.0 to 45.2±12.2 (p *Conclusion:* Ultrasound-guided injection on frozen shoulder obtained better clinical efficacy. It is a kind of promising treatment in pain medicine.

PO-1166

QUANTITATIVE ANALYSIS OF SENSORY FUNCTIONS AFTER TENS COMBINATION WITH COBALAMIN INJECTION FOR POST HERPETIC NEURALGIA: USING CURRENT PERCEPTION THRESHOLD TEST

Gang Xu, Zhongwei Lv, Gang (Xiao) Xu, Yan Feng, Weizhen Tang

Department of Rehabilitation Medicine, Affiliated Tenth Peoples Hospital of Tongji University, Shanghai, China

Objective: To determine the significance of local cobalamin administration in controlling neuropathic pain and improving the functional integrity of sensory nerve fibers using the current perception threshold (CPT) test after treatment at days 60. *Method:* Sixity subjects (age, ≥50 years) with torso PHN and the overall pain score ≥ 4 inthe past 24 h were randomized to receive TENS combination with local methylcobalamin (n=30) or lidocaine (n=30) injection. All subjects underwent CPT testing of the most painful site at three frequencies before and after treatment. Treatment efficacy was assessed based on the patients' pain severity and global impression of change, and the disease-related interference with activities of daily living and quality of life. *Results:* In the TENS combination with local cobalamin group, overall pain (ppppain reduction achieved ≥50%, 22 perceived worst pain ≤3, 16 stopped using analgesics at endpoint; activities of daily living, quality of life significantly improved relative to the lidocaine group (p<0.001). Implications The TENS combination with cobalamin not only relieved overall pain intensity and improved activities of daily living, quality of life for PHN, but also decreased significantly abnormal increase of the CPT in the most painful site. This analgesic effect of cobalamin is probably related to the improving damaged afferent nerves function.

PO-1167

MULTI-RADICULAR SYNDROME SECONDARY TO AIR INTRODUCED INTO THE CERVICAL EPIDURAL SPACE

Sandip Patel, Robert Kent*, Rafael Miguel

University of South Florida, United States

Introduction: The epidural space is a tissue plane between the dura mater and periosteum and ligaments within the vertebral canal. The posterior epidural space is relatively large at the lumbar level and tapers cephalad. Acute radicular pain caused by initial injection of air on accessing the cervical region is presented. *Case Presentation:* A 46 y/o female patient presented with chronic neck pain radiating to her left hand. MRI C-spine confirmed a broad based disk bulge at C5-C6, canal measuring approximately 7 mm. A C5-C6 epidural steroid injection left of the midline under conscious sedation performed. The C5-C6 interspace was accessed using a loss of resistance technique with a 20 gauge Touhy needle. Loss of resistance was found but occurred seemingly in the subdural space on contrast injection accompanied with severe shooting pain down her left upper extremity. Needle was immediately withdrawn, and the C6-C7 epidural space successfully accessed, injected with 6 mL 0.3% lidocaine with 80 mg methylprednisolone acetate. Pain persisted after completion of procedure. Concern for impingement and presence of a space occupying lesion prompted request for an MRI C-Spine. It revealed mild edema within the interspinous ligaments at C5-C6, C6-C7 levels, and small quantity of gas in the dorsal epidural space at these levels causing impingement. *Discussion/Conclusion:* Loss of resistance technique is commonly used for accessing the epidural space. The cervical epidural space is relatively small, so it is susceptible to causing radiculopathy with even a min amount of air or space occupying lesion. Limiting the volume of air injectate is recommended.

PO-1168

EFFECTS OF ACUMICROPROBE TREATMENT ON PAIN IN THE CHRONIC ITEM BACK PAIN PATIENT

Linlin Wang, Shizhong Wang

The rehabilitation hospital affiliatedFujian university of TCM, China

Objective: To observe therapeutic effect of acumicroprobe therapy on pain in the chronic Item back pain patient. *Methods:* Four hundred cases were randomly divided into a acumicroprobe group of 200 cases and a acupuncture group of 200 cases. The acumicroprobe group were treated with acumicroprobe therapy, the treatment spots are chosen the tender-points or scleroma located at the posterior of item back,combined with massage,in every session of treatment, 4-6 points are used,onc every three days, 10 times for a course of treatment. The acupuncture group were treated with electroacupuncture in the conventional point for 30 min. Pain was assessed by visual analogue scale (VAS) and the maintenance time after first treatment. *Results:* After treatment, the pain were significantly improved in the two groups: and after treatment, the VAS score and the maintenance time after first treatment wer (1.03±0.42) points and (168±32) h in the acumicroprobe group and (3.59±1.06) points and (48±16) h in the acupuncture group, respectively, the acumicroprobe group being significantly better than the acupuncture group (p<0.01). Follow-up survey of 6-12 months showed that the VAS score in the acumicroprobe group were superior to those in the acupuncture group. *Conclusion:* Acumicroprobe therapy can significantly improve pain in chronic item back pain patient, with a stable long-term therapeutic effect.

PO-1169

EFFICACY OBSERVATION OF SURROUNDING ELETROACUPANCTURE UNION SUPER LIZER HA-550 ON HERPES ZOSTER

Wan-Rong Zhang, Pei-Shun Chen, Zhen Huang, Yan Gao, Jia-Feng Chen, Zhuo-Rong He

Department of Rehabilitation of Panyu Central Hospital, Guangzhou, 511400, China

Objective: To observe the clinical efficacy of surrounding eletroacupancture union Super Lizer HA-550 on herpes zoster. *Methods:* 38 cases of Herpes zoster were randomly divided into a treatment group of 19 cases treated with surrounding eletroacupancture union Super Lizer HA-550, and a control group of 19 cases supplied with Acyclovir respectively. In the two groups,the time of pain relieving,incrustation and decrustation during treatment were observed and recorded for comprehensive efficacy evaluation. *Results:* The 38 cases in the treatment group were cured within 10 days with an effective rate of 94.7%, Which Was better than 84.2%in the control group (p<0. 05), and the time of pain relieving,incrustation and decrustation of herpes zostor was shortened in the treatment group. The incidence of residual neuralgia reduced. *Impact on Rehabilitation:* Surrounding eletroacupancture union Super Lizer HA-550 has obvious clinical effect on herpes zoster with the time of pain relieving, incrustation and decrustation shortened. The incidence of residual neuralgia reduced.

PO-1170

CLINICAL STUDY OF USING CT-GUIDED MODIFIED NEEDLE KNIFE IN THE TREATMENT FOR LUMBAR DORSAL RAMI ENTRAPMENT SYNDROME

Jinlin Qiao, Jingfu Lin, Jinniu Li

Pain Clinic Center of Navy General Hospital

Objective: To observe the clinical outcome of the closed soft tissue lysis using CT-guided modified needle knife in the treatment for lumbar dorsal rami entrapment syndrome. *Methods:* The patients were definitely diagnosed as lumbar dorsal rami entrapment syndrome based on the clinical symptoms and signs combing with 3D high-resolution CT (HRCT) scan reconstruction. Relying on precise superficial CT positioning and CT-guided technology, the closed soft tissue lysis was performed to release the compressed lumbar dorsal ramus. Oswestry Disability Index (ODI) questionnaire score was used for the quantitative analysis before surgery, seven days and six months postoperatively. *Results:* There were 137 cases in the group, of which 50 cases were cured, 45 cases had fine efficacy, 36 cases had fair efficacy, and 6 cases had no efficacy. The overall effective rate reached 95.73%. There was a significant difference comparing with the preoperative ODI score and the seven-day postoperative one (paired t-test, p<0.01). There was also a significant difference comparing with the preoperative ODI score and the six-month postoperative one (paired t-test, p<0.01). However, the difference of ODI scores between the seven-day and six-month postoperative time point was not significant (paired t-test, p>0.05). *Conclusion:* Base on precise CT-guided positioning, the modified needle knife can effectively release the soft tissue adhesion for the decompression of lumbar dorsal ramus so as to alleviate low back pain and obtain satisfying clinical outcome. Closed acupotomy lysis combining with modern imaging diagnosis have not only gained good clinical efficacy, but also increased the accuracy, safety and scientificity of the needle-knife treatment.

PO-1171

A NEW ANIMAL MODEL OF CENTRAL PAIN INDUCED BY SPINAL INJURY*

Hong Dai[1], Shaoting Xu**[2], Zhongxin Xiao[1], Zuolei Xie[3], Liren Zhang[2], Yingchao Chen[2], Ke Dai[4]

[1]Dept. Rehab Medicine, School of Public Health and Family Medicine, Capital Medical University,China, [2]Dept. Orthopaedics, General Hospital of Beijing Military Area,Beijing,China, [3]Department of Physiology, United University of Medicine,Beijing,China, [4]Department of pathology, Beijing Institute of Neurosurgery, China

Chronic central pain (CCP) induced by Spinal Cord Injury (SCI) is one of it's serious complications, which cause patients depressed, depended on opiate medicine, unsufferable pain and even commit suicide. People cannot find effective management for the CP, since it's mechanism has not clear yet, and there is shortage of a suitable animal model for mechanism study. *Objective:* To probe the mechanism of CCP after SCI and searching an effective approach to CCP management in the future. *Methods:* 30 female rats were divided into 2 groups:G1 and G2., the injury was performed in L1 segment of spinal cord using 300 gcm (X1) and 200 gcm (X2) by WADE method respectively, and sensitive evoked pontential (SEP) was recorded in L2 before and 15 min after injury. Assess pain threshold of trunk to mechanical gently tactile, gently pressure sense & rate of withdrawing hind paws while using von frey hair gently press it, 4, 8, 12, 16, 24 h and every day after operation for about 10 months. Behaviour activity of spontaneous pain was also observed. *Results:* The rats of two groups exhibited typical acute and chronic pain and allodynia phenomena (Comparison of pain threshold before & after operation has significant differences: p<0.05—0.01). *Implications:* 300 gcm SCI in rat by WADE method showed an excellent repeatability and it could simulate pain symptom is similar to that of CP in SCI patients. It is suggested that,it is a new and practical animal model of CP in SCI for further research in SCI-induced CP.

PO-1172

CANCER PAIN AND DEPRESSION- CAUSE/ CONSEQUENCE AND THERAPEUTIC APPROACH

Biljana Vukovic[1], Slavisa Jankovic[2], Ivan Dimitrijevic[3], Milan Jankovic[4]

[1]Pension and invalidity insurance fund, Belgrade, branch department Novi Sad, Serbia, [2]Secretariat of health care – city of Belgrade, Serbia, [3]KCS Belgrade, Serbia, [4]University of Novi Sad, Philosophical Faculty, Department of Psychology, Serbia

Pain is the most common and usual symptom of the malignant diseases and may develop depression and functional difficulties. The severity of pain and physical impairment may as well correlate with the depression and vice versa, so the essential goal of our study was to determinate pain, to find out cause, quality and intensity of it and then to justify the adequate therapeutic approach,phase of treatment and kind of physico-rechabilitation procedures. The further aim of this study was to find out if/how pain have influence on appearance of depression and if there exist any interaction between objective stress measurements and development of depressive condition. In this study we observed 97 patients (male and female),diverse in age span categories, with breast and colorectal adenocarcinoma, in different stage of the illness and still on treatment and observation in KBC Bezanijska Kosa and in Institute for Oncology Sremska Kamenica. In order to achieve the desired goal we had evaluated and establish connection between following parameters:pain (VAS scale), oedema of extremities in postop.region depression (depres-

sive personality scale, depressive state scale, IPQ-R etc). All data was analyzed by using two statistical package (Statistica 7.0 and SPSS 16.0). After summarizing the results of study we find out that pain syndrome in combination with the depressive traits of personality may be significant predictor of depressive state in cancer patients. In accordance with the results of study we concluded that early-on time treatment of pain, with appropriate and adequate therapeutic approach, can help pain be prevented and minimized.

PO-1173

ACUPUNCTURE MODULATES ACUTE LOW BACK PAIN IN THE BRAIN NETWORKS: AN FMRI STUDY

Wen Wu, Zi-Ping Liu, Shan-Shan Zhang

Department of Rehabilitation of Zhujiang Hospital, Southern Medical University, China

Background: A number of neuroimaging studies on experimental noxious heat pain have demonstrated that acupuncture can significantly modulate brain activation patterns in healthy subjects; however, the neural mechanisms underlying the effects of acupuncture on clinical acute low back pain (ALBP) remain unknown. *Objective:* To elucidate these mechanisms of acupuncture on ALBP. *Method:* We introduced an experimental ALBP model involving injections of sterile hypertonic saline into the lower backs of healthy subjects. Following injections, functional magnetic resonance imaging (fMRI) was randomly performed once during acupuncture stimulation (ACUP) and once during tactile stimulation (SHAM). Both stimuli were located at the Weizhong acupoint of right lower extremity. *Results:* Behaviourally, ACUP produced better analgesic effects because it yielded stronger acupuncture sensations and larger change pain score compared with SHAM. Simultaneously, fMRI analysis revealed that ACUP induced more deactivations, primarily limbic system regions, and less activations of sensorimotor and cognitive networks compared with SHAM. Implications Our study demonstrated that acupuncture modulated ALBP by integrating within and across multiple brain networks, including the sensorimotor network, cognitive network and limbic system. Furthermore, ACUP produced significant deactivations in memory (the default network and mammillary body), anti-nociceptive and affective (pregenual anterior cingulated cortex, periaqueductal gray, anterior mid-cingulate cortex and dorsomedial prefrontal cortex) regions of the limbic system, suggesting that acupuncture may go beyond a somatosensory-guided mind-body therapy for ALBP. To our knowledge, this is the first fMRI study on acupuncture for ALBP, and we believe it will help bridge the gap between clinical and experimental pain studies involving acupuncture treatment.

PO-1174

TREATMENT OF THE SHOULDER-HAND SYNDROME AFTER CEREBRAL STROKE FOR PATIENTS BY ELECTROPHONOPHORESIS

Guiqin Song, Pei Dai, Xin Li, Lianfang Zhang, Maobin Wang

Department of Rehabilitation, The Beijing Electric Power Hospital, Teaching hospital of Capital Medical University, China

Objective: To monitor the treatment of shoulder-hand syndrome using mixture of dyclonine hydrochloride and magnesium sulfate administered percutaneously by electrophonophoresis (EP). so as to evaluate whether it is beneficial for the upper limb syndrome and function recovery activities. *Material and methods:* A total of 60 stroke patients with shoulder-hand syndrome hemiplegia were divided into control group and EP treatment group based on treatment modality: control group (n=30), rehabilitation training, such as physical therapy (PT) and occupation therapy (OT); EP treatment group (n=30), PT, OT, along with EP. The pain and swelling as well as changes of upper limb comprehensive sports function were evaluated before and after therapy. *Results:* The upper limb local swelling, pain and function were more significantly improved of the patients in EP treatment group ($p<0.05$) than the control. In comparison, patients in EP treatment group showed more recovery of grip strength and improvement in pain level, finger range of motion, and swelling. Implications Based on these results, electrophonophoresis treatment could effectively improve pain and swelling for stroke patients with SHS hemiplegia, which could beneficial to the upper limb function recovery activities.

PO-1175

IS YOGA THERAPY EFFECTIVE ON LOW BACK PAIN? GRADING THE EVIDENCE THROUGH A META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

Dan Xing[1], Xinlong Ma[1,2], Jianxiong Ma[1], Jie Wang[1], Yang Chen[2]

[1]Tianjin medical university general hospital,China, [2]Tianjin Hospital, China

Objective: The objective of the present meta-analysis was to assess the effectiveness of yoga therapy compared with other treatments and provides recommendations for using yoga to treat low back pain (LBP). *Methods:* A systematic search of all studies published through Nov 2012 was conducted using the MEDLINE, EMBASE, OVID, ScienceDirect and Cochrane CENTRAL databases. The randomized controlled trials (RCTs) that compared yoga to other treatments and provided data on clinical effects were identified. Clinical outcomes were pooled by meta-analysis method. Moreover, the evidence quality levels and recommendations were assessed using the GRADE system. *Results:* Nine studies encompassing 944 patients met the inclusion criteria. Subgroup meta-analyses were performed according to the type of interventions of control groups (physical exercise and non-physical exercise). The subgroup analysis found that yoga therapy was effective in pain relief than physical exercise (SMD= -0.81, 95% CI -1.16, -0.01) and non-physical exercise (SMD= -0.60, 95% CI -0.78, -0.43). There were significant differences between yoga and physical (SMD= -0.72, 95% CI -1.37, -0.07) or non-physical exercise groups (SMD= -0.70, 95% CI -1.34, -0.06) in mood improvement. Yoga yielded significant improvement in pain related disability than non-physical exercise (SMD= -0.67, 95% CI -0.98, -0.35). However, patient disability improvement after yoga was not superior to improvement after physical exercise (SMD= -0.63, 95% CI -1.34, 0.07). The overall GRADE system evidence quality was moderate, which lowers our confidence in their recommendations. *Conclusions:* Yoga reduces pain and improves back function in patients with LBP more effectively than usual-care, self-care book and no treatment. However, there was no enough evidence to differentiate effectiveness in treating LBP between yoga and physical exercise. Due to the moderate quality of the evidence currently available, high-quality RCTs are required.

PO-1176

A CLINICAL STUDY OF NEW SLING EXERCISE TREATMENT COMBINED WITH INJECTIONS OF SODIUM HYALURONATE FOR PATELLOFEMORAL PAIN SYNDROME

Ying Liang[1], Yawen Wu[1], Pingzhi Wang[1], Yanping Xue[1], Quanbing Wang[1]

[1]Shanxi Academy of Medical Sciences Shanxi Dayi Hospital,China, [2]Shanxi Medical University 1st Hospital, China

Object: To investigate the effects of exercises by combining new sling exercise treatment with injections of sodium hyaluronate on radiographic findings and mechanics and clinical parameters in patients with patellofemoral pain syndrome. *Methods:* Seventy patients were randomly divided into two groups: new sling exercise

treatment combined with injections of sodium hyaluronate group (combined therapy group, n=34), injections of sodium hyaluronate group only (control group, n=36). Data were collected at pre- and post-treatment in both groups: The clinical parameters are pain score (assessed by visual analog scale), muscles strength of quadricep muscles, vastus medialis obliquus strength and hamstring (assessed by manual muscle test) and range of motion. The mechanics parameter is Q angle (assessed in dorsal position and standing position). The radiologic parameters recorded from computed tomography are patellar tilt angles, the congruence and sulcus angle. Group means were calculated at two points and were compared statistically. *Results:* After 5-week study, the VAS results by combined therapy group were significantly lower than that by control group (p<0.05). Muscle strength and range of motion at the post-treat in combined therapy group were significantly higher than pretherapy (p<0.05). The level of Q angle (dorsal and standing position) at post-treat were significantly lower than pretherapy (p<0.05). The post-treat mean scales of the congruence and sulcus angle were significantly better than that of pretherapy (p<0.05). *Conclusion:* 5-week follow up study indicates that new sling exercise treatment combined with injections of sodium hyaluronate yields satisfactory clinical and radiologic outcomes in patients with patellofemoral pain syndrome.

PO-1177

LUMBAR DAOYIN AFFECTS LUMBAR FUNCTION OF CHRONIC LOW BACK PAIN

Shaoqing Chen[1], Jianping Lin[2], Shizhong Wang[2]
[1]Fujian University of TCM,China, [2]Rehabilitation hospital affiliated to Fujian University of TCM, China

Objective: to observe the surgical treatment of lumbar guide the clinical efficacy of chronic lumbago and lumbar effects. *Methods:* screening with case selection criteria of sixty cases of chronic back pain patients, be lumbar guidance trained two cycle, the application of VAS score and JOA score to observe clinical curative effect, the application of spinal function test evaluation training system evaluation lumbar function. *Results:* 1. Before and after treatment with clinical symptoms and signs improved markedly, VAS score and JOA score more significant difference (p<0.05); 2. Before and after treatment with lumbar function improved markedly, lumbar proneness, stretch, after left right side bend strength have significant difference (p<0.05); *Conclusion:* lumbar daoyin technique can significantly improve patients with chronic back pain symptoms, signs, improve lumsbar function.

PO-1178

A TRANSIENT RECEPTOR POTENTIAL VANILLOID 4 CONTRIBUTES TO MECHANICAL AND THERMAL ALLODYNIA FOLLOWING CHRONIC COMPRESSION OF DORSAL ROOT GANGLION IN RATS

Shouwei Yue, Yang Zhang, Xinli Ding, Chao Wang
Qilu Hospital, Shandong University, China

Objective: To investigate the role and molecular mechanisms of transient receptor potential vanilloid 4 (TRPV4) in mediating mechanical and thermal allodynia in rodent models of chronic compression of the dorsal root ganglion (CCD). *Method:* The levels of TRPV4 expression and calcium responses were analysis respectively at 7, 14, and 28 days post-CCD. Then after intrathecal administration of TRPV4 antisense ODN, ruthenium red (RR, TRPV4 antagonist), l-NAME (inhibitor of NO synthase), ODQ (soluble guanylate cyclase inhibitor), Rp-8-pCPT-cGMPS (a PKG inhibitor,), NF-B inhibitors (PDTC and BAY), mechanical withdrawal threshold, thermal withdrawal latency and nitrite production was measured. *Results:* The levels of TRPV4 mRNA and protein expression increased significantly at 7–28 days post-CCD. The percentage of DRG neurons responsive to 4α-PDD was also enhanced significantly in CCD group. TRPV4 antisense ODN partly reversed the CCD-induced mechanical allodynia. Intrathecal administration of RR, l-NAME, ODQ, or Rp-8-pCPT-cGMPS induced a significant and dose-dependent increase in the thermal paw withdrawal latency. RR, TRPV4 AS or l-NAME decreased nitrite in the DRG of CCD rats. CCD rats exhibited nuclear NF-B protein expression and low levels of cytoplasmic inhibitory-kappa B (I-B) expression; the increase in NF-B expression and decrease in I-B expression were reversed after intrathecal injection of PDTC. *Implications on Rehabilitation:* TRPV4 plays a crucial role in CCD-induced mechanical allodynia and the TRPV4-NO-cGMP-PKG pathway could be involved in CCD-induced thermal hyperalgesia. It may help us to better understand the molecular basis for nervous injury and chronic neuropathic pain.

PO-1179

THE STUDY OF THE RTMS IN THE CEREBRAL STROKE COMBINATION OF THE CRPS

Min Su
Department of Rehabilitation, First Affiliated Hospitat of Soochow University, China

Objective: In order to observe the clinical curative effect of the Repetitive transcranial magnetic stimulation (rTMS) in the cerebral stroke combination of complex regional pain syndrome (CRPS). *Method:* 50 patients with stroke combination of CRPS were selected, 24 cases as control group with routine rehabilitation therapy, another 26 cases adding rTMS treatment. The rTMS treatment for three times a week, 10 times as a treatment period. Before and after treatment for each patients giving limb pain assessment, limb movement function evaluation (muscle, muscle tension and joint activity), limb autonomic nervous function evaluation (edema, skin temperature, secrete sweat). The change of the patients cortical excitability improvement (feeling and sports EMG change), the perfusion changes of the responsibility brain lesions, the corresponding brain cortical neural function image, and the mood, sleep of the patients were recorded. *Results:* Compared with the control group, the limb pain, limb movement function and limb autonomic nervous function of the rTMS group have obviously improve (p<0.05): The EMG results showed that the bilateral brain feeling and sports cortical excitability increased obviously in the rTMS group (p<0.05): The change of the perfusion changes of the responsibility brain lesions and the corresponding brain cortical neural function image were more significantly than the control group (p<0.05). Meanwhile, the mood and sleep of the patients became better. *Implications:* The rTMS through affecting the central nervous system to improve CRPS.

PO-1180

ASSOCIATION OF PRECIPITATING FACTORS WITH SYMPTOM SEVERITY AND QUALITY OF LIFE IN PATIENTS WITH FIBROMYALGIA

Juan Jiao[1,2], Ann Vincent[3], Chul Kim[4], Connie Luedtke[5], Terry Oh[1]*
[1]Department of Physical Medicine and Rehabilitation, Mayo Clinic, Rochester, Minnesota, USA.,United States, [2]Department of Rheumatology, Guang'anmen Hospital, China Academy of Chinese Medical Sciences, Beijing, China.,United States, [3]Division of General Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA.,United States, [4]Department of Rehabilitation Medicine, Kyungpook National University Hospital, Daegu, Korea.,United States, [5]Department of Nursing, Mayo Clinic, Rochester, Minnesota, USA,United States

Objectives: To examine precipitating factors and their association with symptom severity and quality of life (QOL) in patients with fibromyalgia. *Methods:* Self-reported precipitating factors, demographic and clinical data, as well as the Fibromyalgia Impact

Questionnaire (FIQ) and the Short Form-36 Health Survey (SF-36) from 978 fibromyalgia patients were collected. ANOVA and multivariate regression analyses were performed. *Results:* A total of 295 patients (30.2%) reported precipitating factors. The 4 main precipitating factors were physical trauma, emotional trauma, childbirth, and infection with a distribution of patients of 178 (18.2%), 29 (3.0%), 28 (2.9%) and 57 (5.8%), respectively. Comparison of nonprecipitating and 4 precipitating factor groups showed significant differences in age, marital status, duration and gradual vs. sudden onset condition. After adjusting for these differences, there were no significant differences between precipitating and nonprecipitating groups in the FIQ and Sf-36 measures. However, comparison of the 4 precipitating groups showed significant differences on the FIQ depression (p=0.048) and SF-36 measures in mental component summary (p=0.012), physical component summary (p=0.024), role emotional (p=0.036) and mental health index (p=0.027). Pairwise comparison within 4 precipitating groups showed the infection group having better scores on FIQ depression, SF-36 mental component summary and SF-36 subscales in role emotional and mental health index while having worse SF-36 physical component summary score than other groups. *Impact on Rehabilitation:* Precipitating factors are noted in about 1/3 of patients in fibromyalgia with physical trauma being the most common factor. Different treatment and rehabilitation approach might be desired based on types of precipitating factors.

PO-1181

SHORT-TERM THERAPEUTIC EFFECT OF SCALP ACUPUNCTURE ON PAIN IN PATIENT

Jianle Zhao

Rehabilitation Center for Brain Injury,Hangzhou Hospital of the Chinese People's Armed Police Forces,Hangzhou,China

*Objective:*To explore the therapeutic effect of the scalp acupuncture on pain in patient *Methods:* Fifty-four out-patients were randomly divided into scalp acupuncture group and medium frequency electrotherapy group. Acupuncture group comprised 13 men and 14 women, ranging in age from 25 to 72 years, including neck pain (n=14), shoulder pain (n=4), lumbago (n=8), lung pain (n=1).Medium frequency electrotherapy group comprised 15 men and 12women, ranging in age from 19 to 65 years, including neck pain (n=12), shoulder pain (n=5), lumbago (n=8), knee pain (n=2). The acupuncture group selection of points according to the head of the treatment line Indications range, using ipsilateral acupuncture Law. Neck pain and lumbago take the Up middle line of occiput (Qiangjian, DU18 - Naohu, DU17), Lower-lateral line of occiput (Yuzhne, BL9 - Tianzhu, BL10). Pain in the limbs take Anterior oblique line of vertex-temporal (Qianding, DU21 -Xuanli, GB6), Posterior oblique line of vertex-temporal (Baihui, DU20 -Qubin, GB7). Needles was returned for 20 min per day for 5 days. The control group use the medium frequency electrotherapy, electrodes are placed on the site of pain, stimulus intensity takes that the patient is comfortable as degree, treatment time of 20 min per day for 5 days. After five days of treatment, pain assessment using the Short-form McGill Pain Questionnaire (SF-MPQ). *Result:* Before treatment,There were no statistically significant differences in PRI, PPI and VAS scores of 54 cases of patients with pain. (p> 0 05).After treatment, There were statistically significant differences in PRI, PPI and VAS scores of 54 cases of patients with pain (p<0 01); but no significant differences between the scalp acupuncture group and medium frequency electrotherapy group (p>0.05) *Impact on Rehabilitation:* Scalp acupuncture is a safe and effective treatment for pain. It can relieve patient's pain, improve their function, quality of life and satisfaction, and reduce the use of non-steroidal anti-inflammatory drugs.

PO-1182

THE EFFECT OF HIGH FREQUENCY TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION ON A POSTTHORACOTOMY PAIN RAT MODEL

Ting Yun Chen[1], Yu-Wen Chen[1,2]*

[1]Graduate Institute of Rehabilitation Science, China Medical University, Taichung, Taiwan,Chinese Taipei, [2]Department of Physical Therapy, China Medical University, Taichung, Taiwan, Chinese Taipei

Objective: After open chest surgery, postthoracotomy pain is a severe problem for many patients. Transcutaneous electrical nerve stimulation (TENS) is commonly provided to alleviate pain of patients. The aim of this study was to evaluate the effect of ipsolateral and contalateral TENS in the treatment of postthoracotomy pain. *Method:* Male Sprague-Dawley rats were used to examine mechanical withdrawal threshold on day 10 after thoracotomy. Rats with mechanical allodynia receipted ipsilateral or contralateral method to the application of TENS. *Results:* We found that application of TENS to contralateral area shows greater effect than that to ipsilateral area. *Implications/impact on Rehabilitation:* These results showed that contralateral TENS treatment was more effective in reducing mechanical allodynia in this animal model of postthoracotomy pain, compared with ipsilateral TENS treatment.

PO-1183

THE MANY FACES OF TRADITIONAL PAIN MANAGEMENT IN DEVELOPING COUNTRIES: A CASE SERIES FROM PAKISTAN

Farooq Azam Rathore[1], Sahibzada Nasir Mansoor[2], Ahmad Zaheer Qureshi[3]

[1]Combined Military Hospital and Medical College,Pakistan, [2]Department of Rehabilitation Medicine, Combined Military Hospital, Kohat Cantt, 26000, Pakistan,Pakistan, [3]Department of Physical Medicine and Rehabilitation, King Fahad Medical City, Riyadh Saudi Arabia., Pakistan

Objective: To present different traditional pain management procedures being practiced in remote areas of Pakistan, their effectiveness, adverse effects and possible reasons for their use. *Method:* Four different traditional treatments were identified including burn treatment, skin tattooing, skin laceration/bloodletting and wearing an amulet. There were 8 males and 4 females (age range: 24- 70 years). *Results:* All patients had received traditional treatment before seeking medical advice. Six patients were diagnosed with orthopedic conditions while three had radiculopathy. Skin tattooing was performed on most patients with musculoskeletal pain, while patients with neuropathic pain received burn treatment. The only patient who had mixed neuropathic and musculoskeletal pain wore an amulet. The application of the physical modality corresponded to the site of pain. Three out of six patients who had undergone skin tattooing reported temporary pain relief. None of the patients who used burn treatment, skin laceration or amulet reported pain relief. Only one patient, an elderly male, had a reported complication and presented with a wound infection after burn treatment. *Implications/Impact on Rehabilitation:* Patients in developing countries resort to these procedures because of poor primary health care infrastructure, lack of trained general medical practioners (GPs), financial constraints and lack of faith in the modern medicine. Patient awareness, availability of professional medical support, financial stability and faith in modern medicine can help patient receive right diagnosis and subsequent better pain management.

PO-1184

ROLE OF HAND SPLINTS IN SPASTICITY MANAGEMENT

Naorem Bimol

Deptt of Physical Medicine & Rehabilitation RIMS, Imphal, Manipur, India

Objectives: To determine the effectiveness of hand splints in the reduction of upper limb spasticity in hemiplegia *Design:* Rand-

omized controlled trial Setting Department of PMR, RIMS, Imphal, India Participants 88 hemiplegic patients attending PMR Department, RIMS, Imphal during 1st August 2009 and 31st July, 2011 was included. Intervention Wrist Hand Orthoses was given in the intervention group. It has to be worn for 8 h at night and 4 h during the day for 12 weeks. Followed up was done at the end of 1st, 3rd and 6 months. Outcome measure Spasticity measured by Modified Ashworth Scale. *Results:* 44 were assigned to intervention and 44 to control group. The proportion of patients with biceps spasticity score of ≥2 was observed to be significantly more among controls 36 (85.7%) as compared to the intervention group 10 (25.0%) at first follow up. Flexor spasticity score of ≥2 was also seen more among controls as compared to intervention group. Similar finding was also observed at second follow up. Majority in the intervention group had lower finger flexor spasticity scores 20 (90.9%) at first follow up as compared to the intervention group 9 (56.3%). Similar findings are also observed in case of biceps spasticity. Effectiveness of splints in reduction of spasticity was significant when the duration of hemiplegia was less than two weeks. *Conclusion:* There is significant reduction in upper limb spasticity if hand splint is applied to the affected limb within two weeks of post stroke hemiplegia.

PO-1185

THE ANALGESIA EFFECT OF EXTRACORPOREAL SHOCK WAVE THERAPY FOR TENNIS ELBOW

Pande Zhang, Xiaowen Peng, Xiaochuan Rong, Jie Yin
the First People's Hospital of Foshan, Guangdong, China

Objective: To study the analgesic effect of extracorporeal shock wave therapy (ESWT) in tennis elbow. *Methods:* Forty-five persistent tennis elbow patients had received 3 times with 5 days intervals ESWT. The analgesic effect was assessed by present pain intensity (PPI), VAS and Mills sign at the same day before and after treatment, and 1 week later of the last time treatment. *Results:* The analgesic effect after each treatment was obviously excellent than that before each treatment ($p<0.001$). At the intermission the pain was increased, the PPI scores before next treatment were higher than that of former post-treatment ($p<0.001$), but were lower than that of former pre-treatment ($p<0.001$). At 1 week follow-up, the PPI scores and VAS scores were decreased from (2.29±0.76) to (0.74±0.52) and (5.06±1.51) to (1.99±1.82) respectively, the positive rate of Mills sign was decreased from 95.6% to 33.3%. *Conclusion:* ESWT has significantly immediate analgesic effect and accumulation effect of repeated treatment for tennis elbow.

PO-1186

SINGLE VERSUS REPETITIVE INJECTION OF LIDOCAINE HCL IN MANAGEMENT OF CARPAL TUNNEL SYNDROME

Selim Akarsu[1], Ömer Karadaş[2], Fatih Tok[3], Hakan Levent Gül[4]
[1]Gülhane Military Medical Academy Haydarpaşa Training Hospital, Department of Physical and Rehabilitation Medicine,Turkey, [2]Erzincan Military Hospital, Neurology Service, Erzincan, Turkey,Turkey, [3]İskenderun Military Hospital, Physical Medicine & Rehabilitation Service, İskenderun, Turkey,Turkey, [4]Kartal Training Hospital, Department of Neurology, İstanbul, Turkey, Turkey

Objective: The aim of the present study is to determine the efficacy of single versus repetitive injection of lidocaine HCl into carpal tunnel in management of carpal tunnel syndrome (CTS). *Method:* This prospective, randomized trial included 42 patients (42 median nerves) with clinical and electrophysiological evidence of CTS. The 42 patients were randomly assigned to 1 of 2 groups: group 1 was injected with 4 cc 1% lidocaine HCl for once and group 2 was injected 4 cc 1% lidocaine HCl twice a week for two weeks. Clinical and electrophysiological evaluations were performed at the study onset, 6 and 12 weeks post treatment. *Results:* At the study onset significant differences were not observed between the groups with respect to DML (distal motor latency), CMAP (compound motor action potential) amplitude, CSAP (compound sensory action potential) amplitude, SNCV (sensory nerve conduction velocity), and VAS (visual analog scale); however all the parameters in group 2 improved 6 weeks after treatment (all PP Group 2 had better scores in CMAP amplitude and VAS at 6 and 12 weeks after treatment (all $p<0.05$). *Implications/Impact on rehabilitation:* Repetitive local lidocaine HCl injection was effective in reducing the symptoms of CTS and improving electrophysiologic findings.

PO-1187

CLINICAL IMPLICATIONS OF PERIPHERAL SENSITIZATION DURING MIGRAINE: A CASE REPORT

Fernando Borges[1], Herison Vaz[1], Bruno Nogueira[2], Waldir Cunha[3], Marta Imamura[4]
[1]Academic League of Pain, University Potiguar, School of Medicine, Natal, RN, Brazil, [2]Department of Orthopaedics and Traumatology, Acupuncture Group, University of São Paulo, School of Medicine, São Paulo, SP, Brazil, [3]Department of Orthopaedics and Traumatology, Division of Anesthesiology, University of São Paulo, School of Medicine, São Paulo, SP, Brazil, [4]Department of Orthopaedics and Traumatology, Division of Physical Medicine and Rehabilitation, University of São Paulo, School of Medicine, São Paulo, SP, Brazil

Objective: Present a clinical case of a 27-year-old woman with chronic recurring migraine since 4 years of age presents with 24-hour intense holocranial headache associated with nausea and fotofobia, with six episodes a month. *Method:* The patient received ropivacaine 0.375% injection at the anterior and medial scalene muscle on the left side, under ultrasonographic guidance. The ropivacaine was infused inside the muscle. A total of 5.0 cc was injected in each muscle. Aspiration was done prior to each injection. At discharge, she received paracetamol 500 mg every six h for a week. The patient underwent three sessions of electrical stimulation to induce muscle contraction over the left upper trapezius, cervical paravertebral and scalene muscles, on a weekly basis as well as acupuncture. *Result:* Immediately after the injection, the patient presented with symptoms of Claude Bernard Horner, on the left side, which improved spontaneously ten h after the injection. No other complications were referred by the patient. On day 7 post injection, she presented with significant decrease in pain intensity and increase in neck mobility, no signs of hyperalgesia or allodynia. Pain on muscle palpation subsided completely. At 6 months post injection, the patient continued to demonstrate decreased pain intensity, and no signs of hyperalgesia or pain on muscle palpation. She also did not have any severe recurrence of migraine. *Impact on Rehabilitation:* Intra-muscular injection of the anterior and medial scalene maybe a novel target for patients with chronic recurring migraine.

PO-1188

THE MRI FINDINGS OF KNEE PAIN PATIENTS AFTER STROKE

Zheng-Yu Gao, Ji-Xia Wu, Tie-Shan Li
Affiliated Hospital of Qingdao University Medical College, Affiliated Hospital of Qingdao University Medical College Huang Dao Branch, China

Objective: To investigate the MRI findings of knee pain patients after stroke and explore the cause of pain, the resolution of knee pain also is explored. *Methods:* twelve patients who suffered stroke were taken MRI examination and observed the abnormal imaging findings. *Results:* Twelve patients all had abnormal MRI signal and meniscus injury was most often. *Conclusion:* Patients who have knee pain all display knee structure injury and indicate that the injury is the source of the pain.

PO-1189

HYPEREXCITABILITY TO ELECTRICAL STIMULATION AND ACCELERATED MUSCLE FATIGABILITY OF TAUT BANDS IN RATS

Yonghui Wang[1], Hongyou Ge[2], Shouwei Yue[1]

[1]Department of Physical Medicine and Rehabilitation, Qilu Hospital, Medical School of Shandong University, People's Republic of China, [2]Laboratory for Experimental Pain Research, Center for Sensory–Motor Interaction (SMI), Department of Health Science and Technology, Aalborg University, Aalborg, Denmark

Objective: Myofascial trigger points contribute significantly to musculoskeletal pain and motor dysfunctions and may be associated with accelerated muscle fatigability. The aim of this study is to investigate the electrically induced force and fatigue characteristics of muscle taut bands in rats. *Method:* Muscle taut bands were surgically removed and subjected to trains of electrical muscle stimulation. The electrical threshold intensity for muscle contraction and the maximum contraction force (MCF), electrical intensity dependent fatigue characteristics, and electrical frequency dependent fatigue characteristics were assessed in three different sessions (each n=10) and compared to non-taut band region of the other biceps femoris. *Results:* Threshold intensity for muscle contraction and MCF at the 10th, 15th, and 20th intensity dependent fatigue stimuli of taut band were significantly lower than those of non-taut band (all $p<0.05$). The MCF at the 15th and 20th intensity dependent fatigue stimuli of taut band were significantly lower than those at the1st stimulus (all $p<0.01$). The MCF in the frequency dependent fatigue test was significantly higher and the stimulus frequency generated MCF was significantly lower than those of non-taut band (both $p<0.01$). Pathological sections revealed that more severe edema, uneven cytoplasmic dying and cell degeneration of muscle fiber were observed in taut band than in non-taut band after fatigue tests. *Implications:* These findings suggest that muscle taut band itself was more excitable to electrical stimuluation and significantly less fatigue resistant than normal muscle fiber.

PO-1190

EFFECTS OF ACUPUNCTURE IN FIBROMYALGIA: A LITERATURE REVIEW OF CONTROLLED CLINICAL TRIALS

Herison Harrider S. Vaz[1], Fernando V. G. Borges[1], Marta Imamura[2], Chennyfer P. Paim[2], Tania Gutierrez[3]

[1]Academic League of Pain, University Potiguar, School of Medicine, Natal, RN, Brazil, [2]Clinical Research Center - Institute of Physical Medicine and Rehabilitation, University of Sao Paulo School of Medicine, Sao Paulo, SP, Brazil, [3]Physical Medicine and Rehabilitation Service, Clinica Alemã, Santiago, Chile, Brazil

Objective: Review the effects of acupuncture in fibromyalgia syndrome (FMS). *Methods:* PUBMED and the Cochrane Library were screened through Sep 2012. The search strategy used was based on structured questions as PICO (The initials "Patient," "Intervention," "Control," "Outcome"): Fibromyalgia AND (Acupuncture Therapy OR Acupuncture OR Acupuncture Points OR Acupuncture Analgesia OR Acupuncture Ear). Studies were included for adults diagnosed with FMS, randomized controlled trials (RCTs), published in any date using humans, english language and needle acupuncture. Methodological quality: assessed by the JADAD and Van Tulder scores. *Results:* Seven RCTs with treatment median time of 4.5 weeks (range 3-12), 13 sessions (range 6-24), and 421 patients were included. Studies were reported as: two low risk, three moderate risk and two high risk of bias. *Main Results:* classical acupuncture, as an isolated intervention, does not improve symptoms of fibromyalgia. The association of classical acupuncture with tricyclic antidepressants, relaxation, aerobic and stretching exercises is more beneficial than these interventions alone. Eletroacupuncture alone improves fatigue and anxiety symptoms in patients with fibromyalgia, as well as pain and patient's satisfaction. Molecular neuroimaging studies indicate that acupuncture increase the binding potential of μ-opioid receptors at sensory fields of brain and significantly increase glutamate values within the insula. Main adverse events are discomfort at the site of needle insertion, bruising, nausea and faint. *Impact on rehabilitation:* Eletroacupuncture and the association of traditional acupuncture with other interventions, antidepressants and exercise, seem to provide better relief. Molecular neuroimaging evidence suggests that acupuncture can play a role in the management of fibromyalgia patients.

PO-1191

CLINICAL EFFECTS OF PULSED SHORTWAVE THERAPY IN COMPLEX REGIONAL PAINFUL SYNDROME TYPE I

Dogaru Bombonica Gabriela, Ioan Onac*

Clinic Hospital for Rehabilitation Cluj Napoca, Romania

Objective: The aim of this study is to evaluate the effects of pulsed *shortwave* therapy on pain, edema and joint mobility in patients with complex regional painful syndrome (CRPS) type I. *Method*: 40 patients diagnosed with CRPS type I, posttraumatic stages I and II (following fractures and dislocations), were included in a prospective longitudinal study carried out in a representative sample. Patients with pacemakers were excluded from the study. Treatment was administered with the Diapulse device. Initially, the lumbar region was exposed to a dose of 4/400 impulses/sec for 10 min, then, the affected somatic region was exposed to a dose of 6/600 impulses/sec for 10 min, for 14 days. Before and after the 14 days of treatment, the following were assessed: pain using the visual analogue scale (VAS), edema by measuring the circumference of the affected joint in cm, and joint mobility through joint testing. Patients were monitored one month after treatment. *Results*: After treatment, pain and edema were statistically significantly reduced ($p<0.05$). The functional evaluation of the range of joint motion showed a statistically significant improvement in the mobility of the affected joints ($p<0.05$). After a month, the results of the clinical and functional examination were similar, without significant differences. *Implications/Impact on Rehabilitation*: Pulsed shortwave therapy is efficient in CRPS type I, influencing the clinical and functional picture and determining a significant improvement in the quality of life of these patients.

PO-1192

A SUPPORTIVE CASE FOR MIRROR THERAPY IN TREATMENT OF PHANTOM LIMB SENSATION OR PAIN IN A HIP DISARTICULATED PATIENT: A CASE REPORT

Fajie Ma, Anatoly Shneyder*, Seung Park, Paul Pipia, Sanjeev Agarwal

SUNY Downstate Medical Center, United States

Setting: Inpatient Rehabilitation Unit of a TertiaryCareHospital Patient 56 year old male status-post right hip disarticulation with initial severe right lower extremity sensation and pain that progressively improved on mirror therapy. *Case Description*: Patient presented as a chronic right hip osteomyelitis that became metaplastic into squamous cell carcinoma requiring a right hip disarticulation. Postoperatively, patient complained of severe surgical and "phantom" limb pain/sensation refractory to opioid medications while on the surgical ward. Once admitted to acute inpatient rehabilitation, mirror therapy was initiated with efficacy. The severity of pain decreased from 10/10 to 5/10 within 10 days of therapy along with significant decrease in phantom limb sensation. Furthermore, patient eventually developed the ability to distinguish between nociceptive and neurogenic pain, which allow for focusing of therapy on reduction of phantom pain. *Discussion*: Phantom pain was once believed to be a post-amputation phenomenon related to psychological disor-

der. Evidence now suggests a neurogenic source originating either from the brain and spinal cord as causation. This is significant for providing a model by which CRPS may be explained in stroke/TBI/spinal injury patients. Regarding post-amputation phantom pain, however, identifiable risk factors include pre-amputation pain and persistent stump pain. Data is lacking regarding why some patients develop phantom pain/sensation while others do not. The management modalities are varied and include pharmacological agents, brain/nerve stimulation/injection, and neurectomy with variable efficacy. *Conclusion*: Literature is limited pertaining to the use of mirror therapy in management of phantom pain/sensation. However, current evidence suggests that therapy is efficacious in alleviating limb-lost induced pain/sensation. This is an anecdotal case supporting the use of mirror therapy for treatment of phantom pain/sensation based on subjective measurements given by patient regarding pain abatement, ability to distinguish the different pain sensations, and overall positive perspective on one's rehabilitation.

PO-1193

FILIFORM NEEDLE RED-HOT NEEDLING METHOD WITH THE CONVENTIONAL ACUPUNCTURE CLINICAL RANDOMIZED CONTROLLED OBSERVATION ON SENILE KNEE OSTEOARTHRITIS AND EFFECT ON KNEE JOINT CAVITY FLUID INFLAMMATORY CYTOKINES

Qiusheng Hu, Shunlin Zhou, Qingjun Li
Hebei Yiling hospital rehabilitation center, China

Objective: through the observation of filiform needle red-hot needling method and effect on senile knee osteoarthritis pain degree change in knee joint cavity fluid inflammatory cytokine, filiform needle curative effect comparison of red-hot needling method and routine acupuncture method difference. *Methods:* according to random number table will meet the inclusion criteria of senile knee osteoarthritis were randomly divided into treatment group and control group, two groups of 100 cases. Two groups of the same knee V rabbit, inner eye of the knee, the knee eye, Yanglingquan, yinlingquan, Xuehai, Liangqiu, Xiyangguan, zusanli. Treatment group were treated with acupuncture needle acupuncture, the acupuncture needle on the alcohol lamp burning to whitish, rapid penetration acupuncture point 0.5 ~ 0.8 inches deep, and the needle for 30 min; the control group with routine needling methods, with the point of local tingling pain for the degree, after the gas reinforcing-reducing needle, 30 min. The two groups were 1 treatment every other day, 15 times as a course of 1. After the end of treatment, the standard ELISA method experiment, by comparing the observed changes in patients with knee joint cavity fluid IL-1, IL-6, TNF- αlevels before and after treatment, and the treatment of the two groups before and after the score, main symptoms of pain degree, change the index of severity score, clinical comprehensive evaluation of filiform needle acupuncture the. *Results:* the two groups after treatment, IL-1, IL-6, TNF- αlevels were lower than before treatment ($p<0.01$), there was significant between the treatment group and the control group after treatment differences, $p<0.01$; the two groups after treatment severity scores were compared before treatment were significantly improved ($p<0.01$), the treatment group there was significant and the control group differences ($p<0.05$); pain grading evaluation of two groups after treatment between the two groups before treatment, the pain was no significant difference, u=-0.864, $p=0.388$; there was significant between the two groups after treatment of pain grade difference. U=-2.237, $p=0.023$, the degree of pain in patients in treatment group was lower than control group. Comprehensive evaluation of the efficacy of the treatment group 29 cases were clinically controlled, 46 cases markedly effective, effective 18 cases, invalid 7 cases, the control group 21 cases were clinically controlled, 34 cases markedly effective, effective 29 cases, invalid 16 cases, the comprehensive evaluation of curative effect between the two groups were significantly different, u=-2.702, $p=0.007$, the treatment group the effect was better than the control group. *Conclusion:* Acupuncture red-hot needling method on senile knee osteoarthritis is a than conventional acupuncture is more effective treatment method, it can effectively reduce the expression of inflammatory cytokines in knee joint cavity fluid.

PO-1194

THE REHABILITATIVE EFFECTS OF LUMBAR DISC HERNINATION INPATIENTS

Yunqiang Zan
the first affiliated hospital of Soochow university, China

Objective: To observe the rehabilitative effects of lumbar disc herniation inpatients. *Methods:* 76 cases of lumbar disc herniation inpatients and another 76 cases of outpatients at the same time were studied toassess the rehabilitative effects of hospitalization and outpatient service according to Nakai scale. *Results:* Both hospitalization and outpatient service got the satisfactory effects, while compared to the outpatient rehabilitation, hospitalization reached more remarkable effects and spent much less time. *Conclusion:* Lumbar disc herniation inpatients were fit to receive to hospitalization service.

PO-1195

MYOFASCIAL PAIN OF THE JAW MUSCLES: COMPARISON OF SHORT-TERM EFFECTIVENESS OF BOTULINUM TOXIN INJECTIONS AND FASCIAL MANIPULATION TECHNIQUE

Antonio Stecco[1]*, Marta Imamura[2], Luca Guarda Nardini[3], Carla Stecco[4]
[1]Department of Sport and Medicine, University Padua,Italy, [2]Department of PM&R, University of Sao Paulo,Italy, [3]Department of Maxillo face surgery, University of Padua,Italy, [4]Departmetn of Molecolar Medicine, University of Padua,Italy

A randomized controlled trial was performed to compare the short-term effectiveness of botulinum toxin injections and physiatric treatment provided by means of Fascial Manipulation (a technique licensed by and registered to Luigi Stecco) techniques in the management of myofascial pain of jaw muscles. Thirty patients with a Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) diagnosis of myofascial pain were randomized to receive either single-session botulinum toxin injections (Group A) or multiple-session Fascial Manipulation (Group B). Maximum pain levels (VAS ratings) and jaw range of motion in millimeters (maximum mouth opening, protrusion, right and left laterotrusion) were assessed at baseline, at the end of treatment, and at a three-month follow-up. Both treatment protocols provided significant improvement over time for pain symptoms. The two treatments seem to be almost equally effective, Fascial Manipulation being slightly superior to reduce subjective pain perception, and botulinum toxin injections being slightly superior to increase jaw range of motion. Differences between the two treatment protocols as to changes in the outcome parameters at the threemonths follow-up were not relevant clinically. Findings from the present investigation are in line with literature data supporting the effectiveness of a wide spectrum of conservative treatment approaches to myofascial pain of the jaw muscles. Future studies on larger samples over a longer follow-up span are needed on the way to identify tailored treatment strategies.

PO-1196

MEDIAN SOMATOSENSORY EVOKED POTENTIAL IS A PREDICTOR OF TYPE I COMPLEX REGIONAL PAIN SYNDROME AFTER STROKE

Eun Young Han[1], Bo Ryun Kim[1], Sang Hee Im[2]*

[1]Jeju National University Hospital,Korea, [2]Myongji Hospital, Kwandong University College of Medicine, Korea

Aims: The objective was to determine whether the abnormal findings of somatosensory evoked potentials (SEPs) affect the development of type I complex regional pain syndrome (CRPS) after stroke. *Methods:* This was a retrospective study conducted from January, 2003, to December, 2007. Seventy patients were confirmed as CRPS type I, and one hundred and eighty-two patients were assigned to the control group. The initial clinical data were reviewed including age, gender, main type of stroke (ischemic or hemorrhagic), lateralization of the lesion (right, left, or bilateral), location (cortical vs. subcortical, thalamus vs. others), presence of shoulder subluxation (if surpassing 25 mm in vertical distance), and the development of CRPS. SEP tests (N20 in median nerve, P37 in posterior tibial nerve) were performed. *Results:* CRPS correlated significantly with the absent hemiplegic median SEP, the absent hemiplegic median and posterior tibial SEP, and shoulder subluxation. Binary logistic regression analysis of factors showing significant correlations with CRPS indicated that shoulder subluxation (exp. (B)= 4.083, $p<0.01$) with the absent median SEP (exp. (B)= 3.246, $p<0.01$) were significant independent predictors of CRPS. *Conclusions:* In conclusion, shoulder subluxation and the absent median SEP in the sub-acute phase of stroke was a primary predictor of the development of CRPS type I.

PO-1197

THE CURATIVE EFFECT OF MOBILISATION WITH MOVEMENT TREATMENT THE CERVICAL SPONDYLOTIC RADICULOPATHY

Ming Zhang, Jihong Wang, Wei Chen
Xuzhou central hospital

Objective: To study the curative effect of mobilisation with movement of the Mulligan technique for the cervical spondylotic radiculopathy *Methods:* The cases of the cervical spondylotic radiculopathy patients were randomly divided into observation group and the traditional treatment group, each group of 10 cases. Two groups of all use cervical traction, interferential current therapy and herb fumigation therapy, the traditional treatment used the traditional Chinese medicine massage, the observation group on the basis of add a Mulligan technique, sustained natural apophyseal glides between the cervical joint, and increased mobilisation with movement by patients compliance with. Two weeks after the therapy, used the visual analogue scale (VAS) and clinical assessment scale for cervical spondylosis (CASCS) contrast before and after evaluation. *Results:* The two groups after therapy than before VAS scores were significantly lower, but the observation group was significantly lower than the traditional treatment group; CASCS score more before therapy were significantly improved, but the observation group is obviously higher than that of the traditional treatment group ($p<0.01$). *Conclusion:* Mulligan technique and traditional synthesis method in the therapy of the cervical spondylotic radiculopathy are effective, but the group of increase Mulligan after therapy effect is much better.

PO-1198

ASSASSEMENT OF EFFECTIVENESS OF OVER GROUND AND TREADMILL WALKING IN CHRONIC LOW BACK PATIENTS

Murat Karadeniz*, Kamil Yazicioğlu, A.Kenan Tan
Gülhane Military Medical Academy, Turkey

Objective: The aim of our study is to assess effectiveness of over ground and treadmill walking in chronic low back pain patients and compare them. *Method:* In this randomised-prospective study, 18 patients (10 female, 8 male) were enrolled between 20 and 80 years old. Patients were randomised to two group as over ground and treadmill walking. Ultrasound, hot pack, TENS, abdominal and back strengthening exercises were applied to both groups in same way In addition to these treatments, one group has taken treadmill and other has over ground walking exercise for 4 weeks and 3 times a week under supervision. Patients were assessed in terms of physical examination findings, exercise tolerance test parameters (VO2max, anaerobic threshold, MET, maximal heart rate), pain intensity, disability and quality of life, before and after treatment. *Results:* As result, in the over ground walking group, there was statisticaly significant improvement in T12 and real extension values (p=0,005 ve p=0,010). The improvement of real extension values were significantly higher in over ground walkin group than treadmill walking group (p=0,018). The improvement at the MET levels in treadmill walking group was statistically significant (p=0,004). However, there was no statistically significant difference between two exercise groups. There were statisticaly significant decreases at the Oswestry disability scores in the over ground walking group before and after therapy (p<<0,001). This decrease at the Oswestry disability scores was statistically significant than treadmill walking group (p=0,025). The scores of vitality component of SF 36 health survey increased significantly in treadmill walking group (p=0,011). In the over ground walking group, bodily pain and mental health components of SF 36 health survey scores increased significiantly (p=0,018 ve p=0,012). These improvements were not different between two groups. *Implications/Impact on Rehabilitation:* Walking exercise in addition to conservative treatment can improve pain, disability and psychological status in patients with chronic low back pain. In this study we found that over ground walking is more effective than treadmill walking at reducing disability due to low back pain.

PO-1199

MOTOR IMAGINARY THERAPY COMBINED WITH ANTIDEPRESSANT TREATMENT EFFECTS OF PATIENTS

Wan Shun Wen, Xiang Ming Ye, Jue Bao Li, Wen Jing Huo, Liang Zhou
Department of rehabilitation medicine of Zhejiang Province People's Hospital, China

Objective: Application of motor imaginary therapy combined with antidepressant treatment, to observe the changes of mood and the improve of " phantom limb pain "of patients with spinal cord injury, to discuss the mechanism and treatment method of " the phantom limb pain". *Method:* Rehabilitation medicine center in Zhejiang Province People's Hospital admitted complete spinal cord injury with " phantom limb pain " in 40 cases, were randomly divided into two groups, 20 patients in each group, The two groups were given conventional rehabilitation training methods of rehabilitation medicine, a group of motor imaginary therapy treatment with antidepressant treatment (experimental group), Another group of inform patients of antidepressant treatment, the actual not antidepressant treatment (the control group), to observe the intensity of attack one month after the patients " phantom limb pain ", and Zung 's Self-Rating Depression Scale (SDS) score and anxiety self rating scale (SAS) score. *Result:* Motor imaginary therapy combined with antidepressant treatment after a month, the intensity of attack of the patients " phantom limb pain " improved significantly ($p<0.01$), SDS and SAS scores decreased significantly. *Implications:* Motor imaginary therapy combined with antidepressant treatment can obviously improve the intensity of attack of the patients " phantom limb pain ",and improve the depression and anxiety in patients.

PO-1200

DETERMINATION OF STEROID INJECTION SITES USING LIDOCAINE TEST IN ADHESIVE CAPSULITIS

Sang Jun Kim, Sang Mok Lee, Jeong Min Hwang, Ji Hye Hwang, Jeong Yi Kwon
Samsung Medical Center, Korea

Objective: Adhesive capsulitis is characterized by significant restriction of both active and passive shoulder motion in absence of a known intrinsic shoulder disorder. The pain source of the adhesive capsulitis remains unknown because its pathophysiology has not been well understood yet. Determination of the injection site through the lidocaine test prior to steroid injection would increase the success rate of the steroid injection and prevent the repetitive steroid use in treating the pain caused by the adhesive capsulitis. *Method:* Eighty-four patients who were diagnosed as having adhesive capsulitis were selected in this study. The selected patients were randomly divided into LC group in which lidocaine test injection was done before the steroid injection and GH group in which steroid injection was done at the glenohumeral joint. In LC group, lidocaine injection was done at the subacromial space and if the reduction of pain was more than 50% compared with baseline pain, then the second steroid injection was done at the same site. If the reduction of pain was less than 50%, then the steroid was injected at the glenohumeral joint. Improvement of the shoulder pain was checked 3 months after the injection and expressed as an ordinal scale (0='not improved', 1='slightly improved', 2='much improved'). Passive range of motion (PROM) in 4 directions (flexion, abduction, internal and external rotation) were measured before and 3 months after the injection. To compare the improvement of the pain and the PROM between LC and GH groups, Pearson chi-square and independent t-tests were conducted. *Results:* In terms of improvement of pain, group differences were significant in Pearson chi-square test (Pearson $\chi 2=9.211$, $p=0.010$). Passive ROM in 4 directions changed significantly 3 months after the injection in LC and GH groups, but the differences were not significant between LC and GH groups by independent *t*-test ($p=0.722$ in flexion, $p=0.782$ in abduction, $p=0.099$ in internal rotation, and $p=0.628$ in external rotation). *Implication/Impact on Rehabilitation* From our study, we suggest lidocaine test injection prior to the steroid injection to improve the pain caused by adhesive capsulitis more than the steroid injection at the glenohumeral joint.

PO-1201

VALIDATION OF A COMFORT SCALE IN STROKE PATIENTS

Caroline Rogeau, Franck Beaucamp, Etienne Allart, Walter Daveluy, Marc Rousseaux*
Centre Hospitalier Universitaire, Lille, France

Objective: Comfort/discomfort is an important issue for rehabilitation. It is an essential part of quality of life (QoL) but has the advantage to be a more concrete concept. Stroke can be the source of discomfort in personal activities of daily living (pADL), which assessment is important in clinical practice. The purpose of this study was to further validate a comfort scale in patients with stroke. *Method:* Sixty two patients performed a self-assessment through a visual analogue scale (EVA) of the *i*) comfort/discomfort in different pADL (such as dressing, toileting, bed and chair installations) *ii*) severity of deficits (including pain and spasticity) and miss-adaptation of the environment and *iii*) their participation in comfort/discomfort. We analyzed reliability, construct validity against functional status (MIF and Rankin Scale), QoL (SF12) and burden of care (VAS), and responsiveness between two assessments performed at 6-week intervals ($p \leq 0.05$). *Results:* The test-retest and inter-rater reliability was fair for the overall score (ICC=0.86 and 0.92) and each item (ICC=0.67 to 0.99) in the assessment of comfort/discomfort, but only moderate for the severity of deficits and their participation in comfort/discomfort. Internal consistency was fair (Cronbach alpha =0.91). Greater comfort was associated with less severe deficits, fair functional status and QoL and low burden of care. Responsiveness was modest in the 6-week interval. *Implications/Impact on Rehabilitation:* The comfort scale has fair metrological properties. This innovative tool is useful in the care of stroke patients, especially for defining objectives and modalities of treatment.

PO-1202

DIAGNOSTIC VALUE OF FACIAL NERVE ANTIDRMIC EVOKED POTENTIAL IN BELL'S PALSY

Ji Hoon Lee, Yoon Ghil Park*, Sun Mi Kim,
Gangnam Severance Hospital, Yonsei University College of Medicine, Korea

Objective: Through animal experiments, it has been known that facial nerve antidromic evoked potential (FNAEP) was useful for the early diagnosis of facial palsy. But in humans, few studies have examined diagnostic value of FNAEP. This study aimed to assess whether or not FNAEP latency was suitable as a parameter for the measurement of facial nerve function in Bell's palsy. *Methods:* 24 patients with facial palsy and 10 healthy people were recruited. FNAEP and ENoG test were done. The superficial projection of the homolateral stylomastoid foramen was stimulated, and then FNAEP was recorded at the posterior wall of the external auditory meatus. Degeneration ratio and FNAEP latency difference between affected and unaffected sides were calculated. *Results:* We discovered statistical difference between both sides in patients. In control group, there's no significant latency difference between both sides, and average of latency difference was worked out at 0.36±0.18 ms that can be set up as the reference value. In 13 of 24 patients, both FNAEP and ENoG test showed beyond reference values. In 7 patients during days 4 to 11 of symptoms, ENoG test revealed degeneration ratio less than 50% but FNAEP showed latency difference more than reference value. Conversely, in only 3 cases of FNAEP which were within reference value, ENoG revealed degeneration ratio more than 50%. *Conclusion:* FNAEP has clinical value for diagnosis of facial nerve degeneration. It is imperative that FNAEP should be monitored in patients with facial palsy as work up and integrated with other relevant tests.

PO-1203

ULTRASOUND RELIABILITY OF REHABILITATIVE ULTRASOUND IMAGING OF THE TRANSVERSUS ABDOMINIS AND LUMBAR MULTIFIDUS MUSCLES IN STROKE PATIENTS

Rong Bian[1], Jinjun Shi[2]
[1]jiangsu province hospital,China, [2]jiangsu province official hospital, China

Objectives: To evaluate the intraexaminer and interexaminer reliability of rehabilitative ultrasound imaging (RUSI) in obtaining thickness measurements of the transversus abdominis (TrA) and lumbar multi muscles in stroke patients. *Methods:* A sample of stroke patients with hemiplegia ($n=21$) was examined by 2 clinicians with RUSI experience. Images of the TrA muscle were acquired at rest and during the ASLR maneuver, Images of the lumbar multi muscle were obtained at rest and during a contralateral arm lift maneuver. Thickness measurements of the muscles were obtained by using RUSI. A total of 24 ultrasound images were taken of each participant (12 during session 1 and 12 during session 2) to be able to calculate a mean from 3 measures and to calculate all intraexaminer and interexaminer comparisons for all muscle conditions. *Results:* There was a significant difference in muscle thickness between the contracted and relaxed states for both the TrA and lumbar multifidus muscles. By using the mean of 2 measures, intraexaminer reliability point estimates (ICC3,2) ranged from 0.79 to 0.99 for comparisons. Interexaminer reliability estimates (ICC2,2) ranged from 0.76 to 0.83 for comparisons. IMPLICATIONS RUSI thickness measurements of the TrA and lumbar multi muscles in patients with stroke hemiplegia are highly reliable when taken by a single examiner and

adequately reliable when taken by different examiners. Continued research on the use of RUSI as a tool for both assessment and intervention in stroke patients is needed.

PO-1204

CORRELATION BETWEEN ANKLE JOINT PROPRIOCEPTION AND MUSCLE STRENGTH IN THE ELDER PEOPLE

Xueqiang Wang[1], Jiejiao Zheng[2], Jing Liu[1], Weihuang Qi[1], Yujing Fan[1]

[1]Shanghai University of Sport, Shanghai, China, [2]Huadong Hospital Affiliated to Fudan University, Shanghai, China

Object Comparing proprioception, peak torque between the dominant and non-dominant ankle of the elderly people, and evaluate the relationship between ankle joint proprioception and strength. *Method:* Ankle joint proprioception of twenty-eight healthy elder people (12 male and 16 female: average age 66.1±5.1 year) was measured with positioning test on the Biodex system 3 dynamometer, The absolute error angle of passive replication test was used to assess ankle proprioceptive function. And the ankle flexor muscle, extensor muscle isokinetic concentric peak torque was measured by the Biodex system 3 dynamometer at the speed of 30°/s, Main outcome messure is ankle flexor muscle, extensor muscle concentric peak torque and relative peak torque. *Result:* The absolute error angle of passive replication test in the non-dominant are better than the right (p=0.011); Flexor muscle, extensor muscle concentric peak torque of the dominant ankle are stronger than the non-dominant (p<0.001), and extensor muscle concentric relative peak torque of the dominant ankle are stronger than the non-dominant (p<0.001); There are no significant correlation between the proprioception and strength (p>0.05). *Conclusion:* Proprioceptive function of the non-dominant ankle are better than the dominant, but flexor muscle, extensor muscle concentric peak torque and relative peak torque is smaller than the dominant. There are no significant correlation between the proprioception errors and strength in the elderly.

PO-1205

THE EFFECT OF BOLUS CONSISTENCE ON SWALLOWING FUNCTION IN HEALTHY VOLUNTEERS USING HIGH-RESOLUTION MANOMENTRY

Fan Yu, Yue Lan, Zulin Dou

Department of cardiovascular medicine, the third affiliated hospital of Sun Yat-sen university, Guangzhou, China, 510630

Objective: This study evaluated the effects of three levels of bolus consistency (thin liquid, thick liquid, plaster material) on physiologic pressure and duration in healthy adults with using high-resolution manometers. *Methods:* 34 healthy adults (mean= 24.29 years) participated in this study. Upper esophageal sphincter and pharyngeal manometric pressures were measured during swallows of different viscosity bolus both in 3 ml and 10 ml volume. Variables included maximum pressure, pressure duration and rise rate of pressure increase of pharyngeal and minimum pressure and duration during UES relax, maximum preopening and maximum post-closure UES pressure were analyzed across bolus consistencies using Multiple analysis of variance with repeated measurements (MANOVA) investigating the effect of bolus consistencies. *Results:* No significant difference of minimum pressure of UES relaxation between different viscosities was identified. A significant change of UES relaxation duration, maximum preopening and maximum post- closure UES pressure, maximum pressure, rate of pressure increase and pressure duration in pharynx decreased significantly with increasing bolus consistencies. Implications Varying amplitude of bolus consistencies demonstrates significant effect on physiologic pressure and duration in healthy adults. Identified difference between bolus viscosities might help to understand normal and pathological swallowing deeply.

PO-1206

CHARACTERISTIC ANALYSIS OF THIRD-LEVEL BALANCE IN HEALTH SUBJECTS AND HEMIPLEGIC PATIENTS USING SACRAL MARKER METHOD WITH THREE DIMENSIONAL MOTION ANALYSIS

Sheng Wang[1], Xiaojun Zhu[2], Yi Zhu[1], Dianhuai Meng[1], Tong Wang[1]

[1]The First Affiliated Hospital With Nanjing Medical University,China, [2]jiangsu Province Offical Hospital, China

*Objective:*Use the sacral marker method with three dimensional motion analysis to study the characteristics of third-level balance of health people and hemiplegic patients with brain injury applied with different-direction external force perturbation. *Method:*Recruit 10 health subjects and 10 hemiplegic patients respectively. Exert the external force according to Postural Stress Test to the body in different directions and record the movement of body with the Mean Sway Amplitude (MSA) and Mean Sway Velocity (MSV)of center of gravity. *Results:* In health subjects the backward force can cause the largest value compared with the other three directions in MSA and MSV,while there is no significantly difference between the front-/ left- and right-direction (MSA in front/back/left/right force is13.90±7.46 mm, 0.57±20.63 mm, 16.44±7.28 mm, 15.29±6.54 mm; MSV 1.23±0.38 m/s, 1.45±0.43 m/s, 1.22±0.37 m/s, 1.15±0.34 m/s). In hemiplegic patients the hemiplegic side force can cause the biggest value in MSA (MSA=20.72 mm), and then back-direction in MSA (MSA =17.58 mm),while there is no significant difference in front and non-affected side (MSA =11.87 mm, 13.5 mm). *Implications:* When applying force to health subjects, the balance is weak in back-direction; while the MSA in hemiplegic side force is bigger than the other directions, so hemiplegic patients are easier to fall toward the hemiplegic side.

PO-1207

COMPARISON OF CERVICAL KINEMATICS BETWEEN CERVICAL ARTIFICIAL DISC REPLACEMENT AND ANTERIOR CERVICAL DISCECTOMY AND FUSION FOR TREATMENT OF ONE LEVEL CERVICAL DISC HERNIATION

Jung Hwan Lee[1], Jin Sung Kim[2], June Ho Lee[1], Sang-Ho Lee[1]

[1]Wooridul spine hospital,Korea, [2]Seoul Catholic University hospital, Korea

Objective: Cervical artificial disc replacement (ADR) is the better method to preserve cervical range of motion than anterior cervical discectomy and fusion (ACDF). The purpose of this study is to compare the clinical parameters and cervical kinematics measured by three dimensional motion analysis between ACDF and ADR and to investigate the ability of ADR to maintain cervical kinematics. *Method:* The patients who underwent ADR or ACDF for treating single level cervical disc herniation were recruited and were evaluated by Visual analogue scale (VAS) and Korean version of Neck Disability Index (NDI, %). Cervical kinematics was also assessed by three dimensional motion analysis in terms of sagittal, coronal, and horizontal planes. These evaluations were performed preoperatively and 1 month and 6 months after surgery. *Results:* After surgery, both groups showed significant improvement in VAS for arm pain and NDI. In motion analysis, significantly more range of motion was retained in flexion and extension in ADR group than ACDF group at 1 month and 6 months. In terms of coupled motion, ADR group exhibited significantly more preserved sagittal angle during

right and left rotation and also showed significantly more preserved right lateral bending angle during right rotation than ACDF group at 1 month and 6 months. *Implications/Impact on Rehabilitation:* ADR demonstrated better preservation in main sagittal motion and coupled sagittal and coronal motion during transverse motion than ACDF. Three dimensional motion analysis was useful in objective and quantitative evaluation about cervical kinematics in terms of not only main motion but also coupled motion.

PO-1208

EFFECT OF NEWLY DEVELOPED BALANCE TRAINING SYSTEM (I BALANCE S®) IN HEMIPLEGIC PATIENTS

Byung Hyun Park[1], Myoung-Hwan Ko[1]*, Jeong-Hwan Seo[1], Woo-Suk Chong[2], Tae-Kyu Kwon[3], Jong-Kwan Park[1]

[1]Chonbuk National University Medical School,Korea, [2]Research Institute and Clinical Trial Center of Medical Devices of Chonbuk National University Hospital,Korea, [3]Chonbuk National University, Korea

Objective: To evaluate the effect of newly developed balance training system (I balance S®) in chronic hemiplegic patients. *Method:* Twenty-six chronic (more than 6 months) hemiplegic patients who were capable of standing without assistive devices participated in this study. An A1-B-A2 single-case study design was applied. The study started with "pre 1 evaluation" such as Berg balance test (BBT), 10 m walking test (10 mWT) and Functional reach test (FRT), and then, all of these pre 1-evaluation studies were repeated after 4 weeks (pre 2 evaluation) without any treatment in order to generate the control data. After two pre-evaluations, balance training was applied for 4 weeks. And then, three phases of post-evaluation were performed, just after (post 1), 1 week (post 2), and 4 weeks (post 3) after treatment. *Results:* All subjects showed a significant improvement in BBT (50.47±6.42 (pre 1), 49.70±6.87 (pre 2), 51.76±3.49 (post 1), 52.65±3.38 (post 2), 52.65±3.52 (post 3)), 10 m WT (15.03±5.25 sec, 15.14±5.46 sec, 13.71±2.65 sec, 12.23±2.98 sec, 12.74±2.85 sec, respectively) and FRT (17.69±5.27 cm, 17.33±5.58 cm, 19.86±4.67 cm, 21.13±4.89 cm, 21.15±5.28 cm, respectively) after training compared to the status before training. *Conclusion:* The hemiplegic patients trained by I balance S® showed a significant improvement in BBT, 10 mWT and FRT after training. In addition, this effect lasted for 4 weeks. Therefore, newly developed balance training system (I balance S®) is considered to be a useful tool for balance training of hemiplegic patients.

PO-1209

THE EFFECT OF RECLINED SITTING IN DYSPHAGIA PATIENTS

Jeong Hwan Seo, Byung Hyun Park*, Myoung Hwan Ko, Sung Hee Park, Sang Hyoung Han, Kwang Seop Song

Chonbuk National University Medical School, Korea

Purpose: To determine the effect of a 45° reclining sitting posture on swallowing in patients with dysphagia. *Materials and Methods:* Thirty-four patients with dysphagia were evaluated. Videofluoroscopic swallowing study (VFSS) was performed for each patient in 90° upright and in 45° reclining sitting posture. Patients swallowed 5 types of boluses twice: sequentially 2 ml thin liquid, 5 ml thin liquid, thick liquid, yogurt, and cooked rice. Data such as the penetration-aspiration scale (PAS), oral transit time (OTT), pharyngeal delay time (PDT), pharyngeal transit time (PTT), residue in valleculae and pyriform sinuses, premature bolus loss, and nasal penetration were obtained. *Results:* The mean PAS on the 2ml thin liquid decreased significantly in the 45° reclining sitting posture ($p=0.007$). The mean PAS on 5 ml thin liquid in the 45° reclining sitting posture showed decreasing tendency. The residue in valleculae decreased significantly for all boluses in the 45° reclining sitting posture ($p<0.001$, $p=0.002$, $p=0.003$, $p<0.001$, $p=0.020$, respectively). The residue in pyriform sinuses increased significantly on 5ml thin liquid, thick liquid, and yogurt ($p=0.031$, $p=0.020$, $p=0.002$, respectively). There were no significant differences in OTT, PDT, PTT, premature bolus loss, and nasal penetration between both postures. *Conclusion:* PAS on 2 ml thin liquid and residue in valleculae on all types of boluses were decreased in a 45° reclining sitting posture. Therefore, we believe that the 45° reclining sitting posture on swallowing is beneficial for the patients with penetration or aspiration on small amounts of thin liquid and large amounts of residue in valleculae.

PO-1210

THE RELIABILITY OF KNEE JOINT POSITION TESTING USING DYNAMOMETER

Guangxin Zheng, Xiaoou Zhao, Zhiyue Chang,China

Deptment of Rehabilitation Medicine the 309th Hospital of PLA, China

Objective: To determine the intra- and inter-tester reliability of using dynamometer to assess knee joint position senses (JPS). *Methods:* Sixteen healthy volunteers (intra-rater $n=6$, iner-rater $n=10$) were examined with regard to intra- and inter-tester reliability of knee JPS using Biodex System 3 dynamometer, measured by passive replication test, with subject passively returning to the initial position for30°, 45°and 60° knee flexion. The absolute error (AE) angle was recorded. Both inter-tester reliability studies involved two testers. *Results:* The intra -retest reliability of the AE were moderate reliability at 30°,45°and 60° knee flexion and the values of intra class correlation coefficients (ICC) were respectively 0.728, 0.780 and 0.807. The values of Pearson's correlation coefficients for inter-tester reliability were respectively 0.676, 0.610 and 0.705, the correlations were significant ($p<0.05$). There was no significant difference between the AE values of dominance and non-dominant knees, test and retest, and in the AE values of 30°,45°and 60° knee flexion ($p>0.05$).The 95% confidence upper limits of all subjects AE values were less than 3°. *Conclusion:* The major findings of this study suggest that the test-retest reliability of the knee JPS were moderate reliability using Biodex System 3 dynamometer, and selecting a target angle of passive replication test can achieve the same purpose in 30°-60°knee flexion. It may be considered its clinical significance when the AE changes greater than 3 degrees.

PO-1211

VENTILATORY EFFICIENCY DURING CARDIOPULMONARY EXERCISE TESTING IN PATIENTS WITH MYOCARDIAL INFARCTION

Li-Ling Lin[1], Ssu-Yuan Chen[1]*, Bai-Chin Lee[2], Mao-Yuan Marine Su[3], Ching Lan[1], Wen-Yih Issac Tseng[3], Ming-Fong Chen[2], Jin-Shin Lai[1]

[1]Department of Physical Medicine and Rehabilitation,Chinese Taipei, [2]Internal Medicine,Chinese Taipei, [3]Medical Imaging, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Taiwan, Chinese Taipei

Objective: Cardiopulmonary exercise testing (CPET) measures a broader range of variables related to cardiorespiratory function. The aim of this study was to evaluate the ventilatory efficiency parameters obtained during CPET in patients with myocardial infarction. *Method:* Twenty-two male patients with a mean age of 52.0±7.9 year were included in this study. They had previous myocardial infarction and underwent symptom-limited CPET using a cycle ergometer. Ventilatory efficiency parameters during CPET including oxygen uptake efficiency slope (OUES), oxygen uptake efficiency plateau (OUEP), and VE/VCO2 slope were determined. Cardiac magnetic resonance imaging including late gadolinium-enhanced imaging was used to evaluate the cardiac function and quantify the myocardial infarct size

of the left ventricle. *Results*: The postinfarct patients showed OUES 2051±378, OUEP 37.0±4.2 mL/L, and VE/VCO2 slope 32.0±5.9. The OUES was significantly positively correlated with work rate, oxygen uptake, and oxygen pulse both at peak exercise and ventilatory threshold, and negatively correlated with age ($p<0.05$). The OUEP was significantly correlated with oxygen uptake at peak exercise. The VE/VCO2 slope was significantly negatively correlated with end-diastolic volume, peak filling rate, and peak ejection rate of left ventricle. The myocardial infarct size was significantly correlated with end-diastolic volume, end-systolic volume, peak filling rate, peak ejection rate, and ejection fraction of left ventricle. *Implications:* Our results provide important information on ventilator efficiency parameters obtained during CPET among patients with myocardial infarction. The clinical and possible prognostic applications of ventilatory efficiency parameters require further investigations.

PO-1212

EFFECT OF TAPING ON SHOULDER SUBLUXATION OF STROKE PATIENTS WITH HEMIPLEGIA

Rong Bian[1], Hongmei Zhu[2]

[1]jiangsu province hosipital,China, [2]nanjing physical education institute of university, China

Objective: To observe the effect of both traditional and modified taping on shoulder subluxation of stroke patients with hemiplegia. *Methods:* Two kinds of taping were practiced on 10 stroke patients with shoulder subluxation, using the evaluation index for the X-ray Measurement. *Results:* There was a significant difference between two kinds of taping.And the traditional method had no improvement ($p>0.05$) but the modified method achieved a significant result ($p<0.05$). *Conclusion:* The modified taping on shoulder subluxation of stroke patients with hemiplegia had an immediate effect,which may provide a new treatment for patients with early stroke to correct shoulder subluxation.

PO-1213

EFFECT OF SWALLOWING ANGIOGRAPHY ON INDIVIDUAL TREATMENT OF DYSPHAGIA

Xin Lei, Min Zhang, Fengzhu Zhao

Department of Rehabilitation,the First Hospital of Qiqihar, Heilongjiang, China

Objective: To discuss the value of swallowing angiography check to the individual treatment of dysphagia. *Method:* 60 patients with dysphagia were randomly divided into two groups. One was observation group, patients in this group were treated swallowing angiography check after conventional swallowing disorders assessed and individualized rehabilitation was conducted according to disorder characteristics. The other was control group, and patients were treated with basic rehabilitation after conventional assessment. Three months later, swallowing functions of the patients in the two groups were assessed. *Results:* Individualized treatment plan was selected after swallowing angiography results in observation group, and basic treatment wastreated in control group after routine assessment. Three months after systematic rehabilitation, swallowing function of the two groups of patients were assessed. Statistical analysis was done in these two groups, and the difference was statistically significant ($p<0.05$), the effect of rehabilitation of the observation group was superior to that of the control group. *Implications:* There is guide value of swallowing angiography check to individual treatment of dysphagia. Individualized rehabilitation treatment has the targeted efficacy advantages, can further improve swallowing function, and its curative effect is significantly better than the basic rehabilitation.

PO-1214

REFERENCE VALUES FOR PARAMETERS OBTAINED DURING CARDIOPULMONARY EXERCISE TESTING AMONG HEALTHY CHINESE SUBJECTS IN TAIWAN

Pei-Chun Hsieh[1], Ssu-Yuan Chen[2]*, Ching Lan[2], Chen-Jung Hsu[2], Jin-Shin Lai[2]

[1]Department of Physical Medicine and Rehabilitation, National Cheng Kung University Hospital, Tainan, Taiwan,Chinese Taipei, [2]Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, Taiwan, Chinese Taipei

Objective: The aim of this study was to provide reference values for peak and submaximal exercise parameters obtained during cardiopulmonary exercise testing (CPET) among healthy Chinese subjects in Taiwan. *Method:* 540 healthy subjects, 362 men and 178 women with age between 18 and 87 years, underwent symptom-limited CPET using a cycle ergometer. Expiratory gas analysis and electrocardiograph was measured during the CPET. Work rate (WRpeak), oxygen uptake (VO2peak) and oxygen uptake divided by body weight (VO2peak/BW) at peak exercise, and submaximal exercise parameters including VE/VCO2 slope, oxygen uptake efficiency slope (OUES), and oxygen uptake efficiency plateau (OUEP) were determined. These parameters were regressed by age (A, in year), height (H, in cm), body weight (G, in kg), and gender (S, 0=women, and 1=men), using the multiple linear stepwise regression models. *Results:* The following predictive equations were obtained: (1) WRpeak (W)=-47.3 -1.14 A + 0.64 H + 1.71 G + 37.8 S; (2) VO2peak (ml/min)=665 -14.1 A + 24.7 G + 466 S; (3) VO2peak/BW (ml/kg/min) =41.7 - 0.22 A - 0.11 G + 7.8 S; (4) VE/VCO2 slope=25.0 + 0.06 A + 0.06 G – 2.8 S; (5) OUES =-495.1 – 11.8 A + 11.9 H + 15.1 G + 438.6 S; (6) OUE p=43.39 – 0.12 A + 2.8 S. *Implications:* Our results provide important reference values for parameters obtained during CPET among healthy Chinese subjects in Taiwan.

PO-1215

TAMP: A NOVEL QUANTITATIVE TOOL FOR NON-INVASIVE OBSERVATION ON CONTRACTION ABILITY OF TRICEPS SURAE

Jizhou Li[1,2,3], Li Jiang[3], Junshi Liu[1,4], Lei Wang[1,4], Zulin Dou[3], Yongjin Zhou[1,4]

[1]Shenzhen Institutes of Advanced Technology, CAS,China, [2]College of Mathematics and Econometrics, Hunan University,China, [3]The Third Affiliated Hospital of Sun Yat-sen University,China, 4.The Shenzhen Key Laboratory for Low-cost Healthcare, China

Objective: Muscle contraction ability is traditionally investigated using electromyography (EMG). However, this approach has limited applicability to studies of deep muscles without invasion. The purpose of the preliminary report is to introduce a novel quantitative measure to describe the contraction ability of the triceps surae (TS) using ultrasonography. *Method:* Three patients (age 60.0 +/-7 years, body weight 65.0 +/- 10.8 kg, height 1.69 +/- 0.03 m) with hemiplegia caused by cerebral infarction volunteered to performed plantar flexion in prone position with both the normal and affected lower limbs. The corresponding localized motion of TS muscle was recorded by ultrasonography. Motion profiles of the gastrocnemius muscle (GM) and soleus muscle (SOL) were quantified by temporally averaged motion profile (TAMP). *Results:* The contraction profiles of TS in different depth from skin were exhibited quantitatively using TAMP for all subjects. TAMP reflected not only distinct patterns for normal and affected limbs, but also quantitative differ-

ence between GM and SOL on the affected limb. Taking subject 1 for example, the mean TAMP ratios of normal/affected limbs were about 1.53 and 0.73 for GM side and SOL side, potentially provided a new insight to the cooperation mechanism of GM and SOL during plantar flexion in various pathological conditions. *Implications:* TAMP could provide contraction profiles both in superficial and deep muscles quantitatively, and have the potential toassist the rehabilitation of hemiplegic patient with quantitative assessment means and guided exercise planning.

