

## Research Article

# Pregnancy-related lumbopelvic pain in early postpartum period and risk factors

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### ABSTRACT

**Background:** Pregnancy-related lumbopelvic pain is known as lower back and pelvic girdle pain of unclear etiology, which affects almost half of pregnant women, often starts at 18 weeks and decreases at 6 months postpartum. The purpose of this study is to identify the risk factors in patients with pregnancy-related lumbopelvic pain in early postpartum period and determine the factors associated with pain in patients suffering from lumbopelvic pain at 1 month postpartum.

**Methods:** 339 women of 18-40 years of age who were in the 1st month of postpartum period were included in the study. Socio-demographic data, gynecological history and method of delivery were recorded for all subjects. All subjects were evaluated for pregnancy-related lumbopelvic pain. The Oswestry disability index was used for functional evaluation and the Beck depression inventory was used for assessment of depression.

**Results:** 114 (33.6%) patients had a history of pregnancy-related lumbopelvic pain. 59 (18.9%) patients had ongoing pain at 1 month postpartum. When patients were divided into two groups, consisting of women with and without lumbopelvic pain at 1 month postpartum, no statistical difference was observed between two groups in terms of age, parity, employment status, smoking status, depression score, method of delivery, type of anesthesia, and emergency or elective cesarean section. When the risk factors affecting postpartum lumbopelvic pain were evaluated by using the Stepwise Logistic regression analysis, weight gain during pregnancy, body mass index and presence of lumbopelvic pain during previous pregnancy were found to be independent risk factors ( $p < 0.05$ ).

**Conclusion:** Pregnancy-related lumbopelvic pain is a significant cause of disability that affects many pregnant women. Control of weight gain during pregnancy could be important in avoiding the development of lumbopelvic pain. In patients experiencing lumbopelvic pain in previous pregnancies, necessary measures should be taken against development of lumbopelvic pain during a new pregnancy.

**Keywords:** Lumbopelvic pain, Pregnancy-related pain, Postpartum period

### INTRODUCTION

Pregnancy-related lumbopelvic pain is defined as a pain of unclear etiology and pathophysiology which affects almost half of pregnant women<sup>1</sup> and is felt in the pelvic girdle and/or lumbar vertebral region.<sup>2,3</sup> Lower back pain means pain developing between the 12<sup>th</sup> vertebrae and gluteal fold, and pelvic girdle pain means pain developing

between the posterior iliac crest and gluteal fold.<sup>1</sup> Pregnancy-related lumbopelvic pain usually starts at 18 weeks of pregnancy and reaches a peak at 24 and 36 weeks. Sometimes it is also seen during the first trimester.<sup>1,2</sup>

Pregnancy is a period during which certain physical and hormonal changes occur. There is increased physical load, primarily due to weight gain and increasing fetus

weight. Many changes occur due to physical overload, including irritation of the interspinous, iliolumbar and sacroiliac ligaments,<sup>4</sup> increased pelvic tilt, overstraining of abdominal muscles,<sup>5</sup> shortening of paraspinal muscles and reduced intervertebral disc fluid.<sup>6</sup> Joint mobility also increases during this period due to increased release of the relaxin hormone.<sup>7</sup> All of these physiological changes are believed to contribute to musculoskeletal system pains. It was reported that psychological factors such as stress may also be influential on the development of pregnancy-related lumbopelvic pain, in addition to physical and hormonal factors.<sup>8</sup>

Pregnancy-related lumbopelvic pain may persist in the postpartum period. The pain usually decreases in the first 6 months of the postpartum period<sup>9</sup> but it was also reported that it may persist for up to 3 years postpartum.<sup>10</sup> Its prevalence for the first 1 month following delivery was reported to be 35%.<sup>3</sup>

There are contradictions in the literature about risk factors in the development of pregnancy-related lumbopelvic pain.<sup>1</sup> There are not adequate studies about the prevalence of pregnancy-related lumbopelvic pain in early postpartum period and related risk factors.<sup>3</sup> The purpose of this study is to identify the risk factors in patients with pregnancy-related lumbopelvic pain in early postpartum period and determine the prevalence of lumbopelvic pain at 1 month postpartum and factors associated with pain in these patients.

