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Validation of Self Report Version of the Leeds Assessment of Neuropathic Symptoms and Signs Score for Identification of Neuropathic Pain in Patients from Northern Turkey*

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A – research concept and design; **B** – collection and/or assembly of data; **C** – data analysis and interpretation; **D** – writing the article; **E** – critical revision of the article; **F** – final approval of article; **G** – other

Abstract

Background. Diagnosis and treatment of neuropathic pain is an important clinical problem.
Objectives. A self report version of the Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS) score provides identification of neuropathic pain without the help and need of a clinician. We targeted validation of the S-LANSS score in the nothern Turkish population in this study.
Material and Methods. For the linguistic validation of S-LANSS, translation and back-translation method was used to adapt S-LANSS into Turkish and a cognitive-debriefing test was performed. A total of 148 patients were enrolled in the present study. S-LANSS, The Leeds Assessment of Neuropathic Symptoms and Signs (LANSS), Visual Annalogue Score (VAS) and Neuropathic Pain Questionnaire (NPQ) were performed twice for every patient. The patients were examined and diagnosed as having nociceptive or neuropathic pain by neurologists, who were blind for S-LANSS, LANSS and NPQ scores of the patients.
Results. Results of the McNemar test indicated that S-LANSS scores were reliable when the first and the second scores were compared. The sensitivity and specificity of the scale were found to be 98% and 97% respectively.
Conclusions. We believe that using S-LANSS scores for the diagnosis of neuropathic pain may help our colleagues as a tool for a quicker differential diagnosis of pain in daily practice (**Adv Clin Exp Med 2014, 23, 4, 599–603**).

Key words: S-LANSS, neuropathic pain, validation.

Chronic pain is a common symptom of neurologic disease. İts etiology and pathophysiology is either neuropathic or nociceptive pain. [1, 2]

Diagnosis and treatment of neuropathic pain is an important clinical problem. The Leeds Assessment of Symptoms and Signs of neuropathic (LANSS) pain scale [3] and neuropathic Pain Questionnaire (NPQ) [4] known as neuropathic pain scales have been developed to assess symptoms and signs of neuropathic pain in a clinical setting. LANSS pain scale is a simple measurement tool involving 7 items. LANSS is used for identifying patients whose pain is dominated by neuropathic mechanisms and has been tested in various clinical settings [5, 6]. Each item is a binary response (yes or no) to the presence of symptoms (5 items) or clinical signs (2 items). NPQ has been developed to function as a diagnostic and measurement tool. It is used to assess the intensity of 12 neuropathic symptoms and uses discrimination of function coefficients to arrive at a total score. NPQ requires complex calculations to score and has not been validated against treatment changes [4]. NPQ's ability to discriminate between

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pain types is less than that of the LANSS pain scale [3, 4]. On the other hand, neuropathic pain scale (NPS) and neuropathic Pain Symptom Inventory (NPSI) are not designed to distinguish neuropathic and non-neuropathic pain [7, 8].

LANSS pain scale has been used widely since it was published. Moreover, Turkish version of LANSS pain scale was made by Yücel et al. [9]. Large scale research on LANNS is unlikely, because application is confined to clinicians.

Self report version of the Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS) is a pain scale that provides transmission of patient's complaints to patient's own and the physician. S-LANSS has been used and validated for the first time by Bennett and colleagues [10]. The first Turkish validation of the S-LANSS score was presented by Koç and Erdemoglu [11]. The aim of the present study is to assess the sensitivity and specificity of the Turkish version of S-LANSS score in discriminating neuropathic and nociceptive pain among patients living in northern Turkey. We believe that S-LANSS is a useful scale for clinicians and the widespread use of the Turkish version will provide substantial benefit.

Material and Methods

After approval of the study by Ondokuz Mayis University Faculty of Medicine local ethical committee, 148 patients (86 male and 62 female, ages between 17 and 83 years) who admitted to the Neurology Department of Ondokuz Mayis University Faculty of Medicine between January 2006 and March 2009 were enrolled in this randomized, double-blind study. Differential diagnosis of patients in respect to neuropathic or nociceptive pain was based on medical history, physical examination, quantitative, sensorial tests, electromyography, laboratory examinations, and imaging techniques wherever indicated.

The eligibility criteria for patients included complaints in the nature of neuropathic pain for at least one year. Volunteers with pain complaints other than neuropathic pain were included also. They did not have any neuropathic pain symptoms and were not diagnosed with neuropathic pain in the previous six months. Both the patients and the volunteers were eligible only if they did not have any cognitive impairment or psychiatric disorder that disrupted cognitive functions or changes of perception of reality. Patients and volunteers who did not provide these conditions were excluded from the study.

