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Original Article

Neuropathic pain in pregnant Turkish women with lumbopelvic pain and its impact on health-related quality of life

Filiz Eser[1], Saniye Nebioğlu[2], Aygün Aliyeva[1], Ayşegül Kılıçarslan[1], Cemal Reşat Atalay[2], Gizem Özcanlı[2], Şükran Erten[3], Funda Uysal[4]

Abstract

Objectives: To investigate the prevalence of neuropathic pain in pregnant women and to state its influence on the functional status and health-related quality of life (HRQoL) in terms of physical, social, and emotional functioning.

Material and Methods: A total of 90 pregnant women with lumbopelvic pain (LPP) and non-pregnant and healthy controls were included. The presence of neuropathic pain was determined using the Leeds assessment of neuropathic symptoms and signs (LANNS) questionnaire. The HRQoL was assessed using the Nottingham Health Profile (NHP), and the functional status was evaluated using the Oswestry Disability Index (ODI). The severity of pain was measured using a visual analog scale.

Results: The LANNS score was ≥12 in 34 pregnant women (37.8%). The prevalence of neuropathic pain was higher in pregnant women with LPP (odds ratio=6.22; 95% confidence interval=2.68-14.44) ($p<0.001$) than in controls. The LANNS score was found to be correlated with the physical mobility subgroup in the NHP at high levels ($p=0.002$, $r=0.32$) and with the ODI and pain subgroup in the NHP at moderate levels ($p=0.013$, $r=0.26$ and $p=0.038$, $r=0.22$, respectively).

Conclusion: The present study is the first to demonstrate that neuropathic pain is associated with pregnancy-related LPP and strongly correlated with functional impairment and deterioration in the HRQoL. A better understanding of neuropathic pain mechanisms in pregnancy-related LPP will help us find more effective treatment strategies.

Keywords: Functional status, neuropathic pain, low back pain, pregnancy, health-related quality of life

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[1]Department of Physical Treatment and Rehabilitation, Ankara Numune Training and Research Hospital Ankara, Turkey
[2]Department of Obstetrics and Gynecology, Ankara Numune Training and Research Hospital Ankara, Turkey
[3]Department of Rheumatology, Yıldırım Beyazıt University Atatürk Training and Research Hospital, Ankara, Turkey
[4]Department of Physical Treatment and Rehabilitation, Yenimahalle Training and Research Hospital Ankara, Turkey

Address for Correspondence: Filiz Eser, Department of Physical Treatment and Rehabilitation, Ankara Numune Training and Research Hospital Ankara, Turkey

E-mail: filizeser@gmail.com

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Introduction

Pregnancy-related lumbopelvic pain (LPP) refers to pain that is between the 12th rib and the gluteal fold and that is experienced for more than 1 week during pregnancy (1). LPP is reported by approximately 50% of pregnant women (2). Multiparity, high body mass index (BMI), previous history of LPP, and pregnancy-related LPP are thought to be risk factors for pregnancy-related LPP (3).

Although the etiology and pathogenesis of pregnancy-related LPP are not clearly known, factors including biomechanical changes due to the expanding uterus that result in an increase in lumbar lordosis and the influence of pregnancy hormones on supporting ligaments causing joint hypermobility may be responsible (4).

Pregnancy-related LPP can evolve into chronic pain (2). In a previous study, it has been suggested that 40% of women still had symptoms half a year after delivery (5). There are two types of chronic pain: nociceptive (inflammatory) pain and neuropathic pain. The stimulation of nociceptors through chronic inflammation causes nociceptive pain. It is associated with tissue damage (6). Neuropathic pain has been defined by International Association for the Study of Pain as "pain caused by a primary lesion or dysfunction in the nervous system" (7). Peripheral and central sensitization, inhibition of descending pain inhibitory systems, and functional changes in the autonomic nervous system and neurotransmitters have a role in neuropathic pain (8). People who experience neuropathic pain define it as having burning, electric shock-like, prickling, or itching sensations or numbness (9).

The aim of the present study was to investigate the prevalence of neuropathic pain in pregnant women using the Leeds assessment of neuropathic symptoms and signs (LANNS) questionnaire and to determine its impact on the functional status and HRQoL regarding social and emotional functioning.