## METHODS

This study was conducted in 404 women of 18-40 years of age who experienced live, full-term birth at our hospital's obstetrics and gynecology clinic in 2014 and randomly presented for routine check at 1 month postpartum. All patients were queried for socio-demographic data and gynecological history. Parity, weight gain during pregnancy, baby's birth weight, method of delivery, elective or emergency cesarean section and type of anesthesia received were recorded for all subjects.

All subjects were evaluated for lumbopelvic pain which started during pregnancy and still persisted. Pregnancy-related lumbopelvic pain was defined as pain which starts during pregnancy and is felt in the sacral, gluteal and lumbar regions.<sup>1</sup> Patients were asked if they felt a continuous or intermittent pain in these regions which lasted for more than a week during their pregnancy.<sup>11</sup> Onset of pain was recorded. It was recorded whether the pain still persisted or not. Pain severity was evaluated with the visual analog scale (VAS) in women with lumbopelvic pain. Functional capacity was assessed by using the Turkish version of the Oswestry Disability Index. The Oswestry index is a scale which quantifies intensity of pain, ability to care for oneself, lift, walk, sit and stand, social life, sleep quality and ability to travel, and the validity and reliability of its Turkish version has been investigated.<sup>12,13</sup> The Beck depression inventory,

which was adapted to Turkish and investigated for validity and reliability, was used to assess depression.<sup>14</sup>

Patients were excluded if they had known diseases causing lower back pain prior to pregnancy (lumbar disc hernia, spondylolisthesis, spondyloarthropathy, infection, malignancy etc.), had given premature birth, had multiple pregnancy, had a condition which required more than 6 weeks of immobilization during pregnancy (risk of miscarriage), were diagnosed with osteoporosis associated with pregnancy and lactation, had a cognitive and mental status which could hinder communication, or had a trauma.

## Statistical Analyses

The NCSS (Number Cruncher Statistical System) 2007 and PASS (Power Analysis and Sample Size) 2008 Statistical Software (Utah, USA) were used for statistical analyses. For the evaluation of study data, Student's *t* test was used to compare two groups for parameters with normal distribution and Mann Whitney U test was used to compare two groups for parameters with non-normal distribution in the comparison of quantitative data, in addition to descriptive statistical methods. Pearson's chi-square test and Fisher's exact test were used to compare qualitative data. Spearman's correlation analysis was used to evaluate the relationship between parameters. Stepwise Logistic Regression was used for multivariate analyses. Significance was evaluated at  $p < 0.01$  and  $p < 0.05$ .

## RESULTS

404 postpartum women were evaluated for the study. 65 women were excluded. 25 patients had prolonged immobilization due to risk of miscarriage. 19 patients had a condition which could cause lumbar pain prior to pregnancy, 4 patients had multiple pregnancy and 17 patients were excluded since they had given premature birth. 339 postpartum women were included in this study, with a mean age of  $29.7 \pm 7.3$ . 114 (33.6%) patients had a history of pregnancy-related lumbopelvic pain. 59 (18.9%) patients had ongoing pain at 1 month postpartum. Six patients had lower back pain at 1 month postpartum although they didn't have lower back pain during pregnancy. Week of onset of pain was  $19.6 \pm 3.6$  weeks in the group with a history of pregnancy-related lumbopelvic pain.

When patients were divided into two groups, consisting of women with and without lumbopelvic pain at 1 month postpartum, no statistical difference was observed between two groups in terms of age, parity and employment status, smoking status, depression score, method of delivery, type of anesthesia, emergency or elective cesarean section and baby's birth weight and height. However, there was a statistically significant difference between two groups in terms of body mass index, weight gain during pregnancy, presence of lumbopelvic pain during previous pregnancy, income status and education level (Table 1).