Study Design

S-LANSS pain scale was translated from English to Turkish by the research team, it was translated back to English by an independent person, then original questionnaire and back-translation were compared by a research team and a second version of Turkish S-LANSS questionnaire was prepared. Subsequently, this questionnaire was evaluated in a cognitive perspective by analyzing a small number (n = 10) of patients and healthy volunteers in parallel two stages by research team (cognitive debriefing). Third version of Turkish S-LANSS questionnaire obtained after this process was used in this study.

For clarity assessment of the Turkish S-LANSS questionnaire, the following Clarity Assessment Form was filled out by the first ten patients and five healthy volunteers included in this study and by the physicians who evaluated the questionnaire.

A. I understand the questions clearly /He-she understands the questions clearly.

B. I have difficulty in understanding the questions/He-she has difficulty in understanding the questions.

C. I understand a part of the question/ He-she understands a part of the question

D. I hardly ever understand the question/ He-she hardly ever understands the question.

E. I don't understand the question/ He-she does not understand the question.

Turkısh S-LANSS, LANSS, NPQ pain scales were performed twice in a short period of time (minimum 3, maximum 7 days) to those with neuropathic pain and nociceptive pain. In addition, clinical evaluation was performed in each of the two stages by a doctor. Doctors evaluating patients clinically and evaluating pain scales (S-LANSS, LANSS, NPQ) were blind.

Statistical Analysis

NCSS 2007&PASS 2008 Statistical Software (Utah, USA) programs were used for statistical analysis of the findings of this study. Cronbach's Alpha coefficient calculated with Kuder Richardson 21, Cohen's Kappa harmony, Mc-Nemar test, Spearman's correlation analysis were used for validity and reliability analysis. Pearson correlation analysis was used to evaluate correlations with other scale scores. Diagnostic screening tests were performed in evaluations according to cut-off points.

Results at 95% confidence interval, significance at $p < 0.05$ level was evaluated.

Results

Of the 148 patients who were evaluated, 99 were classified with neuropathic pain and 49 with nociceptive pain (Table 1). While gender distribution of patients did not show any statistical differences between the two groups, age distribution of patients showed statistical differences between the two groups (male/female ratio of 59/40 in neuropathic pain group and 27/22 in nociceptive pain group; p = 0.36; age 55.82 ± 11.38 [mean ± standard deviation] in neuropathic pain group and 43.57 ± 13.18 years in nociceptive pain group; p = 0.001).

The results of the McNemar test indicated that S-LANSS scores were reliable when the first and the second scores were compared. The sensitivity and specificity of S-LANSS score were found to be 98% and 97% respectively, suggesting a high validity for Turkish version of S-LANSS score (Table 2).

Alpha value of S-LANSS first measurements was found as 0.9612 in validity and reliability analysis and was measured with Kuder Richardson 21. The reliability of S-LANSS measurements reviewed in re-test was found as 0.9520. These values showed a high reliability of measurements. Spearman's correlation coefficients between the first and second measurements were found to be between 0.700 and 1.000. This result showed that the correlation was statisticallly significant.

Intraclass correlation coefficients ranged between 0.69 and 0.96 and there was a statistically significant relationship between the first and second measurements.

The rate of correct diagnosis of patients was found as 97.97% in the assessment made by a cut off value of 12. Kappa compliance rate was found as 95.4% and it was observed that the cut-off point of 12 was quite appropriate (Table 3).

The concordance between total scores of first LANSS and S-LANSS measurements was 92.8% (p < 0.01). The concordance between scores of second LANSS and S-LANSS measurements was 91.5% (p < 0.01). These concordance rates were statistically significant (Table 4).

Correlations between total scores of first and second S-LANSS and VAS measurements were not statistically significant (p > 0.05) (Table 4).

There were statistically significant concordances between total scores of first S-LANSS measurements and first NPQ1, NPQ2, NPQ5, NPQ6, NPQ8, NPQ9, NPQ10, NPQ11 and NPQ12 scores (p < 0.01). On the other hand, there were no significant concordances between the total scores of

Table 1. Etiology of pain

	Neuropathic pain (n = 99)	**Nociceptive pain (n = 49)**
Diabetic polyneuropathy	56	
Trigeminal neuralgia	1	
Postherpetic neuralgia	2	
Peripheral nerve injury	3	
Failed back surgery syndrome	3	
Phantom pain	1	
Traumatic plexus avulsion	1	
Other central pain	2	
Drug related to neuropathy	15	
Peripheral neuropathy	15	
Headache		14
Osteoarthritis		8
Inflammatory arthropathies		16
Musculoskeletal Pain		4
Other		7