Material and Methods

Among pregnant patients admitted to our outpatient pregnancy clinic between June 2015 and April 2016, those who met the following criteria were included: singleton pregnancy at 20-38 gestational weeks and LPP of at least 12 weeks' duration. Exclusion criteria included the presence of any known rheumatic disease or endocrine or neurologic disorders. Patients who have a previous history of lumbar herniated disc and lumbosacral radiculopathy were also excluded. The control group comprised 90 non-pregnant and healthy subjects aged between 18 and 40 years. Data regarding age, gestational week, and BMI was recorded. Written informed consent was taken from all participants after they were informed about the study. Ethics committee approval was obtained from the Local Ethics Committee. A visual analog scale (VAS) of 10 cm was used for measuring the severity of pain (10). The HRQoL of the participants was assessed using the Nottingham Health Profile (NHP) (11). The functional status was determined using the Oswestry Disability Index (ODI) (12). The diagnosis of neuropathic pain was based on the LANNS questionnaire (13). Chronic pain can be identified by the LANNS questionnaire, which is simple and self-administered, that was developed to identify neuropathic pain. Yucel et al. (14) adapted it to Turkish and validated its use.

Statistical analysis

Demographics and clinical parameters were evaluated by descriptive statistics [mean, median, standard deviation (SD), minimum, maximum, and frequencies]. Independent samples T-test was used to evaluate differences between the groups. To compare categorical variables, the chi-square test was used. Pearson's correlation coefficients test was used to assess the presence of correlation. A value of $p<0.05$ was accepted as statistically significant. All analyses were accomplished using IBM Statistical Package for the Social Sciences for Windows, Version 21.0 (IBM Corp.; Armonk, New York, USA).

Results

Demographic characteristics

The present study included 90 pregnant women with LPP and 90 healthy controls. The mean age was 28.23±5.17 (18-40) years in the patient group and 29.1±6.81 (18-40) in the control group. The mean age in the patient and control groups were similar (p=0.33).

Functional status and HRQoL of pregnant women

The mean ODI score was 34.8±18.16 (0-90). The mean±SD HRQoL scores in the patient group were 35.87±26.42, 33.61±22.69, 33.33±34.95, 16.44±25.01, 13.78±25.19, and 27.92±29.03 in the pain, physical mobility, energy, sleep, social isolation and emotional reactions subgroups in the NHP, respectively. Table 1 summarizes the demographic data and clinical characteristics of the patients.

Neuropathic pain scores

The mean LANNS score was 11.68±6.38 in the patient group and 5.03±2.73 in the control group. The LANNS score was significantly higher in the pregnant group (p<0.001) (Table 2).

In our study, the LANNS score was found to be ≥12 in 34 pregnant women (37.8%). The prevalence of neuropathic pain was higher in pregnant women with LPP (odds ratio=6.22, 95% confidence interval=2.68-14.44) (p<0.001) compared with controls (Table 3).

Correlation of LANNS scores

Among the pregnant women, the LANNS score was correlated with the physical mobility subgroup in the NHP at high levels (p=0.002, r=0.32) and with the ODI and pain subgroup in the NHP at moderate levels (p=0.013, r=0.26 and p=0.038, r=0.22, respectively) (Table 4).

Discussion

In the present study, the prevalence of neuropathic pain was found to be higher among pregnant women with LPP. The prevalence of neuropathic pain in the general population has been revealed to be 7-8% (15, 16). Epidemiological studies have shown that 20-35% of patients with low back pain suffer from neuropathic pain (17). In a previous study conducted in 1857 patients with chronic pain related to spinal disorders, the prevalence of neuropathic pain in patients with low back pain was reported to be 29.4% (18). In the same study, the presence of neuropathic pain was evaluated by using the neuropathic pain screening questionnaire developed by Ogawa. In another study conducted in 1169 Saudi Arabian patients with chronic low back pain, it was established

Table 1 Demographic and clinical data of pregnant women

Parameters	Mean±SD (range)
Age	28.23±5.17 (18-40)
Gestational week	33.75±33.23
BMI (kg/m²)	27.06±4.47
LANNS score	11.68±6.38
ODI	34.8±18.16 (0-90)
NHP: pain	35.87±26.42 (0-100)
NHP: physical mobility	33.61±22.69 (0-87.5)
NHP: energy	33.33±34.95 (0-100)
NHP: sleep	16.44±25.01 (0-100)
NHP: social isolation	13.78±25.19 (0-100)
NHP: emotional reactions	27.92± 29.03 (0-100)