**Table 1: Evaluation of the parameters according to the presence of Lumbopelvic pain (LPP) in postpartum women.**

(n=339)	LPP(+)	LPP (-)	p
	(n=59)	(n=280)	
	Mean±SD	Mean±SD	
Age	29.12±6.41	30.04±7.17	0.218
BMI (kg/m <sup>2</sup> )	32.75±7.32	29.07±7.55	0.029*
Curent Smoker n(%)	9(% 15.2)	40(% 14.2)	0.285
Education Level n(%)			
Elementary School	49(% 79.6)	201(% 71.7)	0.046*
High School-University	10(% 20.4)	72(% 28.3)	
Employment n(%)			
Homemaker	40(% 67.7)	186(% 67)	0.144
Employed	19(% 32.3)	94(% 33.0)	
Income status n(%)			
Low	36(% 61.0)	146(% 52.1)	0.039*
Medium-good	23(% 39.0)	134(% 47.9)	
Beck Depression Scores	18.84±5.70	17.23±5.00	0.762
Parity			
Primiparity	22(% 37.2)	98(% 35)	0.141
Multiparity	37(% 62.8)	182(% 65)	
Presence of lumbopelvic pain during previous pregnancy	16 (% 27.1)	31(% 11.0)	0.014*
Weight gain during pregnancy(kg)	22.14±5.3	17.22±4.7	0.021*
Method of delivery			0.085
Vaginal delivery	30 (% 50.8)	148(% 52.8)	0.094
Cesarean delivery	29(% 49.2)	132(% 47.2)	
Emergency / elective cesarean(n)	10/19	43/89	
Baby's birth weight(kg)	3.44±1,2	3.21±11	0.214
Baby's birth height(cm)	50.1±4.5	50.7±4.7	0.984

\*p&lt;0.05

Of the risk factors affecting postpartum lumbopelvic pain, body mass index, weight gain during pregnancy, presence of lumbopelvic pain during previous pregnancy, income status and education level were evaluated by using the Stepwise Logistic regression analysis and the model was found to be significant; the model's coefficient of determination (80.4%) was very good. Weight gain during pregnancy, body mass index and presence of lumbopelvic pain during previous pregnancy were found to be independent risk factors ( $p=0.037$ ,  $p=0.035$ ,  $p=0.024$ , respectively). Effects of other variables on the logistic model were not found to be statistically significant ( $p>0.05$ ).

Mean score of the Oswestry disability index was  $14.7 \pm 4.9$  and mean VAS score was  $5.1 \pm 2.3$  in women with lumbopelvic pain at 1 month postpartum. The VAS score and Oswestry disability index were positively correlated. ( $r: 0.604$ ;  $p:0.001$ ;  $p<0.01$ ).

## DISCUSSION

Lumbar and pelvic pains are observed frequently during pregnancy. Several different terms have been used to identify these pains; Wo *et al.*, used the terms "pregnancy-related pelvic girdle pain" and "pregnancy-related lower back pain" for these concepts in their review on the subject. These syndromes can coexist, in which case they are called "pregnancy-related lumbopelvic pain".<sup>1</sup> Prevalence of pregnancy-related lumbopelvic pain was reported to be 3.9% - 89.9% with a mean rate of 45.3%.<sup>1</sup> The width of this range can be explained with genetic and socio-cultural differences between populations or differences in the evaluation of lumbopelvic pain. In this study, the rate of pregnancy-related lumbopelvic pain was found to be 36.6%. The rate of lumbopelvic pain in postpartum women is 25-35% in literature<sup>1,3</sup> while this rate was 18.9% in this study.

Although the average onset week of lower back pain during pregnancy is 18 weeks, nearly 20% of patients

with lower back pain state that their pain started before 16 weeks.<sup>15</sup> Hormonal changes, rather than mechanical overload, are believed to be responsible for early onset of lower back pain. During pregnancy, the relaxin hormone increases up to 10 times, making the spine and pelvic structure more flexible. Pain can occur more frequently in more flexible structures.<sup>16</sup> In this study, the onset week of lumbopelvic pain was found to be  $19.6 \pm 3.6$  weeks.