PO-1216

THE ASSESSMENT OF THREE DIMENSIONAL MOTION ANALYSIS SYSTEM ON MOVEMENT STABILITY IN STROKE PATIENTS WITH HEMIPLEGIA

Xiaojun Zhu[1,2], Yi Zhu[2], Sheng Wang[2], Dianhuai Meng[2], Tong Wang[2]

[1]Department of Rehabilitation, Jiangsu Provincial Research Institude of Geriatrics, Nanjing, Jiangsu.,China, [2]Department of Rehabilitation, the First Affiliated Hospital of Nanjing Medical University, Nanjing, Jiangsu., China

Objective: To explore the assessment of three dimensional (3D) motion analysis system on movement stability in stroke patients with hemiplegia. *Method:* Study sample consisted of twenty post-stroke patients with hemiplegia (twelve men and eight women), who aged (53.4±11.5) years, height (165.8±6.7) cm, weight (62.93±7.85) kg, and disease courses within (7.5±3.1) months. All of study subjects had no history of neurological diseases or vestibular system problems and were able to walk 10m without assistance. The three dimensional (lateral, sagittal, vertical) sway parameters in movement, including mean sway amplitude (MSA), mean sway velocity (MSV) and sway path (SP) of COG, were measured with 3D motion analysis system by twelve segmental method. Timed "Up and Go" test (TUGT), which reflecting movement stability, was evaluated as well. The Spearman correlation coefficient was used to compare sway parameters of COG and results of TUGT. *Results:* 1) There was a high positive correlation of TUGT with MSA and MSV on the sagittal axis ($r=0.660$, $p<0.01$); 2) There was a moderate positive correlation between TUGT and SP on both a horizontal plane and 3D level ($r=0.561$, $p<0.05$); 3) There was no obvious correlation of TUGT with MSA or MSV on neither lateral nor vertical axis. *Implications/Impact on Rehabilitation:* Postural changing and walking instability are common functional impairments in stroke patients with hemiplegia, and lead to reduced activities of daily living and quality of life. 3D motion analysis system is a new balance testing equipment, collecting the sway parameters of COG dynamically through infrared camera with high sensitivity. This study shows that sway parameters of COG collecting by 3D motion analysis system well reflects position changing and walking balance in stroke patients with hemiplegia, which could be used in clinical practice and balance training development, and it has the potential to provide useful data on dynamic stability in the walking position directly applicable to physiotherapy practice.

PO-1217

A NEW EXPRESSION WAY OF GAIT; LISSAJOUS OVERVIEW PICTURE

Kei Ohtsuka[1]*, Eiichi Saitoh[1], Hitoshi Kagaya[1], Norihide Itoh[1], Shigeo Tanabe[1], Hiroki Tanikawa[1], Junya Yamada[1], Takemitsu Aoki[2], Yoshikiyo Kanada[1]

[1]Fujita Health University,Japan, [2]KISSEI COMTEC Co., Ltd.,Japan

Introduction: We made a new expression way of gait for understanding the gait at a glance: the Lissajous Overview Picture (LOP). The purpose of this study is to make the LOP in healthy subjects, and to show the utility of LOP in pathological gait by using three-dimensional treadmill gait analysis system. *Materials and Methods:* Nineteen healthy subjects with an age of 64±4 and 3 patients with gait disturbances who gave written informed consents participated in this study. The patients had subarachnoid hemorrhage (case 1), cerebral infraction (case 2) and bilateral coxarthrosis (case 3). The standard LOP for gait on the treadmill was made in healthy subjects by using KinemaTracer® (KISSEI COMTEC Co., Ltd., Nagano, Japan) and it was compared to each patient. *Results:* In visual inspection, case 1 had circumduction gait in the swing phase on the affected side, case 2 had anterior inclination of the trunk, and case 3 had Duchenne sign in both sides. In LOP, the lateral malleolus and the fifth metatarsal of head of the affected side on the horizontal plane and the frontal plane showed lateral convex curve in case 1. In case 2, the acromions displaced forward, while the hip joints backward than the virtual center of gravity. In case 3, the movement of the hip joints decreased and the coordination of the acromions showed linear line between medial-superior and lateral-inferior on the frontal plane. *Implications/Impact on rehabilitation:* LOP made a new way of easy understanding the gait at a glance.

PO-1218

RETROSPECTIVE ANALYSIS OF THE RESULTS OF EMG FOR 60 LDH PATIENTS

Ya Zong, Lijun Cui, Qing Xie

Ruijin Hospital, Shanghai Jiaotong University School of Medicine, China

Objective: The study aims to characterize the electrodiagnostic findings of patients with injured lumbosacral nerve root caused by the lumbar disc herniation (LDH). *Methods:* Study the EMG results of 60 LDH patients with the symptoms such as lower back pain, lower limes ache, acragnosis and hypodynamia. All these patients are diagnosed as LDH by CT and MRI check to the lumbar vertebrae. By comparing the results of EMG with that of imaging test. *Results:* 41 patients are diagnosed with lumbosacral nerve root injury by EMG, account for 68.33% of the total. Among these patients, 33 are with single nerve root injury, amounting to 80.49%. 6 are with two unilateral nerve roots injury account for 14.63%. 2 are with bilateral single nerve root injury or two nerve roots injury, account for 4.88%. 2 patients are diagnosed by EMD as common peroneal nerve injury, account for 3.33%. 1 is diagnosed as suspicious ankle tube syndrome, account for 1.67%. The disease of 17 are not detected by EMD, account for 28.33%. *Conclusions:* EMG is helpful to locate and diagnose the peripheral neuropathy expect LDH correctly.

PO-1219

GAIT ANALYSIS OF HEMIPLEGIA PATIENTS AND DISCUSSION OF MODELING

Yongqiang Li[1], Guangxu Xu[1], Jingguang Qian[2]

[1]the first affliated hospital of Nan Jing Medical University,China, [2]Nan Jing Institute of Physical Education, China

Objective: Observation of gait characteristics of patients with hemiplegia, Analysis of the reasons for the formation of hemiplegic gait,Aggregating rehabilitation training methods of patients with hemiplegia, And to explore the establishment of hemiplegic gait model. *Methods:* Using three-dimensional gait analysis system, doing gait analysis of 13 cases of patients with hemiplegia, obtaining kinematics data, dynamic data and joint angle data, and so on. *Results:* Statistical analysis of the data shows the significant difference between the measured data and normal data. *Conclusions:* Hemiplegic gait characteristics of patients have certain rules to follow, and have great differences between the measured data and the normal data, that is able to help establishing hemiplegic gait model to some extent.

PO-1220

IS IT FEASIBLE TO DIFFERENTIATE BREATHING PATTERN BETWEEN SEVERE ASTHMA PATIENTS AND HEALTHY INDIVIDUALS?

Wai Leung Ambrose Lo
Faculty of Health Sciences, University of Southampton, Southampton, SO17 1BJ, United Kingdom

Aims: To investigate if breathing pattern parameters (BPP) can be used as a reliable diagnostic tool to differentiate between severe asthma (SA) patients and healthy volunteers, and to investigate how BPP in SA patients relate to those in the healthy population. *Method:* Ten SA patients and 10 healthy volunteers were recruited. BPP were recorded by respiratory inductive plethysmography garment over 30 min of rest. Recorded parameters were: 1. Tidal volume (Vt); 2. Variability in tidal volume (VVt); 3. Expiration time (Te); 4. Symptoms of hyperventilation (SH); 5. End-tidal carbon dioxide levels (ETCO2); 6. Sigh rate and 7. Breathing rate. VVt was assessed by coefficient of variation (CV). SH were assessed by Nijmegen questionnaire (NQ). ETCO2 was monitored by capnography. Time series of breath by breath Vt were inspected for abnormal pattern. Differences between healthy volunteers and SA patients were explored using one-way ANOVA. *Results:* Mean NQ score was higher in SA patients than in healthy volunteers ($p = 0.00$). ETCO2 levels in the SA patients were significantly correlated with NQ score (r =-0.8, p. *Conclusion:* The recorded BPP did not reliably differentiate between SA patients and healthy volunteers in our small study. This study raised doubt that there is a 'pattern' that is common within the SA population and therefore BPP must be considered on an individual basis.

PO-1221

QUALITY OF LIFE AND INFLUENCING FACTORS IN SPINAL CORD INJURY SURVIVORS OF THE SICHUAN- EARTHQUAKE

Yu Zheng[1,2], Xia Zhang[1,2,3], Jan Reinhardt[3,4,5], Jianan Li[1,3]
[1]Department of Physical and Rehabilitation Medicine, First Affiliated Hospital of Nanjing Medical University, Nanjing, China, [2]Caring For Children Foundation, Hong Kong, China, [3]World Health Organization Liaison Sub-Commit-tee on Rehabilitation Disaster Relief of the International Society of Physical and Rehabilitation Medicine, Assenede, Belgium, [4]Swiss Paraplegic Research, Nottwil, Switzerland, [5]Department of Health Sciences and Health Policy, Univer-sity of Lucerne, Switzerland

Objective: To assess the quality of life in spinal cord injury victims of the Sichuan earthquake after discharging from hospitals as well as the influencing factors. *Method:* Twenty-six spinal cord injury victims who sustained their injuries in the 2008 Sichuan earthquake were enrolled. Demographic data included age, gender, marriage, education, work, injury level, ASIA classification were collected. Barthel Index and Visual Analogue Scale were applied to assess the physical functioning, SF-36 was used to evaluate the quality of life at 2-year post injury and 4-year respectively. The univariate and multiple stepwise logistic regression was used to analyse the improvement in quality of life as well as the influencing factors. *Results:* Significant improvement ($p<0.05$) in all domains of the SF-36 questionnaire were observed at the later follow-up, except for general health. Patients with lower scores in quality of life tended to be older, female, divorced/widowed, and less educated. The multiple stepwise logistic regression analysis showed that those with less severity of pain were more likely to have better quality of life. Pain severity was significantly declined at the later follow up. *Implications:* The SCI victims' quality of life was seriously impaired after the earthquake. However, the QoL was improved after discharging from the hospital due to sufficient community based rehabilitation and social factors took a leading impact in QoL.

PO-1222

ISOKINETIC STANDARIZATION OF FLEXOR AND EXTENSOR MUSCLES TO ANKLE IN HEALTHY PEOPLE IN PHYSICAL MEDICINE REHABILITATION UNIT NO. 1, MONTERREY MEXICO

Irene Rodriguez Ramírez, Carmen Rodriguez Nieto, Jaime Garza Benavides
IMSS Mexico

Introduction: The ankle and foot are responsible of propulsion during the stance phase of the gait. For this to happen with the minimal energy expenditure, it most coexits an adecuate distribution of forces and coordination. Isokinetics is based on the measurement of force exerted by the muscle. Isokinetic reference values for a population may not be for another. Objetive Standarize isokinetics values of reference for flexion and extension ankle in healthy males and females. *Methods:* prospective, descriptive, transversal, no comparative study in healthy individual. realized in Mexican Institute of Social Services in Monterrey, 58 subjects of both sexes were evaluated between 22 and 33 years. We performed and isokinetic test with Con-Trex MJ dynamometer the patient in supine position, knee and hip in neutral position. We realized concentric isokinetic contraction 30º/second of velocity. *Results:* Flexor peak torque was 93.9±38.3 Nm and extensor 54.8±25 Nm. Flexor mean power was 20.8±9.9 W and extensor 6.9±3 W. Total work was 132.6±70.2 J. We obtained better results in men than women ($p<0.01$) and a correlation between the results and the weight, height and body mass index. Impact We realized standarization of flexor and extensor muscles of ankle and a probable correlation between the results and the sex, weight, height and body mass index.

PO-1223

HIP BIOMECHANICAL ANALYSIS OF COMMON ACTIONS OF SHUTTLECOCK IN ELDERLY WOMEN

Jun Liang, Shizhong Liu, Qian Lin, Xiaofang Wang, Gang Xu, Liping Huang
tianjin university of sport,tianjin, China

Objective: Hip biomechanics analysis was done for the common actions of shuttlecock (inside kick, the toes straight kick, outside kick of the foot) in order to explore its health significance in the elderly. *Methods:* 15 female shuttlecock exerciser were selected as subjects. The Qualisys motion capture system, sEMG and Kistler force plate were simultaneously used to acquire the kinematics and dynamics datum during the shuttlecock kicking or walking. *Results:* In the swing leg during the three actions, sagittal ROM, iEMG of tibialis anterior, gastrocnemius, rectus femoris, biceps femoris, gluteus maximus, gluteus medius muscle, bilateral vertical spine muscle were significantly greater than those during walking ($p<0.01$).During the inside and outside kicking, the coronal plane and horizontal ROM significantly ($p<0.01$) greater than those during walking. Maximum flexion and extension torque during the toes straight kick were significantly ($p<0.01$) greater than walking; while the maximum outreach torque during outside kick were ($p<0.01$) greater than walking. In the supporting leg, the horizontal plane of the three movements ROM, the shear force, iEMG of tibialis anterior, rectus femoris, biceps femoris, gluteus maximus, gluteus medius muscle, bilateral vertical spine muscle were significantly greater than walking ($p<0.01$); the coronal ROM during outside kick significantly ($p<0.01$) greater than walking. Therefore, compared

to walking, the three movements of shuttlecock had more greater ROM, hip ground reaction force, joint torque and iEMG of lower limbs which implied that shuttlecock kick played a positive role in preventing fall and osteoporosis in the old women.

PO-1224

A NEW ASSESSMENT SYSTEM USED TO EVALUATE PINCH FUNCTION OF PERSONS AFTER STROKE

Qian Ding, Na Chen, Ruihao Bian, Hongyu Gao, Meisi Song, Le Li
Department of Rehabilitation Medicine, The First Affiliated Hospital, Sun Yat-sen University, China

Background: Stroke is a common cerebrovascular accident, which often leads to hand dysfunction. Pinch is an important function of hand which is needed in many activities of daily life, such as picking up, griping and using a pen, etc. *Objective:* To evaluate pinch function and analyze motor control ability changes in affected hands at persons after stroke. *Method:* Two pieces of thin, high-resolution, tactile pressure sensors with diameter of 2.54 cm were pasted on the two sides of a 200 g box. 35 healthy subjects and 4 persons after stroke were recruited. Subjects were seated at a standard table with their forearm in a neutral posture parallel to the table and they were asked to complete the following tasks. Task 1: Subjects were asked to move at a natural pace, and lift the box to 5cm high using a precision pinch and hold for 3 s. Task 2: Subjects were asked to use their maximum isometric force to pinch the pressure sensors. Each task was repeated for 3 times. *Results:* Our preliminary results show that, for healthy subjects, there is no significant difference between the pinch forces of dominant and subdominant hands when lift an object in task 1; But for persons after stroke, their affected hands tend to use a larger force than unaffected hands in task 1 (average pinch force of affected hands is 3.22 N (SD=4.18 N), unaffected hands is 2.76 N (SD=1.11 N)). In addition, the average maximum pinch force of affected hands is marginally significantly smaller ($p=0.06$) than that of unaffected hands of persons after stroke. These results might indicate muscle control abnormality of persons after stroke. *Impact on rehabilitation:* The assessment system offers an objective and accurate approach to assess pinch function of persons after stroke, and also gives a possibility to study the mechanism of muscle control changes.

PO-1225

FAST CARDIAC T1 MAPPING FOR DYNAMIC CONTRAST ENHANCED MRI: A POTENTIAL NON-INVASIVE TOOL TO QUANTIFY THE MYOCARDIAL FUNCTION FOR REHABILITATION

Wen Li[1]*, Xin Yu[2]
[1]Cleveland Clinic,United States,China, [2]Case Western Reserve University, United States

Objective: To develop a fast cardiac T1 mapping method for quantitative dynamic contrast enhanced MRI (DCE-MRI), which provides a non-invasive means to evaluate myocardial function. *Method:* An ECG-triggered saturation recovery Look-Locker (SRLL) method was developed for T1 estimation. The accuracy of SRLL method was validated using two groups of mice with intravenous injection of a low (6.3 µmol, $n=6$) and a high dose (12.6 µmol, $n=8$) of contrast agent (MnCl2), respectively. The T1 of myocardium and left ventricular blood was measured in vivo by SRLL using a 7T Bruker scanner at baseline and throughout the 30-min MnCl2 infusion with 3-min temporal and 234x468 µm2 spatial resolution. Unpaired student *t*-test was used for statistical analysis. *Results:* At baseline, the blood (1.76±0.18s) and myocardial (1.29±0.14 s) T1 were similar ($p>0.05$) between the two dose groups and were consistent with the literature. In response to the low and high dose of MnCl2 infusion, the blood T1 decreased to 1.24±0.28s and 0.81±0.26 s ($p<0.01$) and the myocardial T1 decreased to 0.73±0.15s and 0.50±0.09 s, respectively ($p<0.01$). The changes in both blood and myocardial R1 for the high dose group were 2.2 times of those for the low dose group, consistent with the MnCl2 dose injected. This demonstrated the accuracy of SRLL based on the well-known linear relationship between R1 and MnCl2 content. *Implications/ Impact on Rehabilitation:* The current SRLL method provides robust measurement of the myocardial and blood T1 for DCE-MRI, which can quantify the myocardial function to guide and to evaluate the effect of rehabilitation treatment.

PO-1226

ONE CASE OF PATIENTS WITH LONG-TERM USE NSAIDS CAUSING ACUTE ULCER BLEEDING

Zhengyu Li
The Foshan First Hospital

Objective: One Case of Patients with long-term use NSAIDS causing acute ulcer bleeding *Method:* After the above treatments, the patient did not re-row melena. Her spirit witnessed a gradual improvement and her left limb muscle strength gradually restored to the state before admission. *Results:* Gastrointestinal bleeding has been effectively controlled and five days later the patient discharged from hospital. *Implication:* In addition, special attention should be paid to patients' early symptoms when anorexia, nausea, abdominal distension are often early symptoms. When patients' condition becomes stable, gastroscopy should be taken to clear confirm the site of bleeding.

PO-1227

STUDY ON LIFE QUALITY AND ITS FACTORS OF DISABLED CHILDREN'S PARENTS

Dan Li
Shanxi province Rehabilitation Research Center, China

Background: According to the Second Sample Survey on Disability Report, Shanxihas 0.9 million disabled population. The birth of so many disabled children has brought heavy burden and pressure to the family. We want to found the influential factors, thus providing a basis for parents to lesson pressure, enhance life level. *Objective:* to analyze the possible factors influencing the life quality of disabled children. *Methods:* With the questionnaire survey, 100 questionnaires were distributed, 82 valid questionnaires were received. The research is conducted in the way of questionnaire about assessment questionnaire of life quality of life anxiety scale and depression scale and SPSS 13.0 data analysis; with statistical methods of independent samples *t*-test, correlation analysis, chi-square test. *Results:* The survey has indicated that: The psychological pressure of the disabled children parents total objective social support with significant positive correlation. there is the positive correlation between psychological pressure and their depression ($p<0.01$). *Conclusions:* Parents with disabled children have anxiety and depression, and their life quality is not high.

PO-1228

ANALYSIS OF COMPATIBILITY SPATIO-TEMPORAL PARAMETERS WITH THE GAIT ASSESSMENT USING WISCONSIN GAIT SCALE AMONG PATIENTS AFTER STROKE

Mariusz Druzbicki, Grzegorz Przysada, Andrzej Kwolek, Agnieszka Brzozowska-Magon*, Agnieszka Guzik
University of Rzeszow, Poland

Objective: Aim of this study is to assess the correlation between spatio-temporal gait parameters in patients with hemiparesis after stroke and the result of the assessment using Wisconsin Gate

Scale. *Material and Method:* The study included 30 patients with hemiparesis after ischemic stroke who could walk independently in the late period after stroke.Gait was assessed by two experienced physiotherapists using video recording and Wisconsin Gait Scale (WGS). Based on the gait analysis, using the Smart system BTS, Spatio-Temporal parameters were assessed. *Results:* The mean score of gait assessment using WGS was 26.67 points. In the study a moderate correlation between result in WSG and gait speed has been shown (r =-38). A similar correlation between step length of the left lower limb and the gait assessment using WGS was obtained (r =-0.37). Higher level of correlation demonstrated at length of step (Stride length) for the right and left lower extremity and the stride length of the lower non-paretic limb, WGS third subscale (r =-55; r =-0.51). A good level of compliance has been shown at the Step Width and the Stance Width assessment (r=0.46). Low correlation between the assessment of paretic limb loading using WGS and the symmetry of lower limb loading has been proved. *Conclusions:* The gait assessment by using spatio-temporal parameters and WSG scale parameters has an average level of compatibility. The Wisconsin Gait Scale is a useful and simple tool to assess the quality of the gait after a stroke.

PO-1229

NEW ALTERNATIVE METHOD OF POST-EXERCISE ANKLE-BRACHIAL INDEX USING ACTIVE PLANTAR-FLEXION TECHNIQUE IN SUPINE POSITION

Komwudh Konchalard*, Wutichai Permsirivanich, Sukjai Darunaitorn
Queen Savang Vadhana Memorial Hospital, Thailand

Objective: To compare post-exercise Ankle-Brachial Index (ABI) by active plantar-flexion in supine and standing positions in patients who have peripheral vascular disease (PAD) risks. *Method:* The new alternate method was adapted active plantar-flexion in supine position having patients resist against suspension springs; we compare with the commonly used technique which required the patient to stand and lift the body up by active plantar-flexion. Eighteen patients (36 legs) that have normal resting ABI (> 0.9) were included in the study. The two exercise techniques of post-exercise ABI measurements were done, allowing 15-min rest in between. Pearson correlation was used to find the relationship of post-exercise ABI measured from the two methods. Post-exercise ABI changes from resting ABI were compared by paired t-test using significant level at $p<0.05$. *Results:* The correlation of post-exercise ABI from the two methods of exercise was 0.801. Post-exercise ABI changes from the resting ABI value from the two methods were not statistically different. The new method of exercise revealed additional 15.8% of positive PAD cases of the legs which have normal resting ABI. *Implications/Impact on Rehabilitation:* Active plantar-flexion in supine position can be use as a new alternative method of post-exercise ABI measurement and has advantages in patient who cannot do standing exercise, especially for the disabled.

PO-1230

COMPARISON OF THE VENTILATION DISTRIBUTION DURING DIFFERENT BREATHING PATTERNS

Qi Liang, Yali Huang, Yingshuo Yan, Yuling Wang, Qin Jiang
Dept. of Rehabilitation Medicine, The First Affiliated Hospital, Sun Yat-sen University, China

Objective: To investigate the characteristics of dynamic ventilation and examine the distribution of lung ventilation during different breathing patterns in order to provide the evidence for the clinical intervention. *Methods:* Eight healthy young men were recruited to perform the examination by Vibration Response Imaging respectively in four breathing patterns: thoracic deep breathing, diaphragmatic deep breathing, segmental breathing, and quiet tidal breathing. Quantitative lung data (QLD), the percentage of vibrational energy of upper, middle, and lower lung, were calculated and represented the percentage of air ventilated into different parts of the lung. QLD were analyzed between different breathing patterns. *Results:* The upper lung has the lowest QLD and the lower lung has the highest value during all four different breathing patterns. The QLD difference among three parts of lung was significant (P*Implication:* Airflow distribution of lung of four breathing patterns represents as lower lung >middle lung >upper lung. Change of breathing patterns has little effects on the vibration of percentage of distribution in the three parts of both sides of the lung.

PO-1231

TEST-RETEST RELIABILITY OF DIGITAL ACCELEROMETRY FOR SWALLOW IMAGING FOR SWALLOWING ASSESSMENT

Na Wang, Liming Liu, Tianyu Jiang, Changshui Weng
The Chinese PLA General Hospital, China

Objective: To determine the test-retest reliability of swallowing function assessment by digital accelerometry for Swallow Imaging (DASITM), specially for elderly. *Methods:* 33 volunteers were assessed dry swallowing 4 times with DASITM, get the mean data of ampl of swallow (AS), onset of swallow (OS) and duration of swallow (DS) with the Software provides imaging and physiology measurements. Retested in a week. Statistics by SPSS 17.0, got the intraclass correlation coefficient (ICC) of AS, OS and DS. *Results:* The intraclass correlation coefficient (ICC) of AS and DS were 0.767-0.914 ($p < 0.01$), had very good test-retest reliability. The all volunteers' ICC of OS is 0.410 ($p>0.05$), had medium test-retest reliability. The OS' test-retest reliability of elderly was poor. *Implications:* DASITM had good test-retest reliability on swallowing assessment, it was non-invasive, portable and cheap feasible with most dysphagia patients.

PO-1232

ULTRASONOGRAPHIC MEASUREMENT OF ANATOMICAL STRUCTURES RELATED TO LARYNGEAL ELECTROMYOGRAPHY

Han Gil Seo, Hye Jin Jang, Byung-Mo Oh*
Seoul National University Hospital, Korea

Objective: To measure the representative anatomical landmarks for laryngeal electromyography (EMG) and delineate an accurate approach technique. *Method:* We reviewed medical records of 595 laryngeal EMG cases in Seoul National University Hospital between March 2010 and January 2013. The longest vertical distance of cricothyroid membrane and the distance between the upper margin of cricoid cartilage and the midpoint of vocal fold were measured using ultrasonography. Age, sex, etiology, duration from the onset of symptom to study, laterality of vocal cord palsy were also reviewed. *Results:* Total 595 studies (527 patients; 277 males and 250 females) were reviewed. Mean age was 54.1 ± 15.6 (male, 57.6 ± 15.8; female, 50.5 ± 14.5), and mean duration from the onset of symptom to study was 529.7 ± 1398.2 days. The most common etiology was surgery (45.0%) and the left side (55.9%) was more frequently involved than the right (23.8%) or both sides (8.6%). The longest vertical distance of cricothyroid membrane (CTmax) was 11.1 ± 7.7 mm (male, 12.7 ± 10.3; female, 9.7 ± 2.9, $p<0.001$ by *t*-test). The mean distance between upper margin of the cricoid and vocal fold was 18.8 ± 4.7 mm (male, 20.9 ± 5.0; female, 17.0 ± 3.6, $p<0.001$ by *t*-test). *Implications/Impact on Rehabilitation:* The current study provides the reference ranges of ultrasonographic measurements of important anatomical landmarks in laryngeal EMG. Especially, the distance between upper margin of the cricoid cartilage and vocal fold is a meaningful guidance for electromyographers.

PO-1233

RELIABILITY AND VALIDITY OF THE UCARE ON MONITORING HEART RATE AND ACTIVITIES STATUS IN DAILY LIFE

Chuan Guo, Wenning Jiang, Lingye Zhang, Zhixiang Wang, Lan Zhu, Xiaorong Hu, Qin Zhang, Chunlei Shan, Jianan Li

The First Affiliated Hospital of Nanjing Medical University, China

Objective: The aim of this study was to determine the reliability and validity of Ucare, a newly designed small portable wireless physiological monitoring system, on recording and indicating people's heart rates and activities statuses. *Method:* Twenty healthy participants were asked to perform an incremental treadmill test for 15 min. Heart rates as well as participants' activities statuses (lying, sitting/standing, walking, running and falling) were measured every 30 seconds during the test by a common ECG and an Ucare. *Results:* The heart rates measured by the common ECG and the Ucare did not differ statistically (p>0.05) for most recording points, except for the phase of 5 min, 5.5 min and 6 min. Even though, the accordance rate of heart rates recorded by ECG and Ucare was more than 95% during these 3 recording points. There was no significant difference on activities statuses between Ucare recording and the fact. *Implications:* The Ucare is a valid and reliable device for continuously and remotely measuring and indicating both heart rates and activities statuses during daily living. Therefore, it is helpful for guiding the patients or healthy people to exercise more effectively and safely even in their own house.

PO-1234

THE QUANTITATIVE ANALYSIS OF SCAPULAR MOTIONS IS OF LIMITED VALUE FOR THE PLANNING AND CONTROL OF PHYSICAL THERAPY IN SHOULDER PATIENTS

Ulrich Betz[1]*, Andreas Thösen[2], Nadja Leyendecker[1], Philipp Drees[3], Friedrich Bodem[1]

[1]Institute of Physical Therapy, Prevention and Rehabilitation, Johannes Gutenberg University of Mainz Medical Center, Mainz, Germany, [2]Department of Orthopaedic Surgery, Johannes Gutenberg University of Mainz Medical Center, Mainz, Germany, [3]Center for Traumatology and Orthopedics, Stiftungsklinikum Mittelrhein, Koblenz, Germany

Objective: Any biomechanical dysfunction may contribute to the pathogenesis of musculosceletal pain. The quantitative analysis of selected body motions may be expected to detect and classify pathological aberations and thus yield information supporting the planning and continuous control of physiotherapeutic treatments suitable for the elimination or at least reduction of the patient's complaints. *Method:* In 101 subjects the scapular rotation during arm abduction was measured using a photogrammetric measuring system. Optical land marks were placed on the skin above well-defined anatomical points of the scapula under continuous palpatory control. Standardized photographs were taken at 14 scaption angles evenly spaced over the full abduction range, digitised, and numerically analysed by dedicated computer programs. The measuring data thus obtained were processed applying regression analysis, Student-t, and Wilcoxon statistical testing. *Results:* In healthy subjects the scapular motion patterns are very individual and spread over a wide range. The left and the right side of the same individual may be rather different, too. Considering group averages, however, we could not verify statistically significant differences between the right and left side, between males and females, and between right- and left handers. *Implications/Impact on Rehabilitation:* Only in rather extreme cases a motion pattern exhibited by a shoulder patient can be classified to be outside the physiologically normal range. Only then it may be possible to use a quantitative analysis of the scapular motion as a guideline for the planning of a suitable physiotherapy and the objective control of its progress and success.

PO-1235

THE EFFECT OF VIRTUAL REALITY ON UPPER EXTREMITY FUNCTION IN BRAIN TUMOR PATIENTS

Jisun Yoon, Min Ho Chun*, Sook Joung Lee, Jin Hwa Yi

Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea

Objective: The worldwide incidence of primary brain tumors are increasing. Aggressive treatments based on surgery, radiation and chemotherapy offered to brain tumor patients lead to longer survival rate. Nevertheless of aggressive therapy, brain tumor cause neurologic deficit. The most common deficit was impaired cognition (80%), followed by weakness (78%), visual-perceptual deficit (53%), sensory loss (38%), and bowel and bladder dysfunction (37%). Virtual reality (VR) was revealed an effective treatment not only for upper extremities function but also cognitive function in stroke patients. Several previous studies reported usefulness of using VR system for improvement of upper extremity function in stroke patients. However there was no study about effect of VR program on upper extremity function in brain tumor patients. The aim of this study is to evaluate the effect of VR on upper extremity motor recovery and function in brain tumor patients. *Methods:* Forty brain tumor patients (twenty females, twenty males, mean age was 49.23) who had upper extremity dysfunction were recruited in this prospective, case control study. Patients were divided into control and case group with age and types of tumor matched. Control group treated with conventional occupational therapy for 30 min/day, 5 days/week, for total three weeks. Case group carried out virtual reality for 30 min/day, 3 days/week and conventional occupational therapy for 30 min/day, 2 days/week, for total three weeks. VR was done using IREX systemR (Vivid group, Toronto,Canada). Birds and Ball, coconuts, conveyor, drums, juggler and soccer were selected among VR program. Evaluation of upper extremity function was done by using Brunnstrom stage, manual function test (MFT), box and block test (BBT), Fugle-Meyer scale (FMS). Modified Barthel Index (MBI) was evaluated to assess daily activities. These evaluations were done in all patients before and after treatment. *Results:* There were no significant differences in baseline characteristics between the two groups. Each groups showed significant improvement in MBI, Brunnstrom stage, MFT, FMS and BBT after treatment. In FMS, shoulder, elbow, forearm portion was more improved in case group (p=0.007, p= 0.026) and hand portion was more improved in control group (p=0.003). Box and block test was significantly more improved in case groups. However brunnstrom stage, MFT, MBI showed no significant differences between two groups. *Conclusion:* These findings suggest that VR therapy is more effective than conventional occupational therapy in brain tumor patients especially in proximal upper extremity function. However conventional occupational therapy is more effective for improvement of fine motor function and coordination. In addition we consider the disease progression and chemoradiation therapy can cause worsening of upper extremity function. Further studies are needed with larger sample sizes and long term follow-up.

PO-1236

A TAILORED SMART REMINDER TO FACILITATE POWER WHEELCHAIR USERS USING POWER SEATING FUNCTIONS FOR INDEPENDENT HEALTH MANAGEMENT

Hsin-Yi Liu[1,2], Rosemarie Cooper[1,2], Annmarie Kelleher[1,2], Dan Sieworek[3], Rory A. Cooper[1,2]*

[1]Department of Rehabilitation Science and Technology, University of Pittsburgh,United States, [2]Human Engineering Research Laboratories, Department of Veterans Affairs,United States, [3]Carnegie Mellon University, United States

Objective: To develop a tailored and smart reminder, the Virtual Seating Coach (VSC), which will facilitate power wheelchair (PWC) users to utilize power seating functions (PSF) for independent health management. *Method:* The VSC consists of multiple sensors, encoders and a tablet computer to monitor PSF usage and provide feedback to the user according to clinical recommendations. The feedback includes reminders of positioning for pressure relief, seating comfort and seating stability, and warnings of adjusting seating angles or seat height for driving safety. Subjects are randomized into two groups: 1) Instruction (INS) Group, in which subjects will receive educational material in traditional media format, such as DVD, pamphlet, and flash cards; and 2) VSC Group, in which subjects will use VSC in addition to the education materials. A research PWC equipped with VSC system will be delivered to the subject for use of up to 8 weeks. *Result:* VSC subjects immediately improved in their compliance with clinical recommendations compared to the baseline, and the improvement continued to increase. Improvement in INS subjects was much slower and delayed compared to VSC subjects. *Implications/Impact:* A PWC with PSFs is an important device for people with disabilities, but it could be complicated for some individuals. VSC can assist with trainings for users and clinicians beyond clinical settings. The contents of this abstract do not represent the views of the Department of Veterans Affairs or the United States Government.

PO-1237

THE RESEARCH OVERVIEW OF UNCONVENTIONAL MANIPULATION OF ACUPUNCTURE TREATMENT OF PERIPHERAL FACIAL PALSY

Nianhong Wang[1], Yongshan Hu[1], Yi Wu[1], Yulong Bai[1], Yulian Zhu[1], Chunlei Ding[2,2], Tingting Zhang[2,2]

[1]Department of Rehabilitation Medicine, HuaShan Hospital, Fudan University, Shanghai, 200040, China, [2]Shanghai University of Traditional Chinese Medicine

Objective: The study on treatment of peripheral facial palsy by unconventional acupuncture manipulation can provide basis for clinical and scientific research. *Method:* From the 14 related literature content on unconventional acupuncture manipulation,like Tianshan Burning Method*:* warm needling, hanging needling, we can make a brief comment. *Results:* Unconventional acupuncture manipulation can generally achieve better therapeutic effect than that of conventional acupuncture manipulation,if we have more manual control study, basic research, and further the mechanism research.

PO-1238

ADAPTATIVE UPPER LIMB REHABILITATION BY RFID BASED TECHNOLOGY

Maria Bulgheroni[1]*, Enrico Damico[1], Franco Molteni[2]

[1]Ab.Acus srl - Milano - Italy, [2]Centro di Riabilitazione Villa Beretta - Costa Masnaga - Italy

Objective: This paper is the presentation of a technology based methodology for setup and running of tailored exercises for the upper limb. The system is easily configurable by the therapist that may adapt exercises to the single patient and his/her own level of recovery and compliance all along the rehabilitation process. *Method:* The system is composed by a RFID (Radio Frequency Identification) reader able to recognize tags placed in its range of action and a set of tags used to identify objects of the daily life or rehabilitation tools. The therapist selects the objects the user has to interact with (e.g. balls, cups, boxes,….) and marks them with a RFID tag. The reader is worn by the subject and triggers audio messages to drive him/her in the exercise accomplishment according to the objects he/she is closer (e.g. “take the blue glass and move it to the green plate”). Reaction and execution times are automatically recorded as an outcome measurement. *Results:* Two therapists were instructed to run the system in exercise design and in rehabilitation administration of five patients. Satisfaction was assessed by ad hoc questionnaires. Rehabilitation outcome was measured by the system itself and standard tools. The system proved to be effective and flexible. *Implications/Impact on Rehabilitation:* The system is a useful tool to allow the therapist full exploitation of his/her expertise by a flexible setup aimed at a high and fast adaptation of the exercise to the patient with immediate assessment of the exercise outcome.

PO-1239

THE STUDY OF ACUPOINT CATGUT EMBEDDING ON CHILDREN AUTISM

Chunnan Wang, Shuyun Shang, Ying Lan

Shenyang Children Hospital, China

Objective: To explore the new effective method for children autism *Method:* 90 children were devided into three groups:behavior training group, acupoint catgut embedding group,and behavior combined embedding groups.The therapy is from Monday to Friday,contiously for three months. *Result:* 12 cases are obvious effective and 14 cases are effective.There is no effectiveness in 6 cases.The combined group is more effective than the other two groups.The other two groups also has effectiveness.And in the next 6month follow-up,13 children are in progress,which of three can go to school,but 3 children are more serious than before. Implication Acupoint catgut embedding is effective,and has no adverse effect. *Impact on Rehabilitation:* Acupoint catgut embedding is a effective way to autism children.

PO-1240

EVALUATING THE EFFECTIVENESS OF VIRTUAL REALITY FOR REHABILITATION OF PATIENTS AFTER STROKE

Thais Tavares Terranova, Tatiane Lopes Teixeira De Almeida, Lilian Falkenburg, Gracinda Rodrigues Tsukimoto, Linamara Rizzo Battistella

Institue of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospita, Brazil

Objective: Collect data and examine the evidence of improvement in functional performance of patients after stroke intervention using VR. *Method:* Initially, we sought studies published in scientific journals on the topic "use of immersive and not immersive games in post-stroke." We used the following keywords: stroke, rehabilitation, video games, virtual reality and user - computer interface in the Pubmed database in October 2011. All articles were classified according to the questionnaire Jadad (1996). *Results:* From 270 articles found, 12 were selected for analysis. According to the Jadad scale, only 4 articles obtained score within the level of quality. All the studies analyzed showed positive results regarding the use of VR to improve functional performance, but only 6 showed significant results. *Implications/Impacton Rehabilitation:* Virtual reality as a resource in the rehabilitation of patientsafter stroke is effective when combined with conventional interventions (physiotherapy and occupational therapy). The high level of motivation and fun offered by VR was the key aspect to patient engagement in rehabilitation. There are no adverse effects when using VR in rehabilitation.

PO-1241

EFFECTS OF ACUPOINT AFO ON RECOVERY OF LOWER LIMB FUNCTION OF STROKE PATIENTS WITH HEMIPLEGIA

Guqiang Li[1], Shaolan Zhang[1], Zhaoyou Wang[2], Jin Chen[1]

[1]Yancheng Institute of Health Science,China,[2]Xuzhou No. 1 Peoples Hospital, China

Objective: The effects of acupoint ankle-foot orthosis on recovery of lower limb function of stoke patients with hemiplegia are to be observed. *Method:* 18 patients were randomly divided into three groups, namely Control Group (CG), Dynamic Ankle-Foot Orthosis Group (DG), and Acupoint Ankle-Foot Orthosis Group (AG). All patients in CG were treated and trained with routine practice in neuropathic department; Patients in DG received the same treatment as those in CG but wore dynamic ankle-foot orthosis; Patients in AG received the same treatment as those in CG but wore acupoint ankle-foot orthosis to press acupoints such as yongquan and chengshan to relieve gastrocnemius spasm.The observation consisted of 5 courses of treatment, with 5 days as 1 treatment course. Each group consisted of 6 cases. Before and after each treatment, the effects were assessed with scales in terms of motor function of ankle, ankle spasticity, walking speed, balance function, and ADL ability. *Results:* The results show that the effects on recovery of lower limb function of stoke patients with hemiplegia in each group differs significantly, with DG superior to CG ($p<0.05$), AG superior to DG ($p<0.05$), and AG strikingly superior to CG ($p<0.01$). It is also found that in each group the treatment effects are prominent in comparison with the pre-treatment state. *Implications/Impact on Rehabilitation:* Recovery of lower limb function of stoke patients with hemiplegia can be greatly improved by wearing acupoint ankle-foot orthosis in combination with rehabilitation training.

PO-1242

THE NUROPROTECTIVE EFFECTS OF KETOGENIC DIET AND ITS UNDERLYING MECHANISMS IN A NEONATAL RAT MODEL OF FLUROTHYL-INDUCED RECURRENT PROLONGED SEIZURES

Hong Ni[1], Tian Tian[1], Xueyuan Zhang[1], Baoliang Sun[2]
[1]Neurology Laboratory, Soochow University Affiliated Children's Hospital; Institute of neuroscience, Soochow University, Suzhou 215003, China,[2]Key Laboratory of Cerebral Microcirculation at the Universities of Shandong, Department of Neurology, Affiliated Hospital of Taishan Medical College, Taian, Shandong 271000, China

For the purpose of investigating the intervention effect and the underlying molecular mechanism of an old anti-epileptic diet therapy (ketogenic diet) on hippocampal regenerative mossy fiber spouting of neonatal rats with prolonged seizures, a seizure was induced by inhalant flurothyl daily in neonatal Sprague-Dawley rats from postnatal day 8 (P8). The authors assigned rats randomly into the non-seizure and normal diet group (NS+ND), the control plus ketogenic diet group (NS+KD), recurrent-seizure and normal diet group (RS+ND), recurrent-seizure and ketogenic diet group (RS+KD). Behavioral parameters of brain damage (overhanging test, negative geotaxis response, and plane righting test) were observed from P35 to P42, respectively. On P43, mossy fiber sprouting and zinc transporter 3 (ZnT-3) expressions were determined by Timm staining, real-time RT-PCR and Western blot methods, respectively. In regard to behavioral parameters of brain damage, rats of RS+KD group performed better than RS+ND rats. Ketogenic diet obviously suppressed the aberrant mossy fiber sprouting in the supragranular region of dentate gyrus and CA3 subfield of hippocampus. ZnT-3 expression both in mRNA and protein levels was strongly up-regulated by developmental seizures (RS+ND) compared with that in the NS+ND group. Up-regulation of ZnT-3 was blocked by treatment with ketogenic diet both in mRNA and protein levels. The results of the present study suggests that ketogenic diet, a high-fat content diet which mimics the anticonvulsant effects of fasting, is potentially useful in the inhibition of developmental seizure-induced regenerative aberrant sprouting of mossy fibers in hippocampus through suppressing ZnT-3 expression.

PO-1243

FIT DOCTORS: CREATING A RESIDENT WELLNESS CHALLENGE

Susan Griffee, Noel So, Ron Reeves
Mayo Clinic,United States

Objective: To develop a wellness challenge to encourage residents to engage in physical activity. *Method:* A 16 week wellness competition was developed by the Fellows Association. Residents and fellows were recruited by email. Participants were asked to form teams of 4-6 people. The contest included data entered weekly by team captains. The data included entry of walking steps (measured by pedometer) and gym visits per week (1 max per day). Participant's body fat percentage,Vo2 max, as well as a survey on health were administered pre and post challenge. Participants were awarded prizes based on a variety of categories. *Results:* 240 residents and fellows (41 teams) participated in the wellness challenge. The participants reported a total of 146,904,273 steps and 8,287 gym visits over the 16 weeks. *Implications/Impact on rehabilitation:* Numerous studies have demonstrated the positive effects of exercise on health, burnout, and job satisfaction. As rehabilitation doctors in physical medicine and rehabilitation, we often prescribe exercise to improve health. By encouraging residents to become healthy, we are actively practicing the healthy habits that we prescribe.

PO-1244

EFFECTS OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION ON HAND FUNCTION RECOVERY AND EXCITABILITY OF THE MOTOR CORTEX AFTER STROKE: A META-ANALYSIS

Qu Le[2,3], Yun Qu[1,2,3], Shoujuan Zhu[2,3], Yingxia Tao[2,3], Yi Li[2,3]
[1]Department of Rehabilitation Medicine, West China Hospital, Sichuan University, Chengdu, China., [2]Department of Rehabilitation Medicine, West China School of Clinical Medicine, Chengdu, China., [3]Sichuan Provincial Key Laboratory of Rehabilitation Medicine, Sichuan University, Chengdu, China

Objective: The purpose of this article was to investigate the effects of repetitive transcranial magnetic stimulation (rTMS) on hand function recovery and the plasticity of the cortex in stroke patients. *Method:* A search was conducted in electronic databases for randomized controlled trials exploring the effects of rTMS on hand motor function rehabilitation published from 1990 to January 30, 2012. We summarized the effect size on finger coordination, hand function, cortical excitement and activity of daily living (ADL) by calculating the standardized mean difference (SMD). Subgroup analyses were presented between treatment with low- and high-frequency rTMS. Adverse effects were also discussed. *Results:* Of 564 articles identified, 15 trials (n=331) in 9 articles were included in our study. The summary of effect size (SES) indicated positive effects of rTMS on finger motor ability (SMD=0.49) and hand function (SMD=-0.74). Meanwhile, the cortical excitability increased in the paretic side, as measured by the motor evoked potential (SMD=0.78). Few adverse events were observed. *Implications:* rTMS can improve patient recovery after stroke. We suggest that future trials concentrate on effects in different types of stroke patients in response to stimulation at different sites and explore optimal rTMS parameters for individual treatment.

PO-1245

THE EFFECT OF A NEWLY DEVELOPED PRESSURE MONITORED SYSTEM IN THE STANDARDIZATION OF PRESSURE THERAPY INTERVENTION FOR VARICOSE VEINS

Beibei Feng[1], Wai Ping Cecilia Li-Tsang[2]
[1]The Sixth Affiliated Hospital of Sun Yat-sen University,China, [2]The Hong Kong Polytechnic University, China

Objective: There is still no standardized regime to prescribe pressure garments with quantifiable pressure dosage to patients with different medical conditions, although pressure therapy intervention has been widely applied in disorders such as varicose veins, lymphedema and hypertrophic scars and so on. The present study aimed to examine the efficacy of a newly developed system-Smart Pressure Monitored Suits (SPMS) for pressure intervention when compared to the conventional garment production (CG). *Method:* Patients who required pressure therapy intervention was recruited (n=26). They were randomly divided into two groups, namely group1 and group 2. In group 1, subjects were provided with the SPMS for one months wearing followed by CG for another month, while group 2 received CG for one month followed by 1 months SPMS intervention. The interface pressure levels of both types of garments were measured prior to the implementation. Patients' feedback was collected regarding the comfort of wear, elasticity, durability and permeability of both garments. Feedbacks from occupational therapists were also collected comparing the use of two systems to prescribe pressure therapy. *Results:* Significant differences were found in the pressure generated by the two types of pressure garments before and after 1 month's wearing (p<0.05). However, there was a significant difference in terms of the deterioration of pressure between SPMS and CG (p<0.05). The satisfaction on overall efficacy of SPMS was significantly higher than that of CG (p<0.05). *Implications:* This standardized system using SPMS to provide pressure intervention onto patients, with a carefully pressure monitoring program appeared to be suitable for a wide application in clinical practice, so as to achieve a more precise and standard prescription of pressure therapy.

PO-1246

THE EFFECT OF RESPIRATORY MUSCLE TRAINING IN ACUTE STROKE PATIENTS ACCORDING TO PATIENT'S INITIAL PULMONARY FUNCTION

Jisun Yoon, Min Ho Chun*, Mi Kyung Sim, Sook Joung Lee
Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea

Objective: Decline in respiratory function has been reported in stroke patients. It has been reported that reduced Forced Expiratory Volume in 1 second (FEV1) is associated with an increased risk for all cause of death and recurrent rate of stroke. Previous study showed that respiratory muscle training improved pulmonary function in stroke patients. Nevertheless little attention is generally paid to pulmonary rehabilitation, probably because these patients are free from pulmonary symptoms in acute stage. The aim of this study was to determine which subgroup showed more improvement of pulmonary function and functional status after respiratory muscle training according to their initial FEV1. *Methods:* Patients with first episode of unilateral stroke were recruited. All subjects participated in conventional stroke rehabilitation program and pulmonary rehabilitation program consisted of inspiratory and expiratory muscle training for 3weeks. Subjects performed pulmonary function test and were assessed for modified Barthel index (MBI) and Brief Fatigue Inventory (BFI) at baseline and at the end of the training. The results were assessed in 5 groups according to initial relative FEV1 (Quintile points for relative FEV1 were (1) 107 for men, and (1) 112 for women). *Results:* 24 stroke patients were enrolled. There were no significant differences in age, gender, type of stroke, lesion site, body mass index, duration of disease, and history of smoking according to initial FEV1. Patients with moderate pulmonary function (2nd, 3rd, 4th quintile) showed significant improvement in FEV1, BFI after the training. Patients with mild (1st quintile of FEV1) and severe (5th quintile of FEV1) pulmonary function had improved FEV1 and BFI, however there was no statistically significance. There was a statistically significant increase in MBI score in subjects in the 2nd, 3rd, 4th, and 5th quintile of FEV1. Subjects in the lowest 1st quintile of FEV1 also had improvement in MBI, although there was no statistically significance. *Conclusion:* This study suggests that respiratory muscle training using incentive spirometry was effective for improvement of pulmonary function and recovery of functional status. Patients showed difference in results according to initial pulmonary function after short term follow up. Patients with moderate pulmonary function showed more improvement, because probably they had more reservoir of improvement compared with patients with mild pulmonary function. There was no significant improvement in pulmonary function and MBI in severe pulmonary function, because subjects received pulmonary rehabilitation with simple, non-invasive method for short term in this study. Further study with larger sample size, long term follow up and other specific pulmonary rehabilitation is necessary in those patients.

PO-1248

HOME-BASED ROBOT-GUIDED PASSIVE STRETCHING AND ACTIVE MOVEMENT TRAINING OF ANKLE AND MOBILITY IMPAIRMENTS IN CHILDREN WITH CEREBRAL PALSY

Lin Liu[1], Kai Chen[2], Yupeng Ren[2], Liang Wang[2], Wei-Qun Song[1], Maobin Wang[1], Deborah Gaebler-Spira[2], Li-Qun Zhang[2,3]
[1]Rehabilitation Department of XuanWu Hospital C.M.U,China, [2]Rehabilitation Institute of Chicago (RIC),China, [3]Northwestern University, China

Objective: To test whether Home-Based Robotic assisted and Active Movement Training can benefit children with CP with lower limb impairment. *Method:* 8 children with CP and lower limb impairment participated in home-based Intelligent stretching and active movement training at home 3 sessions a week for 6 weeks (total 18 sessions). Each session included 20 min passive stretching and 30 min active training. Family education was conducted in the first week while assessments were applied in the first 9th and the last visit. *Results*: Significant improvements were seen in the 6 min walk test, Timed Up and Go, Pediatric Balance Scale, Selective Control Assessment of Lower Extremity, Strength of Dorsiflexion, Active and Passive Dorsiflexion before and after training. *Implications/Impact on rehabilitation:* Home based Intelligent stretching have benefit to children with CP. They demonstrate improvement in motor control performance, ability of balance and biomechanical properties.

PO-1249

THERAPEUTIC EFFECTS OF SHOCK WAVE THERAPY ON NUCHAL LIGAMENT CALCIFICATION

Yi-Jen Chen, Chia-Hsin Chen, Min-Cheng Weng, Mao-Hsiung Huang*
Kaohsiung Medical University Hospital,Chinese Taipei

Objective: To investigate the effects of extracorpal shockwave therapy (ESWT) on cervical spondylosis with nuchal ligament calcification. *Method:* 48 patients with spondylotic cervical radiculopathy and nuchal ligament calcification were selected and randomly assigned to two groups A and B (24 patients in each group). Patients in group A received regular rehabilitation with 20 min of hot packs and underwent 15 min intermittent cervical traction three times per week for 8 weeks, from 15% to 25% body weight. Patients in Group B received regular rehabilitation as those in group A and ESWT. ESWT was performed with the piezoelectric shock wave (F10G4 Richard Wolf GmbH, Knittlingen, Germany), 2000 impulses, 0.27 mJ/mm^2 over the calcification soft tissue guided by X-ray image and sonography. The therapeutic effects were evalu-

ated by changes range of motion (ROM) of cervical spine including flexion, extension, lateral bending and rotation, visual analogue pain scale, and neck disable index (NDI), and numeric rating sacle (NRS) before and after treatment, and at follow-up 3 months later. *Results:* Patients in each treated group reduced pain significantly after treatment and at follow-up. However, patients in Groups B showed more improvements in ROM and reduction of neck pain, NDI and NRS values after treatment and at followed up periods. Implication on Rehabilitation ESWT is an effective adjuvant treatment in management of cervical spondylosis with nuchal ligament calcification and results in more functional improvements.

PO-1250

GUA LOU GUI ZHI DECOCTION SUPPRESSES SECRETION OF NF-KB- MEDIATED CYTOKINES IN LPS-INDUCED MICROGLIA BV-2 CELLS

Haixia Hu[1,2], Zuanfang Li[1], Xiaoqin Zhu[2], Ruhui Lin[3], Jiumao Lin[4], Jun Peng[3], Jing Tao[1,2], Lidian Chen[1,2,3]

[1]Key Laboratory of TCM Rehabilitation of State Administration of Traditional Chinese Medicine,China, [2]Fujian Rehabilitation Technology Engineering Center,China, [3]MOE Key Laboratory of Traditional Chinese Medicine on Osteology & Traumatology and Exercise Rehabilitation,China, [4]Fujian Key Laboratory of Exercise Rehabilitation, Fujian University of Traditional Chinese Medicine, China

NF-kB signaling-mediated neuroinflammation contributes to the secondary brain damage in ischemic stroke; therefore, anti-inflammatory therapy via suppression of NF-kB pathway could be a promising strategy for the treatment of stroke and post-stroke disabilities. Gua Lou Gui Zhi Decoction (GLGZD) has long been used in Chinato clinically treat dysfunction after stroke such as muscular spasticity, but the precise mechanisms are largely unknown. Using LPS-stimulated microglial BV-2 cells as an in vitro inflammatory model of neural cells, in the present study we evaluated the anti-inflammatory effect of GLGZD and investigated the underlying molecular mechanisms. We found that GLGZD inhibited inflammatory response in microglial cells as it significantly reduced LPS-induced expression of pro-inflammatory NO, TNF-a,IL-6 and IL-1b in BV-2 cells, in a dose-dependent manner. In addition, GLGZD treatment significantly blocked the nuclear translocation of NF-κB in BV-2 cells, demonstrating its inhibitory effect on the activation of NF-κB signaling. Collectively, our findings suggest that inhibition of inflammatory response via suppressing NFκB pathway might be one of the mechanisms whereby GLGZD ameliorates the damage in ischemic cerebral tissues.

PO-1251

LOWER EXTREMITY ORTHOSIS AND AMBULATION IN STROKE PATIENTS AFTER DISCHARGE FROM THE HOSPITAL

Yoshitake Hirano[1,2], Daisuke Nishio[1,3], Shinichio Maeshima[2], Aiko Osawa[1], Makoto Ikeda[1], Megumi Hirano[1], Tomoya Minagawa[1], Ryota Kaneko[1], Kazunari Hata[1], Hiroshi Kigawa[1]

[1]Hanno-Seiwa Hospital,Japan, [2]Graduate School of Human Health Sciences, Tokyo Metropolitan University,Japan, [3]Graduate School of International University of Health and Welfare, Japan

Objective: The purpose of this study was to clarify the change in lower extremity orthosis and ambulation in stroke patients after discharge from the hospital. *Method:* Subjects were 35 hemiplegic patients who had a stroke for the first time and were discharged from the convalescence rehabilitation ward of our hospital. They were prescribed the lower extremity orthosis (mean age: 61.1 ±12.1 years). The subjects were divided into 2 groups: the using orthosis group, comprising of subjects who used lower extremity orthosis at home, and the not using orthosis group, comprising those who was not at home. Various factors such as clinical features, physical function, ambulation were compared between the 2 groups. In addition, we investigated their awareness using lower extremity orthosis after discharge. *Results:* Differences in the duration of hospitalization and the awareness of the family regarding orthosis use were observed between the 2 groups. Differences were also observed in the physical function and ambulation at discharge and after discharge. The purpose and reason for using orthosis after discharge were also different between the 2 groups. However, their satisfaction and sense of dissatisfaction to the use of lower extremity orthosis were similar in both the groups. *Implications:* If the level of physical function is low, it is difficult to maintain ambulation after discharge. In order to maintain physical function and ambulation, it is important to teach the patients and family to correctly use the lower extremity orthosis through family education during hospitalization.

PO-1252

PRELIMINARY RESULTS OF ORTHOSIS AND DEVICE ON GAIT PERFORMANCE OF STROKE PATIENTS

Tz-Yan Lin, Chia-Hsin Chen, Tien-Wen Chen, Mao-Hsiung Huang

Kaohsiung Medical University, Kaohsiung, Taiwan, Chinese Taipei

Objective: To investigate the effects of anterior ankle foot orthosis (AFO) and quadricane on the gait temporal and distance parameters, and their kinetics and kinematics. *Method:* Thirty patients stroke patients were recruited for randomized study. Twenty-one patients were selected based on the inclusion criteria: first ever stroke, acute or chronic stage of hemiplegia; unilateral weakness; ability to walk at least 10 meters with or without an assistive device; cognitive ability to follow the instruments. Each patient received gait analysis under three conditions: without AFO or device, with AFO, and with orthosis and device. The outcome measurements included temporal and distance parameters, bilateral lower limb kinematics and kinematics. *Results:* The results showed that the use of AFO will increase the difference of bilateral leg in any phase of temporal parameters and less cadence, swing velocity of distance parameter and mean walking velocity. More difference of hip abd-Add, hip flex-ext and foot progression in kinematics, and more difference of knee flex-ext moment, ankle dorsplantarflexion moment in kinetics. However, the use of quadricane will decrease the difference of any phase of temporal parameters but decrease the cadence, and revealed no significance of differences in kinematic and kinetics.Implication on Rehabilitation AFO will increase the difference of bilateral leg motion expression of temporal and distance parameters, and their kinetics and kinematics. Further modification of traditional orthosis is warrented.

PO-1253

THE RESEARCH PROGRESS OF ACUPUNCTURE TREATMENT AND REHABILITATION TRAINING ABOUT DYSPHAGIA AFTER THE STROKE

Jinna Ma, Lina Ning, Jie Xiong

The affiliated hospital of the logistics institute of the Chinese peoples armed police force, China

*Objective:*Introducting of Chinese medicine research about Dysphagia after the stroke. *Method:*The literature of the past five years of dysphagia after stroke were reviewed by acupuncture treatment, swallowing rehabilitation training, treatment for dysphagia therapy and acupuncture therapy combined with other treatment methods, and so on. *Conclusion:* Large number of clinical studies have demonstrated that Acupuncture treatment and rehabilitation training alleviate and cure to dysphagia after stroke, acupuncture treatment in combination with rehabilitation training treating this disease is a trend.

PO-1254

SURFACE ELECTROMYOGRAPHIC STUDY OF KNEE FLEXION DURING BRIDGE-STYLE MOVEMENT

Yangzheng Li
rehabilitation department of Sir Runrun Shaw Hospital, China

Objective: The aim of this study was to investigate the relationship between the angles in knee flexion and the contracted muscles of lower extremity during bridge-style movement in stroke patients. *Methods:* 18 patients in this study were divided into 3 groups, group A was composed the stroke patients with normal muscle tone (n=6); group B was composed the stroke patients with high muscle tone (n=6); group C was composed the normal persons. The surface electromyographic study was used to analysis the different angles in knee flexion during bridge-style movement. *Results:* 1) There were similar contraction in both group A and C during the bridge-style movement. During 0 and 80 degree of knee flexion, biceps femoris muscle was took an important action. At 80 degree, the proportion of biceps femoris muscle was decreased, and the proportion of bilateral erector spine muscle was increased. However, at 110 degree, the proportion of bilateral erector spine muscle was took a more increased and played an important effect. C. 2) In group B, the bilateral erector spine muscle and biceps femoris muscle took an important effects, however, the proportion of biceps femoris muscle was decreased. At 110 degree, the proportion of bilateral erector spine muscle was made a more increase. There were significantly differences in group A compared with group C at 0 degree in knee flexion. *Impact on Rehabilitation:* Bridge-style movement at 0 degree can be more sufficient cause excitability of nerve centre and promote the reconstruction of brain function after stroke.

PO-1255

THE EFFECTION OF THE PATIENTS' STIFF HANDS' FUNTIONAL RECOVERY THROUGH THE TENDON GLIDING TRAINING

Xiulan Han, Chuhuai Wang
Department of Rehabilitation Medicine, Huangpu Division,The First Affiliated Hospital of Sun Yat-Sen University, China

*Objective:*To observe the outcome of the patients whose hands are stiff due to injury through the tendon gliding training. *Methods:*30 patients were divided into the observation group or the control group according to the sequence they came. The control group contained 15 patients, 32 fingers were trained by comprehensive rehabilitation therapy and occupational therapy. While the observation group contained 15 patients, 34 fingers were trained by the program that promoted the tendon gliding in addition to the comprehensive rehabilitation therapy. The protocols of this program included joint orientation training, hooking, making a fist, making a fist at right angles, gliding the superficial flexor tendon independently, and just flexing the metacarpophalangeal (MCP) joints. We measured the total active motion (TAM) of each finger and counted the good and excellent rate recommended by the International association of hand surgery after finishing the therapy. *Results:* The TAM scores between the observation group and the control group were of statistical significance by using paired t-test. The good and excellent rate of the observation group was 70.6%, no patient presented poor function. However, the rate of the control group was 34.4%, and 2 patients presented poor function. Differences of the rate were significant between these two groups (p<0.01) by chi-square test. *Conclusion:*For the patients with hand injury who were not accepted rehabilitation in time, we should focus on the adhesion of tendon,and we should promote the tendon gliding to get better hand function as we do some mobilization, physiotherapy, occupational therapy, etc.

PO-1256

RADIAL SHOCKWAVE THERAPY AS A SHORTER AND SUCCESSFUL STRATEGY TO TREAT THE REFRACTORY PLANTAR FASCIITIS: A RANDOMIZED SINGLE BLIND PLACEBO CONTROLLED TRIAL

Marta Imamura[1,2], Kei Nagata[1], Júlia Maria D'Andrea Greve[1], Rosa Alves Targino[2], Bruno Bonganha Zanon[1], Perola Grimberg Plaper[1], Wu Tu Hsing[1], Gilberto Luis Camanho[1]
[1]Hospital of Clinics Clínicas. University of São Paulo School of Medicine,Brazil, [2]Clinical Research Center. Institute of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital of Clinics Clinics. University of São Paulo School of Medicine, Brazil

Objective: assess the efficacy of radial extracorporeal shockwave (RESW) therapy for the treatment of patients with chronic plantar fasciitis who failed to respond to previous conservative therapies in the Lucy Montoro Institute of Rehabilitation. *Methods:* The patients with plantar fasciitis (visual analogic scale-VAS >4) were randomized in RESW group or placebo group. The RESW group (n=14) received on session weekly (3 weeks) at the origin of the plantar fascia at the medial tubercle of the calcaneus bone. The placebo group (n=16) received the application without density of flux. Assessments were used: VAS, American Orthopedics Foot and Ankle Society (AOFAS) scale, 1 week and 3 months after treatment. The pressure pain threshold (PPT) was quantified by a pressure algometer. Data were analyzed: Student t-test, Mann-Whitney, chi-square, Fisher's test and ANOVA. *Results:* There was a significant reduction of pain in both groups. Compared to the placebo group (p=0.02), RESW only showed significant increase after 12 weeks. There was a significant improvement in hind foot functional in both treatment groups after 12 weeks (p<0.0001 - RESW and p=0.0042 - placebo). A significantly greater improvement of the RESW (p=0.007) compared to the placebo group after three months. RESW patients showed a consistent improvement of plantar fascia PPT in all time frames analyzed compared to baseline values (p<0.0001, mean difference=-3.61, 95% CI -5.51 to -1.70). *Impact on rehabilitation:* The RESW after 12 weeks improvements in all plantar fasciitis symptoms analyzed in relation to placebo treatment, suggesting that the therapy may be a useful choice of intervention for this condition.

PO-1257

EFFECT OF MUSIC THERAPY AND COMBINATION THERAPY ON THE AUTONOMIC NERVOUS ACTIVITY

Tiantian Jia, Misa Miura, Osamu Ito, Rong Rong, Masahiro Kohzuki
Tohoku University Graduate School of Medicine,Sendai, Japan

Objective: Physical activity or exercise requires a range of integrated autonomic and cardiovascular adjustments in order to maintain homeostasis. However, it is still unclear whether the music therapy and the combination therapy (exercise and music therapy) would affect the autonomic nervous activity (ANA). Therefore, the aim of this study is to compare the effect of the music therapy and combination therapy on the ANA. *Methods:* Twenty five healthy young adults were assigned to the music therapy group, the squat excise group, and the combination therapy group. The autonomic nervous activities were analyzed using heart rate variability. Frequency-domain analysis of short-term, stationary R-R intervals was performed to evaluate the low frequency (LF) and high frequency (HF) powers.

The HF to total power (TP) represents the vagal control of heart rate, and the ratio of LF to HF (L/H) is considered to relate to the sympathetic modulations. *Results:* Before the intervention, there were no significant differences in the parameters of ANA among groups. After the intervention, the music therapy group significantly decreased TP. The squat exercise group significantly decreased L/H. Furthermore, when compared these groups, the combination therapy group exhibited a greater gain, significantly increased HF and decreased TP and L/H. *Implications:* Music therapy and combination therapy might improve autonomic nervous activity with specific effect on parasympathetic and sympathetic activity. We should clarify the effects of the combination therapy on the ANA in the subjects with heart failure in further studies.

PO-1258

OBSERVED CHANGES OF BRAIN FUNCTIONAL MAGNETIC RESONANCE IMAGING IN ISCHEMIC STROKE PATIENTS AFTER COMPUTER-BASED UPPER LIMB EXERCISES

Jin Chen[1,2],[1], Lijuan Ao[1], Feifei Yang[3], Yongmei Li[1], Ye Lu[4]

[1]Department of Rehabilitation and Physiotherapy, Kun Ming Medical College, Kunming, Yunnan Province, China 650000, [2]Department of Rehabilitation and Physiotherapy, Tianjin peoples hospital, China 650000, [3]Department of Radiation, Kun Ming Medical College, Kunming, Yunnan Province, China 650000, [4]Disability Center of Yunnan Province,Kunming, Yunnan Province, China 650000

Object: To investigate the effects of computer-assisted technology intervention on cortical reorganization and associated motor recovery. *Methods:* From Nov. 2007 to May.2008, 12 healthy people and 10 stroke patients were chosen to receive computer-assisted exercise for 45 min, 5 times a week for 6 weeks. fMRI with 1.5T scanner was performed at the time of the subjects attempting sequential wrist flexion-extension at pre-treatment and post-treatment. Otherwise, standardized upper limb functional test straining contents included for stroke patients. *Results:* 1. Computer-assisted therapy showed improvements in motor function of affected hand of patients ($p<0.01$). 2. For the hands of healthy subjects and the unaffected hand of patients, contralateral primary sensorimotor cortex (SMC) and ipsilateral cerebellum were activated before training, after six weeks training the activated areas were increased in contralateral SMC, ipsilateral cerebellum and part of the limbic system. 3. For paretic wrist movement, the brain maps showed scattered and weak activity in the contralateral SMC, main activities were found in the ipsilateral SMC and SMA. After training, activated regions were mainly found in hibateral SMC, SMA and contralteral parietal lobule, the intensity of contralateral SMC is increased and surpassed that of ipsilateral SMC. *Conclusion*: 1. Computer-assisted training can improve the ability of the affected upper limb motor for stroke patients. 2. The activated volume and intensity of the ROIs in patients and abnormal people are enhanced after training. 3. The changes of fMRI accompany with the change of upper limb function.

PO-1259

THE VALUE OF FUNCTIONAL FEEDBACK THERAPY IN LOWER LIMB PROSTHESIS ASSEMBLY

Zhibin Wu, Wanling Jiang, Bin Shu

Department of Rehabilitation Medicine, Research Institute of Surgery, Daping Hospital, Third Military Medical University, Chongqing, China

Objective: The purpose was to explore the value of functional feedback therapy in lower extremity prosthetics assembly. *Method:* 20 patients with unilateral amputee were randomly divided into two groups. Conventional group were trained only by the verbal guidance method, and feedback group added the SmartStep feedback training method. Gait data was collected and analyzed before and after the walking training in the 1st day, after the training in the 5th day and the 10th day. The gait temporal and spatial parameters were measured by using electronic gait mat, and the weight bearing (WB) capacity on hindfoot and forefoot were evaluated by the SmartStep system. *Results:* Compared with pre-training, the stride length, single supporting time, forefoot WB of prosthetic gait in the feedback group shown significant difference ($p<0.01$) after training in the 5th day and 10th day. And statistical difference ($p<0.05$) was found after five days' training in the conventional group, until the 10th day, the difference reveal significant ($p<0.01$). There was no difference before training between the two groups. But the use of SmartStep functional feedback training, significantly ($p<0.01$) improved the patients' single supporting time, forefoot WB of gait over the effected limb in the feedback group as compare to the conventional group. *Implications:* Functional feedback therapy can increase the load-bearing capacity of the prosthetic as soon as possible, improve the gait and shorten the training cycle.

PO-1260

TREADMILL TRAINING AFFECTS CELL APOPTOSIS AND EXPRESSION OF NR2B PROTEIN IN ISCHEMIC CORTEX AFTER PERMANENT CEREBRAL ISCHEMIA IN RATS

Luwen Zhu, Qiuxin Chen, Qiang Tang, Yan Wang

Rehabilitation College, Heilongjiang University of Chinese Medicine, Harbin 150001, China

Objective: Cerebral ischemia resulting from permanent occlusion of cerebral arteries causes neurological impairments. In the present study, the effects of treadmill training on cell apoptosis and expression of NR2B Protein in following permanent ischemia were investigated. *Methods:* Rats were randomly divided into three groups: the sham operation group, the contrl group, the training group. Treadmill training started 24h after permanent middle cerebral artery occlusion. Motor performance measured by the rota-rod test. Cell apoptosis using labeling (TUNEL) assay and NR2B protein expression using immunochemical staining (SP method) in the ischemic cortex were examined. *Results:* Two weeks after surgery, we performed rota-rod tests. Compared with the sham operation group on the rota-rod test, the animals had significantly worse performance ($p<0.01$) in the contrl group. Compared with the control group on the rota-rod test, the animals had significantly worse performance ($p<0.05$) in the training group. NR2B protein was significantly reduced in the ischemic cortex of rats with treadmill training than that in rats without a treadmill training ($p<0.05$).There was a few apoptosis cells in the sham operation group. The number of apoptosis cells were significantly decreased in the ischemic cortex of rats in the training group than that in the cortol group ($p<0.05$). *Conclusions:* This study suggests that after permanent brain ischemia, treadmill training improves motor performance and supresses cell apoptosis and expression of NR2B Protein in ischemic cortex after permanent cerebral ischemia

PO-1261

QIGONG EXERCISE COULD REDUCE UPPER LIMB LYMPHEDEMA AND IMPROVE BLOOD FLOW IN BREAST CANCER SURVIVORS

Shirley S.M. Fong[1]*, Shamay S.M. Ng[2], W.S. Luk[3], Joanne W.Y. Chung[4], William W.N. Tsang[2]

[1]Institute of Human Performance, The University of Hong Kong,Hong Kong, China, [2]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University,Hong Kong, China, [3]The Association of Licentiates of Medical Council of Hong Kong,Hong Kong, China, [4]Department of Health and Physical Education, The Hong Kong Institute of Education,Hong Kong, China

Objective: To investigate the effects of Qigong exercise on upper limb lymphedema, arterial resistance and blood flow velocity in postmastectomy breast cancer survivors. *Method:* Eleven breast cancer survivors with Qigong experience (mean age: 58.3±10.1 years) were assigned to the experimental group and 12 breast cancer survivors without Qigong experience (mean age: 53.8±4.2 years) were assigned to the control group. After baseline measurements were taken, the experimental group performed 18 Forms Tai Chi Qigong exercise for approximately 6 min while the control group rested for similar duration in a sitting position. Both groups were then re-assessed. All participants were measured on their upper limb circumference, peripheral arterial resistance and blood flow velocities of the affected-upper-limb. *Results:* The between-group differences were not significant for all outcome measures at baseline ($p>0.05$). The circumferences of the affected upper arm, elbow, forearm and wrist decreased after Qigong exercise ($p<0.05$). However, no significant difference was found in the circumference measures between the two groups post-test ($p>0.0125$). In terms of vascular outcomes, the resistance index decreased and the maximum systolic arterial blood flow velocity (SV) and minimum diastolic arterial blood flow velocity (DV) increased significantly after Qigong exercise ($p<0.05$). The between-group difference was close to significant for SV ($p=0.018$) and was significant for DV ($p<0.001$) post-test. *Impact on rehabilitation:* Qigong exercise could reduce conventional cancer therapy side effects such as upper limb lymphedema and poor circulatory status in breast cancer survivors. However, such effects may be temporary, and repeated practice of the Qigong form may be necessary.

PO-1262

CLINICAL ANALYSIS OF TREATING CERVICAL VERTIGO WITH LOW FREQUENCY REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION

Shoulan Fan, Weifang Zhang, Ticheng Li, Wenwu Zhang, Chaobing Zhang

Department of Rehabilitation Medicine, The Third Peoples Hospital Of Hefei, Hefei 230022, China

Objective: To explore the curative effect of using Transcranial Magnetic Stimulation (TMS) to treat cervical vertigo. *Methods:* 120 cases of Cervical Vertigo were randomly divided into 2 groups: treatment group and control group. Treatment group was treated with TMS and millimeter wave (MMW), and control group was treated with MMW. Marks for pre-therapy and post-therapy of two groups were recorded separately, and the curative effect and side effect were also observed and recorded. This method was designed to discuss the diagnosis of this disease and application of non-operative treatment. *Results:* The differences between pre-therapy and post-therapy marks of two groups were both statistically significant ($p<0.05$). The difference of post-therapy marks between two groups was also statistically significant ($p<0.05$). *Conclusion:* The combination of TMS and MMW can improve the curative effect of vertebral artery type of cervical spondylosis (CSA).

PO-1263

CLINICAL STUDIES OF ACUPUNCTURE COMBINED REHABILITATION IN PATIENTS WITH STROKE

Qiang Tang, Luwen Zhu, Yan Wang

Rehabilitation College, Heilongjiang University of Chinese Medicine, Harbin 150001, China

Objective: This study investigated the efficacy of Acupuncture combined with rehabilitation in Patients with Stroke. *Methods:* Three hundred stroke patients were enrolled in the program. Acupuncture combined with rehabilitation group ($n=75$) received scalp acupuncture and rehabilitation training at the same time. Scalp acupuncture group ($n=75$) received scalp acupuncture. Rehabilitation group ($n=75$) received rehabilitation training. Control group ($n=75$) received. acupuncture needles 0.3×30 mm.Improvements in the motor functions were scored by the Fugl-Meyer score, neurological function score. The ability of daily life (ADL) test was performed before and after treatment. *Results:* After 12 weeks, the scores of Fugl-Meyer, neurological function score and daily living activity in the Acupuncture combined with rehabilitation group were superior to Scalp acupuncture group, rehabilitation group and control group ($p<0.05$).The total effective rate in the Acupuncture combined with rehabilitation group can reach 94.67%. *Conclusions:* This study clearly demonstrates that Acupuncture combined with rehabilitation pari-passu is a useful adjunctive therapy in reducing Neural function defect in patients with stroke.

PO-1264

ELECTRICAL ACTIVITY OF VASTUS MEDIALIS MUSCLE IN DIFFERENT POSITION OF LEG

Waree Chira-Adisai, Pat Swanpitak

Fac.of Medicine Ramathibodi Hospital, Mahidol University, Thailand

Objective: To compare electrical activities of vastus medialis muscle in different position of leg. *Methods:* Thirty subjects aged 20 to 50 years were participated in this study. Electrical activity of vastus medialis muscle was recorded by surface electromyography during isometric contraction in both open-kinetic and closed-kinetic chain exercise in three different leg positions: (a) neutral, (b) adducted hip and (c) external rotated hip. Average root mean square (RMS) of three consecutive muscle contractions for each leg position was calculated. *Results:* For the open-kinetic chain exercise, average RMS (SD) during muscle contraction in a, b, and c position were 104.06 (44.05), 118.68 (53.55), and 113.16 (53.48) uV, respectively. Muscle electrical activity in adducted hip position was higher than the other two positions, but not significant difference. For closed-kinetic chain exercise, average RMS (SD) in position a, b, c were as follows 132.87 (50.40), 147.37 (50.91), and 144.71 (51.36) uV. Muscle electrical activities in adducted hip and external rotated hip were not difference but both were more than in neutral position ($p<0.05$). Implication/Impact in rehabilitation: Positioning leg in adducted hip or external rotated hip in closed-kinetic isometric contraction activates vastus medialis muscle more than in neutral position. For open-kinetic isometric contraction, different leg position is not significant affected the vastus medialis muscle activity.

PO-1265

HUMANOID ROBOT NAO'S INTERACTING WITH CHILDREN WITH AUTISM SPECTRUM DISORDERS

Chongying Wang[1], Peng Yu[1], Xiaoli Li[2], Yao Wang[2], Yantao Zhao[3]

[1]Center for Behavioural Science, School of Medicine, Nankai University, Tianjin, 300071, China, [2]National Key Laboratory of Cognitive Neuroscience and Learning, Beijing Normal University, Beijing, 100875, China, [3]Institute of Electronic Engineering, Yan Shan University, Qinhuangdao, 066004, China

Objectives: The objective of this study is to investigate how children with ASDs interact with a humanoid robot NAO (Aldebaran - Robotics) and improve their social skills. *Methods:* Six children with ASDs age 4-8 from special education unit at Small World School in Tianjin, China, were selected to participate in as many trials as possible during a period of two months, with an average of twenty trials each. The trials were designed to progressively move from simple exposure to the robot to more complex opportunities for interaction. *Results:* Based on the video materials documenting the interactions, a quantitative and qualitative analysis was conducted. NAO's human-like appearance, its capability to speak, dance and play music, coupled with the simplicity of the human robot inter-

action modules helped to entice the children's interest to engage in social communication. The six children with ASDs all showed improvement on social skills. *Implications on Rehabilitation:* This study presented a longitudinal investigation on the exposure of children with ASDs to a humanoid robot. The findings clearly demonstrate the need for, and benefits of, long-term studies in order to reveal the full potential of humanoid robots as augmentative and alternative communication tools on the rehabilitation and education of children with ASDs.

PO-1266

THE CLINICAL STUDY OF STEM CELLS TRANSPLANTATION FOR TREATMENT OF SPINAL CORD INJURY

Mai Li, Lijuan Ao

Department of Rehabilitation, the second affiliated hospital of Kunming Medical University, Kunming, Yunnan Province, China 650000

Objective: To determine the effectiveness of umbilical cord mesenchymal stem cells (UC-MSCs) and umbilical cord blood mononuclear cells (UCB-MNCs) transplantation in the treatment of spinal cord injury patients, to observe their ASIA sensory and motor score, the spinal cord injury degree, changes in nerve electrophysiology, as well as activities of daily living; and to further explore the UC-MSCs or UCB-MNCs transplantation in the treatment of functional recovery of spinal cord injury clinical research to lay the foundation. *Methods:* 15 subjects who attended the Second Affiliated Hospital of Kunming Medical University from August 2010 to September 2011 and eligible for stem cell transplantation were chosen for the research. Another 15 similar patients were chosen for control group, apart from stern cell treatment, both group received comprehensive rehabilitation treatment for one month. The ASIA sensory and motor score, the spinal cord injury degree, the activities of daily living and related nerve electrophysiological indicators were evaluated before treatment and 2 month, 4 month after first treatment. *Results:* 1, UC-MSCs and UCB-MNCs by intravenous and subarachnoid transplantation in the treatment of spinal cord injury is safe. 2, During the treatment period, the ASIA scores and activities of daily living scores of the stem cell group are not better than the control group. 3, Nerve electrophysiological examination may be used for evaluation in SCI patients' nerve and muscle function with early and sensitive index. *Conclusion:* Nerve electrophysiological examination may be used for evaluation in SCI patients' nerve and muscle function with early and sensitive index after stem cells transplantation.

PO-1267

THE EFFECTS OF MIRROR VISUAL FEEDBACK THERAPY ON THE FUNCTION OF UPPER EXTREMITY IN CHILDREN WITH CP OF HEMIPLEGIC

Xiaojie Li[1,2,3], Yang Liu[1,2,3], Qifeng Sunq[1,2,3]

[1]Third Affiliated Hospital of Jiamusi University; Jiamusi 154003, Heilongjiang, China, [2]Children Neural Rehabilitation Laboratory of Jiamusi University, Jiamusi 154003, Heilongjiang, China, [3]Rehabilitation College of Jiamusi University, Jiamusi 154003, Heilongjiang, China

Objective: To observe the effects of mirror visual feedback therapy on the function of upper extremity in CP children with hemiplegic. *Methods:* 30 hemiplegic children were randomly divided into two groups: experimental group (n=16) and control group (n=14). CP children were all treated by physical therapy for 10 weeks. Experimental group treated by placing the affected arm in the mirror box and looking at reflection of uninjured arm in the mirror, 25 min per day for 10 weeks. E-LINK evaluation system, B ultrasonic, PDMS-FM, the Modified Ashworth Scale (MAS) were evaluated of grasp strength, forearm supination angle, muscle tone, upper extremity motor function and biceps muscle thickness before and after treatment. *Results:* After 10 weeks treatment, grasp strength, forearm supination angles, PDMS-FM scores in the two groups had improved (p<0.01), and the grasp strength, forearm supination angle, PDMS-FM scores in the experimental group were significantly higher than the control group (p<0.05). The biceps muscle thickness in the two groups had improved, the muscle thickness in the experimental group had improved significantly than the control group (p<0.05), the control group had no significant difference after treatment (p>0.05). There were no significant differences of MAS after treatment (p>0.05) in two groups, *Implications:* Mirror visual feedback therapy can improve the functional performance of the upper extremity, grasp strength, forearm supination angles, biceps muscle thickness of CP children with hemiplegic, but its effects of relieving spasticity is not obvious. *Keywords*: CP: mirror visual feedback therapy: upper extremity function

PO-1268

INTRODUCES A FORMER ARM PALM FINGER ORTHOPEDIC DEVICE

Chunfeng Ran

The Longgang Centre Hospital of Shenzhen, China

Technology The utility model is related to orthopedic device, especially one of the former arm palm refers to orthopedic device. Technical background At present, there is no one for forearm and wrist, palms and fingers parts orthopedic comprehensive orthopedic device. content The utility model is designed to provide a set of orthopedic device which can work for forearm and wrist, palms and fingers. 1, protection The orthopedic device provide protection for the injury of radial nerve, stretch wrist muscle, extensor digitorum equine wrist muscle, wrist and forearm muscle, vascular 2, improve the joint range of activity Increase the forearm and wrist, knuckle range of activity 3. increase strength IThe orthopedic can ncrease strength of proator teres, pronator quadratus, supinator, flexor carpi radialis, flexor carpi ulnaris, extensor carpus radialis, extensor carpi ulnaris, extensor digitorumr, musculus flexor digitorum sublimis, flexor digitorum profundus.

