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LETTER TO THE EDITOR

COMMENTS ON: INFLUENCE OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION ON SPASTICITY, BALANCE, AND WALKING SPEED IN STROKE PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

Lin et al. (1) recently conducted a systematic review and meta-analysis to evaluate the influence of transcutaneous nerve electrical stimulation (TENS) on spasticity, balance, and walking speed in stroke patients. The review includes 7 randomized clinical trials (RCTs).by Park et al., 2014; Kim et al., 2013; Cho et al., 2013; Yan & Hui-Chan, 2009; Ng & Hui-Chan, 2007; Chen et al., 2005; and Burridge et al., 1997 (see Table I and references 11–16, and 21 in the review (1)). Some processes in this review have been conducted incorrectly and reported ambiguously, resulting in ambiguity and misleading findings, as explained in detail below.

First, in the final paragraph of the introduction, the authors mention that ''some relevant RCTs have shown that the TENS does not improve spasticity and walking speed''. This statement is referenced with 3 RCTs (Burridge et al., 1997, Ng & Hui-Chan, 2007, and Kim et al., 2013), all of which, in fact, show that electrical stimulation significantly improved the spasticity and walking speed.

Secondly, the review was reported according to the PRISMA statement. However, the inclusion criteria are ambiguous. They do not sufficiently follow the PICO format (P: participants, I: intervention, C: comparison, O: outcomes). The authors state the inclusion criteria as: patients with stroke who were able to walk and underwent TENS or placebo TENS, and the study design was a RCT. Although the authors state that the review aims to examine the influence of TENS on spasticity and walking speed, the inclusion criteria do not demand that the studies measure spasticity or walking speed. The included articles were RCTs that compared the effect of different types of electrical stimulation as a single intervention or adjunctive therapy in comparison with placebo electrical stimulation.

Thirdly, the authors do not sufficiently report the methods of data handling and combining results into meta-analysis. For example, 1 of included articles (Ng & Hui-Chan, 2007) has 4 groups. The data processing for multi-intervention or control groups studies is not reported.

Fourthly, although spasticity is a major subject of this review, the authors ignore spasticity measurements in included articles, such as composite spasticity score, tibial F max/M max ratio, H-reflex latency, and H-reflex recovery curve. The measurement of spasticity based mainly on modified Ashworth scale (MAS) is not sufficient (2, 3). Furthermore, the review does not consider ankle muscle force measurements. Ankle muscle strength is correlated strongly with balance, walking endurance, gait symmetry, and walking speed in stroke patients (4–6).

Fifthly, one of the included articles applied different forms of electrical stimulation other than TENS. Burridge et al. (1997) applied functional electrical stimulation, and Chen et al. (2005) applied surface electrical stimulation.

Finally, one of the included articles in the ankle MAS meta-analysis (Kim et al., 2013) measured the MAS for the upper extremity joints.

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The authors of the original articles (Lin et al.) were given the opportunity to comment in response to this Letter, but chose not to do it.

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