Strenuous activity, prior lower back pain and presence of lumbopelvic pain during previous pregnancy have been reported as strong risk factors in pregnancy-related lumbopelvic pain.<sup>1</sup> Similarly, presence of lumbopelvic pain during previous pregnancy was found to be associated with ongoing lumbopelvic pain in early postpartum period in this study. Presence of lumbopelvic pain during previous pregnancy is also an indicator of prior tissue damage. Damaged tissue is more vulnerable to trauma. Lumbopelvic pain experienced during previous pregnancy may also contribute to development of pain during a new pregnancy due to psychological factors.

Contribution of increased body mass index to lower back pain is controversial in literature. While Orvieto *et al.*,<sup>17</sup> found a higher prevalence of lower back pain in those with a high body mass index, Mens *et al.*,<sup>18</sup> determined no difference in BMI between groups with and without lower back pain. In the literature, it is reported that increased maternal weight and increased fetal weight constitute a risk for mild lumbopelvic pain.<sup>1</sup> In this study, weight gain during pregnancy and BMI were determined to increase the risk of lumbopelvic pain development in early postpartum period. Physical activity levels and exercise habits of pregnant women were not investigated in this study. Previous studies reported positive effects of exercise on lower back pain in pregnant women.<sup>19</sup> Increased weight may have contributed to the development of lumbopelvic pain by leading to reduced physical activity and exercise levels. Further studies are required in this subject.

There are conflicting reports in the literature about the effect of maternal age and number of pregnancies on the development of lumbopelvic pain. Some studies claim that younger women are at risk of developing lumbopelvic pain<sup>20</sup> while others state that the risk is higher in older women.<sup>21</sup> There are publications which report that the number of pregnancies increases<sup>22</sup> or decreases<sup>23</sup> the risk or that it has no effect.<sup>24</sup> No difference was found in terms of parity or age in either group in this study.

There are few studies in the literature which evaluate the effect of method of delivery on postpartum lower back pain, and their results are contradictory. Mogren *et al.*,<sup>25</sup> claimed that persistent lower back pain was more common in patients having elective cesarean section but found no difference between epidural and spinal anesthesia in terms of lower back pain. Studies reported that epidural anesthesia given during delivery may cause lower back pain in the first days following delivery due to musculoligamentous trauma occurring during injection;

however, the difference in lower back pain between patients receiving and not receiving epidural anesthesia disappears after 7 days to 6 weeks.<sup>26</sup> In a study conducted by Wang *et al.*,<sup>27</sup> no difference was observed between vaginal delivery and cesarean section in terms of postpartum lower back pain. In this study, no difference was found between methods of delivery and types of anesthesia in patients experiencing lumbopelvic pain in early postpartum period.

Pregnancy-related lumbopelvic pain is a significant cause of disability that affects many pregnant women. Control of weight gain during pregnancy could be important in avoiding the development of lumbopelvic pain. In patients experiencing lumbopelvic pain in previous pregnancies, necessary measures should be taken against development of lumbopelvic pain during a new pregnancy.

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## REFERENCES

1. Wu WH, Meijer OG, Uegaki K, Mens JM, van Dieën JH, Wuisman PI, et al. Pregnancy-related pelvic girdle pain (PPP), I: Terminology, clinical presentation, and prevalence. *Eur Spine J.* 2004;13:575-89.
2. Gutke A, Ostgaard HC, Oberg B. Pelvic girdle pain and lumbar pain in pregnancy: a cohort study of the consequences in terms of health and functioning. *Spine.* 2006;31:149-55.
3. Ostgaard HC, Roos-Hansson E, Zetherstrom G. Regression of back and posterior pelvic pain after pregnancy. *Spine.* 1996;21:2777-80.
4. Sipko T, Grygier D, Barczyk K, Elias G. The occurrence of strain symptoms in the lumbosacral region and pelvis during pregnancy and after childbirth. *J Manipulative Physiol Ther.* 2010;33:370-7. doi: 10.1016/j.jmpt.2010.05.006.
5. Darwich AA, Diwan SA. Management of back pain in pregnancy. *Techniques in Regional Anesthesia and Pain Management.* 2009;13(4):251-4.
6. Botsford DJ, Esses SI, Oglivie-Harris DJ. In vivo diurnal variation in intervertebral volume and morphology. *Spine.* 1994;19:935-40.
7. Ostgaard HC, Andersson GB, Karlsson K. Prevalence of back pain in pregnancy. *Spine.* 1991;16:549-52.
8. Bakker EC, van Nimwegen-Matzinger CW, Ekkelen van der Voorden W, Nijkamp MD, Völlink T. Psychological determinants of pregnancy-related lumbopelvic pain: a prospective cohort study. *Acta Obstet Gynecol Scand.* 2013;92:797-803. doi: 10.1111/aogs.12131.