PO-1269

THE INTELLIGENT STROKE REHABILITATION SYSTEM, A NEW METHOD FOR SEVERE UPPER-LIMB IMPAIRMENT AFTER STROKE: A PILOT STUDY

Wenke Fan[1], Yi Wu[1], Yongshan Hu[1], Yugang Jia[1,2], Wei Zhou[1,2]

[1]Department of Rehabilitation Medicine, Huashan Hospital, Fudan University, Shanghai, China, [2]Healthcare Research Lab, Philips Research Asia-Shanghai, China

Objective: Post-hospital rehabilitation is limited by transportation difficulties and the unavailability of home-based professional rehab services. We developed the Intelligent Stroke Rehabilitation System Training (ISRST), which offers computer and television home-based therapy that can be followed-up by therapists. We examined whether use of this system in the hospital can help improve motor function in the upper limbs over self-exercise with picture guidance. *Method:* Twenty six patients with significant unilateral upper-limb paralysis from a stroke <3 months earlier, but with preserved language and cognition, were enrolled in a randomized, evaluator-blinded, parallel-group 8-week trial. All enrolled patients had proximal Fugl-Meyer (FM-prox) subscores (shoulder/elbow/wrist subsections) between 6 and 13. Patients underwent 8 weeks of conventional rehab therapy, then were block-randomized to 8 weeks of ISRST or picture-guidance physical therapy. Change in upper extremity FM-prox subscore was measured at 0, 4, and 8 weeks. *Results:* At week 4, FM-prox in the ISRST group increased by 3.43 (95%CI, 3.79-6.93, p = 0.030) compared with the control group. At week 8, FM-prox in the treatment group increased by 6.3 (95%CI,

6.95-12.47, $p = 0.009$) compared with that of the control group. The ISRST group was superior to the control group in the secondary outcome measures (the FM sum, the Motor Status Score and the total score of Graded Wolf Motor Function Test) except the median time of GWMFT and the Modified Ashworth Scale at 4 and 8 weeks. Side effects were minimal. *Implications/Impact on Rehabilitation:* ISRST shows promise for extending stroke rehabilitation treatment beyond the hospital to patient homes.

PO-1270

DESIGN OF THE ADJUSTABLE WEARABLE POWER-ASSIST LOCOMOTOR (WPAL) FOR MOTOR-COMPLETE PARAPLEGICS

Shigeo Tanabe[1]*, Eiichi Saitoh[1], Satoshi Hirano[1], Masaki Katoh[1], Tomohiko Takemitsu[2], Akihito Uno[3], Yasuhiro Shimizu[1]

[1]Fujita Health University,Japan, [2]ASKA Corporation,Japan, [3]Tomei Brace Company, Japan

Objective: To design an adjustable wearable power-assist locomotor (WPAL) which could be used in different sized paraplegics. *Method:* Twenty-six healthy volunteers participated (weight: 43-82 kg; height: 150-176 cm). From results of preliminary experiment, it was clear that some adjustable parts were needed for well-fitting to diverse population. The important parts were as follows: 1) circumferential length and anterior-posterior position of thigh cuffs; 2) vertical, horizontal, anterior-posterior position of shin cuffs; 3) length of thigh and shin strut. To clarify the variable range of these parts necessary to fit, circumferential lengths at the four levels (30 mm and 230 mm under the perineum, 0 mm (center level) and 150 mm under the patella), distances between both legs at the two levels (0 mm and 150 mm under the patella) and two craniocaudal lengths (from the perineum to the patella and from the patella to the bottom of the foot) were measured. *Results:* The results suggest that the needed variable ranges of each part are 1) 10 mm of circumferential length and 10 mm anterior-posterior position of thigh cuffs, 2) 40 mm of vertical and horizontal, 10 mm of anterior-posterior position of shin cuffs, 3) 30 mm of thigh strut and 60 mm of shin strut. *Implications/Impact on Rehabilitation:* WPAL is developed for providing independent and comfortable walk for paraplegic patients. Adjustable WPAL enables many paraplegics to directly test the usefulness of the device in a rehabilitation term.

PO-1271

CHANGES OF POSTURAL STRATEGY DURING EXERCISE AGAINST PERTURBATION USING BALANCE EXERCISE ASSIST ROBOT (BEAR)

Shigeo Tanabe[1], Eiichi Saitoh[1], Satoshi Hirano[1], Norihide Itoh[1], Jumpei Kawabata[1], Kazuki Itoh[1], Hiromasa Kaitoh[1], Kenichi Ozaki[1], Ryo Murakami[2], Hitoshi Konosu[2]

[1]Fujita Health University,Japan, [2]Toyota Motor Corporation, Japan

Objective: To clarify the postural strategy changes during exercise against perturbation using Balance Exercise Assist Robot (BEAR). *Method:* Eight healthy volunteers participated. The robot using exercise had 2 motorized wheels controlled by an inverted pendulum system. The users stood on the footplates and operate the robot by the position of center of gravity. When the user leaned forward, the wheel rotated in the same direction, and the robot moved forward until the user's body returned to a vertical position. Conversely, if the user leaned backward, the robot would move backward. In the exercise, the robot leaned and moved automatically (sinusoidal wave with a frequency of 0.5 Hz and amplitude of 4 degrees). Participants were instructed to maintain their default position and done the exercise five times in a row (1 min/ trial). In the first and last session, a total moving distance was calculated. In addition, joint angles of lower extremity (hip flexion/extension, knee flexion/extension, and ankle dorsiflexion/plantarflexion) were measured during both sessions. *Results:* Compared with both sessions, the mean value of the total moving distance was improved from 10.5 m to 7.1 m. The reductions of the motion range of hip and knee joint were greater than ankle joint (67.7 %, 62.5 %, and 83.0 %, respectively). *Implications/Impact on Rehabilitation:* The postural response to perturbation is composed of two strategies (hip strategy and ankle strategy). The results suggest that the ankle strategy might be mainly used by the improvement of ability to cope with perturbation.

PO-1272

EFFECTS OF NEEDLE PIERCING THERAPY OF ZHUANG MEDICINE ON POST-STROKE DYSPHAGIA

Sheng Hang Pang[1],[1], Ting Yi Ya[2,2], Guo Jun Liu[1],[1]

[1]Jiangbin Hospital of Guangxi Zhuang Autonomous Region,China, [2]Guangxi minorities medicine research institute, China

Objective: To investigate the effects of the needle piercing therapy of Zhuang medicine on post-stroke dysphagia. *Methods:* Sixty patients with post-stroke dysphagia were randomized to receive either usual care (including intracranial decompression by dehydration, cervical electrical stimulation by VitalStim, and swallowing rehabilitation training) or in combination with needling piercing (n=30 for each group). The Watian drinking test for evaluation of swallowing function was used for assessing the efficacy. *Results:* After 2 courses of treatment, the Watian drinking test scores were decreased in both groups as compared with pre-treatment scores (p<0.01), with the scores lower in the treatment group than in the control group (PP. *Implications:* The needle piercing therapy of Zhuang medicine may lead to greater improvements in swallowing function in patients with post-stroke dysphagia than usual care.

PO-1273

EFFECTS OF REPETITIVE TASK TRAINING COMBINED WITH NEUROMUSCULAR ELECTRICAL STIMULATION ON LOWER LIMB IN ACUTE STROKE PATIENTS WITH SEVERE PARESIS

Zhen Liu, Pan-De Zhang, Hui-Qiong Chen

Department of Rehabilitation Medicine, First People's Hospital of Foshan, China

Objective: To study the effects of repetitive task training combined with neuromuscular electrical stimulation on lower limb function in acute stroke patients with severe paresis. *Method:* A total of 36 acute stroke patients with severe paresis were randomly divided into two groups (n=18 in each). The patients in control group received a conventional rehabilitative program and higher intensity of neuromuscular electrical stimulation. The patients in treatment group received extra repetitive task training on the basis of control group,including sit, sit-to-stand and stand training. The lower limb motor function, walking function and activities of daily living (ADL) were assessed with the Fugl-Meyer Score of the lower extremity Assessment (FMA), Functional Ambulation Classification (FAC) and the Functional Independence Measure (FIM) before and after treatment. *Results:* After treatment the scores of FMA and FIM were better than the scores before treatment both in the two groups significantly (p<0.05) and at 2 months the patients in treatment group gained better scores significantly (p<0.05). The changes of scores both on FMA and FIM in treatment group were better than control group statistically (p<0.05). The patients in treatment group obtained better walking function as for FAC (p<0.01). *Implications:*Repetitive task training combined with neuromuscular electrical stimulation could more effectively improve motor function of lower limb, walking function and ADL in acute stroke patients with severe paresis.

PO-1274

THE REHABILITATION EFFECT OF ACUPUNCTURE COMBINED WITH PELVIC FLOOR MUSCLE TRAINING FOR FEMALE STRESS URINARY INCONTINENCE

Ran Pang[1], Chun-Lan Jin[2], Xin-Yao Zhou[1]

[1]Guang'an Men Hospital, China Academy of Chinese Medical Science, Beijing, China., [2]Institute of Acupuncture and Moxibustion, China Academy of Chinese Medical Science, Beijing, China

Objective: To investigate the effect of combination therapy of acupuncture and pelvic floor muscle training (PFMT) in rehabilitating female patients with stress urinary incontinence (SUI). *Method:* 61 women with SUI were recruited to take PEMT (30 cases) or combination therapy of acupuncture and PFMT (31 cases) for 8 weeks. In acupuncture procedure, the selected acupoints included BL32, BL35 and SP6. International Consultation on Incontinence questionnaire (ICIQ) score and urine leakage (1-h pad testing) were measured before and after treatment. The cured and improved cases were defined as those whose urine leakage was less than 1g and reduced more than 50% respectively. *Results:* Patients' demographic didn't have significant difference between 2 groups. After 8 weeks ICIQ score and urine leakage showed significant decreases ($p<0.001$) in both groups. Additionally, combination therapy presented a higher response rate (cured/improved) compared with PFMT (74.2% vs. 46.7%) ($p<0.05$), but no significant difference in cure rate (29% vs. 13.3%). *Implications/Impact on Rehabilitation:* PFMT is the first-line rehabilitation therapy for SUI. However, it is reported that the effect of PFMT is limited. In our study, we find that combination therapy of acupuncture and PFMT has a better effect than solo PFMT. Some studies showed that needling BL32 and BL35 can increase the content and ratio of type I and III collagen in pelvic floor tissue and needling SP6 can down-regulate c-Fos expression in brain, which can rehabilitate SUI. Our study suggests that acupuncture has good synergy with PFMT and combination therapy is an effective rehabilitation therapy for SUI.

PO-1275

FACILITATION EFFECT OF ELECTRICAL STIMULATION TO LOWER LIMB FLEXION COMMON PERONEAL NERVE

Da Zheng Jing

Japan Sendai Seiyo Gakuin Junior College, Japan

Purpose: We report the facilitation effect of lower limb paresis flexion by common peroneal nerve electric stimulation and swing voluntary movement. Subjects There are six male patients. Two male hemiplegic patients with cerebrovascular disease, two male cervical cord injury (C4) presenting with incomplete tetraplegia, one male thoracic spinal cord injury (T12) presenting with incomplete paraplegia, one male brain contusion patient. *Method:* The subjects did isometric flexion of the hip and knee in the sitting position. We analyzed the flexural response of the lower limbs of three methods.1)Maximum voluntary contraction flexion (MVF) 2) Common peroneal nerve stimulation (PNS) 3) Maximum voluntary flexion contraction (PNS → MVF) after the common peroneal nerve electric stimulation. *Result:* We found the high frequency makes more torque of maximum voluntary flexion contraction than PNS and MVF also less voluntary muscle maximum constraction time. *Conclusion:* We accomplished to increase the torque of knee and hip that depends on electric stimulation frequency using the residual motor function of the lower limb paresis and electrical stimulation of the common peroneal nerve. We also examined the effect of reinforcing the voluntary movement.

PO-1276

THE EFFECTS OF AQUATIC QUADRICEPS BENCH ON MOTOR RECOVERY OF LOWER LIMBS IN PATIENTS WITH INCOMPLETE SPINAL CORD INJURY

Yao Cui[1,3], Fang Cong[1,3], Xuejun Cao[1,2], Long Jin[1,3], Fengshan Si[1,3], Bin Yao[1,3], Wei Jia[1,3], Dunwu Xiao[1,3], Youlin Li[1,3]

[1]Department of Modality Therapy, Beijing Bo'ai Hospital, China Rehabilitation Research Centre, [2]Institute of Rehabilitation Engineering, China Rehabilitation Research Centre, [3]Capital Medical University School of Rehabilitation Medicine

Objective: To investigate the effects of Aquatic Quadriceps Bench on Motor Recovery of lower limbs in patients with incomplete spinal cord injury (SCI). *Method:* Thirty incomplete spinal cord injury patients were randomly divided into treatment group ($n=15$) and control grounp ($n=15$). Routine rehabilitation excecises were performed in both groups, while additional Aquatic Quadriceps Bench training was used in treatment group. The Aquatic Quadriceps Bench was self-designed and self-developed by China Rehabilitation Research Centre. Patients were assessed with American spinal injury association (ASIA) lower limb motor score, modified Lovett manual muscle test (mMMT), walking index for spinal cord injury II (WISCI II) , 10 meter walk test (10 MWT), and functional independence measure (FIM) score before treatment and after 8 weeks. *Results:* Before treatment there was no significant difference between the two groups. There were significant differences in all the assessment results in the treatment group after treatment compared with before treatment and compared with the conventional rehabilitation training group. After 8 weeks, ASIA lower limb motor score, WISCI II, 10 MWT and FIM score improved significantly in both groups ($p<0.05$), and Treatment group had significant improvements of ASIA, WISCI II and 10 MWT scores when compared with the control group ($p<0.05$). *Implications:* On the basis of conventional rehabilitation program, Aquatic Quadriceps Bench training has important significance in improving lower limbs' motor function in patients with incomplete spinal cord injury. As a new kind of rehabilitation devices, the Aquatic Quadriceps Bench is worth promoting.

PO-1277

CHALLENGES OF CONDUCTION RESEARCH STUDIES INTO POWER WHEELCHAIR USERS FOR DEVELOPING NEW ASSISTIVE TECHNOLOGY

Hsin-Yi Liu[1,2], Rosemarie Cooper[1,2], Annmarie Kelleher[1,2], Rory A. Cooper[1,2]*

[1]Department of Rehabilitation Science and Technology, University of Pittsburgh,United States, [2]Human Engineering Research Laboratories, Department of Veterans Affairs, United States

Objective: To share the challenges in conducting research into power wheelchair (PWC) users for improving their quality of life. *Method:* Through the process of developing a new assistive technology device for (PWC) users and conducting research studies to evaluate the effect of the device in their daily life, the research team has been facing many challenges. We want to share these challenges to allow researchers preparing better to conduct studies among PWC users. *Results:* Subject recruitment is difficult because PWC users are sensitive to changes from their daily routines, devices, and environmental settings. Transportation is a very common issue for PWC to participate in any activities. A novice PWC user may still mentally process the fact of needing a PWC for mobility and starting home

modification. This status is overwhelming and may prevent PWC users from participating in a research study. Some PWC users are living with significant assistance from their caregivers, and therefore the caregiver's attitude toward the research activity will determine whether the user can participate in the study. *Implications/Impact:* Developing new assistive technology to improve the quality of life of PWC users and their families is necessary and important. Researchers should plan the study protocol more carefully, and establish statistical analysis methods to appropriate demonstrate the significance of the study results. The contents of this abstract do not represent the views of the Department of Veterans Affairs or the United States Government.

PO-1278

MAJOR PERIRECTAL HEMATOMA COMPLICATING SACROILIAC JOINT INJECTION" AND THE KEY WORDS AS "SACROILIAC INJECTION, COMPLICATION, HEMATOMA

Emre Adiguzel, Serdar Kesikburun, Evren Yasar, Mehmet Ali Taskaynatan
Department of Physical Rehabilitation and Medicine, Gulhane Military Medical Academy, Turkish Armed Forces Rehabilitation Center, Turkey

Introduction: Sacroiliac joint injection is both a way of confirming sacroiliac joint pain and a therapeutic method. Perirectal hematoma has not been reported before as a complication of sacroiliac joint injection. Here we report a case to take clinicians attentions. *Case Report:* A 40 years old woman presented with buttock pain extending to left hip. After physical examination, patient was diagnosed as having sacroiliac joint dysfunction. We performed fluoroscopically guided sacroiliac joint injection with 22 gauge spinal needle (1 ml lidocaine, mixed with 1 ml betamethasone, after confirming intraarticular position of needle by contrast medium). The patient felt relief of the pain immediate after the injection. One day after the procedure, the patient reported a severe buttock pain spreading to posterior aspect of the femur on the left side. Her active and passive left hip movements were painful. She had no sensory or muscle strength loss. She had difficulties with urination and defecation. Because the neurological examination was normal, we suspected a soft tissue pathology obstructing urethra and rectum. A pelvic magnetic resonance imaging revealed a 9x4x5,5 cm sized hematoma which was lining from left obturator to perirectal region. Conservative treatment was recommended. Two days later her pain began to relieve. Urination and defecation became normal. At the laboratory investigations for bleeding diatesis, no hematologic disorder was detected. *Conclusion:* We suggest that, because of anatomical variations, the practician should be alert about the vascular tissues around injection landmarks and the patients should be questioned at early periods of injection.

PO-1279

DRIVING PERFORMANCE ON THE UNIMANUAL AND BIMANUAL STEERING DURING THE SIMULATED DRIVING TASK AFTER STROKE

Hwa-Kyung Shin*, Young-Uk Ryu, Han-Seong Choe
Catholic University of Daegu, Korea

Objective: Stroke causes physical and cognitive impairments that may influence driving ability.The aim of the study was to analyze the driving performance on the bilateral vs unilateral steering during the simulated driving task after stroke. *Methods:* 20 participants with stroke were recruited for this study. Virtual reality (VR) driving simulation system (UC-win/Road Ver.5) was used as the experimental apparatus for driving task. Participants steered with paretic, nonparetic and the both arm in the straight road of VR. Main outcome measures was Offset from the lane center, average speed, and steering variability. *Results:* Using One way ANOVA, Significance was reported across paretic, nonparetic, and both arm ($p<0.05$). *Implication/Impact on rehabilitation:* This pilot study offer provide preliminary evidence for the future direction of VR simulator-based poststroke driving evaluation and training.

PO-1280

THERAPY FOR IMPROVING BALANCE USING VIRTUAL REALITY TECHNOLOGY IN A CHALLENGING AND UNIQUE TRAINING ENVIRONMENT

Arie Burstin[1]*, Heidi Sugarman[2], Asaf Manor[3], Eldan Karr[3], Riki Brown[1]
[1]Beit Rivka Geriatric Rehabilitation Center,Israel, [2]Research Institute for the Health and Medical Professions, Ono Academic College, Kiryat Ono, Israel,Israel, [3]Kinvestix, Israel,Israel

Modern, evidence-based rehabilitation guidelines include functional, goal-based training and numerous repetitions at the appropriate intensity. Virtual reality (VR) satisfies these guidelines by combining relevant experience with multi-sensory stimulation in an ecologically valid and safe environment. In the present study, we demonstrate the feasibility of using a combined innovative resistance system and VR training to improve balance and movement smoothness in a patient with high level gait disorders. The subject was a 72-year-old woman who had been suffering from a high-level gait disorder for three years and was experiencing problems in walking and balance. The VR system used was the SeeMe system. This novel computer-based system uses the Microsoft Kinect sensor to detect motion in three dimensions in a double display setting with a large television screen. The therapist can make on-line changes, adapting the parameters of the program to the patient's ability, while the patient interacts normally within the virtual story.VR training was combined with resistance training provided by POWER VEST (Kinvestix). The POWER VEST is a wearable system that provides both linear resistance to motion and approximation of joints. Combination VR and resistance therapy was given for one 45-min session. We found that therapy improved the accuracy of movement in space, as measured by SeeMe, the stability of the patient, as measured by the Fokuda Test, and the ability to stand on one foot. We attribute these improvements partly to the addition of significant proprioceptive information while performing tasks in virtual environments. The results of this study indicate potential feasibility of combined VR and strength training using the SeeMe VR and the POWER VEST wearable resistance systems.

PO-1281

MYOELECTRICALLY CONTROLLED FUNCTIONAL ELECTRICAL STIMULATION OF DORSIFLESOR MUSCLE: EFFECTS OF PLANTAR PRESSURE ON STROKE PATIENTS

Xiangnan Yuan, Zhiqiang Zhang, Yuchen Wan, Shi Sun
ShengJing Hospital of China Medical University, China

Objective: To evaluate the therapeutic effects of myoelectrically controlled Functional Electrical Stimulation (FES) to the plantar pressure of stroke survivors. *Method:* 10 subjects were included in this study, who were with foot drop resulting from stroke, but could partly dorsiflex the paretic limb's ankle. Subjects performed tests (walking on the RS-footscan plate) with myoelectrically controlled FES to the paretic limb and without FES. Plantar pressure data of paretic limb were compared with and without FES intervention. *Results:* Initial Paretic foot contact was changed from Meta 5 to Heel when Performed with FES ($n=8$). The curve of Center of position (COP) was smoother with FES than that without FES. The ratio of Heel Medial, Heel Lateral and Meta 1 contact time

to the whole foot contact time were significantly increased from 74.1%±7.8%, 74%±7.6% and 81%±8.6% to 81%±6.2%, 80%±5.9% and 88%±5.1% separately, while the ratio of meta 5 was decreased significantly from 86%±0.8% to 79%±3.3%. Similarly, the contact area ratio was significantly improved ($p<0.05$). Peak force of Heel Medial, Heel Lateral and Meta 1 ($p<0.05$) were increased, while Peak force of Meta 5 was reduced. A significant ($p<0.05$) increase of Meta1 impulse was also found. *Implications on Rehabilitation:* Myoelectrically controlled FES can improve Heel strike and Meta contact area and force, which would be benefit for the stability and the gait pattern of selected stroke survivors.

PO-1282

A THREE ARM PILOT RANDOMIZED CONTROLLED TRIAL OF USING WII FOR POST STROKE UPPER LIMB RECOVERY: RATIONALE, PROTOCOL AND DEMOGRAPHICS

Yong Joo Loh, Keng He Kong*, Shirlene Toh, Audrey Chai, Ernest Thia, Yan Ming Soh, Chwee Yin Ng
National Healthcare Group, Singapore

Background: Conventional rehab's intensity is limited by heavy dependency on finite therapist resource. The potential benefits of COTS include a safe and interesting platform to augment conventional rehabilitation strategies. *Aim:* To investigate if Wii can effectively be used as a rehabilitation tool to enhance post stroke upper limb recovery. *Hypotheses:* Wii is comparative to additional conventional therapy and better than self-guided exercises to enhance post stroke upper limb recovery. *Methodology:* A single centre, assessor blinded RCT involving patients admitted within 6 weeks after first stroke. A total of 105 patients will be recruited, divided into 3 arms (35 patients each). As baseline, all patients will receive conventional, multidisciplinary rehabilitation administered by therapists. Wii arm will receive additional 12 supervised sessions (4 times a week for 3 weeks, 1 hour per session). Another arm will receive 1 h of self-guided exercises. The last arm will receive 1 h of additional conventional therapy conducted by a specified therapist. Primary outcome is Fugl Meyer upper limb motor score and Action Research Arm Test (ARAT). Secondary outcomes include Functional Independence Measure (FIM), Stroke Impact Scale (upper limb items) and depression scale (CES-D). *Results:* The ongoing demographics data of recruited patients will be presented together with preliminary data. The study will complete its recruitment by June 2013. *Discussion:* This is the first 3 arm randomized parallel controlled trial that involves direct comparison of conventional therapy with gaming. Positive results from this study may introduce a cheap and practical way of increasing intensity of rehab that may be generalized to community or home based settings.

PO-1283

EXERCISE TRAINING REDUCES BLOOD PRESSURE VIA AN ENHANCED BLOOD PRESSURE-REGULATING MECHANISM IN HYPERTENSION

Yanxia Pan[1], Na Dang[1], Cheng Lin[1], Wei Wang[1,2]
[1]Department of Rehabilitation Medicine, Fujuan Medical University, Fuzhou, 350004, China, [2]Department of Cellular and Integrative Physiology, University of Nebraska Medical Cener, Omaha, USA

Objectives: Baroreflex, a key regulating mechanism of blood pressure hemostasis, is attenuated in hypertension. The present study was to determine whether exercise training (ExT) reduces high blood pressure by an enhanced baroreflex function in spontaneously hypertensive rats (SHR). *Methods:* Wistar rats and SHR were divived into sendentary and trained groups, n = 10 each group. The trained rats run on a treadmill at 60 min/d, 6 days/wk for 8 weeks. Blood pressure was measured using a tail-cuff method. Baroreflex function was assessed by phenylephrine-induced increase in blood pressue and bradycardia. *Results:* Systotic blood pressure (SBP) was significantly decreased after 4 weeks of treadmill runing and further fell at the end of training protocol. Compared with sedentary SHR, SBP in trained SHR was lower (172 ± 6 mmHg vs. 163 ± 5 mmHg, $p<0.01$). Heart rate (HR) was reduced in trained SHR than in sedentary SHR (342± 13 beats/ min vs. 365± 11 beats/ min, $p<0.05$).Furthermore, ExT restored baroreflex function in SHR, and baroreflex sensitivity was increased in trained SHR compared with sedentary SHR. In contrast, ExT had no effects on SBP, HR and baroreflex function in Wistar rats. *Implications:* Exercise training reduces high blood pressure associated with an improvement of baroreflex function in the state of hypertension. Exercise training is an important physical therapy for hypertension rehabilitation.

PO-1284

EFFECT OF SUPERIMPOSED ELECTRICAL STIMULATION WITH BACK EXTENSION ON BACK MUSCLE STRENGTHENING

[1]Chang Han Lee, Jae Hyeon Park, [1]Shi Uk Lee
Department of Rehabilitation Medicine, Seoul National University College of Medicine, [1]Department of Rehabilitation Medicine, Boramae Hospital, Seoul National University College of Medicine

Objectives: To determine the additional effect of electrical stimulation (ES) of back extensor muscle on back muscle strength in healthy adults. *Study design:* Prospective, single blinded, randomized controlled trial. *Methods:* Twenty healthy adults without low back pain for last 1 month, 20-29 years of age, were recruited. Subjects were randomly allocated into one of two groups. In group A (ES group), surface electrodes were attached to bilateral L2 and L4 paraspinal muscles. Intensity of the stimulation was set for maximal tolerability. With voluntary contraction of back extensors, electrical stimulation was superimposed for 10 seconds. Resting period was followed for 20 seconds. In group B (sham stimulation group), same procedure was applied except stimulation intensity set at just above sensory threshold. All subjects performed back extension exercise using Swiss-ball, 10 contractions per set, 2 sets in a day, 5 times a week for 2 weeks. The primary outcome measure was the change in isokinetic strength of the trunk extensor at 60 and 180 degrees per second by using isokinetic dynamometer (Biodex System 3, Biodex Medical Systems, Shirley, NY). In addition, endurance was measured by using modified Sorensen test. Outcome measures were assessed at baseline and 2 weeks after the each intervention. *Results:* After 2 weeks' of back extension exercise, peak torque of trunk extensor and endurance increased significantly compared to baseline in both groups ($p<0.05$). The mean increase in the back muscle strength after 2 weeks was greater in ES group than sham stimulation group although there was no statistical significance. In addition, the gain of endurance was not significantly different between the two groups. *Implications/Impact on rehabilitation:* This study suggests that 2 weeks of back extensor strengthening exercise on Swiss-ball was effective for strength and endurance. Superimposed ES on back extensor during strengthening exercise could provide additional effect on increasing strength but further study with large number of subjects is needed.

PO-1285

REHABILITATION EFFECT OF PARTIAL BODY WEIGHT SUPPORT TREADMILL COMBINED WITH TASK OF KNEE AND ANKLE CONTROL TRAINING IN HEMIPLEGIA

Jubao Du
Beijing Xuanwu Hospital, China

Objective: To explore the effects of partial body weight support treadmill (PBWST) combined with task of knee and ankle control training on motor function of lower limb, walking ability and activity of daily living (ADL) in hemiplegia who cannot control knee and an-

kle joint well after stroke. *Method:* Seventy four patients (hemiplegiclimb Brunnstrom′s scale ≥ II with stable stroke within 3 months were test group, who have accepted targeted therapy and PBWSTT. Sixty seven patients received the neuron-facilitation technique and PBWST training in the past served as control group. *Result:* The result obtained from the two groups pre- and post treatment, showed great difference. The score of FAC of the test group after treatment (3.8±1.1) is distinctly higher thanpre-treatment (0.36±0.12), $p<0.01$. The score of FMA of the test group after treatment (43.6 ±6.8) was obviously higher than pre-treatment (22.6±6.5), $p<0.01$. The score of FIM of the test group after treatment (78.8±6.6) was markedly higher than pre- treatment (32.8±3.3), $p<0.01$. The score of FAC of the control group after treatment (2.5±0.9) was higher than pre- treatment (0.39±0.28) ($p<0.05$). The score of FMA of the control group after treatment (34.3±4.8) was distinctly higher than pre- treatment (22.1±6.2) ($p<0.05$). The score of FIM of the control group after treatment (70.8±6.2) was significantly higher than pre-treatment (32.3±3.6) ($p<0.05$). The score of FAC,FIM and FMA of the test group after treatment exceeded that of control group ($p<0.05$), After treatment the patients of the test group who could walkindependently were significantly exceeded those of the control group ($p<0.05$). *Conclusion:* The application of partial body weight support treadmill combined with task of knee and ankle control training has distinctly improved the motor function of lower limb, walking ability and activity of daily livingfor patients after stroke.

PO-1286

COMPARISON OF MODULAR PROSTHESIS WITH SILICONE LINER PROSTHESIS IN PATIENTS WITH TRANSTIBIAL AMPUTEES

Evren Yasar*, Fatih Tok, Bayram Kelle, Bilge Yılmaz, A. Salim Goktepe, A. Kenan Tan

GMMA, Dept. of PM&R, Rehabilitation Center, Ankara-Turkey

Objective: To compare modular prosthesis with siliconeliner prosthesis in patients with transtibial amputees. *Materials and Method:* This study included the hospitalized combattranstibial amputees in Rehabilitation Center. Epidemiologicaldata and stump complications of the patients were reviewed. *Results:* The study included 209 below knee amputees. Mean age of patients was 23.12±3.99 years. 55% of the patients were still actively working. 88% of them were using modular prosthesis and 12% of them were using silicone liner prosthesis with pin system. Stump complications was not observed in 61.1% of patients. However, neuroma and spur formation were observed in 13.5% of patients. Skin problems were observed in remaining patients. While both groups were similar in terms of age and duration of prosthesis use, stump complications of patiens with silicone liner prosthesis with pin system were significantly fewer than those using modular prosthesis ($p<0.05$). *Implications/Impact on rehabilitation:* While most of the patients were able to return to their active career with both modular prosthesis and silicone liner prosthesis with pin system, silicon liner prosthesis have some advantages over modular ones in terms of stump complications.

PO-1287

BINAURAL BEATS AND MUSIC THERAPY IN THE REHABILITATION OF PATIENTS WITH HYPERTENSION

Tarek Shafshak*, Ebtihag Hamdy, Shereine El-Sherief, Omnia Aly

Faculty of Medicine, Alexandria University, Egypt

Objective: To assess the effect of binaural beats (BB) and music therapy on blood pressure (BP). *Methods:* 30 patients with mild essential hypertension (HTN) and without previous experience to antihypertensive drugs were included. Patients were divided randomly into two groups each of 15 subjects. Patients of group I listened to BB combined with relaxing music; and those of group II listened only to relaxing music. The BB frequency decreased from 33 Hz to 13 Hz in 10 min (rate= 4Hz/2 min); then the frequency decreased to 7 Hz over 20 min (rate= 2 Hz/5 min). Each patient received 12 sessions (30 min each), scheduled as 3 sessions/week (on alternate day) for 4 successive weeks. BP was measured before and after each session. *Results:* There was no significant difference between groups regarding age, sex, occupation, body weight, base line BP or duration of HTN. Therapy was tolerated by all patients. There was a significant reduction ($p<0.01$) in the systolic and diastolic BP in both groups. The mean decrease in systolic BP was10.1±1.8 (range= 7.3-12.4) mmHg in group I; and was 6.6±1 (range= 5.2-8.2) mmHg in group II. The mean decrease in diastolic BP was 6.9±1.2 (range= 4.6-9) mmHg in group I; and was 4.7±0.4 (range= 4-5.5) mmHg in group II. The decrease in systolic or diastolic BP was significantly more in group I ($p<0.01$). Implication BB and music therapy are safe and effective in treating patients with HTN.

PO-1288

DEVELOPMENT OF VIRTUAL REALITY SYSTEMS FOR COGNITIVE REHABILITATION

Youliang Huang[1], Yuan He[2]

[1]Information Center,Beijing University of Chinese Medicine, [2]Ear-Nose-Throat department,Beijing Rehabilitation Center

Objective: In response to the severe challenges of the cognitive rehabilitation of patients with neuropsychological disorders, We development a virtual reality systems to help patients rehabilitation. *Method:* Combining with pathological features of patients, we have developed a virtual reality system for test and rehabilitation of patients.A set of virtual reality based task-oriented multi-mode rehabilitation strategy was proposed. We design a virtual environment.It is a shopping in the Bookstore. Shopping in the Bookstore is a virtual environment for the treatment of patients with cognitive disorders. The patient's objective is to buy books and to memorize prices, opening h, etc. As a result, the patient will need to plan the process taking several restrictions into account: time, money, number of books they must buy, etc. The system uses a joystick for navigation and interaction. The virtual environments are visualized by the patient using a LCD monitor. *Result:* Rehabilitation system based on Virtual Reality technology is being validated in the Speech Rehabilitation Service of Beijing Rehabilitation Center. In order to learn its potential for improving the cognitive rehabilitation process. The first patient group selected (three patients, 18 to 45 years old) are very interested in and they receive stimuli when they overcome these situations. In addition, all patients consider the system devices very easy and intuitive to use. *Implications:* A set of strategy and theory for patient's cognitive rehabilitation training has been formulated. It can be used to develop and to guide the virtual reality based rehabilitation system.

PO-1289

EFFECT OF FITNESS QIGONG (YI JINJING) ON CARDIO-PULMONARY FUNCTION AND PHYSICAL QUALITY OF THE ELDER FEMALE PEOPLE

Weibing Wu[1,2], Xiaodan Liu[1,2]

[1]School of Kinesiology, Shanghai University of Sport,China, [2]School of Rehabilitation Medicine, Shanghai University of Traditional Chinese Medicine, China

Objective: To explore the effect of Fitness Qigong (Yi Jinjing) exercise on cardio-pulmonary function and physical quality of the elder female individuals. *Method:* The subjects of this experiment are 64 elder female individuals who were divided into 2 groups randomly: exercise group (34 cases) and control group (30 cases). The exercise group practiced 40-50min pre time, six times pre week for six months, and the control group had no exercise with collective or individual scheme. The indexes of cardio-pulmonary function

and physical quality of the elder female individuals were measured before and after 6-month exercise. *Results:* After six months Yi Jinjing exercise, the exercise group showed decrease in DBP ($p<0.05$), increase in FEV1 ($p<0.05$), significant increase in FEV1% ($p<0.01$), increase in FC, VC, FVC and MVV ($p>0.05$), significant increase in back strength ($p<0.01$), increase in sit-and-reach and eye-closed and single-legged ($p<0.05$), significant decrease in reaction time ($p<0.01$). The control group showed no significant change in these variables ($p>0.05$). *Implications:* Fitness Qigong (Yi Jinjing) exercise has the positive effects on cardio-pulmonary function, and improves the strength, flexibility, balance and sensitivity physical qualities of elder female individuals.

PO-1290

EFFECTS OF BUZHONGYIQI DECOCTION ON FATIGUE AFTER REHABILITATION OF STROKE PATIENTS

Ling Feng, Hong Fan, Lingyan He, Xiaofeng Xu, Wenya Ru, Yuefeng Wu

Rehabilitation Center of Shaoxing Peoples Hospital of Zhejiang Province, Zhejiang Province Traditional Chinese Medicine

Objective: To observe the effects of Buzhongyiqi decoction on fatigue after rehabilitation of stroke patients. *Method:* Totally 100 stroke patients were enrolled, and were treated with regular rehabilitation and Buzhongyiqi decoction based on regular rehabilitation respectively. The fatigue (sEMG Mean Frequence and Media Frequence), motor function (simplified Fugl-Meyer Assessment) and ADL (Bathel Index Rating Scale) were assessed before treatment and 4 weeks after treatment. *Results:* Before the treatment, the sEMG Mean Frequence and Media Frequence, the Fugl-Meyer and ADL scores of the two groups were no significance ($p > 0.05$). The sEMG Mean Frequence and Media Frequence, the Fugl-Meyer and ADL scores of the two groups were -.66±0.53, -1.90±2.03 (p±1.10, -1.75±2.26 (p ±10.97, 42.48±14.04 (p ±13.19, 57.62±12.33. *Implications:* Buzhongyiqi decoction reduces the fatigue after the rehabilitation of stroke patients effectively, and improves their motor function and ADL ability effectively.

PO-1291

EFFECTS OF VIRTUAL REALITY COMBINED WITH TRADITIONAL OCCUPATIONAL THERAPY ON FUNCTION OF UPPER LIMBS AND HANDS FOR STROKE PATIENTS

Wen He, Kai Wang

Department of Rehabilitation the geriatric Hospital of JING'AN of Shanghai, China

Objective: Virtual reality (VR) is a relative new approach in upper limbs and hands rehabilitation for stroke. VR offers the possibility of creating an interactive, motivating environment in which training intensity and feedback can be manipulated to provide individualized treatments or motor rehabilitation under a range of stimulus conditions that are not easily controllable and quantifiable in the real world, especially in elderly. So we devise three groups of clinical controlled trials, in order to explore the effects of virtual reality combined with traditional occupational Therapy on the function of upper limbs hands for stroke patients. *Methods:* 12 stroke patients were divided into observation group 1 (n=4) for VR, observation group 2 (n=4) for VR combined with traditional occupational Therapy and control group (n=4). All groups were treated with basic medication and physical therapy. The function of upper limbs and hands was assessed by Fugl-Meyer assessment (FMA), and activities of daily living was assessed by Modified barthel index (MBI) before and after treatment. *Results:* There were significant differences in all the three groups in the scores of FMA and MBI after the treatment ($p<0.05$). But only the VR combined with traditional occupational therapy group showed significantly improvement ($p<0.001$). *Conclusion:* Virtual reality therapy combined with occupational therapy can effectively improve the function of upper limbs and hands for elderly stroke patients, and also can even effectively improve the functional activities of daily living.

PO-1292

FEASIBILITY OF A NOVEL TWO-PIECE NASOGASTRIC FEEDING TUBE FOR PATIENTS WITH DYSPHAGIA

Tsung Ju Wu

Changhua Christian Hospital,Chinese Taipei

Objective: Patients with severe dysphagia often require a nasogastric (NG) tube for feeding and administering medication. The exposed section of the traditional nasogastric (T-NG) tube can interfere with patients' social activities and result in distress. Therefore, we conducted a study evaluating the feasibility and safety of a noveltwo-piece NG tube in patients with dysphagia. *Method:* In this prospective study, patients with dysphagia were recruited from the inpatient and outpatient departments of Changhua Christian Hospital between November 2011 and May 2012. Individual patients were excluded who were unconscious or in critical condition, had a T-NG tube <50 or="">60 cm in fixed length, or unable to follow instructions and sign consent forms. The two-piece NG tube was placed in patients for one week, and assessments of safety and effectiveness of the device were performed daily. After one week, the two-piece NG tube was removed and patients received a T-NG tube again. *Results:* Ten patients participated in the study. All patients were able to receive feedings without complication with the two-piece NG tube. No study participants experienced premature removal of the two-piece NG tube. No serious NG tube complications or malfunctions were observed. *Implications/Impact on Rehabilitation:* Results indicate the two-piece NG feeding tube to be feasible in patients with dysphagia. Future improvements to the connector may enhance its performance, and a rigorous randomized controlled trial will examine the effect of the two-piece NG tube on patient quality of life and quality of medical care.

PO-1293

SCIENTIFIC FOUNDATIONS OF AQUATIC REHABILITATION

Bruce E Becker

Department of Rehabilitation Medicine,University of Washington School of Medicine,Seattle WA, USA, United States

Aquatic therapy has broad rehabilitative potential, extending from the treatment of acute injuries, through health maintenance in the face of chronic diseases, yet it remains an underused modality. There is an extensive research base supporting the benefits of aquatic therapy in the management of many medical concerns, both within the basic science literature and clinical literature. This presentation will describe the many physiologic changes that occur during immersion and aquatic therapy as applied to a range of common rehabilitative issues and problems. Because of its wide margin of therapeutic safety and clinical adaptability, aquatic therapy is a very useful tool in the rehabilitative toolbox. Through a better understanding of the applied physiology, the practitioner may structure appropriate therapeutic programs for a diverse patient population.

PO-1294

EFFECTS OF ROBOT-ASSISTED THERAPY COMBINED WITH ELECTROMYOGRAPHIC BIOFEEDBACK ON UPPER-LIMB IN ACUTE STROKE PATIENTS

Zhen Liu[1], Pan-De Zhang[1], Xiao-Chuan Rong[1], Jin-Xin Zhang[2]

[1]Department of Rehabilitation Medicine, First People's Hospital of Foshan, Foshan, Guangdong, China, [2]School of Public Health, Sun Yat-sen University, Guangzhou, Guangdong, China

Objective: To study the effects of robot-assisted therapy combined with electromyographic biofeedback on upper limb function in acute stroke patients. *Methods:* A total of 30 acute stroke patients were randomly divided into two groups (n=15 ineach). The patients in control group received a conventional rehabilitative program and electromyographic biofeedback. The patients in treatment group received robot-assisted therapy of 30 min one day for 6 days a week for 3 weeks on the basis of conventional rehabilitative program and electromyographic biofeedback. The upper limb motor function and activities of daily living (ADL) were assessed with the Fugl-Meyer Score of the upper extremity Assessment (FMA) and the Functional Independence Measure (FIM) before and after treatment. *Results:* After treatment the scores of FMA and FIM were better than the scores before treatment both in the two groups significantly. At 3 weeks there was no statistical difference in the FMA Scores between the two groups, but at 3 months the patients in treatment group gained better scores significantly. The differences were not significant in the FIM Scores between the two groups both at 3 weeks or 3 months. The changes of scores both on FMA and FIM in treatment group were better than control group statistically. *Impact on Rehabilitation:* Robot-assisted therapy combined with electromyographic biofeedback could more effectively improve motor function of upper limb and ADL in acute stroke patients.

PO-1295

MUSCLE NT-3 LEVELS INCREASED BY EXERCISE TRAINING CONTRIBUTE TO THE IMPROVEMENT IN CAUDAL NERVE CONDUCTION VELOCITY IN DIABETIC RATS

Hongwei Li[1], Zhenhai Shen[1], Yun Lu[1], Feng Lin[2], Yawen Wu[2], Zhongli Jiang[2]

[1]Taihu Cadres Sanatorium of Jiangsu Province,China, [2]Nanjing Medical University, China

Objective: To explore the role of exercise in diabetic peripheral neuropathy (DPN) and the mechanisms involved. *Methods:* For this purpose, 31 male Sprague-Dawley rats were used. The rats were assigned to 5 groups: diabetic rats subjected to exercise training (swimming) for 8 weeks (D-Ex1 group), diabetic rats subjected to exercise training for 4 weeks after 4 weeks of being sedentary (D-Ex2 group), diabetic rats which remained sedentary for 8 weeks (D-Sed group), control rats subjected to exercise training for 8 weeks (C-Ex1 group) and control rats which remained sedentary for 8 weeks (C-Sed group). *Results:* Blood glucose levels and caudal nerve conduction velocity (NCV) were evaluated at 0 (baseline), 28 (4 weeks) and 56 days (8 weeks) after the induction of diabetes. The levels of neurotrophin-3 (NT-3) in skeletal muscle were measured by ELISA at the end of the experiment. Blood glucose levels in the D-Ex1 group rats decreased significantly after 8 weeks of exercise. The caudal NCV markedly decreased in all diabetic rats and significantly increased after 4 or 8 weeks of exercise training. Muscle NT-3 levels were significantly lower in the D-Sed compared to the 4 other groups. Muscle NT-3 levels positively correlated with caudal NCV. *Implications:* Swimming training has a beneficial effect on DPN and muscle NT-3 levels, which could help improve caudal NCV in streptozotocin-induced diabetic rats.

PO-1296

MUSLE FUNCTION OF THE KNEE EXTENSORS AND FLEXORS: EFFECT OF CONCENTRIC AND ECCENTRIC ISOKINETIC EXERCISE

Hua Liu[1], Yi Yang[2]

[1]Wuhan institute of physical education,China, [2]Research Department, Wuhan institute of physical education, China

Objective: We compared the performance of the 4 weeks concentric with eccentric isokinetic exercise on knee, and analyzed the optimal protocols of training the knee extensor and flexor. *Methods:* Thirty health college students (22.2±0.6yr) participated in maximum concentric (n=15) or eccentric (n=15) resistance training of the right knee extensors and flexors 3 times per week for 4 weeks. The concentric strength was measured using a Biodex II isokinetic dynamometer at 30°.s-1/60°.s-1/90°.s-1, eccentric strength was measured at 60°.s-1/120°.s-1/180°.s-1. Peak torque (PTQ) adjusted for body weight (PTQ/BW), total work (TW), and agonist/antagonist (agon/antag) ratio was compared between tests. *Results:* Concentric isokinetic training could improve the knee flexors strength during concentric contraction (p<0.01) and eccentric contraction (p<0.05), the extensors strength was also increased during concentric contraction (p<0.01). The agon/antag ratio was decreased (p<0.05) at 90° .s-1. Isokinetic eccentric training, subjects showed the extensor and flexor PTQ uptrend, PTQ of extensor was downtrend at 60 ° .s-1 and 120 °.s-1. The agon/antag ratio dispersion was decreasing, but not significantly different. *Implications:* This study observes the concentric training is superior to eccentric training to improve the muscle strength after 4 weeks training with slow velocity. But eccentric training is better on knee stability. Also the data suggests that for improving the knee extensor eccentric function, isokinetic eccentric training with the angular velocity at intermediate speed should be advised.

PO-1297

EFFECTS OF ELECTRIC STIMULATION COMBINED WITH TRANSCRANIAL DIRECT CURRENT STIMULATION ON UPPER HEMIPLEGIA IN CHRONIC STROKE PATIENTS

Shusaku Kishimoto[1]*, Takashi Kato[1,2], Takashi Suetsuna[1], Yoshie Ishii[1], Jun-Ichi Inobe[1]

[1]Inobe Hospital General Rehabilitation Center,Japan, [2]Graduate School of Oita University of Nursing and Health Science, Japan

Objective: We investigated whether electric stimulation (ES) combined with transcranial direct current stimulation (tDCS) improves motor function of the paretic upper extremity (UE) in patients with chronic stroke. *Methods and subjects:* Eighteen patients were included in the study (mean age 63.8±8.7 years, time from symptom 55.6±40.3 months). UE function was evaluated by Fugl-Meyer Assessment (FMA=17.5±11.7 points). Patients received bihemispheric DCS via cathodal stimulation of the unaffected motor cortex and anodal stimulation of the affected motor cortex. Patients also participated in a rehabilitation program that included ES delivered through the newly designed Finger Equipped Electrode (FEE). The FEE device fits over the therapist's index finger. The palmer surface of the device is made of a metal-coated fabric that enables the therapist to trigger ES by touching the patient, thereby controlling the location and timing of ES. ES was administered to the flexor and extensor muscles of the shoulder, elbow, wrist, and finger of each patient. Patients received 30 min of tDCS twice a day and 120 min of ES training during six times per week for 2-5 weeks (mean 27.4±6.2 days). *Results:* ES combined with tDCS significantly improved FMA scores (mean gain 5 points, p<0.001). *Conclusion:* These results suggest that ES combined with tDCS improves UE paralysis in patients with chronic stroke. Further studies with controlgroups are needed to confirm the effectiveness of the combined treatment.

PO-1298

A PRELIMINARY STUDY OF THE PROLIFERATION OF NERURAL STEM CELLS IN VITRO INDUCED BY RTMS

Hua Liu, Xiaolin Huang

Dept. of Rehabilitation Medicine, Tongji Hospital

Objective: To explore the optimal stimulation parameters of the repetitive Transcranial Magnetic Stimulation (rTMS) on neural stem cells (NSCs) proliferation induced in vitro. *Method:* Neural stem cells derived from neonatal rat were exposed in magnetic stimulation. There were 4 groups: (1) the control group, NSCs were cultured without any stimulation; The rTMS groups, NSCs were treated with 1000 stimuli resulting from (2) 1HZ, 10 trains (3) 10HZ, 20 trains (4) 20HZ,8 trains at maximum output for 5 days. CCK-8 assay was applied to detect the activity of the cells as expressed by OD value, and CFSE was used to valuate the NSCs proliferation and survival. *Results:* After 5 days' stimulation, NSCs in rTMS groups all had some extent proliferation. The neural stem cells with the frequency of 20HZ were significantly high OD value ($p<0.5$). In addition, an increase in the rate of cell division was observed in 20HZ stimulation group. *Impact on Rehabilitation:* (1) rTMS group under 20HZ, 8 trains, total 1000 stimuli for 5 days can be can be more effective to promote the proliferation of neural stem cells in vitro; (2) Further to confirm the mechanisms of rTMS in treating ischemic stroke patient; (3) Cell Transplantation Therapy. As an adjunctive therapy, rTMS may help NSCs proliferation and neurogenesis in vivo.

PO-1299

EFFECTS OF EIGHT-WEEK'S SLING EXERCISE TRAINING ON FEMALE GYMNASTICS ATHLETES SUFFERING

Shan-Shan Mao, Yan-Qing CHANG

Sport Rehabilitation Department, Beijing Sport University, China

Introduction: Scoliosis is one of the most frequent causes that results in low back pain (LBP). Sling exercise training (SET) is a prevailing training method recommended in rehabilitation and performance enhancement. This study is dedicated to investigate whether SET can act the symptoms relief. *Methods:* 18 female gymnastics athletes that suffer from scoliosis with LBP, 20 years old, are selected. They accord with: (1) except symptoms of LBP, no nervous injure or potential serious diseases, and (2) slight scoliosis. They are divided randomly into two groups, controls and SET, each with 9 athletes. The program lasts for 8 weeks. Everybody takes the routine exercise as they do before. The SET group fulfills the neuromuscular activation of SET (Neurac) triple a week and one hour each time. The control group sleeps on couch to rest for 30 min during the SET group doing the training. Before and after the program, 4 aspects are evaluated: (1) Weak Link Testing (WLT), (2) Oswestry lumbago questionnaires, (3) Numeric Rating Scale (NRS), and (4) Cobb's angle. *Results:* In contrast with the control group: (1) scores of NRS are quite significantly declined (p<0.01), (2) the index of Oswestry is also very significantly dropped (p<0.01), (3) the positivity of Weak Link Testing drops sharply from 77.8% to 33.3% (p<0.01), but (4) no marked change takes place on Cobb's angle. *Implications:* The study seems to support that 8-week-Neurac of SET can significantly relieve LBP symptoms. Moreover, the SET may improve the strength of core muscles. (Acknowledgment: This work is supported by Project 2012YB019.)

PO-1300

THE EFFECTS OF A LOWER-LIMB REHABILITATION ROBOT AND BODY WEIGHT SUPPORTED TREADMILL TRAINING ON THE WALKING ABILITY OF HEMIPLEGIC PATIENTS WITH STROKE

Xudong Gu[1], Hua Wu[1], Jianhua Li[1,2], Zhisheng Xu[1,2], Yunhai Yao[1], Yan Li[1], Hui Li[1], Jianming Fu[1]

[1]The Second Hospital of Jiaxing, Zhejiang Province, China, [2]Sir Run Run Shaw Hospital, Zhejiang University School of Medicine, China

Objective: To observe the effects of a rehabilitation robot and body weight supported treadmill training (BWSTT) on the walking ability of hemiplegic patients with stroke. *Methods:* Sixty hemiplegic patients were divided randomly into treatment and control groups (n=30 in each). The treatment group received training asisted by a leg rehabilitation robot for 10-20 min once daily, 6 days per week for 8 weeks in addition to conventional treatments and BWSTT.The control group was only given conventional treatments and BWSTT once daily for 8 weeks. Their lower extremity functions, balance and walking ability were assessed with a simplified Fugl-Meyer assessment (FMA) and using the Berg balance scale (BBS) and Functional Ambulation Categories (FACs). *Results:* After training, both groups showed significant improvements in terms of FMA, BBS and FAC results. The treatment group showed significantly better improvements in lower extremity function, balance and walking ability compared with the control group. *Impact on Rehabilitation:* The lower-limb rehabilitation robot and BW STT could together improve balance and walking ability.

PO-1301

RSEARCH AND DEVELOPMENT ON REHABILITATION ROBOTICS BASED ON THE RESTORATION OF WALKING ABILITY IN PATIENTS WITH PARALYSIS

Junhua Wang

Rehabilitation Department GangDong Second Provincial Traditional Chinese Medicine Hospital, China

The gait rehabilitation robot (such as Lockmat) is the skeleton booster type and passive rehabilitation, neither training on standing balance, and not solving the problemo of ankle joint. Researchers can solve the problem of R & d standing balance balance rehabilitation training robot and can solve the problem and ankle active rehabilitation of gait rehabilitation training robot. Balance rehabilitation training robot is composed of four parts such as weight loss system,foot standing mode automatic conversion system, the pressure sensing system and video display system. Achieving more than 10 kinds of static, dynamic automatic balance rehabilitation training mode, by patients in weight loss and virtual reality technology condition, is through the "step base", "base changes before and after step height changes and" step "base" swinging back and forth. Gait rehabilitation training robot is composed by weight loss system, functional electrical stimulation system, a walking track power system and a visual display system. Gait rehabilitation training is a very active functional electrical stimulation for gait rehabilitation mode, through electromyography EMG feedback evaluation, stimulation, and mimicking the normal ankle, knee, hip and pelvis trajectory,under patients in weight loss and virtual reality technology. It can also be achieved: 1. gait rehabilitation training by passive functional electrical stimulation, 2. assisted by active gait rehabilitation training, 3. assisted by the passive rehabilitation training. The above is based on walking ability in patients with paralysis recovery, from the standing balance training to walk training rehabilitation robot development.Because of weight loss device, suitable for paralyzed patients early, recovery period.

PO-1302

DACHOR- AN ACTIVE ORTHOTIC SOLUTION FOR DROP FOOT TREATMENT

Cátia Galvão[1]*, Paulo Melo[2], Carlos Vasconcelos[2], Jorge Martins[2], Miguel Silva[2], Dava Newman[3]

[1]Department of Physical Medicine and Rehabilitation, Hospital de Curry Cabral, Lisbon, Portugal, [2]IDMEC, Instituto Superior Técnico, Universidade Técnica de Lisboa, Lisbon, Portugal, [3]Aeronautics and Astronautics Department and Engineering Systems Department, MIT, Massachusetts, USA

Objective: The conventional approach to treat drop-foot gait relies on passive mechanical braces known as Ankle Foot Orthoses (AFO). Although these AFOs have been shown to improve gait, they only provide passive support during locomotion. Within this scope, the

DACHOR (Dynamics And Control of Hybrid active ORthoses) project proposes the development of an active AFO comprising a mechanical actuator, to provide support throughout all gait phases, combined with a Functional Electrical Stimulation (FES) actuator, that will harness as much energy as possible from the patient muscles, until fatigues start to surface. *Methods:* Development of a hybrid orthosis with characteristics of a mechanically-actuated active AFO combined with functional electric stimulation. *Results:* The DACHOR project developed an innovative Hybrid Active AFO (HAAFO) to treat drop foot. Currently, the mechanical actuator and the FES systems have been built, together with a sensor network of inertial and pressure sensors that enable correct detection of the gait phases. To be able to better help the daily locomotion of drop foot patients, the HAAFO will use a hybrid controller architecture, that minimizes energy consumption and maximizes foot function by balancing the FES and mechanical actuators usage during gait. The uniqueness of this HAAFO system is based on the active role that the mechanical part plays when the muscle is fatigued and FES is no longer efficient. *Implications/Impact on rehabilitation:* This project will allow a passively and actively assisted motion of the ankle during gait with the benefits of FES rehabilitation.

PO-1303

A NEW LEG/WHEEL STRUCTURAL CLIMB STAIRS ELECTRIC-WHEELCHAIR

Hongbo Wang, Xiaohua Shi, Qi Li, Li He
School of Mechanical Engineering, Yanshan University, China

China has entered into the aging society period and the disabled members has increased year by year, it is regarded as a serious social problem that how to help the old and the disabled men up/douwn stairs.Though traditional wheel chair was the necessary auxiliary equipment for the men lower extremities cinstrained,but it is fulfilled to realizd up/down stairs.so we developed the electric-wheelchair embodies the climb funtion as shown in fig1. 1. The equipment contained 8 legs and a pair of drive wheels. The wheelchair run with wheels in the gentle road, using two-dimensional rocker to control direction and speed,similar to other Electric-Wheelchair. To complete climb stairs action, the wheelchair needs the 8legs. Every leg is a electric telescopic rod. The foundation of the equipment include two platforms,Each consists of 4 legs. It provides support and balance. The motion of the two platform realized by motor drive the screw. The process of the climbing is shown in fig 1.2. The parameters of distance and height can be setted in the controller. It is more effective in a broader scope of environments and could do more to help users.

PO-1304

PRIOR EXPOSURE TO ENRICHED ENVIRONMENT REDUCES NITRIC OXIDE SYNTHASE AFTER TRANSIENT MCAO IN RATS

Kewei Yu, Yi Wu, Jie Jia, Yongshan Hu, Qi Zhang, Hongyu Xie
Fudan university, huashan hospital, China

Increasing evidence shows that exposure to an enriched environment (EE) after cerebral ischemia/reperfusion injury is neuroprotective in animal models. However, little is known about of the neuroprotective effects of EE exposure prior to injury. The current study examined the effects of prior EE exposure on inducible and neuronal nitric oxide syntheses (iNOS and nNOS) after transient middle cerebral artery occlusion (MCAO) in rats. A total of 72 rats were exposed to EE or standard housing (SC) for one month, followed by 90-min MCAO and reperfusion or sham surgery, leading to the following three groups: 1) EE + MCAO (n=24), 2) SC + MCAO (n=24), 3) SC + sham (n=24). Rats were sacrificed at 1, 6, or 24 h after MCAO (n=6/group) for iNOS and nNOS mRNA quantification by real-time PCR or were evaluated for neurological deficits, then sacrificed to assess infarct volume (n=6/group). Results showed that prior exposure to EE reduced iNOS and nNOS mRNA and improved neurological status after MCAO without affecting infarct volume, suggesting that EE may provide neuroprotection via ischemic preconditioning.

PO-1305

CLINICAL OBSERVATION OF ELECT ACUPUNCTURE COMBINED WITH LOCAL MASSAGE ON ACUTE IDIOPATHIC FACIAL PARALYSIS

Jingyuan Deng[1], Yu Peng[1], Chunyang Fan[1], Yanchao Cui[1], Jun Feng[2], Hongying Cui[1], Fei Mao[1], Xiaohong Hu[1], Zhonghua Wang[1]
[1]Department of Rehabilitation Medicine, the First Affiliated Hospital, Medical School of Xi'an Jiaotong University,China, [2]Department of Neurology, the First Affiliated Hospital of Medical College, Xi'an Jiaotong University, China

Objective: Idiopathic facial paralysis (IFP, Bell's palsy) is a common, frequently occurring disease in clinic; the elect acupuncture is wildly used in the treatment of Bell's palsy. However, due to the long course of the tradition simple electro-acupuncture treatment, it is hard to persist for the patients. The authors improved the treatment combined with the local massage show good results in the clinical treatment. Here we report this comparison study with a 165 -cases scale. *Methods:* We randomly assigned 165 patients with idiopathic facial paralysis onset within 7 days (Male, n=68; Female, n=97; 2-70 years old) to receive the elect acupuncture treatment with (Observation group) or without the local massage (Control group). We set, ten days as one course of treatment, the clinical efficacy was evaluated every course for total 3 courses with House-Brackmann facial nerve grading system. *Results:* After the first course, the cured cases in treatment group compared with control group was significantly increased (p<0.05), the effective rate of the two groups were 100% and 82.5%.There was a statistically significant difference between the two groups (p<0.05). *Implications/Impact on Rehabilitation:* Both elect acupuncture combined with local massage and elect acupuncture only were effective in cure acute idiopathic facial paralysis, and elect acupuncture combined with local massage is better than elect acupuncture only.

PO-1306

THE APPLICATION OF HIGH-VOLTAGE STATIC CURRENT AND MAGNETIC FIELD IN INSOMNIA REHABILITATION AND THERAPY EVALUATION

Yuanli Li, Zhaohui Liu
Department of Rehabilitation and Physiotherapy, Tangdu Hospital, The Fourth Military Medical University, China

Objective: To explore low-frequency high-voltage static current and alternate magnetic field for insomnia rehabilitation and its therapy evaluation. *Method:* A total of 92 cases with insomnia were randomly divided into control group, high-voltage static current group and magnetic therapy group. Static current group have received low-frequency high-voltage static electricity one time per day, 10 times for a course treatment; magnetic therapy group received alternating magnetic field treatment one time per day, 10 times for course of treatment. Respectively SPIEGEL and the percentage of clinical observation scale to assess their insomnia treatment. *Results:* Treatment of insomnia in low-frequency electrostatic prominent effective rate 62.50% (p<0.01,vs control), the total effective rate was 93.75% (p<0.01,vs control) ; alternate magnetic field treatment of insomnia prominent effective rate 53.33% (p<0.01, vs control), total effective rate was 93.33% (p<0.01,vs control). *Conclusion:* Both the low-frequency high-voltage electrostatic and alternating magnetic field therapy have possess excellent effect on insomnia rehabilitation treatment, low-frequency electrostatic prominent has a superior therapy effect than the alternating magnetic field application.

PO-1307

TASK-ORIENTED THERAPEUTIC BRAIN COMPUTER INTERFACE (BCI) APPLICATION TO PATIENTS WITH SEVERE HEMIPARESIS

Toshiyuki Fujiwara*, Atsuko Nishimoto, Michiyuki Kawakami, Atsuko Hoeie, Atsushi Maeda, Daisuke Kamatani, Junichi Ushiba, Akio Kimura, Meigen Liu
Keio University School of Medicine, Japan

Objective: BCI can directly translate brain signals for the intension of moving fingers into commands for control of a motor-driven hand orthosis. BCI systems estimate patient's motor intention from the amplitude modulation of event related desynchronization (ERD). We developed a new compact BCI system and applied it to a clinical rehabilitation setting. We detect ERD using a pair of dry electrodes. Patients wear the motor-driven orthosis, which extend their paretic fingers triggered with ERD. Using this BCI, patients were trained to pick up and release pegs. *Methods:* Participants were 23 patients with severe chronic hemiparetic stroke. BCI training consisted of a 40-min session per day and was performed for 10 days. Before and after the BCI training, we assessed Fugl-Meyer upper extremity motor function (FM) and motor activity log (MAL) scores. We also measured short intracortical inhibition (SICI) of the motor cortex with transcranial magnetic stimulation and reciprocal inhibition (RI) in the affected forearm. *Results:* After the BCI training we found significant improvements of FM and MAL. We could not find any significant change of unaffected SICI. Before the BCI training, we could not elicit any MEPs in the affected finger extensors. We found MEPs in the affected finger extensors in two patients after the BCI training. The BCI training increased the magnitude of RI and reduced spasticity. *Implications:* Our BCI improved UE motor function and daily use of the paretic hand. It was supposed that the BCI training induced functional recovery based on cortical and spinal plastic changes.

PO-1308

CAN ELECTROSTATIC PULSES WAVES DEVICE (MPK) IMPROVE THE EFFICACY OF HOME-EXERCISE FOR SHOULDER PAIN? SINGLE BLIND, MONOCENTRIC, RANDOMIZED CONTROLLED TRIAL

Francesca Pastorelli, Antonella Grimaldi, Luca Boni, Pietro Pasquetti*
University Hospital of Florence, Italy

Objective: To compare the efficacy of MPK device combined with home-exercise versus home-exercise alone in patient with shoulder pain. *Methods:* Sixty-six patients with subacromial shoulder pain lasting at least one month were randomized in a 1:1 ratio to home-exercise plus activated MPK device or home-exercise plus inactivated MPK device. The primary endpoint was the change in the baseline Constant-Murley score (CMS) 5 weeks after the start of treatment. Estimates of treatment effect were obtained with GLMs, adjusting by baseline values, and ITT approach. *Results:* Baseline characteristics were well balanced between the two study groups. The median age was 56.5 years (range 30-65), 61% were female, median CMS and pain VAS were 60.5 and 53, respectively. Most of participants (98.5%) completed the 5 week study visit. The average change in the CMS was higher in the home-exercise plus MPK group (19.4; 95% CI: 15.1–23.7) than in the control group (9.1; 95% CI: 5.3–12.9). The adjusted estimate of the treatment effect was equal to 9.1 (95% CI: 4.2–14.0; $p<0.001$). Higher improvement of pain was seen in the experimental arm, with a difference of the average reduction of VAS equal to +12.5 points (95% CI: 4.3–20.6; $p=0.003$). Change in CMS was also significantly higher after 5 min from the wearing of the MPK device (4.7; $p<0.001$). *Implications/ Impact on Rehabilitation:* MPK device plus home exercise was more effective than home exercise only in improving symptoms of patient with subacromial shoulder pain.

PO-1309

CLINICAL OBSERVATIONS OF JOINT ADHESION TRADITIONAL RELEASE TECHNIQUE AND EXERCISE THERAPY ON SHOULDER DYSFUNCTION

Hui Liu, Bo Liu, Xin Zhang, Pan Yan, Luoxi Chen, Guizhou Yu
Department of Rehabilitation, Sichuan Province Orthopedic Hospital

Objective: To observe the clinical effects of the manipulation of joint adhesion traditional release technique and exercise therapy on shoulder dysfunction. *Methods:* The procedure of joint adhesion traditional release technique was made up of thermal therapy, soft tissue and joint mobilization, cold therapy,three times per week. 71 cases of shoulder dysfunction were treated by joint adhesion traditional release technique and exercise therapy. Pay attention to the function of no pain exercise therapy on recovery of activities of daily living (ADL). The clinical effects were evaluated by the JOA shoulder score of pain, strength, range of motion (ROM), total score and ADL. *Results:* With the treatment (11.21±6.51) times, the JOA shoulder score of pain (12.14±7.97/21.67±6.32), strength (3.00±1.29/3.76±1.14), range of motion (15.27±8.72/22.33±6.63), total score (54.66±19.37/76.38±17.13) and ADL (84.81±14.07/94.53±8.51) were improved significantly ($p<0.05$). *Implications:* Joint adhesion traditional release technique and exercise therapy had exact clinical effects on patients with shoulder dysfunction.

PO-1310

CLINICAL INVESTIGATION OF XINGYI EXERCISES ON REHABILITATION OF ANKLE INSTABILITY

Kaibo Liu, Hui Liu, Xin Zhang, Sa Wu
Sichuan Province Orthopedics Hospital, Department of rehabilitation, China

Objective: To observe the clinical effects of Xingyi exercises on rehabilitation of ankle instability. *Methods:* A randomized, single-blind, controlled method of design was accepted in this investigation. The cases of ankle instability were randomly divided into two groups: experimental group 30 cases with Xingyi and routine ankle muscle strength training; 30 cases of control group with ankle muscle strength training only. Baseline data such as age, sex, height, weight, course of disease, instability of ankle had no differences between the two groups. The parameters including VAS, equilibrium index, isokinetic parameters of ankle, EMGs and JOA ankle performance score were measured pre-investigation and 2, 4, 6 weeks later. All data were analyzed by SPSS 17.0 statistical software. *Result:* After six weeks of training, the intensity of pain, the equilibrium index, the peak torque of diseased ankle plantar flexion, RMS of EMSs and JOA ankle performance score were improved significantly in the experimental group. The improvement rate of the experimental group was 70.42%, and 30.21% for the control group. *Conclusion:* The results indicate that Xingyi and routine ankle muscle strength training on the rehabilitation of ankle instability is more effective than a simple ankle strength training.

PO-1311

TRANSCRANIAL DIRECT CURRENT STIMULATION AND NEUROGENIC BLADDER IN PATIENTS WITH COMPLETE SPINAL CORD INJURY: A PILOT STUDY

Sonia Cremascoli[1], Gabriella Fizzotti[1], Benedetta Cazzulani[1], Alberto Priori[2], Caterina Pistarini[1]
[1]Salvatore Maugeri Foundation,Italy, [2]Policlinico of Milan, Italy

Objective: The neurogenic bladder is one of the main problems related to the spinal cord injury (SCI). In this study we investigate whether the transcranial direct current stimulation (tDCS) may modify the detrusor activity and thus the function of bladder emptying. This is a prospective observational pilot study. *Method:* We considered 6 patients with complete spinal cord injury in sub-acute phase, admitted to the Spinal Unit of the Salvatore Maugeri Foundation in Pavia. Each patient is subjected to a urodynamic test, then to a stimulation session with tDCS and, at the end of the treatment, to a second urodynamic examination. The positioning of the electrodes is: the anode on the lumbar region between L2- S3 and the cathode on the abdominal wall of the bladder projection area with passage of a current which gradually reaches 2 mAmpere. *Results:* The statistical analysis of the results of the clinical observations and neurophysiological data, to evaluate a possible difference of the considered parameters before and after the treatment, is in progress. *Implications/Impact on Rehabilitation:* To obtain an adequate management of the neurogenic bladder in SCI patients is one of the main goals in their rehabilitation program. Finding a noninvasive technique that may change the bladder function in these patients may result in a significant improvement in their quality of life. Moreover, this study could help researchers to better understand how the bladder function is affected by SCI and provide new ideas for research.

PO-1312

AN ANALYSIS OF THE SURFACE EMG DETECTION SITES OF FOREARM FOR EMG BRIDGING SYSTEMS

Yuxuan Zhou[1], Xiaoying Lü[1], Zhigong Wang[2], Zonghao Huang[2], Suyang Wang[1]

[1]State Key Lab of Bioelectronics, Southeast University, [2]Institute of RF- & OE-ICs, Southeast University

Objective: An EMG bridging system is a non-invasive version of the microelectronic neural bridge which decodes the real time sEMG (surface EMG) of a healthy limb to stimulate a paralyzed limb in order to rebuild the motor function [1,2]. One important aspect of this technique is to decide the optimal sEMG detection sites of the agonist muscles. In this study we developed a method to decide the sEMG detection sites using a multi-pad electrode array and a sEMG RMS (root mean square) map analysis. *Method:* A multi-pad electrode array has been developed with 138 detection sites made of Ag/AgCl and an inter-electrode distance of 1.8 cm (Fig. 1). The multi-channel sEMGs have been recorded during 4 different movements (finger extension, finger flexion, wrist extension, wrist flexion). The RMS-values of the sEMGs will be calculated and plotted. In addition, the subtraction of sEMG's RMS-values between two extension and flexion movements were pseudo-color plotted in order to decide the sEMG detection site used in real time sEMG decoding. Finally, an LDA (Linear Discriminant Analysis) algorithm [3] for motion recognition will be performed to test the rationality of the chosen detection site. *Results:* The sEMG RMS maps during 4 kinds of movements are plotted in Fig. 2. The subtraction sEMG map was shown in Fig. 3. The red regions will be chosen as the detection sites of the wrist agonist and the blue regions, as the finger agonists. The LDA motion recognition results are shown in Table 1 with a high accuracy. *Impact on rehabilitation:* The EMG bridge yields a novel way to achieve contralaterally- controlled functional electrical stimulation [4] for extremity rehabilitation in hemiplegic patients. In this study a rational sEMG detection site decision method we proposed.

PO-1313

EFFECT OF TRANS-CRANIAL DIRECT CURRENT STIMULATION ON SWALLOWING FUNCTION IN POST STROKE PATIENTS

Valeria Pingue[1]*, Barbara Cattani[1], Alberto Priori[2], Caterina Pistarini[1]

[1]Salvatore Maugeri fundation,Italy, [2]Policlinico of Milan,Italy

Objective: We investigate the effect of trans-cranial direct current stimulation to the pharyngeal motor cortex combined with swallowing therapy in post-stroke dysphagia. *Method:* 20 patients with sub-acute unilateral hemispheric stroke were randomly assigned to receive 10 sessions lasting 20 min each of either 2-mA anodal trans-cranial direct current stimulation (tDCS) or a sham procedure to the principal pharyngeal motor cortex for two week, along with simultaneous conventional swallowing therapies Severity of dysphagia and risk of aspiration were measured using validated swallowing scales: (Dysphagia Outcome and Severity Scale, Waxman scale and Penetration- aspiration scale) and by video-fluoroscopy ; in addition we have evaluated the neuropsychological assessment with ENB2 (short neuropsychological examination) We exanimated the patients before, immediately after, and 1 month after the last session of treatment. *Results:* the statistical analysis of the results of the clinical observations and neurophysiological data, to evaluate a possible difference of the considered parameters between the two groups is in progress. *Impact on Rehabilitation:* finding a noninvasive technique that can enhance the beneficial effects of motor function in the rehabilitation process in post stroke patients could improve their quality of life.

PO-1314

BOTULINUM TOXIN IN THE TREATMENT OF DROOLING IN TETRAPLEGIC PATIENTS WITH BRAIN INJURY

Sung Hwa Ko, Yong Beom Shin*, Jae Hyeok Chang, Myung Jun Shin

Department of Rehabilitation Medicine, Pusan National University School of Medicine and Biomedical Research Institute, Pusan National University Hospital, Busan, Korea

Objective: To investigate the effect of botulinum toxin type A (BTXA) injection into the salivary gland and to evaluated the changes in the degree of drooling in varied postures in tetraplegic patients with brain injury. *Method:* Eight patients (6 males, 2 females and age 46.6 ± 13.2 years) were enrolled in this study. The severity and the frequency of drooling and the modified Schirmer test was measured for the patients in each posture as supine, sitting and tilt table standing, before the injection, 3 weeks and 3 months after the injection respectively. The severity and frequency of drooling was assessed using questionnaire-based scoring system for drooling severity and frequency. BTXA was injected into each parotid and submandibular gland under ultrasonography-guidance. *Results:* The severity and the frequency of drooling and the modified Schirmer test decreased significantly 3 weeks and 3 months after the injection ($p<0.05$). The results of evaluation according to the posture, drooling was more severe in tilt table standing than in sitting and supine position ($p<0.05$). *Implications:* Salivary gland injections of BTXA under ultrasonic guidance in patients with tetraplegia resulting from tetraplegia who had severe drooling and aspiration symptoms could improve the symptoms for 3 months. However, the severity of drooling was dependent on the posture and the present of involuntary mastication. That is, the amount of drooling increased more in standing than in sitting positions and in sitting than in supine position. Therefore, proper posture and involuntary mastication should be taken into account in the treatment.

PO-1315

TRANS-CRANIAL DIRECT CURRENT STIMULATION IN GLOBAL APHASIA IMPROVES UNDERSTANDING IN SUBACUTE STROKE PATIENT

Valeria Pingue[1]*, Alberto Priori[2], Barbara Cattani[1], Caterina Pistarini[1]

[1]Salvatore Maugeri fundation,Italy, [2]Policlinico of Milan, Italy

Objective: We investigate the effect of trans-cranial direct current stimulation to the Broca 's area in post-stroke severe aphasia. *Method:* We present the case of a patient of 50 years with a left hemisphere brain stroke who developed global aphasia.The patient was submitted to three weeks of treatment with anodal trans-cranial direct current stimulation (20 min each of either 2-mA) to the left superior temporal gyrus and cathodal on the contralateral side during the conventional speech and language therapy. The Italian version of the protocol Aachener Aphasie Test (AAT), a series of tests to highlight any deficiencies in praxis, calculation, non-verbal intelligence (Progressive Matrices Raven, standard version), access to the lexicon (Testing Production of Words, words of Free Association Test) and to evaluation of dysarthria (Robertson Dysarthria Profile) was used to assess the patient before and after treatments. *Results:* after trans-cranial direct current stimulation sessions, the patient was re-evaluated in speech therapy that detected a severe impairment in all tests, but there was an improvement in the understanding. *Impact on rehabilitation:* The results from this study suggesting that trans-cranial direct current may be an adjuvant treatment approach for aphasia rehabilitation therapy in patients in an early stage of stroke.

PO-1316

EFFECTS OF AQUATIC ANKLE TRAINER ON MOTOR RECOVERY OF LOWER LIMB IN STROKE PATIENTS WITH FOOT DROP

Yao Cui[1,3], Fang Cong[1,3], Xue-Jun Cao[1,2], Long Jin[1,3], Feng-Shan Si[1,3], Bin Yao[1,3], Wei Jia[1,3], Dun-Wu Xiao[1,3], You-Lin Li[1,3]

[1]Department of Modality Therapy, Beijing Bo'ai Hospital, China Rehabilitation Research Centre, [2]Institute of Rehabilitation Engineering, China Rehabilitation Research Centre, [3]Capital Medical University School of Rehabilitation Medicine

Objective: To observe the effects of Aquatic Ankle Trainer on the lower limb motor function of stroke patients with foot drop. *Method:* Twenty stroke patients with foot drop were randomly divided into treatment group (10 cases) and control grounp (10 cases). Routine rehabilitation excecises were performed in both groups, while additional Aquatic Ankle Trainer training was used in treatment group. The Aquatic Ankle Trainer was self-designed and self-developed by China Rehabilitation Research Centre. The subjects were treated for 20 min once per day, 5 days a week for 8 weeks. Patients were assessed with active ankle dorsiflexion range of motion (AROM), the modified Ashworth scale (MAS), Fugl-Meyer movement function scale (FMA) assessments, 10 meter walk test (10 MWT), and functional independence measure (FIM) score before treatment and after 8 weeks. *Results:* Before treatment there was no significant difference between the two groups.There were significant differences in all the assessment results in the treatment group after treatment compared with before treatment and compared with the routine rehabilitation training group. After 8 weeks, AROM, FMA, 10 MWT and FIM scores improved significantly in both groups ($p<0.05$), and Treatment group had significant improvements of AROM, FMA, 10 MWT scores and FIM scores when compared with the control group ($p<0.05$). *Implications:* On the basis of routine rehabilitation program, Aquatic Ankle Trainer has important significance in improving lower limb motor function in stroke patients with foot drop. As a new kind of rehabilitation devices, the Aquatic Quadriceps Bench is worth promoting.

PO-1317

SURFACE ELECTRICAL STIMULATION TO THE ABDOMEN IMPROVES MOTOR PERFORMANCES IN THE INACTIVE ELDERLY

Misa Miura[1]*, Masahiro Kohzuki[1], Osamu Ito[1], Makoto Nagasaka[1], Kazunori Seki[2], Yasunobu Handa[3,2]

[1]Tohoku University Graduate School of Medicine,Japan, [2]Sendai School of Health and Welfare, Sendai, Japan,Japan, [3]Division of Developmental Neuroscience, Tohoku University Graduate School of Medicine, Sendai, Japan

Objectives: Strength of the trunk muscles is a key of motor performance, but it declines easily with the process of disuse. In the present study, we investigate local and general effects of the surface electrical stimulation (ES) to the abdominal muscles in the inactive elderly. *Methods:* Twenty inactive elderly (65–89 years) in a nursing home participated in this study were assigned to the ES and non-ES groups in a random order. In addition to the conventional therapy, surface ES to the abdomen to 10 subjects (ES group) for 8 weeks. Functional examination was performed at 0, 2, 4 and 8 weeks after beginning of the study. Moreover the cross-sectional area (CSA) and eleectromyography (EMG) of the abdominal muscles were measured at 0 and 8 weeks after beginning of the study. *Results:* In the ES group, Movement time of sitting up, number of trunk flexion significantly improved after 4 weeks ($p<0.05$). Sit-to-stand time and walking speed improved significantly after 8weeks. Both CSA and EMG activity of the abdominal muscles also increased significantly ($p<0.05$). Neither HDL-cholesterol, LDL-cholesterol, triglyceride, fasting plasma glucose and flexibility of the trunk, Barthel Index or grip strength change significantly. *Conclusion:* ES to the abdominal area has the potential to improve motor performance with reinforcing the abdominal muscles power. The surface ES to the abdomen might be taken into consideration as one of the rehabilitation programs for the inactive elderly.

PO-1318

CURRENT STATES AND FUTURE DEVELOPMENT OF ORTHOSES FOR SPINAL CORD INJURY

Jianjun Li[1,2], Mingliang Yang[1,2], Yiji Wang[1,2], Lin Wang[1,2], Feng Gao[1,2], Liangjie Du[1,2]

[1]China Rehabilitation Research Center, [2]Faculty of Rehabilitation Medicine, Capital Medical University

Objective: To evaluate commercial orthoses, integrate existing orthosis technology for patients with spinal cord injury (SCI). *Method:* Literature analysis and technological evaluation in rehabilitation practice. *Results:* Orthoses, defined as the devices attached or applied to the external surface of the body to improve function, restrict or enforce motion, or support a body segment, can be divided into two major categories: traditional and dynamic orthoses. According to locations of the orthosis installation, we group the traditional orthoses into three categories: upper extremity orthoses, spinal orthoses and lower limb orthoses. Upper extremity orthoses are applied not only to enhance function, but also to protect the hand in a functional position and to prevent contractures while recovery takes place. A spinal orthosis is orthotic device that is placed on the outside of the body to hold the spine in a certain position, thus limiting the motion of the spine. It can also be used to reduce axial loading on, or improve the function of a particular spinal segment of the body. Lower limb orthoses are indicated to assist gait, reduce pain, decrease weight-bearing, control movement, and minimize progression of a deformity. The dynamic orthoses, such as robot, dynamic devices for patients with SCI is one of the most promising technologies. China RehabilitationResearch Centeris now working towards the development of dynamic orthoses that can assist them to return to their family and community. *Impact on Rehabilitation:* Orthosis technology is a very extensive and diverse area in practice. An attempt integrated existing orthosis, electrical stimulation and power may bring innovative devices.

PO-1319

EFFECTS OF ELECTRICAL STIMULATION TO SKELETAL MUSCLE AND EXERCISE ON THE AUTONOMIC NERVOUS ACTIVITY

Misa Miura*, Osamu Ito, Makoto Nagasaka, Masahiro Kohzuki
Tohoku University Graduate School of Medicine, Japan

Objectives: It has been reported that physiotherapy affects autonomic nervous functions. In this study was to determine whether exercise of abdomen and electrical stimulation could improve autonomous nervous activities. *Methods:* Nineteen healthy adults (11 males, 8 females, aged 28.1±6.8 year old) were divided into four groups, exercise of abdomen group, exercise of lower-limb group, an electrical stimulation to abdomen group, a control group.The tasks of each group were performed for four week. The autonomic nervous activities were analyzed using heart rate variability before and after the intervention. *Results:* Before the intervention, there were no significant differences in the parameters of autonomic nervous activity among groups. Parasympathetic activity was increased significantly in the electrical stimulation group, from 464 to 800 msec2 ($p<0.05$), but in the other groups, there were no difference significantly among groups, additionally before and after the intervention. Sympathetic nervous activity was significantly decreased in the exercise of abdomen group, from 5.9 to 4.2 ($p<0.05$). But in the other groups, there were no difference significantly among groups and before and after the intervention. Total power of autonomic nerve activity was significant increased from 6.4 to 8.5 % in the electrical stimulation group, but in the other groups, there were no difference significantly among all groups, in addition to before and after the intervention. *Conclusions:* Exercise of abdomen and electrical stimulation might improve autonomic nervous activity with specific effect on parasympathetic and sympathetic activity.

PO-1320

PHYSIOTHERAPY USING THE HYBRID ASSISTIVE LIMB FOR A PATIENT WITH PARAPARESIS

Daisuke Nishio[1,2]*, Shinichiro Maeshima[3], Aiko Osawa[3], Yoshitake Hirano[1,4], Hiroshi Kigawa[1], Hitoshi Maruyama[2]
[1]Hanno-Seiwa Hospital,Japan, [2]Graduate School of International University of Health and Welfare,Japan, [3]Saitama Medical University International Medical Center,Japan, [4]Graduate School of Human Health Sciences, Tokyo Metropolitan University, Japan

Background: The hybrid assistive limb (HAL) is a wearable robot expected to support for independent mobility of elderly people with muscle weakness and patients with motor impairment. We report the experience of physiotherapy using HAL for a patient with paraparesis caused by spinal cord tumor. *Case Presentation:* A 47-years-old woman with a metastastic spinal cord tumor due to a breast cancer had paraparesis and moderate hypesthesia below Th11 level. She had the capability to hold sitting square, transfer from bed to wheel chair and walk using a walker and both ankle foot orthoses. In addition, she did not have cognitive dysfunction. She was provided with the standing and walking trainings using HAL for five days before hospital discharge and once per week after hospital discharge. Such trainings with HAL and herself training caused to maintenance of activities of daily living (ADL) and working in the office, and improve of ambulatory at least for three months after discharge. *Conclusions:* Physiotherapy using HAL may be useful for maintenance of ADL and improvement in ambulatory ability. HAL can be expected to be used as a brace or a piece of training equipment for future rehabilitation.

PO-1321

EFFECTS IN QUALITY OF LIFE OF SCALP ACUPUNCTURE FOR LONG TIME COMBINED WITH REHABILITATION TRAINING ON THE STROKE PATIENTS WITH COGNITIVE DISFUNCTION

Jianming Fu, Xudong Gu, Yunhai Yao, Jing Wang, Liang Li, Min Gu, Yun Ren, Hankui Yin, Minmin Jin
The Second Hospital of Jiaxing, Zhejiang Province, China

Objective: To observe the effects in quality of life of scalp acupuncture for long time combined with rehabilitation training on the stroke patients with cognitive disfunction. *Methods:* 84 stroke patients with cognitive disorder were raildomly divided into the treatment group (n=42) and the control group (n=42). All patients of two groups were treated with routine therapy and cognitive rehabilitation training by professional physiotherapists, but the patients of treatment group were combined with scalp acupuncture for long time. All cases were regularly evaluated by Loewenstein occupational therapy cognition assessment (LOTCA) and WHOQDL—BREF before and 10 weeks after treatment. *Results:* The scores on LOTCA had significant diference in the two groups before and after treatment ($p<0.05$). Effects of the treatment group are superior to that of the control group ($p<0.01$). *Impact on rehabilitation:* The methods which scalp acupuncture for long time combined with rehabilitation training can significantly improve cognitive ability. Effects of treatment group are superior to that ofthe control group.

