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CLINICAL REPORT

A Questionnaire for the Assessment of Pruritus: Validation in Uremic Patients

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A questionnaire was constructed for the evaluation and measurement of pruritus. The questionnaire, based on the short form of the McGill Pain Questionnaire, was tested in 145 patients suffering from uremic pruritus and currently undergoing hemodialysis treatment in 3 centers. The newly developed questionnaire proved to be reliable and provided valid data on the sensory, affective and overall intensity of uremic pruritus. The data suggest that uremic pruritus tends to be prolonged, frequently intense and a major source of distress to the patient. Dialysis was not found to influence the pruritus. The questionnaire may also be useful in pruritus secondary to other causes. ***Key words: itch: questionnaire, uremic pruritus.***

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Pruritus is a major symptom in a variety of dermatological conditions as well as in systemic disorders such as uremia, chronic hepatic obstruction and lymphomata (1). Despite the clinical importance of pruritus there is a lack of studies evaluating the sensory and affective dimensions as well as the assessment of this very troubling symptom. Most studies provide data only on the intensity of the sensation of itch, with no data on the quality (2–4). The sensations of itch and pain have a lot in common. Both are unpleasant somatosensations that elicit distinctive behavioral responses and are transmitted by C-nerve fibres (5). The McGill Pain Questionnaire (MPQ) (6) has become an accepted world-wide test for the measurement and evaluation of the different dimensions of pain. Recently, Darsow *et al.* (7) developed a structured questionnaire based on the MPQ; however, they did not evaluate it in any published study. Uremic pruritus is one of the most common and potentially disabling symptoms in patients with end-stage renal disease, with approximately 60–90% of patients on long-term maintenance dialysis suffering from this problem (3, 8, 9). In spite of this, there are few studies evaluating the clinical characteristics of uremic pruritus.

Therefore, a questionnaire was constructed for the evaluation and measurement of pruritus, based on the short form of the MPQ (10), and this study examined its validity in uremic patients and its usefulness in characterizing the pruritus in these patients.

MATERIALS AND METHODS

Subjects

Of a total of 264 uremic patients receiving hemodialysis treatment in 3 centers who were screened for pruritus, 42 patients were excluded because of communication problems and the patients' refusal. In total, 145 uremic patients, who were documented as suffering from uremic pruritus, agreed to complete the questionnaire. The study was authorized by the ethics committee of the respective centers. Each Hebrew-speaking subject was approached by a single investigator (IZ) and asked to agree to complete the questionnaire during a personal interview after giving informed consent.

For the purpose of this study uremic pruritus was defined as pruritus appearing in close conjunction with the commencement of dialysis, or appearing in conjunction with significant deterioration in renal function or during dialysis with no evidence of another disease that could be a possible explanation for pruritus.

Pruritus was defined as:

(a) at least 3 episodes of itch during 2 weeks or less, the itch occurring several times a day, lasting for more than 5 min and being bothersome;
(b) an intermittent itch over a period of 6 months or more, with a cyclical appearance, but with a lower frequency than in (a);
(c) pruritus in the past was defined as pruritus that disappeared at least 6 months before the time of the study.

The questionnaire

The short form of the MPQ (10) was used as the basis for the construction of a pruritus questionnaire. The following is a short description of the questionnaire.

(A) *Personal data*: This section includes personal data, past history and medical history.

(B) *Pruritus history*: The history of pruritus contains the following items:

i) Does the patient suffer from pruritus at present (during the last 5 months) or did he/she suffer from it previously?
ii) When does it appear? (daily, weekly, fortnightly or monthly)
iii) What is its duration?
iv) Open questions regarding the circumstances of the initiation of pruritus, and its cessation, as well as accompanying symptoms, such as pain, sweating, headache, heat sensation and cold sensation. Circadian changes in the appearance and pattern of pruritus.

(C) *Current antipruritic medications*: The various medications were documented and their efficacy was marked as follows: 1 = no effect, 2 = short-term effect (less than 24 h), and 3 = long term effect.

(D) *Effect on sleep*: Patients were asked to rank the effect of pruritus on sleep with 3 descriptors (almost always, sometimes, never) in the following categories: difficulty in falling asleep, disturbance of sleep by pruritus, and the requirement of soporifics.