BMI: Body Mass Index; VAS: Visual Analog Scale; ODI: Oswestry Disability Index; LANNS: Leeds assessment of neuropathic symptoms and signs; NHP: Nottingham Health Profile

Table 4 Relation of LANNS scores with functional status and quality of life scores

		LANNS
ODI	r	0.26
	p	0.013*
NHP: pain	r	0.22
	p	0.038*
NHP: physical mobility	r	0.32
	p	0.002**
NHP: energy	r	0.026
	p	0.81
NHP: sleep	r	0.067
	p	0.528
NHP: social isolation	r	-0.004
	p	0.97
NHP: emotional reactions	r	0.083
	p	0.44

LANNS: Leeds assessment of neuropathic symptoms and signs; LPP: lumbopelvic pain; ODI: Oswestry Disability Index; NHP: Nottingham Health Profile; *p<0.05 (significant); **p<0.01 (highly significant)

Table 2. Comparison of LANNS scores between the groups

	Pregnant women with LPP (n=90)	Controls (n=90)	p
LANNS score	11.68±6.38	5.03±2.73	<0.001**

LANNS: Leeds assessment of neuropathic symptoms and signs; LPP: lumbopelvic pain; *p<0.05 (significant), **p<0.01 (highly significant)

Table 3. Prevalence of neuropathic pain in pregnant women with LPP

	Number	%	Difference (95% CI)	p
Pregnant women with LPP (n=90)	34	37.8	6.22 (2.68–14.44)	<0.001**

LPP: lumbopelvic pain; *p<0.05 (significant); **p<0.01 (highly significant)

that 54.7% had neuropathic pain according to the LANNS (19). In a study performed on black African patients with low back pain, the prevalence of neuropathic pain was reported to be 49.5% in a study where neuropathic pain was assessed using the Douleur Neuropathique 4 questionnaire (20).

Peripheral neuropathy, polyneuropathy, and mononeuropathy have been previously reported in pregnant women. The incidence of idiopathic facial nerve palsy or Bell's palsy was reported as 2-3-times higher in pregnant women than in nonpregnant women (21). Moreover, the prognosis for a satisfactory recovery was established to be significantly worse in pregnant patients than in the general population (22). In a study conducted in 301 Polish pregnant women, the rate of carpal tunnel syndrome was reported to be 32% (23). In another study by Pazzaglia et al. (24), this rate was found to be as high as 62%. Additionally, brachial plexus neuropathy, meralgia paresthetica, acute immune demyelinating polyneuropathy (Guillain-Barre Syndrome), and chronic immune demyelinating polyneuropathy may occur during pregnancy (25-28).

Lumbopelvic pain is a common musculoskeletal disorder during pregnancy, and approximately 60-70 % of women experience pregnancy related-LPP (29). Pregnancy related-LPP is increasingly thought to be associated with chronic pain (2). Ostgaard (30) reported that 16% of pregnant women had persistent LPP symptoms 6 years after childbirth.

To our knowledge, neuropathic pain components in pregnancy-related LPP have not been assessed previously using the LANNS questionnaire. The prevalence of neuropathic pain was higher (37.8%) in pregnant women with LPP. Moreover, we investigated the impact of neuropathic pain on the functional status and HRQoL in terms of physical, social, and emotional functioning. We found that neuropathic pain was associated with functional impairment and deterioration in the HRQoL in terms of physical mobility and pain. We found no relationship between neuropathic pain and the HRQoL regarding social and emotional functioning.

The present study has some limitations. The first is that the number of study subjects is low. The second is the absence of electrophysiological studies. Due to the fact that subclinical neuropathy is not detected in early stages, the LANNS questionnaire, which can differentiate neuropathic pain from nociceptive pain, was used.

In conclusion, neuropathic pain syndrome is associated with pregnancy-related LPP and has a negative impact on the functional status and HRQoL. Pregnant women with LPP should be assessed using validated screening tools to distinguish neuropathic pain from nociceptive pain. A better interpretation of the mechanisms of neuropathic pain in pregnancy-related LPP will provide a more targeted approach to pain treatment in such patient groups.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Numune Training and Research Hospital.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

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