PO-1322

THERAPEUTIC EFFICIENCY OF LAMIFAREN GEL PHONOPHORESIS AT CORNEAL ULCER

Victor Egorov[1,2], Galina Smoliakova[1,2], Tatiana Gokhua[1]*
[1]Khabarovsk branch of S. Fyodorov Eye Microsurgery Federal State Institution, Khabarovsk, Russia, [2]Postgraduate Institute for Public Health Workers, Khabarovsk, Russia

Objective: The Lamifaren gel made of brown seaweed, growing on the coast of the Far East, is the active modulator of trophic and immune functions thanks to the high content of various trace substances, vitamins, polysaccharides and carotenoids in its structure. *Method:* For optimization of rehabilitation and recovery treatment of 20 patients (20 eyes) with a corneal ulcer (post-burn and herpetic), refractory to standard metabolic therapy the contact Lamifaren gel phonophoresis was carried out. Before carrying out the contact ultrasonic scoring Lamifaren gel was put in the conjunctival cavity and was put with thin layer on skin of the upper eyelid. Results of treatment showed total disappearance of inflammation signs, edema resorption and restoration of full-fledged epithelial covering of the cornea and its normal thickness (in optical zone – to 540 against 780 microns before treatment) at 15 patients after 8-10 sessions of phonophoresis, at 5 patients – after 12-15 sessions. Visual acuity in the treated patients increased to 0.5-0.7 against 0.2-0.3 initial (on the average on 0.34±0.56). This research testifies to perspective application of the Lamifaren gel phonophoresis for rising of recovery potential of the cornea at the ulcer.

PO-1323

EFFECTS OF A DAO YIN YANG SHENG EXERCISE (DYYSE) ON PHYSICAL HEALTH AND QOL OF MIDDLE-AGED AND ELDERLY JAPANESE POPULATION

Yubo Cao[1,3], Toshio Kobayashi[1], Yukio Urabe[2], Kensuke Norikoshi[1], Akemi Furuyashiki[1], Sanki Lee[1], Hiroshi Shinohara[2], Eri Fujii[2], Junpe Sasadai[2]
[1]Department of Health Promotion and Development, Hiroshima University, Hiroshima, Japan, [2]Department of Sport Rehabilitation, Hiroshima University, Hiroshima, Japan, [3]Beijing Open University,Beijing, China

Introduction: The Dao Yin Yang Sheng Exercise (DYYSE) is a Chinese traditional therapy and it is a type of Chinese Qi Gong. DYYSE's positive effects on healing chronic diseases have been

verified in China. However, it is not clear on how DYYSE affects physical health and quality of life (QOL) of middle-aged and elderly populations. This study focused on Japanese middle-aged and elderly population. Four weeks of DYYSE were conducted, and the subjects were further analyzed for physical functions and QOL indices. *Method:* The subjects of this study were 27 middle-aged and elderly populations (mean age: 64.7 years ±10.7 years) living in Hiroshima, Japan. The evaluation indices for body function were "maximum one-step length" and "time for single leg balance with closed eyes", which are commonly referred to balance function. The QOL was measured using SF-36 indices. The exercise was performed for three times in the first week followed by twice a week for the next three weeks (total of ten times). Pre and post evaluation data were compared and analyzed using t-test using SPSS. *Results:* After four weeks of the DYYSE, the maximum one-step length and the time for single leg balance with closed eyes were increased significantly. Among the sub-scales of SF-36 indices, "physical functioning", "bodily pain", and "general health" have also significantly improved. *Discussion and conclusion:* This study showed that practice of DYYSE is effective not only on physical health but also on the QOL among middle-aged and elderly Japanese.

PO-1324

THE CARRYOVER EFFECT OF FUNCTIONAL ELECTRIC STIMULATIONON WALKING SPEED IN STROKE PATIENTS: A LITERATURE REVIEW

Jia Hu
Yangzhi Rehabilitation Hospital,Shanghai Sunshine Rehabilitation Center, China

Objective: To determine the carryover effect of the single channel functional electric simulation (FES) on the walking speed in adults with chronic stroke. *Method:* Literature search was performed in the following databases with a restriction between 1950 and October 2010: PUBMED, CINAHL, and MEDLINE. Prospective clinical studies were included if peroneal nerve electric stimulation was used to treat stroke subjects and walking speed was used as an outcome measure. Studies were excluded if they involved subjects with a variety of neurologic conditions, used implantable electrodes, or combined electric stimulation with treadmill training. The following data was extracted from the selected studies: study design; the characteristics of subject, description of the intervention, outcome measures and overall results. PEDro Scalewas employed to assess the methodological quality of the studies. *Results:* Four studies were included in this review. Three studies demonstrated that the FES could significantly improve the walking speed of stroke patients while the rest study reported conflicting results. *Conclusion:* There is no solid evidence to demonstrate the carryover effect of FES on the walking speed for stroke patients due to insufficient data and the methodological flaws of the current studies. More well-designed studies with methodological rigor are warranted to investigate the efficacy of the single channel FES on walking speed forstroke patients.

PO-1325

CLINICAL OBSERVATION OF MASSAGE AND SUPER LAZER THERAPY FOR TEMPOROMANDIBULAR JOINT DISORDER SYNDROME

Zaigao Liu, Hongshu Jin, Jie Zheng
Department of rehabilitation, Shenzhen city Longgang District Peoples Hospital, China

Objective: To explore simple and effective treatment method for temporomandibular joint disorder syndrome by investigating 80 temporomandibular joint disorder syndrome patients using massage and super lazer therapy. *Method:* 80 patients with temporomandibular joint disorder syndrome were invloved and then divided into massage combined with super lazer group (the treatment group) and drug group (the control group) equally and randomly, with 40 cases in each group. The therapeutic effect in the two groups was carried out. *Results:* The total effective rate was 92.5% in the treatment group, and 75.0% in the control group. Statistical analysis showed a significant difference ($p<0.05$). *Implications:*Massage combined with super lazer therapy has a good therapeutic effect on temporomandibular joint disorder syndrome.

PO-1326

EFFICACY OF 50 HZ ELECTROMAGNETIC FIELDS ON TRANSPLANTION HUMAN EPIDERMAL STEM CELLS SEEDED IN COLLAGEN SPONGE SCAFFOLDS FOR WOUND HEALING IN A MURINE MODEL

Mingsheng Zhang, Wenfang Bai, Hongxiang Zhu, Weicheng Xu, Bo Wu, Hong Huang
Guangdong general hospital, Guangdong Academy of Medical Sciences, Institute of Geriatric Medicine

Objective: In order to explore the possible efficacy of electromagnetic fields (EMF) for skin tissue engineering, the effects of EMF exposure on transplantion epidermal stem cells (ESC) seeded in collagen sponge scaffolds for wound healing in a murine model were investigated. *Method:* The wound models of a full-thickness defect established with thirty six 7~8-week old nude mice were randomly divided into three groups: a control group, an ESC-only group and an ESC with EMF exposure group (frequency of 50 Hz, magnetic induction of 5 mT, 60 min per day for 20 d). ESC separated from human foreskin and cultured in vitro, were seeded in collagen sponge scaffolds and transplanted to wounds of ESC only group, and ESC with EMF exposure group was exposed to EMF after ESC transplantion. The effects of EMF on morphological changes and the expression of beta1 integrin in regenerated skins were observed. The wound shrinkage rates and healing time were collected to evaluate the repairment of skin. *Results:* Human ESC successfully transplanted in nude mice participated in forming intact skin. Compared with the other groups, the wound healing of ESC with EMF exposure group was the fastest ($p<0.05$), the structure of regenerated skins was more mature, contained more continuity in the number of viable cell layers and rich hair follicles and sebaceous glands, and the human beta1 integrin positive cells appeared at regenerated skin had a larger number. *Implications:* 50Hz EMF as a non-invasive treatment can significantly accelerate the wound healing of ESC transplantion, and restore the structural integrity of regenerated skin.

PO-1327

FUNCTIONAL OUTCOME OF THE SEATING SERVICES CHARACTERIZED BY NEEDS-CENTERED APPROACH

Hiroki Ishihama
Eisei Hospital, Japan

Objective: We have continued seating services for patients who have problems sitting or decubitus while adopting an approach to goal setting by listening to their needs. This study attempted to verify the effect of our seating approach on ADL score. *Method:* Subjects were 57 patients of convalescent and general ward, of the 318 users of the seating clinic From 2006 to 2012.Control group were patients of the same wards who did not use the seating service ($n=432$). As a measure, we used the functional independence measure (FIM). Before and after seating, FIM total score and the gain of each item were compared. Furthermore, FIM improvement rate of the seating group was compared with the control group. The mean age was 70 years old, the main disease was in the order cerebrovascular disorders, other diseases, orthopedic disease, dementia, in both groups. *Results:* After seating, FIM total score was significantly improved ($n=57$, $p<0.01$, number of days between pre and post

evaluation: Mean 14.7 ± 11.8SD). Item improved gain after seating was in the order of wheelchair, toilet transfer, bladder management, upper dressing. FIM improvement rate of the seating group (n=57) was significantly higher than the control group (n=432) (p<0.01). *Implications/Impact on Rehabilitation:* These Results suggest that seating services characterized by needs-centered approach could be effective for improving ADL of the patients. In addition, from the fact that item improved gain was not only Locomotion but also other items, the stability of the sitting posture would be important to the improvement of overall ADL.

PO-1328

EVIDENCES FROM GAIT ANALYSIS: IS ANKLE-FOOT ORTHOSIS WORTH TO USE IN POST-STROKE HEMIPLEGIC SURVIVORS?

Seung-Ki Kim, Deog Young Kim, Jong Bum Park
Department and Research Institute of Rehabilitation Medicine, Yonsei University College of Medicine, Korea

Objective: To assess the effectiveness of ankle-foot orthosis on adult post-stroke hemiplegic patients for walking ability and gait pattern through a meta-analysis with the randomized controlled gait analysis study. *Method:* We searched The literatures on effect of ankle-foot orthosis for walking ability and gait pattern using quantitative analysis in adult post-stroke patients were searched though the PubMed (1950 to July 2012), Korean Journal of Academy of Rehabilitation Medicine (1977 to July 2012). Of the 46 articles, we selected 16 articles that provided quantitative gait parameters using gait analyzer and were randomized controlled trials. We analysed the results as standardized mean differences (SMDs) with Comprehensive Meta Analysis V2 program (Biostat, Englewood, USA). *Results:* We included 16 trails (274 participants) in this update of our review. The ankle-foot orthosis in post-stroke hemiplegic patients did improve the walking speed, cadence, and stride length on affected side, and decrease in double limb stance time, the portion of stance period and increase in the portion of swing period on unaffected side, as well as increase in symmetry at the swing period, and improve the oxygen cost (p<0.05). And, The ankle-foot orthosis did improve ankle dorsiflexion at initial contact and maximal ankle dorsiflexion at swing phase. *Implications/Impact on Rehabilitation:* The ankle-foot orthosis has some evidence to improve the walking ability and gait pattern in post-stroke hemiplegic patients.

PO-1329

AGE BUT NOT SIT OR STANCE, AFFECTS RAPID REACHING MOVEMENT TIME TO VIRTUAL OBJECTS IN RESPONSE TO A SIMPLE OR GO\NO-GO TASK

Riki Brown[1], Arie Burstin[1]
[1]Beit Rivka Geriatric Rehabilitation Center,Israel,[2]Physical Therapy Department, Faculty of Social Welfare and Health Sciences, University of Haifa, Israel, Israel

Virtual reality (VR) technology is being used increasingly by clinicians both for assessment and treatment of sensori-motor and cognitive functions. With recent advances in technology, affordable VR hardware and software, which are more adaptable to the needs of different patient populations, are becoming more readily available. The objectives of the present study were to investigate the reliability and validity of a VR environment (SeeMe), which is based on a portable video capture system mounted on a computer screen, and was developed for the rehabilitation of subjects with a variety of impairments related to motor and balance control. Specifically, using a simple and Go\No-go upper extremity movement- time paradigm, the study was designed to determine: 1. Test retest reliability; 2. Age effect; 3.Effect of standing versus sitting in elderly adults. *Methods:* The tasks involved reaching to virtual balls appearing in random order on the left and right side of TV screen which connects to the computer, placed in front of the participant. In the Simple Movement Time (SMT) task subjects were asked to touch each ball as soon as it appeared. In the Go\No-go task the participants were to touch only the smooth looking balls and avoid from balls with spines. Total duration of each task was one min. For the reliability study, 19 young healthy male and female adults (age ± SD: 24.6±2.9 years) performed the tasks twice while standing with one week between sessions. To determine age effect, 18 young female subjects (age ± SD: 24.9±2.7 years) and 16 older female subjects (age ± SD: 72.2±5.8 years) performed the same tasks as in the previous study. ANOVA was used to determine age and task effect. In the third study a group of 22 elderly participants (age ± SD: 76.6±5.2 years), performed both the SMT and Go\No-go tasks while sitting and standing in a comfortable stance. ANOVA was used to determine task and position effects. Significance was set at $p \leq 0.05$. *Results:* The interclass correlation coefficient (ICC) for the SMT and the Go\No-go were 0.717 and 0.564, respectively. ANOVA resulted in significant age, task, and interaction effects, indicating that not only are older subjects slower than younger adults in both simple and complex Go\No-go times, but the difference between the SMT and Go\No-go is greater in the older subjects. While the Go\No-go was longer than the SMT in the third study as well, no differences were noted in old subjects between performance while sitting or standing. *Conclusions:* The studied VR environment is user friendly to both the operator and older adults, and demonstrates moderate to high test retest reliability. While older adults respond more slowly, particularly when faced with a Go\No-go reaction, the need to maintain upward posture while maintaining a comfortable stance position does not challenge the older subjects sufficiently to effect movement time during stance.

PO-1330

COMPARISON OF CONTINUOUS EPIDURAL ELECTRICAL STIMULATION AND TRANSCRANIAL MAGNETIC STIMULATION ON BRAIN OF RAT WITH FOCAL ISCHEMIA

Yongsoon Yoon*, Kwangjae Lee, Kipi Yu
Presbyterian (Jesus) Medical Center, Korea

Objective: To compare between continuous epidural electrical stimulation and repetitive transcranial magnetic stimulation on the behavioral recovery in rats with photothrombotic stroke. *Method:* 24 male Sprague-Dawley rats were pre-trained on a single pellet reaching task (SPRT) and Rotarod test (RRT) for 14 days, and then received the photothrombotic infarction on dominant sensorimotor cortex (SMC) to make stroke model. All rats divided into three groups as follows: Electrical stimulation group (ES), Anodal stimulation (50 Hz and 194 μs duration), which electrode was implanted over the peri-lesion SMC surface, repetitive transcranical magnetic stimulation group (MS), received magnetic stimulation (10 Hz, 3 sec stimulation 6 sec interval, 4,000 stimulation per day), and no stimulation on SMC of sham group (SG). The rats were trained and measured SPRT and RRT for 14 days for rehabilitation after infarction. *Results:* 1) There was significant improvement of SPRT and RRT in ES & MS groups in 14 days stimulation and rehabilitation (p<0.05). 2) SPRT improved significantly from day 9 in ES, and from day 8 in MS (p<0.05). 3) RRT improved significantly from day 10 in ES, and from day 9 in MS (p<0.05). 4) The ES better in SPRT compare to MS but there was no difference in RRT (p<0.05). *Conclusion:* ES with rehabilitation may be considered to be better way in stoke rat model.

PO-1331

RELICT-05 ELECTROPHORESIS IN SYSTEM OF COMPLEX TREATMENT OF PATIENTS WITH AN ENDOGENOUS IRIDOCYCLITIS

Victor Egorov[1,2], Galina Smoliakova[1,2], Tatiana Gokhua[1]*

[1]Khabarovsk branch of S. Fyodorov Eye Microsurgery Federal State Institution, Khabarovsk, Russia, [2]Postgraduate Institute for Public Health Workers, Khabarovsk, Russia

Objective: Medical possibilities of the tray "Relict-05" electrophoresis at endogenous iridocyclitis are studied. This phytomineral complex is received from peat raw materials and mineral waters of the Far East region and is carried to category of medical factors with antiinflammatory and resorptional action. *Method:* We observed 28 patients (28 eyes) at whom one of the main clinical implications of the endogenous iridocyclitis was the fibrinous exsudate in the anterior chamber and pupil area. All patients received systemic and local antibacterial, antiinflammatory, desensitizing therapy and parabulbar injections of fibrinolitic enzyme – gemase. Among selected patients 15 people (15 eyes) made the main group. In addition to the main treatment they received the "Relict-05" electrophoresis. Other 13 people (13 eyes) made the group of comparison and received the standard treatment without the "Relict-05" electrophoresis. *Results:* On the basis of the carried-out researches reduction of terms of intraocular inflammation cupping and full resorption of fibrin in patients of the main group was established on the average 4.2±0.09 days quicker, than in group of comparison. Maximum visual acuity peer on the average 0.87±0.09 conventional unit was received in the main group of patients in 8-10 days and in group of comparison (0.71±0.07 conventional unit) in 12-15 days. During research there was confirmed the medical ability of the "Relict-05" electrophoresis to reduce terms of aftertreatment of patients with a fibrinoid syndrome at endogenous iridocyclitis.

PO-1332

OBSERVATION ON CLINICAL THERAPEUTIC EFFECT OF MECOBALAMIN ACUPOINT INJECTION ON HEMIPLEGIC PATIENTS AFTER CEREBROVASCULAR DISORDER

Hui Xie[1], Dongmei Shi[2]

[1]Department of rehabilitation medicine, The first peoples hospital of chenzhou, [2]Acupuncture and Moxibustion College, Hunan University of Traditional Chinese Medicine

Backgrand Mecobalamin acupoint injection, a traditional acupuncture technique, means injecting the liquid medicine into the acupoint,to treat diseases.Therefore the present study was designed to assess its therapeutic responses in the treatment of hemiplegia due to acute ischemic stroke. *Objective:* For evaluating the clinic curative effect of the therapy of Mecobalamin acupoint injection, acupuncture and rehabilitation technique Bobath for treating Hemiplegic patients after cerebrovascular disorder. *Methods:* Eigthy cases patients team who suffer from cerebrovascular disorder are randomly divided into two groups in order of visiting.The treatment group (n=40) were treated by the way of combination of therapy of Mecobalamin acupoint injection, electrical acupuncture and scalp acupuncture with rehabilitation technique Bobath,The control group were cured by the way of combination electrical acupuncture and scalp acupuncture with rehabilitation technique Bobath. Modified Barthel Index (MBI) and Fugl-Meger Assertion (FMA) were used to evaluate the effectiveness of 4 weeks treatment. Results after four weeks treatment, The FMA and MBI score in two groups are both high obviously, but the treatment group increased more significantly than those of the control group. (p<0.05). *Impact on Rehabilitation:* The therapy of Mecobalamin acupoint injection, acupuncture and rehabilitation technique Bobath for treating Hemiplegic patients after cerebrovascular disorder get high curative effect, is worthy to be popularized.

PO-1333

EFFECTIVENESS OF A HEEL CUP WITH AN ARCH SUPPORT INSOLE ON THE STANDING BALANCE OF THE ELDERLY

Mujung Kao[1,2], Tzuhsuan Chen[3], Ming-Jor Lo[1]

[1]TAIPEI CITY HOSPITAL,Chinese Taipei, [2]National Yang-Ming University,Chinese Taipei, [3]Wan Fang Hospital,Chinese Taipei

Objective: The aim of this study is to investigate the effectiveness of a modified insole on the standing balance of the elderly. *Method:* Subjects more than 65 y/o at outpatient clinic of a community hospital without abnormal gait patterns, lower limb deformities or foot pain were employed. A static foot pressure test for the arch index (AI) and a static balance test for stability index (SI) were performed at the initial and eight weeks after the assigned insoles were worn. The participants were assigned into the good (G) and poor (P) stability groups based on SI. Both groups were randomly divided into the experimental group (E) and the control group (C). The experimental group, which wore a heel cup with an arch support insole, and the control group, which wore a conventional plain insole. *Results:* Seven participants (7.1%) quit the study from all 99 participants. There were 25 subjects in GE group, 26 subjects in GC group, 20 subjects in PE group and 21 subjects in PC group. No significant differences in age were observed between all groups. There are significant differences on the improvement of SI (GE=0.172±0.159 vs GC=0.000±0.000), (PE=0.190±0.112 vs PC=0.000±0.000) (p<0.001). The differences in the change of AI between the experimental and control groups were statistically significant (p<0.001). *Implications/Impact on rehabilitation:* The heel cup with arch support insoles was effective in improving the standing balance of the elderly and can be used to prevent falling accidents.

PO-1334

PARAMETERS TO INDICATE ORTHOSIS SUPPLY IN POLIOMYELITIS PATIENTS

Barbara Bocker, Ulrich Smolenski

Institute for Physiotherapy, Germany

Objectiv The clinical presentation after an acute poliomyelitis exhibits residual paralysis with instability in gait and standing. The question is, when is an orthosis supply indicate? *Method:* In 10 Patients with partial paralysis of the quadriceps muscle and the dorsal flexors of the foot and instability of the knee joint caused by poliomyelitis anterior acuta were provided with a femoral orthosis. Changes of muscle function were evaluated after a three months baseline (t1) and after three months gait training with orthosis (t2) by clinical muscle force and surface emg-activity (sEMG) measurement of specified leg and trunk muscles, knee joint angle and stance duration. The significance was tested by Anova Varianzanalysis and Pearson-correlation of the values. *Results:* In patients increased sEMG-activity in m gluteus medius (by 3,35 µV at paretic side/9,71 µV at the stable side) as well as an activation of the m. bizeps femoris of the stable leg by 1,97 µV was observed; lower activity in m. obliquus externus abdominis (decrease of 10,86 µV), at the the paretic side could occured. The results in m. gluteus medius correlated with the changes of muscle force as well as stance duration (p. *Impact on Rehabilitation:* A precondition for orthosis supply is the possibility of improvement of muscle activity in both legs and trunk. sEMG is a significant parameter to indicate this.

PO-1335

COMPARISON OF ROBOT-AIDED TRAINING IN THE HEMIPARETIC UPPER LIMB BETWEEN STROKE AND BRAIN INJURY: A PRELIMINARY STUDY

Sheng Bi[1], Linhong Ji[2], Zixi Wang[2], Shurong Ji[2]

[1]Department of Rehabilitation, ChinesePLAGeneralHospitalBeijing,China, [2]Department of PrecisionInstruments and Mechanology ,TsinghuaUniversityBeijing, China

Objective: To investigate the effects of robot-assisted training of the upper limb after stroke or traumatic brain injury (TBI).

Methods: This is a baseline, pre-post treatment comparison study. Thirteen subjects with chronic stroke and nine subjects with TBI were enrolled in a program of straight-line and exterior-oriented circular path exercises constrained by a training robot. Subjects trained assisted by the robot according to their motor abilities for 45 min 20 times over a period of 4 weeks. The Fugl-Meyer test of upper-extremity function, the Motor Status Score (MSS) and the Modified Ashworth scale (MAS) were used to assess their progress 4 weeks before the training, one day before, and one day after the training ended. *Results:* Significant improvements were registered in the FM, MSS and MAS of elbow flexor (MASF) but no significant differences were detected in the MAS of elbow extensor (MASE) in patients with stroke following robotic training. In patients with TBI, the significant improvements occurred in the FM and MMS after the robot-assisted training, however, no significant improvements were found in both MASF and MASE. *Conclusion:* Robot-aided training conducting straight-line and exterior-oriented circular path exercises can reduce upper limb impairment after stroke or brain injury.

PO-1336

ELECTRICAL STIMULATION (ES) ON LEGS AND ABDOMEN MIGHT BE MORE EFFECTIVE THAN ON LEGS ONLY

Makoto Nagasaka
Tohoku University Graduate School of Medicine, Japan

Objectives: Electrical stimulation (ES) of the skeletal muscles has been shown to increase oxidative enzyme activity in skeletal muscle fibers, to enhance muscular regeneration,and to prevent atrophy. Therefore electrical stimulation on legs was studied in the patients who could not undertaken conventional forms of exercise. Moreover ES on abdomen was effective to improve muscle power and movement. But the effect of ES on both legs and abdomen at once is unknown. The aim of this study was to investigate how ES on both legs and abdomen were effective. *Materials and Methods:* 8 person (mean age, 83.3±4.43 years, a mean FIM score 83.56±4.94%) were studied. The patients had 2 weeks of ES applied simultaneously to the quadriceps and calf muscles of both legs and abdomen. Electrical stimulation was performed 60 min/day, 5days/week. The stimulator delivered a biphasic current of 10 Hz frequency. The maximal stimulation amplitude was well tolerated by the patients. Before and after the 2-weeks ES, Functional examination was performed to determine muscle power of legs and abdomen, the movement, and the FIM score of the patients. *Results:* 2 weeks of ES on legs and abdomen increased the muscle power of legs and abdomen, the movement, and FIM score of the patients. *Conclusions:* ES on both legs and abdomen improve physical performance for 2 weeks. As ES on legs need to improve muscle strength or movement for more than 4 weeks, ES on legs and abdomen may improve physical performance earlier than Es on legs only.

PO-1337

VALIDATION OF CHINESE VERSION TRINITY AMPUTATION AND PROSTHESIS EXPERIENCE SCALES (C-TAPES)

Kui Cheng Kui Cheng[1], Cecilia Li-Tsang[2]
[1]Department of Occupational Therapy, the Guangdong Provincial Work Injury Rehabilitation Hospital,China, [2]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University, China

Objective: The Trinity Amputation and Prosthesis Experience Scales (TAPES) is a wide used instrument for measuring the outcome and quality of life of people with amputation. The aim of the study was to develop a Chinese version Trinity Amputation and Prosthesis Experience Scales (C-TAPES) and validate the reliability and validity. *Methods:* The original English version TAPES was translated into Chinese. Then, the face validity was tested by eight professionals. After modification, twenty experts, including ten professionals and ten people with amputation were composed into an expert panel to evaluate the content validity of C-TAPES. The WHOQOL-BREF, Amputee Body Image Scale, and FIM were applied to test the concurrent validity. The test-retest reliability was tested by 80 persons with amputation. *Results:* The C-TAPES showed good face validity and content validity. All the items of C-TAPES got higher agreement scores (more than 4 out of 5) both in final face validity and content validity test. The test-retest reliability (Cronbach's alpha ranged from 0.770 to 0.993) and internal consistency (Cronbach's coefficient alpha ranged from 0.703 to 0.998) was acceptable. C-TAPES showed signification correlated with WHOQOL-BREF, ABIS, and FIM. *Conclusion:* The Chinese version of TAPES (C-TAPES) was proved to have good face validity, content validity, test-retest reliability, internal consistency, and concurrent validity. It is recommended to be used for people with amputation to test the quality of life and outcomes.

PO-1338

THE DESIGN OF CONTINUOUS FORCE PROFILE GENERATOR SYSTEM

Jianting Fu, Yizhi Shi, Lei Ma, Yao Li
Chongqing Institute of Green Intelligent Technology, Chinese Academy of Sciences

Surface Electromyography (sEMG) comprehensively reflects the electrical changes on the skin surface when muscle contracts. Precise gesture and force information extracted from the sEMG signal will provide a natural and convenient interface for human – machine interaction control. This project designs a continuous force profile generator system, which could produce force with different amplitude and changing rate. This system could also simultaneously detect the contact pressure and the surface EMG signal. The design of the continuous force profile generator system includes micro-processor control module, stepper motor, putter gearing, pressure sensor, vacuum pad and wireless acquisition module via Bluetooth. A pressure spring device is utilized to generate continuous force, the acquisition module has the capability of 4-channel simultaneous recording with the resolution of micro volt and the effective wireless communication range could extend to 15 meters. The generated force is applied to wrist joint of different gestures, the wireless acquisition module simultaneously detects the pressure signal and 3-channel surface EMG signal of forearm musculature, the computer process the experimental data and analyze the relationship between force signal and surface EMG. The parameters and the biomechanic model could be used to extract the force information from the surface EMG, which has significant impact for customized prosthetic control, human-machine interface and other important rehabilitation applications.

PO-1339

LONG-TERM EFFECT OF GAIT TRAINING ON A BIOFEEDBACK TREADMILL AMONG PATIENTS AFTER STROKE

Agnieszka Brzozowska-Magon*, Mariusz Druzbicki, Agnieszka Guzik, Andrzej Kwolek, Grzegorz Przysada
University of Rzeszow, Poland

Objective: Aim of this study is to assess long-term effect of gait training among patients with hemiplegia after stroke. *Material and Method:* The study included 28 patients after ischemic stroke. The patients were randomized into an experimental or control group. The experimental group completed a 2-week training program on the treadmill with biofeedback. The control group practiced on the treadmill without biofeedback. The study was made on the first and the last day of the program and after six months. Gait velocity in the 10-Meter Walking Test, functional evaluation by Barthel index and balance in timed up and go test were tested. Spatio-temporal and kinematic gait parameters were also evaluated. *Results:* At baseline,

the average walking speed in the experimental group was 0.6 m/s, increased to 0.77 m/s after exercise and maintained at a level of 0.69 m/s after six months. The difference between the results was statistically significant (p=0.002). In the walking speed a significant improvement was obtained after the exercise program in the control group but after six months, the average walking speed was close to the value before the start of the program. The distance in the experimental group has been improved and was 18,6 meters and was statistically significant. *Conclusions:* The exercise program and gait training after stroke with using treadmill have an impact on a significant gait improvement in both groups. In the late period an improvement in the exercise group on a treadmill with biofeedback has been shown.

PO-1340

PREDICTORS OF THERAPY RESPONSIVENESS FOR A MULTIMODAL THERAPY CONCEPT AND AEROBIC TRAINING IN BREAST CANCER PATIENTS WITH CHRONIC CANCER-RELATED-FATIGUE

Mathias Kroez[1], Roland Zerm[1], Matthias Fink[2], Christoph Gutenbrunner[2], Fadime Candir[2], Kai Winter[2], Andreas Nikolaou[2]*

[1]Research Institute Havelhoehe Berlin,Germany, [2]Medical school hanover clinic for rehabilitation, Germany

Backround Cancer-Related-Fatigue (CRF) and insomniac sleep distubances are the most frequent and burdensome symptoms of disease-free breast cancer patients (BC). Non-pharmacological treatments such as aerobic training (AT) and sleep (SE) are the treatments with the best evidence. In this pilot-study we tested beside the implementation of a new multimodal concept of therapy (MM), consisting of SE, psycho-education, eurythmy and painting therapy and its comparison to AT which questionnaire is the best predictor for the treatment responsiveness. *Methods:* At the Gemeinschaftskrankenhaus Havelhöhe and the Hannover Medical School 31 out of 34 patients suffering from BC and CRF could be fully evaluated in a ten-week intervention study; 21 of them chose MM and 10 decided for AT. CRF was measured with the help of the Cancer Fatigue Scale (CFS-D). Beside the CFS-D we captured by questionnaire the Pittsburgh Sleep-quality-index (PSQI), autonomic regulation (aR), self-regulation (SR), internal coherence (ICS) and quality of life with EORTC-QLQ C30. Statistics SPSS 19.0. *Results:* We tested the correlations of baseline PSQI and EORTC subscales emotional, physical, role functioning and global health with CFS-D at baseline (R2=0.02 - 0.40) and at the end of the intervention (R2=0.05 - 0.24). Baseline aR, SR and ICS correlated with CFS-D with R2=0.27, 0.17 and 0.44 at baseline and with R2=0.22, 0.38 and 0.48 at the end. Participants with high SR or ICS and high CFS-D at baseline had the best CRF improvement after the intervention. *Conclusion:* This pilot-study supports the hypothesis that questionnaires measuring adaptive capacities such as self-regulation and internal coherence are more appropriate as outcome predictors than classical HRQL or sleep questionnaire for educative intervention studies

PO-1341

PATELLAR TENDON RUPTURE: A RARE COMPLICATION OF TOTAL KNEE REPLACEMENT

Nasir Mansoor Sahibzada[1]*, Farooq Azam Rathore[2], Ahmed Zaheer Qureshi[3]

[1]Department ofRehabilitation Medicine, Combined Military Hospital, Kohat, KPK, Pakistan, [2]Department ofRehabilitation Medicine, Combined Military Hospital, Lahore Cantt, Punjab,Pakistan, [3]KDepartment ofPhysical Medicine and Rehabilitation, King Fahad Medical City, Riyadh SaudiArabia, Pakistan

Objective: To present a rare complication of total knee replacement *Methods:* Total Knee Replacement (TKR) is the procedure of choice for patients with advanced knee osteoarthritis when non surgical treatment options fail. Complications of TKR include infection, deep vein thrombosis and joint loosening. A rare but debilitating complication is patellar tendon rupture, which may be due to inherent weakness of the tendon and damage to the tendon during surgery or trauma.We report a case of patellar tendon rupture after TKR in a 75 years old female. On post operative day 22, she experienced excruciating pain in the left knee while getting up from a low lying commode chair and was unable to stand without assistance. Clinical examination revealed patellar tendon rupture and radiographs confirmed patella Alta. Site of rupture was confirmed by MRI and musculoskeletal ultrasound. *Results:* Patellar tendon repair surgery was done using semitendinosis graft followed by knee immobilization for six weeks. Rehabilitation was continued for twelve weeks. Patient was able to walk with cane and was independent in activities of daily living. *Implications/Impact on rehab:* Patellar tendon rupture is a rare complication of total knee replacement surgery. Care should be taken before, during and after surgery. Low lying commode chairs and commode can lead to rupture of an already compromised tendon. Clinical examination and radiographs can confirm the diagnosis. Surgical repair is the only option for treatment. Prognosis is usually notgood.

PO-1342

EVALUATION OF SLEEPINESS IN PATIENTS WITH THORACIC OUTLET SYNDROME

Natasa Milenovic[1], Milanka Uscumlic[1], Budimir Popovic[2]

[1]Special Hospital for Rheumatic Diseases, Faculty of Medicine, University of Novi Sad, Serbia, [2]Faculty of Medicine, University of Novi Sad, Serbia

Objective: Thoracic Outlet Syndrome (TOS) is one of the most common syndromes of compromised circulation in the cervical region. The aim of the study was to evaluate the sleepiness in patients with diagnosed TOS. *Methods:* 100 patients (26.7% males and 73.3% females) aged 51.11 (28-84) with diagnosed TOS were evaluated. All patients filled a questionnaire about their quality of sleeping and Epworth sleepiness scale. *Results:* 55.6% of patients evaluated their state of health as moderate and 73.3% of them evaluated their pain as moderate. 84.4% of patients indicated that they had some problems with sleeping- half of them have subject impression of permanent problem with sleeping. According to the Epworth scale 35,6% had some problem with sleepiness but patient`s subject impression of having sleeping problem was not correlate (r=0.048; $p$=0.755) with result of observed sleepiness problem on Epworth scale. Patient`s evaluation of pain statistically significant (r=-0.316; p=0.034) correlate with sleepiness. Results pointed that the most problematic sleepiness factor was "lying down to rest in the afternoon when circumstances permit" (r=0.760; p=0.000) and the least problematic was "sitting and talking to someone" (r=0.349; p=0.019). One statistically significant canonical correlation (F=0.907; p=0.000) was observed which pointed that predictor of good sleep could be slight chance of dozing during TV watching or predictor of sleepiness problem could be sitting inactive in a public place. Implication on Rehabilitation: Clinical manifestations of TOS affected more the quality of sleeping than on sleepiness, which means that there is a need for more research in this direction.

PO-1343

REHABILITATING CLAW-THUMB BY RECONSTRUCTIVE SURGERY (OPPONENSPLASTY) IN LEPROSY CURED PATIENTS

Soumya Santa Pan, Ajit Kumar Varma*

Patna Medical College, India

Objective: In leprosy, hand deformities stigmatize affected persons as 'leprosy patients'. Intrinsic muscles of the thenar eminens which are responsible for abduction-opposition of thumb are paralysed in leprosy neuritis leading to claw-thumb deformity. The objective of this study is to find out the importance of reconstructive surgery (Opponensplasty) in achieving voluntary abduction-opposition of the deformed thumb and its impact on rehabilitation of claw-thumb in leprosy cured patients. *Method:* A total of 42 leprosy cured persons (age 14-55) presenting with bilateral claw-thumb deformity were selected from a pool of 57 claw-thumb patients admitted to this deptt., based on certain inclusion criterias. Passive stretching exercises were employed to one thumb and such exercises along with opponensplasty operation were performed to the other thumb of each of selected 42 patients. Choice of thumb for opponensplasty were random in such cases. Opponensplasty was followed by vigorous tendon re-education upto next four weeks. Functional outcome of Opponensplasty were assessed and compared with non-operated thumb after 3, 6 and 12 months following operation. *Results:* The abduction-opposition of operated thumb achieved satisfactorily with tripod grasp in 29 patients, partially with abduction>45 degrees in 7 patients and poorly with abduction *Implications/Impact on rehabilitation:* Reconstructive surgery (Opponensplasty) leads to significant functional improvement of claw-thumb and hence must be practiced in large numbers by Physiatrists, as a part of rehabilitation of hand deformity, in leprosy cured patients.

PO-1344

EARLY NEUROGENIC BLADDER REHABILITATION – RASHID HOSPITAL EXPERIENCE

Emela Skikic Mujic*, Suad Trebinjac, Vandana Walia, Zuzanne Ehmer Nelepa

DHA, Rashid Hospital, United Arab Emirates

Objective: Symptoms of dysfunction of the urinary bladder caused by an impairment of the nervous system are often neglected in acute stage of hospitalization. Starting proper bladder management during initial stage of hospitalization is very important to reduce later complications and sometimes to improve bladder control. Intermittent catheterization (IC) is the gold standard for the management of Neurogenic lower urinary tract dysfunction (NLUTD). *Method:* Quality improvement process using FOCUS PDCA methodology was introduced by creating several guidelines, protocol and procedures related to bladder management. Educational training sessions were conducted for nurses, as well for the patients. Knowledge and skills were checked through competency assessment. Patients referred for bladder management were followed from General hospital wards, and later on, if needed, transferred to the Rehabilitation ward. Comprehensive rehabilitation treatment including training for self catheterisation and Urodynamic studies continued in Rehabilitation ward. *Results:* 36 patients with symptoms of neurogenic bladder, admitted to Rehabilitation ward, were observed and statistical data analyzed. Neurogenic lower urinary tract dysfunction - evidence based guideline was applied for early bladder rehabilitation. The outcomes with analytical data of main neurological impairment, length of stay until beginning of treatment, infection rate and management on discharge will be presented. Obstacles and challenges of proper bladder management will be discussed. *Conclusion:*Early, systematic and multidisciplinary approach in neurogenic bladder management will improve patients' independence and quality of life and reduce possible complications of urinary tract, considering life long care - to maintain quality of life and maximize life expectancy.

PO-1345

FUNCTIONAL LEVEL UP TO TWO YEARS AFTER TRAUMATIC BRAIN INJURY: ASSESSING COURSE AND OUTCOME PREDICTORS AT DICHARGE, 3 MONTHS, 12 MONTHS AND 24 MONTHS

Maria Sandhaug[1]*, Nada Hadiz-Andelic[2,3], Birgitta Langhammer[1], Aase Mygland[4,5]

[1]Oslo and Akershus University College, Oslo, Norway, Institute of Physiotherapy,Norway, [2]Oslo University Hospital, Ulleval, Norway, Department of Physical Medicine and rehabilitation,Norway, [3]Oslo University, Oslo, Norway, Institute of Health and Society, Research Centre for Habilitation and Rehabilitation Models and Services (CHARM),Norway, [4]Sørlandet Hospital, Kristiansand, Norway, Departement of Habilitation,Norway, [5]Bergen University, Bergen, Norway, Department of Clinical Medicine, Norway

Objective: To describe the functional level across four time periods up to 24 months after traumatic brain injury (TBI), and to evaluate the predictive impact of pre-injury and injury-related factors. *Method:* A cohort of 65 patients with moderate (n=21) or severe (n=44) TBI were examined with Functional Independence Measure (FIM) and Glasgow Outcome Scale Extended (GOSE). Possible predictors were analyzed in a regression model using FIM total score at 24 months as outcome. *Results:* In the TBI total group all mean FIM scores improved significantly from rehabilitation unit discharge to 24 months after injury (p<0.001). In the severe TBI group mean FIM scores improved with peak levels at 12 and 24 months with a significant effect of time (p<0.001). The distribution of GOSE outcome for the whole group and the severity groups across three time periods was significantly shifted towards better recovery and less severe disability (p<0.002, p<0.008), except from the severely injured (p = 0.117). Predictors such as FIM admission to the rehabilitation unit (B=0.265) and GCS score admission to rehabilitation (B=2.883), may explain 40% of the FIM variance 24 months after injury. *Impact on rehabilitation:* Our follow-up data on working situation, cognitive problems, and health services needed show the importance of a holistic long-term perspective in TBI rehabilitation. It may suggest a need for more intense cognitive training and rehabilitation overall in the post-acute TBI phase.

PO-1346

VALIDITY OF A DEVICE FOR QUANTITATIVE MEASUREMENT OF ANKLE TORQUE IN PASSIVE MOVEMENT IN STROKE HEMIPLEGIC PATIENTS

Hirofumi Maeda[1], Shiho Mizuno[1], Yutaka Tomita[2]*, Genichi Tanino[2], Sayaka Okamoto[1], Yasunori Ozeki[1], Wataru Narita[1], Sachie Ozaki[1], Shigeru Sonoda[1]

[1]Fujita Health University Nanakuri Sanatoriumu,Japan, [2]Division of Rehabilitation, Fujita Memorial Nanakuri Institute, Fujita Health University, Japan

Objective: Although management of spasticity is important inrehabilitation,objective methods for quantitative assessmentof spasticity are not yet established. We developed a device that measures plantar flexion torque as an indicator of spasticity. Torques and clinical parameter was compared to validate this device. *Method:* The device was composed of a motor,rack-and-pinion and a double-upright ankle foot orthosis. Twenty stroke hemiplegics (12males; mean age 66.5 y) were placed in a sitting position with the knees at either 0 or 60 degrees of flexion. Passive dorsiflexion from 30 degrees of plantar flexion to 10 degrees of dorsiflexion was applied

to the affected ankle at an angular velocity of 5 and 100 degrees per second. The torque during passive movement was measured together with its angle and surface EMGs of the tibialis anterior and lateral head of gastrocnemius. Correlation coefficients between torques and the modified Ashworth scale (MAS) was calculated. *Results:* Plantar flexion torques at 100 degrees per second and clinical parameter (MAS) was significantly correlated (0.73). *Impact on rehabilitation:* This device will be objective clinical tool to assess spasticity and treatments of spasticity would be sophisticated by using this device.

PO-1347

1 CASE OF DYSPHAGIA WITH LARYNGOSTENOSIS CAUSED BY CLOSED NECK INJURY

Yuan He, Yu Pan, Renjie Han
Beijing Rehabilitation Center, Beijing, China

Objective: Closed neck injury with laryngostenosis can easily lead to dysphagia. When the laryngoplasty was not proceeded, the patient needs to be done with endotracheal intubation to breath, and nasal feeding or percutaneous endoscopic gastrostomy were proceed in order to avoid aspiration pneumonia. In this case, common swallowing rehabilitation exercise is not effective. This article discussed the swallowing disorder treatment for 1 case caused by closed neck injury patient with laryngostenosis. *Methods:* We treated the closed neck injury patient with laryngoplasty by external cervical surgical approach. We closed the aditus of laryngis, kept the tracheal tube, removed the nasogastric feeding tube. Then postoperative exercise was proceeded including of esophageal pronunciation training, eating and drinking training. *Results:* After a period of exercise, the patient can communicate by esophageal pronunciation. And he can drink and eat easily without aspiration by the check of VF. It has greatly improved the patient's quality of life. *Conclusion:* For swallowing disorder patients with laryngeal stenosis caused by closed neck injury, the aspiration may lead to aspiration pneumonia. Laryngoplasty which closed the aditus of laryngis with rahabilitation training after surgery can improve the patient's quality of life greatly.

PO-1348

POSSIBILITIES OF REHABILITATION FOR PATIENTS WITH ARTIFICIAL PACEMAKER AFTER CARDIO-EMBOLIC STROKE

Irina Sidyakina*, Vadim Ivanov, Tatyana Shapovalenko, Konstantin Lyadov
Medical and Rehabilitation Center, Russia

When a patient after stroke has an artificial pacemaker, a possibility of stimulation procedures on different stages of rehabilitation is strongly limited. Using of alternative and effective ways of CNS motor centers activation is an actual problem. Purpose of our investigation is a comparative estimation of programmed electromyostimulation and proprioceptic stimulation efficiency. Proprioceptic stimulation includes pneumostimulation of foot supporting points and dynamic propriocorrection. *Matherials and methods:* 26 patients divided in 2 groups were taken into investigation. First group included 12 patients (7 men) from 37 to 76 years old. Rehabilitation program for the first group included programmed electromyostimulation. Second group (9 men) from 42 to 80 years, consisted of patients with artificial pacemaker. Instead of programmed electromyostimulation, rehabilitation program for the second group included pneumostimulation of foot supporting points, or exercises in dynamic propriocorrection costume. *Results:* Differences between two groups of patients after rehabilitation were statistically insignificant according to clinical functional scales. Bartel index in first group before rehabilitation counted 69 points in average, after rehabilitation course the count increased to 78 points. Second group counted 70 and 81 points, respectively. Muscle force was estimated by 6-points scale. The count for the first group was 3,2 points in average before rehabilitation, and 3,9 points after course; for the second group, counts were 3,3 points before and 4,1 ponits after rehabilitation procedures. *Conclusions:* Efficiency of proproceptic stimulation methods for rehabilitation of patients with artificial pacemaker is comparable to that electromyostimulation procedures.

PO-1349

CLINICAL OBSERVATION OF COMPREHENSIVE PHYSICAL FACTORS IN THE TREATMENT OF FROZEN SHOULDER

Xiaohong Wu
The First Affiliated Hospital, Zhejian University, China

Objective: To observe the ultrashotwave,magnetic therapy, audio, combined with the efficacy of treatment of frozen shoulder. *Methods:* 108 cases of frozen shoulder were randomly divided into a treatment group of 58cases and a control group of 50 patients, the treatment group received ultrashot wave, magnetic therapy and audio treatment.The control group was given the treatment of drug block. *Results:* the treatment group was significantly better than control group in clinical efficacy analgesic and shoulder range of motion. *Conclusion:* In the clinical treatment of frozen shoulder physical synthesis treatment,more convenient and secure.

PO-1350

AMPUTEE REHABILITATION IN SINGAPORE GENERAL HOSPITAL: A REVIEW OF CLINICAL DATA AND FUNCTIONAL OUTCOME

Yeow Leng Tan, Cl Lee, Hm Saw, Ashfaq L
Singapore General Hospital

Purpose: A retrospective review of lower limb amputees in Singapore General Hospital (SGH). To ascertain the functional outcomes using Functional Independence Measure (FIM), mortality within 18months of surgery, number receiving prosthesis and the outpatient ambulatory status. *Methods:* 98 amputees were reviewed from October 2010 to March 2012 and followed up for 18months after surgery. Parameters reviewed: age, gender, co-morbidities, amputation level, average length-of-stay (ALOS), functional outcome using mean FIM gain and mean motor FIM score at discharge (mFIM), rate of prosthesis fitting and outpatient ambulatory status. *Results:* The mean age (years) was 61 +/- SD 12.8. 63 (64%) patients were male. The 3 main co-morbidities were diabetes with peripheral vascular disease (91%), ischemic heart disease (47%) and end-stage renal disease (33%). The 2 most common levels of amputations were unilateral below-knee-amputation (n=62, 63%) followed by unilateral above-knee-amputation (=16, 17%). 37 (38%) subjects were transfer to rehabilitation unit and the ALOS was 56 days. 11 (11.2%) patients passed away within 18 months after surgery.6 subjects were lost to follow-up. 37 (40.2%) of the remaining 92 patients had prosthesis fitting. Cost of prosthesis and severe co-morbidities were possible cited reasons for low prevalence of prosthesis fitting. There was no difference in the mean FIM gain between amputees with 2 or less co-morbidities versus those with 3 or more. However mFIM was higher in former group (mFIM= 67.3) than the latter group (mFIM= 58.7), p= 0.02. Only 15 (40.5%) patients were able to achieve community ambulation using prosthesis. 9 (24.3%) achieve home ambulation with the use of prosthesis. 2 were lost to follow-up with regards to the use of prosthesis and the remaining 11 (29.7%) were either using walking aid without prosthesis or wheelchair within the home or when outdoors. *Conclusions:* Diabetes remains a significant co-morbidity predisposing to lower limb amputation. There is a need for early optimization of diabetic control as one of the key strategies for lower limb amputation prevention. The functional outcome of lower limb amputees remains poor especially in amputees with multiple co-morbidities. New local healthcare strategies are needed to increase the rate of prosthesis fitting and to target greater number of amputees to achieve community ambulation.

PO-1351

THE VALUE OF CARDIOPULMONARY EXERCISE TESTING IN ROUTINE CHECK-UP

Lingye Zhang
Jiangsu Province Hospital Zhongshan Rehabilitation Branch, China

Background: Cardiopulmonary exercise testing (CPET) has been widely accepted in the field of rehabilitation. It is one of the core diagnostic tests available to clinicians by monitoring the gas metabolism and electrocardiogram (ECG) during the exercise, which provides valuable diagnostic and prognostic information regarding patients with cardiovascular, pulmonary and even metabolic disease. ECG at rest is a routine examination, however, it is often not so easy for ECG to catch the abnormal conditions, when CPET can arouse the physiologic derangement during the exercise. *Methods and Results:* There were 582 people to Jiangsu Province Hospital Zhongshan Rehabilitation Branch/Jiangsu Zhongshan Geriatric Rehabilitation Hospital for a routine ECG, and 32.99% of these people had positive ECG performance. 40 study participants were randomly drawn from adults who had normal ECG to perform CPET, and they were aged 22 to 70. 30% of them had positive parameters during the exercise, such as ST-segment depression, the decreased peak oxygen intake, the fall of anaerobic threshold, and so on. *Conclusions:* CPET is a non-invasive stress test which could help to show more abnormal conditions in a check-up, and provide the evidence for people who don't have another unusual perform to hospital for further examination. Meanwhile, after playing its evaluation role, CPET is helpful to make individual exercise prescription to increase the exercise tolerance, to improve the cardiopulmonary function, to promote the consumption of body fat, which is the purpose of a check-up.

PO-1352

TECHNOLOGY IN LOCOMOTION AND DOMOTIC CONTROL FOR QUADRIPLEGIC

Mauricio Plaza, Oscar Aviles, William Aperador
Address is missing

The electronic control technology for mobility and domotics control (home automation systems) can be a great help to people with spinal injuries who have major limitations in the mobility and in the use of devices for normal life activity. The design of different type of technologies to provide to the patient an aids, is able to increase his quality of life. A spinal cord injury (SCI) is typically defined as damage or trauma to the spinal cord that in turn results in a loss or impaired function resulting in reduced mobility or feeling. Typical common causes of damage to the spinal cord, are trauma (car/motorcycle accident, gunshot, falls, sports injuries, etc.), or disease (Transverse Myelitis, Polio, Spina Bifida, Friedreich's Ataxia, spinal cord tumour, spinal stenosis, etc.). The resulting damage to the spinal cord is known as a lesion, and the paralysis is known as quadriplegia or quadraplegia/tetraplegia if the injury is in the cervical (neck) region, or as paraplegia if the injury is in the thoracic, lumbar or sacral region. Equipment manufacturers say that designing applications for users with disabilities is not cost-effective. Most of these systems are designed for users who are not disabled; therefore, systems that address disabled users need special interfaces in order to be accessible. In this paper we present a method for developing a electric and mechanical prototype for quadriplegic people provided that they can perform specific grade of mobility. Using an infrared technique, computer vision technology and mechanical design, users can perform some activities for improve his quality of live and give some grade of independence.

PO-1353

EMG-GUIDED TRAINING AND TESTING IN REHABILITATION FOR PATIENTS AFTER TARGETED MUSCLE REINNERVATION

Agnes Sturma[1], Malvina Herceg[2], Peter Goebel[3], Veronika Fialka-Moser[2], Oskar Aszmann[1,4]*
[1]Christian Doppler Laboratory for Restoration of Extremity Function, Medical University of Vienna, AUSTRIA, [2]Department of Physical Medicine and Rehabilitation, Medical University of Vienna, AUSTRIA, [3]Otto Bock Healthcare Products GmbH, Vienna, AUSTRIA, [4]Division of Plastic and Reconstructive Surgery, Department of Surgery, Medical University of Vienna, AUSTRIA

Objective: Targeted Muscle Reinnervation (TMR) provides an opportunity to improve prosthesis control for patients with high amputations of the upper extremity. It leads to additional myo-signals that can be used to control the prosthesis intuitively. Following TMR surgery, the so-called "TechNeuroRehabilitation" starts. Within this process the patient has to learn how to control his new muscular interface in order to govern a prosthesis with sEMG signals. Therefore, EMG biofeedback is used. To evaluate the patient's ability of generating myo-signals a new sEMG testing tool was developed. *Method:* In our sEMG test tool, specific motor tasks are presented to the patient on a computer screen. He/she needs to activate myo-signals according to predesigned specific geometric profiles. Depending on the standard deviation between the sEMG and the given targeted contraction task, the patient is classified. So the ability to generate sEMG-signals can be quantified and further training can be planned. *Results:* First testing shows that the sEMG test tool is able to detect an improvement in coordination within healthy subjects tested 3 times. The tool has also successfully been tested for amputees. *Implications/Impact on rehabilitation:* The sEMG test tool is used to support Rehabilitation, since it shows special needs for training.

PO-1354

FUNCTIONAL-COGNITIVE PROGRESS IN APHASIC PATIENTS WITH STROKE DURING POST-ACUTE PHASE

Asiye Gulsum Yilmaz, Sibel Ozbudak Demir, Guldal Nakipoglu Yuzer, Betul Yavuz Keles, Nese Ozgirgin*
Ankara Physical Medicine and Rehabilitation Training and Research Hospital, Ankara, Turkey

Purpose: To determine the prognostic factors and the effects of the aphasia rehabilitation program in patients who had aphasia after sub-acute stroke and to evaluate the relationship between motor functional, cognitive status and life quality and language functions. *Methods:* Thirty-six aphasic patients who admitted to the rehabilitation hospital for inpatient rehabilitation program were included in this study. Motor function was evaluated by Brunnstrom stages. Functional Independence Measure and Barthel Index were used to assess functional status. Life quality was measured by Stroke and Aphasia Quality of Life scale-39 (SAQOL-39). Language functions were evaluated by Gülhane Aphasia Test-2 (GAT-2). The patients were applied to a conventional speaking therapy program for 45 min, 3 days a week during their hospitalization. *Results:* There were significant improvement in all SAQOL-39 and in GAT-2 subscales (all $p<0.05$) except for automatic speech subscale ($p>0.05$). SAQOL-39 physical subscales were corralated with GAT-2 reading comprehension, repetition and naming. SAQOL-39 communication subscale showed a significant correlation with the improvement in the GAT-2 total reading comprehension and repetition subscale. *Conclusions:* Our results showed that improving of the language functions are correlated with the cognitive and functional status and life quality of the patients. Additionally, the aphasia rehabilitation program that we applied is effective on all language functions except for the automatic speech. On the other hand, the least improvement of the language functions were seen in mixed aphasic patients.

PO-1355

CPAP-THERAPY IN THE FUNCTIONAL FOREPLAY OF PATIENTS WITH MORBID OBESITY TO BARIATRIC SURGERY

Svetlana Vostruhova*, Tatyana Shapovalenko, Konstantin Lyadov
Medical and Rehabilitation Center, Russia

Relevance Last decade, incidence of morbid obesity where conservative treatment is ineffective dramatically increased. Morbid obesity patients always suffer from syndrome of obstructive sleep apnea (OSAS). Severe form of OSAS leads to chronic O2-deficiency, that worse for all reparative processes, and promotes a number of complications. *Objective:* To evaluate role of CPAP-therapy in preoperative foreplay of morbid obesity patients. Materials 28 patients with morbid obesity and OSAS. Inclusion criteria:• BMI over 40 • The index of de-saturation more than 30%. • The average saturation within the night less than 92% Exclusion criteria • General contra-indications for surgical intervention The main group consisted of 15 patients, the control - 13 patients. There were no significant differences between groups. The control group included patients with low compliance to CPAP-therapy. *Methods:* Before starting the study, all patients were performed respiratory monitoring during night. Effectiveness of CPAP-therapy was carried out by monitor pulseoximetry. In the main group there was CPAP-therapy, duration of course - 14 days, then gastric bypass was performed. In the control group gastric bypass was performed. *Results:* Mean increase in oxygen saturation during night in comparison with the initial data in the group of CPAP-therapy amounted to 4.8+1,6%, p‹0,05. In the main group, postoperative complications were not observed vs 5 patients (38%) in the control group. Duration of staying in hospital in the main group was 4.8 days less, $p<0.05$ *Conclusions:* Functional foreplay by CPAP-therapy in morbid obesity patients and OSAS significantly improves the course of the postoperative period.

PO-1356

EFFICACY OF BOTULINUM TOXIN -A VERSUS STABILIZATION OCCLUSAL SPLINT IN TREATMENT OF TEMPOROMANDIBULAR DISORDERS: CLINICAL AND QUANTITATIVE ELECTROMYOGRAPHIC STUDY

Enas Shahine
Faculty of Medicine, Alexandria University, Egypt

Objective: to evaluate the efficacy of BTX- A therapy versus stabilization occlusal splint in treatment of temporomandibular disorders #TMD# clinically and by electromyographic quantitative interference pattern analysis #QIPA#. *Methods:* twenty-four female patients with TMD symptoms and signs were enrolled in the study. Patients were randomly assigned into 2 groups. Group 1 patients injected with botulinum toxin type A #BTX-A# in the affected masseter and temporalis muscles, while Group 2 patients treated with occlusal splint therapy. Patients were evaluated at baseline, at 8 and 12 weeks by the Anamnestic Dysfunction Index #Ai#, measurement of maximum mouth opening #MMO#, and surface electromyographic QIPA. *Results:* on follow up, Ai improvement and MMO was significantly larger in BTX-A group than splint group. Botulinum toxin –A injections produced general reduction of the QIPA parameters of masseter as and temporalis muscles at the 1st follow up which increased slightly on the 2nd assessment. In group 2, QIPA parameters significantly increased at both assessments. Implication:BTX-A injection offers advantages over the stabilization splint provided it isadministrated in appropriate dose.

PO-1357

EFFECTS OF TOTAL CONTACT CAST TREATMENT ON THE DIABETIC FOOT ULCERS

Wei Liu
West China Hospital,Sichuan University, China

Objective: To explore the effect of Total Contact Cast Treatment on the Diabetic non healing Foot Ulcers. *Methods:*35patients with diabetic foot ulcers were randomly divided into two groups. One group was treated with conventional treatment methods by medical department, and another treated by Total Contact Cast, Replace the plaster once two weeks until it was healed, Observe the changes of wound size and color in plantar ulcers. The therapeutic effect in different two groups was analyzed. *Results:* the curative rate of diabetic foot ulcers in Contact Cast Treatment group was significantly higher than other group ($p<0.01$), and the healing time of foot ulcers was significantly shortened. *Conclusion:* Total Contact Cast treatment has significant value in the treatment of diabetic non healing foot ulcers.

PO-1358

INTERACTIVE HAND REHABILITATION IN CENTRAL HEMIPARESIS

Pavel Snopkov*, Olga Dobrushina, Irina Sidyakina, Tatyana Shapovalenko, Konstantin Lyadov
Medical and Rehabilitation Center, Russia

Objective: to investigate effectiveness of complex interactive hand rehabilitation in central hemiparesis. *Method:* The study included 19 patients aged 55.6±17.8 years (17 men, 2 women; stroke – 16, traumatic brain injury – 3) with central spastic hand paresis (6-grade muscle strength scale 2.8±1.1, Modified Ashworth Scale 1.1±0.9) within 14 to 2880 days after stroke/trauma. Daily conventional ergotherapy, electric stimulation and interactive training with biofeedback with HandTutor system were performed. HandTutor consists of a glove with tension sensors sending information to a computer for evaluation of the range of motions and biofeedback. Treatment lasted 20 to 30 days. *Results:* We observed a significant increase in total active (from 59.3±29.7 to 75.3±26.5 mm, $p=0.004$) and passive (from 95.5±18.6 to 111.9±19.3 mm, $p=0.01$) range of hand motions and an increase in Frenchay Arm Score from 1.8±1.4 to 2.7±1.4 ($p=0.004$). Improvement was larger in fingers 1, 2 and 3 (active amplitude increased from 27.8±13.5 to 57.8±10.2 mm, $p=0.004$, passive amplitude increased from 46.5±10.4 to 57.8±10.2 mm, $p=0.002$). In fingers 4 and 5 we observed no gain while in the wrist there was an increase in active, but not passive range of movements. There was a weak but significant negative correlation between time after stroke/trauma and the gain in active ($R=-0.44$, $p=0.03$) and passive ($R=-0.4$, $p=0.04$) motions. Patient age and the side of the lesion had no influence on treatment effectiveness. *Implications:* Early complex interactive training is a feasible method of hand rehabilitation regardless of patient age and the side of the lesion.

PO-1359

DEEP VENOUS THROMBOSIS DEVELOPED AFTER USE OF INTRATHECAL BACLOFEN PUMP IN CHRONIC SPINAL CORD INJURY: A REPORT OF TWO CASES

İlknur Tuğcu, İsmail Safaz, Serdar Kesikburun*, Rıdvan Alaca, Arif Kenan Tan
Gülhane Military Medical Academy, Department of PM&R, Turkish Armed Forces Rehabilitation Center, Ankara, TURKEY

Objective: Intrathecal baclofen that provides direct and selective effect at the spinal cord level is used for the treatment of intractable spasticity of spinal or cerebral origin. *Method:* The most common complications associated with intrathecal baclofen pump (IBP) include mechanical problems with the device, procedure-related complications and drug side effects. We present two tetraplegic patients with deep venous thrombosis (DVT) secondary to hypotonia resulted from IBP. *Results:* Both patients needed to be treated with anticoagulant therapy. This is the first case report of DVT associated with use of IBP in spinal cord injury (SCI). *Implications/Impact on rehabilitation:* Clinicians should be alert to risk of thrombosis in SCI patients receiving intrathecal baclofen and can consider prophylaxis in high level SCI.

PO-1360

TRANSIENT EFFECT OF ACUPUNCTURE HEGU ACUPOINT: A RANDOMIZED TRIAL

Jun Wang[1], Tiegang Wang[1,2]
[1]Daqing City Chinese medicine hospital, Rehabilitation department, China, [2]Harbin Medical University graduate school, China

Objective: In the spastic paralysis period of cerebral infarction, we want creat a new method to reduce the muscle tone of hand by acupuncture Hegu acupoint. *Method:* In this experiment, 60 patients with cerebral infarction (mean age, 64±6 years) were randomly assigned to normal treatment (continuous passive dorsiflex motion) group (n=30), or acupuncture (needling Hegu acupoint) group (n=30) for 1 week. We measured indexs (include the lasting time of relexation and Ashworth scale) to evaluate the effect of this special treatment. *Results:* The lasting time of relexation is obviously longer in acupuncture group (Mean time: 17 Min) then in normal treatment group (Mean time: 10 Min). And the grades of Ashworth scale are also better in acupuncture group (Mean scores:0) then in normal treatment group (Mean scores:I). This study demonstrates that acupuncture Hegu point is effective and well tolerated in patients with spastic paralysis of hand due to cerebral infarction, especially its transient effect. But this trial had limitations: the study was not double blind, and the sample size studied was small. *Impact on rehabilitation:* We sure that acupuncture Hegu point is effective in reducing the muscle tone of hand, and this reduction is related to the operation mode. Therapist can save lots of time by using the meyhod. Although the mechanism of this treatment is still not clear, it do worth spreading.

PO-1361

GUIDELINES: TOPICAL SUBSTANCES FOR THE REHABILITATION OF PRESSURE ULCERS

Talita Justino Dos Santos*, Lisley Keller Cintra, Karla Barbosa De Freitas, Priscilla Alcantara, Fernando Scapassassi, Marta Imamura, Linamara Rizzo Battistella
Institute of Physical Medicine and Rehabilitation, University of Sao Paulo School of Medicine, São P, Brazil

Objective: Provide information on the use of topical substances in the treatment of pressure ulcers. *Method:* a Pubmed database search of randomized clinical trials was conducted using P.I.C.O. strategy (P.I.C.O. stands for: Patient, Intervention, Comparison and Outcome).The following terms were arranged for each search strategy: pressure ulcer; saline hypertonic solution, collagenase, papain, alginate, activated charcoal;and hydrocolloid. Methodological quality of the studies was assessed by JADAD score. *Results:* The search strategies retrieved 1,502 articles of which 109 were related to pressure ulcer treatment. After methodological quality assessment, 13 articles were used. Saline 0.9% applied on stage II, III and IV pressure ulcers for 35 weeks promotes complete healing of 63%, however no significant difference was founded when saline treatment was compared to the use of polyurethane (p= 0.817) (p<0.001)[RRA=0.93, Confidence interval (CI) 95% 0,16, 5,2]. The use of collagenase twice a day promotes in four weeks a reduction of 50% in the necrosis area in ulcers stage II, III and IV (p= 0.115) (RR=8%CI 95%-35%-51% RRA=0.029 CI 95%-0.133–0.191, NNT=34, CI 95% 5–INF). Treatment twice a day with papain associated to debridement in pressure ulcer stage III/IV with granulation tissue promotes a total healing of 13% after six weeks, but this effect is inferior to the vacuum therapy (VAC) (RRA=0,033 CI 95%-0.183–0.249, NNT=30, CI 95% 4–INF). The use of charcoal is superior to the hidrocolloid use in the reduction of pressure ulcer with tissue necrosis (26.9%) (p= 0.056). (RR=58% CI 95%0%-100% RRA=0.218 CI 95%-0.001–0.437, NNT=5, CI 95% 2–INF) (A). Hydrocolloid use for 8 weeks in pressure ulcer stage I and II promotes 85% of healing in ulcers stage I p<0.05) and 67% (p<0.005) (RRR=57% CI 95% 18%–96%, RRA=0.342 CI 95% 0,109–0.575,NNT=3 CI 95 % 2–INF). *Implications/Impact on Reahabilitation:* Different types of topical substances have been demonstrated to help in the healing process of pressure ulcer. Saline hypertonic solution, papain, activated charcoal and hydrocolloide are used according to the healing stages.

PO-1362

THE EFFECT OF REPETITIVE BILATERAL ARM TRAINING WITH RHYTHMIC AUDITORY CUEING ON MOTOR PERFORMANCE AND CENTRAL MOTOR CHANGES IN PATIENTS WITH CHRONIC STROKE

Enas Shahine*, Tarek Shafshak
Faculty of Medicine, Alexandria University, Egypt

Objective: To investigate the effects of bilateral arm training with rhythmic auditory cueing (BATRAC) versus control intervention (CI) on both upper extremity (UE) motor performance and motor evoked potential (MEP) changes in patients with chronic stroke. *Methods:* 76 patients (mean age=50.2±6.2 years) with chronic stroke (disease duration=6-67 months after stroke onset) were enrolled. Patients were randomized to receive either BATRAC (n=40) with both UE trained simultaneously in symmetric and asymmetric patterns or CI (n=36) in the form of traditional therapeutic exercises for one h/day, 3 days/week for 8 weeks. Functional and neurophysiological assessment was done before and after intervention. Outcome measures included: 1) Fugl-Meyer (FM) UE motor performance test and 2) Transcranial magnetic stimulation (TMS) to elicit MEP from the paretic abductor pollicis brevis (APB) muscle. The recorded MEP parameters included threshold to TMS, MEP amplitude (expressed as ratio to M amplitude) and central motor conduction time. *Results:* There was no significant difference between groups regarding age, sex, duration of stroke, side affected or the pre-intervention FM-UE scores or pre-intervention MEP parameters. There was a significant increase in FM-UE scores in both groups. However, there was a significant improvement in all MEP parameters only in the BATRAC group. I mplication: BATRAC and CI reduced motor impairment; but only BATRAC improved the MEP parameters of the paretic ABP. These findings recommend the use of BATRAC in chronic stroke patients to improve motor performance and the central excitability. The latter might increase the duration of functional improvement.

PO-1363

RESEARCH ON THE EFFECT OF GROUP SELF-DISCLOSURE INTERVENTION ON THE DEVELOPMENT OF POSTTRAUMATIC GROWTH IN ACCIDENTALLY INJURED PATIENTS

Xiaoqing Wang[1,2], Guanyu Wang[2], Lin Gong[2], Yuanyuan Zhu[2], Zhen Zheng[2], Chao Xie[1], Bin Zhou[2]
[1]Nanjing RUIHAIBO Medical Rehabilitation Center,China, [2]The 454th hospital of peoples Liberation Army, China

Objective: To validate the group self-disclosure intervention's effect on the posttraumatic growth (PTG) level of accidentally injured patients. *Methods:* The intervention trail was conducted by using quasi-experiment design in a rehabilitation hospital in Nanjing. All the participants were assigned into experimental group (n=17) and control group (n=18) according to the sequence of admission to hospital. All the participants in both groups received routine rehabilitation training and nursing care, while those in the experimental group received additional 5 weeks' group self-disclosure intervention. Posttraumatic growth inventory (PTGI) was used to test the PTG level before and after the intervention in both groups. *Results:* After four-week intervention, score of total PTGI, score of appreciation of life subscale, score of personal strength subscale, and score of new possibility subscale were significantly increased in experimental group (p<0.05). However, in control group, the score of "relating to others" was decreasing, while the score of total PTGI and its other subscales were not significantly different from the baseline level. *Conclusion:* Group self-disclosure intervention is useful

for participants' psychological adjustment and posttraumatic growth. It is highly recommended that group self-disclosure intervention can be included in the long-term rehabilitation plan.

PO-1364

EFFICACY OF REHABILITATION WITH THE INFINITY METHOD TREATMENT IN LOW BACK PAIN

Michaela Tomanova
Rehabilitacni ustav Brandys nad Orlici, Czech Republic

Objective: INFINITY method represents a kinesitherapy approach based on anatomy, neurophysiology and biomechanics to musculoskeletal dysfunction. In the pre-operative and early post-operative phases, static sub-maximal isomeric contraction with exercise is utilized. In other therapy, 3-dimensional movements in figure eight, circular and spiral dynamic stabilization exercises in low back pain (LBP) patients. To improve the range of motion, strength, coordination and proprioception, which lead to better joint stabilization, postural control and balance of body and spine. To test a hypothesis that rehabilitation with the INFINITY method treatment (IMT) is more effective than a conventional method treatment (CMT) in LBP patients. *Method:* Quasi-experimental, non-randomized study in a rehabilitation hospital. 89 participants divided into the IMT (n=60) and CMT (n=29) groups. We treated and tested the LBP subjects with the IMT and CMT. The dependent variable was the visual analog scale (VAS) of subjective pain scores (from 1 for "no pain" to 10 for "very severe pain"). *Results:* For the CMT and IMT groups, the mean ± standard deviation of baseline VAS pain score differences were 1.86±1.10 and 2.54±1.51 (p<0.05), respectively. *Implications/Impact on rehabilitation:* Although both groups exhibited decrease of pain after the treatments, rehabilitation treatment in the LBP subjects is more effective with the use of the INFINITY method treatment.

PO-1365

REHABILITATION INTERVENTIONS AFTER INTERNAL HEMIPELVECTOMY IN A 17-YEAR OLD MALE DIAGNOSED WITH CHONDROSARCOMA: A CASE REPORT

Ana Paula Lim, Ma. Hazel Rita Therese Gazmen*
Philippine Academy of Rehabilitation Medicine,Philippines

Objective: This paper aims to report on a case of post-internal hemipelvectomy with L3-4 nerve root transection patient who underwent four weeks of rehabilitation for pain control and functional training. *Method:* Outcomes were measured using the Pain Intensity Numerical Rating Scale (PI-NRS), the Musculoskeletal Tumor Society (MSTS) Rating Scale and Functional Independence Measure (FIM) score. *Results:* A 17-year old male, diagnosed with chondrosarcoma stage IIb, underwent pelvic tumor resection with transection of the L3-4 nerve roots and hip joint muscles on the left, internal hemipelvectomy and reconstruction with fibular strut grafts, followed by application of external fixation over the right pelvis and left femur. Functional outcome after limb-sparing surgery was evaluated after 4 weeks of rehabilitation, using the MSTS Rating Scale and FIM score. Pain over post-operative site was managed and monitored using the PI-NRS. Functional outcome after 4 weeks of rehabilitation improved by 5 points using the MSTS Rating Scale, and by 2 and 7 points on 2- and 5-month follow-up, respectively. Using the Functional Independence Measure, the patient scored 80/126 on admission, 88/126 on discharge and 107/126 five months after discharge. The patient is currently ambulatory with bilateral axillary crutches on level surfaces and stairs. *Implications/Impact on rehabilitation:* Functional outcome of a patient after internal hemipelvectomy is improved if pain is controlled at the earliest possible time and with early rehabilitation management.

PO-1366

THE IMPACT OF CHINESE MEDICINE COMBINED WITH PULMONARY FUNCTION TRAINING ON PATIENTS WITH PNEUMOCONIOSIS RESPIRATORY FUNCTION AND SERUM FACTORS

Shunlin Zhou, Qiusheng Hu, Qingjun Li, Jinwei Duan
Department of Rehabilitation centers,Yiling Hospital of Hebei Province

Objective: To observe the effect of Chinese medicine combined with pulmonary function training on the lung function of pneumoconiosis patients and transforming growth factor-B (TGF-β1), platelet-derived growth factor (PDGF), connective tissue growth factor (CTGF). *Method:* 62 Pneumoconiosis patients diagnosed with stage II, III were randomly divided into the treatment group (31) and the control group (31). All patients were treated with respiratory function training, including lip contract breathing training, thoracic assisted breathing training, strengthen the training of the respiratory muscles, walk abdominal breathing training and aerobic training etc. And the treatment group on the basis of the above plus Chinese herb (Ginseng, Astragalus, Radix, Salvia, peach, bellflower, fritillary, Morus alba, earthworm, cordyceps, rhodiola, cornus, Cimicifuga, Anemarrhena, Bupleurum, yam etc) The two groups of patients assessed for efficacy by detecting lung function before treatment and after 8 weeks of treatment, blood gas analysis, and the 6-min walk test, and the serum of TGF-β1, PDGF, CTGF. *Results:* After 8 weeks of treatment, it is found that the two groups of patients with lung function, blood gas analysis, and 6-min walk scores improved significantly compared with pre-treatment,and it is more significant in control group. The difference between two groups has statistical significance (p. *Implications:*Chinese medicine combined with pulmonary function training can not only improve the respiratory function and the life quality of pneumoconiosis patients, but also delay pneumoconiosis progression of the disease.It is provides an effective way for pneumoconiosis in Integrative Medicine.

PO-1367

EFFECTS OF TRANSCRANIAL DIRECT CURRENT STIMULATION ON THE DISPHAGIA OF MEDULLA OBLONGATA DORSOLATERAL SYNDROME

Yu Cui
Jiangsu province peoples hospital Zhongshan branch of rehabilitation, China

Objective: To observe the dorsolateral syndrome the dysphagia treatment effect in patients with severe transcranial direct current stimulation (tDCS) treatment of the medulla oblongata. Methed:Treatment procedure was divided into phase A and phase B.First routing three-weeks Surface electrical stimulation of the lower jaw treatment was applied in phase A,then routine transcranial direct current stimulation (tDCS) in the treatment of surface electrical stimulation therapy. 1cm, ipsilateral occipital protuberance located transcranial direct current stimulation of the anode cathode in the contralateral cheekbones; stimulus intensity 1.0mA stimulation time 13min, rest stimulus 13min 20min after. Application improved swallowing ability evaluation form (MMASA) the assessment before and after each treatment period. *Results:* surface electrical stimulation of three weeks, although the patient's thyroid cartilage elevation more fully, but still can not eat; transcranial direct current stimulation therapy, swallowing function classification assigned to six points from 0 and pull out the feeding tube. *Conclusion:* Transcranial direct current stimulation of dorsolateral medullary syndrome dysphagia provides a new and effective treatment technology, can speed up the recovery of swallowing function.

PO-1368

THE EFFICACY OF KNEE DISARTICULATION IN AN ELDERLY CANCER PATIENT: A CASE REPORT

Amy Ng
MD Anderson Cancer Center, United States

Objectives: To highlight a case where knee disarticulation was considered in lieu of above knee amputation. *Methods:* Case report of a?80-year-old female presented with right anterior knee mass with progressive worsening lower extremity edema. Biopsy of the mass showed soft tissue spindle cell sarcoma with mixed cellularity. She underwent chemotherapy and radiation treatment and subsequent right knee disarticulation. Her course?through rehabilitation is highlighted. *Results:* Patient presented to acute rehab 11 days after knee disarticulation. Postoperatively, she complained of a burning sensation and was started on a small dose of Neurontin 100 mg po TID.? Her pain is well controlled with a small minimal dose of gabapentin. She remained on the same dosage of Neurontin throughout her hospitalization.? She had no phantom limb sensation or phantom limb pain. She tolerated ACE wrapping and shrinker application on the stump site. She tolerated bearing weight on the stump site. Since the initial date of surgery, she has had no complications to date. The sutures on her incision were removed on the day of discharge. Her wound continues to heal without any complications. Her overall hospital stay was 20 days, which included 9 days in inpatient rehabilitation. *Conclusions/Impact on Rehabiltation:* Knee disarticulation is a rare type of amputation but should be evaluated as an option before above-knee amputation, regardless of age and etiology. Knee disarticulation in this patient resulted in little to no pain and improved tolerance to physical therapy.

PO-1369

MANY SEGMENTS BETWEENCERVICAIMOREDISKLESIONS (MODIFIOD) CLINICAL REHABILITATION THERAPY REPORT

Weibin Chen[1,2], Shuping Qi[1,2], Bingwen Dong[1,2]
[1]Dalianpulandian.certral.hospital.rehabilitation.department.Zip.code:116000, [2]Dlian.medical.university.affiliated.2.hospital.rehabilitation.departmentZip.code:116027

Objective: to determine many sections of the cervicai intervertebral-disc lesion (modified period) treatment and CT change and effect rehabilitation ship between change. Methods1. Gruping. *Method:* according to the patient to the hospital sequence, CTdiagnosis, will be eligible to diagnosis fault scalequasi random grouping method corresponding physical therapy group, technique, infusion grop, the joint group phase should be serial number is 0 1 2 3 2. Treatment. *Methods:* physical therapy group with ultrashort wave, such as deputy intermedite frequeny electric, paraffin wax therapy, technique group with traditional, McCANN base, joint release andinstruments therapy method, infusion group with safflower, mannitoland cytidine, diphosphate choline, bone peptide and drugs, joint group of the above three methods. *Result:* The curative effect between the four groups have a high diversity X=73 15 (x0 005=23 19 p<0 005) the care rate for:physical group 25%,technique group 21%, joint group 31% infusion group 56% CT rate and carative effect rate between height difference X=796 39 (X0 005=7 88 p<0 005). Conclsion segment of the cervical intervertebral disc lesion (modified period Rehabilitation schemeis multivarite, gauge fan, clear physical therapy group with the lesion site for therapeutic part, adjuct the therapeutic dosc and time through change date of departure technique groupin no root edema and extrusion infusion group in never root edema and extrusion application,joint groupinsin accordance with the above principic to choosc with personalized treatment CT changes and carative effect change monitoring signicance is not clear.

PO-1370

USE OF BOTULINUM TOXIN A IN PATIENTS WITH SEVERE UPPER AND LOWER LIMBS SPASTICITY

Akiyoshi Nagatomi, Hiroaki Kimura, Naoya Yamane
Hiroshima University Hospital, Japan

Objectives: This is a preliminary evaluation of botulinum toxin A treatment on disability caused by upper and lower limbs spasticity. *Methods:* Seventeen patients with severe spasticity were treated with intramuscular botulinum A neurotoxin (average age: 50.4+/-20.0 years old; median time between onset and botulinum toxin treatment 8.3 years). Of 17, fifteen cases were diagnosed as post-stroke hemiplegia and two cases were diagnosed as hereditary spastic paraplegia. Baseline and assessments four weeks, 3 months and 6 months after treatment were compared to assess efficacy. The duration of improvement in disability was documented. Outcome measures used were; passive range of movement, modified Ashworth scale to assess spasticity, walking speed. Some muscles of upper and lower muscles were treated with intramuscular botulinum toxin. Up to a total dose of 240-360 mouse units (MU) of BOTOX (GlaxoSmithKline) was injected in each patient. *Results:* Passive range of movement at elbow, wrist, knee and ankle improved after treatment. Modified Ashworth Scale score in upper and lower limbs were decreased from 3.0 at baseline to 2.5 at four weeks. Walking balance improved in four patients and 10-meter walking speed improved in two patients in two cases at 4 weeks. Benefit was noted within four weeks and lasted one to 3 months. Fourteen cases were treated every 3 months but three cases were dropped out. No adverse effects occurred. *Conclusions:* This study may suggest that intramuscular botulinum toxin is a safe and effective treatment for reducing spasticity and disability in patients with severe spasticity.

PO-1371

THE EFFECT OF ELECTRICAL STIMULATION COMBINED WITH FOAM DRESSING ON ULCER HEALING IN RATS WITH SPINAL CORD INJURY

Yongsoon Yoon*, Kipi Yu, Eunsil Kim
Presbyterian (Jesus) Medical Center, Korea

Objective To evaluate the effect of electrical stimulation combined with foam dressing on wound healing in rats with spinal cord injury. *Method:* Thirty five male Sprague-Dawley rats were induced complete spinal cord injury by electrical cauterization after laminectomy at T11-L1 level, then the pressure ulcer was induced at left thigh by magnet application. The newly invented surface electrode which is fitted with foam inside was applied on ulcers. Ratswere divided into two groups as follows: Electrical stimulation (ES) group with foam dressing and electrical stimulation (2 Hz and 200μs duration, 15m) for 30 min per time, 4 times per day, for 3 weeks and control group with foam dressing and no electrical stimulation. A picture of ulcer was taken daily from day 0 to day 21 by electronic camera and the ulcer area was calculated by Image J program. Histopathological and immune-histochemical evaluation were performed at day 1 and days 7 and 21. *Results:* The area of ulcers of ES group was smaller than that of the control group after day 14 (p<0.05), and vascularity and α-SMA positive stained area of ES group was more increased on day 7 and more decreased on day 21 than that of the control group.*Conclusion:* Electrical stimulation combined with foam dressing by using a newly invented surface electrode facilitates and accelerates the wound healing process.

PO-1372

OSTEOPOROSIS IN SPINAL CORD INJURY

Marina Da Paz Takami*, Sofia Bonna, Alyne Rangifo, Carolina Mendes Pinheiro, Leda Maria De Campos Guerra, Marta Imamura, Linamara Rizzo Battistella

Clinical Research Center. Institue of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, São Paulo, São Paulo, Brazil

Objective: Provide information on rehabilitation in patients with spinal cord injury presenting osteoporosis. *Method:* Pubmed database search of randomized clinical trials was conducted using P.I.C.O. strategy (P.I.C.O. stands for: Patient, Intervention, Comparison and Outcome). The following MeSh terms were the search strategy: (Spinal cord injury) and (Osteoporosis) and (Risk factors or Prevention) and (Calcium) and (Vitamin D or Ergocalciferol or Cholecalciferol) and (Physical therapy modalities OR Physical exercise) and (Vibration or Vibration therapy) and (Biphosphonate OR Diphosphonates) AND (Eletric stimulation or Ultrasound) from to Jul 2012. *Results:* Forty-two articles were selected. As predictor and risk factors for osteoporosis are the degree as the lesion is incomplete ($p<0.0001$), the body mass index ($p=0.0035$), the age ($p=0.0394$), smoking and alcohol consumption ($p=0.0518$). Exclusive use of calcium does not prevent the reduction of bone mineral density, however the combination of alendronate and calcium prevents bone loss > 10% in the tibial trabecular for 24 months, with a reported mean consumption of 1263 mg ± 97.3 mg/day. The use of the substance analogous to vitamin D (1α D2), 4 µg/day for 24 months associated with 500 mg/day of calcium and vitamin D promotes na increase in the bone mass with a peak effect at 6 months. There is no evidence showing the benefit of exercise, vibration therapy, bisphosphonates, short term of therapeutic ultrasound, and functional electrical stimulation is not effective to prevent or treat bone loss after spinal cord injury. *Implications/Impact on rehabilitation:* The use of calcium combined with alendronate and vitamin D prevents bone loss and promotes its increase.

