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Level and Intensity of Back Pain during Pregnancy

Poziom i natężenie bólu kręgosłupa w ciąży

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Abstract

Introduction. Lumbar-sacral pain in pregnant women is a common, but still not fully understood ailment.
Aim. The main aim of the study was to determine the impact of the course of pregnancy on the occurrence and profile of back pain in pregnant women. The specific aim was to analyze and evaluate spine pain in pregnant women, taking into account the dependence on selected variables.
Material and Methods. A total of 118 pregnant women participated in the study. The research was conducted among women under gynecological and obstetric care of the Specialist Hospital in Krakow. The research was conducted in 2024. The survey questionnaire was based on the international RMDQ Low Back Pain Questionnaire and a 10-point VAS scale for self-assessment of the felt back pain.
Results. Spinal pain of varying intensity affected 61.1% of pregnant women participating in the study. The average level of pain and the average level of functional capacity according to the RMDQ concerned 27.9% of women and on average it was 7.8±7.8 points. The average spine pain in the study group of pregnant women according to VAS was 3.1±3.2 points.
Conclusions. The incidence of back pain in pregnancy was high. The level of pain and functionality according to the RMDQ and VAS of the surveyed pregnant women was determined to be average. As pregnancy progressed, the intensity of back pain experienced by women increased, and higher levels and intensity of pain were recorded in younger age groups of the surveyed women. The level and intensity of back pain did not depend on the sexual activity of pregnant women. **(JNNN 0000;0(0):0–0)**
Key Words: back pain during pregnancy, RMDQ Low Back Pain Questionnaire, VAS pain scale

Streszczenie

Wstęp. Ból odcinka lędźwiowo-krzyżowego u kobiet w ciąży jest częstą, ale wciąż nie do końca poznaną dolegliwością.
Cel. Celem głównym pracy było określenie wpływu przebiegu ciąży na występowanie i profil dolegliwości bólowych kręgosłupa kobiet w ciąży. Celem szczegółowym była analiza i ocena dolegliwości bólowych kręgosłupa kobiet w ciąży z uwzględnieniem zależności od wybranych zmiennych.
Materiał i metody. W badaniu uczestniczyło łącznie 118 kobiet w ciąży. Badania były przeprowadzone wśród kobiet pozostających pod opieką ginekologiczno-położniczą Szpitala Specjalistycznego w Krakowie. Badania przeprowadzono w 2024 r. Kwestionariusz ankiety składał się z metryczki, Międzynarodowego Kwestionariusza Bólu Krzyża RMDQ oraz 10-punktowej skali VAS do samooceny odczuwanego bólu kręgosłupa.
Wyniki. Ból kręgosłupa w różnym natężeniu dotyczył 61,1% kobiet w ciąży uczestniczących w badaniu. Średni poziom bólu i średni poziom wydolności funkcjonalnej według RMDQ dotyczył 27,9% kobiet i w ujęciu średniej wynosił 7,8±7,8 punktów. Średnia bólu kręgosłupa w badanej grupie kobiet w ciąży według VAS kształtowała się na poziomie 3,1±3,2 punktów.
Wnioski. Częstość występowania bólu kręgosłupa w ciąży była wysoka. Poziom bólu i funkcjonalności według RMDQ oraz VAS badanych kobiet w ciąży zostały określone jako średnie. Wraz z rozwojem ciąży wzrastało natężenie bólu kręgosłupa odczuwanego przez kobiety, a wyższy poziom i natężenie bólu odnotowano w młodszych grupach wiekowych badanych kobiet. Poziom i natężenie bólu kręgosłupa nie były zależne od aktywności seksualnej kobiet w ciąży. **(PNN 0000;0(0):0–0)**
Słowa kluczowe: ból kręgosłupa w ciąży, Kwestionariusz Bólu Krzyża RMDQ, skala bólu VAS

Introduction

Lumbar-sacral pain in pregnant women is a common, but still not fully understood symptom. Epidemiological data on the frequency of spine pain in pregnant women are inconsistent (20–90%), which is due to inaccuracies in the definition and classification of low back pain, and there are also other factors, including: the subjectivity of the assessment or the variety of pain components that should be considered in this context [1]. The incidence of pain increases as pregnancy progresses. Spinal pain usually appears in the second trimester of pregnancy, most often around the 22nd week of pregnancy, but it is most severe in the third trimester of pregnancy [2].