(E) *Effect of pruritus on daily activities and habits*: Patients were asked to evaluate the effect of the daily activities and physical conditions on their symptoms; whether caused an increase in the intensity, did not affect or relieved their itch.

(F) *Coping with pruritus, and quality-of-life measures*: The patients were questioned regarding the effect of pruritus on mood, behaviour,

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ability to concentrate, change in appetite and sexual desire and function.

(G) *Verbal descriptor scale of itch sensation and affective dimension*: A set of words, which were used by more than 80 historical cases of patients suffering from generalized pruritus to characterize their itch sensation, was selected as descriptors. The following 6 words were most commonly used to describe the sensation; tickling, stinging, crawling like ants, stabbing, pinching, burning. Another set of 4 words, which were most commonly mentioned by patients suffering from pruritus, was used to characterize the affective dimension of the itch: bothersome, annoying, unbearable, and/or worrisome. Each descriptor could be ranked on an intensity scale of 0 = none, 1 = mild, 2 = moderate, and 3 = severe. For the 6 parameters describing sensation an index of sensation was calculated as the sum of all parameters divided by the maximum possible number 18. For the 4 affective parameters an index of affect was similarly calculated. The questions regarding sensory and affective dimensions referred to pruritus during the last half year.

(H) *Severity of pruritus*: The severity of pruritus was assessed by a visual analogue scale (VAS) for 4 different temporal states; at present, i.e. at the time when the patient was being examined, at the time of the worst pruritus, at the time when the condition was in the best state, and at the time of the strongest itch after a mosquito bite. A VAS was constructed consisting of a 10 cm line anchored at one end by a label "no itch" and at the opposite end by a label "very strong itch, as bad as could possibly be" (2, 11). The subject was asked to mark the intensity of the itch in the aforementioned situations.

(I) *Area of itch*: The patient was asked to mark the areas where he or she usually itches on a body diagram so that the percentage of area of skin affected by pruritus could be calculated using the rule of nines, which divides the body surface into areas of 9%, and is used clinically to assess the severity of burns (12).

Statistical analysis

All statistical analysis was carried out using SPSS 8.0. Frequencies and descriptive statistics are presented. For quantitative variables satisfying the normality condition, 2-sample *t*-tests and Pearson's correlation were used, otherwise the Mann–Whitney *U*-test and Spearman's correlation were used, respectively. Since there were only 28 subjects for revalidation, the Wilcoxon sign rank test was used on the VAS scores. McNemar's test was used to determine whether there were any significant differences with regard to site of itch. Statistical significance was achieved at $p < 0.05$.

RESULTS

Evaluation of the questionnaire in uremic pruritus

Patient characteristics. Out of the 145 patients analysed, 105 patients (88 men and 57 women) complained of itch at the time of the study and 40 gave a past history of uremic pruritus. The mean age was 62 ± 13.5 years (range 33–92). Dialysis duration was 4 ± 4.1 years. Most patients had suffered from pruritus for periods ranging from 1 to 6 months (43%), 19% between 6 and 12 months and 30% had suffered for more than 1 year. Most patients (46%) suffered from daily itching bouts, 37% suffered from weekly bouts and 15% suffered fortnightly; only 2 patients had a low frequency, once monthly.

Only 5% of patients complained of other symptoms associated with the itching: two reported sweating, one headache, two felt warmth and one complained of a cold sensation.

Antipruritic therapy. The majority (58%) of the pruritic patients were not receiving any current antipruritic treatment. The most common treatment was oral antihistamines (24%): 90% of these patients were on sedative H_1 blockers (hydroxyzine). Topical antipruritics were used by 18% of the patients, including corticosteroids in 7 patients, fatty ointments in 4 patients and counterirritants (menthol 1% and calamine lotion) in 4 patients. Phototherapy with ultraviolet-B (UVB) light was given to fewer than 2% of the pruritic patients. The 24 h efficacy of treatments, as reported by the patients, was very effective in 24%, partially effective in 51%, not effective in 13%, and 12% were unable to respond.

