Depression, Anxiety and Quality of Life among Chronic Low Back-leg Pain Patients with or without Neuropathic Pain

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Aims: To investigate depression, anxiety and quality of life among chronic low back-leg pain patients with or without neuropathic pain.
Place and Duration of Study: Ankara Numune Education and Research Hospital Department of Physical Medicine and Rehabilitation Polyclinic, between October 2012 and June 2013.
Methodology: One hundred and one patients with chronic low back and leg pain were enrolled in the study. This study is a cross-sectional study. The severity of low back and leg pain was evaluated by visual analogue scale (VAS). The DN4 (Douleur Neuropathique en 4 Questions) and LANSS (Leeds Assessment of Neuropathic Symptoms and Signs) scales were used in order to evaluate the neuropathic pain. Existence of depression was evaluated by the Hamilton Depression Rating Scale (HAM-D) and anxiety was assessed by Hamilton Anxiety Rating Scale (HAM-A). The quality of life was questioned by Short Form-36 (SF-36).
Results: Neuropathic pain was detected in 65.3% by DN4 and 40.6% by LANSS among all patients. According to HAM-D results, 22.7% of the patients had depression and according to HAM-A results, 8.9% of the patients had anxiety. While frequency of depression was statistically

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significantly higher in patients with neuropathic pain according to LANSS (p<0,05), the frequency of anxiety was similar between groups. Although depression and anxiety was more common among patients with neuropathic pain according to DN4, there was no statistically significant difference between chronic low back-leg pain patients with or without neuropathic pain. The median SF-36 mental score was significantly lower in patients with NP according to LANSS (p<0.05). Although the median SF-36 scores (mental, physical) were higher in patients with NP according to DN4, there was no significant difference between groups (respectively p>0.05, p>0.05).
Conclusion: Patients with chronic low back and leg pain should also be questioned in terms of neuropathic symtoms and the conservative treatment should be arranged in this direction. Thus concomitant depression and anxiety would decrease, and the quality of life would increase.

Keywords: Chronic low back pain; leg pain; neuropathic pain; depression; anxiety; DN4; LANNS; SF-36.

1. INTRODUCTION

Low back pain (LBP) is a global public health problem. For a considerable part of patients affected by chronic back pain, the disease is notably disabling; it has tendency to coexist with some mood disorders and it is related to risk of early retirement or inability to cope with daily activities [1]. A vast majority (90%) of patients suffering LBP usually return to their daily activities within a month after the onset of symptoms. As for 10% to 15% of patients with LBP, the problem persists more than it is expected to recover [2]. LBP with or without leg pain is one of the most serious chronic pain disorders, partially depending on its heterogeneity and, presumably due to multiple underlying mechanisms [3].

Chronic LBP was classified as a mixed pain syndrome since it was shown to be related to neuropathic as well as nociceptive pain mechanisms. It's multifactorial nature has not been well-defined and appropriately treated. The presence of a neuropathic pain component leads to severe pain symptoms and higher healthcare costs [4]. There is strong evidence that psycological and social factors are crucial in disability due to low back pain. The anxiety related to pain and the patient's attitude against it may be more disabling than pain itself [5]. Incompletely comprehended comorbidities such as depression and anxiety may also affect the manner against pain [6].

The number of studies concerning psychosocial status of patients with chronic low back and leg pain is limited. Therefore, in this study we aimed to detect the frequency of neuropathic pain in patients with chronic low back and back related-leg pain and to investigate the relationship between neuropathic pain and depression, anxiety and quality of life.

2. MATERIALS AND METHODS

In this study, 101 patients with chronic low and leg pain, aged 18-60 years, applying to Ankara Numune Education and Research Hospital Physical Medicine and Rehabilitation Polyclinic between October 2012 and June 2013, were examined. We randomly selected patients. A total of 101 patients with positive straight leg raising (SLR) and/or femoral nerve stretching tests were enrolled in this study. The physical examination and evaluation with scales were performed by the same physician. The participants were informed about the study and their written consents were obtained. The study was approved by ethical committee of Ankara Numune Education and Research Hospital.