Table 2. Concordance of S-LANSS Scores

S-LANSS items	**Positive S-LANSS score**		**Mc Nemar test p**	**Kappa compliance rate**
	1. measurement	**2. measurement**		
S-LANSS:1	97 (%98.0)	97 (%98.0)	1.000	1.000
S-LANSS:2	35 (%35.4)	32 (%32.3)	0.250	0.932
S-LANSS:3	84 (%84.8)	83 (%83.8)	1.000	0.885
S-LANSS:4	82 (%82.8)	76 (%76.8)	0.109	0.688
S-LANSS:5	91 (%91.9)	90 (%90.9)	1.000	0.807
S-LANSS:6	71 (%71.7)	66 (%66.7)	0.125	0.835
S-LANSS:7	81 (%81.8)	76 (%74.7)	0.180	0.724

Table 3. S-LANSS cut off point

S-LANSS cut off Point	Sensitivity	Specificity	Positive sharp value	Negative sharp value	Accuracy
10	100.00	87.76	94.29	100.00	95.95
11	100.00	95.92	98.02	100.00	98.65
12	97.98	97.96	98.98	96.00	97.97
13	94.95	97.96	98.95	90.57	95.95
14	87.88	100.00	100.00	80.33	91.89

Table 4. The Relationship Between LANSS, VAS and S-LANSS measurements

	S-LANSS 1.sum		S-LANSS 2. sum	
	r	p	r	p
LANSS 1.measurement	0.928	0.001	–	–
LANSS 2.measurement	–	–	0.915	0.001
VAS	0.146	0.150	0.178	0.079

r – Pearson correlation coefficient.

first S-LANSS and first NPQ3, NPQ4 and NPQ7 ($p > 0.05$).

There were significant correlations between total scores of second S-LANSS measurements and second NPQ1, NPQ2, NPQ3, NPQ4, NPQ5, NPQ7, NPQ8, NPQ9, NPQ10, NPQ11 and NPQ12 questions ($p < 0.05$). There was no statistically significant relation between the total score of second S-LANSS measurement and the second NPQ6 ($p > 0.05$).

Discussion

Classification of pain and clarification of specific pain mechanisms help clinicians choose the appropriate treatment. The various tests used in clinical practice is important to identify pain models in which different mechanisms play role and differentiate neuropathic and nociceptive pain. However, these tests are usually in the English language and require the participation of the patient. Whereas, determining the reliability and validity of these scales would prevent misinterpretations secondary to diversities of language and culture.

Validated Turkish LANSS pain scale is widely used in differentiation of neuropathic and nociceptive pain. However, confining the application of the test to physicians restricts its extensive use [3, 9].

S-LANSS is a pain scale that can translate the patient's complaints about pain. Its usage may inform both the patient and the physician about the characteristics of pain in question.

S-LANSS has been used and validated for the first time by Bennett and colleagues [10].

In this study, the effectiveness and usability for distinguishing neuropathic and nociceptive pain of Turkish version of S-LANSS pain scale was investigated in patients from Northern Turkey.

The Turkısh validation of the S-LANSS was first presented by Koç and Erdemoglu. Koc and Erdemoglu reported that the sensitivity and specificity of S-LANSS were 72.3% and 80.4%, respectively [11]. Bennett et al. reported that the sensitivity and specificity of S-LANSS were 74% and 76%, respectively [10]. We found that the sensitivity and specificity of S-LANSS score were 98% and 97%, respectively. This was a higher rate when compared with the other studies.

In the present study, we used test-retest analysis. This, together with the use of cognitive debriefing and intelligibility evaluation forms were methods that increased the reliability of our study.

In this study, the relationship between Turkish version of S-LANSS scores and LANSS, VAS and NPQ scales were also examined. There was no statistically significant correlation between S-LANSS and VAS scales. However, correlations between many parameters of NPQ scales and LANSS pain scale were observed. We believe that these correlations may increase the validity and reliability of the Turkish Version of S-LANSS.

Our study was performed in the northern part of Turkey. This situation may be considered as a limitation of this study. However, linguistic diversity as well as cultural and regional differences are important in the assessment of the validity and reliability of a scale. People in northern Turkey express their pain in many different local words bearing different accents that make them sometimes hard to understand even for physicians who are native speakers. This study, we believe, has done a lot by revealing that S-LANSS is highly reliable and valid in the evaluation of neuropathic pain in northern Turkey. The limitation of our study may be the small number of patients.

In crowded outpatient clinics, physicians need a simple and less time consuming diagnostic tool for the assessment of neuropathic pain. In developing countries, the diagnostic tool should also be inexpensive [9]. We believe that Turkish version of S-LANSS can be used for differential diagnosis of neuropathic pain.

This study demonstrates that the Turkish version of S-LANSS can distinguish patients with neuropathic pain from those with nociceptive pain even in northern Turkey where accent and culture play a major role in expressing pain.

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