PO-1373

MULTIDISCIPLINARY THERAPY TO IMPROVE MOBILITY IN A PATIENT WITH MULTIPLE SCLEROSIS CASE REPORT

Goldenberg Katalin
Bnai Zion Medical Center, Israel

Approximately 75% of patients with Multiple Sclerosis (MS) present walking impairment. Spasticity is one of the most common symptoms in patients with MS significantly affecting mobility, activities of daily living (ADL) and quality of life (1). We present a case of patient with MS with severe symptoms of spastic paraplegia, confined to wheelchair. Following a multidisciplinary approach including pharmacological, physiotherapy, occupational and surgical therapy she resumed short distance walking with the help of a walking aid.

PO-1374

OBSERVATION ON THE CLINICAL EFFICACY OF CHINESE MEDICINE WITH THE REHABILITATION TREATMENT OF TRAUMATIC PARAPLEGIA

Qingjun Li, Hongxia Li, Jing Wang, Chunru Liu
Department of Rehabilitation centers,Yiling Hospital of Hebei Province

*Objective:*To observe the clinical effect of traditional Chinese medicine combined with the rehabilitation of patients with traumatic paraplegia. *Methods:* 60 patients with Trauma lead to limb flaccid paralysis,spasm,Sphincter disturbances,muscle atrophy, neuralgia, lower limb cool were randomly divided into treatment group and control group of 30 patients in each.The treatment group on the basis of conventional rehabilitation plus Chinese medicine temperature Governor Tongluo blood circulation.The control group were treated with conventional physical rehabilitation.Using *t*-test and Ridit analysis statistical analysis after 3 months of treatment. *Results:* Symptoms of treatment group improved were significantly better than the control group.Effective treatment group was 90%. It is significantly better than the control group of 63.3%.The difference between the groups was statistically significant ($p<0.05$). *Implications:* The traditional Chinese medicine combined with rehabilitation therapy play a significant role in improving the symptoms of paraplegics.

PO-1375

SEXUALITY AFTER BRAIN INJURY – FEARS AND BELIEFS

Gustavo Beca*, Maria Cunha, Ana Rita Almeida, Ines Campos, Anabela Pereira, Jorge Laíns
Centro de Medicina de Reabilitação da Região Centro - Rovisco Pais, Portugal

Objectives: This study aims to understand the beliefs and fears concerning sexuality in patients with brain injury (BI) admitted in a Rehabilitation Department (RD) and thus establish strategies for assessment and adequate intervention. *Methods:* We collected data for all patients admitted with a BI in a RD during December 2012, concerning demographic information. A questionnarie was made, with 18 questions to assess fears and beliefs of patients with BI sequelae. Exclusion criteria: patients not cooperating and/or disoriented, aphasia, previous sexual dysfunction. SPSS was used for descriptive and statistical analysis. *Results:* The sample consisted of 13 patients with stroke and 10 with TBI. The majority of patients were sexually active before the injury, 26% thought they would never be able to have an active sex life again, 52.2% thought physical changes prevented from having a fulfilling sex life, 34.8% didn´t have anyone to discuss issues about sex and 30.4% stated would like to talk to someone about resuming sex. 87% denied feeling too old for sex, 73.9% denied fear of rejection and 68.2% denied feeling less attractive and his/her partner wouldn´t be interested in her/him. Of the stroke patients, 38.4% feared that sex would cause another stroke. The youngsters have more fear that physical changes would prevent them from having satisfying sex life. *Implications/Impact on rehabilitation:* We obtained a broader understanding of the needs of our patients concerning sexuality. We hope to better target our efforts to meet their expectations/fears, minimizing restrictions on participation of a satisfying sex life.

PO-1376

REHABILITATION IN REPETITIVE STRAIN INJURIES (READ) OR WORK-RELATED MUSCULOSKELETAL DISORDERS (WMSD) IN UPPER LIMBS

Gustavo Fadel*, Arlete Salimene, Renata Moraes Dos Santos, Viviane Duarte Correia, Linamara Rizzo Battistella
Clinical Research Center. Institute of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objective: To verify the treatments described in the literature for repetitive strain injuries of the upper limbs. *Method:* A multidisciplinary team elaborated 15 questions related to repetitive straininjuries of the upper limbs and ergonomic measures, educational gymnastics, rest, immobilization, physical, acupuncture, physiotherapy, occupational therapy, physical exercise, analgesics, anti-inflammatory drugs, antidepressants, surgical methods, and psychosocial approaches. We reviewed articles in the MEDLINE (PubMed) database and other sources with no time limit. The search strategy was based on structured questions as PICO ("Patient","Intervention", "Control", "Outcome"). *Results:* 11305 articles were found and 30 articles were selected. Ergonomic measures (postural orientation, adaptation of securities and short break 20-40 min) may prevent

discomfort and pain of RSI/WMSD. There is no scientific evidence to confirm the use of educational programs, gymnastics, rest or immobilization, acupuncture, occupational therapy, analgesics, anti-inflammatory drugs, antidepressants, surgical methods and psychosocial approaches to the issue of RSI/WMSD. For shoulder tendonitis is recommended using a needle guided by ultrasound in combination with shock wave therapy of high energy, for epicondylitis for wrist extensors, laser (904 Ga-As, 50 Hz, 40 mW - 2.4 J/cm^2) and plyometric exercises. Physiotherapy (stretching, compression of trigger points, hot packs) is recommended to reduce shoulder pain. Manual exercises associated with deep shoulder massage, mobilization and proprioceptive techniques reduce pain shoulder. *Implications/Impact on rehabilitation:* For treatment of RSI/WMSD the use of ergonomic measures, needling combined with shock waves,laser associated exercises and physiotherapy and manual exercises are the resources listed, but studies are desirable with stronger evidence.

PO-1377

REHABILITATION IN DYSTONIAS

Tatiana Domingues Pedroso*, Thais Tavares Terranova, Lilian Falkenburg, Maria Angela De Campos Gianni, Tatiane Lopes Teixeira De Almeida, Maria Inês Nacarato, Maria Inês Paes Lourenção, Linamara Rizzo Battistella

Clinical Research Center. Institute of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objective: To verify the treatments described in the literature for dystonia. *Method:* A multidisciplinary team elaborated 10 questions related to dystonia with muscle relaxant, botulin toxin, botulin toxin after phonotherapy, therapeutic exercises, biofeedback, transcranial magnetic stimulation (rTMS), assistive technology, functional training daily activities, and deep brain stimulation. The final data of the search was in July 2012 and the Pubmed Database was used as a source for the use of the articles. The search strategy was made in the PICO format (Patient, Intervention, Comparison and Outcome). *Results:* 4133 articles were found and 35 were selected. Although botulin toxin (type A or B) is recommended as first choice treatment for cervical dystonia the phonotherapy is recommended as an adjunct to decrease side effects. The use of botulinum toxin is also recommended for focal dystonia (writer's cramp). The use of biofeedback and deep brain stimulation has also been named as a resource for dystonia, but not as first-line choice. The low-frequency rTMS (less than or equal to 1 Hz) is effective in the treatment of focal dystonias, such as blepharospasm and focal hand dystonia, but there is still a lacking of evidence from controlled studies that evaluate the long-term effects. There is also a lack of evidence regarding therapeutic exercises the use of muscle relaxants, assistive technology and functional training. *Impact/Implications for rehabilitation:* The use of botulin toxin is the most recommended for cervical dystonia, and the use of physical therapy and phonotherapy associated is recommended.

PO-1378

THE DEVELOPMENT OF CATHETER WITH SLOW-RELEASE AMIKACIN AND THE RELEASING RESEARCH IN VITRO

Ming Feng Xiong, Hong Jun Yu

address is missing

Objective: To develop the catheter with slow-release amikacin for decreasing the catherter—associated urinary tract infection (CAUTI). *Methods:* The chitosan as the carrier, the amikacin was added to the surface of catheters. The density of amikacin in leach liquor, the element components and the antibacterial activity of amikacin in the membrane were determined by spectrophotometric method, energy spectrum analysis technology (EDAX) and direct antibacterial experiment. *Result:* The antibacterial amikacin was added to the the surface of catheters by the method described in this paper. The slow-release time of amikacin exceeded 15 days. *Conclusion:* The method described in the paper can be used for developing the catheter with slow-release amikacin. The catheter would be used to preventing the CAUTI.

PO-1379

SOLVING DISABLED PROBLEMS

Yousef Shehada

Fata Hospital, Nawwar Centre, Gaza Strip

Objective: The goal of this paper is to discuss obstacle faces disabled inclusion and all related problems, and find how to solve them. *Method:* Data collection about inclusion efforts in different countries. International achievements in this field. The situation of inclusion today. Concentrating on items like treatment, technical aids, attitudes, cost and research. Data analysis to find success size and values. *Results:* Some countries have achieved good progress in solving disabled problems but many others haven't. A concrete development have been achieved in all fields related to disabled inclusion. Therapeutic intervention, technical aids and rehabilitation techniques showed obvious progress. Countries of reasonable health services showed approximately normal rate of age to disabled persons. Although such progress happened, but the benefits are still very limited due to causes related to attitudes and cost. Disabled persons find that they should have their own initiatives to solve their problems. Local and international collaborative efforts could achieve real and full inclusion. *Implications:* "Help myself initiative" is a proposal for all disabled people in order to solve most of disabled problems. Even talking about disabled inclusion but it will be better to underline the important items and talk more about needs, researches, cost, and attitudes.The expensive cost of technical aids and therapeutic intervention are unjustified and needs national and international collaborative to be solved. Regular human rights and institutions are enough for all including disabled persons. Negative attitudes should be finished now.

PO-1380

A SYSTEMATIC REVIEW: EFFICACY OF MIRROR THERAPY IN THE TREATMENT OF UPPER LIMBS OF STROKE PATIENTS

Yushan Yue[1], Jie Huang[2], Yi Zhu[1], Zhonghan Li[1], Wenyi Zhang[1], Liting Zhu[1], Xudong Wang[3]

[1]The Second Clinical Medical School, Nanjing University of Chinese Medicine, Nanjing, Jiangsu, China, [2]Tongji Hospital, Tongji Medical College,Huzhong University of Science and Technology,Wuhan,Hubei,China, [3]Institude of literature in Chinese Medicine. Nanjing University of Chinese Medicine, Nanjing, Jiangsu, China

Objective: To evaluate the effect of mirror therapy for treatment of upper limbs for stroke patients. *Method:* PUBMED, MEDLINE, EMbase, Cochrane Library, ISI Web of Knowledge, OVID, CNKI, VIP, Wanfang Database were searched for randomized controlled trials (RCTs) of mirror therapy for treatment of upper limbs for stroke patients from April 2012. The bibliographies of retrieved studies were also searched. Two independent researchers evaluated the included studies using the risk of bias. The extracted data were analyzed by RevMan 5.1 and GRAED profiler 3.6. *Results:* 9 trials were included. Meta analysis showed mirror therapy increased Brunnstrom stage scores for hand and FIM self-care scores after 4 weeks of treatment and at 6-month follow-up, MAS scores at 6-month follow-up, Modified Barthel Index scores after 4 weeks of treatment. In the GRADE system, Brunnstrom stage scores for hand after 4 weeks of treatment were of moderate quality; Brunnstrom stage scores for hand and MAS scores at 6-month follow-up were

of low quality; FIM self-care scores after 4 weeks of treatment and at 6-month follow-up and Modified Barthel Index scores after 4 weeks of treatment were of low quality. *Impact on Rehabilitation:* Studies show that mirror therapy could effectively improve upper limb function and quality of daily life in stroke patients. However, more large-sample and high-quality RCTs are needed because there were some limitations in the included studies such as poor quality, different end points and different courses (or cause) of stroke.

PO-1381

CHALLENGES IN FITTING OF YOUNG AMPUTEES

Jorge Caldas
Department of Physical Medicine & Rehabilitation, CHTV Viseu, Portugal

Introduction/Objectives: Amputation of young amputees, which is often of traumatic cause, becomes a challenge for rehabilitation since that there should be a compromise among the new technological advances, the level of activity expected, future profession and the economic resources. *Methods/Results:* Among outpatients of our department we chose two clinical cases as examples of intervention of rehabilitation. *Case 1:* Female, 6 years, car accident, right Syme amputation level associated with multiple areas of cutaneous grafts along the leg. After several years with orthosis modified along with the growth till the age of 12, it was prescribed a exoskeletal prosthesis with pelite socket and an Flex Foot with excellent adaptation including integration in sports activities. However, after 14 months, it appeared excoriation on the anterior leg. This was considered as a result of friction between the bone and the rigid prosthesis. In this context we choose a new endoskeletal prosthesis with a carbon socket and an thin thickness Seal In Interface. *Case 2:* Male, 18 years old, student, car accident, bilateral transtibial amputation. The initial goal was to acquire immediate autonomous locomotion, allowing the return to school and sport's practice. Therefore, we selected a 2-carbon prostheses with suction interface and Variflex xc® feet. This solution allowed the stability and security needed in the stance phase and, simultaneously, the achievement of maximum storage and energetic return even while changing gait velocity and running. *Conclusion/Impact of rehabilitation:* The fitting of young amputees is still a challenge in Rehabilitation. Therefore, it is of utmost importance the correct timing on the placement of the prosthetic components, in order to take advantage of the latest technological advances available.

PO-1382

EFFECT OF LOWER LIMB END-EFFECTOR ROBOT-ASSISTED THERAPY WITH BODY WEIGHT-SUPPORT IN PROGRESSIVE SUPRANUCLEAR PALSY PATIENTS

Patrizio Sale*, Daniele Galafate, Domenica Le Pera, Fabrizio Stocchi, Ivan Sova, Laura Vacca, Paola Grassini, Valentina Lombardi, Marco Franceschini
Irccs San Raffaele Pisana Rome, Italy

Objective: Progressive supranuclear palsy (PSP) is a rare neurologic disorder primarily presenting with motor disturbances (e.g., postural instability, parkinsonism, slowing of vertical saccades) and is characterized by a progressive decline of locomotor abilities of lower limb so that gait rehabilitation. The Aim of the study is to validate the efficacy of a robotic system specific for lower limb (G-EO) on gait recovery in this. *Design:* Observational study. *Participants:* Diagnosis of PSP Disease by the clinical criteria of the National Institute of Neurological Disorders and Stroke Society for PSP International Workshop, stable doses of Parkinson's medications for at least 8 weeks prior to study onset, and an endurance sufficient to stand at least 20 min. Inclusion criteria: evidence of motor deficit in one lower limb, age between 18 and 79 years, capability to walk, unassisted or with minimal assistance, for 25 feet. *Exclusion criteria:* Association of neurological, orthopaedic or cardiopulmonary pathologies. Psychiatric disorders reducing patient collaboration. Interventions: If eligible, the patients were assigned to Robot assisted therapy. *Rehabilitation Treatment:* twenty sessions of 45'. Ten subjects underwent a lower limb rehabilitation consisting of a treatment cycle using the GE-O system device, according to individually tailored exercise scheduling. The practice included an add-on robot-assisted walking therapy at variable speeds for 45 min with a partial body weight support (BWS). All participants started with 30-40% BWS and an initial speed of 1.5 km/h speed were increased to a range of 2.2 to 2.5 km/h before BWS were decreased. All the treatment consists of 20 sessions for the lower limbs, each lasting 45 min, 5 days a week for 4 weeks. *Main Outcome Measures (Abstracts Only):* " At the beginning of the treatment and after 20 sessions, opto-cinematic analysis of gait and clinical specific scales (PSP rating scales, The Six-Min Walk Test e Ten Meter Walk Test) were delivered." *Results:* "Ten patients (6 male; mean age 67,17+/- 8,63 mean height 162,5 +/- 3,97, mean weight kg 70,0 +/- 1,987) had H&Y median score of 3,0. The ones treated with G-EO showed a not significative changes of gait spatio-temporal parameter with an improvement of Barthel and FIM scores at discharge compared to admittance. *Conclusions:* Our preliminary results show that G-EO system treatment is well tolerated by all patients without improvements of spatio-temporal gait parameter and performance.

PO-1383

LONG TERM OUTCOME AFTER BELOW AND ABOVE KNEE AMPUTATION

Boris Tchalabian
Department of Rehabilitation, Bnai Zion Medical Center, Israel

Introduction: Lower limb amputation is performed for different reasons including: peripheral artery disease, diabetes, tumor or secondary infections. Lower limb amputation results in significant physiological and functional changes leading to severe impairment in the quality of life. The information of long term results in patients following lower limb amputation is limited. (1-3). We present our findings regarding functional independence in patients five years after lower limb amputation. *Methods:* This is a retrospective study including 62 patients with below or above knee amputation treated in the Rehabilitation Department, Bnai-Zion Medical Center, between 2004-2008. Thirty two patients (52%) replied to questionnaires. The following tests were used: Functional Independence Measure (FIM) to asses functional independence, Frenchay Activities Index (FAI) to asses instrumental activities of daily life before and after lower leg amputation and Houghton Scale (HS) to asses prosthetic use. *Results:* The activities of daily living score (113.2 + 10.2 according to the FIM assessment) showed conditional independence; however the mean instrumental function score was low (10.53 + 8.6 according to FAI) and significantly decreased in comparison with pre-amputation levels, as reported by the patients. (26.25 + 6.83). There was a significant correlation between the degree of daily independence and degree of participation in instrumental activities. (p Twenty eight participants (88%) had prosthesis and 23 participants (82%) reported that they used the prosthesis. It was a statistical significance correlation between the frequency of the prosthesis use and the degree of daily independence (p. *Conclusions:* Lower limb amputation results in a decrease in the quality of life and social activities involvement. However, use of prosthesis is very important to promote independence and participation in daily life activities. References: 1) Hawamdeh, Z.M., Othman, Y.S., & Ibrahim, A.I. (2008). Assessment of anxiety and depression after lower limb amputation in Jordanian patients. Neuropsychiatric Disease and Treatment. 4 (3). 627-633. 2) Norvell, D.C., Turner, A.P., Williams, R.M., Jakimi, K.N., & Czerniecki, J.M. (2011). Defining successful mobility after lower extremity amputation for complications of peripheral vascular disease and diabetes. Journal of Vascular Surgery, 54 (2). 412-9. 3) Steinman, M.G., Kurichi, J.E., Kwong, P.L., Maislin, G., Reker, D.M., Vogel, W.B., Prvu-Bettger, J.A., Bidelspach, D.E., & Bates, B.E. (2009). Survival analysis

in amputees based on physical independence grade achievement. Archive Surgery, 144 (6). 543-552.

PO-1384

REHABILITATION OF LUMBAR DISC HERNIATION

Luisa Moraes Nunes Ferreira*, Pedro Claudio Gonsales De Castro, Camila Morassi, Aline Oyakawa, Lilian Braighi Carvalho, Renato Silva Martins, Linamara Rizzo Battistella

Clinical Research Center. Institute of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objective: To review the literature on the treatment of lumbar disc herniation. *Methods:* A multidisciplinary team elaborated 14 questions related to lumbar disc herniation combined with muscle relaxant, anti-inflammatory drugs, opioids, antidepressants, gabapentin, acupuncture, exercise, rehabilitation, pre-and postoperative assessment, cognitive behavioral therapy, educational program and infiltration. A search in the Pubmed database was completed in July 2012 and articles of randomized clinical trials with high methodological quality (JADAD> 3) were selected. The search strategy was made in the PICO format (Patient, Intervention, Comparison and Outcome). *Results:* 50 articles were selected. As first line treatment is recommended: epidural injection of methylprednisolone at a dose of 80mg, using procaine infiltration with 1% or 0.25% bupivacaine and lidocaine 1% by intensive physical exercise. The classic acupuncture and electroacupuncture, the use of corticosteroids, nerve blockade and the combined use of physical means such as traction, low power laser and ultrasound are effective, but are not a first choice. There is no evidence to confirm first choice as opioids, antidepressants and gabapentin for lumbar disc herniation. The use of warm compresses (20 min) is indicated for acute or chronic pain in pre-surgical. Postoperatively exercises performed two times per week are options for first-line treatment. There is insufficient evidence and reports of the use of scales to assess depression and anxiety as well as cognitive-behavioral therapy. *Impact/Implications on Rehabilitation:* Features such as muscle relaxant injections, physical exercises, and warm compresses on preoperative are indicated for lumbar disc herniation.

PO-1385

PATTERN AND ASSOCIATED FACTORS OF DISABILITY AMONG INDIVIDUALS WITH SCHIZOPHRENIA IN A WEST AFRICAN BASED TREATMENT FACILITY: FURTHER EVIDENCE FOR INTEGRATED REHABILITATIVE TREATMENT MODEL

Andrew Olagunju

College of Medicine, University of Lagos, Nigeria

Introduction: Schizophrenia is frequently regarded as a chronic debilitating mental illness, however treatable. This study aims to explore the pattern of disability and associated factors in clinically stable individuals with schizophrenia. *Method:* A total of 100 consecutively recruited consenting participants were subjected to designed questionnaire to inquire about their demographic and illness-related variables. This was followed by the administration of Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID) and Brief Psychiatric Rating Scale (BPRS) to confirm the diagnosis of schizophrenia and rate severity of symptoms respectively in them. In addition, the World Health Organisation Disability Assessment Scale II (WHODAS-II) was used to assess for disability in all participants. *Results:* In this study, different degrees of disability based on WHODAS-II mean score of 27.02±3.49 were noted among individuals with schizophrenia and affectation of domains of disability like self care, getting along with others, life activities and participation in the society among others were observed. Furthermore, poorer level of disability was significantly associated with age group 18-44 years ($p = 0.007$), unemployment status ($p = 0.003$), remittance source of income ($p = 0.034$) and Yoruba ethnic group ($p = 0.017$); conversely, both lesser number of children ($p = 0.033$) as well as amount spent on treatment ($p < 0.001$) and lower BPRS score ($p = < 0.001$) seem protective against disability among participants. Implication Integrated recovery orientation rehabilitation is indicated to reduce disability in patients with schizophrenia. In this respect, further research to assess causes of disability and interventional models for best recovery in individuals with schizophrenia is necessary.

PO-1386

EVALUATION OF DIFFERENT ACUPUNCTURE THERAPEUTIC REGIMENS FOR MUSCULAR TENSION ABNORMITY CAUSED BY CEREBRAL INFARCTION BASED ON SIMPLIFIED FUGL-MEYER ASSESSMENT OF SENSORIMOTOR RECOVERY

Guilan Han, Dongmei Zhu, Fen Miao, Zhifang Li

Rehabilitation Department of Xuzhou Senile Diseases Hospital, China

Optimize acupuncture therapeutic regimen for muscular tension abnormity caused by cerebral infarction in the acupuncture time (the first, second and third 5 days of disease's course) and acupuncture points (scalp and Yin Meridian, scalp and Yan Meridian, scalp and a combination of Yin Meridian and Yan Meridian), via a factorial analysis on a observing group of 63 patients with muscular tension abnormity caused by cerebral infarction receiving normal standard internal medicine and recovery treatment, and a measurement of Simplified Fugl-Meyer Assessment of Sensorimotor Recovery.

PO-1387

THE RELATIONSHIPS BETWEEN PERFORMANCE OF THERAPEUTIC SCREEN TASKS AND CLINICAL UPPER LIMB ASSESSMENTS IN PATENTS WITH STROKE

Chang Jyh-Jong, Yusheng Yang*

Department of Occupational Therapy, Kaohsiung Medical University, Chinese Taipei

Objective: Conventional stroke upper limb motor rehabilitation would not provide immediate objective motor performance measure during training of motor impairment. Motor training with computerized therapeutic screen tasks (TSTs) would overcome such problems. The purpose of this study was to analyze the relationships between performance score of therapeutic touch screen task and clinical assessment score of the paretic limb. Materials: All-in-one computer, with 23 inches touch screen and one wireless click-button were used. Five TSTs were designed to reflex shoulder stability, arm displacing, arm reaching, thumb-index selective movement and upper limb inter-joint coordination abilities, and were used in this study. Clinical functional assessment tools utilized in the study, including Fugl-Meyer Motor Assessment (FMA), Action Reach Arm Test (ARAT), and Motor Activity Log (MAL). *Methods:* Fifty chronic stroke subjects were ask to performed the selected five therapeutic touch screen tasks 3 times. The TSTs including filling block area task, button to screen target reaching task, screen target pointing task, thumb-index individual movement task and figure tracking task. Average scores of TSTs performance were recorded. All the subjects were also received clinical upper limb functional assessments for further analyzing the relationship between performance of TSTs and clinical upper limb assessment. *Result:* The strength of correlation between performance scores of TSTs and clinical

functional assessment scores were ranged between 0.50~0.74. Regression analysis showed that figure tracking scores, thumb-index individual movement scores and filling block area scores were significant predictor of FMA scores (R2=85.2%). Significant predictors of ARAT scores were figure tracking scores and thumb-index individual movement scores (R2=79.1%). Figure tracking scores and screen target reaching scores were effective predictors for MAL score (R2=74.5%). *Conclusions:* Findings in this study showed high strength of correlations exit between performance of TSTs and clinical upper limb assessment. Progress in performance of TSTs may reflect improvement in paretic upper limb motor function in patients with stroke.

PO-1388

ATLANTO-AXIAL SUBLUXATION

Daxin Zhang, Guiha Ma, Decheng Du, Hongjing Shen
China-japan friendship hospital belongs to the east lake community health service centers

Caused a lot of patients with traumatic atlanto-axial subluxation were misdiagnosed as bone disease in orthopedic surgery, rehabilitation treatment instead of neurosurgery overall mechanics, cause lifelong regret.

PO-1389

EVALUATION OF DIFFERENT ACUPUNCTURE THERAPEUTIC REGIMENS FOR MUSCULAR TENSION ABNORMITY CAUSED BY CEREBRAL INFARCTION BASED ON MODIFIED ASHWORTH SCALE

Fen Miao, Meiqin Guo, Yuzhu Sun, Guilan Han
Rehabilitation Department of Xuzhou Senile Diseases Hospital, China

Optimize acupuncture therapeutic regimen for muscular tension abnormity caused by cerebral infarction in the acupuncture time (the first, second and third 5 days of disease's course) and acupuncture points (scalp and Yin Meridian, scalp and Yan Meridian, scalp and a combination of Yin Meridian and Yan Meridian), via a factorial analysis on a observing group of 63 patients with muscular tension abnormity caused by cerebral infarction receiving normal standard internal medicine and recovery treatment, and a measurement of Modified Ashworth Scale.

PO-1390

EFFECT OF SEAT SURFACE INCLINATION ON RESPIRATION ABILITY AND MUSCLE ACTIVITY IN CHILDREN WITH SPASTIC CEREBRAL PALSY

Eun Jin Byeon, Hwa-Kyung Shin
Graduate School of Health and Medical Science, Catholic University of Daegu, Korea

The purpose of this study was to evaluate the difference of respiratory ability and muscle activation in accordance with seat surface inclination. The subjects were sixteen children with cerebral palsy (CP), aged 6 to 12 years. The respiratory ability (FVC, FEV1, PEF, MPT) and respiratory muscle activity (% rest, APDF 10th-50th-90th percentile) were measured in three sitting conditions: a flat seat surface, the seat surface tilted anterior 15 degrees, and the seat surface tilted posterior 15 degrees. In the children with cerebral palsy, we found that the mean values of FVC from the seat surface titled anterior 15 degrees were statistically different comparing the other two types of sitting position ($p<0.05$). However there was no significant difference among FEV1, PEF, and MPT. We also found that the muscle activity of the left pectoralis major muscle was significantly different ($p<0.05$), and that the left pectoralis major muscless activation in the APDF 10th percentile was statistically significant ($p<0.05$). This study shows the respiratory ability and muscle activation of the children with spastic CP are benefited by the seat surface tilted anterior chairs.

PO-1391

THERAPEUTIC GOAL ASSESSMENT IN SPASTICITY AFTER BOTULINUM TOXIN TYPE A INJECTION IN THE SPANISH POPULATION THE 5E STUDY

Garreta I Figuera Roser, Torrequebrada Giménez Agustín
Rehabilitation dept, Hospital Universitari Mutua Terrassa, Terrassa, Spain

Objective: The main objective of this study was to explore on a national basis the methods currently employed to evaluate spasticity, and secondarily, to check if those methods are appropriate to assess outcomes in patients with adult spasticity treated with botulinum toxin type A. *Methods:* Multicentre, retrospective, observational study (49 hospitals and 235 adult patients included). Patients were reviewed in at least one baseline and one follow up visit. 504 therapeutic objectives have been reported and several assessment methods. The list of measurements considered as appropriate is the result of an expert consensus. *Results:* The methods for the evaluation of spasticity were: Ashworth scale (67% for LL and 54% UL), goniometry (42% for LL and 31% for UL), gait analysis (1.9%). Only 5 and 13% of the centers use movement analysis. Although in 93% of the patients the therapeutic objective were clearly defined (51% of the cases were agreed with the patients and in 40.5% with both patient and caregivers), only in 23% it was considered properly evaluated. Objectives ranking according to ICF levels: structure and body function (S&BF) 43.5%, activity 56.3% (passive function 19%) and participation. *Implications:* Ashworth scale was the most employed method to evaluate spasticity. Even if the therapeutic objectives were nor usually properly assessed, they were commonly clearly defined (93%) and in 51% agreed with the patients. The use of activity scales, Goal Attainment Scale and scored methods of assessment is still limited.

PO-1392

INTRATHECAL BACLOFEN THERAPY FOR SPASTICITY: ASSESSMENT OF OUR CASES BETWEEN 2004-2012

Alev Cevikol
DISKAPI YB TR HOSPITAL, Turkey

Objective: To evaluate the effects and complications of intrathecal baclofen therapy (ITB) in patients with severe spasticity. *Method:* The patients who were given test dose and after then implanted baclofen pump, included in the study between 2004-2012. Assessment criteria were Modified Ashworth Scale (MAS), Penn's spasm scale (PSS), visuel analog scale (VAS), functional independence measurement (FIM) and Short Form- 36 (SF-36). Tests were given before ITB and 3 months after implantation. *Results:* 21 patients were given test dose and 16 began ITB treatment. Mean age was 33±10.34 ranged between 12-53 years. 11 (68.75%) had spinal cord injury, 2 (12.50%) had multiple sclerosis, 2 (12.50%) had cerebral palsy, and 1 (6.25%) hypoxic brain. Mean follow up was 52.25±33.10 months ranged between 3-100 months. Daily baclofen dose was between 70-475 µg, average 220±110.58 µg. MAS decreased from 3.43±0.53 to 1.00±0.73 (p=0.00); PSS 3.50±1.03 to 1.12±1.02 (p=0.001); global pain 44.37±36.14 to 18.75±19.95, (p=0.003); FIM increased from 71.18±20.88 to 76.31±28.25 (p = 0.023); SF-36 physical function 2.06±8.25 to 18.25±26.06 (p =0.006); physical role 1.56±6.25 to 40.31±29.74 (p = 0.002); general health 29.37±17.68 to 47.62±27.35 (p = 0.005); bodily pain 26.31±30.49 to 53.37±26.45 (p = 0.005); vitality 38.93±20.94 to 61.25±19.70 (p = 0.001); social

function 19.31±14.59 to 70.56±82.74 ($p = 0.001$); emotional role 10.37±26.40 to 56.31±38.08 ($p = 0.004$); mental health 46.25±18.12 to 61.12±19.81 ($p = 0.004$). Three patients' pump was changed after 84 months. Two patients had catheter related complications. *Implications/Impact on Rehabilitation:* ITB is a good and safe treatment option in severe spastic patients.

PO-1393

QUANTIFICATION OF LONG TERM TISSUE ATROPHY IN UNILATERAL TRANSTIBIAL AMPUTEES

Alexander Daich*, Hagay Amir
Cheba Medical Center, Israel

Objective: To quantify long term tissue atrophy in different levels and tissue compartments of the residual limb in transtibial amputees. *Method:* Circumference measurements of the unamputated and the residual legs were taken in increments of 10% of the sound tibia height. Postero-anterior and lateral diameters of bone muscle tissue and the whole leg were measured by radiographs. Using the above measurements cross-section area estimates of bone, muscle and skin/fat layer, were calculated for the sound side and the residual limb. Atrophy percentage of the different compartments was calculated in comparison to the respective cross sectional area in the sound limb. *Results:* The cross sectional area of the proximal and distal portions of the residual limb was smaller than the sound side. This was due to an equal percent of atrophy in the muscular and skin fat compartments. There was no decrease in the bone measurements at any level or any time from amputation. Essentially all of this atrophy occurred in the muscle compartment and there was little decrease in the skin/fat layer. No significant time trends in the atrophy pattern were observed. *Implications/Impact on rehabilitation:* In the residual limb of transtibial amputation, long-term atrophy takes place mainly in muscle in the level where it predominates the soft tissue mass. Whereas in areas with less muscle tissue, considerable atrophy is observed in the skin/fat compartment. This can help to understand the need for specific socket adjustments at different levels.

PO-1394

COMPREHENSIVE REHABILITATION MANAGEMENT TO TREAT WOUNDS AND FUNCTIONAL DECLINE IN A PATIENT WITH MIXED CONNECTIVE TISSUE DISEASE AND CALCINOSIS CUTIS

Elena Jelsing*, Joshua Sole, Karen Andrews
Mayo Clinic, United States

*Case Description :*A 51 year old female with diffuse wounds, fatigue, fever, confusion and diffuse alveolar hemorrhage was admitted for infected leg ulcerations in the setting of mixed connective tissue disease complicated by calcinosis cutis. Given her vast wounds, decreased range of motion and impaired mobility she was ultimately admitted to inpatient rehabilitation. *Assessment/Results:* Plain films of the lower extremities revealed impressive evidence of diffuse calcinosis of the subcutaneous tissues with associated soft tissue swelling. She underwent comprehensive wound management with modalities including sterile whirlpool, underwater ultrasound, non-contact low frequency ultrasound, selective debridement, manual lymphatic drainage, wound packing and complex dressing changes. *Discussion:* Calcinosis cutis is the deposition of calcium deposits in the skin. It can be divided into four categories based on pathogenesis: dystrophic, metastatic, idiopathic, and iatrogenic. It first appears as firm, whitish-yellow papules, plaques or nodules on the skin. Over time, these lesions become tender, may ulcerate or spontaneously expel calcium debris. Radiologic imaging can determine the extent of the calcification. Biopsy can confirm the diagnosis. Medications have been tried, with limited success, including corticosteroids, probenecid, colchicine, etidronate, bisphosphonates, diltiazem, warfarin, minocycline, and magnesium/aluminum antacids. Lesions are surgically removed only if circumstances require, as trauma can make the condition worse. *Implications/Impact on Rehabilitation:* Calcinosis cutis can be a disabling condition causing decreased joint range of motion, tremendous pain and ulcerations leading to recurrent infections. Comprehensive multidisciplinary management with physiatric care, modalities and extensive physical therapy are often required to coordinate the complex wound management and functional impairment that is secondary to this condition.

PO-1396

EFFECTS OF MULTISENSORY TRAINING ON BALANCE AND GAIT IN PATIENTS WITH TYPE II DIABETES: A RANDOMIZED CONTROLLED TRIAL

Nizar Abdul Majeed Kutty
Universiti Tunku Abdul Rahman, Malaysia

Introduction: Progressive deterioration of physical function develops in elderly Type II diabetes patients with peripheral neuropathy. The loss of somatosensation, especially that of plantar cutaneous sensation, is believed to be primarily responsible for a host of specific diabetic peripheral neuropathy related movement disturbances observed during weight-bearing situations. Currently the evidence for the effects of multi-sensory exercise on balance and gait in Type II diabetes patients is less conclusive. *Objective:* To determine the effects of multisensory training on balance and gait in Type II diabetes patients. *Methods:* 32 male Type II diabetes patients with peripheral neuropathy were enrolled for the study in the age group of 55–75 years. The intervention group was submitted to multisensory exercise training thrice a week for 30 min over 6 weeks and the control group with no intervention. Balance was evaluated in all subjects using One-Legged Stance Test (OLST) and Timed "Up and Go" test and gait using Six min walk test. Standard descriptive statistics were used to report means, standard deviation, and range for baseline characteristics. Paired sample t-test, and t-test for independent groups were used to determine significant differences among groups and between pre-test and post-test periods used to analyze the data ($p<0.05$). *Results:* By the end of the trial, the intervention group showed a significant improvement in scores of balance tests while no significant difference was found in 6 Min Walk Test. There was no statistically significant difference in any of the out come measures in the control group. Therefore multisensory exercises could be implemented in treatment to improve balance in Type II diabetes patients with peripheral neuropathy.

PO-1397

DAD IN A WHEELCHAIR: GROUP THERAPY FOR FATHERS WITH SPINAL CORD INJURY DURING THEIR INPATIENT REHABILITATION

Avital Gershfeld-Litvin, Tamara Shaoul, Gavriel Zeilig, Ayala Bloch
The Rehabilitation Hospital, Chaim Sheba Medical Center, Tel-Hashomer, Israel

Background: About 80% of spinal cord inpatients in our rehabilitation department are men under the age of 40, fathers to underage children. During their hospitalization they have to cope not only with their own physical and psychological issues but also with the consequences of the disability and the long absence period on their family and parenting. *Objective:* To provide support and guidance for hospitalized fathers through group therapy, focusing on: parenting skills, preserving parenting role while hospitalized, preparing for discharge as disabled fathers. *Method and setting:* Participants: 7 wheelchair-bound fathers to underage children, age 30-60, length of rehabilitation stay 2-8 months. Setting: Once weekly meeting, co-therapy by two therapists. A self-assessing questionnaire (measuring: 1. parental functioning in the past, present, future, 2. the effect

their injury and hospitalization on parental functioning, 3. general perceptions on physically disabled fathers, 4. Preoccupation with parenting issues during hospitalization) was completed by the participants before and after the interventional group. *Results:* Several prominent processes characterized the group: participants exhibited change from a dichotomous to a continuity perception regarding disability and parenting. Talking about parenting allowed them to address personal, dyadic, and social aspects of their disability e.g. feelings, coping with losses, adjusting to disability. *Impact on rehabilitation:* Participants adopted a more adaptive perception of their disability and being disabled fathers, and they improved their participation in their family day by day activities and preparation to discharge.

PO-1398

BIOMECHANIC CHANGES IN PHARYNX AND UPPER ESOPHAGEAL SPHINCTER AFTER BALLOON DILATATION IN BRAINSTEM STROKE PATIENTS WITH DYSPHAGIA: A INVESTIGATION USING HIGH-RESOLUTION SOLID-STATE MANOMETRY

Yue Lan[1], Guangqing Xu[2], Zulin Dou[1], Guifang Wan[1], Fan Yu[1], Ming Liang[1]

[1]The Department of Rehabilitation Medicine, The Third affiliated hospital of Sun Yat-sen University, Tianhe Road, No 600, Guangzhou, Guangdong, China., [2]The Department of Rehabilitation Medicine, The First affiliated hospital of Sun Yat-sen University, Zhongshan No 2 Road, Guangzhou, Guangdong, China

Objective: Using high-resolution solid-state manometry, we examined biomechanic changes of physiologic swallowing events in patients with dysphagia after brainstem stroke. *Method:* Thirty brainstem stroke patients with pharyngeal stage dysphagia were involved in this study. 15 of them as dilatation treatment group completed 3 weeks of modified balloon dilatation treatment and traditional swallowing therapy. Another 15 patients as control group only completed 3 weeks of traditional swallowing therapy. Before, and following the dilatation we measured FOIS (Functional Oral Intake Scale), pharyngeal manometric pressures peak and duration, the nadir of UES and its duration during swallows of thin liquid, thick liquid, and pasty material in 3 ml volumes. We compared these results to identical measures obtained from control group. *Results:* Brainstem stroke patients with dysphagia always manifest failed UES relaxation and poor pharyngeal propulsion, with decreased UES resting pressure. Following dilatation treatment, 12 of 15 patients were removed feeding tube in dilatation group. Post-dilatation the relaxation of UES and propulsion of pharynx were both significantly better than Pre-dilatation in the group of dilatation treatment for three materials (p<<0.05). UES resting pressure approximated to normal. Only 2 of 15 patients were removed feeding tube in control group following traditional swallowing therapy. Post-treatment the relaxation of UES in control group was not shown any significantly difference from pre-treatment (p>>0.05) for all three materials. *Implications:* Dysphagia therapy with dilatation improves relaxation of UES and propulsion of pharynx during swallowing.Moreover, it is helpful for restoring UES resting pressure.

PO-1399

THE EFFECTS OF DIFFERENT INJECTION TECHNIQUES OF BOTULINUM TOXIN A IN POSTSTROKE PATIENTS WITH PLANTAR FLEXOR SPASTICITY

Isil Fazilet Turna[1]*, Belgin Erhan[1], Berrin Gunduz[1], Serdar Kocer[2], Ozgu Kesmezacar[3], Onder Turna[4]

[1]Department of Physical Medicine and Rehabilitation, Istanbul Physical Medicine and Rehabilitation Training and Research Hospital, Istanbul, Turkey,Turkey, [2]Department of Physical Medicine and Rehabilitation, Centre de Readaptation de Coubert, Paris, France,Turkey, [3]Department of Statistics and Information Technology, Directorate of Public Health of Istanbul, Istanbul, Turkey,Turkey, [4]Department of Radiology, Istanbul Eyup Community Hospital, Istanbul, Turkey, Turkey

Objective: The purpose of this study was to compare the effects of different injection techniques -guidence with electrical stimulation (ES) vs ultrasonography (USG) of botulinum toxin A injection (BoNT A) in poststroke patients with plantar flexor spasticity. *Material and Methods:* Forty chronic poststroke patients with plantar flexor spasticity and who were able to walk were included in the study. They were randomized into two groups: in 20 patients the BoNT A injection was applied with the guidance of ES, in 20 patients with the guidance of USG by the same physician. Gastrocnemius, soleus, tibialis posterior were injected. Spasticity was evaluated by ashworth scale, the functional status was evaluated by ankle goniometry for range of motion (ROM), Brunnstrom stages, Barthel Index and 20-mt walk test before the treatment, 2 weeks and 12 weeks after the treatment. Statistical significance was defined as $p<0.05$. *Results:* Two groups were similar in respect to demographical and clinical features. In both groups walking speed and range of motion increased significantly after the treatment. When the two groups were compared at 12 weeks after the treatment; ROM of the ankle joint plantar flexion and dorsiflexion when knee in extension, showed a significant difference between the two groups. Ashworth scale, Brunnstrom stages, Barthel Index, walking speed tests and other ankle goniometry for ROM showed no statistically significant difference between two groups. *Implications/Impact on rehabilitation:* We can conclude that USG and ES guidence are both effective injection techniquies when applying BoNT A to ankle plantar flexor muscles.

PO-1400

VIBROTACTILE FEEDBACK PATTERNS FOR UPPER LIMB PROSTHESES

Cosima Prahm

Medical University of Vienna, Austria

Objective: Intuitive control resulting from sensory feedback are of high importance for upper limb amputees. In this regard, this study deals with providing haptic feedback in prostheses. Currently, users of prosthetic devices are limited to visually monitor their performance, demanding high cognitive effort. *Method:* Vibrotactile feedback patterns were generated using a motor attached to the skin of healthy participants. It employed vibrations within a defined setting of a maximum frequency of 60 Hz, corresponding to the mechanoreceptors of the skin. Three types of patterns were adopted: static, dynamic and pulsed ones, which differed in amplitude and frequency combinations as well as break time in between one amplitude and frequency display. Those patterns were subsequently evaluated for intuitiveness and preference according to the following prosthetic movements: grip force, position of hand and contact with objects – which resulted in four dynamic movements and four static states. While one pattern was applied, participants could choose between two movements to be coded by it and rate their choice afterwards. *Results:* Analysis showed distinct mapping of static patterns to static states and dynamic and pulsed patterns to dynamic movements. Moreover, one pattern per movement could be identified as the most prominent in cast votes as well as rating. This study provides a catalog of patterns to be used in tactile feedback. *Implications on Rehabilitation:* By providing intuitive sensory substitution in the form of vibrotactile patterns to the users, prosthetic control can be improved and resulting cognitive effort in handling be diminished.

PO-1401

CEREBRAL PLASY – LOWER LIMBS: REHABILITATION

Patricia Yuri Capucho, Débora Ciotek De Castro, Natália Thinen, Ana Paula Finocchio, Marta Imamura, Linamara Rizzo Battistela

Clinical Research Center. Institute of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objective: Offering information regarding the effectiveness of available auxiliary resources for the treatment of children with cerebral palsy. *Method:* Pubmed database search of randomized clinical trials was conducted using P.I.C.O. strategy (P.I.C.O. stands for: Patient, Intervention, Comparison and Outcome). The following MeSh terms were the search strategy: (Cerebral palsy or Quadriplegia or Cerebral palsy, spastic, diplegic or Hemiplegia) and (Stretching or Muscle spasticity or Muscle Stretching exercises) and (Physical Modalities or Rehabilitation) and (Virtual Reality) and (Robotic-assisted OR Gait training or Treadmill training or Walking). *Results:* Muscular stretching in children with CP of the type tetratparetic, hemiparetic or diparetic, spastic and/or dystonic combined to type A botulinum toxin promotes an improvement in muscular spacity and balance easing gait and gross motor function. As the treatment with virtual reality exercises showed to be effective in the motivation and motor selectivity in both children with and without CP, there is a need for more evidences in the CP population. Some studies showed the validity of the robotic devise use to improve gait in children with CP. *Implications/Impact on rehabilitation:* The available interventions for the CP child rehabilitation seems to be helpful, but more evidences based on randomized trials are needed.

PO-1402

CEREBRAL PLASY – UPPER LIMBS: REHABILITATION

Patricia Yuri Capucho*, Natália Thinen, Débora Ciotek De Castro, Ana Paula Finocchio, Linamara Rizzo Battistela

Clinical Research Center. Institute of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objective: Offering information regarding the effectiveness of available auxiliary resources for the treatment of children with cerebral palsy. *Method:* Pubmed database search of randomized clinical trials was conducted using P.I.C.O. strategy (P.I.C.O. stands for: Patient, Intervention, Comparison and Outcome). The following MeSh terms were the search strategy: (Cerebral palsy) and (Rehabilitation treatment or Motor activity) and (Home care) and (Kinesio tape or KT or Bandages or Surgical tape or Therapeutic taping OR Athletic tape) and (Rehabilitation or Physical therapy techniques) and (Botulinum toxins or Orthopedic Equipament or Orhtotic devices) and (Upper extremity or Upper limb). *Results:* Home occupational therapy program for upper limb functional gains must be suggested with a specific prescription. The use of kinesio taping associated with physical rehabilitation treatment does not lead to significant differences over time when performed in the paravertebral region of CP children aged between 3 and 13 years old with athetoid tetraplegia. It was observed the same gains for alteration of muscle tone and active movement for wrist and elbow in children who received botulinum toxin application and used wrist and finger positioning orthosis, and in children who had occupational therapy and physical therapy. Only when combined with conventional therapy conventional therapy on specific muscles the toxin use is recommended for functional gain of upper limb in children with cerebral palsy. *Implications/Impact on rehabilitation:* The available interventions for the CP child rehabilitation seems to be helpful, but more evidences based on randomized trials are needed

PO-1403

ELECTIVE TRANSRADIAL AMPUTATION AND BIONIC RECONSTRUCTION OF A MUTILATED HAND AFTER SEVERE BILATERAL ELECTRIC BURN INJURY

Oskar Aszmann[1], Malvina Herceg[2], Hans Dietl[3]

[1]Division of Plastic and Reconstructive Surgery, Department of Surgery, Medical University of Vienna, Austria, [2]Department of Physical Therapy and Rehabilitation, Medical University of Vienna, Austria, 3.Division of Research & Development, Otto Bock HealthCare Products, Vienna, Austria

Electrical injuries are the most frequent cause of major upper extremity amputations in the western world. These injuries call for multiple revisions until one can be sure that the climax of tissue damage is overcome. Even at this stage of treatment one must have all the biological and technical reconstructive possibilities in mind. If all reconstructive measures fail, modern myoelectric prostheses are a promising resort to go to. Here we report of a young man who has had both hands affected by an electrocution injury. On the dominant right hand the thumb and middle finger had to be amputated. The left hand lost all functional tissues in the distal third of his forearm which was salvaged by a groin flap primarily. Later on the fourth finger was used to reconstruct the thumb of his right hand. The soft tissue deficit and finger flexion was attempted with an ALT flap. Even though all surgeries were successful, the young man was left with an almost useless and painful left hand. After much discussion we offered the patient an elective amputation with a bionic solution. For this purpose a preliminary "hybrid" situation was tested where the patient could evaluate the usefulness of the prosthesis. This has proven to be extremely helpful to him in the decision making process and we have proceeded with the transradial amputation. Today the patient is fitted with a linearly controlled myoelectric prosthesis with three levels of freedom. The results of this patient will be presented and consequences discussed.

PO-1404

NEUROPATHIES – GUILLAIN-BARRÉ SYNDROME: REHABILITATION

Tatiana Amodeo Tuacek*, Gracinda Rodrigues Tsukimoto, Carmen Silvia Figliolia, Maiara Celina Cardoso, Denise Rodrigues Tsukimoto, Marta Imamura, Linamara Rizzo Battistella

Clinical Research Center. Institute of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, São Paulo, São Paulo, Brazil

Objective: To assess the treatment and the rehabilitation indicated for the Guillain-Barré syndrome avaliable in the literature. *Methods:* Pubmed database search of randomized clinical trials was conducted using P.I.C.O. strategy (P.I.C.O. stands for: Patient, Intervention, Comparison and Outcome). The following MeSh terms were the search strategy: (Guillain Barre Syndrome or Acute Autoimmune Neuropathy) and (Physical Exercise or Preventive Therapy OR Physical Therapy or Plasmapheresis or Immunoglobulins/therapeutic use or Physical Therapy or Orthopedic Fixation Devices OR Electric Stimulation Therapy) from to Jul 2012. *Results:* Twenty five articles were selected. Intravenous immunoglobulin treatment has less complication than plasmapheresis. High intensity rehabilitation shows better functional improvement when compared to low intensity (p Functional Electrical Stimulation) in patients with

Guillain Barré syndrome. Passive joint mobilization, and early isometric and isotonic exercises help to prevent contractures, deformities, complications of immobility, loss of strength and muscle tropism maintenance. Autonomic cardiovascular dysfunction and the incapacity for actively raise the head are predictive factors for mechanical ventilation (odds ratio 10.66, 95% confidence interval [CI]2.4-49; $p<0.05$, and 9.86, 95% CI 1.7-56; $p<0.05$, respectively). *Implications/Impact on rehabilitation:* High intensity rehabilitation and early mobilization is the most recommended in the maintenance of muscle tropism and deterioration of function.

PO-1405

BOTULINUM TOXIN A FOR TRISMUS IN FOVILLE'S SYNDROME

Amra Saric

Dalhousie university, Department of Medicine, Division of PM&R, Canada

Objectives: To evaluate treatment and determine efficacy of Botulinum Toxin A (BTX A) for trismus in a patient diagnosed with Foville's syndrome. *Background:* Foville's syndrome (inferior medial pontine syndrome) was described by Achille Louis Francois Foville, a French psysician in 1859. Foville syndrome is caused by the blockage of the perforating branches of the basilar artery in the pons. Structures affected by the infarct are the nuclei of the cranial nerves VI, VII, corticospinal tract, medial lemniscus, medial longitudinal fasciculus and paramedian pontine reticular formation. It is characterized by: facial nerve palsy, horizontal gaze palsy, contralateral hemiparesis, hemisensory loss and intarnuclear ophtalmoplegia. *Methods:* This case report describes a 59 year old male with past medical history significant for hypertension, and dyslipidemia who developed visual disturbances, vertigo, headache and right sided weakness in September 2012. MRI showed right PCA CVA, as well as left pontine infarct consistent with basilar thrombosis. It was felt that intra-arterial thrombolysis was not an option due to location of thrombus. His deficit consisted of right hemiparesis, left facial trismus and dysphagia. Due to significant trismus, a difficulty with clearing secretion and respiratory care tracheostomy was completed. Due to ongoing trismus, a decision was made to proceed with Botulinum Toxin A injection in order to relieve spasm. The patient received an injection at masseter muscle and initially had a modest improvement with incomplete relaxation. At a subsequent injection, the patient received injection at masseter and temporalis muscle. *Results:* The patient reported that he feels more comfortable, his care and communication has improved. *Implication and impact on rehabilitation Medicine:* This was an example of "off label use" of Botulinum Toxin Type A, but the treatment had significant impact on patient care and quality of life. Trismus after acute CVA is a rare complication, but this case report demonstrates that Botulinum Toxin Type A was a safe and effective treatment for patients with severe trismus.

PO-1406

VALIDITIES OF THE COMPUTERIZED TMT-B AND DRIVING TMT-B FOR DRIVING ASSESSMENT

Hyun Choi, Jung Ah Lee, Sol Lee

Korea National Rehabilitation Research Institute, Department of Motor & Cognitive Rehabilitation, Korea

Objective: The Trail-Making Test B (TMT-B) has been used in evaluating driving abilities including the executive function. We developed a computerized version of the Trail-Making test B (CTMT-B) and the Driving Trail-making test (DTMT-B) to measure driver's cognitive abilities. The purpose of the present study was to assess the validities of the CTMT-B and DTMT-B for driving assessment in stroke patients. *Method:* The twenty-eight stroke patients participated in the study. Participants performed the TMT-B, CTMT-B and DTMT-B. The CTMT-B was developed as a software program to emulate the paper and pencil version of the test on a computer screen. The DTMT-B was tested on a driving simulator in which the individual drove the TMT points modeled after real roads, rather than connecting with lines as the paper and computerized TMTs. For all three tests, times to complete the tasks were used as the dependent measure. Also, the Intra-class correlation coefficients (ICCs) were used to assess validities. *Results:* There were significant correlations between the TMT-B and the CTMT-B ($r=0.829$, $p<0.001$), and also between TMT-B and DTMT-B ($r=0.812$, $p<0.001$). The ICCs were above moderate (the CTMT-B: ICC=0.735, $p<0.001$, 95% confidence interval=0.428-0.877; the DTMT-B: ICC=0.680, $p<0.005$, 95% confidence interval=0.428-0.877). *Conclusion:* The TMT-B, the CTMT-B, and DTMT-B were all demonstrated to be valid in the study. They may be useful as part of driver screening assessment for stroke patients' cognitive functions.

PO-1407

QUALITY OF LIFE AND FUNCTIONALITY OF PATIENTS WITH HEEL RECONSTRUCTION AFTER LANDMINE EXPLOSIONS

Levent Tekin

GMMA Haydarpasa Trainig Hospital, Department of Physical Medicine and Rehabilitation, Turkey

Background: Landmine injuries cause extensive soft and bony tissue loss of the weight bearing areas, particularly the heel. Reconstruction of these injuries is challenging and there is lack of information about late functional results. *Objective:* To determine the quality of life and long term functionality of the patients who had heel reconstruction with free muscle flap following after landmine injuries. *Participants:* Case-control study. 9 male patients who had heel reconstruction with free muscle flap. 10 male volunteers without any gait disorder were included in the study as the control group. *Methods:* Functional ambulation scale (FAS), Visual Analogue Scale (VAS), Energy Expenditure Index (EEI), 6 Min Walking Test (6 MWT), 10 Meters Walking Test (10 MWT) and Short Form-36 (SF-36) were performed to determine the quality of life and functionality of participants. *Results:* There were no statistically significant differences between the two groups in terms of FAS, EEI, 6 MWT and 10 MWT. Regarding SF-36 scores, all subgroup values were lower in the reconstruction group whereas only those of general health, vitality and physical-emotional role limitation subgroups showed statistical significance. Mean VAS scores were found to be statistically different between groups ($p<0.05$). Mean Freiburg Ankle scores showed moderate functionality. *Implications/Impact on Rehabilitation:* Although some physical and emotional role limitations, patients with heel reconstruction have adequate and functional ambulation at long term follow up. Early rehabilitation and close cooperation between surgeons and rehabilitation physicians during the follow up of these patients would help to eliminate limitations of these patients.

PO-1408

THREE-DIMENTIONAL INTERACTIVE MIXED REALITY SYSTEM FOR BALANCE AND MOBILITY REHABILITATION

Youn Joo Kang[1], Yon Joon Kim[1], Jeounghun Ku[2], Sangwoo Cho[3], Yun Kyung Cho[1], Teo Lim[1], Dal Jae Im[1], Hyungjun Im[1], Hyun Jung Kim[1]

[1]Department of Rehabilitation Medicine, Eulji Hospital, Eulji University School of Medicine, Seoul, Korea, [2]Department of Biomedical Engineering, Keimyung University, Daegu, Korea, [3]Department of Biomedical Engineering, Hanyang University, Daegu, Korea

Objectives: We attempted to develop novel 3D interactive mixed reality system (3D MRS) for balance and mobility. This system enables participants training within realistic 3D interactive balance

exercise and to assess the movement parameters and the joint angle using kinetic sensor system. *Methods:* Sixteen old aged participants between 56 and 76 years old who could independently walk and stand with one leg were recruited. The group experienced 3D MRS training for 10 session of exercise program (30 min for one session) for 4 weeks. 3D MRS training was composed of bubble game for hip exercise, cave game for knee exercise and rhythm game for one leg balance exercise. Lower-extremity clinical scale scores, automatic balance score using Tetrax® posturography and kinematic performances were measured before, during and after training. *Results:* The participants showed increased balance and mobility after therapy, demonstrated by statistically significant improvements in Berg balance scale (54.38 to 55.44, $p = 0.001$), Timed up and go test (7.93 to 7.42, $p<0.001$), Fugle-Meyer scale (lower extremity; 33.00 to 33.56, $p<0.01$, balance; 13.00 to 13.69, $p = 0.001$) and fall risk index score using tetrax (47.29 to 30.86, $p<0.01$). Furthermore, participants who received 3D MRS training showed a consistent improvement in kinematic measurements, both hip and knee angle ($p<0.05$). Performance variables such as success rate or response time of each exercise were improved gradually during 3D MRS training ($p<0.01$). *Implications:* The substantial improvements after new 3D MRS training demonstrate that this system has the potential to enhance functional ability and enables the valuable kinematic assessment lower extremity.

PO-1409

CHRONIC ELECTRICAL STIMULATION OF THE DORSAL GENITAL NERVE INCREASE CYSTOMETRIC CAPACITY IN A MAN WITH SPINAL CORD INJURY

Hongjun Zhu, Qingfa Feng

Dept. of Rehabilitation, the First Affiliated Hospital, Soochow University, China

Objective: High bladder pressure and incontinence are caused by neurogenic detrusor overactivity (NDO) in patients with spinal cord injury (SCI). The objective of this study was to determine whether chronic electrical stimulation of the dorsal genital nerve could increase cystometric capacity (CC).| *Methods:* A man aged 68 years old with a T12 ASIA B SCI who managed his bladder with clean intermittent catheterization demonstrated NDO on urodynamics. For stimulation, a self-adhesive surface electrode patch was placed over the dorsal genital nerve (dorsal base of penis), with the counter electrode on one hip. Biphasic rectangular pulses at 20 Hz frequency and 250 μs pulse width were used. The current intensity was 30 mA at a level equal to twice the threshold for reflex contraction of anal sphincter. A total of 5 week stimulation was performed (30 min per time, 6 times per week). CC was evaluated before stimulation and 1 week after stimulation. *Results:* Chronic electrical stimulation of the dorsal genital nerve increased CC from 200 ml to 250 ml (25%), and did not significantly decrease post-void residual volume (100 ml). *Implications:* Chronic electrical stimulation of the dorsal genital nerve increased CC, mechanism of which should be investigated in future studies.

PO-1410

FIVE WATER CHESTNUTS POWDER COMBINED WITH INTERMITTENT URETHRAL CATHETERIZATION FOR TREATMENT OF SPINAL CORD INJURY OF URINARY RETENTION AFTER CURATIVE EFFECT OBSERVATION

Lizhong Ma

Zhejiang Taizhou Hospital Department of rehabilitation medicine, China

Objective: To observe five Ling San combined with intermittent urethral catheterization for treatment of spinal cord injury caused by voiding disorders clinical curative effect. *Methods:* 60 cases of spinal cord injury after urination disorders were randomly divided into 2 groups, were treated with intermittent catheterization methods of treatment, treatment group at the same time plus five water chestnutsdisperse, compared 2 groups of patients with complete residual urine volume less than 100 mL time required. *Results:* The treatment group in shortening the duration of treatment is superior to the control group. *Conclusion:* Five Ling San combined with intermittent catheterization in shortening after spinal cord injury induced by micturition disorder treatment time on curative effect.

PO-1411

ADVANCES IN CLINICAL APPLICATIONS OF FUNCTIONAL MAGNETIC STIMULATION IN SCI

Vernon Lin[1,2]*, Xiaoming Zhang[1,2]

[1]Cleveland Clinic Lerner College of Medicine,United States, [2]Louis Stokes Department of Veterans Affairs Cleveland Medical Center, United States

Functional Magnetic Stimulation (FMS) can be defined as a technique that uses magnetic stimulation to produce useful bodily function. Over the last twenty years, several major clinical applications using FMS has been successfully demonstrated in patients with spinal cord injury (SCI). By placing a magnetic coil (MC) at the low cervical region can result in substantial inspired function; and by placing a MC at lower thoracic region would result in very high expired pressure in normal subjects that were comparable to their voluntary maximal expired function. Using similar technique, and stimulating the lower thoracic nerves in chronic SCI for six weeks, resulted in substantial improvements in their expired function. Lower thoracic MC placements have also been demonstrated to be effective in improving gastric emptying, colonic transit and overall gastrointestinal motility in patients with chronic SCI. Placing the MC along the lumbar spine as well as the suprapubic region produced detrusor contractions and improved voiding in SCI with neurogenic bladder. When the calf muscles were stimulated by placing the MC near the popliteal region, this resulted in improvements in fibrinolysis in SCI and normal subjects alike; thus, FMS can also be considered as an alternative tool for preventing deep venous thrombosis of the lower limbs. In addition, this paper will review some of the technical breakthroughs and challenges relating to the above clinical advances, and will also attempt to introduce the next frontiers for using FMS as a non-invasively technology for enhancing bodily functions in patients with neurological impairments.

PO-1412

THE ELECTROPHYSIOLOGY OF RESONANT FREQUENCY IN HUMAN SPINAL MOTOR NEURONS

Guangxu Xu, Wentong Zhang, Lin Li

The first affliated hospital to Nanjing medical university, rehabilitation medicine department, China

Objective: To explore the resonant frequency of human spinal motor neurons under different vibration frequencies. Subjects and *Methods:* Twenty normal college students in supine position accepted the 20 Hz, 30 Hz, 40 Hz, 50 Hz and 60 Hz frequencies vibration stimulation for 5 mins. The stimulator was located above for the lateral malleolus. M-wave was recorded before intervention. F-wave parameters were recorded before and immediately after each intervention. *Results:* There was significantly difference between the subjects of gender ($p<0.05$) in F-wave amplitude and F/Mmax. No interaction between gender and vibration frequencies. The 30 Hz vibration showed significantly improvements immediately after the intervention in F-wave amplitude and F/Mmax ($p<0.05$). However, no significantly difference between 20 Hz, 30 Hz and 40 Hz. *Conclusion:* The resonant frequency of human spinal motor neurons may be at 30 Hz.

PO-1413

MULTIPLE-FACTORS ANALYSIS OF AFFECTING THE EFFICACY OF REHABILITATION FOR MEMORY DISORDERS FOLLOWING ACQUIRED BRAIN INJURY

Mingming Gao, Xiaoping Yun
Capital Medical University School of Rehabilitation Medicine, Department of Rehabilitation Evaluation, Beijing Charity Hospital, China Rehabilitation Research Center, Beijing 100068, China.

Objective: The purpose of this study was to investigate the efficacy of Cognitive rehabilitation for memory deficits after acquired brain injury and to analyze the possible factors affecting the efficacy of memory rehabilitation. *Method:* One hundred and forty-four inpatients and outpatients with memory disorders following acquired brain injury, who from China Rehabilitation Research Center and other 11 hospitals in mainland were selected. The patients were randomly assigned to control group and training group. The training group was given cognitive rehabilitation training primarily on memory disorders for 6 weeks. The instantaneous memory, short-term memory and long-term memory function were evaluated before and after training. The effect of gender, age, education, course, site of injury and coma duration on training efficacy were analyzed as well. *Results:* At 6 weeks of training, the training group showed a significant improvement in memory abilities when compared to the controls (p<0.01). We established the equation of gender, age, education, course, site of injury, coma duration and the difference before and after training using the multiple linear regression theory. The results showed that only negative correlations were found between age and training efficacy (the correlation coefficient was -0.202), the other factors showed no impact on the training efficacy. *Implications on Rehabilitation:* Cognitive rehabilitation based mainly on memory training can significantly improve memory condition of patients with brain injury. Furthermore, course, site of injury and coma duration showed no impact on the training efficacy, which may indicate that it was never too late to conduct the memory rehabilitation.

PO-1414

EXPRESSION OF ADENOVIRAL-MEDIATED KERATIONCYTE GROWTH FACTOR ENHANCES IN VITRO EPIDERMAL STEM CELLS PROLIFERATION

Xinping Li, Mingsheng Zhang, Liming Bai, Kenzo Uchida, Hongxiang Zhu
Department of Physical Medicine and Rehabilitation, Guangdong Academy of Medical Sciences and Guangdong General Hospital, Guangzhou, China

Epidermal stem cells (ESC) are characterized as slow-cycling, multipotent, and self-renewing cells that do not only maintain somatic homeostasis but also participate in tissue regeneration and repair. To determine the effects of keratinocyte growth factor (KGF) on the growth of ESC, ESC were isolated from human skin, cultured in vitro and then transfected with recombinant adenovirus (Ad) carrying the human KGF gene (AdKGF) or the green fluorescent protein gene (AdGFP). The effects of KGF on cell proliferation, cell cycle arrest, cell surface antigen phenotype and the expression of cyclin D1, cyclin A and β-catenin were investigated. Compared with AdGFP, the AdKGF-transfected ESC grew well and maintained a high proliferative capacity in keratinocyte-serum-free medium, and expressed high levels of cyclin D1, cyclin A and β-catenin. AdKGF infection increased the number of ESC in the G0/G1 phase and promoted ESC entry into the G2/M phase, but had no effect on ESC cell phenotype (CD49+/CD71-) expression in these cells. The results suggest that KGF can stimulate ESC to grow and undergo cell division, which enhance the process of cutaneous wound healing.

PO-1415

EFFICACY OF COMBINED PASSIVE AND ACTIVE REHABILITATION FOR ANKLES IN PATIENTS WITH STROKE USING A PORTABLE ROBOT – A PILOT STUDY

Yuan Zhou[1], Yao Sun[2], Ninghua Wang[1], Kunlin Wei[2], Zhihao Zhou[2]
[1]Department of Rehabilitation, Peking University First Hospital, mChina, [2]College of Engineering, Peking University, China

Objectives: 1) To develop a portable ankle robot for quantitative passive stretching and active movement training. 2) To investigate the efficacy of combined passive stretching and active movement training with visual feedback display using the robot. *Methods:* The stroke patients were divided into two groups, experimental and control group. In the experimental group, for each session, the device stretched the ankle throughout the ROM to extreme dorsiflexion. The ankle was held at the extreme position, and the patients were required to actively plantarflexion, while their soleus-EMG, as the visual feedback, should be controlled at a predetermined level. In the control group, no active plantarflexion was required, with all the other treatments exactly the same with the experimental group. The treatment outcome will be evaluated in multiple aspects, including biomechanical measures (passive ROM, resistant torque-angle relation, PF-MVC-torque, etc), functional measures (timed up & go test, gait analysis, plantar pressure analysis, etc) and imaging measures of related soft tissues. *Results:* After trainings, either passive stretching or passive stretching combined with active movement training, joint stiffness changed in many measures mentioned above. Impacts This research developed a robust robotic device for the labor-intensive physical training. This device is promisingly efficient for either passive stretching alone or combined with active movement training.

PO-1416

THE INFLUENCE OF BALANCE CORRECTION ON THE STATE OF ON BALANCE AND COGNITIVE FUNCTIONS OF PATIENTS OF STROKE RECOVERY PERIOD

Semen Prokopenko, Mariya Abroskina*, Vera Ondar
Krasnoyarsk State Medical University named after prof. V.F. Vojno-Yasenetsky, Russia

The aim of research is to compare the influence of the author innovative method of balance recovery with method based on the biofeedback principle on balance and cognitive functions for the patients during recovery post-stroke period. *Methods:* 50 patients with atactic syndrome and light cognitive disorders during recovery post-stroke period were included into investigation. The I group (n=30) contained the patients whose comprehensive treatment included standard drug therapy together with the suggested technique of balance correction. Patient was doing easy exercises accompanied by the simultaneous provocative center-of-gravity shift as a result of patient's holding a pole with distal loading. The II group (n=20) was presented by those patients whose treatment included standard drug therapy combined with moto-rehabilitation and bio-feedback balance exercises. For assessment these methods we used the neurological status assessment, objective evaluation of balance by Computer Stabilometry (CS), balance clinical function – by Berg Balance Scale, walking function – by Dynamic Gait Index, cognitive functions – MMSE, FAB, clock drawing test. *Results:* In the I group patients had significant improvement by the CS and scales (Wilcoxon nonparametric test: p<0.05). In the II group patients had significant improvement by the CS and scales (Wilcoxon nonparametric test: p<0.05) too. Statistically significant differences between the I and II groups have't been identified. *Conclusions* The suggested technique, lets enhance patient's stability while standing and walking, decrease the risk of falls during walking with vestibular

loads, help create a new movement stereotype. The efficiency of author method is comparable with high-tech modern methods of balance correction.

PO-1417

THE EFFECTS OF PAIRED ASSOCIATIVE STIMULATION ON MOTOR CORTEX EXCITABILITY AND RECOVERY OF MOTOR FUNCTION OF UPPER LIMB IN STROKE PATIENTS

Yanfang Sui[1,2], Tiecheng Guo[1,2], Zhenhua Song[1,2]

[1]Department of Rehabilitation Medicine, Haikou Hospital, Central South University,China, [2]Department of Rehabilitation Medicine, Tongji Hospital, Huazhong University of Science and Technology

Objective: To investigate the effects of paired associative stimulation (PAS) on motor cortex excitability and the recovery of motor function of upper limb in stroke patients; and to analyse the relationship between the change of motor cortex excitability of contralesional hemisphere and the recovery of motor function of upper limb. *Methods:* Thirty stroke patients with hemiplegia were divided randomly into two groups: a treatment group and a control group. Both groups were given routine rehabilition, and the treatment group was also administered with PAS composed of a trascranial magnetic stimulation (TMS) of the motor cortex on the affected side and an electric stimulation (ES) of the median nerve contralateral to the motor cortex as an addition, with a interval of 10ms between the TMS and ES (PAS10). The PAS10 was delivered at a frequency of 0.05 Hz, and an intensity of 120% resting motor threshold (RMT), once daily for 30 min for a total of 4 weeks. The corticospinal excitability was measured with motor evoked potentials (MEP) and RMT with all the patients, and the Fugl-Meyer upper limb assessment (FMA), Brunnstrom staging, as well as the modified Barthel index (MBI) were also evaluated with the patients before and at the end of the 4 weeks of treatment. The patients in treatment group were also tested with MEP and RMT at immediately and 1 h after the first session of PAS10. *Results:* Before intervention there was no significant difference between the two groups in any of the assessments. After the first session of PAS10, the MEP amplitude [pre: 1.29±0.66 mV, post: 0.55±0.36 mV (immediately), 0.72±0.43 mV (1 h)] and latency [pre: 20.79±1.48 ms, post: 22.14±2.36 ms (immediately), 21.93±2.06 ms (1 h)] and RMT [pre: (42.75±9.91)%, post: (48.18±10.65)%] of contralesional hemisphere which measured at immediately and 1 h after treatment in the treatment group were significantly different from those before the treatment. In seven patients from whom the MEP evoked by TMS of the hemisphere could be recorded in the treatment group, the MEP amplitude, latency and RMT of the lesioned hemisphere were [pre: 0.16±0.07 mV, post: 0.39±0.13 mV (immediately), 0.29±0.10 mV (1 h)], [pre: 24.35±1.87 ms, post: 22.23± 0.99 ms (immediately), 22.93±1.06 ms (1 h)], [pre: (81.5±12.02)%, post: (68.5±12.59)%], respectively. The MEP amplitude and RMT which measured immediately after the PAS10 were significantly changed after the first session of paired associative stimulation in the treatment group comparing to those before treatment. But there was no significant difference between the two groups in any of the assessments except the MEP amplitude (treatment group: 0.88±0.77 mV, control group: 1.67±0.95 mV) after 4 weeks of treatment. Before intervention, the average FMA, Brunnstrom staging (forearm and hand), MBI results of treatment group were 15.72±17.70, 48.18±24.42, 2.58±1.38 (forearm), 1.40±0.52 (hand), respectively; and the average FMA, Brunnstrom staging (forearm and hand), MBI results of control group were 14.90±16.99, 47.27±21.60, 2.83±1.53 (forearm), 1.40±0.55 (hand), respectively. After 4 weeks of treatment, the average FMA, Brunnstrom staging (forearm and hand), MBI results of treatment group were 26.63±19.19, 63.63±25.74, 3.25±1.7 (forearm), 1.56±0.53 (hand), respectively; the results of control group were 17.54±18.24, 55.45±19.29, 3.42±1.44 (forearm), 1.50±0.52 (hand), respectively. After 4 weeks of treatment, all assessments were significantly changed as compared to those before the treatment. But there was no significant difference between the two groups in any of the assessments. After 4 weeks of treatment, the difference of MEP amplitude from contralesional hemisphere and the difference of FMA had positive correlation, correlation coefficient was r =0.431, $p<0.045$; the difference of RMT of contralesional hemisphere and the difference of FMA also had positive correlation, with a correlation coefficient r=0.608, $p<0.01$. *Conclusions*: PAS10 can significantly change the motor cortex excitability of contralesional hemisphere, and facilitate the recovery of motor function of upper limb. The change of motor cortex excitability of contralesional hemisphere significantly correlates to the recovery of motor function of upper limb.

PO-1418

REAL-TIME MUSCLE STIFFNESS MEASUREMENT WITH SHEAR WAVE IMAGING IN POSTSTROKE PATIENTS

Peng-Ta Liu[1,2], Huihua Kenny Chiang[1]*, Ta-Sen Wei[2]

[1]Biophotonics and Ultrasound Lab, Department of Biomedical Engineering, National Yang-Ming University, Taipei, Taiwan,Chinese Taipei, [2]Department of Physical Medicine and Rehabilitation, Changhua Christian Hospital, Changhua, Taiwan, Chinese Taipei

Objective: To evaluate the stiffness of biceps muscle and changes in its muscle echogenicity and architecture. *Method:* Eighteen stroke patients (15 male) with spastic hemiplegia (Modified Ashworth Scale ≥ 1) were examined. The thickness, echogenicity and shear wave velocity of biceps brachii were measured bilaterally by a real-time shear wave ultrasound elastography system (Siemens Acuson S2000). Young's modulus was derived from shear wave velocity which was captured by a fixed region of interest (5 mm x 5 mm) at three different depths (0.5, 1.0, 1.5 mm). Additionally, to further verify the elastography measurement, a myotonometer was also employed to test the stiffness of muscle. Both measurements were performed in a standardized position (elbow flexed at 90 degrees under relaxed condition). The differences between both upper limbs were determined using paired *t*-test. *Results:* The biceps thickness was significantly decreased on spastic biceps muscle (2.17 mm vs. 2.64 mm, $p<0.05$). The mean Young's modulus was 13.9 ± 7.5 kPa for both affected and non-affected biceps muscles. The spastic biceps muscle had significantly higher stiffness (p <.05) and greater Young's modulus (p <.05) than non-affected arm. Significant correlations were found between Young's modulus and stiffness (r=0.43; p =.039), and also between echogenicity and Young's modulus (r=0.34; P =.048). *Implications/Impact on Rehabilitation:* Quantitative measurement of Young's modulus by shear wave technology may assist clinicians in characterizing the muscle stiffness and rheological changes. It could be a useful method for evaluating the efficacy of spasticity managements.

PO-1419

EXPERIENCE OF PEOPLE WITH DISABILITIES IN THE ADAPTATION OF THEIR CLOTHES

Maria Clara Pinto Pfister*, Thais Tavares Terranova, Gracinda Rodrigues Tsukimoto, Linamara Rizzo Battistella

Clinical Research Center. Institue of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine. São Paulo, Brazil

Objective: assess the need for customization of clothes to facilitate occupational performance, considering that commonly, disabled people fail to dress the way they prefer and fashion can influence the functionality as the clothes optimize the activities of dressing and undressing. *Methods:* Interviews collected from 173 patients, including male and female, during weekly meetings, where the main theme was inclusive fashion. The following items were evaluated: ergonomics,mobility and functionality of the clothes. *Results:* the

patients mentioned during the meetings, among other issues, the difficulty dressing and undressing, and questions about appropriate fabrics and seams. The group discussion brought improvement in the perception of functionality in fashion and the possibility of creating new adaptations, positively influencing the quality of life of the patient. *Implications/Impact on rehabilitation:* More ergonomic and functional clothes favor independence and autonomy, provides better self esteem, motivation and confidence so it is necessary to sensitize the manufecturers and professionals that work in this area, as well as the family or people who is caring the people with disabilities, about this subject.

PO-1420

LOW FREQUENCY ELECTROMAGNETIC FIELD ENHANCES EPIDERMAL STEM CELL GROWTH AND PROMOTES EPITHELIAL WOUND HEALING IN THE PROGRESS OF TRANSPLANTATION OF EPIDERMAL STEM CELLS FOR TREATMENT OF FULL THICKNESS SKIN DEFECTS

Mingsheng Zhang, Liming Bai, Wenfang Bai, Kenzo Uchida, Weicheng Xu, Hongxiang Zhu

Department of Physical Medicine and Rehabilitation, Guangdong Academy of Medical Sciences and Guangdong General Hospital, China

Objectives To elucidate the effect of low frequency EMF on epidermal stem cells (ESC) proliferation and observe the therapeutic effects of low frequency electromagnetic field on full thickness skin reparatory processes by transplantation of epidermal stem cells. *Methods:* The ESC were exposed for 30 min/day to a 5 mT low frequency EMF at 1, 10, and 50 Hz for 3, 5, or 7 days. Meanwhile, the ESC were grafted into type-I three-dimensional collagen sponge scaffolds, and then were exposed with 50 Hz EMF for 14 days. The effects of low frequency EMF on cell growth and proliferation were investigated. Comparing with ESC grafting alone, the effects of transplantation of ESC combined with EMF exposed on the healing of the full thickness skin defects was evaluated. *Results:* Low frequency EMF significantly enhanced the proliferation of ESC with the highest cell proliferation rate at 50 Hz in a frequency-dependent manner, while no difference in cell viabilities were detected. ESC cultured in collagen sponge scaffolds could be steady grown and EMF could promote ESC proliferation compared with control ($p<0.05$). Under the influence of 50 Hz electromagnetic field, the healing of the skin defect was accelerated in comparison with the control group ($p<0.05$). *Conclusions:* Our results show that EMF modulates ESC growth and have a promoting effect on the wound healing process combined with ESC transplantation. EMF could represent an accessorial therapeutic approach in the treatment of skin injury using tissues-engineered skin.

PO-1421

CLINICAL EFFECT OF ULTRASOUND COMBINED WITH ELECTRICAL STIMULATION GUIDANCE INJECTION IN UPPER LIMB SPASTICITY IN STROKE PATIENTS WITH BOTULINUM TOXIN TYPE A

Li Jiang, Zu-Lin DOU, Hong-Mei WEN, Xiao-Mei WEI, Wei-Hong QIU

the Third Affiliated Hospital, Sun Yat-sen University, China

Objective: To evaluate the clinical effect of ultrasound combined with electrical stimulation technique guidance botulinum toxin type A (BTX-A) injection in spastic upper limb muscles in poststroke patients. *Methods:* Twenty-three patients with ULSupper extremities spasticity following stroke were recruited in this clinical study. Under the guide of color Doppler ultrasound combined with electrical stimulation, BTX-A (Botox) was injected into multi- points of several spastic upper limb muscles in patients. Some rehabilitation training (including joint traction, electrical stimulation and active motion)were performed after Botox injection The outcome after Botox injection was assessed by modified Ashworth scale (MAS), active rang of movement (AROM), and Fugl-Meyer assessment (FMA). All assessments were performed at the baseline, 1, 2, 4 and 12 weeks after injection treatment respectively. *Results:* Compared with preoperation, Compared the sscores of MAS, AROM and FMA were obviously improved after 1, 2, and 4 and 12 weeks with basic lineafter Botox injection, there were significant differences statistically (all $p<0.05$). AROM and FMA were statistically improved after 2 weeks and continued to 12 weeks after treatment ($p<0.05$). *Conclusion:* Ultrasound combined with electrical stimulation guidance injection is an accurate positioning method in using BTX-A to treat spastic upper limb muscles in poststroke patients.

PO-1422

ANALYSE ON THE CHARACTERS OF STANDING BALANCE AND INTERVENTION IN HEMIPLEGIC PATIENTS AFTER STROKE

Rongrong Lu[1], Fang Li[1], Yi Wu[1], Xiulin Xu[1], Xiufang Hu[1]

[1]Rehabilitation Department, Huashan Hospital,China, [2]College of medical equipment and food University of Shanghai for Science and Technology, China

Objective: To observe the change of the ability of static balance of the paralysis patient under different intervention, and to discuss whether the visual feedback balance training could improve the motor, balance and ADL ability of the paralysis patients after stroke. *Method:* 10 stroke patients are randomized divided into 2 groups (routine balance training and the machine balance training). Fugel-Meyer scale is used to assess the motor ability, while the BBS, RMAS and RMI are used to assess the balance ability, and Barthel index is used to assess the ADL. The multi-balance training system (MBTS) is used to test the static balance parameter. After 28 days' treatment, all the above assessments are done again. *Results:* Before the therapy, there are no difference in demographic feature, motor ability, balance ability, ADL and the static balance parameters in different conditions between the control group and the treatment group. After 28 days' treatment, both groups have improved in motor and balance control but there exist no significant difference. The stability and symmetry of the treatment group also improves a lot but does not meet the significant criteria. *Implications on Rehabilitation:* Hemiplegic patients after stroke were trained by MBTS, their motor function, balance ability and ADL were better than that of the routine training group. But when using MBTS to assess the patients, no significant difference exists between these two groups. A larger sample and a longer training time were needed to work on the further research.

PO-1423

PREVALENCE RATE OF DYSPHAGIA IN ACUTE HOSPITAL -THE FIXED-POINT EXAMINATION TO ALL THE INPATIENTS -

Seiko Shibata*, Fumi Toda, Hitoshi Kagaya, Eiichi Saitoh, Takashi Higashiguchi, Tomoko Nishimura, Yuriko Ito

Fujita Health University, Japan

Purpose: Japan is an aged society and the elderly ratio is 23.3%. Pneumonia ranked of the cause of one's death 3rd in 2011. 96% of the patients send to hospital for pneumonia are aged 65 and over, and it is said that the most is based on aspiration pneumonia. Dysphagia is one of the factors of aspiration pneumonia. It aimed at investigating the prevalence rate of the dysphagia in an acute

hospital. *Materials and Methods:* The questionnaire was performed for the adult inpatient who was in one day in November, 2012. An evaluator were ward nurses. Severity of dysphagia was assessed by using the Dysphagia Severity Scale (DSS), a 7-point ordinal scale. DSS 1 to 4 has aspiration.The existence of the dysphagia in each patient and the dietary intake situation and the existence of aspiration pneumonia were investigated. *Results:* Investigation of 1,087 examples was conducted among 1155 adult inpatients, and the data of 1,070 examples except a data defect was analyzed.There were 129 patients (12.0%) who have a dysphagia except the patient under a respirator management and severe consciousness disorder. There were 106 (28.2%) of dysphagia patients had aspiration. There were 10 patients who have pneumonia among dysphagia patients. *Conclusion:* In an acute hospital, a dysphagia patient existed about 12%.Moreover, those about 9% had aspiration pneumonia. In order to prevent serious aspiration pneumonia, it is important to carry out screening evaluation of a swallowing function at an early stage to an inpatient.