9. Sabino J, Grauer JN. Pregnancy and low back pain. *Curr Rev Musculoskelet Med.* 2008;1:137-41. doi: 10.1007/s12178-008-9021-8.
10. Norén L, Ostgaard S, Johansson G, Ostgaard HC. Lumbar back and posterior pelvic pain during pregnancy: a 3-year follow-up. *Eur Spine J.* 2002;11(3):267-71.
11. Mogren I.M. Previous physical activity decreases the risk of low back pain and pelvic pain during pregnancy. *Scandinavian J Public Health.* 2005;33:300–6.
12. Yılmaz A, Altuğ F, Coşkun E. Pain, Disability Status and Psychological Factors in Patients with Chronic Low Back Pain. *Turkiye Klinikleri J Med Sci.* 2012;32:1278-83.
13. Yakut E, Duger T, Oksuz C, Yorukan S, Ureten K, Turan D, et al. Validation of the Turkish version of the Oswestry Disability Index for patients with low back pain. *Spine.* 2004;29:581-5.
14. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatry.* 1961;4:561-71.
15. Mogren IM, Pohjanen AI. Low back pain and pelvic pain during pregnancy: prevalence and risk factors. *Spine.* 2005;30:983–91.
16. MacLennan AH, Nicolson R, Green RC, Bath M. Serum relaxin and pelvic pain of pregnancy. *Lancet.* 1986;ii:243–5.
17. Orvieto R, Achiron A, Ben-Rafael Z, Gelernter I, Achiron R. Low back pain of pregnancy. *Acta Obstet Gynecol Scand.* 1994;73:209–14.
18. Mens JM, Vleeming A, Stoeckart R, Stam HJ, Snijders CJ. Understanding peripartum pelvic pain. Implications of a patient survey. *Spine.* 1996;21(11):1363–70.
19. Kashanian M, Akbari Z, Alizadeh MH: The effect of exercise on back pain and lordosis in pregnant women. *Int J Gynaecol Obstet* 2009;107:160–161.
20. Endresen EH. Pelvic pain and low back pain in pregnant women--an epidemiological study. *Scand J Rheumatol.* 1995;24(3):135-141.
21. Nwuga VC. Pregnancy and back pain among upper class nigerian women. *Aust J Physiother.* 1982;28:8-11. doi: 10.1016/S0004-9514(14)60772-8.
22. Kristiansson P, Svärdsudd K, von Schoultz B. Back pain during pregnancy: a prospective study. *Spine.* 1996;15;21:702-9.
23. Thompson JF, Roberts CL, Currie M, Ellwood DA. Prevalence and persistence of health problems after childbirth: associations with parity and method of birth. *Birth.* 2002;29:83-94.
24. Ostgaard HC, Andersson GB. Previous back pain and risk of developing back pain in a future pregnancy. *Spine (Phila Pa 1976).* 1991;16:432-6.
25. Mogren IM. Does caesarean section negatively influence the post-partum prognosis of low back pain and pelvic pain during pregnancy? *Eur Spine J.* 2007;16:115-21.
26. Macarthur A, Macarthur C, Weeks S. Epidural anaesthesia and low back pain after delivery: a prospective cohort study. *BMJ.* 1995;18;311(7016):1336-9.
27. Wang CH, Cheng KW, Neoh CA, Tang S, Jawan B, Lee JH. Comparison of the incidence of postpartum low back pain in natural childbirth and cesarean section with spinal anesthesia. *Acta Anaesthesiol Sin.* 1994;32:243-6.

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