The exclusion criteria were; being younger than 18 years or older than 60 years, having metabolic or endocrine disorders such as diabetes mellitus and hypothyroidism, using medications such as isoniazid, vincristine and disulfiram, infections like herpes zoster and HIV, having collagen tissue disorders and vasculitides such as rheumatoid arthritis, sjögren syndrome and polyarteritis nodosa, cancers, complex regional pain syndromes, amyloidosis, phantom pain, entrapment neuropathies, spinal cord injury, tumors, arachnoiditis, syringomyelia, stroke, Parkinson's disease, Multiple Sclerosis, fractures of the lumbar spine, inflammatory disorders, active psychiatric disorders and having had low back surgery.

A detailed anamnesis including the age, gender, height, weight, body mass index (BMI), occupation, educational status, the duration (months), severity and nature of low back and leg pain and the factors increasing or reducing it, comorbid disorders and history of operations was performed.

All of the patients underwent detailed physical and neurological examination. The muscle strength was evaluated with manual muscle testing. To determine the radicular pain in leg, straight leg raising (SLR) and femoral nerve stretching tests were applied. The visual analogue scale (VAS) was used to asesses the severity of low back and leg pain. The patients were divided into three groups as low-grade pain: 0-3, medium-grade pain: 4-6 and high-grade pain: 7-10 according to VAS values.

The DN4 (Douleur Neuropathique en 4 Questions) and LANSS (Leeds Assessment of Neuropathic Symptoms and Signs) scales were performed to all participants in order to evaluate the neuropathic pain.

The DN4 scale consists of 10 questions evaluating sensory descriptors and sensorial examination. The score of 4 points and above (on 10 points) substantiates neuropathic pain. The sensitivity and specificity of DN4 for NP was shown to be 83% and 90% respectively [7]. In a study from our country, Çevik et al. [8] found the sensitivity of LANSS and DN4 to be 95% on 180 patients.

The LANSS scale consists of 7 items. It identifies neuropathic pain if the score is 12 points or above (on 24 points). Its sensitivity and specificity for NP is 83% and 87% respectively [9]. Its validity and reliability in Turkish population was proven by Yücel et al. in 2004 [10].

The existence of depression was evaluated using the Hamilton Depression Rating Scale (HAM-D) [11]. The results were evaluated as; 0-7 points: no depression, 8-15 points: minor depression, 17 points or above: major depression. Anxiety was assessed by Hamilton Anxiety Rating Scale (HAM-A) [12]. The results were evaluated as; 0-5 points: no anxiety, 6-14 points: Minor anxiety, 15 points or above: major anxiety. The study of validity and reliability of HAM-D for Turkish society was performed by Akdemir et al and the study of validity and reliability of HAM-A was performed by Yazıcı et al. [13,14].

The quality of life was questioned using the Short Form-36 (SF-36) which was developed in 1992 [15]. The scale consists of 36 items and its validity for Turkish population was proven in 1999. It has two summary scales as Physical component (Physical Component Scale, PCS) and mental component (Mental Component Scale, MCS). A score of zero indicates bad health status while 100 indicates good health status [16].

2.1 Statistical Analysis

SPSS for Windows 15.0 statistical pocket program was used in order to evaluate the data. As well as definer statistical methods (median, minimum-maximum), Mann Whitney U test was used or intergroup comparisons of the parameters which do not distribute normally. $p < 0.05$ is considered statistically significant.

3. RESULTS

One hundred and one patients with low back pain, aged 18-60 years, 36 of whom (35.6%) were male and 65 of whom (64.4%) were female were enrolled in the study. Fifty four percent of the patients were housewives. Eighty seven percent of them were married and 59.4% were primary school graduates. According to BMI, 47.5% of the patients were overweight, 19.8% were normal weighted, 28.7% were obese, 2% were morbid obese and 2% were low-weighted. While 62.4% had never smoked, 37.6% was currently smoking. Among 87 patients with lumbar magnetic resonance imaging, disc protrusions were observed in various levels in majority of them (78.2%). The demographic characteristics of the patients were shown in Table 1.