PO-1424

COMPARISON OF KNEE CARTILAGE THICKNESS IN LOWER EXTREMITY AMPUTEES AND NON-AMPUTEE CONTROLS

Serdar Kesikburun[1]*, Özlem Köroğlu Omaç[2], Evren Yaşar[1], Kamil Yazıcıoğlu[1], Arif Kenan Tan[1]

[1]Gülhane Military Medical Academy, Turkish Armed Forces Rehabilitation Center, Ankara, TURKEY, [2]Elazığ Asker Hastanesi, Elazığ, TURKEY

Objective: Patients with lower limb amputation are suggested to be predisposed to osteoarthritis of the intact knee attributed to alteration in gait biomechanics and abnormal joint loading. The purpose of this study was to determine if femoral articular cartilage thickness of intact knee measured sonographiycally is thinner in lower extremity amputees compared to age-matched non-amputee controls. *Method:* Patients (n=31, mean age=32.5±9.6) with a unilateral below knee amputation, knee disarticulation, or above knee amputation and non-amputee controls (n=53, mean age=28.8±6.4) were assessed. All participants were male. Participants were excluded if they were younger than 18, had a history of significant knee injury or prior surgery to knee, and had a rheumatic disease. Femoral articular cartilage thickness was measured using ultrasound at sites of medial/lateral condyles and intercondylar notch. The measurement was performed in the intact knees of amputees and bilateral knees of non-amputees. *Results:* Femoral articular cartilage thickness was thinner especially at lateral condyles in amputees compared to non-amputees. The measures of lateral condyles reached a significant difference only on the left side (p<0.05). *Implications/Impact on Rehabilitation:* The results suggest that the intact knee of amputees has a cartilage deterioration which was more in the lateral compartment.

PO-1425

FALL FREQUENCY AND FEAR OF FALLING IN PERSONS WITH LATE EFFECTS OF POLIO

Christina Brogårdh[1,2]*, Jan Lexell[1,2]

[1]Lund University,Sweden, [2]Skåne University Hospital, Sweden

Objective: Many people with late effects of polio have muscle weakness, impaired balance and decreased gait performance, which are known risk factors for falls. Few studies have investigated fall frequency and factors associated with falls in this population. The aim of this study was to examine: (*i*) fall frequency the last year; (*ii*) factors associated with falls; and (*iii*) fear of falling in persons with late effects of polio. *Method:* A total of 251 persons (mean age 70 years) completed a questionnaire about walking ability, balance, fall frequency the last year, fear of falling and how bothered they were about falling (using the Falls Efficacy Scale-International; FES-I) when performing daily activities. *Results:* Sixty-three percent reported at least one fall during the last year. Most of the falls were reported when walking outdoors (53%) and in the afternoon (67%). A majority of the participants reported impaired balance (90%); two-thirds were able to walk less than 1,000 meters and 74% used walking aids. Seventy-four percent reported fear of falling and over 60% of those avoided doing activities in daily life because of their fear of falling. The most bothering activities to perform were walking on slippery and uneven ground, walking on hillsides and climbing stairs. *Implications:* Falls and fear of falling are common in persons with late effects of polio. Therefore, many avoid doing activities in their daily life because of fear of falling. Targeted interventions are needed to increase their activity level and thereby their participation in various life situations.

PO-1426

EFFECT OF BALLOON DILATATION ON HYOID BONE AND UPPER ESOPHAGEAL SPHINCTER IN BRAINSTEM STROKE PATIENTS WITH DYSPHAGIA

Zulin Dou, Yue Lan, Guifang Wan, Fan Yu

The Department of Rehabilitation Medicine,The Third affiliated hospital of Sun Yat-sen,China University,Tianhe Road, No 600, Guangzhou, Guangdong, China.

Objectives: We examined effect of balloon dilation intervention on opening of upper esophageal sphincter (UES) and excursion of hyoid bone in brainstem stroke patients with dysphagia before and following treatment by using digital analysis of videofluoroscopy. *Methods:* Thirty brainstem stroke patients with pharyngeal dysphagia were recruited in this study. 15 of them as dilatation treatment group completed 3 weeks of modified balloon dilatation treatment and traditional swallowing therapy. Another 15 of them as control group only completed 3 weeks of traditional swallowing therapy. Before, and following the dilatation we measured opening of upper esophageal sphincter (UES) and excursion of hyoid bone during swallows of thin liquid, thick liquid, and pasty material in 3 ml volumes. We compared these results to identical measures obtained from control group. *Results:* Following dilatation treatment, 12 of 15 patients were removed feeding tube in dilatation group.Post-dilatation the opening of UES and excursion of hyoid bone were both significantly better than Pre-dilatation in the group of dilatation treatment for three materials (p<0.05). Only 2 of 15 patients were removed feeding tube in control group following traditional swallowing therapy. However, Post-treatment the relaxation of UES in control group was not shown any significantly difference from pre-treatment (p>0.05) for all three materials. *Implications:* Dysphagia therapy with dilatation improves opening of UES and excursion of hyoid bone during swallowing. Traditional swallowing therapies have certain effect but do not have positive effect on opening of UES and excursion of hyoid bones.

PO-1427

EFFECT OF OCCUPATIONAL THERAPY ON THE RECOVERY OF MODIFIED RADICAL MASTECTOMY PATIENTS

Xuelei Chen, Yuhong Chen

Tianjin Medical University Cancer Institute and Hospital, China

Objective: To explore the effect of occupational therapy on the recovery of modified radical mastectomy patients. *Methods:* 162 patients of modified radical mastectomy were divided into control group (n=80) and observation group (n=82). Both groups received rehabilitation gymnastics without auxiliary neans, the observation group received occupational therapy additionally. Their ADL and psychology symptom were assessed before and 2 weeks after treatment. *Results:* The Barthel Index score were significantly higher in observation group than control group ($p \leq 0.01$);the psychology symptom score were significantly higher in observation group than

control group on depressed/anxious/pressure and anger ($p<0.05$, $p\leq0.01$). *Conclusion:* Occupational therapy can improve the patients` ADL and relieve their psychology symptom.

PO-1428

RADIAL EXTRACORPOREAL SHOCK WAVE THERAPY IN THE TREATMENT OF GASTROCNEMIUS SPASTICITY IN PATIENTS WITH STROKE: A RANDOMIZED, SINGLE-BLIND, PLACEBO-CONTROLLED CLINICAL TRIAL

Zhijie Yang[1], Tieshan Li[2], Xiuping Chen[1]

[1]Medical College of Qingdao University, China, [2]Rehabilitation Department, the Affiliated Hospital of Medical College, Qingdao University, China

Objective: This study aimed to explore the effects of radial extracorporeal shock wave therapy (rESWT) on gastrocnemius spasticity in post-stroke patients. *Method:* Nineteen patients (8 female and 11 male) with gastrocnemius spasticity were randomly assigned to receive either oneactive treatment or one sham treatment. The modified Ashworth Scale (MAS), passive range of motion (PROM), Hmax/Mmax ratioand the latency of H reflex,tibial motor nerve conduction were introduced to evaluate the clinical and electrophysiological changes of gastrocnemius spasticity at the following time points: before and immediately after the treatment and at time intervals of 1, 2 weeks. *Results:* It showed significant differences between rESWT group and sham treatment group in modified Ashworth Scale (MAS) and passive range of motion (PROM) after intervention. In rESWT group significant improvements were observed in modified Ashworth Scale (MAS) and passive range of motion (PROM) immediately after the treatment and at weeks 1 and 2 ($p<0.05$, all p-values calculated for change from baseline). No significant differences were observed in Hmax/Mmax ratio between groups or across time, neither the conduction velocity, distal latency and amplitude of tibial nerve conduction ($p>0.05$). No significant changes were found after the sham treatment at all time points ($p>0.05$). *Implications:* Treatment with radial extracorporeal shock wave can improve spasticity of gastrocnemius. Further studies on mechanisms of effects of rESWT and long-term study are warranted.

PO-1429

LEG MOTOR LEARNING IN PATIENTS AFTER STROKE

Natsuki Yamakami[1], Koji Oohata[1], Ryosuke Kitatani[1], Yu Hashiguchi[1], Kaoru Sakuma[1], Yoshitaka Miyazaki[2], Aki Watanabe[2]

[1]Kyoto University,Japan, [2]Yufuin Kouseinenkin Hospital, Japan

Objective: Motor learning is an important process for improving motor function in individuals after stroke. In the normal learning process, the amount of movement variability is reduced. However, such variability control has not been investigated during leg extension movements in individuals after stroke. This study aimed to clarify the change in variability of movement patterns in motor learning in individuals after stroke. *Methods:* Seventeen ambulatory patients with hemiplegia performed a leg extension task in the sitting position. Participants extended their toes in the paretic side toward a target in front of them as quickly as possible. They repeated the trial 20 times, and knee and hip joints angles during the task were recorded. The amount of movement variability was analyzed using the standard deviations (SDs) of hip and knee joint angles. Successful and unsuccessful trials were determined by error distances between the target and the actual extension points. Furthermore, participants were divided into two groups: those who reduced error distances through repetition (RG) and those for whom error distances were unchanged (UG). *Results:* Hip and knee SDs in successful trials were significantly reduced compared to those in unsuccessful trials ($p<0.05$). Hip SD significantly decreased in RG ($p<0.05$), but not in UG. There was no significant decrease in knee SD in either group. *Implications/Impact on Rehabilitation:* The decreased SD at the hip joint was considered to result from selection of an optimal movement pattern, and could be an indicator for kinematic change resulting from motor learning.

PO-1430

VESTIBULAR ATAXIA SYNDROME CORRECTION IN VERTEBRO-BASILAR STROKE SURVIVORS WITH THE STABILIZING PLATFORM USING

Vera Ondar*, Semen Prokopenko, Mariya Abroskina, Alexander Lapin

Krasnoyarsk State Medical University named after prof. V.F. Vojno-Yasenetsky, Russia

Background and Objectives: After stroke in many cases the balance disorder is the main syndrome which limits the functional abilities and independence in daily life. The aim of our study was approbation of the gait and balance correction method with stabilizing platform (with decreased square of support) for the patients after stroke with cerebellar or vestibular ataxia syndrome. *Methods:* We proposed a new balance correction method based on the using of device which excluded the ankle strategy from postural control process and the square of support was decreased. When the ankle strategy was excluded, equilibrium system used hip strategy. 30 patients were treated by this method (13 male, 17 female). Aged from 35 to 73 years. During the training the patient walked in the platforms with the reduced square effective support from 60 to 180 meters (10 min). The trainings were held during 10 days. Balance and gait state were assessed by using the Berg Balance Scale, and the Dynamic Gait Index. For assessing the state of equilibrium to all patients the computer stabilometry (CS) was carried. *Results:* Positive changes in neurological status were noticed in all patients of the group after the atactic disorders correction training course. Statistically significant differences ($p<0.01$) before and after treatment obtained in the computer stabilometry results analysis (statokinesiogram square) and functional scales evaluation. *Conclusions:* This method has shown its efficacy for treating post-stroke patients with vestibular and cerebellar ataxia.

PO-1431

THE EFFECTS OF RADON HOT SPRING AND SUPER LIZER THERAPY ON WOUNDS AFTER LARGE SURFACE BURNS

Tianbao Sun, Lu Fang, Qin Guo, Shuxian Wu, Fosheng Hu

Guangdong Provincial Work Injury Rehabilitation Hospital, China

Objective: To observe the effects of radon hot spring and super lizer therapy on wounds after large surface burns. *Methods:* 36 cases with large surface burn wounds were randomly divided into the treatment group (19 cases) and control group (17 cases). The treatment group received the conventional treatment and super lizer therapy after radon hot spring bathing therapy, the control group just with the conventional treatment. Wounds area, depth, exudates quantity and tissue types were assessed at pre and after treatment of 2 month. Wilcoxon signed rank test was used by SPSS13.0. *Results:* After 2 months treatment, the treatment group cure rate was 73.68%, the control group cure rate was 47.05%. There were significant statistical differences when comparison to the two groups about wound area, depth, exudates quantity and tissue types ($p<0.01$). *Conclusion:* Radon hot springs and super lizer therapy in the treatment of large surface burn wounds has high cure rate and also can improve the wound conditions to receive surgical operation for the intractable wounds.

PO-1432

EFFECTS OF SURFACE ELECTROMYOGRAM BIOFEEDBACK STIMULATION ON FUNCTION OF PHARYNX AND UES DURING SWALLOWING IN BRAINSTEM STROKE PATIENTS WITH DYSPHAGIA

Yue Lan[1], Guangqing Xu[1], Zulin Dou[1], Guifang Wan[1], Fan Yu[1], Xiyuan Wang[1]

[1]The Department of Rehabilitation Medicine,The Third affiliated hospital of Sun Yat-sen University,Tianhe Road, No 600, Guangzhou, Guangdong, China 510630., [2]The Department of Rehabilitation Medicine,The First affiliated hospital of Sun Yat-sen University,Zhonshan No2 Road, Guangzhou, Guangdong, China 510080.

Objectives: Using high-resolution solid-state manometry, we examined biomechanic changes of physiologic swallowing events in brainstem stroke patients with dysphagia when performing surface electromyogram biofeedback stimulation (sEMG), electrical stimulation (estim), or no stimulation. *Methods:* Fifteen brainstem stroke patients with pharyngeal stage dysphagia participated in this study. Pharyngeal pressures peak and duration, UES residual pressure and duration were measured during swallows of water, thick liquid, and pasty material in 3 ml volumes. Swallow were completed under random presentation of sEMG, estim, or no any stimulation. The effects of three conditions on biomechanic changes of swallowing were investigated by three way repeated measures analysis of variance (ANOVA). *Results:* In sEMG condition, UES relaxation and pharyngeal propulsion were both significantly improved for three materials (p<0.05) compared with other conditions. However, no significant main effect on UES relaxation and pharyngeal propulsion were identified in estim condition for all three materials (p>0.05) compared with no estim condition. *Implications:* sEMG has immediately obvious effects on swallowing function. However, estimdon't likely to have any immediate effect on physiologic aspects ofswallowing. Identified effects of different patterns of electrical stimulation might help to refine clinicalapplication on patients with dysphagia.

PO-1433

FUNCTIOAL MAGNETIC STIMULATION OF INSPIRATORY AND EXPIRATORY MUSCLES IN PATIENTS WITH TETRAPLEGIA

Xiaoming Zhang[1,2], Ela Plow[1,2], Vinoth Ranganathan[1,2], Milissa Schmitt[1], Vernon Lin[1,2]*

[1]Louis Stokes Department of Veterans Affairs Cleveland Medical Center,United States, [2]Cleveland Clinic, United States

Objective: To evaluate the effectiveness of functional magnetic stimulation (FMS) for conditioning inspiratory and expiratory muscles in patients with tetraplegia. *Method:* Three patients with tetraplegia were enrolled in a six-week FMS protocol for conditioning the inspiratory and expiratory muscles. A magnetic stimulator and a race-track magnetic coil were used, placed at C7 and T9 vertebral levels, respectively. Pulmonary function tests were performed every two weeks. Respiratory variables included inspiratory reserve volume (IRV), expiratory reserve volume (ERV), peak inspiratory flow (PIF), peak expiratory flow (PEF), maximal inspiratory pressure (MIP), and maximal expiratory pressure (MEP). *Results:* After 6 weeks of conditioning, the values for one C5 subject were the following (mean ± standard error): IRV, 1.71 ± 0.07 liter; ERV,0.31 ± 0.02 liter; PIF, 230 ± 2.6 L/min; PEF, 274 ± 8.5 L/min; MIP, 95 ± 0.5 cmH2O; and MEP 28 ± 0.5 cmH2O. These values corresponded to 115%, 119%, 141%, 123%, 142%, and 119% of pre-FMS conditioning values respectively. When FMS was discontinued for 4 weeks, these values had the following decrements (IRV, 11%; ERV, 0%; PIF, 20%; PEF, 11%; MIP, 7%; and MEP, 4%). The other two subjects were not able to complete the study and withdrew pre-maturely. *Conclusion:* A 6-week FMS conditioning of the inspiratory and expiratory muscles improved voluntary inspiratory and expiratory functions, indicating that FMS may be a potential noninvasive therapeutic technology for training respiratory muscles in persons with tetraplegia; and continual FMS may be required to maintain gains in pulmonary functions.

PO-1434

THE EFFECT OF SPINAL ROTATION REHABILITATION THERAPY (SRRT) ON THE QUALITY OF LIFE OF PARAPLEGIA PATIENTS AFTER SPINAL CORD INJURY

Zhuo Xu[1,2], Chaoyi Wang[3], Pinmei Li[1], Minhua Yu[1]

[1]China-Japan Union Hospital of JILIN University, Changchun, China, [2]Research Institute for Diseases of Old Age, Juntendo University School of Medicine, Tokyo, Japan., [3]Texas A&M University, Texas, United States

Objective: To investigate the effect of Spinal Rotation Rehabilitation Therapy (SRRT) on the quality of life of paraplegia patients after spinal cord injury. *Methods:* Forty-two paraplegic patients were randomly assigned to two groups: the Taichi Group (22 cases) and the Control Group (20 cases). The Taichi Group received the training protocol of Spinal Rotation Rehabilitation Therapy; the Control received the regular exercise training protocol. After an average of three months training, the motor function, sensory function, and activities of daily living were compared between the two groups. The motion and sensory index scores were accessed using the revised 2000 American Spinal Injury Association (ASIA) classification. Barthel index score was also accessed. *Results:* Both the motor index for the Taichi Group were higher than the Control Group, p<0.01 and p<0.05. In addition, the Barthel index for the Taichi Group was also higher than that of the Control Group, p<.01.

PO-1435

PHYSICAL FUNCTION AND QUALITY OF LIFE IN AMPUTEES FROM THE 2008 SICHUAN EARTHQUAKE

Ling Li[1,2], Jan D Reinhardt[3,4,5], Xia Zhang[1,2], Jianan Li Jianan Li[1,3]

[1]Department of Physical and Rehabilitation Medicine, First Affiliated Hospital of Nanjing Medical University, Nanjing, China, [2]Caring For Children Foundation, Hong Kong, China, [3]World Health Organization Liaison Sub-Committee on Rehabilitation Disaster Relief of the International Society of Physical and Rehabilitation Medicine, Assenede, Belgium, [4]Swiss Paraplegic Research, Nottwil, Switzerland, 5.Department of Health Sciences and Health Policy, University of Lucerne, Switzerland

Objective: To examine the long-term outcomes of amputation victims, and to explore factors affecting the physical function and quality of life (QoL). *Method:* Seventy-two amputation victims who suffered amputation from the Sichuan Earthquake and rehabilitated in Mianzhu county hospital were enrolled. Twenty-seven victims were lost to follow up. Data on demographic information, physical function were collected at 3 measurement points (2009, 2010 & 2012), and data on QoL was collected at 2 measurement points (2010 & 2012). Physical function was measured with activities of daily living using the Barthel Index and pain level with a visual analogue scale. Quality of life was evaluated with the Medical Outcomes Study Short-Form 36 (SF-36). Data were analyzed with a longitudinal Tobit regression and linear mixed models. *Results:* Pain severity was significantly declined and the activities of daily life was remarkable improved by 2012. Significant improvement in physical function and overall social functioning of SF-36 were observed over time. The education levels were highly correlated with quality of life in physical health (SF-36 physical function,

role physical) and mental health status (SF-36 vitality, social functioning, role emotional, mental health). *Implications:* The physical function and QoL in amputation victims improved over time due to effective rehabilitation therapy. Special attention should be paid to illiterate patients.

PO-1436

CASE REPORT ON SUCCESSFUL TREATMENT OF DELAYED WOUND HEALING WITH PULSATING MAGNETIC FIELD THERAPY IN COMBINATION WITH HYDROCOLLOID PLASTER

Stephan Gruener
Orthopaedic ambulance Dr. Gruener, Germany

Objective: Case report on successful treatment of delayed wound healing with pulsating magnetic field therapy in combination with hydrocolloid plaster method Report of an 48 year old healthy man with tricondylar closed fracture of the distal parts of the lower leg, tibial/fibular plate/screw-osteosynthesis, after seam removal secondary wound healing 10 * 2.5 cm fibular, based on Staphylococcus-aureus-infection. Reoperation was refused by patient, starting with local common conservative antiseptical/antibiotical wound treatment and oral clindamycin, following antibiogram showed in conclusion suspicion of hospital germ, changing to sensible oral amoxycillin. Furthermore delayed but progressive wound healing under continuing local therapy and intermittent pulsating magnetic field therapy (80 cm solenoid, 33 Hz, 15 G, 20 min., 2-3 units/week, company ASA (Italy)). Three months after osteosynthesis, part load with Vacoped ® orthesis and radiological bone healing, complete metal removal under antibiotics was accomplished, sore smear showing the same germ in the wound, no germs in the bone smears, no germs in following wound wound smear. Five months after first operation, wound was divided up in two parts with skin bridge between with about 50 % remaining open area. Finally intermittent pulsating magnetic field therapy was combined with hydrocolloid plaster (Sorbact ®, company BSN (Germany)). Within two further months, there was complete wound healing without huge scares, no remaining inflammatory. impact Case report on a secondary wound healing after months, little success after normal local conservative therapy in combination with pulsating magnetic field therapy (PMT), good quick success with combination of PMT and hydrocolloid plaster

PO-1437

FUNCTIONAL OUTCOME AFTER HAND AND FOREARM TRANSPLANTATION -LONG TERM FOLLOW UP: UPDATE ON INNSBRUCK PROGRAM

Marina Ninkovic*, Johann Pratschke, Stefan Schneeberger
Innsbruck Medical University, Austria

Objective: The upper extremity allotransplantation became a new field in the reconstructive transplantation medicine but it still remains controversial and raises serious ethical issues. We herein provide an update on two bilateral hand, one bilateral forearm and one unilateral hand transplants with emphasis on functional outcome at 13 years and 7 years after bilateral hand, 10 years after bilateral forearm and 4 years after unilateral hand transplantation. *Method:* Between March 2000 and July 2009, four patients underwent unilateral or bilateral hand or forearm transplantation at our institution. The intensive rehabilitation protocol was based on an early protective motion program and on a specific cognitive exercise program after Perfetti, including electrotherapy, occupational therapy, splinting and lymph-drainage. Clinical follow-ups with evaluation of hand function, mainly according to the DASH questionnaire, Ipsen test, Hand Transplant Score System (HTSS) and Action Research Arm test, were performed at regular intervals. *Results:* The presence of the intrinsic muscle function was observed in all recipients. Protective sensibility was observed in all patients; however discriminative sensation was only accomplished after hand but not forearm transplantation. QOL was improved compared to pre-transplant. The HTSS measures between good and excellent. *Implications/Impact on Rehabilitation:* Hand and forearm transplantation aims to improve functional outcome and the QOL of upper limb amputees. For this purpose the rehabilitation program should be adequate and individually-tailored. We have demonstrated that peripheral input can modify cortical hand organisation in sensorimotor regions attaching great importance to the rehabilitation program and functional assessment of transplanted patients.

PO-1438

VITALSTIM ELECTROACUPUNCTURE TREATMENT OF SWALLOWING DISORDER RESULTING FROM CEREBRAL INFARCTION

Bing Zheng, Yuan Zhou, Lang Jia, Lehua Yu
The Second Hospital Affiliated of Chongqing Medical University, China

Objective: To observe the safety and efficacy of VitalStim electroacupuncture treatment of swallowing disorder resulting from cerebral infarction. *Method:* The 21 patients with swallowing disorder were treated by VitalStim electroacupuncture instrument as well as Dietary management and swallowing training. The patients were assessed by WaTian water test and Modified mann swallowing capability evaluation method before the treatment, two treatment courses and four treatment courses. *Result:* After the four treatment courses, Patients with swallowing ability have been improved obviously. Compared with before treatment, swallowing score have increased significantly, there is statistical significance (p<0.05). *Conclusion:* VitalStim electroacupuncture is safety and effective treatment for swallowing disorder resulting from cerebral infarction

PO-1439

THE EFFECT OF BOTULINUM TOXIN A INJECTION FOR SPASTICITY IN THE UPPER LIMB

Hisae Onaka[1]*, Hitoshi Kagaya[1], Noriko Wada[1], Masayuki Yamada[2],[1], Eiichi Saitoh[1]
[1]Fujita Health University Hospital, Japan, [2]Fujita Health University, Japan

PurposeThe Botulinum toxin A injection has covered by medical insurance since 2010 in Japan. The objective of this study is to evaluate the effect of Botulinum toxin A in patients who have upper limb spasticity. *Methods:* Forty-two patients (28 males and 14 females) who gave written informed consents were enrolled in this study. The average age of the patients was 55 years old. The cause of the spasticity was stroke in 41 and traumatic brain injury in 1 patients. The Botulinum toxin A (240 U or less) was injected to the flexor digitorum profundus, flexor digitorum superficialis, flexor pollicis longus, flexor carpi radialis, flexor carpi ulnaris, palmaris longus, pronator teres, biceps brachii, triceps brachii, and/or pectoralis major. The 3D motion analyses were performed at 0, 2, 6 and 12 weeks after the injection by using KinemaTracer (Kissei Comtec, Matsumoto, Japan). The elevation of the affected limb from the contralateral thigh and the flexion and extension of each digit were evaluated at a sampling frequency of 60 Hz. The modified Ashworth scale (MAS), Stroke Impairment Assessment Set (SIAS), grip and pinch power were also measured. *Results:* The MAS of the injected muscles were significantly reduced after 2 weeks. Some patients improved active motion by 3D motion analysis. *Conclusion:* The Botulinum toxin A injection reduces the spasticity in the upper limbs. It may also improve active motion.

PO-1440

THE OBSERVATION OF THE CLINICAL EFFECT OF THE EXERCISE THERAPY JOINED WITH PHYSICAL THERAPY ON THE OSTEOPOROSIS PATIENTS WITH SPINAL COMPRESSIVE FRACTURES

Xin Zhang, Bo Liu, Hui Liu
The orthopaedic hospital in sichuan province, China

Object: To observe the clinical effect of the exercise therapy joined with Physical therapy on the osteoporosis patients with spinal compressive fractures. *Method:* During 2009 to 2011, seventy-five osteoporosis patients with spinal compressive fracture, thirty-three males, average-aged fifty-four years, forty-two females, average-aged fifty-eight years. All received exercise therapy joined with Physical therapy, included ultrashort wave, low frequency pulse magnetic therapy and La-Liao wax. The evaluation items included JOA's scores, Oswestry's scores and the ROM of the lumber. *Result:* The average days on bed of the patients were 28.51±20.98. The JOA's scores showed significant improvement between the begin and the end. *Conclusion:* The exercise therapy joined with Physical therapy can be effectively improve osteoporotic compression fracture patients symptoms, improve the quality of life.

PO-1441

MEASURING BALANCE IN STROKE PATIENTS WITH TETRA-ATAXIAMETRY AND CLINICAL BALANCE SCALES

Huai He, Gui-Ying DAI, Chuan-Dao LIU
Department of Medical Rehabilitation, The First Affiliated Hospital of Soochow University, Suzhou 215006, China

Objective: To compare balance assessment with static balance measuring equipment and clinica1balance measuring scales. *Methods:* Seventy hemiplegic stroke patients (the patient group) and 36 healthy volunteers (the controls) were recruited. Each subject s equilibrium was measured using the Berg Balance Scale (BBS). The Fugl-Meyer Balance Scale (FM-B)and tetra-ataxiametry, all by the same therapist. *Results:* The BBS and FM-B results both showed significant differences between the patient group and the control group. The data obtained through tetra-ataxiametries assessment showed that the average weight distribution index (WDI) and stability index (SI) were significantly lower in the patient group than among the control. There was a strong correlation between thetetra-ataxiametric assessment results and the clinical balance test outcomes. The W DI and SI from tetra atax Jametrvwere strong} y correlated with Berg total static scores. *Conclusions:* Tetra-ataxiametry and the BBS and FM B tests can all effectively refJect the equilibrium of stroke patients. Tetra-ataxiametry Can measure balance ability quantitatively, while the eliniea1 balance tests (BBS. FM. B) are easier to conduct.

PO-1442

VIDEO FLUOROSCOPIC SWALLOWING STUDY WITH DIFFERENT FORMS OF MEGLUMINE DIATRIZOATE IN DYSPHAGIA AFTER STROKE

Zhenfen Sima, Xiaofeng Xu, Ling Feng
Shaoxing Peoples Hospital, Shaoxing Hospital of Zhejiang University, China

Objective: To explore the feasibility of video fluoroscopic swallowing study with different forms of meglumine diatrizoate to assessment dysphagia after stroke. *Method:* Selected 30 patients who were dysphagia after stroke. These patients were evaluated by video fluoroscopic swallowing study with 20 ml: 12 g meglumine diatrizoate and 20 ml: 12 g meglumine diatrizoate mixed food thickener. *Results:* The study results that video fluoroscopic swallowing study with different forms of meglumine diatrizoate can show the patients oral and pharyngeal retention, regurgitation, aspiration, occult aspiration and clearance, and the complications of study-related did not occur. *Impact on Rehabilitation:* Video fluoroscopic swallowing study with different forms of meglumine diatrizoate can reflect the swallowing function in dysphagia after stroke safely and effectively, and can guide dysphagia rehabilitation.

PO-1443

FACTORS INFLUENCING TURNING AND EFFECTS OF SPECIFIC TREATMENT PROGRAM ON TURNING PERFORMANCE IN INDIVIDUALS WITH PARKINSONS DISEASE

Fang-Yu Cheng
National Yang-Ming University, Chinese Taipei

Objective: Many studies indicate that more than 50% of people with Parkinson's disease (PD) have difficulty in turning. The first aim of this study was to determine the factors that influence the turning performance. The second aim was to design a specific treatment program according to the influencing factors, and to establish its effects on turning performance. *Methods:* Regarding the first aim, a battery of tests including 180° turn time, balance, muscle strength, levels of disease severity, and freezing of gait were administered. Pearson's correlation coefficient and regression model were used to determine the influencing factors. The subjects of second part were randomly assigned to the two groups to receive general physical therapy training or specific training program emphasizing the influencing factors respectively, 30 min per session for total 12 times in 4 to 6 weeks. *Results:* According to the results of 37 participants, the most important factor influencing turn time was the balance control as demonstrated by Tinetti assessment tool. The preliminary results (n=4 for each group) indicated a trend that the specific exercise training could decrease turn time (p=0.2), improve Tinetti balance score (p=0.2), and improve the muscle strength of hip extensors (p=0.2), abductors (p=0.1), knee extensors (p=0.1), ankle dorsiflexors (p=0.1) in the more affected side as compared with the general physical therapy. *Implications:* The balance control influence the turning performance in subjects with PD. The specific exercise emphasizing the balance control may improve the turning performance as a result of improving balance and muscle strength

PO-1444

EFFECT OF ELECTROMYOGRAPHY BIOFEEDBACK ON THE FUNCTIONS OF PSYCHOLOGY AND MOTOR IN PATIENTS WITH SPINAL CORD INJURE

Huai He, Gui-Ying Dai, Yue Liu, Hai-Bo Wang
Department of Rehabilitation, The first Affiliated Hospital of Soochow University, 215006, Suzhou, China

Objective: To investigate the therapeutic effects of electromyography biofeedback on the motor function and psychological function in patients with spinal cord injure. *Methods:* 70 spinal cord injured patients were randomly divided into research and control groups with 35 patients in each. In addition to the conventional therapy for rehabilitation, the patients in research group received electromyography biofeedback training with AM800, and those in control group were treated with intermediate frequency. To evaluate the patients' self confidence and their motor function of the paralyzed limbs, RSES and ASIA locomotor function scoring were performed before and six weeks after the interventions in both groups of the patients. The changes of EMG of quadriceps muscle, hamstring and anterior tibial muscle under the biggest contraction were also observed in research group patients before and six weeks after the interventions. *Result:* There are no significant difference of the scores of RSES and ASIA locomotor function evaluation between both groups of the patients before the interventions. ASIA locomotor function evalu-

ation scores were significantly increased in patients of both groups after the interventions ($p<0.05$), with the better results ($p<0.01$) in patients of the research group than those in control group. The RSES scoring in patients of the research group was improved significantly after the interventions ($p<0.05$), but no statistical improvement found in patients of the control group. The muscle contraction amplitudes on EMG were significantly increased in patients of the research group after the interventions ($p<0.01$). RSES scoring and ASIA scoring were positively correlated in patients of the research group. *Conclusions:* Application of electromyography biofeedback training could enhance the patients' self-confidence which helped the patients with spinal injury to improve their motor functions.

PO-1445

THE REHABILITATION THERAPY EFFECT OF ELECTRO-ACUPUNCTURE TREATMENTS ON EXTRAOCULAR MUSCLES FOR EYE MOTOR NERVES PALSY

Lingyun Zhou, Xiaojie Ji, Ming Zhao, Jichao Liu, Qiaoying Liu

The first affiliated hospital of Harbin medical university

Objective: To observe the clinical effect of electro-acupuncture treatments on extraocular muscles for eye motor nerves palsy and explore the mechanism. *Method:* 240 cases were randomly divided into a treatment group and a control group. The treatment group was treated by electro-acupuncture on extraocular muscles. The control group was treated by extraocular muscles movement therapy. Changes of the rima oculi, the range of ocular movement and the diplopia angle were recorded and statistically analyzed in the two groups after the treatments. *Result:* In the treatment group, the total effective rate was 83.6%, the cure rate was 52.4%; and they were 57.4% and 18.6% in the control group.There was a significant difference between the two groups ($p<0.01$). *Conclusion:* The electro-acupuncture on extraocular muscles for eye motor nerves palsy had a significant effect, which was better than extraocular muscles movement therapy group.

PO-1446

THE EFFICIENCY OF MANUAL LYMPH DRAINAGE ON POSTOPERATIVE SWELLING, PAIN AND TRISMUS FOLLOWING MANDIBULAR THIRD MOLAR SURGERY

Arben Murtezani[1], Bekim Haxhiu[2], Valë Hysenaj[1], Fatmir Dragidella[1], Zana Agani[1], Vlorë Hysenaj[1]

[1]University Dental Clinical Center of Kosovo,Macedonia, [2]University Clinical Center of Kosovo, Physical Medicine and Rehabilitation Clinic, Macedonia

Background: Third molar surgery is a common intervention in oral and maxillofacial surgery. Swelling, pain and trismus are postsurgical sequels caused by complex molecular and biochemical factors related to healing process. The aim of this study was to evaluate the effectiveness of Manual Lymph Drainage (MLD) in combination with cryotherapy and medications. *Methods:* Forty nine patients aged 19 to 31 years were included in this study, divided into two groups. Group A received MLD (after Vodder's method) combined with cryotherapy and NSAID (Ibuprophen 400 mg and Paracetamol 250 mg) one hour after third molar surgery. Group B received only cryotherapy and NSAID. To evaluate swelling four standard landmarks of measurement were included: tragus-lip junction, mandibular angle –alanasi, mandibular angle-external corner of eye and mandibular angle-medial point of chin. Standard pain VAS was used to measure pain values, meanwhile, mouth opening abilities were registered on 24 and 48 h after surgery. Data were analyzed using SPSS (v17). *Results:* The obtained results from group A showed statistical significant difference ($p<0.01$) in relation to swelling and pain; however, between the groups there was no significant difference in relation to trismus ($p>0.05$). *Conclusion:* Manual Lymph Drainage combined with cryotherapy and NSAID medications was more effective in reduction of swelling and pain. We suggest further controlled trials with larger sample sizes.

PO-1447

A REPORT OF RANDOMIZED CONTROLLED CLINICAL TRIAL: COMPARING PALPATION, ULTRASOUND AND EMG GUIDED BOTULINUM TOXIN A INJECTION TECHNIQUES IN STROKE PATIENTS WITH EQUINOVARUS

Haining Ou

Department of Rehabilitation Medicine, Guang Dong Provincial Traditional Chinese Medicine Hospital, Guang Zhou TCM University, China

Objective: To compare the clinical outcomes of three different injection techniques: palpation guidance, ultrasound guidance, and EMG guidance, for botulinum toxin A injection into calf muscles for the treatment of spastic equinovarus in stroke patients. *Design:* A randomized controlled trial was used to investigate the effectiveness of the three injection techniques. 78 stroke patients with equinovarus were randomly assigned to one of three groups. All of patients received injection of 300 U botulinum toxin A in gastrocnemius, soleus and tibialis posterior in one of the techniques. Group 1 ($n=19$) applied palpation-guided technique. Group 2 ($n=21$) applied ultrasound-guided technique. Group 3 ($n=19$) applied EMG-guided technique. Modified Ashworth Scale (MAS), Gait pattern scale, Speed of gait, Passive range of motion (PROM) of ankle dorsiflexion and eversion were measured at baseline, weeks 2, 4, 8, and 12 after injection. *Results:* Comparing with baseline measurement, within each group, measurements significantly improved post-injection. Among the three groups, the ultrasound-guided group improved significantly inMAS at weeks 4, PROM of ankle eversion at weeks 4 and 12 compared with the EMG-guided group. The ultrasound-guided group improved significantly inMAS, Gait pattern scale, PROM of ankle dorsiflexion and eversion at weeks4, in MASand PROM of ankle dorsiflexion at weeks 8, in MAS, speed of gait and PROM of ankle eversion at weeks 12 compared with the palpation- guided group. The EMG group improved significantly in Gait pattern scale at weeks 4, PROM of ankle dorsiflexion at weeks 4 and 8 compared with the palpation group. The variations of measurements during follow-up periods among three groups were found no statistical difference. *Conclusions:* Our study shows that the correction of equinovarus in stroke patients can be obtained by injection BT-A with three types of guidance technique. Ultrasound-guided technique is considered a valid alternative, which has a slight advantage over EMG-guided technique in correction of equinovarus. Both the EMG and ultrasound-guided techniques obtained superior results than Palpation-guided technique.

PO-1448

A PILOT STUDY TO INVESTIGATE THE MOST EFFICACIOUS DOSE OF BOTULINUM TOXIN A FOR THE TREATMENT OF SIALORRHEA IN ADULTS WITH NEUROLOGICAL DISEASES

Mazlina Mazlan[1]*, Mohd Harith Abdul Aziz[1], Julia Engkasan[1], Saini Jeffery Abdullah[2], Ouzreiah Nawawi[1], Khean Jin Goh[1]

[1]University Malaya, [2]KPJ Tawakkal Specialist Hospital, Malaysia

Objective: To assess the most efficacious dose of botulinum toxin type A (BTX-A) for treating sialorrhea in adults with neurological diseases. *Method:* Nine patients with various neurological diseases and disabling sialorrhea were randomized into three treatment groups using different BTX-A dosages injected to bilateral parotid

and submandibular glands: group 1–50 units, group 2–100 units and group 3- 200 units. Out of the 9 patients, 7 were with stroke, one with motor neuron disease and one with Parkinsons disease. Salivation was measured using the differential weight of dental roll gauze and the Thomas Stonell score. Both assessments were performed at baseline and repeated at 2 weeks, 6 weeks and 12 weeks post injection. *Results:* The mean differential weight of dental roll gauze reduced in all three treatment groups when measured at 2 weeks post injection (group 1=65.31% ± 0.00, group 2=66.26% ±10.48, group 3=35.51% ± 11.35). The reduction continued until 12 weeks but the percentage of reduction was highest in group 3 (54.19% ± 4.59). Similar findings were observed for the Thomas Stonell score. However, only the reduction of Thomas Stonell score at 2 weeks between group 2 and group 3 was statistically significant when comparisons between groups were done, F (2,6)=7.00, $p<0.05$. No complications were reported in all the treatment groups. *Implications/Impact on Rehabilitation:* The results suggest that BTX-A dosages up to 200 units are effective and safe to improve sialorrhea severity in patients with neurological diseases. Larger sample size is needed to confirm the most efficacious dose of BTX-A for the treatment of sialorrhea.

PO-1449

THE IMPACT OF LOAD STRENGTHS' DIFFERENCES ON SIMPLE REACTION TIME OF ANKLE DORSIFLEXION

Chang Liu
Bei jing Rehabilitation Center, China

Objective: To explore the relationship between the resistance of load strengths and the reaction time (RT) with the method of Proprioceptive Neuromuscular Facilitation (PNF). *Method:* 8 healthy adult females whose middle feet sections are fixed with different qualities (0.5 kg, 2 kg, 4 kg and 6 kg) of weights through the pulley; under quiet, awake and supine states, at the instant of hearing the electronic prompt tone, the tested feet flex with the fastest speed from the natural droop position to the maximum dorsiflexion position and keep for 5 seconds. After 5 seconds it is to remove weights and measure the RT of tibialis anterior. Continuously measure the same weight for 8 times, and give 5-min rest between the measurement of different weights (in random order). RT and PMT (Premotor time), are obtained from measuring the EMG of the tibialis anterior and the data in the electronic angle meter of ipsilateral ankle input into PC. MT (Motor time) = RT-PMT. Statistical processing adopts the SPSS16.0 by the dispersion analysis of one-way layout to perform the normal distribution confirmation and the multiple comparison checkups for the data in each group of RT, PMT and MT. The statistical significance of differences in $p<0.05$ available. *Results:* When it is quiet, 0.5 kg, 2 kg and 4 kg MT tend to shorten in order, while 4 kg to 6 kg MT tend to increase. In which when 4 kg MT is under quieter condition, the statistical significance of MT is reduced. *Implications:* The results of this study indicate that during the clinical performance of PNF, selecting the appropriate resistance strength is significant to the promotion of the reaction time.

PO-1450

EFFECT OF EXTRACORPOREAL SHOCK WAVE THERAPY ON UPPER LIMB SPASTICITY OF HEMIPLEGIC PATIENTS

Xin Lin
Department of Modality, Capital Medical University School of Rehabilitation Medicine, Beijing Charity Hospital, China Rehabilitation Research Centre, China

Object: To observe the effect of Extracorporeal Shock Wave Therapy on upper limb tension of hemiplegic patients. *Methods:* Hemiplegic patients with upper extremity spasticity were randomly divided into ESWT group (n=15) and control group (n=15). Routine rehabilitation therapy were administrated in the two groups. Furthermore the patinents of the ESWT group received four sessions (once weekly) of Extracorporeal Shock Wave Therapy (ESWT). The Modified Ashworth Scale (MAS) and Fugl-Meyer upper limb Assesment (FMA) were used in evaluation at different time points: before treatment, after each treatmentand four weeks after four sessions. *Results:* Compared to pretreatment values, decrease in MAS scores ($p<0.01$) and increase in FMA scores ($p<0.01$) were achieved in ESWT group: for control group at 4th week and four weeks after four sessions, increase in FMA ($p<0.05$) were oberved. Compared to control group, MAS assessmentsdemonstrated much better results in ESWT group ($p<0.01$) since 1st ESWT: and the FMA scores in ESWT group were much higher ($p<0.01$) at 4th week and four weeks after four sessions. There were no adverse effects associated with ESWT. *Conclusion:* Upper limb spasticity of hemiplegic patient could be treated with radial EWST at 1.5 bar, 2000 impluse/muscle, once/week, last for 4 weeks. The treatment is effective, sustained and safe.

PO-1451

ABOVE VERSUS BELOW KNEE AMPUTEES IN INPATIENT ORTHOPEDIC REHABILITATION SETTING

Iuly Treger
[1]Orthopedic Rehabilitation Department of Loewenstein Hospital Rehabilitation Center,Israel, [2]Sackler School of Medicine, Tel-Aviv University, Israel

Objective: To better understand the differences between below knee amputees (BKA) and above knee amputee (AKA) with regards to gender, age and length of stay (LOS) in rehabilitation hospital. This could clarify if selecting a BKA predicts fast rehabilitation process as it predicts better mobility with prosthesis. *Method:* Hospital records of 271 amputees, rehabilitated in the department within last 3 years were analyzed. Subjects were divided to groups according to the level of amputation: 160 patients to BKA and 111 to AKA group. Age, gender and LOS were compared. *Results:* The total number of females is 60 (22%) versus 211 males. Pearson's Chi-square test for independence for gender differences between groups was found insignificant. However total gender difference is significant by the same test with p= 2.4 e-7. Hence amputees' dominant gender is male. Mean age is 61±12.7 in AKA and 59±11 in BKA group and the difference was insignificant. LOS of the BKA group was 53.5±41 and LOS of AKA group was 46±27. The difference between the groups is significant with two tailed t-test for independent groups with different variance (p=0.07). Thus there is a trend of longer LOS for BKA patients. *Implications/Impact on Rehabilitation:* The LOS of AKA tends to be shorter. This is though mastering prosthetic ambulation is known to be better in the BKA group. We contribute this result to a faster healing process of the surgical wound among AKA patients. This finding is important in planning the acute rehabilitation process for lower limb amputee patients.

PO-1452

GUIDELINES: THE USE OF TECHNOLOGIES IN THE REHABILITATION OF PRESSURE ULCERS

Talita Justino Dos Santos*, Lisley Lidke Cintra, Priscilla Alcantara, Karla Barbosa De Freitas, Fernando Scapassassi, Marta Imamura, Linamara Rizzo Basttistella
Institute of Physical Medicine and Rehabilitation, University of Sao Paulo School of Medicine, São P, Brazil

Objective: Provide information on the use of technologies for pressure ulcers healing. *Method:* A Pubmed database search of randomized clinical trials was conducted using P.I.C.O. strategy (P.I.C.O. stands for: Patient, Intervention, Comparison and Outcome). The following MeSh terms were the search strategy: (pressure ulcer; topical negative pressure therapy, extracorporal shock

wave therapy OR extracorporeal shock wave therapy, hyperbaric chamber) from December 2011 to July 2012. *Results:* The search strategy retrieved 109 articles of which 12 were selected. Vaccum therapy during six weeks promotes a length reduction of 85% in ulcers stage III/IV (p=0.46) [RR= 5%, confidence interval CI 95% -177% – 100%, RRA=0.005 IC 95% -0.177–0.187, NNT=200, CI 95% 5 – INF) (A). Shockwave therapy using 100–1,000 shocks/ cm^2 0.1 mJ/mm^2 applied in pressure ulcers during three months or more than 6-8 weeks (two periods of 4 weeks and washout of 2 weeks) promotes the lesion length em 100% of the ulcers and the healing of 55.6% or them (p<0.005). The use of topical hyperbaric oxygen (1,004-1,013 atmospheres) during 4-16 weeks for 4h per day in necrotic pressure ulcers stage II/IV after surgical debridement promotes 100% of healing whithin 16 weeks (RRA= 0,677 IC 95% 0.518 – 0.836, NNT=1, IC 95% 1 – 2) (A). *Implications/Impact on Rehabilitation:* The use of technological innovations promotes a faster and complete healing of pressure ulcers when compared to conventional treatment.

PO-1453

THE APPLICATION OF CLINICAL HEALTH EDUCATION PATHWAY ON THE REHABITITATION AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

Zhenjie Zhu
Affiliated Hospital of Nantong University, China

Objective: To explore the effects of clinical health education pathway in the rehabititation after anterior cruciate ligament reconstruction. *Method:* 27 patients underwent arthroscopic reconstruction for ACL injury were divided randomly into two groups. Except the Routine rehabilitation therapy, The treatment group was given clinical health education pathway. The Control group was received the routine rehabilitation therapy and health education. Then clinical assessment was conducted with Lysholm knee functional scoring system on admission and after the 3th months postoperation, Observe the disease - related knowledge about ACL injury and satisfaction. *Result:* The treatment group is superior to the control group in The Lysholm knee functional scoring system on admission and after the postoperation, the disease - related knowledge and satisfaction, there was significant difference between two groups (p<0.05). *Conclusion:* clinical health education pathway can improve the recovery the knee functional after the postoperation, the disease - related knowledge and satisfaction.

PO-1454

THE CONSTRUCTION MODE OF REHABILITATION HOSPITAL IN CHINA

Yingjie Dang, Jian Luo, Yiwen Fu
Wuxi Rehabilitation Hospital, China

With the deepening of the medical system innovation, rehabilitation medicine has made great progress in China. During the development of rehabilitation medicine across the country, how to allocate medical resources is very important. In this article, we discuss the current construction and development mode of rehabilitation hospital, to find a suitable and scientific strategy for rehabilitation hospital development in China.

PO-1455

BACK TO THE FUTURE: OR REHABILITATION IN A CREATIVE WAY!

Arie Burstin*, Riki Brown
Beit Rivka Geriatric Rehabilitation Center, Israel

Background: quality in rehabilitation is based on clinical evidence, when given in high frequency and intensity and combined with functional tasks, preparing the patient for independent function in the community. Population in the project, included the hospitalized at Beit Rivka Geriatric Rehabilitation Center in Israel, for in-patient rehabilitation after Stroke, Fractures and Decondition The program goals were: 1. To find, define and to activate innovative treatment paradigms to ensure task oriented treatment, with the frequency and intensity that suits the up to date guidelines and without an addition of human resources. 2. Empowering the physiotherapist as a Case Manager of the diverse treatment given in the Physical Therapy Department. The Case Manager refers the patient to different "work stations" depending in their actual stage, and in addition to the regular therapy Work process includes: 1. Defining equilibrium problems falls as a main problem – and implementing phosturographic technology for diagnosis and aid for planning a suitable paradigm of treatment, using postural biofeedback for stability improvement 2. Adoption of advanced technologies for equilibrium training using Virtual Reality 3. Improving muscles force, power and endurance, using an adapted fitness room 4. Development of a unique program for endurance and walking speed improvement by using partial body weight support while walking on a treadmill, even for patients after bone fractures. 5. Development of a unique program for patients struggling to stand: safe standing groups using standing frames in high intensity practice. This innovative treatment paradigm application has brought a significant change and a considerable increase in the amount of treatments at the different work stations. The data from the treatments was combined with patient satisfaction and functional clinical outcomes in order to evaluate the effect of the high intensity and frequency treatment on the function at discharge. *Conclusions:* The innovation of the current work is by application of current treatment theories using techniques and technologies in a way that has never been used before. It is possible to change common treatment ways, and increase patients and care giver satisfaction, by establishing a professional learning team, which plans treatment according to the organization needs, and the changes on health policy.

PO-1456

PRELIMINARY DISCUSSION ON CAPACITY BUILDING OF REHABILITATION MEDICINE DEPARTMENT IN MIANZHU COUNTY PEOPLE'S HOSPITAL

Hao Chen[1], Zheng'En Zhao[1], Nan Xia[2], Xia Zhang[2,3], Hong Jin[1], Jianan Li[2,3]
[1]Mianzhu County People's Hospital, Sichuan, China;, [2]The First Affiliated Hospital of Nanjing Medical University, Jiangsu, China., [3]World Health Organization Liaison Sub-Committee on Rehabilitation Disaster Relief of the International Society of Physical and Rehabilitation Medicine, Assenede, Belgium.

Objective: To evaluate the construction of rehabilitation medicine department in Mianzhu County People's Hospital after a 3 years' capacity building project. *Method:* Sustaining team trainings consisted of rehabilitation doctors, therapists and nurses were launched monthly to train the rehab professionals in Mianzhu county people's hospital included theoretical and practical knowledge. A yearly comparative analysis including standardized construction, management technology, community-based rehabilitation, research and teaching standard was done to summarize the development of rehabilitation system based on the standards of rehabilitation department in Chinese General Hospital. *Results:* Department of rehabilitation medicine in Mianzhu County People's hospital is qualified for the basic standard of rehabilitation department in Chinese Grade II General Hospital. The staff of the department increased from 16 to 29 at the end of 2012. The comprehensive score of rehabilitation department had been improved for 44.6% compared with 3 years ago. In 2012, the average examination scores in theory and practice for rehab doctors, therapists and nurses increased 23.3% and 42.2% respectively compared with 2010. *Implications:* Significant progress has been made by the rehabilitation department in the past 3 years. The sustaining team training project should be referenced for the

development of rehabilitation medicine department in towns and villages level in the near future.

PO-1457

REHABILITATION REDUCES MORTALITY OF PATIENT WITH GUILLAIN-BARRÉ SYNDROME: ANALYSIS USING A NATIONAL ADMINISTRATIVE DATABASE IN JAPAN

Haruhi Inokuchi[1]*, Hideo Yasunaga[1], Yasuo Nakahara[1], Michio Tojima[1], Hiroshi Mano[1], Naoshi Ogata[1], Hiromasa Horiguchi[1], Junko Fujitani[2], Nobuhiko Haga[1]
[1]The University of Tokyo,Japan, [2]Natinal Center of Global Health and Medicine, Japan

Objective: To investigate the effect of rehabilitation on mortality of patients with Guillain-Barré syndrome (GBS), using a Japanese national administrative database. *Methods:* Using the Diagnosis Procedure Combination Database between July 2007 and October 2011, we identified 3,835 patients diagnosed with GBS. We extracted the following data; age, sex, comorbidity, Barthel index at admission, presence of ventilation, intensive treatment for GBS, and rehabilitation in hospital, hospital volume, type of hospital, and in-hospital death. We performed one-to-one propensity score matching to compare mortality rate of groups with or without rehabilitation. The adjusted odds ratio of rehabilitation to mortality was also estimated. *Results:* Patients with older age, lower Barthel index at admission, comorbidities, ventilation, intensive treatments for GBS tended to receive in-hospital rehabilitation. In the propensity-matched analysis with 926 pairs, the group with rehabilitation had lower mortality rate within both 30 days (0.2% vs 1.4%, $p=0.007$) and 90 day after admission (0.4% vs 1.7%, $p=0.011$). The adjusted odds ratios of rehabilitation to mortality within both 30 and 90 days were 0.143 (95% confidence interval 0.032-0.646, $p=0.011$) and 0.23 (95% confidence interval 0.075-0.706, $p=0.01$), respectively. Implication The results suggested that rehabilitation may reduce mortality of patients with GBS.

PO-1458

ANALYSIS ON THE STRUCTURE OF HOSPITALIZATIOIN EXPENDITURE AND THE FUNCTIONAL OUTCOME OF THE STROKE REHABILITATION PATIENTS

Jie Fang[1], Yingying Xie[2], Cuihuan Pan[1]
[1]The Second Affiliated Hospital of Guangzhou Medical University, China, [2]The Fisrt Affiliated Hospital of Guangzhou Medical University, China

Objective: To analyze the structure of hospitalizatioin expenditure and functional outcome of the stroke rehabilitation patients. *Methods:* An analysis was performed based on 237 stroke patients divided into actue group, Convalescence group, and resid group. Descriptive statistical method was used to analyze the characteristic and hospitalization expenditure. *Results:* Among the total expenditure, expenditure for drug treatment propotion in the three periods were respectively 50.65%,18.84%,and 17.43%. The expense for rehabilitation treatment propotion in the three periods were respectively 10.39%, 53.39%, and 57.63%.and the improvement on modified Barthel index (MBI) in the three periods were respectively 10.1, 6.4, and 5.0. There were 7 factos have difference significantly among three groups ($p<0.05$). The stepwise multiple linear regression suggested that the hospitalization, expenditure on drugs,rehabilitation treatment, chemical examination, auxiliary examination and MBI elevation were contributed to the total expenditure ($p<0.05$). *Conclusion:* The expense of drug treatment was also highly in acute stroke. Control the complication and involve rehabilitation treatment in early stroke,will be improve activities of daily living, the structure of hospitalizatioin expenditure and reduce the length of stay of stroke.

PO-1459

AN INTEGRATED TRANSDICIPLINARY APPROACH DECREASES FALL INCIDENCE AND RELATED INJURIES IN HOSPITALIZED PATIENTS

Ta-Sen Wei*, Jong-Jer Lin, Peng-Ta Liu
Department of Physical Medicine and Rehabilitation, Changhua Christian Hospital, Changhua, Taiwan, Chinese Taipei

Objective: Falling is a high volume, high risk and modifiable event which accounts for more than 80% of hospital incidents. An integrated transdiciplinary team approach had been implemented to reduce the risk of patient harm resulting from falls. *Methods:* The task-oriented Fall Prevention Committee, led by a physiatrist, set in July 2008, which team members include physicians, physiotherapist, occupational therapist, nurses, pharmacist, administrator of medical quality, engineering technician, and administrator of environmental hygiene. The team provided multi-factorial fall prevention approaches and innovated case management services for inpatients who fell or were at high risk of falling, and it was dedicated to (1) develop fall-related policies and procedures, (2) establish on-line reporting system (medication, consultation, and hospital maintenance) and (3) perform case management and surveillance. Fall incidences, injury rates and injury severities were collected from July 2004 to June 2012, and were compared between different periods (before vs. after team approach). To avoid underestimation of falls, nursing staffs were encouraged to report events via a blame-free reporting policy. *Results:* A total of 2,993 falls (1,423 falls after team intervention) were recorded. Fall incidence was significantly reduced from 1.05‰ to 0.78‰ (a 26% decrease), and incidence rate ratio (IRR) of falls was 0.75 (95% CI=0.67~0.84; $p<0.001$). Injury rate was also improved (28.6% vs. 27.9%, IRR=0.73, 95% CI=0.63~0.85; $p<0.001$). For fall-related injury, there were 2.1% decreased (24.3% vs. 23.8%) in mild injurious falls and 25% increased (2.4% vs. 3.0%) in moderate injurious falls. Most importantly, there was a 42% reduction of the severe injury (1.9% vs. 1.1%). *Conclusions:* This integrated transdiciplinary fall prevention program had been significantly improved the fall incidence and rate of severe injury. This successful model not only provides better quality of medical care for inpatients, but also saves huge amount of unexpected healthcare cost.

PO-1460

PROFILE OF DISABILITY AMONG INDIVIDUALS WITH BIPOLAR AFFECTIVE DISORDER IN A NIGERIAN MENTAL HEALTH HOSPITAL AND CONSIDERATION OF ITS SOCIO-ECONOMIC DIMENSION

Andrew Olagunju*, Dapo Adegbaju, Richard Uwakwe
College of Medicine, University of Lagos, Nigeria

Introduction: Individuals with Bipolar Affective Disorder (BAD) often contend with disability in spite of symptoms remission making overall outcome unpredictable. This study is aimed at assessing the profile of disability among individuals with BAD and explores the associated factors. *Method:* A total of one hundred consecutively enrolled study participants made up of stable, adult outpatients with BAD were interviewed. The participants were subjected to questionnaire to inquire about demographic and illness related variables. Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID) was used to confirm diagnoses of BAD in them. Both Young Mania Rating Scale (YMRS) and Hamilton rating scale for depression (HDRS) were used to rate the severity of symptoms and lastly the World Health Organisation Disability Assessment Schedule II (WHODAS II) was used to assess disability in participants. *Results:* The mean WHODAS score and range for the participants were 24.93 (±2.2) and 21.11-32.20 respectively. The WHODAS mean score in domain 3 [self care –2.39 ±0.30] was least, while domain 6 [par-

ticipation in the society –7.55 ±1.18] had the highest mean score. Participants that were single (t=-2.016, $p = 0.047$) and unemployed (t=-2.306, $p = 0.023$) were more disabled, while those that earned money were less disabled (t= -2.898, $p = 0.005$). *Implications:* Based on the findings of this study, proactive intervention (preventive and treatment) approaches to address disability in individuals with BAD for better outcome and to mitigate the indirect socioeconomic cost are implied.

PO-1461

THE COMBINATION OF SWALLOWING TRAINING AND ACUPUNCTURE: AN EFFECTIVE REHABILITATION METHOD FOR POST-STROKE DYSPHAGIA

Wenguang Xia[1], Chanjuan Zheng[1], Suiqiang Zhu[1,2], Zhouping Tang[1,2]

[1]Department of Rehabilitation Medicine, Hubei Xinhua Hospital, Wuhan 430015, China, [2]Department of Neurology, Tongji Hospital, Tongji Medical College, Huazhong, University of Science and Technology, Wuhan 430030, China

Objective: To assess the effect of swallowing training combined with acupuncture on the swallowing function of patients with post-stroke dysphagia. *Methods:* A randomized single-blind controlled design. A total of 120 people with post-stroke dysphagia. were randomly divided into two groups. The subjects in the experimental group were given swallowing training and acupuncture treatment, while those in the control group received swallowing training alone. The Standardized Swallowing Assessment (SSA), Videofluoroscopic Swallowing Study (VFSS), Modified Barthel Index (MBI) and Swallowing-Related Quality of Life (SWAL-QOL) were used to assess the swallowing function and quality of life of patients in the two groups. *Results:* Compared with the values before treatment, the SSA, VFSS, MBI and SWAL-QOL scores at the fourth week post-treatment were significantly changed in both groups. The VFSS, MBI and SWAL-QOL scores of patients in the experimental group were significantly higher and the SSA scores were significantly lower than those in the control group. The SSA score was negatively correlated with the VFSS, MBI and SWAL-QOL scores. *Implications:* Swallowing training combined with acupuncture provided better rehabilitation treatment for patients with swallowing disorders after stroke than conventional swallowing training alone.

PO-1462

EVALUATION AND REHABILITATION TRAINING OF STROKE PATIENTS WITH DIFFERENT DEGREE OF DYSPHAGIA

Chanjuan Zheng, Wenguang Xia, Qiang Hua, Yangpu Zhang

Department of Rehabilitation, Hubei Xinhua Hospital, Wuhan 430015, China

Objective: To detect the characteristics of dysphagia after stroke and explore the relationship between swallow disorder and neural function impairment, metal status or life quality of stroke patients with dysphagia before and after rehabilitation training. *Methods:* Water swallowing test (WST) was used to identify the presence of dysphagia and 124 stroke patients with dysphagia were divided into mild dysphagia group (n=58), moderate dysphagia group (n=50) and severe dysphagia group (n=16) according to the WST. VFSS, NIHSS, HAMD and SWAL-QOL questionnaire were used to assess the swallow function, neural function, metal status and life quality of patients respectively before and after 4-week rehabilitation training. The scores of VFSS, NIHSS, HAMD and SWAL-QOL of three groups were compared and analyzed. *Results:* The incidence rate of dysphagia after stroke was 46.91%. Before rehabilitation training, there was no statistic difference in scores of NIHSS, HAMD and SWAL-QOL among three groups. After rehabilitation training, the scores of VFSS increased and the scores of NIHSS, HAMD and SWAL-QOL decreased in mild or moderate dysphagia group but only the scores of NIHSS decreased in severe dysphagia group. VFSS scores negatively correlated with HAMD and SWAL-QOL scores, but did not correlate with NIHSS scores. *Implications:* Dysphagia was common in stroke patients and rehabilitation training could improve the swallow function, thus improving depression and life quality of patients with mild or moderate dysphagia but not with severe dysphagia.

PO-1463

HOSPITAL-SUPPORTED HOME PROGRAM IN CHINA

Yan Lin, Ming Li

the pediatrics of Peking university first hospital, China

Objective: Due to the uneven regional economic and social development and overall shortage of rehabilitation service and resources in China as a developing country, most families who have children with development disability could not afford for the long-term hospitalization or frequent roundtrip to rehabilitation centers, thus it is necessary to develop a home program guided by the experts in hospitals for each child with disability. *Method:* In the last ten years, we have dealt with thousands of children with varied developmental disability in child neuro-habilitation Clinic. Some principles have developed for setting up a home program for each case accordingly. *Result:* We proposed that any home program for these children should be in accordance with the following general principles, which included "initiative"-with plenty of judgment and plan in advance, "distinction"-to distinguish severity of the disability and affordability of the family, "rationality" -rational goal setting and home training protocal, "operability" -easy to learn for parents and suitable for families, and "comunication"-to maintain the stable contact with the family. *Conclusion:* Hospital-supported home program could be a effective and practical way of dealing with child with disability in China.

PO-1464

WORLDWIDE HEALTHCARE PROVIDER SHORTAGE AND REHABILITATION CARE IN COMING DECADES

Vernon Lin[1,2]*, Deepak Patel[2], Xiaoming Zhang[1,2]

[1]Cleveland Clinic Lerner College of Medicine,United States, [2]Louis Stokes Department of Veterans Affairs Cleveland Medical Center, United States

In the global arena, health care demand is growing at an unprecedented pace. In this study, we examined current and future healthcare workforces (Physicians, Nurses, Physical Therapists (PT), and Occupational Therapists (OT)) in three different regions (China, the European Union (EU), and the United States (US)). Projected populations and percentages of elderly (age >65) in these regions in 2030 will be: 1.4 billion (19%), 520 million (23%), and 364 million (19%), respectively. Demand and supply models were used to forecast the shortages (jobs) and shortage ratios (jobs per 100,000 populations) in these regions. In 2030, we project physician shortage and physician shortage ratios will be 683,800 (49) in China, 410,280 (79) in EU, and 645,277 (177) in US, respectively; nursing shortages and nursing shortage ratios will be 813,559 (58), 514,800 (99), and 918,232 (252), respectively; PT shortages and PT shortage ratios will be 200,000 (14), 33,888 (6), and 140,345 (39), respectively; and OT shortages and OT shortage ratios will be 100,000 (7), 35,880 (7), and 55,997 (15), respectively. China shows the largest shortage in physicians, PT, and OT in 2030, while the US is projected to have the largest shortage ratios in all four of the professions in 2030. Implementation of the one-child policy (China), healthcare workers exiting the workforce due to retirements (EU and US), and the recent passage of the Patient

Protection and Affordable Care Act (US), have major implications in these regions; and solutions to solve this growing demand need to be sought urgently and collectively.

PO-1465

RESEARCH OF THE FAMILY REHABILITATION GUIDANCE TO LATER STAGE STROKE PATIENTS ADL INFUENCE

Fengzhen Du, Ying Hou, Pengrong Zhang, Yun Ling
Loufeng Hospital Industrial Park Suzhou, Jiangsu, China

Objective: Research The family rehabilitation guidance to later stage stroke patients influence Through observa the Activity of Daily Living (ADL) chang after leaving hospital. *Methods:* Assess ADL of 64 cases stroke patients who had discharged between January 2010 and December 2011 when leaving hospital and in 2 months with the Modified Bathel Index (MBI) by telephone follow-up. Divide the patients into Observation group and control group.The observation group 33 cases, among them Male 18 cases, Femal 15 cases, Average age 60.4. The control group 31 cases, among them male 19 cases female 12 cases Average age 62.2. Rehabilitation professionally formulate training plan for the patients.and train technolog for family members or workers for two group, To do in family. Rehabilitation professionally does technolog guidance in family of the Observation group pations. A total of eight once. Technolo guidance content are Environmental transformation, Training methods, Transfer technolog and ADL action etc. *Results:* The ADL of Observation group had improved obviously (p<0.05). *Conclusion:* Rehabilitation professionally must do Rehabilitation technolo guidance for Stroke patients those who had got rehabilitation therapy in rehabilitation institutions after leaving hospital in family. It is every important to improve ADL of stroke patients.

PO-1466

THE ECONOMIC IMPORTANCE OF IMPLEMENTING CLINICAL CRITERIA FOR KNEE ARTHROPLASTY

Luna Cabrera Francisco, De La Torre Lopez Luis Eduardo, Ruiz Ruiz Manuel Anselmo, Justicia Rull Emilio Alfredo, Mesa Lopez Carmen Maria, Soler Vizan Elena
SAS. Hospital Infanta Margarita, CABRA (Cordoba) Andalusia, SPAIN, Spain

Goal: We studied the results for 12 months after implantation of the clinical criteria for the indication of knee arthroplasty in our hospital. *Material and Methods:* All patients with knee osteoarthritis who decides knee replacement must comply with the clinical criteria for it.Clinical criteria: Body mass index (BMI) 60, Visual Analogue Scale (VAS)> 7, Stage IV Gonarthrosis Kellgren-Lawrence, Age> 60. *Results:* In 2010 there were 227 interventions for knee replacement in our hospital in 2011 were 263 and 229 have been in 2012 after the introduction of the clinical indication for knee arthroplasty. *Conclusion:* The introduction of these clinical criteria has solved the upward trend in this surgery in our hospital.These clinical criteria have led to significant cost savings for our hospital.

PO-1467

THE EFFECT OF TESTING BLADDER VOLUME IN SPINAL CORD INJURY (SCI) INDERECT CATHETERIZATION

Xiao-Min Jiang
Jiangsu Provincial Peoples Hospital

Purpose of bladder volume measurement in application of indirect catheterization in patients with sci sequelae:to understand the measurement of bladder volume and pressure guide prescription and indirect catheterization of CSI patients with bladder dysfunction. *Methods:*In 6 months of 2012,apply bladder volume to 30 cases of SCI,to figure out the security capacity, maximum capacity, safety pressure, to guide indirect catheterization and prescription. *Results:* 20 days of treatment and nursing has a good curative effect on bladder capacity. *Conclusion:* Bladder volume has important clinical significance for SCI patients with bladder dysfunction who need indirect catheterization and establishing balance of bladder.

PO-1468

A COMPARISON OF REHABILITATION MANAGEMENT AFTER NATURAL DISASTERS IN DIFFERENT COUNTRIES

Huacong Wen[1], Andrew J Haig[2,3], Lars Johnson[2], Josh Verson[2], Yih-Chieh Chen[2], Jianan Li[1,3], Jan D Reinhardt[3,4,5]
[1]The First Affiliated Hospital of Nanjing Medical University, Nanjing, China, [2]Department of Physical Medicine and Rehabilitation, University of Michigan, Ann Arbor, Michigan, USA, [3]International Society of Physical and Rehabilitation Medicine Committee for Rehabilitation Disaster Relief, [4]Swiss Paraplegic Research, Nottwil, Switzerland, [5]University of Lucerne, Department of Health Sciences and Health Policy, Lucerne, Switzerland

Objective: Natural disasters happen around the world frequently, causing substantial disability. Rehabilitation management after natural disaster is important. However, the literature on rehabilitation management after disaster is limited and chaotic. It's useful to compare the rehabilitation management after natural disaster between different places. Similarities may imply better practices that should be emulated by disaster planners, while differences may point out important customized needs. *Methods:* A systematic review of literature was performed relating to rehabilitation after natural disaster. A student team traveled to various global disaster sites to gather information and interview persons involved in the disaster, experts who had participated in disaster response were interviewed and asked for insights. *Results:* The major similar aspects of rehabilitation response across the systems studied include substantial disabling injuries, shortage of rehabilitation professionals and resources, less significant role in medical response, and less comprehensive rehabilitation service. On the other hand, some differences in sites involve natural disaster severity, geographic feature of affected area, rehabilitation medicine development, and cultural background. While some of the differences appeared to reflect less than optimal rehabilitation planning, best practices include a national medical response system, cohesive healthcare system, and public understanding of rehabilitation medicine. *Impact on rehabilitation:* Each country or area may have different rehabilitation infrastructure, national medical response system, religious and cultural activities. Despite these differences, it's still useful to learn lessons from different rehabilitation response systems. This can facilitate the development of optimal rehabilitation plans for future disasters. The ideal plan increases work efficiency and coordination between agencies and results in decreased medical complications and maximizes physical function.

PO-1469

THERAPEUTIC EXPERIENCE ON THE KNEE-ANKLE-FOOT ORTHOSIS WITH ELECTRONICALLY CONTROLLED KNEE JOINT SYSTEM IN PATIENT WITH POLIOMYELITIS

Jung-Hwan Kim, Jae-Hyung Kim*, Kang-Jae Jung
Eulji University Hospital and School of Medicine, Korea

Objectives: recently, the KAFOs was adapted by adding electrically activated powered knee joints to provide knee extension torque during stance and also flexion torque in swing phase. The aim of this

case study was to know the results of rehabilitation on the powered SCKAFO (Stance-Control Orthotic Knee Joint) in a person with poliomyelitis. *Case description:* a 54 year-old man had been walking using a KAFOs with drop ring lock knee joint for 40 years. The muscle strength in left lower limb was grade 3- on manual muscle test. His gait pattern was accustomed to overuse left pelvic girdle muscles. Left pelvic hiking and circumduction in order to create sufficient toe clearance were observed during swing phase. He prescribed a KAFOs with electronically controlled knee joint system (17B200 E-MAG control joint) and also received a rehabilitation therapy for correcting gait pattern including muscle re-education of pelvis-hip-knee-ankle components, neuromuscluar electrical stimulation therapy, the strengthening exercise of lower extremities and balance training twice a week for 4 months. We performed gait analysis before and after rehabilitation therapy. *Results:* the walking speed, step length and vertical and horizontal displacement of the pelvis were improved after rehabilitation. The kinematic data of hip, knee and ankle joints after rehabilitation were improved compared to the data of before rehabilitation. *Implications:* We thought that it needed to correct gait pattern by means of a proper rehabilitative therapy for a more normal gait pattern when we use SCKAFO in patient with poliomyelitis.

PO-1470

PROBLEMS AND APPROACHES IN THE DEVELOPMENT OF REHABILITATION MEDICINE

Yi Shen

Department of Rehabilitation of Wuhu's fifth People's Hospital. Zip Code: 241000, China

Objective: We often encounter the problem which hinders the development of rehabilitation business. We try to find out the effective approaches to promote the rapid development of rehabilitation. *Method:* We should advertise the significance of rehabilitation medicine and attempt to make sure the rehabilitation therapy covered by national medicare policy. We also invite the dean of our hospital to the annual meeting of the recovery, so he knows the career future of national rehabilitation and supports the rehabilitation programs. For example, he approved more state-of-the-art hardware facilities and approved the preferential rehabilitation medicine bonus policy. Orthopaedic-recovery unit should be set up in the rehabilitation medicine. The patients can get rehabilitation therapy in the second day after operation. Orthopaedic surgeons could conduct regular visit to our patients together with rehabilitation physicians. Outcome Medicare policy has validated the rehabilitation projects. The number of patients who need consultation by rehabilitation medicine has been increased. Other departments assist us to give medical treatment to those patients in critical conditions. We have set up orthopaedic-recovery unit, realized the operation-rehabilitation service. *Impact on Rehabilitation:* We meet with a lot of difficulties and problems during the developing stage of rehabilitation medicine. We can find out countermeasures if the hospital leader could pay attention to our department. We have increased manpower and material resources. The number of beds has been increased from 20 to 150. We have imported a lot of new equipments and achieved significant social consequences. All of these could expedite the development of the rehabilitation business

PO-1471

THE WORK ABILITY INDEX PREDICTS APPLICATION FOR DISABILITY PENSION IN CHRONIC BACK PAIN PATIENTS AFTER WORK-RELATED MEDICAL REHABILITATION

Matthias Bethge[1]*, Christoph Gutenbrunner[1], Silke Neuderth[2]

[1]Hannover Medical School,Germany, [2]University of Wuerzburg, Germany

Objective: To investigate whether the Work Ability Index (WAI) identifies chronic back pain patients at risk of disability pension application, other adverse work-related criteria and referrals for further treatment. *Method:* Chronic back pain (ICD-10: M50, M51, M53, M54) patients recruited at seven German inpatient rehabilitation centres completed the WAI at beginning of rehabilitation. Disability pension applications and other work-related outcomes were assessed by postal questionnaires three months after discharge. Referrals for further treatment at discharge were extracted from the standardised discharge report. *Results:* The sample included 294 patients (mean age: 49.9 years, 57.1 % female). Receiver operating characteristic curve analysis of the association of the continuous baseline WAI rating and a subsequent disability pension application revealed an area under the curve equal of 0.80 (95 % CI: 0.62 to 0.97). Youden's J was highest when the WAI cut-off was ≤ 20 points (sensitivity: 72.7 %, specificity: 82.2 %). After adjusting for age and gender, a WAI rating of ≤ 20 points was associated with 15.6 times higher odds of a disability pension application (95 % CI: 3.6 to 68.2), 4.9 times higher odds of unemployment (95 % CI: 1.5 to 16.8), 6.4 times higher odds of long-term sick leave (95 % CI: 2.5 to 16.0), and 2.1 times higher odds of a referral for further vocational rehabilitation (95 % CI: 1.0 to 4.2). *Implications/Impact on rehabilitation:* The WAI could help rehabilitation professionals identify back pain patients with a high risk of application for disability pension.

PO-1472

THE STUDY IN EFFECTS OF CLINICAL PATHWAY FOR CEREBRAL INFARCTION

Jianhong Zhang, Jian-Zhong FAN

Department of Rehabilitation Medicine, NanfangHospitalof the southernMedicalUniversity, China

Objective: To observe the effects of clinical pathway for cerebral infarction. *Methods:* The 100 patients with cerebral infarction were divided in conventional therapy group 50 cases and clinical pathway group 50 cases. The main criteria for evaluation were Fugl-Meyer, MMSE and Barthel index. The therapeutic efficacy and mean length of stay in hospital were compared between the two groups. *Results:* The grades of Fugl-Meyer, MMSE and Barthel index were improved after treatment in both groups. There are no difference in therapeutic efficacy between the two groups after treatment. But the mean length of stay in hospital of clinical pathway group is shorter than that of conventional therapy group. *Conclusion:* Clinical pathway for cerebral infarction can shorten the mean length of stay in hospital.

PO-1473

QUALITY ASSESSMENT OF MONGOLIAN REHABILITATION CARE SERVICES: A PRELIMINARY SELF-ASSESSMENT QUESTIONNAIRE STUDY

Batgerel Oidov[1], Batchimeg Shirmen[2], Zolzaya Batdavaajav[3], Baljinnyam Avirmed[2], Kenji Shirakura[1]

[1]Graduate school of Medicine, Gunma University, JAPAN

[2]Department of Trauma Orthopedic and Rehabilitation Medicine of Health Sciences University of Mongolia, [3]SOS Medica Mongolia Hospital

Objective: To assess Mongolian rehabilitation care services structure and process quality. *Methods:* The study was as a cross-sectional design with self-assessment questionnaire form. The content of the quality assessment questionnaire form includes some categories such as medical facilities care and service's structure and care processes. *Results:* Total 47 hospitals from the urban and rural areas, who responded to a quistionnaire (90.3% responce rate). Among the survey participants, more than 70% hospitals, evaluated their own hospitals' structure and setup as unsatisfactory, by defining that their

hospitals don't have appropriate building, facility, environmental condition, provision of the necessary equipments, ability and skills of the medical professionals, as well as their leadership are not suitable to those hospitals' human resource placement and service. In addition, 60% of the rehabilitation care providers who participated in the survey also view their service quality to be not acceptable and 70% of them assessed that there are not enough work has been done to improve the quality of service assistance, performed by the rehabilitation care providers. *Implications/Impact on rehabilitation:* One can conclude that the quality level, structure and setup of the rehabilitation care providers in Mongolia, is very inadequate situation. It is needed to establish and develop such a structure and system that can give rational, accessible and quality rehabilitation care service, which meets international standard.

PO-1474

EVALUATION OF APPLYING BU WEI INFORMATION MANAGEMENT SYSTEMIN COMMUNITY-BASED REHABILITATION

Jingxuan Shang[1], Xinjian Zhou[2], Rongping Tian[2], Zhen Tang[2]

[1]Chongqing City management College Chongqing 401331,China, [2]Chongqing Yuxi Hospital Chongqing 400050, China

The application of Information technology is the tendency of future development in community-based rehabilitation services. Chongqing Yuxi Hospital has developed the technology named Bu Wei Information Management System; which has been established in Yangjiaping Tiema community service. After operation in two years, Bu Wei Information Management system has demonstrated the effectiveness in developing of community-based rehabilitation programs at the local community; satisfied the needs of people with disability; integrated the network in service management; saved resources and social welfare; specified community-based rehabilitation process; improved the quality of the service; and facilitated the coordination in the community. Since there was no previous report of applying information system on community-based rehabilitation service, Bu Wei Information Management System should be promoted.

PO-1475

COST-EFFECTIVENESS ASSESSMENT IN OSTEOARTHRITIS BASED ON A MODIFIED SHORT FORM 36 HEALTH SURVEY

Dan Surducan[1], Dan Nemes[1,2]*, Elena Amaricai[1], Liliana Catan[1], Mihai Dragoi[1,2], Daniel Popa[1,2], George Puenea[1], Diana Andrei[1]

[1]"Victor Babes" University of Medicine and Pharmacy, Timisoara, Romania, [2]City University and Emergency Hospital, Timisoara, Romania

Objective: To estimate the medical effectiveness and the cost of different therapies in osteoarthritic patients. *Method:* 143 patients diagnosed with osteoarthritis at hip, knee or spine level were assessed using a modified Short Form 36 Health Survey. In this questionnaire the Activities of Daily Living were emphasized. The patients underwent 5 groups of therapies (1: electrotherapy and medication; 2: electrotherapy and manual therapy; 3: electrotherapy, manual therapy and medication; 4: electrotherapy, kinesiotherapy and medication; 5: electrotherapy, manual therapy, kinesiotherapy and medication). Assessments were performed before and 21 days after treatment. For each group we evaluated health improvement and costs. The therapies were sorted by health improvements. ICER (incremental cost-effectiveness ratio) was evaluated by the ratio between the difference of therapy prices and the difference of health improvement. A therapy is more efficient than another if the value of its ICER is lower. *Results:* The group 4 treatment was the most efficient (ICER=6.12). The group 2 and 3 therapies led to high values of ICER (42.85 and 33.33 respectively) meaning that no improvement of health status was recorded in spite of a higher price. The groups 1 and 5 had medium values (13.04 and 14.15 respectively). *Implication/Impact on Rehabilitation:* The cost-effectiveness assessment is a useful tool in order to achieve better medical outcomes and a proper use of the available resources. Medication combined with physical therapy including kinesiotherapy remains a landmark in rehabilitation of osteoarthritic patients.

PO-1476

FACTORS ASSOCIATED WITH PATIENT SATISFACTION IN INPATIENT REHABILITATION AFTER STROKE

Mooyeon Oh-Park[1,2]*, Bruce Pomeranz[2], Pasquale Frisina[2], A.M. Barrett[1,2]

[1]Kessler Foundation Research Center,United States, [2]Kessler Institute for Rehabilitation, United States

Objectives: Patient satisfaction is increasingly important aspect in health care. The objective of this study is to determine whether provider-centered, versus patient-centered or team-based care, determines satisfaction with inpatient rehabilitation among stroke survivors. *Method:* Data from a 34-item Patient Satisfaction Survey (PSS) was assessed from stroke survivors admitted to the Kessler Institute for Rehabilitation during 2011. Outcome was overall satisfaction (1-5 scale, 1 being worst, 5 being highest) with poor satisfaction defined as <4. Willingness to recommend the facility to others was a secondary outcome. *Results:* Among 308 patients participating in the PSS, 35 (11.3%) reported poor satisfaction. The motor Functional Independence Measurement (FIM) score at discharge was significantly lower among the group with poor (48.1±17.5) versus excellent satisfaction (54.0±15.2). There was no difference in demographics and admission FIM scores between the two groups. Among the PSS items, there were 4 drivers (rs ≥0.5) of overall satisfaction and willingness to recommend the facility: 1) coordination of care among the rehabilitation team, 2) attention to patient's individual needs and preferences, 3) patient's involvement in goal setting, 4) pain control. The level of satisfaction in performance of individual practitioners (e.g. therapists, physician) showed modest correlations (<0.4) with overall satisfaction. *Implications/Impact on Rehabilitation:* The overall satisfaction of stroke patients in inpatient rehabilitation is correlated most with team work, a personalized approach tocare and goal setting, and pain management. Improving teamwork of care and patient-centered care planning, in addition to individual practitioner excellence, may enhance patient satisfaction in inpatient rehabilitation after stroke.

PO-1477

THE EFFECTIVENESS OF THE MANAGEMENT UNDER CLINICAL PATHWAY FOR THE INPATIENTS SUFFERING FROM HEMIPARALYSIS AFTER STROKE

Su Huo, Weiqun Song, Yingmei Deng

Department of Rehabilitation Medicine, Xuanwu Hospital of Capital Medical University, Beijing, 100053, China

Objective: To discuss the content and economic effectiveness of the clinical pathway for the inpatients who suffered from hemiparalysis after cerebrovascular accident. *Methods:* Review the medical record, and choose the inpatients who measure up the criterion of the clinical pathway, then analysis the economic indexes such as hospital expenses, the expenses for medicine and its percentage in the total cost etc of every patients before (taking the period of Mar. 2009 to Jan. 2010) and after (taking the period of Mar. 2010 to Jan. 2011) the implementation of the clinical pathway. *Results:* The degree of scatter of hospital expenses came down after the implementation of the clinical pathway. The mean expenses for the medicine dropped from 5215.73 CNY to 3481.40 CNY. The percentage of the expenses

for the medicine in the total cost dropped from 45.80% to 36.52%. The differences of expenses for the medicine and its percentage in the total cost before and after the implementation of the clinical pathway are significant ($p<0.05$). *Conclusion:* The clinical pathway for the inpatients suffering from hemiparalysis after cerebrovascular accident can standardize care for the patients and decrease the expenses for medicine effectively.

PO-1478

CASE MANAGEMENT SOLUTION FOR CARDIAC REHABILITATION IN HOSPITAL

Bo-Ru Wu, Yueh-Hsuan Lee, Rong-Rong Chen, Ya-Ling Chen, Tung-Hung Lu*

Industrial Technology Research Institute, Chinese Taipei

Objective: Information and communication technology (ICT) has been recognized a new tool in clinical practice. The feature of high accessibility, huge data capacity and strong computing ability make them an attractive means to apply on the use of clinical. The project is developing an ICT enabled case management solution for Cardiac Rehabilitation in hospital. *Methods:* Service process analysis and ICT engineering are used in developing process. Cardiac rehabilitation process in hospital was divided into three sub-processes, which are information collection, data analysis, and intelligent feedback. Two new Interactive exercise training companion programs are developed from new technology. *Results:* This solution includes three components. *Clinical decision support system on mobile device:* It accesses the patient's record, receives the result of risk analysis and risk stratification, and provides the suggestion of home exercise based on clinical guidelines. Interactive exercise training companion system (3D camera exercise coaching program and Smart Bike program): It collects patient's physiological measurement data and exercise data and analyzes in real-time for coaching. *Case management platform:* It integrates all physiological measurement data and exercise status from multiple patients for case manager's reference and provides 2-ways video conference to patients and remote control on interactive exercise training companion system. *Implication on Rehabilitation:* The concept of ICT enabled case management solution will help the hospital to provide safer, more effective and efficient solution, and it will be implemented in hospital for usability and acceptance clinical trial in 2013.