The most common risk factors for pregnancy-related lumbopelvic pain include: pelvic injuries, young mother's age (<35 years), multiparity, history of back pain, high body mass index (≥25 kg/m²) and low education (≤16 years of education) [3]. However, the most important cause of pain is still weight gain during pregnancy, which causes instability of the sacroiliac joint, increased flexibility of the spine and, consequently, the occurrence or intensification of lumbar pain [4].

The aim of the study was to assess spine pain in pregnant women.

Material and Methods

The study involved 118 women in various trimesters of pregnancy. Non-pregnant women and minors were excluded. The study was conducted in 2024 at the Specialist Hospital in Kraków. Only fully completed questionnaires were included in the analyses. The survey questionnaire was developed based on age, the international RMDQ (Reduced Low Back Pain Questionnaire), and a visual analog scale (VAS).

The Roland-Morris Disability Questionnaire (RMDQ) allowed for self-assessment of low back pain and subsequent self-assessment of related physical disability. It consists of 24 items derived from the Disease Impact Profile (SIP), which are clearly linked to bodily processes affected by back pain [5]. The final score is the sum of the fields indicated by the respondent, and the score can range from 0 to 24 points. Basic descriptive statistics (M, SD, Min, Max, Me, and CV) were used in statistical analyses. The nonparametric Kruskal–Wallis test and the nonparametric chi-square test were used to examine correlations between selected variables. Pearson's r (r) and the resulting coefficient of linear determination (R2) were used to assess the strength of correlation.

Results

The surveyed group of women was dominated by respondents aged 26 to 35 (59.32%). Nearly 1/3 (31.36%) of the respondents were between 18 and 25 years old. However, the smallest group (9.32%) were respondents over 35 years of age. Due to the advancement of pregnancy — 26.27% of the respondents were women in the first trimester, 34.75% in the second trimester, and 38.98% in the third trimester.

Most of the surveyed women lived in rural areas (58.47%), were married (74.58%) and had secondary education (60.17%). The majority of respondents also declared low physical activity (72.88%) and low or normal sexual activity (44.92% and 37.29%, respectively). Only 17.80% of respondents declared no sexual activity, and 27.12% declared average physical activity.

Due to the number of children they had, for 40.68% of them the current pregnancy was their first pregnancy. More than one third of the surveyed group of women (34.75%) had 1 child, 16.95% had 2 children, and 5.08% had 3 children.

Based on the Roland-Morris Disability Questionnaire (RMDQ), it was found that 38.9% of the pregnant women studied had no back pain. Back pain of varying severity affected 61.1% of the pregnant women participating in the study, with severe pain occurring in 18.6% and mild pain in 14.4%. Therefore, it was concluded that 27.9% of the respondents had an average level of pain and an average level of functional capacity according to the RMDQ.

The statistical distribution for the entire study group showed that the average pain level according to the RMDQ was 7.8±7.8 points, which qualified it as moderate pain. The range of scores among the pregnant women studied fell within the full range of the RMDQ scale, from 0 to 24 points. The median score was 5 points. A detailed analysis of the individual questions in the RMDQ revealed that the majority of pregnant women surveyed reported walking slower than usual due to back pain, trying not to bend or kneel, and also indicated that back pain was their most common symptom (61.02%).

More than half of the pregnant women surveyed admitted that they frequently changed their body position to achieve the most comfortable position (55.9%). Nearly half of the respondents also indicated that due to discomfort, they lay down more often than usual to rest (48.3%). 45.7% of the respondents spent most of the day sitting down, dressed more slowly than usual, and avoided heavy housework and climbing stairs (44.9%). Respondents were less likely to report that back pain caused them to have to be dressed with help (0.85%), have a poor appetite, and spend most of the day in bed (2.5% each).