The median age of the participants was 42 (18-60 years) and median duration of low back-leg pain was 36 months (3-224 months). The median score of low back and leg pain assessed by VAS was 80 mm (60-100). Results are given in Table 2.

VAS-pain of low back-leg values were significantly higher in patients with NP detected by DN4 and LANSS compared to those without NP (respectively; $p < 0.05$, $p < 0.05$).

When the patients were observed in terms of results of NP scales, NP was detected in 65.3% by DN4 and 40.6% by LANSS. The median score of DN4 was 5 (0-10) and the median score of LANSS was 9 (0-24).

The patients who were detected to have NP by DN4 had symptoms of numbness in 97%, tingling in 84.8%, hypoesthesia to touch in 80.3%, pins and needles in 78.8%, hypoesthesia to pinprick in 75.8%, burning in 63.6%, painful cold in 48.5%, electric shocks in 45.5%, allodynia in

56.1% and itching in 42.4% rates. These results were statistically significant when compared to the group without NP (respectively p<0.001, p<0.005, p<0.001, p<0.001, p<0.001, p<0.001, p<0.001, p<0.001, p< 0.001, p<0.001).

Among the patients who were detected to have NP according to LANSS, 100% had dysesthesia, 14.6% had autonomic symtoms, 61% had evoked pain, 78% had paroxysmal pain, 82.9% had thermal pain, 85.4% had allodynia and 100% had altered pinprick test. These results were statistically significant when compared to the group without NP (respectively p<0.001, p<0.005, p<0.001, p<0.001, p<0.001, p<0.001, p<0.001).

Table 1. The demographic characteristics of the patients

	Numbers of patients	%
Sex		
Female	65	64,4
Male	36	35,6
Marital status		
Married	88	87,1
Divorced	4	4
Single	9	8,9
Occupation		
Worker	32	31,7
Officer	5	5
Housewife	55	54,5
Unemployed	1	1
Retired	7	6,9
Self-employment	1	1
Educational status		
Illiterate	8	7,9
Primary school	60	59,4
Secondary school	9	8,9
Highschool	17	16,8
University	7	6,9
BMI (weight/height)		
Low weight	2	2
Normal	20	19,8
Overweight	48	47,5
Obese	29	28,7
Morbid obese	2	2
Smoking		
Never smoked	63	62,4
Current smoker	38	37,6
Lumbar MRI		
Normal	1	1,1
Bulging	10	11,5
Protrusion	68	78,2
Extruded	8	9,2

Table 2. The median age, duration of low back-leg pain and score of low back- leg pain

	Median (minimum-maximum)
Age (year)	42 (18-60)
Duration of low back-leg pain (month)	36 (3-224)
Score of low back and leg pain (VAS)	80 (60-100)

All patients were assessed in terms of existence of anxiety and depression. Median score of HAM-D was 3 (0-24), while the median score of HAM-A was 2 (0-35). According to HAM-D results, 22.7% of the patients had depression and according to HAM-A results, 8.9% of the patients had anxiety.

The median HAM-D score of the patients who had NP according to DN4 was 4 (0-24) and the median HAM-A score was 3 (0-35); the median HAM-D score of the patients who did not have NP according to DN4 was 2 (0-11) and the median HAM-A score of those patients was 0 (0-22). While the rate of depression in patients who had NP according to DN4 was 28.8%, the rate was 11.4% in patients without NP. The rate of anxiety in patients who had NP according to DN4 was 10,6 % and the rate of anxiety was 5.7% in patients without NP. Although depression and anxiety were seen more commonly in patients with NP according to DN4, no statistically significant difference was observed between the groups (respectively p>0.05, p>0.05) (Table 3).