PO-1479

IMPORTANCE OF IMMEDIATE AND LONG-TERM TRAINING IN THE TREATMENT OF CEREBRAL PALSY:ONE REPORT OF REHABILITATION FOR AN ATHETOSIS CEREBRAL PALSY CHILD AFTER 26 YEARS TRAINING

Hao Ma

Center rehabilitation for disabled children of Nanjing, China

Cerebral Palsy (CP) is a non-progressive cervical lesion resulted from various causes occurring during pregnancy and one month after birth. The major symptoms are activity limitations on centrocinesis and posture, which are often accompanied by disturbances of visual and acoustic sensation, speech, intelligence, cognition and depth perception. In 1987, our rehabilitation center had received a seven years old patient with cerebral palsy of moderate hypertonia Athetosis. Check-up: muscular hypertonia of four limbs, ATNR (+), involuntary motions including asymmetric posture, hypsokinese of head and having trouble holding the head up in medium position; the child was able to stand with help but incapable of walking. In this case, the combined treatment of clinical training and domestic rehabilitation was adopted by teaching the parents some basic training methods such as Bobath, Peto etc. After 26 years rehabilitation training, the patient has basically obtained the ability of doing daily activity (e.g. walking without help, going up and down stairs, operating computers and naturally communicating with people) and has participated in the activities of the local association for the handicapped. By observing this case, it is clear that coordinated domestic rehabilitation training is very important. Therefore, the conclusions are: (1) children who are found to have motor delays require skilled physical therapy as early as possible; the earlier the therapy is applied, the more benefits they may get from it. (2) Once a child is confirmed as CP, it is necessary for the parents to cooperate with the clinical training, because most of the children will not stay in the hospitals for extended periods of time. (3) CP children require continuous training in order to achieve levels of rehabilitation that will be profitable for their personal development and the families and the whole society.

PO-1480

REMOTE MONITORING OF HYPERTENSIVE DISORDERS IN PREGNANCY BASED ON INTERNET OF THINGS

Lin Yang, Yang Li, Song Zhang, Yimin Yang, Xuwen Li

College of Life Science and Bioengineering, Beijing University of Technology, Beijing, China

Objective: Hypertensive disorders in pregnancy (HDP) occupy a serious position in maternal death and are serious harm to pregnant women and fetal health. At present, universal prenatal care is periodic hospital check-ups in China, but between each hospital check-up, there are a large number of blind spots in prenatal care and HDP monitoring. *Method:* We proposed remote monitoring of hypertensive disorders in pregnancy based on internet of things, for pregnant women prenatal care and HDP monitoring in the family units or community hospitals. *Results:* Internet of things technology was used in this study to the healthy pregnant women or non-severe HDP women for HDP monitoring and health care in the family units or community hospitals, with hemodynamic testing equipment used at home or community, between each hospital check-up. *Implications:* This study has important clinical values in HDP risk evaluation, HDP controlling and HDP rehabilitation, while in the control of maternal mortality and reducing maternal health care costs it also has some social values.

PO-1481

COMPARISON OF THE WAITING PERIOD TO BEGIN REHABILITATION BETWEEN IN JAPAN AND CHINA WITH THE CEREBRAL INFARCTION

Yuma Tamura, Peijun Gui, Nobuyoshi Mori, Bin Xu, Makoto Nagasaka, Satoru Ebihara, Osamu Ito, Masahiro Kohzuki

Tohoku University, Japan

Backgrounds: Early post stroke rehabilitation has been reported to reduce the mortality rate. Under the Medical Insurance System in Japan, early rehabilitation service is strongly recommended. In China, it accounts for 26% of the entire patient to whom the cerebrovascular disorder has received rehabilitation. Cerebrovascular disorder patient is the largest subject in rehabilitation, but it is unclear when the rehabilitation therapy is started. On this report, we investigated initiation of rehabilitation for cerebral infarction patients in China. *Methods:* We researched period to start of rehabilitation from cerebral infarction in China and Japan. An e-mail survey containing questions about initiation of rehabilitation for cerebral infarction patients was sent to physiotherapists in China. We used the results of the "final report of the utility making public concerning evaluation of quality of medical care - National Hospital Organization" that the Ministry of Health, Labour and Welfare 2010 was conducted as implementation rate of early rehabilitation for cerebral infarction in Japan. *Results:* With available data, we defined early rehabilitation service in this study as rehabilitation performed by physical therapists within 4 days after onset. We obtained responses of 29 patients from Chineses physiotherapists.

The period until the start of rehabilitation was 22.2 ± 11.1 day from the onset of all subjects, and rehabilitation start within four days of onset was 0%. The mean value of early rehabilitation service in 35 Japanese National Hospital is 72.8 percentage points. *Conclusions:* There may be room for enhancing early rehabilitation in China.

PO-1482

ECONOMICAL EVALUATION OF KNEE OSTEOARTHRITIS: A LITERATURE REVIEW

Carolina Pastorin Castineira*, Chennyfer Dobbins Paes Da Rosa
IMREA HC FMUSP, Brazil

Objective: Identify in the literature updated information on economical studies of knee OA. *Method:* Literature review in Pubmed database and Cochrane library. It was used the PICO strategy. *Results:* The anual spent related to knee OA, in the United Kingdom, is about 1 billion dollars and reveals that one third of this cost is due to prescription of antiinflammatories. It concludes that the oral presentation has a better cost-effectiveness relation over topic antiinflamatories, for it is cheaper and more effective. However, there is a wide list of options for knee OA treatment, from low cost options, like education and life style changes, to high costs, as knee arthoplasty. Low cost measures can turn the treatment better cost-effective. One study revealed that patients involved in health care and decisions showed both improvement in health status and lower costs. That result was supported by another study. Due to the importance of the disease it is surprising that there aren't many studies comparing cost-effectiveness of the different treatment options. Therefore it is important to find treatments that can establish a good relation. With more data available it is possible to indicate the most appropriate treatment to handle the burden of this disease. *Impact*: Knee OA is a important health problem and it is essential to find treatments that present a better cost-effectiveness analysis. The cost analysis is relevant specially for communities that have limited resources. So, the costs of introducing different interventions must be considered along with its benefits.

PO-1483

CURRENT SITUATION OF THE REHABILITATION CARE SERVICES IN MONGOLIA

Batchimeg Shirmen[1], Batgerel Oidov[1,2], Zolzaya Batdavaajav[1,3], Baljinnyam Avirmed[1], Sakamoto Masaaki[1], Nakazawa Rie[1]
[1]Health sciences university of Mongolia,Mongolia, [2]SOS medica Mongolia hospital,Mongolia, [3]Graduate school of medicine, Gunma University, Japan, Mongolia

Objective: To clarify the current situation of rehabilitation care cervices in Mongolia. *Methods:* A cross sectional design which is based on postal questionnaire survey was carried out in a total of 52 hospitals of Mongolia which provide rehabilitation care services. The survey is divided into 5 parts including the formal organizational structure of rehabilitation hospitals, the types of services offered, concepts of care, number of health care providers available, common diseases in rehabilitative field. *Results:* There were 49 (94.2%) participant hospitals who responded completely to the survey. There are 4 (4.2%) inpatient wards, 26 (53.1%) outpatient clinics, and 15 (30.6%) have combined services. All hospitals have an alternative rehabilitation room and 71.4% have a physical therapy room. A combination of modern, traditional rehabilitation methods and an acupuncture treatment have been offered to the patients. The leading causes for receiving rehabilitation services were arthritis (69.4%), back pain (65.3%), peripheral neurologic problems (36.7%) and stroke (22.4%). *Implications/Impact on rehabilitation:* The review has identified that there is a significant shortage of rehabilitation services in rural area. There are apparent overlaps and some blurring of service roles between rehabilitation service and other services including traditional medicine of Mongolia. In spite of some changes that have been made in recent years, the formal organizational structure presents some barriers to the development and delivery of an effective system of rehabilitation service. These include clinical staffing levels, specialist rehabilitation needs, orthotic and prosthetic services, improved facilities, equipment and a need to strengthen overall clinical direction for rehabilitation services.

PO-1484

EVALUATION OF UPPER LIMB MOTION FUNCTION FOR STROKE PATIENTS REHABILITATION

Caifeng Wang[1], Zhipei Huang[1], Jiankang Wu[1], Fei Liu[1], Shuai Huang[1], Zhen Huang[2]
[1]University of Chinese Academy of Sciences,China, [2]Peking University 1st Hospital, China

Objective: There are two million new stroke patients, and rehabilitation is the only way to bring them back to normal life. In existing rehabilitation, evaluation and training are conducted and supervised in hospitals by doctors and therapists manually. Evaluation is subjective and qualitative, rehab exercises are hard and boring, leading to very low rehab rate. This paper describes objective and quantitativeperformance measures for the automatic evaluation of stroke patients' upper limb movement. Method I In order to capture clinically meaningful features of upper limb movement, five feature measures are extracted from kinematic data obtained in real time by using micro-sensor motion capture device worn by the subject. *Results:* The experimental results have shown that the proposed five upper limb movement performance measures can well capture and represent aspects of upper limb movements of patients with various degree of paralysis. *Implications/Impact on Rehabilitation:* By using these measures, rehabilitation exercises are visualized and built into games so that the patients can see his rehab results and the exercise becomes interesting and motivated.

PO-1485

STUDY ON THE CHARACTERISTICS AND STRATEGIES OF REHABILITATION FOR THE ELDERLY WITH DISABILITIES IN CHINA

Jianjun Li
[1]China Rehabilitation Research Center,China, [2]Faculty of Rehabilitation Medicine, Capital Medical University, China

Objective: This paper is to investigate the current status and characteristics of the rehabilitation for the elderly in China mainland, as well as to explore the way to attain the goal in the " Twelfth Five-year " plan in this field. *Methods:* Systematic research on the historical process of aging, features of elderly disability, the policies of the welfares and services of the rehabilitation on elderly disability, and their effectiveness of the major countries around the world, was conducted by literature research, questionnaires and client visits. *Results:* Compared to the western developed countries, the issue of elderly disability in China mainland owned itself with a variety of features, such as the considerable populations, rapid speed of elderly disability, complicated classifications of elderly disability and scarce services, etc. *Implications on rehabilitation:* In view of those properties, a well-established intervention system, leading by the government, functioning by the market, supporting by the society, and participating by the whole nation is imperative.

PO-1486

DEMAND ANALYSIS OF CBR FOR POST-STROKE PATIENTS FROM DIFFERENT REGIONS IN CHINA

Yali Liu, Chunhua Gao, Zhengyu Fang, Xiaolin Huang
Department of Rehabilitation Medicine, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430030, People's Republic of China

Objective: To investigate the current situations and rehabilitation demands of CBR for post-stroke patients from different regions in China. *Method:* We surveyed the stroke patients from different regions inHubeiProvince (CentreChina) and Xinjiang Province (Western China) by questionnaire, to assess the rehabilitation demands regarding CBR. *Results:* We found even though there were some differences in lifestyle, knowledge, course of treatment, medical cost and burden of the disease between the patients from the two different socio-economic regions, the key rehabilitation demands is similar, including: 1) providing educational assistance; 2) training family and community members on disability after stroke and CBR by using the training manual as a guide; 3) referring people with disabilities to specialist services, e.g. rehabilitation services, where physiotherapists, speech therapists and occupational therapists are available; 4) providing assistive devices, e.g. walking sticks, crutches, wheelchairs; 5) providing support for social activities including for sports and recreation. *Implications/Impact on Rehabilitation:* Post-stroke patients in home need community-based rehabilitation intervention. Development of CBR reconstruction is necessary.

PO-1487

ELEMENTS TOWARD A SUCCESSFUL ASSISTIVE TECHNOLOGY SERVICE DELIVERY: A LITERATURE REVIEW (2008-2013)

Hsin-Yi Liu[1,2], Rosemarie Cooper[1,2], Annmarie Kelleher[1,2], Rory A. Cooper[1,2]*
[1]Department of Rehabilitation Science and Technology, University of Pittsburgh,United States, [2]Human Engineering Research Laboratories, Department of Veterans Affairs, United States

Objective: To review the factors contributing a successful assistive technology (AT) service delivery (SD) to improve clients' satisfaction and acceptance of AT. *Method:* Literature review was performed with keywords of assistive technology, service delivery and limitation on articles published after 2008 and accessible from the Health Science Library System of the University of Pittsburgh. *Results:* Seventeen journal articles, one guideline, and one position paper were reviewed. The importance of the user-center and interdisciplinary team approach, clinical assessment, device trial, training, outcome measurement, follow-up, and maintenance are emphasized in many articles. However, there are several factors which are not directly related to addressing the client's needs but could potentially influence the outcome of AT delivery, including the location of SD, expertise of the clinician, the client's familiarity with the SD process, the client's relationship with the clinician, payor requirements and the complexity of the payment process, and policy. Increasing the amount of time for the follow-up seems to have a positive impact on clients' satisfaction. *Implications/Impact:* Seating clinicians should be aware of all the potential factors that could affect the decision making and clients' satisfaction during the SD process. Some factors should be considered prior establishing a SD process for AT. The contents of this abstract do not represent the views of the Department of Veterans Affairs or the United States Government.

PO-1488

THE ANALYSIS ON SERVICE AND DEMAND RELATED EXERCISE FOR THE DISABLED IN JIANGSU PROVINCE

Jiansong Dai[1], Biao Sun[1], Haifeng Chen[2], Nailiang Hu[2]
[1]The Department of Kinesiology, Nanjing Sport Institute, [2]Disabled Persons Federation of Jiangsu Province

In order to discover some important information which affects the disabled participation in exercise, the research analyzed data from the Second National Sampling Survey on Disability in Jiangsu Province, which are the closest relationship with exercise demand, such as assistive devices, rehabilitation training and service, barrier-free structures and culture service. The results showed that we can improve the disbled participation in exercise if they are satisfied with service including assistive devices, rehabilitation traning and service, barrier-free structures and culture service.

PO-1489

DEVELOPING RECOVERY-ORIENTED MENTAL HEALTH SERVICES IN SWEDEN

Carolina Klockmo*, Sven-Uno Marnetoft
Mid Sweden University, Sweden

Objective: The objective was to examine the knowledge about recovery in three different mental health services: Supported Housing Team (SHT), Psychiatric Outpatient Service (POPS) and Personligt Ombud (PO). *Method:* The selection of participants was made so that different parts of Sweden were represented. A questionnaire based on the Recovery Knowledge Inventory (RKI) was sent by e-mail to selected participants. The RKI has 20 items divided into four subscales and are measured on a Lickert scale ranging from 1–5, from strongly disagree to strongly agree. In the analysis both an ANOVA test and a multiple linear regression were used. *Results:* The results showed that the services had knowledge about recovery, but there were areas where the knowledge needs to be developed. There were also differences between the groups where the PO service had a higher score compared to both SHT and POPS on all four subscales, and the difference was significant compared to the POPS on all subscales. The SHT only differed significantly from PO on two of the subscales. The results of the regression also indicate that participants who were educated at university had better knowledge. Training in recovery shows a positive effect upon the knowledge about recovery. *Implications:* In developing recovery-oriented services it can be important to pay attention to the organizational regulations and legislation and how these impact on the development of the services. It can also be important to pay attention to the educational level of the professionals and to train professionals in recovery.

PO-1490

REHABILITATION WORK

Chennyfer Dobbins Paes Da Rosa*, Dayana Pinezzi
Institute of Physical Medicine and Rehabilitation, University of Sao Paul, Brazil

Objective: to contextualize the impact and difficulties faced in the rehabilitation process of formal workers in Brazil. This is a descriptive study that was based on the methodological literature in order to achieve a significant number of updated information were used ten articles. *Method:* This is a descriptive study that was based on the methodological literature in order to achieve a significant number of updated information were used ten articles. *Results:* The divergence between the logic of care (prevention and care) and the Social Security Agency (insurance) is reflected in daily conflicts and contradictions, which appear in the conduct of cases and may compromise treatment, secondary prevention and vocational rehabilitation. *Implications/Impact on Rehabilitation:* We need to incorporate social security in its concept of excellence to his character, in fact,

the public and their important role in the implementation of social security, institutional transparency, enabling broad participation of society in decisions regarding their courses.

PO-1491

USING CASE MANAGERS TO KEEP THE CLIENT IN AN ACTIVE REHABILITATION PROCESS

Carolina Klockmo*, Sven-Uno Marnetoft
Mid Sweden University, Sweden

Introduction: Personligt Ombud (PO) is a Swedish version of Case Management (CM) aiming to support persons with psychiatric disabilities. The PO aims to support the person to reach his or her own goals and to promote the recovery/rehabilitation process. POs should also ensure that the client receives the services they are entitled to. There is a lack of knowledge about how POs support clients in the recovery process. *Objective:* To explore what supportive strategies POs use in their work with clients who have PO support. *Method:* Telephone interviews with 22 POs across Sweden were made. The interviews were recorded, transcribed and analyzed by using qualitative content analysis. *Results:* The results showed that the PO put the person in an active changing process based on personal, active choices. The PO supported the person in defining goals; their actions aimed to push the client forwards. They functioned as mentors, strengthening the person internally and mobilized external resources. Implication The PO used several strategies to prepare and strengthen the person to move forward in the recovery/rehabilitation process. But POs tend to focus on problems instead of using a more systematic review of the strengths of a client, by for example using an already existing assessment instrument like the one in the Strengths Model CM, to more consciously capture both individual and environmental strengths. Using this strategy could also support POs to move the focus from problems to supporting the client to achieve a more integrated life in society.

PO-1492

THE SERVICE TREND FOR ACUTE INPATIENTS WITH SPEECH-LANGUAGE PATHOLOGY IN TAIWAN 2000-2009

Lin Wen-Chih[1],[1], Hark Ho[2]*, Willy Chou[3,4], Ching-Lin Hsieh[5]
[1]Department of Physical Medicine and Rehabilitation, Chiali Chi Mei Hospital, Tainan, Taiwan,Chinese Taipei, [2]Department of Research, Chi Mei Medical Center, Tainan, Taiwan,Chinese Taipei, [3]Department of Physical Medicine and Rehabilitation, Chi Mei Medical Center, Tainan, Taiwan,Chinese Taipei, [4]Department of Recreation and Health-Care Management & Institute of recreation Industry Management, Chia Nan University of Pharmacy & Science, Tainan, Taiwan,Chinese Taipei, [5]School of Occupational Therapy, National Taiwan University, Taipei, Taiwan, Chinese Taipei

Objective: The purpose of the study is to investigate the temporal trends of characteristics including major diagnosis, referral sources, and complexity of comorbidity in inpatients who received services from speech-language pathologists, by using a nationwide population-based database. *Method:* Data from Taiwan's National Health Insurance Research Database from 2000 to 2009 were used in our retrospective longitudinal cohort study. Patients with speech pathology (order codes: 44001 to 44012) were selected as our study population. *Results:* There are 3,142 patients received inpatient speech pathology during 2000 to 2009. The average age of them was 63.99 ± 16.6. The percentage of speech pathology referrals to all inpatients increased steadily from 1.64% in 2000 to 6.34% in 2009. The majority of referral is neurology section (35.02%), followed by acute rehabilitation ward (31.64%). The most frequent cause was stroke and is found to be steadily increased (154 patients in 2000 to 298 patients in 2009). The majority of age group was 65-79 (43.09%), followed by 50–64 (26.54%), the least is <20 age group (2.2%). *Implications/Impact on Rehabilitation:* We found that the need for inpatient speech-language pathologist intervention has been significantly increase in the time frame we study. Also, patients with stroke or those who are older than 50 years old are found to be the largest group that need inpatient speech-language pathology.

PO-1493

THE IBARAKI STROKE FOLLOW UP STUDY - DEVELOPMENT OF PSD (POST STROKE DEPRESSION) AND QOL OF 10 YEARS AFTER THE ONSET OF ILLNESS AND HOSPITALIZATION-

Sawa Shunji, Hiroyasu Iso, Eiichi Saito, Shigeru Sonoda, Yoshikiyo Kanada, Yuriko Yamakawa, Megumi Suzuki, Masayuki Yamada, Takashi Shimamoto, Hitoshi Ota*
Faculity of Rehabilitation, School of Health Sciences, Fujita Health University, Japan

Purpose: To observe the characteristics of changes in the mind and physical functions of patients affected with cerebral vascular disorders, "IBARAKI Stroke Follow up Study" is conducted with consistent evaluation that spans 20 years after the onset of the illness and hospitalization. This is a report on the development of PSD (Post Stroke Depression) and QOL of 10 years after the onset of the illness. *Subjects and Methods:* The subjects consist of 36 patients whose clinical examinations and surveys could be conducted once annually at the patient's home for 5 years after onset of the illness. Dysfunction (SIAS), activity restriction (FIM and COPM), entry restriction (FAI), environment (Emotional Support Network), individual factors (PSD and QOL) are clinically examined or surveyed. SDS (Zung Self-rating Depression Scale) and QUIK (Self completed Questionnaire for QOL by Iida and Kohasi) are used for PSD and QOL respectively. This study has been conducted with the approval of the ethical review boards of Ibaraki Prefectural University of Health Science and Fujita Health University. *Results:* (1) SDS: The ratio of depressive subjects (48-80 points) is high with 43% of the subjects depressed at the time of discharge and 25% in 10th year after onset of the illness. (2) QOL: The ratio of poor QOL is 49% at the time of discharge and 50% in 10th year after onset of the illness. (3) The correlation between the SDS and the QIKU is significant ($p<0.01$) at any period. (Spearman rank method). *Conclusions:* After discharge from the hospital, PSD has been observed in 25% of the subjects and QOL has worsened This means that social rehabilitation support has not been effective. Development of a proper citizen-based CBR is necessary.

PO-1494

CHALLENGES RECRUITMENT OF SUBJECTS FOR CLINICAL RESEARCH IN REHABILITATION – ACTION SOCIAL WORKER – SÃO PAULO, BRAZIL – CASE REPORT

Dra. Arlete Salimene, Denise Pinheiro*, Dra. Marta Imamura, Dra. Linamara Battistella
Clinical Research Center. Institue of Physical and Rehabilitation Medicine. Lucy Montoro Institute for Rehabilitation. Hospital das Clínicas. University of São Paulo School of Medicine, Brazil

Objectives: Establish group of research subjects, through the recruitment of patients for the development of clinical research project: "Effectiveness of Block Paraespinhoso Functional Recovery in Chronic Nonspecific Low Back Pain"; sensitize and detect possible sources of referral of patients with diagnosis of low back pain; effective technical and administrative procedures for referrals of possible subjects; Methodology grounded in ethical and scientific rigor of the research project in question was held technical visits and meetings with public health services; organizing a list of patients

potential research subjects; awareness and telephone contacts with the universe of 2,583 people diagnosed with lumbago from July 2011 to November 2012. *Results:* We recruited 381 (15%) people according to established inclusion criteria and were formed by the author in the group of subjects. *Conclusion:* The recruitment process is highly complex and social worker shows up with professional training and affections instrumental to this approach in an objective and clear the patient to awaken interest and motivation. The ethical and humane as recommended by the National Health System in Brazil are inherent in the recruitment process and add value to clinical research in rehabilitation. The methodology points to face the challenges of recruiting subjects for research, through the possibility of establishing a social network of partnerships and operational dynamics in the health system itself.

PO-1495

COMPARATIVE REHABILITATION CONSEQUENCES OF TSUNAMIS AND FLOODS

Lars Johnson, Andrew Haig, Joshua Verson, Yih-Chieh Chen*

University of Michigan, United States

Introduction: Natural disasters can inflict extensive damage and injury upon an affected area, especially in the field of rehabilitation medicine. The lasting heath effects of a tsunami or flood, however, have not been extensively explored in this field, yet it is clear that these events cause severe disability for some. Research is needed so that governments, aid agencies and rehabilitation professionals can respond appropriately. *Methods:* A search of 9 major health databases online databases Scopus, PubMed, and MEDLINE on January 8, 2013 on the terms 'floods', Tsunami' and matching with topics of disability, rehabilitation, near drowning, spinal cord injury, and amputation was performed. Having found few relevant articles, a less structured search of non-scientific websites for information of specific floods was performed to look for information related to rehabilitation. *Results:* Only 11 scientific articles provided original data or research on disability or rehabilitation after floods or tsunami. In addition the internet search offered zero articles. Of these, zero compared the relative rehabilitation effects among floods versus tsunamis. However, almost no disability epidemiology or rehabilitation research has been performed after most floods or tsunami. *Discussion:* Natural disasters have real rehabilitation consequences. However, the lack of investigation into the rehabilitation effects of floods and tsunamis precludes preparedness measures by rehabilitation medicine organizations. We must prospectively study the physical disability consequences of floods and tsunamis and the impact of medical rehabilitation.

PO-1496

DIGITAL REHABILITATION SYSTEM BASED ON COMBINATION OF KINEMATICS AND EMG CHARACTERISTICS

Fei Liu[1], Lianying Ji[1], Caifeng Wang[1], Jiankang Wu[1], Bin Xie[2], Zhen Huang[2]

[1]University of Chinese Academy of Sciences,Beijing,China., [2]Peking University First Hospital,Beijing, China

We present a hybrid quantitative rehabilitation system for upper limb rehabilitation of post stroke patients. The Immersive, Ubiquitous and quantitative Rehabilitation System (IMURS) integrates movement and EMG data acquisition and analysis, rehabilitation assessment, plan management and rehabilitation training in one system. Simultaneous micro-sensor based motion capture and SEMG acquisition and fusion provide important movement injury and biological mechanism behind it. Kinematic and SEMG indices are derived for quantitative rehabilitation assessment. Also, the training is conducted in game mode and thus is more efficient and immersive. Experiments are conducted in Peking University First Hospital. Results show the usability and effectiveness of the IMURS.

PO-1497

CHANGING THE REHAB SERVICE MODEL FOR ACUTE HOSPITAL CARE

Stephen Wilson

Royal North Shore Hospital, Australia

Objective: Develop a Dynamic Process Model for Rehabilitation Medicine in an acute teaching hospital. *Method:* There were three steps in developing and implementing the rehab service model: Firstly, engagement of multidisciplinary members of the department of Rehabilitation medicine to process map the referral, consultation and discharge transfer activities. Then, transfer this map to a dynamic interactive computer model. Finally,the introduction of new rehabilitation services using the model to inform best practice. *Results:* Referral Activity Data collected in financial year 2010/11 demonstrated a total number of n=1,451 patients referred for inpatient rehabilitation. The following year 2011/12 indicated a reduction of 5% to n=1381. More importantly there was a reduction mean waiting time of transfer to rehabilitation from 4.7 days to 4.1 days. The overall saving associated with this intervention was 1262 beddays. *Implications/Impact on rehabilitation:* The service changes that the model influenced were associated with considerable savings in beddays. The assessment process has been modified from single discipline (medical) to allied and multi-disciplinary team assessment. The treatment in acute care has been enhanced through the introduction of an acute in-reach rehabilitation service for general and renal patient groups. The discharge transfer activites have been streamlined to using existing services for improved home-based and ambulatory options for rehabiltiation post discharge. The reduction of length of stay can be attributed to a greater availability of rehabilitation subacute beds.

PO-1498

BATTERY POWERED, HIGH VOLTAGE NEUROMUSCULAR STIMULATOR FOR EMG BRIDGING

Zonghao Huang[1], Zhigong Wang[1], Xiaoying Lü[2], Yuxuan Zhou[2], Sihao Zong[1], Jingdong Yang[2]

[1]Institute of RF- & OE-ICs Southeast University, [2]State Key Lab of Bioelectronics, Southeast University

Contralaterally controlled functional electrical stimulation (CCFES) is a new therapy designed to improve the recovery of paretic limbs after stroke. This paper foucus on the design of a novel neuromuscular stimulator for CCFES. The schematic diagram and the simulation result has been given.

PO-1499

INVESTIGATION OF DEVELOPMENT SITUATION OF CHINA PEDIATRIC REHABILITATION

Xiaojie Li[1,2,3], Shiling Zhang[1,2,3], Liping Wang[1,3]

[1]Third Affiliated Hospital of Jiamusi University; Jiamusi 154003, Heilongjiang,China, [2]Children Neural Rehabilitation Laboratory of Jiamusi University, Jiamusi 154003, Heilongjiang,China, [3]Rehabilitation College of Jiamusi University, Jiamusi 154003, Heilongjiang,China

Objective: To investigate the situation of pediatric rehabilitation in China. *Methods:* In 2009 and 2011, using questionnaire survey to investigate of 111 hospitals and 49 hospitals to collect the information of pediatric rehabilitation situation. *Results:* In 2009, the proportion of the hospitals with proficiency technique of PT, OT and ST were 75.67%, 77.95% and 62.16% respectively, two years later, this proportion increased to 90.00%, 90.00% and 76.00% (p<0.05). In 2009, each hospital has an average of 6.71 rehabilitation pediatricians, and only 22.31% was professional background of rehabilitation medicine, 32.53% was professional background of pediatrics

which was the largest number, the qualifications proportion of doctor degree for 4.70%, master degree for 21.90% and bachelor degree for 46.37% among them. In 2011, each hospital has an average of 8.58 rehabilitation pediatricians, the professional background of rehabilitation medicine and pediatrics were 29.37% and 39.16%, doctor degree for 9.09%, master degree for 43.59% and bachelor degree for 45.69%. Compared between the two years, the quantity of rehabilitation pediatricians increases significantly ($p<0.05$), the qualifications proportion of doctor and master degree increased ($p<0.05$), while the bachelor degree did not change significantly ($p>0.05$), the professional constituent ratio did not change significantly. *Implications:* The situation of pediatric rehabilitation in China has been developing in two years but still have lots of challenges.

PO-1500

THE REHABILITATION SURVEY OF DONGGANG COMMUNITY OF SUZHOU

Ying Hou

Rehabilitation department of Lou Feng Hospital of Suzhou Industral Park, China

Objective: To investigate the rehabilitation status and demands of Donggang community of Suzhou. *Methods:* To investigate the 10,348 family in Donggang community of Suzhoudoor to door, chose the rehabilitation objects and release the survey scales designed and get them back when they were done. *Result:* Of the 10,348 families 353 objects were collected. Most of them were with stroke or chronic joint pain, the percentages were 32.3% and 35.1%. 37 objects had no Suzhou Medical Insurance.71 got rehabilitation therapy in latest 6 months, the main reasons for those who had not got were: having no idea of rehabilitation; do not know where to get it and having no demand to do that. In the 353 objects, 30 would like to accept the institutions rehabilitation, 111 felt the community rehabilitation were the best choice, 40 chose the family rehabilitation and 59 did not answer because they could not tell the rehabilitation. Most of them hoped more rehabilitation items would merge into Suzhou Medical Insurance and wanted to learn more about rehabilitation. *Implications on rehabilitation:* The residents knew few about the rehabilitation but have big demand to rehabilitation, and the demand could not be satisfied by the current service of this community. More rehabilitation propaganda, community and family rehabilitation services are needed.

PO-1501

RESEARCH ON MARRIAGE OF DISABLED PEOPLE IN WUHUA DISTRICT OF KUNMING

Jibing Ou, Liqing Yao

Department of Rehabilitation, The Second Affiliated Hospital of Kunming Medical University, Kunming, China

Objective: To study the WuHua district disabled people's marital status and its influence factors. *Methods:* 7,357 cases of disabled persons were join in this questionnaire survey,their marital status, education background, employment, economic condition, psychological and social security were collected. *Results:* 57.7% cases were married, 24.6% cases were unmarried, 9.6% cases were divorced, 5.8% cases were widowed, about 0.6% cases were remarried, and 1.8% cases didn't fill in this blank. According to the data of The Second National Sample Survey on Disability, the unmarried and divorced rate in this district is obviously higher than the whole country's 12.42% and 1.77%.However,its marriage and widowed rate is lower than the country's 60.82% and 24.99%. *Conclusion:* In our surveys,psychological factors, economic factors, disability itself, social and legal factors are the main obstacles of Disabled marriage. So we suggest that the society should create more employment opportunities for disabled persons, eliminate discrimination and create more exchange platform for them, let them out of psychological shadow, enjoy the economic developments with healthy people.

PO-1502

A NEW PAGE FOR PEOPLE WITH SPINAL CORD INJURY (SCI): FROM HOSPITAL TO COMMUNITY

Ivan Su[1], Stc Cheng[2], Cy Lam[3]*

[1]Physiotherapist, SAHK, Hong Kong, China, [2]Occupational therapist, Jockey Club New Page Inn, SAHK, Hong Kong, China, [3] Specialist in Rehabilitation, Tuen Mun Hospital, Hong Kong, China

Objective: To review whether the rehabilitation programme provided by a transitional facility for SCI was effective in attaining sustainable self-management. *Method:* The Jockey Club New Page Inn (JCNPI) was established in 2008 as a transitional facility providing integrated rehabilitation and re-integration programme. It provides participation-based trainings and the staff members of JCNPI worked with their clients as partners to set and achieve realistic goals by administering expectation management, facilitating acceptance of limitations, developing coping skills, cultivating interest in adaptive games, and building supportive network. The outcome was assessed at the times of admission, mid-stay, discharge, and 6-month post-discharge with the Spinal Cord Independence Measure (SCIM) and the Moorong Self-Efficacy Scale (MSES). *Results:* Forty-six clients completed the rehabilitation programme. All of them resumed community living. The average length of stay was 10 months. Across the four assessment times, significant improvements were found in all three SCIM domains ($p<0.01$, Friedman). Post-hoc tests revealed continuing improvements from admission to 6-month post-discharge in mobility and from admission to discharge in self-care ($p<0.05$, Wilcoxon). For self-efficacy, significant differences were found in all five MSES domains ($p<0.05$, RM-ANOVA). Post-hoc tests revealed significant improvements between admission and discharge in personal, leisure, and productivity domains ($p<0.05$, pairwise). Slight decline from discharge to 6-month post-discharge was observed in all domains. *Implications:* The rehabilitation programme of JCNPI is effective in maximising the capacity of SCI in self-care, mobility and self-efficacy which are crucial for active participation in community living. A continuing work on self-efficacy after discharge is recommended.

PO-1503

PEER SUPPORT GROUP CAN IMPROVE PHYSICAL AND SOCIAL FUNCTIONING AMONG STROKE SURVIVALS

Lena Lutsky Treger[1]*, Batik Woller[1], Nama Sharabi[1], Orit Ilsar[1], Tania Boguslavsky[1], Iuly Treger[2,3]

[1]Hartzfeld Geriatric Rehabilitation Hospital,Israel, [2]Loewenstein Hospital Rehabilitation Center,Israel, [3]Sackler School of Medicine, Tel-Aviv University, Israel

Objective: To find out, if Peer Support Group (PSG), managed by social workers, can help in improving the subjective filling of health among stroke survivals, according to the Short Form Health Survey (SF36). *Method:* 10 patients, 1 to 4 months after first stroke, all ambulating and independent, aged from 50 to 65 years were included. They attend Day Rehabilitation Program of Harzfeld Geriatric Rehabilitation Hospital. The PSG for patients' discussion and support was organized for all of them by social workers as a once a week, one hour activity. SF36 survey was filled by all the patients before starting the PSG and after leaving the group. Two measurements were compared to understand the influence of PSG on patients' health perception. *Results:* The perception of physical functioning improved from 18.7±15.4 to 32.5±24.6. Role limitation due to physical health was 0 before the start of the program and increased to 25±20.4 after one month. The indicator of social functioning also improved from 34.25±36.3 to 50±31. The level of energy/fatigue sensation snowed small trend of increase from 33.7±13.1 to 43.3±19.7. The indicators of role limitation due to emotional health, emotional well-being, pain and general health did not show significant changes. *Implications/Impact on Rehabilita-*

tion: The results of the study indicate that the PSG, managed by social workers can be helpful tool as a part of stroke rehabilitation program. According to SF36 survey, PSG can help in improving subjective feeling of physical and social functioning and role limitation due to physical health among stroke survivals.

PO-1504

THE EXPERIENCES AND SUGGESTIONS ABOUT REHABILITATION MEDICINE TEACHING ON COMMUNITY GENERAL PRACTITIONERS

Ping Qiu
Second Hospital of Shanxi Medical University

The experiences and suggestions about rehabilitation medicine teaching on the community general practitioners are as follows: 1. The general practitioners feel much interest in and thirsty for rehabilitation medicine knowledge. To improve standard of based rehabilitation knowledge and technical ability on community general practitioners is a task of top priority and also is rehabilitation workers responsibility., 2. According to the general practitioners background of record of formal school and clinical experiences, we should pay attention to explain the profound in simple terms about the rehabilitation theory and pay attention to integrate rehabilitation knowledge with clinical practice of community common diseases., 3.The general practitioners need to learn on the job in the institution based rehabilitation at least one year. They should get certificate about rehabilitation medicine examination. The institution based rehabilitation should receive general practitioners free to learn on the job., 4.We should emphasize transformation system between community based rehabilitation and institution based rehabilitation., 5. To advocate doctors of the related departments to go to the rehabilitation department to have a part time work is worth., 6.To depend on community sthength and mobilize health administration department members to support and participate in community health work is necessary. The disabled persons can get convenient, effective, lessening burden rehabilitation therapy in community based rehabilitation and return to society. These are chinese rehabilitation developing direction.

PO-1505

EFFECT OF "INDIVIDUAL PLACEMENT AND SUPPORT" WITH PSYCHOEDUCATIONAL APPROACH FOR SCHIZOPHRENICS

Toshio Terai*, Reiko Hashimoto, Yusuke Nitta, Tomomi Monkawa, Yasuhiro Kawasaki, Kenji Kagechika
Kanazawa Medical University Hospital, Japan

Objective: Individual Placement and Support (IPS) is the most well-established method of place then train in Vocational Rehabilitation. There is now overwhelming international evidence that place then train models are much more effective than traditional approaches such as vocational training and sheltered work in successfully getting people into work. However, there are few cases in that the psychiatry outpatients are introduced IPS in the university hospital in Japan. The purpose of this study was to examine the effect of IPS with psychoeducational approach in the group activity. *Method:* We visited an employment agency and held meetings together with staff and patients. At the same time, we tried to increase the strength (mental, social, physical and so on.) of patients in the closed group with psychoeducation. And the cognitive-behavioral therapy was administered to patients, too. In this study, the medical services were applied to four patients (male=2, female=2, average age=37.25 years) who diagnosed as having schizophrenia, according to DSM-IV. They desired to go to work and their conditions were stable, but had continued recuperation at home. *Result:* Three patients got a part-time job. And one patient led to use "Transition Support for Employment" which is one of method of place then train. All of four patients developed in social function. In addition, the mean of Social Functioning Scale Japanese versions (SFS-J) were improved from 113 to 125 in 6 months. *Implications:* It was suggested that IPS with psychoeducational approach in the group activity was effective for the psychiatry outpatients.

PO-1506

PRESERVING OF WALKING ABILITY AT HOME ONE YEAR AFTER DISCHARGE FROM REHABILITATION HOSPITAL

Lena Lutsky Treger[2,1], Iuly Treger[3,4]*
[1]Hartzfeld Geriatric Rehabilitation Hospital, Israel, [2]Tel-Aviv Jaffa District, Clalit Health Services, Israel, [3]Loewenstein Hospital Rehabilitation Center, Israel, [4]Sackler School of Medicine, Tel-Aviv University, Israel

Objective: To find out, if patients, ambulating at discharge from rehabilitation hospital, are still walking at home one year later. If there is any improvement or decrease in ambulation level, and what is the role of Community Based Rehabilitation (CBR) in walking ability saving. *Method:* 61 patients, ambulating at discharge from rehabilitation hospital were investigated. Their level of ambulation was evaluated at home due to community records one year after discharge. The ambulation level was analyzed in correlation with age, treatment in CBR and Length of Stay (LOS). *Results:* The median mobility function decreased from walking with crutches or stick to ambulation using walker. Only 5 (0.08%) patients achieved better ambulation. The mobility function of 34 patients (55.7%) deteriorated at home. Out of 36 patients that received CBR, only 1 improved mobility level. The ambulation ability of 20 patients within this subgroup (55.5%) deteriorated at home. Using Chi squared test we determined with $p = 0.02$, that the level of mobility upon discharge is related to age: younger age predicts better mobility. 71% of patients aged less than 65 years achieved independent ambulation with crutches or stick, while only 41% of older patients achieved the same. Using Chi squared test we determined with $p = 0.055$, that patients with LOS < 62 are more likely discharged with independent ambulation with crutches or stick. *Implications/ Impact on Rehabilitation:* The level of walking independence at home one year after discharge from rehabilitation hospital was found to decrease and the CBR do no succeed to influence this tendency.

PO-1507

FACTORS INFLUENCING THE SUCCESS OF HOME MODIFICATION IN PARAPLEGIC SPINAL CORD INJURED INDIVIDUALS IN BANGLADESH

Mohammad Iqbal*, Jillian Fitzgerald
Centre for the Rehabilitation of the Paralysed, Bangladesh

Objectives: 1. To identify the factors assisting participants to complete successful home modifications. 2. To identify the barriers experienced by participants to complete home modifications. Methodology A qualitative study design was selected to explore the individual experiences of people living in the community post rehabilitation. *Results:* Of the 30 participants, 15 were successful and fifteen were unsuccessful in the achievement of an accessible home environment. Factors presenting difficulties for the participants included: new and challenging environments, financial strains, insufficient space, poor understanding about modification, living in a rented home and inadequate support from family members and relatives. Those participants who had made sufficient modifications had: engaged themselves in productive occupation, a tendency to be independent in all activities, good family and relative support, understood the importance of modification, received regular follow-up and held promising future plans. Those who had insufficient home modifications were seen to: have little involvement in any form of productive occupation, be residing in rural areas or in a rental house, be facing financial insecurity, be lacking in confidence and receiving poor family support. These participants also held no

specific plan regarding home modification and were fully dependent on their family. All participants reported a positive impression of the information gained from home modification classes at CRP. However, they offered suggestions regarding ways in which the service could be developed or improved. These included: the arrangement of a home visit prior to discharge, strengthening the follow-up visit, the provision of individual home designs and the inclusion of family members in counseling. *Conclusion:* Following spinal cord injury successful home modification is affected by a number of factors. Social awareness, community and local government support, advocacy and policy development are essential to the process, and needs to be considered by any organization offering home modification services.

PO-1508

AN INTERNET-BASED COMMUNITY REHABILITATION MODEL: NEW ASSESSMENT AND SERVICE MODEL

Shaoqin Gu, Lingling Huang
Nanjing Ruihaibo Rehabilitation Center, China

Objective: A large number of staff provide rehabilitation services to community residents in a traditional way by face to face. It costs a large amount of manpower and resources. At the same time, it makes it difficult to meet increased individual needs, monitor service progress, and save, analyze, and share service information. We want to introduce the internet to address those issues. *Methods:* Internet technologies have been used for community based rehabilitation service offered by Nanjing Ruihaibo Rehabilitation Center. The technologies include: 1) Setting up a community based rehabilitation database and website. 2) Establishing personal files and analyzing statistical rehabilitation needs by assessing and collecting consumers' individual information and inputting relevant documents to the database. It also provided services of preliminary screening, following-up, and referrals. 3) Community based rehabilitation networks connect between rehabilitation hospital, community rehabilitation centers, and families. 4) One end of network terminals was set up in community rehabilitation centers and rehabilitation hospital. 5) The other end of network terminals was established in the consumers' home via phone or internet. The network has ensured close contact between rehabilitation center and consumers or caregivers. 6) All rehabilitation training towards consumers or caregivers and service monitoring were offered through the network. The service information was recorded in the system.7) Nanjing Ruihaibo Rehabilitation Center has used this model to provide real time competency training monitoring and track consumer progress and ongoing needs in the community. *Results:* The use of the internet-based community rehabilitation model provided sharing the resources between consumers and professionals; met the increasing community rehabilitation service needs, and provided better and more efficient rehabilitation service. *Implications:* With the development of the Internet and Internet of things technology, the community resident will get a better CBR service.

PO-1509

EFFECT OF CONTROL TRAINING FOR I5 INFANTS WITH CONGENITAL TALIPES EQUINOVARUS

Shaodong Xie[1], Qichou Wang[2]
[1]Department of Rehabilitation Medicine, Foshan Hospital of Chinese Medicine, [2]Children's Department of Orthopedics, Shanghai Xinhua Hospital Affiliated to Shanghai Jiaotong University

Objective: By observing the changes both on the shape and the function of the back ankles after the control training, the curative effect of rehabilitation training on infants with CTEV will be discussed here. *Methods:* 15 infants with CTEV who had been diagnosed by ultrasound or identified after birth had been enrolled in this study. At the time of enrollment, during Jan. 2009 to Jan. 2012, there were totally 10 male infants and 5 female infants aged 10 days to 52 days after birth (22 days on average). There were basically three statuses in the training process: first, training on orthopedic manipulation in the early time to reshape the foot processively. Second, the weak muscle group of those infants would be strengthened when in the intermediate stage of the treatment with the help of orthosis. At the later period, the weight loading control was the main part to train to get the correct walking mode. As result, the clubfoot changed into normal shape with rebuilt ankle function and walking pattern. *Results:* At closeout, patients were contacted every 14 months on average. 13 infants had been completed the rehabilitation training, including 10 infants with good prospective recovery. Still 2 other infants suffered from the contracture of achilles tendon and there was 2 out of 14 who couldn't follow up the treatment. According to the assessments from joint flexibility, stability, orthosis for walking, gait, ability to wear shoes and walking distance before and after the treatment, the statistics were compared and analyzed according to the criteria designed to be matched and examined, which proved that the rehabilitation method was effective for those infants ($p<0.001$). Comment Control training from the infancy will be effective to rectify the growth and the shape of CTEV, and will be helpful for infants to assume normal functions of the feet.

PO-1510

THE RIGHT APPROACH TO OVERCOME THE TECHNOLOGICAL GAP OF PEOPLE WITH A PHYSICAL DISABILITY

Germano Pestelli[1,2], D.Bonacini Eng<<,E.Bonacini[2]
[1]Simfer, Italy, [2]You Able Organization,Milan, Italy, Networking Doctors In Rehabilitation, Orthopaedic Technicians, Physiotherapist, Ngos And Corporations

More than 1 billion of people has a disability. 15% of the global population. 1/5 – 110/190 millions of people – is unable to face the daily life. Only a percentage between 5 and 15% have devices to allow them in daily life (WHO). Why? Local Manufacturing is low and often of bad quality, lacking qualified human resources and costs are really high. What it means? Especially in developing countries disability is cause of marginalization, cause and consequence of poverty. In case of amputation of legs or arms, technology can change life. We are not so far from developing countries. What happens in Italy? If the cause of disability is an accident the welfare system often doesn't provide tech devices and in any case no sport devices. You Able Onlus is the Italian Association born to answer to these needings. It's a service organization based on collaboration with corporations and other Associations. His aim is to provide all devices people need to face all activities of daily life and to practice sport, especially running. How we do it? - Network: You Able Onlus works on a network of orthopaedic facilities worldwide: - Non Profit: You Able Onlus is totally Non Profit organization, - Corporations: the matching between profit and non profit is the basis of the approach, working on an economy of scale to have the availability of devices at production cost. How it works? - A support network beyond suppling devices, including sport, rehabilitation and advocacy, - Sport as the core of rehabilitation, starting from the participation of sponsored disabled to marathons, - Working with all the organization locally active, supporting all international campaigning.

PO-1511

HOW CAN REHABILITATION BE PROVIDED SAFELY AND EFFECTIVELY FROM COMMUNITY - A PRELIMINARY STUDY FOR " DESHENG MODEL OF CBR"

Yongxi Huang, Jingsheng Zhang Han Zheng-Zheng, Wang Ning-Hua, Xie-Bin

Peking University First Hospital, China

"Rehabilitation for all" is an important part of basic health care for all. The key point of realizing this goal is to spread the Community-base Rehabilitation (CBR), thus to make rehabilitation enter the community and serve to all families. But now a lot of people still cannot have rehabilitation or are unwilling to receive rehabilitation at the Community, because CBR system has not been set up generally, especially the Community is short of qualified professional persons which results in failing to the people's need.How can rehabilitation service be provided safely and effectively from the Community? Five basic experiences which are summarized from the authors' practice are called-"DeSheng model of CBR", meanwhile some other difficult point should be solve in order to run the CBR better suggested by the authors.

PO-1512

REHAB: A THIRD WORLD PERSPECTIVE

Raghu Maddela
Montefiore Medical Center, United States

62 year old male with End stage kidney disease who received a kidney transplant. Post-transplant renal function never normalized and creatinine levels stayed between 2 to 3.5. He was off dialysis for 18 months but had multiple UTIs, Severe Anemia and Protein Energy Malnutrition and hemodialysis was initiated. After the first dialysis session, he felt so weak that he couldn't even stand. Patient became dependent for all activity due to severe weakness. The weakness was felt to be due to a catabolic uremic state and other causes were ruled out. Patient was not provided with any rehabilitation for a period of 3 months. Upon my evaluation of this patient, it was recommended the patient be provided a Rollator, Tub chair and Commode chair. Family was given instructions to provide necessary assistance and to give enteral supplements. Slight modifications in his chair and bed were done which allowed him to stand up with minimal assistance. He was able to perform all his activities with minimal assist and this boosted his morale in a short time period. Due to financial reasons he was only able to obtain a few sessions of out patient physical therapy. *Results:* Applying rehabilitation principles to a country that does not have any structured rehabilitation services allowed for a rapid improvement in function. Within 3 months he was able to walk more than 3 blocks. *Conclusion:* Rehab plays an important role in recovery of chronically debilitated patients but its services are underrated in third world countries due to the ingrained beliefs, attitudes and behaviors. Costs are prohibitive and a lack of holistic approach to medical care delays the recovery process. Developing an integrated system involving rehab services for all eligible patients and provider education would greatly improve morbidity and mortality in these countries.

PO-1513

THE EFFICACY OF TONGDUQIANGJI GUIDING TECHNIQUE TO THE PAITIENTS WITH CERVICAL SPONDYLOSIS

Lechun Chen[1],[1], Ming Li[2], Shizhong Wang[1]
[1]The rehabilitation hospital affiliated Fujian university of TCM, China, [2]Fujian university of TCM, China

Objective: To investigate the efficacy of Tongduqiangji guiding technique to the paitients with cervical spondylosis. *Method:* The cervical spondylosis patients (n=60) without symptom through conservative treatment were bring into the randomized controlled clinical trial. Patients were randomly divided into guiding technique group and control group, 30 patients in each group. The patients of guiding technique group practice Tongduqiangji (free Du channel and strengthen spine) guiding technique after hospitalization for 2 weeks, 1 time/day, 30 min/time; the patients of control group didn't practice. Detect the maximal strength of neck muscle stretch by Multifunctional Cervical Unit (MCU) before the patients were brought into the treatment group and after the test. All of the patients were asked to be examined of the symptom relapse at the follow-up visit 1 month later,3 months later and 6 months later. *Results:* The maximal strength of neck muscle stretch of the patients of guiding technique group were stronger than the control group. The patients of guiding technique group maintain more longer without system and lower recurrence rate than the control group. There was significant differences between the guiding technique group and the control group. After the theatment for 2 weeks: the maximal strength of the throat equine muscle of the guiding technique group is (9.162±2.225) better than the prior treatment (6.435±3.323), $p<0.01$; The maximal strength of the Neck after protractor of the guiding technique group is (9.162±2.225) better than the prior treatment (6.435±3.323), $p<0.01$. The maximal strength of the throat equine muscle of the control group is (6.767±3.387),however the prior treatment is (6.633±3.351), $p>0.05$; The maximal strength of the Neck after protractor of the control group is (8.485±2.270), however the prior treatment is (8.689±2.079) $p>0.05$. The follow-up visit: 1 month after treatment, the guiding technique group has 3 recurrent case, the control group has 8 recurrent case; 3 months after treatment, the guiding technique group has 12 recurrent case, the control group has 23 recurrent case; 6 months after treatment, the guiding technique group has 21 recurrent case, the control group has 27 recurrent case. The Average Duration of the guiding technique group without symptom is (97.8±36.6 day), The Average Duration of the control group without symptom is (66.3±49.3 day). *Conclusion:* Practicing the Tongduqiangji guiding technique combining the primary treatment can improve the maximal strength of neck muscle stretch of the patients, and postpone the time of symptom coming again,and reduce the recurrence rate.

PO-1514

FACTORS ASSOCIATED WITH SELF-ESTEEM AMONG ADULTS WITH DISABILITIES

Soyeon Yu[1], Heejin Kimm[2], Seung Hee Ho[1]*, Sun Ha Jee[2]
[1]Department of Rehabilitation Standard & Policy, Korea National Rehabilitation Research Institute, Seoul, Korea, [2]Graduated school of public health, Yonsei University, Seoul, Korea

Objective: This study was intended to explore gender-specific factors associated with self-esteem in people with disabilities. *Method:* Using the 3rd waves (2008) Supplemental Survey Data of Korea Welfare Panel Study on Individuals with Disabilities, the self-esteem-related factors of 642 adult disabled people aged over 20 (males: 363, females: 279) were analyzed. The Rosenberg Self-esteem Scale was used as the self-esteem assessment tool. *Results:* Men with disabilities showed a high odds ratio indicating a low self-esteem, when their activities of daily living were dependent (OR 6.7, CI 2.5-17.7), when they were unsatisfied either with social relationships (OR 4.0, CI 1.5-10.2) or with family relationships and other factors causing low self-esteem included having no spouse, worsening or progressive disability status, a low academic achievement especially less than a high school diploma, and a lack of economic abilities. For women with disabilities, the odds ratio indicated a low self-esteem, when they were unsatisfied with social relationships (OR 4.5, CI 1.5-14.2), and when they had poor self-perceived health status (OR 3.4, CI 1.1-10.6). Overall, people with disabilities tended to have low self-esteem, when they were unsatisfied with social relationships (OR 3.5, CI 1.8-6.9); or family relationships (OR 2.5, CI 1.2-4.9), when they perceived to have a poor health status, when they depended on others for daily activities, and when they did not have a spouse, economic activities, or at least a high-school diploma. *Implications/Impact on Rehabilitation:* An approach considering the self-esteem-related factors and in terms of gender difference would be needed for developing rehabilitation programs and a services to improve self-esteem of the disabled.

PO-1515

THE DEVELOPMENT OF DISCHARGE TOPICS ON ADJUSTING TO SOCIETY FOR SPINAL CORD INJURY PATIENTS

Mi Hyun Ahn[1], Eun Seok Lee[1]*, Jeong In Jeong[1], Yie Lin Kim[1], Gwang Sook Kim[3], Ji Cheol Shin[2]

[1]Severance Rehabilitation Hospital, Yonsei University Health System,Korea, [2]Department and Research Institute of Rehabilitation Medicine, Yonsei University College of Medicine,Korea, [3]College of Nursing, Yonsei University, Korea

One of the most important fields regarding spinal cord injury patients is to teach them how to adjust into society during their admitted time. However, comparing to the needs of a systematic and thorough approach, there is a lack of specific research studies. This methodological research is to develop discharge topics on adjusting to society for spinal cord injury patients. Topics were developed through references, it was verified by valid professionals, traits and specificity were considered on the recipient's demands, and through them, results of the last entries (mandatory and optional) were selected. As a result of eight experts validity on the preliminary topics, 20 of the 21 factors of skill training were assessed for more than 0.8 points. Of the 41 factors based on the recipient's demands, one being the highest score, 0.8 points were scored for 11 topics. Discharge topics divided into mandatory and optional factors based on the different expertise validities, recipient's needs and characteristics. Developed mandatory topics were based on the professionals' CVI and had to score more then 0.8 points on both sides. Optional discharge topics were selected if it had more than 0.8 points of either the professionals' CVI value or of the 1point.'Skill training' was both eliminated from the area of expertise and recipient's needs scoring under 0.8 points.This study gives a lead on a systematic approach on the discharge topics for spinal cord injury patients. Based on the topics developed through, a thorough and systematic exploitation would be a successful nursing intervention.

PO-1516

EVALUATING A COMMUNITY BASED ADAPTATION CENTER (CAM), BY THE UNIT PHYSICAL MEDICINE AND REHABILITATION IMSS-MEXICO

Lucia Allen*, Jc Tamez

Mexican Social Security Institute, Mexico

Introduction: In Mexico disability is a serious social problem for prevalence and lack of space for treatment and appropriate counseling for family members in the physical, social and psychological factors that may affect their integration. The major conflict is marginal population that presents dilemma of not having the financial means to achieve welfare rehabilitation treatment for their patients. *Objective:* Determine the level of physical dependence in patients with disabilities in a comprehensive program that provides community rehabilitation activities and comprehensive rehabilitative health care. Methodology Descriptive cross-sectional study on people with disabilities attend in Service Center Guadalupe Made in November 2012 Monterrey México. They were given assessment of Barthel and Tinnetti scale, postural assesment and Zarit assessment for parents. Statistical analysis was performed using SPSS 17.0. *Results:* 37 patients were assessed with 11 caregivers, 78% male, average age 9 years. Prevalence of physical dependence was 76%. The risks of falls and balance problems were up 43% at risk. A caregiver burden showed presence of mild and one moderate. Impact The prevalence of physical dependence in patients attending multiple community service centers is moderately common presenting alterations in gait and balance may be factor for falls and fracture risk. Their presence of mild to moderate burden for their caregivers, who indicates opportunity for self-management training programs and stress management for them.

PO-1517

QUALITY OF LIFE OF SPINAL CORD INJURED CLIENTS IN HONG KONG

Sze Wing Julia Wong

Hong Kong Sanatorium & Hospital, Hong Kong, China

Objectives: Spinal cord injury (SCI) is one of the most tragic conditions suffered by human being in this modern society. Clients with SCI have to live with their permanent disabilities throughout their whole life. With improved healthcare, lifespan of this population is getting much longer than in previous decades. So their quality of life is a major concern needed to be attended. The aims of this study were to explore the quality of life of clients suffering from SCI and to investigate the obstacles that might have an impact on their functional rehabilitation progress. *Methods:* The Hong Kong version of WHOQOL-BREF and face-to-face individual interviews were used for collecting quantitative and qualitative data. A total of 63 completed questionnaires were received and 10individual interviews conducted. *Results:* The results showed no difference among the QOL scores for paraplegia and tetraplegia clients, as well as different age groups, length of injury and marital status. However, there were significant gender differences in psychological ($p = 0.02$) and social relationships domains ($p = 0.00$). Significant difference was also found between non-traumatic and traumatic cases in both physical domain ($p = 0.04$) and psychological domain ($p = 0.02$). In addition, the results also showed that gender was positively correlated to psychological (r=0.29) and social relationships domains (r=0.42); the nature of injury was also positively correlated to physical health (r=0.31) and psychological domains (r=0.29). The nature of injury was found to be the best predictor in the physical health domain (b=0.33) and gender was another best predictor in the social relationships domain (b=0.44). Results from the interviews reflected that bowel management, bladder management and impotence were the physical issues of most concern to them. Psychological impact is mostly found in the first few years after injury but clients later adapted to their changed conditions. Unemployment and lack of comprehensive community support directly affected their community reintegration. Implication/Impacts on rehabilitation The results of this study produced a clear picture of SCI clients' needs during their hospitalization as well as living in the community. Improvement on both sides would enhance disabled persons' quality of life and maximize their residual functional capabilities in order to reach the optimal rehabilitation goals.

PO-1518

COMBINED QUALITATIVE STUDY AND COGNITIVE EVALUATION OF SOCIAL PARTICIPATION FOR COMUNITY LIVING TBI PERSONS

Kaoruko Takada, Naohisa Kikuchi, Hidetaka Wakabayashi, Hironobu Sashika*

Yokohama City University, Japan

Objective: It is difficult to return to former work for TBI persons with cognitive disorder, even if they can be back to daily community living. When we have to analyze precisely the ability of social participation for TBI persons, qualitative research method might be more useful than quantitative one. In this research, we tried to clarify the relationship between ability of social participation, cognitive and psychological function. *Methods:* Participants were 109 TBI persons who were treated in our emergency center from 2007 to 2011. Inclusion criteria were 18 to 75 years old and independent walking. Exclusion criteria were psychiatric history and consciousness disorder. We selected 17 subjects who consented to ask qualitative study with structured interviews. Items of cognitive evaluation were Kohs Block Design Test (KOHS-IQ), WAIS-III, SF-36 and Zung depression scale. We divided subjects to 2 groups; social participation in worker/student/housewife group (SPG, $n=5$) and community living jobless group (CLG, $n=12$). *Results:* About

KOHS-IQ, 3/4 subjects were normal range in SPG, 4/6 subjects were normal range in CLG. About SF-36, 3/4 subjects were normal range in SP-G, 7/10 subjects were normal range in CLG. About Zung depression scale, all subjects were normal range in SPG, 3/12 subjects were normal range in CLG. In some subjects, abilities of social participation from qualitative interviews and cognitive data showed contradiction. *Implication/Impact on rehabilitation:* We showed effectiveness of combined qualitativestudy and cognitive evaluation for the ability of social participation in community living TBI persons.

PO-1519

GAIT SPATIOTEMPORAL PARAMETERS AND WALKING ABILITY CHANGES OF PERSONS WITH SUBACUTE STROKE AFTER BODY WEIGHT-SUPPORTED TREADMILL TRAINING

Na Chen, Yurong Mao, Dongfeng Huang, Le Li
The First Affiliated Hospital, China

Objective: To identify gait spatiotemporal parameters of persons with subacute stroke after Body Weight-Supported Treadmill Training (BWSTT) and compare to the clinical scores. *Method:* 20 subacute stroke patients were randomly divided into experimental group and control group of 10 patients. Experimental group was given Body Weight-Supported Treadmill Training (20-40 min/d, 5 d/w) for 3 weeks, while control group was given only traditional physical therapy at the same period of time. Gait analysis was conducted before and after the 3-week training. Spatiotemporal characteristics and lower extremity motor function (Fugl-Mayer, FMA), were recorded from the hemiparetic lower extremity while the participants walked at a self-selected pace. All the patients in the experimental group and 8 patients in the control group finished the experiment. *Results:* Compare to the baseline parameters, the cadence, walking speed, stride length and step length of the hemiparetic lower extremities of the experimental group significantly increased after 3-week training, Fugl-Meyer motor scales of the experimental group was significantly higher than baseline value ($p<0.05$). There was no significant difference of the above spatiotemporal parameters and Fugl-Meyer motor scale scores in the control group before and after the traditional physical therapy. *Implications on Rehabilitation:* BWSTT enables hemiparetic stroke patients to practice walking at an early stage. Compared to traditional gait therapy, BWSTT has proved more effective in improving walking capacity and establishing symmetric and efficient gait. Understanding the gait mechanics in patients who show well improvement in walking ability is meaningful for looking for the key problems in the restoration of gait.

PO-1520

LIPID METABOLISM IMPROVEMENT AFTER 8 WEEKS CORE STRENGTH TRAINING IN MIDDLE-AGED TAXI DRIVER

Jiang Ma[1], Liping Huang[2], Zhenping Han[1]
[1]The first hospital of Shijiazhuang,China, [2]Tianjin University of Sport, China

Objective: To investigate the efficacy of core strength training and education of loss weight on the middle-aged taxi driver with Lipid Disorders, in order to offer experimental clues for lowering the incidence rate of Metabolism syndrome. *Methods:* Forty middle-aged taxi drivers, forty to fifty-five years old, years of experience as driver above five, have been selected, then definite the experiment group 18 subjects (47.33±3.99 years old), the control group 16 subjects (49.75±3.47 years old). In the experiment group, the core strength training has been applied 8 weeks, the plan includes: Draw in maneuver, Floor bridge, 30 or 60-degree hold, Alternating crunch hold, Hip raises, Russian twists, Plane hold (each elbows), Plane hold (elbows), Suitcase Crunches, Windshield wipers, exercise intensity: controlled heart rate is 55%-65% maximal heart rate (about 120 b/min), three time per week, one time every other day, 60 min each time (warm-up 15 min, core training 35 min, warming down 10 min), Both groups participant in workshops for body weight control once a week. Data comparisons were made using paired-sample *t*-test in inner group, independent-sample *t*-test between deferent group. *Results:* 1. After 12 week intervention, in the experimental group, the waistline (93.33±9.05 Vs. 90.44±8.55, $p<0.001$) and the hip circumference (102±6.24 Vs.100.11±5.21, $p<0.05$) have all decreased significantly, the body weight, BMI, WHR have all decreased, but no significant changes are evidenced. In the control group, all index have decreased, but no significantly., [2]In the experimental group, after 12 week intervention,the TG (1.90±0.71 Vs. 1.63±0.68, $p<0.01$), CHO (5.46±0.91 Vs. 5.06±1.02, $p<0.01$), LDL (3.31±0.76 Vs. 2.97±0.87, $p<0.05$)have all decreased significantly, the HDL (1.20±0.19 Vs. 1.27±0.16, $p<0.05$) have increased significantly. In the control group, all index have improved, but no significantly., 3.In the experimental group, the Insulin (9.23±3.86 Vs. 8.68±3.92, $p<0.01$), Leptin (1.96±0.87 Vs. 1.32 ±0.58, $p<0.01$), Visfatin (5.30±3.43 Vs. 3.60±2.23, $p<0.001$) have all decreased significantly after 12 week intervention, In the control group, all index have decreased, but no significantly. *Implications:* Eight week training with core strength training and education of loss weight may improve the middle-aged taxi driver suffered from simple ventral obesity, increase lean body mass, improve lipid metabolism, lower metabolism syndrome, lowering the incidence rate of Metabolism syndrome.

PO-1521

THE RESEARCH OF THE EFFECT OF WUQINXI EXERCISE ON THE ELDERLY FEMALE PATIENTS' PROPRIOCEPTION WITH KOA

Yuanpeng Liao[1], Buongo Chun[2]
[1]ChengDu Sports University,China, [2]Beijing Sports University, China

Purpose: In this study, the proprioception of the elderly female patients with KOA were determined before and after Wuqinxi exercise to explore the effect of Wuqinxi exercise on the proprioception of them, which will provide new methods and theoretical support for functional rehabilitation of patients with KOA and new ways of improving health fitness effects of Wuqinxi. *Method:* Forty female KOA patients in 60-70 years old who had received the same clinical treatment were randomly divided into the experimental group ($n=20$) and the control group ($n=20$). A 24-week exercise of Wuqinxi were conducted in the experimental group, while any sports activities were not allowed in the control group. Pre-experimental and post-experimental proprioception of the affected knee were tested by Biodex Pro System 3 from America. We reconstructed the error by testing the joint angle in active state (30°and 60°) and passive state (30°and 60°). *Result:* There is no significant change in the reconstruction error of control group before and after experiment, while there is significant reduction in the reconstruction error of experimental group before and after experiment. *Conclusion:* The proprioception of the elderly female patients with KOA will be well improved and the fall risk will be reduced by a long-term exercise of Wuqinxi.

PO-1522

EXERCISE PRESCRIPTION FOR OVERWEIGHT DIABETIC PATIENTS - A PRELIMINARY STUDY

Sen-Wei Tsai[1,2]*, Francois Liang[3], I-T Lee[4]
[1]Deaprtment of Physical Medicine and Rehabilitation. Taichung Veterans General Hospital,Chinese Taipei, [2]Center of General Education, National Taichung University of Science and Technology,Chinese Taipei, [3]Deaprtment of Research, Cycling & Health Tech Industry R&D Center,Chinese Taipei, [4]Deaprtment of endocrinology,Taichung Veterans General Hospital, Chinese Taipei

Objective: The rating of perceived exertion (RPE), maximal heart rate (HRmax) are common used methods in monitoring exercise intensity. But the appropriate training intensity for Type 2 diabetes mellitus (DM) patients is not well demonstrated *Methods:* Twenty Type 2 DM patients (BMI> 24 kg/m2) were recruited. The physiological parameters (maximum oxygen uptake, maximum heart rate, and RPE at VT) during a cardiopulmonary exercise test were collected and compared. *Results:* The mean age of the subjects is 54.3±10.9 years, and the mean body mass index is 30.3±3.7 kg/m2. There was no differences on the maximum oxygen uptake, maximum heart rate, and RPE by gender effect (p>0.05). At VT, the mean metabolic equivalent (MET) is 4.1±0.9, and the mean RPE was 13.0±1.7. The mean heart rate at VT is 117.3±14.5 beats/min, which is corresponding to 70.6±8.3 % of age-predicted HRmax, the heart rate reserve is 36.3±14.7%. *Implications/Impact on Rehabilitation:* Our results indicate that the exercise intensity of 70% age-predicted HRmax, 30-40% heart rate reserve based on age-predicted HRmax, MET 4, and RPE 13 is recommended in overweight Type 2 DM patients.

PO-1523

COMPARE THE ROBOT ASSISTED GAIT TRAINING SYSTEM BETWEEN ALEX AND LOKOMAT

Mei Wang
Wuhan sports institute, China

Objective: To study the difference of ALEX and LOKOMAT robot assisted gait training system, to know their advantage. *Method:* Through the published papers to know the data of two robot system, compare their charters. *Results:* ALEX and LOKOMAT all belong to robot assisted gait training system, patients need to have walking ability, with or without body weight reducing in training, both can help patients rehabilitation better. ALEX and LOKOMAT both are active leg exoskeleton system design, they have hip and knee design, let the patient wear touch. Both ALEX and LOKOMAT can improve the walk distance in one step, have digital analysis with all data, can help with visual feedback. Both ALEX and LOKOMAT are better than traditional support treadmill ambulation training (STAT). Research on LOKOMAT showed that when clinical outcomes changed minimally after full guidance robotic training, but improved considerably after 4 weeks of reduced guidance robotic training. Of the research show that improvement is seen as an increase in the size of the patients' gait pattern, increased knee and ankle joint excursions and increase in their walking speeds on the treadmill. The new ALEX will provide more force when the patients walk far away the ideal gait pattern, to help patient to correct the mistake next time. *Impact on rehabilitation:* Both ALEX and LOKOMAT are providing force to patient in walking, to improve their walking ability. The different between ALEX and LOKOMAT is that LOKOMAT provide help force to walk while ALEX provide resisted force walk. Both robot system ALEX and LOKOMAT can improve the patient gait.

PO-1524

PLATELET-RICH PLASMA IN SPORTS INJURIES

Leticia Rivero González[1]*, Luis Til Pérez[2], Gabriel Lupón Escobar[2], Sara Estévez Sarmiento[1]
[1]Medicina Física y Rehabilitación Hospital Insular de Gran Canaria, Spain, [2]Medicina del Deporte CST-CAR (Consorci Sanitari de Terrassa en el Centre d'Alt Rendiment de Sant Cugat, Barcelona, Spain

Introduction and objectives: The use of platelet-rich plasma (PRP) is widespread as treatment of locomotor system injuries due to the practice of sports. The objective is to evaluate the security of the technique. *Design:* Descriptive retrospective study. *Materials and Methods:* 104 patients affected by sports injuries were treated with PRP injections, ultrasound-guided most of them, their preparations involve a centrifugation process and pipetting (BTI method). The epidemiological variables of the sample, the complications recorded and the degree of patient satisfaction (scored from 0 to 10) are presented. *Results:* 104 patients (68 men and 36 women) with an average age of 27 years old (14-47). 25 subjects were professional athletes, 17 football players and other smaller groups. 65 had acute-subacute lesions and 39 chronic lesion. In 25% of the cases, the treatment was applied to tendon problems, in 17.3% to synovial pathology and in 15.4% to cartilage pathology. The most common injection sites were in their knees (41.3%), ankles (15.4%) and shoulders (12.5%). In 78.3% of the cases, the technique was done under ultrasound imaging control.Mild and self-limiting adverse reactions were recorded in two patients. A patient suffered from pain, edema and tenderness; and the other, from intense pain after injection. Median satisfaction score was 7 (p<sub>25-75 4-8). There were statistical differences according to the region treated (K-W test, p = 0.028). The best results (n>5) were obtained in foot lesions (median 9, p25-75 6-10). 49% of the athletes were very satisfied with the treatment. *Conclusions:* We have obtained satisfactory results in sports injuries after using PRP injections without recording important side effects.

PO-1525

EARLY QUANTITATIVE WEIGHT REDUCTION RUN TABLE TRAINING ON ACHILLES TENDON RUPTURE POSTOPERATIVELY, THE INFLUENCE OF MOVEMENT FUNCTION

Kejun Li, Yongjun Jiang
Shenzhen Pingle orthopedics hospital, Shenzhen, China

Objective: To study the quantitative weight loss run sets early training to broken Achilles tendon postoperative patients movement function influence. *Methods:* in August 2008 a March 2011 undergraduate course with key fracture patients were 23 cases, 17 were male, female 6); Age 31-45 years old, an average of 36 years old; Open damage 9 cases, closed damage in 14 cases, are all fresh broken with key. 23 cases are used Buuuell method with key suture fracture; All the plantar flexion with 30 °, knee 30 ° buckling a plaster cast long legs, and cooperate with rehabilitation training. Using random number method points the observation group (11), male, female 7 cases 4 cases) and the control group (12 cases, male, female, 10 cases of 2 cases). The control group in the traditional methods of rehabilitation training, the observation group 6 weeks traditional method of rehabilitation training after also started early quantitative weight training run sets. After 12 weeks to two groups of patients for lift heel is strong, ankle activities on foot, it is normal to have pain, to assess whether jogging. *Results:* The observation group 11 patients were cured (47.82% proportion); The control group 12 patients 1 cases were cured (4.3% ratio), 8 patients were on foot and ankle pain when there except the weakness (proportion 34.78%), 3 patients when there is movement Achilles check point to drag the pain (ratio of 13.04%). *Conclusion:* Early quantitative weight ran a training can markedly improve broken Achilles tendon postoperative patients exercise function.

PO-1526

CORE MUSCLE ACTIVATION IN WHEELCHAIR RACING ATHLETES DURING 400 – METER OVERGROUND SPRINTING

Wipoo Kumnerddee[1]*, Tanormsak Senakham[2], Aungkana Theplertboon[3]
[1]Dpt. of Rehabilitation Medicine, Pramongkutklao College of Medicine,Thailand, [2]Dpt. of Physical Education, Srinakharinwirot University,Thailand, [3]Dpt. Of Rehabilitation Medicine, Charoenkrung Pracharuk Hospital, Thailand

Objective: To determine electromyographic activities (EMG) of the core muscle and middle trapezius during 400-meter maximal speed propulsion in wheelchair racing athletes. *Methods:* International wheelchair racers with normal upper limb and partial to normal abdominal function (T54 class) propelled their racing wheelchairs with maximal speed in 400-meter competition track. EMG of the rectus abdominis, iliocostalis lumborum, longissimus thoracis and middle trapezius were separately recorded in each 100-meter distance using a wireless surface EMG recorder. Percentage of maximal voluntary contraction (% MVC) was determined by comparing with EMG during maximal isometric contraction. *Results:* There were 8 male subjects, age 28.24±4.17. Core muscle activations among subjects were so individual that no common pattern could be identified. There was no significant difference between %MVC of these four muscles (p>0.05). %MVC of rectus abdominis was correlated with propulsion speed in the first 100-meter reach (p=0.041, r=0.727). Negative correlation between %MVC of middle trapezius and propulsion speed was found in the third 100-meter reach (p=0.025, r=-0.771). *Implications/Impact on rehabilitation:* It is important to train the rectus abdominis to improve acceleration performance in wheelchair racers. Excessive scapular retraction during recovery phase should be inhibited while maintaining in high speed.

PO-1527

THE PRINCIPLE OF HEALTH PRESERVATION AND REHABILITATION OF TAIJIQUAN

Jingchao Hu

[1]hebei normal university sports institute, [2]henan pollytechnic university sports institute

Objective: In this study, through the analysis and research on Taijiquan related literature, combined with the operating characteristics and movement of Taijiquan, to explore the principle of improving health by means of taijiquan. *Method:* Document research, Observation, Logical analysis. *Results:* through the analysis of Taijiquan literatures, combined with the practice of Taijiquan, found the following four features: Keeping calm and relax from mind to body; Moving slowly, gently and continuously; Linking consciousness, breathing and movement closely; Moving as a whole. These four elements are the essential facts cultivating primal internal force and promoting healthy condition. In the present study Taijiquan practice to promote health, people use more modern detection methods, expounds the principle of health preservation and rehabilitation of Taijiquan, such as the use of psychological analysis approach, to promote mental health of Taijiquan, relieve stress, reduce depression etc. Using the method of physiology, biomechanics, the Tai Chi improve heart and lung function, improve the function of digestive system, promoting sports system functions. Based on previous research results, this study think Taijiquan rooted in Chinese traditional health theory, with round-coherent body movements, controlled by the human body posture adjustment, breathing exercises, ideas. Often practicing Taijiquan, have health care and rehabilitation of unique value to the human body.

PO-1528

A MATTER OF EQUALITY

Maria Silva*, Gonçalo Borges, Liliana Rocha, Edgar Tamegão, Manuel Almeida

Hospital da Prelada, Portugal

Objective: People with reduced mobility have the same constitutional right but less access to sports practice. Our aim is to promote sports that meet the needs of our patients and mobilize other Hospitals and volunteers. *Method:* Our Hospital medical, nursing, physiotherapy, psychology, medical assistants and marketing departments are working together to improve the quality of life of our patients, especially the ones with physical and intellectual disabilities. Adapted sailing and trail orienteering were the modalities chosen. We invited the patients from Physical Medicine and Rehabilitation department to practice these two sports and provided the human and material resources needed for their dislocation as well as most of material required. *Results:* Our Hospital is pioneer in trail orienteering in our country. It is a cheap sport, based on map reading and can be practiced by physically disabled and nondisabled people, as equals. Furthermore, this sport can be easily adapted for mentally disabled. Adapted sailing requires more economical resources. It is a safe sport that gives an incredible feeling of freedom and can be practiced by patients with very severe disabilities. Due to our athletes' enthusiasm, we decided to create an international agenda for both sports. *Implications/Impact on Rehabilitation:* Physical Medicine and Rehabilitation must be familiarized with the existing disabled sports in order to present them to their patients and improve their quality of life. This is a matter frequently forgotten and it is Physical Medicine and Rehabilitation departments' responsibility to endorse it.

PO-1529

AQUATIC EXERCISE INCREASED THE MUSCLE STRENGTH WITHOUT SPASTICITY INCREMENT IN THE PARETIC LOWER LIMB OF THE STROKE PATIENTS DURING THE RECOVERING STAGE

Yizhao Wang[1,2], Liping Huang[1], Linying Zhang[2], Yue Zhang[2], Wei Xu[2], Jintao Fan[2], Hongtu Wang[2], Shi Zhou[3],[1]

[1]Tianjin University of Sport, department of exercise rehabilitation, China, [2]Tianjin Huanhu hospital, rehabilitation center,China, [3]Australia Southern Cross University, China

Objective: To investigate the effects of hydrotherapy on the lower limb muscle strength, spasticity and walking ability of patients during the recovering stage. *Method:* The patients (n=20, age: 41.5±16.5 yr), who suffered from the stroke for the first time,were randomly allocated into two groups. Each group has 10 patients. The normal rehabilitation exercises were performed for control group. The 25 min hydrotherapy, three or four sessions a week, were performed for experimental group in addition to normal exercise. Both groups have the same therapeutic time for each session (45 min), 5 times a week, for four weeks. Fourteen times aquatic exercises in four weeks were totally done. The maximum isometric voluntary contraction of flexion in the paretic knee and ankle and extension, spasticity, lower limb motor function and walking ability of the patients were assessed before and after the exercises. t-test statistical analyses was used to compare the differences. *Results:* The gastrocnemius isometric contraction moment (ICM) with ankle plantation demonstrated a significant increase (p<0.05) after the 4 weeks exercise. The rectus femoris ICM showed a significant increase (p<0.01) with the knee extension. The significant increase of motor function,walking ability and equilibrium function were found on the patients (p<0.05).There is no change on the spasm degree with the rectus femoris and gastrocnemius pre- and post-exercises (p>0.05). *Implications:* The short period hydrotherapy appeared to improve the extension muscular strength without increasing spasticity in the paretic lower limbs of the patients. It is the benefit to improve the motor function and walking ability of the effected lower limbs.

PO-1530

CASE STUDY OF WEIGHT TRAINING USING A NOVEL WEIGHT TRAINING METHOD

David Burke

Emory University School of Medicine, United States

Strength training, also known as resistance training is recommended by the American College of sports medicine, the American Heart Association with recommendations found for both men and women in a large spectrum of age groups. Studies have demonstrated that resistance training can lead to lean body mass, decreased fat mass, increased resting metabolic rate, and improved bone health. in

addition, resistance training has been found, among the elderly population, could prove the ability to perform functional tasks and reducing the risk for chronic disease and mortality. as the health industry provides a variety of options for resistance training, some techniques have received more attention than others. In 2003 the United States patent was issued to a Russian inventor created a new apparatus and method for weight training exercise. Known as the Anatoly gravitational system, proponents have suggested that participants can using these techniques lift weights far in excess of those using other methods and can gain strength faster than in any other system. this case study review the authors experience with this new weight training system. Beginning at weights in excess of lifetime personal bests (over 500 pounds for leg lifts, and over 200 pounds for bench press), the leg and arm exercise program provided dramatic weekly gains with no ill effects.

PO-1531

TENNIS OR TAEKWONDO IS BETTER FOR MY KID? – DIFFERENTIAL SENSORY ORGANIZATION OF BALANCE CONTROL IN YOUNG TENNIS PLAYERS AND TAEKWONDO PRACTITIONERS

Shirley S. M. Fong[1], Joanne W.Y. Chung[2], William W.N. Tsang[3]

[1]Institute of Human Performance, The University of Hong Kong,Hong Kong, China, [2]Department of Health and Physical Education, The Hong Kong Institute of Education,Hong Kong, China, [3]Department of Rehabilitation Sciences, The Hong Kong Polytechnic University,Hong Kong, China

Objective: To compare the sensory organization and standing balance control of adolescent tennis players, taekwondo (TKD) practitioners, and healthy control participants. *Method:* Sixty participants including 12 tennis players (mean age: 14.0±2.1 years; 9 males and 3 females), 21 TKD practitioners (mean age: 13.1±1.0 years; 13 males and 8 females), and 27 healthy control participants (mean age: 12.8±1.8 years; 18 males and 9 females) were tested. All of the participants underwent the Sensory Organization Test (SOT) and the Unilateral Stance Test (UST) on a Smart Equitest® system. One-way analysis of variance (ANOVA) was used to compare all the outcome variables among groups. Significant results were further analyzed with post hoc Bonferroni multiple comparisons. *Results:* Results revealed that tennis players had higher SOT visual ratios than the control participants (p=0.005), and TKD practitioners swayed more slowly in the UST than the control participants (p=0.039). No differences (p>0.05) were found in the SOT composite score, somatosensory ratio, or vestibular ratio between the groups. To summarize, tennis players relied more heavily on visual input to balance, whereas TKD practitioners were more stable when standing on one leg. *Implications:* Parents may consider these sports as recreational activities for their children to develop specific balance abilities.

PO-1532

THE FIFA 11+ WARM UP PROGRAMME TO PREVENT INJURIES IN FOOTBALL WHERE WE ARE TODAY

Rui Sales Marques

Hospital de Faro, E.P.E., Portugal

Objective: The objective of this study is to review the FIFA 11+ warm up programme to prevent injuries in football. *Method:* In this research, a systematic review was made using database of MD Consult, UpToDate, Pub-Med and Science direct. The expression "the 11+ warm up programme prevent injuries" was searched and 59 articles were found. *Results:* The "11+" is a complete warm-up programme to reduce injuries among male and female football players aged 14 years and older. It has three parts with a total of 15 exercises, which should be performed in the specified sequence at the start of each training session. Part 1 consists in running exercises at a slow speed combined with active stretching and controlled partner contacts. Part 2 includes six sets of exercises focusing on core and leg strength, balance and plyometrics/ agility, each with three levels of increasing difficulty. Part 3 also includes running exercises, but at moderate/high speed combined with planting/cutting movements. The programme should be performed, as a standard warm-up, at the start of each training session at least twice a week, and it takes around 20 min to complete. Prior to matches, only the running exercises (parts 1 and 3) should be performed. Correct performance is very important in all exercises. *Implications/Impact on Rehabilitation:* The 11+ warm up programme to prevent injuries in football have some scientific evidence in reducing the risk of injuries in football if correctly done.

PO-1533

ART, SPORTS OF STUDENTS PHYSICAL EDUCATION IN THE INVESTIGATION AND ANALYSIS OF THE SPORTS INJURY AND REHABILITATION

Jungang Yang[1], Yiqing Yu[1,2], Xianzhi Xie[1,3], Bo Yang[4], Xinchun Dong[4]

[1]Hebei Institute of Media,China, [2]Beijing institute of fashion technology, China, [3]He Zhou institute, China, [4]Zhaoqing institute, China

Objective: To survey and analysis of students' physical education arts, sports sports injury reason and rehabilitation methods. *Methods:* questionnaire investigation method to Hebei Institute of Media, Beijinginstitute of fashion technology, He Zhou institute,guangdongzhaoqing university different professional college students' sports injury of questionnaire survey. Issuing questionnaires, 213 valid questionnaires were received, recovery of 95.9%. *Results:* A total of 137 patients with sports injury occurred, the total incidence was 64.3%, among which the boy for 83 cases (60.5%), the girl is 54 cases (39.4%), hebei institute of media and Beijing institute of clothing technology art college students sports injuries happened in 91 cases (56.2%), HeZhou colleges and guangdong zhaoqing university sports of students' sports injury happened for 46 cases (76.7%). *Conclusion:* The boy is obviously higher than that of the girl. The reason is that the boy to participate in sports more intense; The boy to participate in sports activities time more than girls. Sports class students happen the proportion of sports injury is obviously higher than that of the art students, the reason of which lies in the sports class the student to participate in the fierce antagonism project is art, intense degree is higher, and in the course of the events, and follow the rules of discipline than art students; Sports class students to participate in sports activities for a long time, especially extracurricular activities than art.