Effect on sleeping. In most patients (60%) pruritus was aggravated during the night-time, whereas only 6% reported aggravated pruritus during the daytime ($p < 0.001$). Forty-six per cent of the patients reported that sleep alleviated their itch. It can be assumed that some patients who suffered itch in the night had their itch alleviated after they fell asleep. Pruritus was a frequent cause of difficulties in falling asleep in 33% and an occasional cause in 28% of the patients. Twenty per cent of the patients were frequently awakened by the itch and 24% occasionally. Soporifics (benzodiazepines: lorazepam and diazepam) were used by 23% of the pruritic patients.

Effect of daily activities. The major aggravating factors reported were: rest (57%), dry skin (42%), heat (35%), sweat (33%), clothing (19%), psychological stress (19%) and food (13%). Thirteen per cent reported that itch was aggravated in relation to the duration since previous dialysis treatment. The major alleviating factors were: activity (57%), hot shower (44%), cold shower (39%) and cold ambient temperature (28%).

Effect of dialysis. Most patients (62%) did not note any effect of dialysis on the itch. In 19% of patients dialysis aggravated the itch and 7% reported that the itch appeared solely during dialysis, whereas 11% of patients reported that itch was reduced during dialysis.

Effect on mood. Fifty-two patients (36%) reported nervousness due to pruritus, and 12 patients (8%) reported depression related to pruritus. Pruritus did not have any effect on mood in 52% of the patients.

Itch intensity scaling. The intensity of itch using the VAS is shown in Fig. 1. There was no relationship between gender, age and itch intensity.

Sensory and affective scores. The average sensory score was 0.42 ± 0.13, and the affective score was 0.6 ± 0.19. The most common sensory descriptors for itch were "crawling" in 40%, "stinging" in 39% and "tickling" in 15% of the patients. The most common affective descriptors during itch were "bothersome" in 80%, "annoying" in 68% and "unbearable" in 33% of the patients.

A correlation was noted between affective score and VAS during the worst state of the itch ($r = 0.58$, $p < 0.001$). A low direct correlation was noted between sensory score and affective score ($r = 0.39$, $p < 0.001$). No correlation was noted between sensory score and VAS.

Site of pruritus. The pruritus was symmetric in 116 patients (80%). The mean body area involved was $37 \pm 37\%$ (range 10–97%), with the most common pruritic sites being the back (69%), head (44%), abdomen (46%) and arms (43%).

Revalidation of the questionnaire

In patients ($n = 28$) in whom the questionnaire was repeated after 2 weeks there were no significant differences regarding VAS in all 4 temporal states (Wilcoxon rank test). There were also no significant differences between the 2 questionnaires as regards the site of the itch (McNemar test). Comparison of

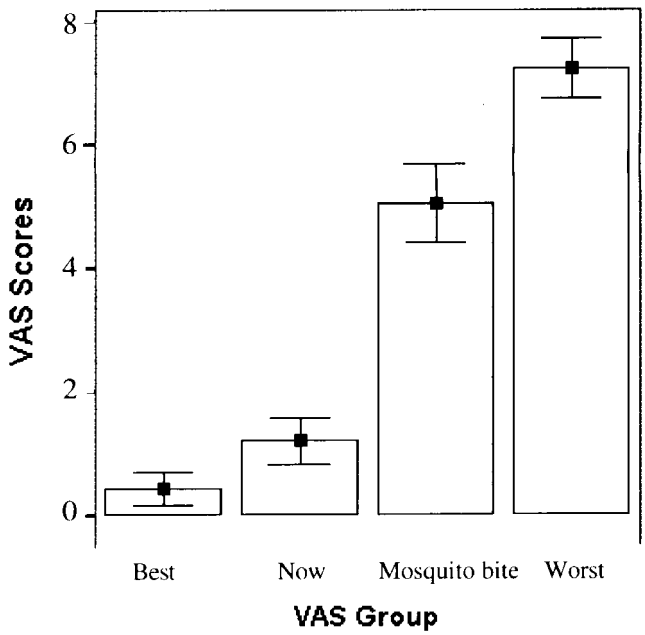

Fig. 1. Pruritus intensity using a visual analogue scale (VAS) (0–10 cm) in 4 temporal states in 145 patients with uremia: now, during the interview; best, at the time when the condition was in the best state; worst, at the time of the worst pruritus; mosquito bite, at the time of the strongest itch after a mosquito bite. Columns show mean VAS. Error bars show the 95% confidence interval (CI) of the mean.

the repeated VAS test with the original showed the test reliability to be high ($r = 0.72$, $p < 0.01$).