The SF-36 was used to evaluate the quality of life for all patients. The median score of SF-36 in patients who had NP according to DN4 was as follows; SF-36 (mental): 44 (17.1-68.3), SF-36 (physical): 27.5 (14.2-52.2) and the score of patients without NP according to DN4 was; SF-36 (mental): 47.3 (20.3-67.7), SF-36 (physical): 28.3 (15.6-61.7). Although the median SF-36 scores (mental, physical) were higher in patients with NP according to DN4, there was no significant difference between groups (respectively p>0.05, p>0.05) (Table 3).

The median HAM-D score of the patients who had NP according to LANSS was 6 (0-24) and the median HAM-A score of those patients was 4 (0-35). The median HAM-D score of the patients who did not have NP according to LANSS was 2 (0-15) and the median HAM-A score of them was 1 (0-22). While the rate of depression in patients

Table 3. The results of assessment of depression, anxiety and quality of life in patients with and without neuropathic pain according to DN4

	DN4 NP+ median (min.-max.)	DN4 NP- median (min.-max.)	p
HAM-D	4 (0-24)	2 (0-11)	0.072
HAM-A	3 (0-35)	0 (0-22)	0.412
SF-36 (mental)	44(17.1- 68.3)	47.3(20.3-67.7)	0.119
SF-36 (physical)	27.5(14.2-52.2)	28.3(15.6-61.7)	0.966

NP: Neuropathic pain HAM-D: Hamilton Depression Rating Scale HAM-A: Hamilton Anxiety Rating Scale Min.-max: Minimum- maximum

Table 4. The results of assessment of depression, anxiety and quality of life in patients with and without neuropathic pain according to LANSS

	LANSS NP+ median (min.-max.)	LANSS NP- median (min.-max.)	p
HAM-D	6 (0-24)	2 (0-15)	0.022
HAM-A	4 (0-35)	1 (0-22)	0.095
SF-36 (mental)	37.9(22.6-64.7)	51.5(17.1-68.3)	0.009
SF-36 (physical)	27.7(14.2-48.4)	27.7(15.6-61.7)	0.597

NP: Neuropathic pain HAM-D: Hamilton Depression Rating Scale HAM-A: Hamilton Anxiety Rating Scale Min.-max: Minimum- maximum

who had NP according to LANSS was 36.6%, the rate was 13.3% among patients without NP. The frequency of depression in patients with NP according to LANSS was significantly higher than the ones without NP (p<0.05). The rate of anxiety in patients who had NP according to LANSS was 14.6% and the rate of anxiety in patients without NP was 5%. Although anxiety was seen more commonly in patients with NP according to LANSS, no statistically significant difference was observed between the groups (p>0.05) (Table 4).

The median score of SF-36 in patients who had NP according to LANSS was as follows; SF-36 (mental): 37.9 (22.6-64.7), SF-36 (physical): 27.7 (14.2-48.4), and the median score of patients without NP according to LANSS was; SF-36 (mental): 51.5 (17.1-68.3), SF-36 (physical): 27.7 (15.6-61.7). The median SF-36 mental score was significantly lower in patients with NP according to LANSS (p<0.05). The results were shown in Table 4.

4. DISCUSSION

Chronic low back pain is defined as a pain in low back lasting more than 3 months or relapsing with attacks in a period of 6 months [2]. Clinical management of low back pain is frequently insufficient [6]. Chronic LBP was considered to be a result of both neuropathic and nociceptive pain mechanisms and thus classified as a mixed

pain syndrome. The multifactorial nature of chronic LBP has frequently not been adequately comprehended and treated [4]. In studies from different countries, a neuropathic component was revealed in 33 to 71% of the cases with chronic low back pain [17-21].

We used the DN4 and LANSS scales in our study to assess existence of NP. The DN4 is the most commonly applied scale to evaluate NP in clinical practice. We detected NP in 65.3% of our patients according to this scale. Ouedraogo et al. [20] found NP in 40 of 66 patients (60.6%) with lumboradicular pain according to DN4. Walsh et al. [19] detected NP in 42% of patients with chronic low back-leg pain.