PO-1534

EFFECT OF TRAINING ON DIASTOLIC FUNCTION OF THE HEART IN MALE VOLLEYBALL PLAYERS

Begad Abbas*, Fatma Abdelmetaal, Hala Saleh, Ola Abdelaziz, Shereif Souliman

faculty of medicine, ain shams university, Egypt

Background: Long-term athletic training is associated with cardiac changes including increased left ventricular cavity dimension and wall thickness; these changes have been described as 'athlete's heart' (1). *Objectives:* The aim of this investigation was to study the ability of diastolic function measured by echocardiography to reflect changes in endurance as assessed by maximal oxygen consumption (VO2 max) in response to combined strengthening and endurance training in male volleyball players. *Materials and Methods:* This study was conducted on 30 apparently healthy male volleyball players at the beginning of the training cycle. After routine history taking and a general examination, echocardiography was

performed for all players, during which the cardiac structure was assessed and systolic and diastolic functions were measured. VO2 max was also calculated by ergospirometry. A combined training program was designed for 12 weeks after which echocardiography and measurement of VO2 max were repeated. *Results:* We found that a combined training program leads to significant increase in cardiac wall thickness, diastolic function of the heart [mainly propagation velocity (Vp)], and VO2 max. Further, we found that there is a close relationship between changes in VO2 max and changes in all indices of diastolic function studied (Vp, E/A ratio, and deceleration time). *Conclusion:* We concluded that diastolic function measured by echocardiography can reflect changes in endurance as previously assessed by VO2 max only, in response to a combined strengthening and endurance training program. Moreover, Vp is a better indicator of diastolic function in athletes compared with E/A ratio and deceleration time. Also, echocardiographic parameters of cardiac hypertrophy increase in response to the combined training program.

PO-1535

EFFECTS OF PROPRIOCEPTION ENHANCEMENT TRAINING ON RECOVERY OF KNEE FUNCTION AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

Hua Wu, Xu-Dong Gu, Wei-Guo Wang, Yun-Hai Yao, Yan Li

The Jiaxing second hospital rehabilitation medical centre, Zhejiang, China

Objective: To investigate the effects of proprioception enhancement training on recovery of knee function after anterior cruciate ligament reconstruction. *Methods:* Thirty patients were randomly divided into intervention (n=15) and control (n=15) group. Both groups received regulation rehabilitation, which intervention group received proprioception enhancement training based on. Before and after 8 weeks treatment, proprioception, balance, the lower extremity muscle coordination and knee function were assessed with the passive angle reproduction test, computerized balance performance monitor (BPM) included sway index, sway tract length and area, the patients were assessed twice with eye opened and eye closed respectively, surface electromyography and Lysholm knee score (LKS). *Results:* After eight week treatment, the angle deviations in intervention group (7.62+3.21) mm were lower than those in control group (12.96+4.63) mm (p<0.05). The antagonistic coactivity ratios in intervention group were significantly lower than before during maximal isometric voluntary contraction, and the hamstring coactivity ratios in intervention group were also significantly lower than before during squat, the patients in the intervention group are significantly lower than the patients in the control group. all the assessment scores obtained with the BPM (in eye closed state) and LKS in the intervention group were significantly better than those in the control group. *Implication:* Proprioception enhancement training can improve knee function after anterior cruciate ligament reconstruction.

PO-1536

THE COMPARING OF METS AND CI INDEX DURING EXERCISE ELECTROCARDIOGRAPHIC TEST OF METABOLIC SYNDROME PATIENTS COMPLICATED WITH TYPE 2 DIABETES MELLITUS

Min Gao[1], Wei Chen[1], Liang Han[1], Li Zhang[2]

[1]Department of Rehabilitation Medicine, Clinical Hospital of Xuzhou Medical College In Xuzhou (Xuzhou Center Hospital), Xuzhou,Jiang su, 221004,China, [2]Department of Electrocardiogram room, Clinical Hospital of Xuzhou Medical College In Xuzhou (Xuzhou Center Hospital), Xuzhou,Jiang su, 221004,China)

Objective: To observe the exercise electrocardiographic responses to metabolic syndrome patients complicated with type 2 diabetes mellitus, compare the CI index and metabolic equivalents (METs) and the electrocardiographic change of ischemia. *Method:* A total of 120 patients with T2DM were grouped into MS group and non-MS group and all of them completed the electrocardiographic exercise testing, the indexes of CI :ratio of heart rate, heart rate reserve and METs were measured. Coronary ischemia was measured by ST change of electrocardiogram (ECG). *Result:* Patients in MS group had a higher prevalence of CI indexes (rHR, HRR)and METs than in the non-MS group, the difference between two groups was remarkable (p<0.05).The percentage of ST change of ECG with coronary ischemia in MS group is 35.9%,the nonMS group is 19.6% (p < 0.05). Patients with coronary ischemia had lower CI indexes and lower METs (p<0.05). *Conclusion:* In the patients with metabolic syndrome complicated with type 2 diabetes mellitus had silent coronary ischemia,the CI indexes (rHR, HRR) and METs are lower than those without metabolic syndrome. Metabolic syndrome complicated with type 2 diabetes mellitus had higher coronary ischemia occurred than those without metabolic syndrome. Metabolic syndrome and CI are predictors of cardiovascular risk. The prevention and rehabilitation to patients of metabolic syndrome complicated with type 2 diabetes mellitus have clinical significance.

PO-1537

HAMSTRING MUSCLE FLEXIBILITY AMONG KONI PROPINSI DKI JAKARTA'S VOLLEYBALL PLAYERS

Hendriko, Tirza Ediva Tamin*

Cipto Mangunkusumo Hospital, Indonesia

Objective: This study tends to find hamstring muscle flexibility among KONI Propinsi DKI Jakarta's volleyball players, based on age, sex and playing position particularly. *Methods:* A cross sectional study performed in 25 female and 24 male athletes using Sit and Reach Test (SRT) box, had done 3 times trial with the best score was recorded. *Results:* Hamstring muscle's mean value score was 18,21 (SD 6,5) cm, male athletes was 17,6 (SD 6,5) cm, female athletes was 18,8 (SD 6,6) cm, middle adolescence 14-16 years old was 19,91 (SD 6,9) cm, young adulthood 21-24 years old was 18,79 (SD 4,6) cm, hitters was 18,8 (SD 6,6) cm, centers was 15,5 (SD 6,3) while allround players was 20,4 (SD 5,9).

PO-1538

AN ELECTROMYOGRAPHIC STUDY OF ISOKINETIC AXIAL ROTATION AT DIFFERENT ANGULAR VELOCITIES IN YOUNG CHINESE MALES

Xia Liu, Jianzhong Fan, Renhong He

Nanfang Hospital Department of Rehabilitation, China

Objective: The purpose of this study was to explore the effect of velocity of movement on the muscle activity during isokinetic axial rotation movements and to investigate both relative muscle activity and ratios of local to global muscle activity at the different velocities of isokinetic movements on an Isomed2000 dynamometer. *Method:* Twenty-four young healthy males performed maximal right and left concentric axial rotation efforts against an isokinetic dynamometer at each of three angular velocity settings (30°/s, 60°/s and 120°/s) in random order. The Peak Torque (PT) and surface electromyagrams (EMG) activity of bilateral external oblique (EO), internal oblique (IO), latissimus dorsi (LD) muscles were recorded. *Results:* Our results showed that L/R ratio was 0.91 at 30°/s, 0.92 at 60°/s, 0.94 at 120°/s. In each direction, the peak torque and PT/WB decreased with the increase of angular velocity, and there were significant differences between 30 and 120. Statistics show no significant effect of velocity on the abdominal muscles ratios between left and right

rotation. The ratio IO/EO during different velocities of isokinetic rotation is significant difference between left and right side. No significant main effect for direction of rotation.We also found that all muscles activity decreased, increasing with the angular velocity. External oblique was showed highest RMS values during isokinetic axial rotation. *Implications:* This study revealed that the velocity of isokinetic axial rotation movements influences the recruitment of the abdominal muscles, meaning that protocols of training programs should be adapted in function of the focus of the therapy.

PO-1539

RESISTANCE TRAINING IN CARDIAC REHABILITATION TRAINING APPLICATION IN TREATMENT

Shoubin Luo, Xiaoying Shang
Heilongjiang province hospital, China

Resistance training is training muscles in against the force of its own gravity conditions or dynamic or static active contraction movement. Resistance movement is cardiac rehabilitation treatment indispensable method. During the course of treatment with aerobic training can improve the patients with cardiopulmonary function. Twenty min every time, every week 3 ~ 5 times, one to two weeks after patients blood pressure and heart rate indexes improved significantly. The clinical common indications for:1. latent coronary heart disease. 2. Stealthiness angina pectoris. 3. No complication of acute myocardial infarction or Mild patients with cardiac dysfunction.4. Coronary heart disease after bypass surgery. 5. Chronic heart failure. Resistance training status: Due to lack of awareness of cardiac rehabilitation, most patients with heart disease are not properly rehabilitation therapy, and so produce waste with sexual decline lead to reduce the daily living skills. With the deepening of the research on cardiac rehabilitation, resistance training has set up a file in the clinical more and more get attention, and resistance training in the stable heart rate, blood pressure, improve the ability of daily life widely affirmation.

PO-1540

CI THERAPY CLINICAL APPLICATION

Xiaoying Shang[1], Kenji Kagechika[2], Shoubin Luo[1], Yasutaka Takagi[3]
[1]Heilongjiang Province Hospital, China, [2]Kanazawa Medical University, Japan, [3]Tonami General Hospital, Japan

Ci (Constraint induced movement therapy) therapy is a constraint health side upper limbs and concentrated training with side upper limb function, so as to improve the upper limb function in patients with hemiplegia rehabilitation treatment. It is in the treatment of points do not use normal upper limb on the basis of hemiplegia side upper limbs for five h every day for 2 ~ 3 weeks of rehabilitation training. And it doesnt need high medical treatment. Ci therapy indications: 1. Limb wrist active joint mobility bowed back twenty degrees. Three fingers above IP, MP joint stretch up to 10 degrees., 2. Use the hand can achieve the ADL themselves., 3.Basic rehabilitation training is over, and can walk alone., 4. Patients have a strong desire to recover, and can fully understand ci therapy., 5. Patients have enough stamina., 6. A patients life signs stability. The present situation of the ci therapy: Ci therapy originated from the United States in 1989. It's a new method which can inhibit the disuse syndrome and other bad results of rehabilitation. Now this therapy is begun to implemented in Japan, Germany, South Korea and other countries, but has not been widely used in China. Ci therapy can be used in basic stroke rehabilitation training, and can be applied to the disease as brain injury, cerebral palsy. Ci therapy can improve the limb movement function so as to improve the quality of life, and lower blood pressure, etc.

PO-1541

THE COMPARATIVE STUDY ON THE DYNAMIC EQUILIBRIUM ABILITY OF THE COLLEGE STUDENTS BY DIFFERENT SPORTS MODE

Xiangjiang Rong, Jingjing Qian
Capital University of Physical Education and Sports

Objective: To explore the impact of different sports on college students dynamic equilibrium ability. *Methods:* 1. Survey paper would be issued before the experiment and unqualified participant are picked out. The total number of participant is 117 persons in which there are 50 males and 57 females. People in each of the 4 test groups: Wushu Serials group: 30 persons, 15 males, 15 females. Aerobic Exercises group: 30 persons, 15 males, 15 females.Mid-long Distance Running group: 27 persons, 15 males, 12 females. No exercises group: 30 persons, 15 males, 15 females, 2.Use Gait Trainer to collect running data of participants separately while they run with their eyes open and closed. Calculate and compare the difference of data got from Gait Trainer., 3. Test the participants' lower limb muscle with lower limb muscle machine, and compare the Lower limb muscle strength., 4. The data difference got from Gait Trainer between open-eye running and closed-eye running reflect the dynamic equilibrium Ability of participants. *Results:* 1. There is significant difference in the data got from running machine (open eyes and closed eyes) comparing between Wushu Serials group and No exercises group ($p<0.05$), same as the data beteen Aerobic Exercises group and No exercises group ($p<0.05$), Mid-long Distance Running group and No exercises group ($p<0.05$)., 2. Considering the difference between open-eye running data and closed-eye running data, there is no significant difference between Wushu Serials group and Aerobic Exercises group ($p>0.05$); however there is big difference between Wushu Serials group and Mid-long Distance Running group ($p<0.05$); there is also significant difference between Aerobic Exercises group and Mid-long Distance Running group ($p<0.05$)., 3. Lower limb muscle strength data comparison shows that there is significant difference between Wushu Serials group and No exercises group ($p<0.05$); same as the data between Aerobic Exercises group and No exercises group ($p<0.05$), Mid-long Distance Running group and No exercises group ($p<0.05$)., 4. Lower limb muscle strength data comparison shows that there is significant difference between Wushu Serials group and Mid-long Distance Running group ($p<0.05$), same as the data between Mid-long Distance Running group and Aerobic Exercises group ($p<0.05$); Wushu Serials group and Aerobic Exercises group ($p<0.05$). *Impact on rehabilitation:* The results of this study can be applied to the use of movement to improve the human dynamic equilibrium ability rehabilitation.

PO-1542

THE EFFECT OF MUSCLE RELAXATION PROGRAM ON THE HEALTH PROMOTION AND QUALITY OF LIFE IN GERIATRIC

Ali Hassanpour Dehkordi
Shahrekord University of Medical Science, Shahre-kord Nursing Faculty, Shahre-kord, Iran. 2- Iranian National Elite Foundation 3- Tehran University of Medical Sciences, Iran

Introduction: Health promotion and quality of life as a process is concerned with positive health and well-being; it adopts a holistic concept of health that relates to lifestyles and living conditions. The present study aimed to investigate the effect of muscle relaxation program on the health promotion and quality of life in geriatric. *Methods:* Subjects were sixty adult volunteers over the age of 60 years. None of the subjects had any experience in exercise programs but were physically active and able to perform activities of daily living independently. The subjects were randomly assigned into one of two groups each with 30 persons: test (muscle relaxation program)

group and control (no muscle relaxation program) group. The test group was taken into a 12-week aerobic exercise program. No such a program was prescribed for the control group. Both groups were assessed before and after the exercise program. *Results:* The results showed there was no significance difference between the two groups of test and control in terms of the demographic features such as sex, age, rate and degree of physical activity and score dimensions of quality of life in the beginning program. (p>0.05, Chi-square and Mann-Whitney). Measures of health promotion improved with exercise so that there were no dimensions of quality of life changes in the control but significant changes were observed in the exercise group. *Conclusion:* This study suggests that a muscle relaxation program has a positive effect on health promotion and quality of life in geriatric especially improvement sexual programs.

PO-1543

ANALYSIS AND RESEARCH ON ENERGY EXPENDITURE OF THE PURPLE MOUNTAIN CLIMBING IN DIFFERENT SPEED

Biao Sun, Qiang Sun
Nanjing Sports Institute, China

Objective: To explore the changing laws of energy consumption of human when climbing Purple Mountain (448 meters above sea level) with different speeds and in different routes. *Method:* Choose 12 college students (six males, six females), choose Purple Mountain (An altitude of 400 meters) as the destination, climb Purple Mountain along two typical mountaineering ways: the Steep mountain road (a slope ramp, 2,380 meters with an average slope of 7.5 °) and the Gentle slope climbing way (a slow ramp, 4,750 meters with an average slope of 3.6 °), with a slow speed (80 steps/min, about 2.5 km/h) and a medium speed (100 steps/min, about 3.3 km/h) respectively by wearing K4b2 portable heart lungs function instrument and get the relevant parameters of the energy consumption. *Results:* (1) When climbing Purple Mountain along the Steep mountain road with a slow speed, the energy consumption is (1,296.98±201.39) J, and the energy consumption is (1467.67±180.09) J with a medium speed. When climbing along the Gentle slope climbing way with a slow speed, the energy consumption is (1,675.45±179.86) J, and (1,810.39±253.22) J with a medium speed. (2) Establish multiple regression equation of energy consumption: energy consumption of Steep mountain road: y=[160.629+3.609* weight (kg) -41.699* sex]* 4.182 (r2=0.86) energy consumption of Gentle slope climbing way: y=[686.292-1.819* weight (kg) -116.434* sex] * 4.182 (r2=0.81) sex: male is 1, female is 2. *Implications:* The results of the study is to promote peoples health and rehabilitation has important significance.

PO-1544

THE EFFECTS OF GAIT TRAINING CORRECTION APPARATUS ON STROKE PATIENTS WITH FOOT DROP AND VARUS

Congxiao Wang, Jiafeng Deng, Shuyan Qi, Yu Pan, Yonghong Ding
Beijing Rehabilitation Center, Beijing, China

Objective: To observe the effects of gait training correction apparatus on the lower extremity walking function and foot drop and varus of stroke hemiplegic patients. *Method:* Forty stroke patients were randomly divided into Training group (n=20) and Control group (n=20). The training group received gait training correction apparatus combined with routine rehabilitation training. The control group only received routine rehabilitation training. Both group received routine internal medicine. After 8 weeks, we use the lower limbs of Fugl-Meyer motor assessment Scale (FMA-L) to assess the lower limb motor function, 10 m walking speed measurement assess lower limbs walking function, Modified Ashworth Scales to assess tibialis posterior muscle tension, Modified Barthel Index (MBI) to assess activities of daily living. *Results:* There was no significant difference between two groups before treatment (p>0.05). After treatment, Compared to control group, All indexes were significant differences in training group (p<0.05). *Impact on Rehabilitation:* Gait training correction apparatus was significantly better than routine rehabilitation training in improving the symptoms of foot drop and varus of stroke patients. It might enhance walking function and quality of life in poststroke patients.

PO-1545

THE STUDY PERIOD OF LIMB SWELLING PRESSURE THERAPY ON CEREBRAL INFARCTION

Jing Chen
Harbin NO.2 Hospital, China

Objective: Treatment of stroke limb improve motor function. *Method:* Using the statistical software were randomly divided into four groups. According to the four groups of patients with gender, age, course of disease, Fugl-Meyer motor function assessment score before and after treatment, the neurological deficit scores, Brathel index, lower limb swelling. *Results:* Pressure treatment instrument combined with rehabilitation therapy can effectively eliminate the cerebral infarction recovery of limb swelling. Impact The study period of limb swelling pressure therapy on cerebral infarction obtain satisfactory clinical effect.

PO-1546

SINGLE- VERSUS DOUBLE-BUNDLE ACL RECONSTRUCTION: IS THERE ANY DIFFERENCE IN BALANCE STABILITY AND PROPRIOCEPTION AT 1-YEAR FOLLOW UP?

Yubao Ma[1], Masataka Deie[1]*, Daisuke Iwaki[1], Makoto Asaeda[1], Nobuo Adachi[2], Mitsuo Ochi[2]
[1]Department of Musculoskeletal Medicine,Graduate School of Biomedical & Health Sciences,Hiroshima University,Japan, [2]Department of Orthopaedic Sugrery, Graduate School of Biomedical & Health Sciences, Hiroshima University, Japan

Objective: Anterior cruciate ligament (ACL) injury causes balance stability and proprioception dysfunction. It has been reported that the balance stability disorders lead to ACL re-injury. The changes in balance stability and proprioception were also reported about ACL pre-and post reconstruction. However, the difference of balance stability and proprioception at single- and double-bundle ACL pre- and post reconstruction are unclear. *Methods:* This study included 20 ACL-reconstructed patients, single-bundle group 10 patients and double-bundle group ten patients. Measurement of body sway using leg load cell G-620, 20 seconds of one-leg standing with eyes closed, total length, area, effective surface area was calculated. Proprioceptive function was measured using kinesthesia- position sense apparatus (Sensor Ouyou Co. Ltd., Japan). This device measured knee-joint kinesthesia at angular velocity of 0.2°/s. The starting angles of knee-joint flexion were 15° and 45°; kinesthesia was measured with elapsed time when the subjects felt a passive lower leg movement at 0.2°/s in the direction of extension. *Results:* There was no significant difference in the single- and double-bundle group with balance stability and proprioception (p=0.08). However, the double-bundle group was better than single group with balance stability and proprioception at ACL post reconstruction 6 and 12 months. *Implications/Impact on Rehabilitation:* Balance stability and proprioception improved in postoperative patients 6 and 12 months after ACL reconstruction. However, no significant differences changes in balance stability and proprioception at single-bundle and double-bundle underwent ACL reconstruction.

PO-1547

ANTERIOR SUPERIOR ILIAC SPINE AVULSION FRACTURE PRESENTING AS MERALGIA PARESTHETICA

Chia-Yu Hsu[1]*, Chu-Ming Wu[1], Shih-Wei Lin[2], Kui-Lin Cheng[3]

[1]Department of Physical Medicine and Rehabilitation, Ten Chen General Hospital, Taoyuan, Taiwan,Chinese Taipei, [2]Department of Orthopedic Surgery, Ten Chen General Hospital, Taoyuan, Taiwan,Chinese Taipei, [3]Department of Radiology, Ten Chen General Hospital, Taoyuan, Taiwan, Chinese Taipei

Objective: We report a rare case of anterior superior iliac spine avulsion fracture with initial presentation of meralgia paresthetica in Taiwan. *Method:* Anterior superior iliac spine avulsion fracture is rare in adolescent athletes. Rare case report describes the initial presentation as meralgia paresthetica in the current literature. We present a 14-year-old male sprinter with anterior superior iliac spine avulsion fracture that was presenting as meralgia paresthetica in the emergency department, and was negative on initial plain radiograph of right hip. *Results:* Both clinical presentations and electrophysiological studies were compatible with meralgia paresthetica. The lateral femoral cutaneous nerve of thigh was possibly compressed by an inguinal hematoma resulting from sartorius muscle strain, which was detected by musculoskeletal ultrasound. Repeated plain radiogragh and computed tomography of pelvis confirmed the diagnosis of anterior superior iliac spine avulsion fracture. *Implications/Impact on rehabilitation:* Meralgia paresthetica can be the presentation of anterior superior iliac spine avulsion fracture in adolescence. Sonography is a valuable tool in screening muscular hematoma and may assist clinicians in diagnosing the nature of muscle injury, thus guiding the most appropriate therapeutic strategy.

PO-1548

FORMULATION AND EVALUATION OF EXERCISES PRESCRIPTION FOR INDIVIDUALS WITH DISABILITIES

Xin Dai, Xiangjiang Rong

Capital University of Physical Education and Sports, China

Objective: Physical activity is important for individuals with disabilities. The health benefits from physical activity include improving overall well-being and their quality of daily life. In formulating a prescription for disabled juniors, we must not only ensure the juniors participate in physical activity but also prevent secondary body injuries. Therefore, it's very important to formulate and evaluate the exercise prescription during physical rehabilitation. *Method:* Formulate exercise prescription for 5 cerebral palsy juniors and 5 mental retardation juniors. In the process of exercise prescription, evaluate the physical activity level by heart rate telemetry, pedometer and physical activity questionnaire. *Results:* The corresponding symptoms alleviated after 3 months exercises and there's no secondary body injuries occurred. Cerebral palsy juniors improved ataxia, poor balance ability and limb spasm safely by reducing exercise intensity. Improved muscle strength and flexibility by exercises of increasing the strength, flexibility and endurance. Improved reflection delay by pre-exercise stretching. Mental retardation juniors improved overall fitness by reducing the exercise intensity, exercising longer, using visual aids and transforming different types of movements. *Conclusion:* Exercise prescription should be set down according to the type of disabilities to meet their special needs. Reasonable exercise prescription can maximize the effectiveness and safety of persons with disabilities to participate in exercises and provide scientific support for the disabled rehabilitation. Funds from Funding Project for Academic Human Resources Development in Institutions of Higher Learning Under the Jurisdiction of Beijing Municipality.

PO-1549

OBJECTIVELY MEASURED PHYSICAL ACTIVITY AND SEDENTARY TIME IN CHINESE ADOLESCENTS

Biao Sun, Songjun Li

Nanjing Sports Institute, China

Objective: To characterize levels of objectively measured physical activity and sedentary time in adolescents in Nantong, Jiangsu Province and to investigate the relationship between adolescents' fitness and physical activity. *Method:* The study comprised 286 Chinese adolescents (148 girls) aged 11-17 from middle school and high school. Physical activity was measured by GT3X accelerometers and was expressed as average intensity (counts/min) (AI) and amount of time (min/day) spent engaging in moderate-to vigorous-intensity physical activity (MVPA). Time spent in sedentary behaviors was also objectively measured. Physical fitness was measured by national students physical fitness test and physical fitness test (Fitnessgram). *Result:* 1.The level of boys' AI and MVPA are higher than girls', there are only 42 people reach the recommendations (MVPA 60 min/d), accounted for 5%, girls' time of sedentary behavior is more than boys'. 2.Among the boys who are in the middle period of adolescence, the power of gripping and vertical jump of the physical activity standard group are better than the substandard group, and in the later period of adolescence, both boys' and girls' power of gripping and vertical jump of the physical activity standard group are better than the substandard group. *Implications:* The purpose of this cross-sectional study is to obtain the objective data of adolescent physical activity in China, and to find out the does-response relationship between PA and physical fitness in adolescents. It has the important meaning to promote the adolescents' health.

PO-1550

POSTURAL ALTERATIONS IN ASYMMETRIC SPORTS

Paolo De Blasiis*, Pietro Gravina, Dario Calafiore, Ilaria Riccio, Giovanni Iolascon, Raffaele Gimigliano

Second University of Naples, Naples, Italy

Objective: The aim of our study is to evaluate the interference of non-symmetric muscular activity on the postural asset in asymmetric sports. *Method:* From January to May 2012, we recruited 35 subjects; 10 were playing asymmetric sports (5 boxers and 5 kick-boxers), 10 symmetric sports (5 cyclists and 5 basket players), 10 no sport. Inclusion criteria were: age 18 - 35 years, male gender, BMI range 20-25 kg/m², right hand preference, middle-high agonistic level (at least 4 training for week, duration of the session ≥ 1 h), absence of pain or of muscle-skeletal injuries in the last 12 months. All subjects underwent clinical and biopostural (baropodometric static and stabilometry) examination. *Results:* Our results show that, in static, there are no significant differences between the groups of non athletes and of athletes playing symmetric sport: their values are within the normal range.Instead asymmetric sport players show some alteration in the podalic load distribution, in the hindfoot/forefoot ratio with overload on the left hindfoot and right forefoot with inversion of this ratio. Moreover in agonistic players the stabilometric examination shows a reduction of ellipse surface with OE compared to CE, unlike physiological conditions, suggesting an increase of proprioceptive control on the balance. *Implications/Impact on Rehabilitation:* Our results seem to confirm the hypothesis that asymmetric sport bring some postural changes and suggest the possibility to correct the altered load distributions with repetitive exercises that act on the plasticity of the tonic-postural system.

PO-1551

ASSOCIATION OF MUSCLE STRENGHT AND ATHLET'S PERFORMANCE

Dusa Marn-Vukadinovic
University Rehabilitation Institute Republic of Slovenia - Soca, Slovenia

Objective: To show a relationship between clinical measurements and activity/participation. *Method:* Athlets refered to rehabilitatinon after unilateral knee injury during recreation - with Tegner Activity Score (TAS) of ≥4 were involved. Objective outcomes were: range of the impaired knee motion (ROM), normalized thigh circumference difference showing muscle atrophy (MA) and muscle weakness determined by isokinetic dynamometry (peak torque deficit at 60°/s of knee extensors normalized according to the uninvolved side, PTD). These data were compared to perceived health domains of the Short Form Health Survey (SF-36) through Spearman correlation coefficient. *Results:* The activity level prior to injury of most of 78 participants (74 %) was rated at 5 or 6 according to TAS. They were 40 years old on average, injured during downhill skiing (37 %) and treated with arthroscopic surgery (47 %) after sustaining an anterior cruciate ligament injury only (23 %) or in combination with other ligaments or menisci tear (24 %). Patients were able to fully extend the knee and flex it more than 110° accept for 3 ones. Median MA was 2 cm (range 0–9.3 cm). PTD varied from 0.4 % to 88.6 %, median 30.9 %. Knee ROM or MA did not correlate with the SF-36 subscale scores. PTD was the only measurement showing a significant negative correlation with physical activity, body pain and social functioning (r ≥ 40, $p<0.01$). *Implications/Impact on Rehabilitation:* Knee muscle weakness is strong qualifier of activity and participation after sport injury.

PO-1552

INJURY PREVALENCE, INCIDENCE AND BALANCE IN RUGBY PLAYERS

Jaco Ras[1], Threethambal Puckree[2]*
[1]Sharks Rugby Medica,South Africa, [2]durban University of Technology, South Africa

Objective: This study correlated injury prevalence, injury incidence and balance in rugby players. *Methods:* Injury prevalence and incidence were determined using a retrospective and prospective survey on first year Sharks Rugby players. Postural stability as Sway Index (SI) and Limits of Stability (LOS) were tested pre and postseason using a calibrated Biosway portable balance system. The data was analysed using paired sample *t*-tests at $p<0$, 05 and Spearman's correlation co-efficient. *Results:* 75.5% participated, 71.4% were 18 years old, and 71.4% were White. Injury was prevalent in 43% of players and sustained by 83% of players during the season. The knee (25%) was most commonly injured. Injury prevalence was 1.18 per player compared to injury incidence of 1.52 per player with injury rate at 5.95 injuries per 1000 match playing h. The SI increased significantly ($p=0.034$) by 15% in the medial/lateral direction postseason compared to pre-season. The mean LoS direction control increased significantly ($p=0.000$) in all directions, especially in the forward direction (17%), post-season compared to pre-season, but remained poor (LOS<65%). Post-season backward/right LoS correlated significantly with injury prevalence (Spearman's rho=0.247; $p=0.027$), and injury incidence and limits of stability pre-test for forward/right direction (Spearman's rho=0.232; $p=0.031$). Risk factors for injury included the scrum-half (14.8%) playing position, lack of protective equipment (69%), right side (46%) of the body, and injuries during match (66%) especially in the 2nd half of the match (57%), during contact (67%), and rehabilitated injuries (69%). *Implication:* Static and dynamic balance training should be considered in injury prevention programmes

PO-1553

ONE MONTH AFTER ACL RECONSTRUCTION RECOVERY TO SPORTS

Tucoulou Tachoueres Yves, Jun Yang, Juan Chang, Jiancheng Xu
Gansu Provincial Hospital center of rehabilitation of sports, China

Objective: 1) By priority to establish a real and necessary classification of different phases of the rehabilitation at first. 2) Allowed a female athlete to do practice sport safely as soon as possible after ACL reconstruction. *Methods:* 1) To reawaken the quadriceps muscle 2) To fight against normal edema post operation and during or after every session of rehabilitation 3) To find the same extension before injury 4) To boost the stability of knee then exercise of walking 5) To improve efficiently knee flexion then exercises by bike 6) To run in a straight line 7) To skip rope 8) To restart doing sport and play badminton *Results:* 1) 4th day quadriceps muscle waked up against after operation 2) 5th day the stability of knee was right 3) 5th day the beginning of the walk without scratches 4) 7th day edema was controlled 5) 10th day made a full turn by bike 6) 16th day ran in a straight line 7) 21th day skipped rope 8) 30th day played badminton for the first time. Implication This method could let patients who practice sports get back to a normal life in one month after operation of ACL reconstruction (STG).Meaningful time of recovery is shortened comparing with international, domestic and traditional principles, and would bring more benefits to the society and economy.During the treatment, the rules that are safe and pain-free are fairly respected.

PO-1554

ASSESSMENT OF MUSCLE STRENGTH AND BALANCE ABILITY IN CHINESE ELITE SABRE FENCERS

Liancheng Wang
Department of Rehabilitation,Tianjin TEDA Hospital, Tianjin, China

Objective: Assessment of muscle strength and balance ability to find out weak muscles in Chinese elite sabre fencers in this study. *Methods:* Bilateral peak torque of flexors and extensors of knee in 8 sabre fencers of chinese national team, Average age 25.25±0.56 yrs, were tested isokinetically at speeds of 600/s and 2400/s, The trunk muscle strength were evaluated by isometric test. *Results:* (1) Knee: Compared with 2400/s, Peak torques of extensors and flexors significantly increased at 600/s ($p<0.01$);strength of extensors in 600/s of male fencers were significantly different between leading and trailing legs ($p<0.05$); Male fencer at 600/s and 2400/s bilateral knee flexor and extensor peak torque was significantly higher than female fencer; female knee flexor/extensor ratio at 2400/s were significantly higher than flexor/extensor ratio at 600/s (leading leg $p<0.01$trailing leg $p<0.05$); Female knee flexor/extensor ratio were lower than normal ($p<0.05$). (2) Trunk muscle: Male trunk muscle strength was significantly higher than female; Male rotation muscle strength were lower than normal. (3) stability of Balance index were normal. *Conclusion:* (1) Bilateral asymmetry in isokinetic knee muscle strength exists in male fencers, but not obvious in female fencers. (2)Weak muscles were knee flexor of female fencers and trunk rotation muscle of male fencers.

PO-1555

EFFECT OF NEW EXERCISE CONDITIONING LUNG'S PRESCRIPTION ON REHABILITATION THERAPY OF OLD COPD PATIENTS

Weibing Wu[1,2], Xiaodan Liu[1,2]

[1]School of Kinesiology, Shanghai University of Sport,China, [2]School of Rehabilitation Medicine, Shanghai University of Traditional Chinese Medicine, China

Objective: To explore the effect of new exercise conditioning lung's prescription on rehabilitation therapy of old COPD patients. *Method:* The subjects of this experiment are 48 COPD patients on stable phase who were divided into 2 groups randomly: exercise group (24 cases) and control group (24 cases). The exercise group practiced 30-45min pre time, six times pre week for six months, and the control group had no exercise with collective or individual scheme. The indexes of FEV1, FEV1/FVC, 6-min walking distance, dyspnea scores and St George's Respiratory Questionnaire were measured before and after 6-month exercise. *Results:* After six months new exercise conditioning lung's prescription, the exercise group showed increase in FEV1/FVC and 6-min walking distance ($p<0.05$), increase in FEV1 ($p>0.05$), increase in the individual amounts of o and I dyspnea scores, decrease in of activating ability score, living score and total score ($p<0.05$), and decrease in symptom score ($p>0.05$). The control group showed no significant change in these variables ($p>0.05$). *Implications:* New exercise conditioning lung's prescription has the positive effects on improving lung function, alleviating dyspnea symptom and improving life quality in COPD patients.

PO-1556

THE EFFECT OF CONSTRAINT-INDUCED MOVEMENT THERAPY ON UPPER LIMB FUNCTION IN HEMIPIEGIC STROKE PATIENTS

Hui Lin, Xiaoxi Gao, Ying Hao
AhanshanTanggangzi hospital, Anshan, Chia

Objective: To study the effect of constraint induced movement therapy (CIMT) on upper limb function in hemiplegic patient. *Methods:* Seventy-two hemiplegic stroke patients were recruited and divided into two groups: a treatment group (n=36) and a control group (n=36).All groups received routine rehabilitative treatment, including physical therapy, 2 times/day, 45 min /times; occupational therapy, 30 min/times; functional electrical stimulation 20 min/times; Acupuncture 20 min/times; mineral hydrotherapy, 15 min/times. Above treatment for 4 weeks. The patients in treatment group was also treated with constraint induced movement therapy. The Fugl-Meyer assessment (FMA),the modified Barthel index (MBI) were assessed before and after 4 weeks of treatment. *Results:* After 4 weeks of treatment all groups had significantly higher FMA scores and MBI scores, but the effect in the treatment group were significantly better than those in control group. *Conclusions:* Constraint induced movement therapy can more effectively promote recovery of upper limb function in hemiplegic stroke patients.

PO-1557

MOTION STEREOTYPE: VALIDITY OF VISUAL INVESTIGATION AGAINST SUR-FACE EMG

Ulrich Christian Smolenski, B. Bocker, A. Schwarz, N. Schwarz
School of Medicine, Jena University Hospital, Department of Physiotherapy, Germany

Background: In the present study evaluation methods, their results and reliabilities in the examination of muscular functions in motion control/stereotype motions according to JANDA (arm abduction, hip abduction, hip hypertension, trunk mobility) are checked. *Methods:* Two methods are compared: visual examination and measurement of muscular function using an 8-channel-surface-EMG (OEMG) with innovative/latest evaluation software. A random sample of n=20 test persons were examined. To assess the reliability of the measuring procedure, we tested the intrasession reliability of the OEMG, the intersession reliability of the OEMG by test – retest, and the validity of the OEMG by comparison with visual assessment. Main attention is focussed on the succession of activation of the different muscle groups and movement stereotypes, with the postulated activation sequence by JANDA. *Results:* the visual evaluation come to a clear ranking with small variation. The aktivation differences we find in interval time of msec. So it is better to tell the difference between the muscles. Important is not the sequence but starting muscle activation, the others vary. *Conclusion:* Aim is a clinical presentation of the succession of activation and a determination, which method is more appropriate for a reliable examination under everyday conditions and how reliably stereotype is assessed. The method is suitable for research investigations, for clinical diagnostic procedures and clinical application as bio-feed-back therapy.

PO-1558

WEIGHT LIFTING WITH THE ANATOLY METHOD

David Burke
Emory University School of Medicine, United States

Strength training, also known as resistance training is recommended by the American College of sports medicine, the American Heart Association with recommendations found for both men and women in a large spectrum of age groups. Studies have demonstrated that resistance training can lead to lean body mass, decreased fat mass, increased resting metabolic rate, and improved bone health. in addition, resistance training has been found, among the elderly population, could prove the ability to perform functional tasks and reducing the risk for chronic disease and mortality. As the health industry provides a variety of options for resistance training, some techniques have received more attention than others. In 2003 the United States patent was issued to a Russian inventor created a new apparatus and method for weight training exercise. Known as the Anatoly gravitational system, proponents have suggested that participants can using these techniques lift weights far in excess of those using other methods and can gain strength faster than in any other system. This case series reviewed the outcomes of 160 patients seen at one American clinic. patients ranging in age from nine years old to 65 years old were included. Initial weights lifted with the legs ranged from 300 to 800 pounds, with weights achieved after 10 sessions ranging from 800 to 1800 pounds. This initial exploration of this method provides evidence of remarkable weight training gains using this new method.

PO-1559

A STUDY ON FOCUSED ULTRASOUND TREAT SOFT TISSUE PAIN

Hong-Yu Xiao[1], Sheng Bi[1], Jun Li[1], Ling Ma[1], Yu-Kun Luo[1]
[1]Department of Rehabilitation Medicine Center Chinese PLA General Hospital, Beijing 100853, China, [2]Department of Ultrasound Diagnosis Chinese PLA General Hospital, Beijing 100853, China

Objective: To study the therapeutic effect of soft tissue pain by focused ultrasound. *Methods:* A total of 118 patients were treated and each part of the treatment time was 5 min. Visual analogue scale (VAS) was assessed at end of treatment. The average number of treatment was 8.3 ± 4.3 times. Paired t-test was used for statistical analysis, and significance level is $p<0.05$. *Results:* Shoulder adhesive capsulitis, forearm extensor and flexor tendinitis general, finger tenosynovitis, spine interosseous ligament injuries, back hip muscle fasciitis, knee ligament injuries, plantar and dorsum fasciitis on VAS before and after treatment were significantly different. Knee osteoarthritis on VAS before and after treatment were not statistically significant different. *Conclusion:* Preliminary observations indicate that focused ultrasound in the treatment of soft tissue pain showed better efficacy. It has a good application prospects in rehabilitation medicine, sports medicine and clinical treatment of pain.

PO-1560

ACHILLES TENDON RUPTURE POSTOPERATIVE THE CONSTANT VELOCITY REHABILITATION OBSERVED EFFECT

Xiaoxin Yang, Yiming Tang, Peilan Li, Zhongxia Jin, Haijian Mao
The Shanghai Sunshine rehabilitation center, China

Background: Traditional repair for Achilles tendon rupture has disadvantages of long cast immobilization times, poor outcomes and many complications. *Objective:* To explore the safety and efficacy of early isokinetic rehabilitation training for patients after repair of Achilles tendon ruptures. *Methods:* A total of 20 patients with Achilles tendon ruptures received treatments at the Department of Orthopedics, The Shanghai Sunshine rehabilitation center, from September 2009 to September 2012, were included. ten of them underwent 8-week isokinetic exercises by using lsomed-2000 at 4 weeks after tendon repair. the ankle range of motion, and extensor-flexor peak torque. *Results and Conclusion:* The follow-up averaged 6 months, ranging from 5 to 9 months. The results showed a significant improvement in the ankle range of motion and extensor-flexor peak torque ($p<0.05$). There were no infection or re-rupture cases. It is indicated that early isokinetic rehabilitation is safe and effective for patients with Achilles tendon ruptures at 4 weeks postoperatively. It provides evidence for early rehabilitation in patients with Achilles tendon ruptures.

PO-1561

THE BIOMECHANICAL RESEARCH OF DYNAMIC STRUCTURE AND STATIC STRUCTURE TO SHOULDER JOINT

Huifang Wang[1,2], Yubin Wang[2], Hua Zhai[1], Fang Cui[2], Yuedong Hao[2], Zongbao Wang[2], Chuanfu Wei[2], Zhenhua Li[2], Ke Zhan[2]
[1]Yangzhi Rehabilitation Hospital,Shanghai Sunshine Rehabilitation Center,China, [2]Shanghai East Hospital, China

Objective: To study the biomechanical effect of dynamic structure and static structure to shoulder joint. Method 1. sixteen upper limbs specimen from flesh adult corpse were tested by 3-dimensional motion analysis system, the change of glenohumeral ligment and coracohumeral ligment' lenth were measured, the motion of glenohumeral rotation was observed,the movement of humeral head was measured. 2. experimental group: nine traumatic anterior instability of shoulder patient, control group:ten volunteers. Electromyographic signal was registered with Biovision16, Contrex System-Top1000 was used to test. *Result:* 1. Resist external rotation influence of GHL have load-sharing effect, IGHL-AB was most important anterior structure to resist GH joint external rotation. Overage external rotation was the cause of shoulder pain and TASI. 2.IGHL posterior band was important to the posterior shoulder stability at abduction angle of 45° and 90°. IGHL injure will cause posterior shoulder instability. 3. sEMG of Serratus anterior muscle and supraspinatus muscle showed downward trend at most range of motion, Anterior deltoid lateral deltoid, infraspinatus and pectorals showed downward trend at some range of motion. 4. sEMG of Biceps showed upward trend at most range of motion, it may be Compensation Mechanism for anterior shoulder instability. 5. The peak torque, average power of abduction and external rotation was decreased sharply, ratio of external rotation and internal rotation peak torque was decreased. *Conclusion:* Dynamic structure (muscle, tendon) and static structure around shoulder joint are important to shoulder stability.The damage of two structures can lead to shoulder instability.

PO-1562

THE INVESTIGATION OF EFFECT AND DURABILITY OF SELECTED AEROBIC TRAININGS ON DYNAMIC BALANCE IN HEALTHY ELDERLY FEMALES

Mohammad Rahimi, Reza Rajabi, Mohammad Hosaine Alizadeh, Hashem Piri
Tehran university, Iran

Objective: Falling is a prevalent problem among the elderly people and the most important factor in elderly people falling is balance changing. Therefore, in traumatology and corrective exercises researches considering of this point will be useful. The purpose of this study was to investigate the effect of selected sport's exercises (with emphasizing on aerobic exercises) on dynamic balance of healthy elderly females of region 6 of Tehran municipality, after 8 weeks training and following with one period of 8 weeks detraining. *Method:* This study was semi-experimental type with design of post-test pretest and control group. In this study 60 healthy elderly females (mean age 41/3±95/62 Y, mean weight 11/7±8/67 kg, mean height 86/6±3/159 cm) were selected purposefully in first phase in region 6 of Tehran municipality at Golha and Aghaghia parks, after that their dynamic balance in three directions were tested using Y test (Y balance test). Then, subjects randomly divided in two equal control and experimental groups. The experimental group participated in an 8 weeks training program (3 sessions per week with emphasizing on aerobic training) and the control group accomplished the activity of daily living. 8 weeks after that pretest was applied from each of groups, succeeding that the experimental group training was ceased and 8 weeks after that Y test was applied again. Repeated measure ANOVA, One-way ANOVA, and Post-hoc tests were used for data analyzing. *Results:* Based on results, there was a significant difference between average reaching distance of experimental and control groups in all directions of Y test, not only in post-test phase but also in follow up phase (p 05/0≥). Also, we observed a significant difference between post-test and pretest of experimental group, but there was no significant difference between post-test and follow up test of experimental group. *Implications/ Impact on Rehabilitation:* The results indicate that the selected aerobic training used in this study have a positive effect on elderly female dynamic balance improvement. With regard to lack of improving in balance of control group, improvement in balance of experimental group can be attributing to this training. With regard to these study findings, it can be concluded that aerobic training with emphasizing on balance training can improve the balance of elderly females in an effective manner and have a noticeable role in living of healthy elderly females that troubling from balance problem. Because the aerobic trainings are simple and useable in different places especially in home and public environments such as parks and also they are inexpensive, they can be present as an alternative for balance training in water and clubs.

PO-1563

A CLINICAL STUDY ON SUSTAINED ELECTRICAL STIMULATION TO GAIT RECONSTRUCTION OF SEVERE STROKE PATIENTS

Rong Xu, Xiguang Li
Department of Rehabilitation, Nanjing Drum Tower Hospital the Affiliated Hospital of Nanjing University Medical School

Objective: Analysis the clinical effects of the sustained electrical stimulation (ES) on gait reconstruction. *Methods:* 48 of the first onset of stroke from Apr. 2010 to Jan.2012 as the pathology models.Implement Sustained ES on the quadriceps femoris in conventional training.Set determination distance as 10 meters. Measure the Maximum walking speed (MWS) and walking step numbers (WSNs) under ES and conventional therapy. *Results:* 3 patients can complete 10ms walking after ES who can not walk at the beginning of training. 1 patient can not walking after 6 months rehabilitation therapy in other hospital, but can walk with the help of orthosis after 1 month ES training. There are significant difference on MWS between None

ES and ES ($p<0.05$). But WSNs shows opponent ($p>0.05$). After the training program, all patients MWS are over 20 m/min, which could walk without using orthosis. Furthermore, neither the MWS nor the WSNs between None ES and ES has no difference ($p>0.05$). Compare the beginning of training, all patients MWS and WSNs are different ($p<0.05$). *Conclusion:* The Sustained ES has Positive effect to the hemiplegic stroke patients. It could accelerating there maximum walking speed and reducing the walking step numbers. But stimulation, with the improvement of the patients'walking ability, the stimulation showed a decreasing trend.

PO-1564

APPLICATION OF HEART SOUND SIGNAL FOR CARDIOPULMONARY EXERCISE TESTING IN MALE ATHLETES

Junzhi Sun

[1]Institute of Sports Medicine and Health, Chengdu Sport University, Sichuan, China, [2]Graduate School of Beijing Sport University, Beijing, China

Objectives: To observe the change rule of heart sound signal in cardiopulmonary exercise testing, so as to explore the possibility of the signal application in cardiac rehabilitation, athletes training and fatigue recovery. *Methods:* Sixteen subjects from the physical education department in Beijing Sport University (National Second Grade Athletes) were enrolled and evaluated. They performed on bicycle ergometer with increasing loads till fatigue. The initial load is 50 W, and it will add 50 W every three min till it reaches 200 W. The cardiac contractility change trend (CCCT), diastole/systole ratio (D/S ratio), ejection fraction (EF) and ventilation function were monitored during different exercise stages and recovery phase. The exercise cardiac contractility monitor, the color Doppler imagining and the exercise cardiopulmonary function analyzer were applied to examine. *Results:* The CCCT was significantly correlated with oxygen uptake during exercise and recovery. A positive correlation existed between the D/S ratio and EF before exercise testing. The maximum of CCCT and peak VO2 appeared at the instant after exercise. *Implications:* The heart sound signal (CCCT and D/S ratio) might be considered as a cardiac function indicator of monitoring and appraisal during cardiopulmonary exercise testing. However, the further expanded studies are expected.

PO-1565

THE EFFECT OF HYDROTHERAPY ON LOWER LIMB MUSCLE STRENGTH AND MUSCLE TENSION OF SPASTIC CEREBRAL PALSY CHILDREN

Bing Liang[1], Jie Bao[2], Dongmei Zhang[1]

[1]The Boai School of Soochow Industrial Park District, Soochow, China, 215021, [2]Sport and Physical Education School of Soochow University, Soochow, China, 215021

Objective: Researching the effect of hydrotherapy on improvement of spastic lower limb muscle strength and muscle tension in order to provide the scientific practice base for hydrotherapy of the cerebral palsy children. *Method:* According to study design, 12 children with CP randomly divided into control group and hydrotherapy group. C group of 6 children only choose the omprehensive treatment method, and H group of 6 children choose the hydrotherapy with the comprehensive treatment for 12 weeks. Evaluating the effect of each group therapy method with the Ashworth Muscle Tension Rating Scale and the Muscle Strength Rating Scale. *Results:* There were significant improvement of spasm lower limb muscle tension of the most case in H group ($p<0.05$), and the effect of some smaller gross motor muscle strength improvement is significantly better than control group ($p<0.05$). *Conclusions:* Hydrotherapy can significantly improve the spasm muscle tension and improve muscle strength with its unique thermal conduction and mechanical effect.

PO-1566

THE EFFECT OF HYDROTHERAPY ON LOWER LIMB GROSS MOTOR FUNCTION OF SPASTIC CEREBRAL PALSY CHILDREN

Jie Bao[1], Bing Liang[2], Dongmei Zhang[1]

[1]Sport and Physical Education School of Soochow University,Soochow,China,215021, [2]The Boai School of Soochow Industrial Park District, Soochow, China, 215021

Objective: Researching the effect of hydrotherapy on improvement of spastic lower limb muscle strength and muscle tension in order to provide the scientific practice base for hydrotherapy of the cerebral palsy children. *Method:* According to study design, 12 children with CP randomly divided into control group and hydrotherapy group. C group of 6 children only choose the omprehensive treatment method, and H group of 6 children choose the hydrotherapy with the comprehensive treatment for 12 weeks. Evaluating the effect of each group therapy method with the Ashworth Muscle Tension Rating Scale and the gross motor function of muscle with seated posture, four points knelt posture and stood posture. *Results:* There were significant improvement of spasm lower limb muscle tension of the most case in H group ($p<0.05$), and the rehabilitation time of improving their posture control from the seated balance to the four knelt balance or to the stood balance were significantly shorter in H group ($p<0.05$), and some case of H group could independently four knelt climb. *Conclusion:* Hydrotherapy can significantly improve the spasm muscle tension and promote the development of lower limb gross motor function with its unique thermal conduction and mechanical effect.

PO-1567

THE EFFICACY OF THERA–BAND STRETCH STRAP ON CALF MUSCLE WITH DELAYED-ONSET MUSCLE SORENESS IN HEALTHY INDIVIDUALS

Yuling Wang[1], Yanfei Xie[2], Qi Liang[1], Yafei Wang[1], Zhou Zhang[1], Zhiqin Xu[1]

[1]Department of Rehabilitation Medicine, The First Affiliated Hospital of Sun Yat-sen University,China, [2]Department of Rehabilitation Therapy, Zhongshan School of Medicine of Sun Yat-sen University, China

Objective: Calf muscle stretching programs are widely used in sporting, fitness, and rehabilitation settings to prevent the sport injuries and increase dorsiflexion range of motion at the ankle. The purpose of this present study is to investigate the effectiveness of the Thera-Band stretch strap on the delayed-onset muscle soreness (DOMS) on calf muscles compared to static stretching. *Methods:* Forty-five healthy subjects were recruited by poster from the university students. The DOMS was induced (day zero) by a bout of lengthening contractions until exhaustion; with a bilateral calf muscles in terms of gastrocnemius and soleus. All participants were randomized into three groups: Thera-Band stretch group ($n=15$), static stretch group ($n=15$), and a control group ($n=15$). Thera-Band stretch group performed the stretch by Thera-Band stretch strap one week stretching program with a dynamic contract-relax stretch for gastrocnemius and soleus. Static stretch group performed the stretching using the common strap without elastic and graded progression features. Both stretching group conducted 2 sessions for each muscle which were stretched 30 seconds, 10 times respectively per day. The control group recovered naturally with the same activities of daily living. All subjects were evaluated for dorsiflexion and plantar flexion range of motion (ROM) and muscle strength of two muscles of the

dominant-limb using the digital handheld dynamometer and inclinometer (HOGGAN Health Industry, Inc. US) before DOMS inducing exercises and at 8, 24, 48, 72, 96, and 120 h after the exercises. Pressure pain threshold (PPT), muscle soreness and lower leg girth were measured in the same assessment protocol. *Results:* The main findings of the study were that Thera-Band stretch group and static stretch group showed a reduction in DOMS symptoms in the form of greater muscle strength, less PPT, and muscle soreness ($p<0.05$) compared with the control group. But, there was no significant effect for ROM and lower leg girth ($p>0.05$) in the three groups. Repeated measure ANOVA revealed that the significant effects for PPT and muscle soreness during the whole protocol in Thera-Band stretch group. *Implications:* The evidence from this study suggests that dynamic contract-relax stretch by Thera-Band stretch strap could reduce DOMS symptoms on calf muscles.

PO-1568

NEW EVIDENCE OF THERAPY FOR STENOSING TENDOVAGINITIS OF RADIAL STYLOID

Luoxi Chen, Bo Liu
Sichuan Orthopeadic Hospital, China

Objective: To find an best selection of acupuncture point of radial styloid narrow tenosynovitis through an evidence-based way. *Methods:* On the basis of a full assessment of the patient's condition, develop search strategies, retrieving the literature (2002 to 2012) of the Chinese Journal Net database website and VIP website. according to the international Cochrane Collaboration Handbook standard. *Results:* 27 relevant literatures were retrievaled,which 2b level evidence was 4, 4 level evidence 21, and 5 level evidence 2,according to the evidence grading of the UK Cochrane Centre. *Conclusion:* Combination of the economic background and hysiotherapy conditions of the patients, the treatment programs of radial styloid narrow tenosynovitis was: the patients in remission over the course of two weeks-line can be acupunctured.And the acupuncture mainly selected Ashi points, yangsi (Jing-River Point,LI 5), Lieque (LU 7), and Hegu (LI4).

PO-1569

EARLY EXERCISE PROTECTS BLOOD-BRAIN-BARRIER AGAINST CEREBRAL ISCHEMIA-REPERFUSION INJURY

Yuling Zhang, Pengyue Zhang, Yongshan Hu
Departmentof Rehabilitation, Huashan Hospital, Fudan University, China

Objective: Early exercise within 24 h after stroke may reduce neurological deficits after ischemic stroke. However, mechanisms underlying this neuroprotection are yet unknown. Ischemic brain injury generated blood-brain-barrier (BBB) disruption, and then triggered a cascade of events such as oxidative stress and inflammation, leading to secondary brain injury and long-term neurological outcomes. This study assessed the hypothesis that early exercise protected BBB via suppression of matrix metalloproteinases (MMPs) and protection of tight-junction proteins (TJs) after ischemia. *Method:* Adult male rats were subjected to ischemia induced by middle cerebral artery occlusion (MCAO) followed by reperfusion and then randomly assigned to sham, early exercise (EE) or non-exercise (NE) groups. EE group rats ran on the treadmill starting at 24 h after ischemia, 30 min per day for 3 days. Neurologic deficits, Evans blue (EB) extravasation and electron microscopy for BBB function, and expression of MMPs and occludin were detected up to 3 days after reperfusion. *Results:* The data indicated that early exercise significantly improved BBB integrity and neurological status after ischemia, obviously suppressed ischemia-induced decreases of occludin and increases of MMP-9 and MMP-2. EE also diminished the infarct volume in ipsilateral hemisphere. *Implications/Impact on rehabilitation:* Our results demonstrate that early exercise was effective in protecting neurological disability against brain ischemic. And the potent protection conferred by EE was very likely achieved through improving BBB integrity. Acknowledgments: This study was supported by the National Natural Science Foundation of China (No. 81272169; 81171854; 81171855).

PO-1570

THE EFFECT OF PLYOMETRIC TRAINING ON THE VERTICAL LEAP OF UNIVERSITY VARSITY BASKETBALL PLAYERS

Lohindren Adorable[1,2,3], Christopher Alladin Caparino[1,2]*
[1]Sacred Heart Hospital, Philippines, [2]Southwestern University, Philippines, [3]Vicente Sotto Memorial Medical Center, Philippines, [4]Philippine Academy of Rehabilitation Medicine, Philippines

Objective: This study determined the effect of plyometric training on the vertical leap of university varsity basketball players. This study further determined the significant difference of the vertical leaps before and after five sessions; before and after 10 sessions, and after five and 10 sessions of plyometric training. *Methods:* Nine of sixteen qualified players made it to end of study. Baseline heights of vertical leap of the players were measured by letting them touch the vertically wall-mounted black Velcro tape with their chalk dust coated middle finger of the dominant hand for three trials. The plyometric training consisted of squatting, jump squatting, lateral jump squatting, and stair jumping in this order for two weeks at five sessions per week. Each exercise was performed for three sets with 30-second rest between sets; each set consisting of ten repetitions of exercise with the players carrying a pair of 10-pound dumbbells. The vertical leaps measurement after training was done just before the 6th training session and two days after the 10th session in the same manner as the baseline. The significant difference of vertical leaps were determined using paired *t*-test with *p* value set at 0.05 and degree of freedom of 8.0. *Results:* The differences of vertical leaps before and after five training sessions, before and after 10 sessions, and after five and 10 sessions are significant. *Implication:* Members of the rehabilitation team who are involved in sports medicine should always consider plyometric exercise in the training of athletes in team sports.

PO-1571

EFFECTS OF A CONTINUOUS COLD AND COMPRESSION ON EARLY POSTOPERATIVE OUTCOMES IN KNEE ARTHROSCOPY PATIENTS

Xie Qi, Hui Liu, Huang Hua-Yang, Wang Yu-Qing, Duan Jun-Feng
Rehabilitation Medicine Department,General Hospital of Guangzhou Military Command of PLA, Guangzhou, China

Objective: The aim was to evaluate the efficacy of a continuous flow cold and compression on the postoperative management of swelling and pain in in knee arthroscopy patients. *Methods:* Forty patients undergoing knee arthroscopy were randomized into continuous flow cold therapy group and traditional ice bag groups,with 20 patients in each group. Patients with major ligament reconstructions were excluded. The values of swelling and pain (visual analogue scale,VAS) in two groups were calculated and recorded. *Results:* After cold therapy of 24 h and 48 h, the values of swelling and sleep pain in continuous cold therapy group were significantly lower than those in control group ($p<0.05$). *Implications:* Continuous flow cold can be superior to tradition ice therapy in knee arthroscopy patients and should be an alternative strategy in knee arthroscopy patients.

PO-1572

EFFICACY OF MODIFIED CONSTRAINT-INDUCED MOVEMENT THERAPY FOR UPPER-EXTREMITIES IN PATIENTS WITH STROKE

Yue Zhang, Linying Zhang, Yizhao Wang, Hongtu Wang
Rehabilitation department,Huanhu hospital,Tianjin,China

Objectives: To assess the efficacy of modified constraint-induced movement therapy (mCIMT) for patients with upper-extremity motor disability after stroke. *Methods:* 50 hemiplegic patients with upper-extremity motor disability after stroke were randomly divided into conventional rehabilitation group (25 cases) and mCIMT group (25 cases). The patients in conventional rehabilitation group just accepted the conventional rehabilitation treatment such as positive and negative joint movements, functional electrical stimulation, neurophysiology treatment, neurodevelopment treatment etc. The patients in mCIMT group were trained (by shaping) the more affected extremity without restriction of movement of intact upper extremity for 2 h per day on the 25 week days during mCIMT period.Evaluators blinded to group designation administered primary (Wolf Motor Function Test, WMFT) and secondary (Fugl-Meyer motor assessment, FMA) outcome measures among the 50 participants before and after therapy. *Results:* Upper-extremity motor ability was improved after therapy in both group. In conventional group, the scores in WMFT and FMA after treatment were improved apparently as compared with those before treatment ($p<0.01$). In modified CIMT group, after treatment, WMFT and FMA scores were improved significantly ($p<0.01$). And the assessment scores in mCIMT group was obviously superior to those in conventional group ($p<0.01$). *Implications:* mCIMT is an efficacious method of improving movement function and use of the more affected arms of patients with upper-extremity motor disability after stroke. It can improve the affected arm motor function, activity of daily life and life quality of hemiplegia patients.

PO-1573

THE STUDY OF MOVING ELECTRICAL STIMULATION APPLIED TO THE CORRECTION OF HEMIPLEGIC GAIT

Jingguang Qian, Ke Rong
Nanjing Sport Institute, China

Objectives: In our country, Incidence of apoplexy is quite high. Hemiplegic gait is typical sequels of patients of apoplexy. This study compiles a control dialog box program to provide electrical parameters to control the moving electrical stimulation. Use the moving electrical stimulation instrument to correct the hemiplegic gait. *Methods:* Use Microsoft Visual C++ compiles a control dialog box program to provide electrical parameters to control the electrical stimulation. Those parameters based on the actual situation of the hemiplegia patients. So the moving electrical stimulation could be getting a good obvious effect. Choose 8 hemiplegia patients and use Motion Analysis motion capture system to obtain kinematics data basing on 35 markers according to the requirements of Lifemod software. Use Lifemod software to establish the dynamics model for the hemiplegia patients before and in the electrical stimulation respectively. the dynamics results can be got to tested the effect of the moving electrical stimulation. *Results:* The software of the electrical stimulation can provide different electrical parameters for different hemiplegia patients. It is the characteristics of convenience and accurateness. Use Motion Analysis to obtain the locus data from 8 hemiplegia patients successfully. The kinematics and dynamics datum, including the joint angle, length of a step, the muscles force of bad leg were improved. *Conclusion:* The degree of simulation of the model established by Lifemod and Motion Analysis is very high. The simulation can provide accurate datum for the study. Based on the analysis of datum from stimulation before and in the electrical stimulation, it is confirmed that the moving electrical stimulation instrument is effect for correcting the hemiplegic gait.

PO-1574

THE INFLUENCE OF AEROBIC TRAINING COMBINED WITH RESISTANCE TRAINING ON THE BLOOD LACTATE LEVEL OF TYPE 2 DIABETES

Jing Cheng, Wenliang Zhang, Fan Zheng, Suixin Liu
Xiangya Hospital of Central South University, China

Objective: The present study is to investigate the clinical significance of blood lactate level in type 2 diabetes and the effectiveness of aerobic training combined with resistance training therapy for type 2 diabetes. *Methods:* 80 type 2 diabetes outpatients with no complications and another 20 normal healthy people were recruited to observe the relationship between blood lactate level and type 2 diabetes. Then 38 of these 80 type 2 diabetes outpatients were subdivided into two groups randomly: the conventional therapy group (n=22) and the advanced exercise therapy group (n=16). The conventional therapy includes regular medication plus the guidance of diet and exercise, while the advanced exercise therapy adds aerobic training combined with resistance training (8 weeks, 36 sessions in total) besides the conventional therapy. Each exercise session includes: aerobic training at an intensity of 60-80% HRR (Heart Rate Reserve) lasting for 30-45 min (6 times/week during the first 4 weeks and 3 times/week during the last 4 weeks), and the following resistance training at the intensity of 50-55% 1RM (one Reception Maximum) for 15-30 min (3 times/week, 8 weeks). All the groups were asked to take the tests of fasting blood glucose (FBG) level, 2-h postprandial blood glucose (PBG) level, fasting insulin (FIN) level, postprandial plasma Insulin (PIN) level, total cholesterol (TC) level, high density lipoprotein (HDL) level, glycated hemoglobin (HbA1c) level, insulin resistance index (IRI) level and blood lactate (Lac) level before and after the intervention. *Results:* (1) The Lac level of diabetic group was significantly higher than normal control group. *Impact on rehabilitation:* (1) Blood lactate level could be used as a new clinical indicator for the type 2 diabetes. (2) The advanced exercise therapy (aerobic training combined with resistance training) is recommended for type 2 diabetes.

PO-1575

RESEARCH ON THE RETIRED SPORTSMEN KNEE OSTEOARTHRITIS WITH MASSAGE AND EXERCISE THERAPY

Pin Lv
Anhui Normal University, Wuhu, China

Objective: To observe the effect and mechanism of massage and exercise therapy on the retired sportsmen' knee osteoarthritis. *Method:* To divide 42 retired sportsmen with knee osteoarthritis with randomness into the massage group and training group by 1:1, each group has 21 cases. Massage group use traditional Chinese medicine massage therapy, and training group use trigger point massage combined with resistance exercise prescription in treating, before and after treatment, using the Lysholm score table (LKS) and Thera-Band elastic band respectively, assess the effect and knee muscle strength of 2 groups of patients with LKS. *Results:* Compared with before treatment, the LKS, knee muscle strength of the two groups were improved, the difference was statistically significant ($p<0.05$), Efficiency of the training group is 95.24%, efficiency of massage group is 85.71%; the efficiency improvement of practice group is better than the massage group in LKS, knee muscle strength, the difference was statistically significant ($p<0.05$). *Conclusion:* Quadriceps injury and weakness may be an important factor leading to the formation of knee osteoarthritis, trigger point massage combined with resistance exercise prescription therapy on the retired athletes' knee osteoarthritis has remarkable curative effect.

PO-1576

THE IMPACT OF OCCUPATIONAL THERAPY AND THERAPEUTIC EXERCISES ON ADL OF PATIENTS WITH HEMIPLEGIA

Jihong Wang, Wei Chen, Qiuyang Zhang
Xuzhou Center Hospital Rehabilitation Medicine, China

Objective: To observe the impact that the occupational therapy and Therapeutic exercises on activities of daily living (ADL) of

stroke patients. *Methods:* 60 patients with stroke were divided into two groups randomly. The group of 30 patients with Therapeutic Exercises, Occupational therapy at the same time a systematic treatment in the control group, only 30 cases of Therapeutic exercises. *Results:* The Group's activities of daily living (ADL) score was significantly higher ($p<0.01$). *Conclusion:* Occupational therapy is of great significance to improving ADL of stroke patients with hemiplegia and patient quality of life.

PO-1577

EFFECT OF ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION ON TEMPORAL PLANTAR PRESSURE VARIABLES DURING WALKING

Hongshi Huang, Yingfang Ao, Qinwei Guo
Institute of Sports Medicine, Peking University Third Hospital, China

Objective: To evaluate the change in temporal parameters for foot roll-over during walking following Anterior Cruciate Ligament (ACL) reconstruction. *Methods:* A prospective case-control study was performed in 12 unilateral ACL-deficient subjects before and six months after ACL-reconstruction. Subjects walked on footscan® system at a self-selected speed. Five events were used to divide stance phase into four time periods (initial contact phase, forefoot contact phase, foot flat phase, forefoot push off phase). The reliability of parameters was analyzed with intraclass correlation coefficient. *Results:* There was no significant difference in body mass, speed of walking before and after ACL-reconstruction. Intraclass correlation coefficients of all temporal variables during walking were above 0.76. A statistically significant shorter initial contact phase was found on the ACL-injured side following ACL-reconstruction. Symmetry index (SI) between both sides for initial contact phase showed a statistically significant improved from 50.7±18.6 before operation to 17.6±19.9 after ACL-reconstruction ($p<0.05$). A significantly longer foot flat phase was found on both sides after ACL-reconstruction (from 33.09±5.43 before operation to 37.68±6.27 after ACL-reconstruction on the injured side: from 30.61±7.01 before operation to 34.62±7.14 after ACL-reconstruction on the non-injured side). *Implications/Impact on rehabilitation:* Temporal plantar pressure variables were reliable to evaluate foot roll-over uring walking in ACL-deficient subjects. ACL-reconstruction improves temporal loading characteristics during walking. Dynamic pedobarography might therefore be a new tool to objectively document pivot and rotational abnormalities of both the ACL-deficient and ACL-reconstructed knee.

PO-1578

THE EFFECT OF LONG TERM TAI CHI EXERCISE ON CHINESE OLD MEN'S PHYSICAL ACTIVITY AND QUALITY OF LIFE

Jie Bao[1], Sheng Ma[2], Guoxiang Wang[1]
[1]Sports and Physical Education School of Soochow University, Soochow, China, [2]Soochow Sports Research Institute, Soochow, China

Objective: To determine the effects of long term Tai Chi exercise on physical activity level (PA) and quality of life (QOL) in old men. *Methods:* 32 male participants aged 60 years nd older were randomly selected to be divided into two groups, 16 participants mong them in Tai Chi exercise group (TE) had persisted in Tai Chi exercise at least for more than a year, others among them in control group (C) were used to do less or no exercise. Applied the international physical activity questionnaire (IPAQ) to evaluate weekly average physical activity and the SF-36 questionnaire to evaluate each dimension score of the quality of life (QOL). All the data would be analysed by Pasw 18.0. *Results:* (1) Weekly MPA (METs) and weekly TPA (METs) in IPAQ of TE group were significantly higher than those of C group with independent samples *t*-test analysis ($p<0.05$); (2) PF, BP, GH, VT, RE, PCS and MCS standard scores in SF-36 questionnaire were significantly higher than those of C group with independent samples *t*-test analysis ($p<0.05$); (3) PCS and MCS were linear positive related with TPA by linear regression analysis ($p<0.05$). *Conclusions:* Tai Chi exercise could improve the daily physical activity and the quality of life.

PO-1579

RELATIONSHIP OF PERCEIVED ENVIRONMENTAL BARRIERS AND DISABILITY IN COMMUNITY-DWELLING ELDERLY IN COMMUNITIES IN ONE SPECIAL MUNICIPALITY IN SOUTHERN TAIWAN

Wei-Chih Lien, Ta-Shen Kuan*, Nai-Wen Guo, Jer-Hao Chang, Shu-Min Chen
National Cheng Kung University, Chinese Taipei

Purpose: Craig Hospital Inventory of Environmental Factors (CHIEF) is one of few scales to assess perceived environmental barriers. To best of our knowledge, there was no study focusing on the role of perceived environmental barriers and examining multivariate predictors of disability in elderly. The purpose of the study is to assess the relationship of perceived environmental barriers and disability in community-dwelling elderly in communities in a special municipality in southern Taiwan. *Methods:* The data was collected by convenience sampling with 200 community-dwelling elderly from two communities located in East and North District of Tainan. The subjects who were diagnosed as having dementia or less than 8 points on the Short Portable Mental State Questionnaire and age less than 65 year-old were excluded. *Results:* Content validity index of all questions were above 90%. Spearman's correlation coefficient of test-retest reliability was above 0.90. Mean age was 75.8±7.2 year-old. For Hierarchy of the Care-Required (HCR), nondisabled was 42%, only instrumental activities of daily living impairment was 44%, 1-2 activities of daily living impairment was 12%. For the relationship of CHIEF and HCR, Spearman's correlation coefficient was 0.612 ($p<0.05$), and when setting Time Get Up and Go (TUG) as fixed factor, coefficient of determination was 0.703 ($p<0.05$). *Implications to Rehabilitation:* CHIEF was statistically correlated with HCR, even TUG as a fixed factor. We will continue to enroll case and complete factor analysis. The CHIEF adds a new tool for assessing the perceived impact of environmental barriers in research targeted toward community-dwelling elderly.

PO-1580

GRAPHICAL MODELING OF COMPREHENSIVE ICF CORE SETS FOR OSTEOPOROSIS

Feng Lin, Zhongli Jiang, Jie Liu
Rehabilitation Department, The First Affiliated Hospital of Nanjing Medical University, China

Objective: Based on the International Classification of Functioning, Disability and Health (ICF), this study was to explore infrastructure which embeded among functioning variables of osteoporosis. *Methods:* The 69 categories of comprehensive ICF core sets for osteoporosis were defined as variables. Graphical modeling was based on a convenience sample of 50 osteoporosis persons. The "least absolute shrinkage and selection operator" was used for mining conditional dependencies between the variables. Bootstrap resampling method and confidence interval approach were used to enhance the reliability and validity of model selection. R software and Pajek2.05 were used for modeling and analysis. *Results*: In the 69 items, there are 31 interconnected ones which organized into the maximal independent component in the functioning mapping. The main component contains three clusters which refer to self care, living trip and house work. There are four items, including s750 (Structure of lower extremity), s740 (Structure of pelvic region), b455 (Exercise tolerance functions) and e150 (Design, construction and building products and technology of buildings for public use), form a center

of the structure of the main component. This center serve as hub of the three clusters. *Implications*: Graphical modeling would reveal complex relational structures embeded in functioning categories. Such graph has clinical evidences and would provide clues for using ICF to guide clinical practices and scientific studies in osteoporosis.

PO-1581

DISRUPTION OF FRONTOPARIETAL NETWORK BY CONTINUOUS THETA BURST STIMULATION

Guangqing Xu[1], Yue Lan[2], Zhong Pei[1]
[1]Department of Rehabilitation Medicine, The First Affiliated Hospital of Sun Yat-sen University,China, [2]Department of Rehabilitation Medicine, The Third Affiliated Hospital of Sun Yat-sen University, China

Objective: Frontoparietal networks (FPNs) including regions of the posterior parietal cortex (PPC) and dorsolateral prefrontal cortex (DLPFC) have been implicated in visuospatial attention. Noninvasive brain stimulation, a powerful tool for inducing transient disruptions of neural activity in the cerebral cortex, may be useful in investigating deficits and interactions of visuospatial attention in frontoparietal fields. *Method:* The Attention Network Test (ANT) was used to test healthy subjects following continuous theta burst stimulation (cTBS) to the left or right FPNs. *Results*: During the ANT task, subjects exposed to cTBS to the right PPC responded significantly slower to spatial cues than subjects in the sham and left PPC cTBS conditions and showed deficits in both alerting and orienting indices. In addition, subjects exposed to cTBS to the left-DLPFC showed significant improvements in network effect indices compared with members exposed to the sham cTBS condition on alerting and conflict indices and significant deficits on the orienting index. Moreover, compared with subjects exposed to the sham cTBS condition, subjects exposed to cTBS to the right-DLPFC exhibited significant decreases in the efficiency of the alerting and conflict indices and significant increases in the orienting index. Furthermore, significant differences were observed in the alerting, orienting and conflict effect indices between those exposed to cTBS to the left-DLPFC and the right-DLPFC.in the orienting index. Furthermore, significant differences were observed in the alerting, orienting and conflict effect indices between those exposed to cTBS to the left-DLPFC and the right-DLPFC. *Conclusions:* These results suggest that the right DLPFC played a pivotal role in executive control process, whereas the right PPC was associated with orienting attentional function. The current study not only supports the model of inter-hemispheric rivalry for visuospatial attention, but also indicates inter-regional competition between the different areas of the FPNs.

PO-1582

TRADITIONAL FILIPINO MUSIC IN IMPROVING GAIT IN A PATIENT WITH PARKINSON'S DISEASE: A CASE REPORT

Rodolfo Jr. Estrellado, Teresita Joy Evangelista
Department of Rehabilitation Medicine University of the Philippines - Philippine General Hospital, Philippines

Objective: To examine if Rythmic Auditory Stimulation (RAS) with traditional Filipino music can be used in the rehabilitation of gait in a patient with Parkinson's Disease. *Methods:* Over the course of 3 weeks, the patient underwent 15 individual RAS gait training sessions for 1 h per session. The tempo for the song was set at 120 beats per min. Marching while sitting and marching in place while following beat of the music and tapping, walking, turning, starting and stopping synchronized to the beats of the music. The patient's gait and balance was assessed using the Tinetti Gait & Balance Assessment Tool and Get Up and Go Test and at the end of every week, patient was reassessed using the same outcome measures. *Results*: At the end of the first week, reevaluation using the same parameters with the Tinetti Gait and Balance Assessment Tool revealed an improvement from 11/28 to 21/28, indicative of moderate risk for falls. By the end of the second week, further improvement to 26/28 was noted, which indicates a low risk for falls. At the end of the first week, reevaluation using Timed Up and Go Test revealed an improvement to 17.9 seconds from 27 seconds, interpreted as good mobility with low risk of falls. At the end of the second week, further improvement to 9.78 seconds was noted, indicative of normal or low risk for falls. *Implications/Impact of Rehabilitation*: Rhythmic auditory stimulation with Filipino music can be used in this institution as part of rehabilitation of gait in patients with Parkinson's disease.

PO-1583

REVISITING CONSTRAINT-INDUCED MOVEMENT THERAPY BY EXERCISE PHYSIOLOGY APPROACH

Marcio Makoto Nishida, Moritani Toshio
Kyoto University. Graduate School of Human and Environmental Studies, Japan

Objective: To examine the possible physiological principles involved in the constraint-induced movement therapy (CIMT) described by Taub et al. *Method:* Literature review of CIMT, confronting the behavioral approaches of motivation, learned nonuse and interlimb inhibition hypothesis with physiological approaches of voluntary motor control, motor cortex feedfoward /propioception feedback and exercise training improvement hypothesis. *Results*: Although fMRI studies on adult stroke patients have demonstrated functional changes in cortical excitability, metabolic rate, and blood flow after CIMT (Schaechter et al., 2002), systematic review and meta-analysis are inconclusive about the improvement of disability with CIMT versus conventional physiotherapy treatment (Corbetta et al, 2010). There are few empirical evidence for behavioral theories to support CIMT and the experimental model of single forelimb somatosensory deafferentation appears to have not enough neurophysiological similarities with upper limb stroke disability to be used for an analogical comparison. *Implications/Impact on rehabilitation:* The author believes that the use of physiological principles could enhance the results of CIMT and would recommend an exercise physiology approach to further technique modifications.

PO-1584

THE EFFECT OF FOOT ORTHOSIS ON MUSCLE INJURY INDICATOR IN YOUNG ADULT WOMEN WITH BIOMECHANICAL ABNORMALITIES PRONATED FEET AND FUNCTIONAL LEG LENGTH DISPARITY

Maria Rachmawati, Angela Tulaar, Muchtarudin Mansyur, Ferial Idris Ismail
Indonesian Medical Association, Indonesia

Objective: Anyalyze the changes of the creatine kinase-MM enzyme concentrations after physical activity by using foot orthosis. *Method:* Double blind randomized clinical trials with controls. Research subjects were divided into 2 groups, namely using foot orthosis and not using foot orthosis. The whole subject examined the concentration of creatine kinase-MM enzyme before and 24-72 h after the walking test. The duration of walking test is 15 min with maximum speed. Preliminary study conducted on 6 subjects to determined the highest creatine kinase-MM enzyme concentrations 24-72 h after physical activity. *Results*: Based on preliminary studies obtained the highest concentration of creatine kinase-MM enzyme was 45 h after walking test. The Concentration of creatine kinase-MM enzyme before walking test on treatment group was 70.07 ± 15.33 IU, similar with the control group was 69.85 ± 17.03 IU (p=0.971). An increase in creatine kinase-MM enzyme concentrations 45 h after the walking test was less in the treatment group 7.8 ± 9 UI than the control group 22.0 ± 11.5 IU (p=0.001). Creatine kinase-MM enzyme concentrations continue to decline in the treatment group after the

second walking test 77.21 ± 17.47 IU, and after the third walking test 69.86 ± 11.88 IU (p=0.018). *Conclusion:* The foot orthosis for pronated feet correction reduced the Creatine kinase-MM enzyme concentrations, which is an objective indicator of skeletal muscle injury after walking activity. *Implication*: Physical Medicine and Rehabilitation doctors must be suggested young adult women who has biomechanical abnormalities using foot orthosis while walking activity to prevent muscle injury and decline leg muscle function.

PO-1585

MEASURING REHABILITATION OUTCOME IN POST-ACUTE HIP FRACTURED PATIENTS

Avital Hershkovitz[1]*, Arie Burstin[1], Riki Brown[1], Shai Brill[1,2]

[1]Beit Rivka Geriatric Rehabilitation Center, Israel, [2]Tel Aviv University, Israel

Objective: To assess rehabilitation achievements in post-acute hip fracture patients with various disability level *Design:* A retrospective study. *Setting*: A post-acute geriatric rehabilitation center. Participants: Hip fractured elderly patients admitted from January 2010 to may 2012. Main outcome measurements: Functional Independence Measure (FIM), the Timed Get Up and Go (TUG) test and the 'bed to chair' transfer FIM parameter. *Results:* 387 hip fractured patients: 149 (38.5%) intracapsular and 238 (61.5%) extracapsular fracture were included in the study. The study population was divided into three disability groups according to their admission disability level: high (admission FIM score <40), moderate (FIM 40-79) and low (FIM ≥80). The FIM instrument was found to be most sensitive in identifying functional change in patients group with moderate disability. Low disability patients received a higher average physiotherapy and occupation therapy treatment time/day, yet, achieved a lower mean FIM score change compared to moderate disability patients. When assessed by the TUG test, however, most patients (94%) improved their score: in 38 patients (71.1%) the relative improvement exceeded 31%, indicating a real change; 35.9% achieved a discharge score of <20 seconds. The high disability group achieved the lowest mean FIM score change. Yet, while on admission 52 out of 64 (81%) patients, required considerable help in transferring from bed to chair (FIM 1-2), on discharge the majority (69.2%) improved to the level of one man transfer (FIM ≥3); 41 (64.1%) were discharged home. *Conclusions:* Post-acute hip fracture patients exhibit variable functional ability. Assessing rehabilitation achievements with a disability measure is limited. It is therefore advisable to use an instrument most suitable to the patients' disability level.

PO-1586

A VIRTUAL INTEGRATED ENVIRONMENT AS A TOOL FOR MODULAR PROSTHETIC LIMB DEVELOPMENT

Briana N. Perry[1], Aimee L. Alphonso[1], Brett T. Monson[1], Robert S. Armiger[2], Paul F. Pasquina[1], Jack W. Tsao[3]*

[1]Walter Reed National Military Medical Center, Bethesda, MD USA, [2]John Hopkins University, Baltimore, MD USA, [3]US Navy Bureau of Medicine and Surgery, Washington, DC USA

Objective The virtual integrated environment (VIE) produces an on-screen, real-time simulated limb system via myoelectric input from an amputees residual limb. The VIE may be efficacious for training upper limb amputees to command and control an advanced modular prosthetic limb (MPL), which has the potential to restore full motor and sensory capability to upper-extremity amputees. *Methods:* A total of 6 unilateral, upper-extremity amputees were recruited from Walter Reed National Military Medical Center for participation in twenty VIE study visits. The primary endpoint with respect to efficacy of control was the proportion of participants achieving at least 80% accuracy in signal-to-motion accuracy. After achieving this threshold, a 33-year-old trans-radial amputee went on to command the MPL across twenty sessions. *Results:* 5 out of 6 (83%) subjects showed >80% sEMG signal-to-motion classification accuracy by the end of study participation. Motion classes achieved include wrist roation, wrist flexion/extension, hand opening, cylindrical grasp, and elbow flexion/extension. A participant with a wrist disarticulation also achieved pointer, lateral, and spherical grasps. The MPL participant improved classification accuracy from 48% to 79% across the assessment period. Successful use of MPL tactile feedback allowed for grasp discretion between soft and hard objects. *Implications/Impact on Rehabilitation:* The VIE can be used clinically as a screening and training device for advanced myoelectric prosthetics. Real-time pattern recognition and personalized signal-to-motion recordings allow for individualized prosthetic development. Findings from initial MPL use have the potential to inform better prosthetic design and restore motor and sensory function to upper-extremity amputees.

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OBSERVATIONAL STUDY OF SURVIVAL IN A COHORT OF PATIENTS RECEIVING INPATIENT REHABILITATION FOR CANCER RELATED DISABILITY

T Saotome, Steven Faux

Sacred Heart Rehabilitation Services & St Vincent's Pain Service, St Vincent's Hospital, Darlinghurst, Sydney, Nsw, Australia

Objective: The aim of this study was to examine the functional outcomes and factors associated with survival of cancer patients who received inpatient rehabilitation. *Method:* A retrospective audit of the hospital records from 2005 through 2011 was conducted to identify patients who received inpatient rehabilitation for cancer or its treatment. A consecutive sample of 45 patients was identified. Functional status was measured using the functional independence measure (fim). Length of survival was the number of days between discharge from the rehabilitation unit and date of death or censored at the end of the study period. *Results:* Significant functional gains were found in 34.9% Of patients. At the end of 2011, 31 patients had died, with an average survival time of 356 days (range 9-1,552 days). A significant difference in fim efficiency between those that died prior to 12 months and those who survived longer than 12 months was shown (1.01 V 0.14, p=0.050). *Implications/Impact on rehabilitation:* Those who survived longer than 12 months had higher fim efficiency, were more likely to be discharged home and less likely to have depression or anxiety. Response to inpatient rehabilitation may be an indication of a positive prognosis for survival in for cancer patients and may assist rehabilitation physicians in selecting appropriate cancer patients for inpatient rehablitation.

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