DISCUSSION

In 1978 Melzack & Katz developed the McGill Pain Questionnaire (MPQ). It has been translated into several languages and revalidated, and has become an important tool for the clinical evaluation of pain (13). A revised short form of the MPQ, which contains 3 parts, 15 words for pain description, and a verbal intensity scale of 5 levels, was later utilized (10, 13). In this study a structured questionnaire was developed for evaluating itch, based on this form. The current questionnaire differs significantly from a recent questionnaire developed by Darsow *et al.* (7) based on the long form of the MPQ. Although the latter questionnaire is more informative in itch description, providing 80 adjectives for itch sensation and affect compared with 10 in the present questionnaire, it does not evaluate the effect of daily life habits and physical activities on itch, nor does it evaluate the effect of antipruritics. Furthermore, it does not evaluate the effect of itch on measures of quality of life and only assesses itch intensity during the current interview, whereas the present questionnaire assesses itch intensity in 3 additional temporal states. The information elicited from this questionnaire could provide invaluable data on temporal features (onset, pattern, course), location, severity, characteristics (crawling, stinging, tickling), and exacerbating and relieving factors of itch. This questionnaire was relatively easy to use and may be utilized to provide comparative information on differences between uremic itch and that of other pruritic states (14).

Few studies have described the clinical characteristics of uremic pruritus. Ståhle-Bäckdahl described the itch location and intensity in 77 hemodialysis patients based on interviews (3). However, she did not provide detailed information as to what questions were asked. Gilchrest *et al.* (9) performed an itch survey in 237 hemodialysis patients based on a self-reported itch questionnaire. Only 50% of the questionnaires were completed and returned. The questionnaire was short and not detailed; for example, the patients had only 2 options to describe their itch location: pruritus on part of body, or pruritus all over the body. Neither of the above studies evaluated the sensory and affective components of the itch.

Several clinical characteristics reported by the pruritic patients have previously been related to uremic pruritus, such as dry skin (8, 15). The most prevalent body sites such as the upper back, forehead and arms have been documented previously (3, 8). The questionnaire enabled the assessment of the interference of pruritus with the activities of everyday life and provided important information on factors aggravating and relieving the itch. Of special interest is the finding that 35% of the patients reported that heat increased their itch, yet 44% reported that hot showers alleviated it. Possible explanations may relate to the flow of water causing relief of the itch, similarly to patients reporting relief from cold water. Another possible explanation is that different temperature ranges have different effects on the itch; moderately warm temperatures (as in hot ambient temperature) increase it, while temperatures around 40°C (hot shower) relieve it by stimulating pain fibres, thus creating a block effect explained by the gate theory (16).

The ability to quantify relevant dimensions of chronic itch is of prime importance in patient management and allows an objective assessment of the response to treatment. Some forms of pruritus may respond better to certain therapeutic agents than others and one should be able to document these responses.

The current study demonstrates that uremic pruritus causes significant suffering and disturbs the quality of life. Two important aspects related to quality of life, working capacity and sexual function, could not be accurately evaluated owing to the general effect of dialysis on these factors. The current study provides data on the effect of pruritus on common behavioural markers of suffering such as disturbed sleep, nervousness and depression. However, in populations suffering from chronic pain such as cancer patients the interrelationship between these behavioural factors was much higher than in the present study (17). The high correlation found here between the affective score of pruritus and the VAS of the worst itch is not surprising. Gupta *et al.* (18) have shown a relation between depression, as expressed by a rating scale for anxiety, anger and depression, and pruritus severity. The sensory index was found to be less sensitive as a quantitative tool and did not correlate to the VAS. These findings differ from the study by Melzack (6) on pain and from a study in psoriatic patients (14) and the authors' unpublished data in patients with atopic dermatitis and chronic urticaria.

The questionnaire used in this study, originally written in Hebrew, has now been translated into English, and thus it may provide a basis for future cross-cultural studies of itching. Such studies have already been conducted in Singapore with patients of Chinese, Malay and Indian ethnicity (14).

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