The LANSS scale is a clinical-based device with proven validity and reliability in different languages which was developed to define the patients with predominant neuropathic pain [22]. In Arabian-Gulf region, NP was detected in 41% to 55.4% of patients with chronic low back pain according to LANSS [17,18]. In another study by Walsh et al. [19], NP was found in 33% of 45 patients with back-leg pain which were assessed by LANSS. In the USA, the LANSS scores were 12 or above in 71% of the patients with chronic low back pain applying to primary healthcare [21]. In our study we revealed that 40.6% of our patients had NP according to LANSS. These results are compatible with the literature.

Chronic pain is assumed to have both nociceptive and neuropathic etiology [2,3]. Most commonly, although the reason triggering the pain was removed, the lesion or disease occuring in nervous system continues the pain [22,23]. The NP in chronic low back pain is associated with radiculopathy traditionally. The problem of this restricted view is neglecting all neural structures of the central and peripheral nervous system except for the nerve root [24]. The lesions of nociceptive buds in degenerated disc, mechanical compression of the nerve root or the inflammatory mediators from the degenerated disc may be reasons of NP in chronic low back pain [2]. The scales such as DN4 and LANSS has made contribution in determining the characteristics of pain and assessment of the treatment [25].

There are few studies investigating the relationship between pain and depression. In these epidemiological studies of limited number, it was reported that depression is more common in patients with chronic pain [26]. We evaluated the relationship between neuropathic pain and depression and anxiety using the scales HAM-A and HAM-D. Although scores of anxiety and depression were higher in patients with NP, we were able to detect only depression to be statistically significantly more common among patients with NP according to LANSS. Walsh et al. [19] did not find any relationship between hospital depression and anxiety scales and neuropathic pain. In another study, the rate of depression was found to be higher in patients with chronic LBP compared to healthy individuals [27]. Beith et al. [28] found the prevalence of depression to be higher and SF-36 (mental) scores to be lower in patients with LBP accompanied by neuropathic pain. Our results are similar with this study. In that study, it was stated that chronic pain had negative impact on general health, daily activities and business life and that it was an important risk factor for depression [25]. Having depression and chronic back pain concurrently causes greater socioeconomic disadvantage and disability than having either circumstance alone [20]. Psychological state, as well as peripheral sensitization mechanisms contribute to perception of pain in patients with LBP accompanied by NP.

Chronic pain has been shown to be related to symptoms of neuropathic pain and this relationship affects the qualite of life [2]. The scales of quality of life are among the most important parameters to determine the perception of patients about the disease [15]. Although it was reported that quality of life decreases in patients low back-leg pain along with NP, the results of the studies on this issue are conflicting. In a study by Walsh et al. [19] a significant effect of neuropathic pain on quality of life was not shown in patients with low back and leg pain. Vieira et al. [29] revealed a significant decrease in quality of life of patients with NP. In the present study we assessed the relationship between NP and quality of life using the SF-36. While the scores of quality of life in patients with NP were lower, SF-36 (mental) scores were found to be statistically significantly lower only in patients with NP according to LANSS. The scores of quality of life were generally lower in patients with or without NP.

Pain affects individuals in a multidirectional way and its interpretation varies between different cultural and socioeconomic circumstances [29]. The capability to face the pain and the resistance against pain which were lower in our patient population with low socioeconomic status may have affected the results regarding quality of life.

5. CONCLUSION

In this study we investigated the relationship between neuropathic pain and depression, anxiety, and life quality among patients with chronic low back-leg pain, with or without neuropathic pain. Chronic LBP leads to disability and workforce loss, and it is among the leading causes of application to physician with complaint of pain. It has different development mechanisms, therefore it should be handled with care [10]. Although peripheral and central mechanisms have pivotal role in development of NP due to chronic low back pain, the mood and quality of life also contribute to perception of pain and the chronicity. By discovering the underlying mechanisms of pain and developing convenient treatment approaches, incorrect medications would be avoided and economic losses would be hampered.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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