The use of the VAS scale confirmed that the absence of back pain affected 38.9% of the surveyed pregnant women. 12.7% and 10.2% of respondents declared feeling mild or moderate pain, respectively. Severe pain affected 19.5% of respondents, very severe pain — 16.9% of women, and the worst pain — 1.7% of pregnant women. The average spine pain in the study group of pregnant women was 3.1±3.2 points, which, according to the VAS scale used, corresponded to moderate pain. The range of individual results covered the entire scale and ranged from 0 to 10 points, with a median of 5 points.

Back pain was significantly dependent on the trimester of pregnancy (p=0.0000).

In the statistical distribution for women in the first trimester of pregnancy, the average pain according to the RMDQ was 1.7±4.5 points, with a median of 0 points, and the highest score in this group of respondents was 19 points. For women in the second trimester of pregnancy, the average pain according to the RMDQ was 4.8±5.6 points. The median was 3 points, and scores ranged from 0 to 21 points. However, the average RMDQ score for women in the third trimester of pregnancy was 14.6±6.0 points, with a median of 13 points. The range of results was the entire range of the RMDQ scale from 0 to 24 points. Based on statistical analysis, it was found that the level of pain and the associated functional dysfunction according to the RMDQ increased with the trimester of pregnancy.

Analyzing the qualitative distribution, it was found that 83.9% of the surveyed pregnant women did not report back pain in the first trimester of pregnancy, while in the second trimester of pregnancy the percentage of women who did not experience back pain dropped to 41.5%, and in the third trimester pregnancy up to 6.5%. Severe pain was reported by 41.3% of women in the third trimester of pregnancy, 4.9% of women in the second trimester of pregnancy and 3.2% of women in the first trimester of pregnancy. The chi-square test for the qualitative scale used confirmed the existence of significant differences (p<0.001) between the level of pain felt according to the RMDQ depending on the trimester of pregnancy.

The intensity of spine pain according to the VAS scale was significantly dependent on the trimester of pregnancy (p<0.001). The average assessment of the level of back pain for women in the first trimester of pregnancy was 0.7±1.9 points (mild pain), for women in the second trimester of pregnancy it was 1.9±2.2 points (mild pain), and for women in the third trimester pregnancy 5.9±2.4 points (severe pain). The strength of the correlation was high and positive (r>0.6).

The declared back pain was significantly dependent on the age of the pregnant women examined (p<0.05) (Table 1).

Table 1. RMDQ qualitative results for pregnant women by trimester

Scale (points)	Numbers					
	I trimester		II trimester		III trimester	
	N	%	N	%	N	%
0	26	83.87	17	41.46	3	6.52
1–7	2	6.45	13	31.71	2	4.35
8–15	2	6.45	9	21.95	22	47.83
16–24	1	3.23	2	4.88	19	41.30
χ^2	p=0.0000**					

N — number of observations, p — coefficient of significance of differences, χ^2 — chi-square test, **p<0.001

The highest mean for perceived back pain according to the RMDQ was found for women aged 18 to 25 years (11.4±8.4 points). For this group of respondents, the range of individual results was from 0 to 24 points, with a median of 12 points and a range of result variability of 73.7%. However, the lowest average score according to the RMDQ scale was recorded for women over 35 years of age, which was 2.0±3.7 points. The median in this group of pregnant women was 0 points, and the range of results was from 0 to 12 points. Volatility was determined to be 183.0%. The average spine pain score for middle-aged women (26 to 35 years old) was 6.8±7.2 points, with a median of 5 points. Individual results ranged from 0 to 21 points. The determined linear correlation coefficient (r<0) and the trend line showed that the level of back pain according to the RMDQ reported by pregnant women decreased with increasing age. The correlation was moderate (r>–0.6). The determined coefficient of determination R2 was 16.7%.

In the youngest age group of the surveyed pregnant women (18 to 25 years old), respondents who experienced high (35.1%) and medium (29.7%) back pain dominated. No pain according to the RMDQ was found for almost one fourth (24.3%) of women in this group, while low level of pain was found for 10.8% of pregnant women. In the group of respondents aged 26 to 35, no back pain was noted in 42.8% of respondents, medium pain according to RMDQ among 30% of respondents, low pain in 14.3% of respondents, and high pain in 12.9% of women pregnancy. The oldest group of surveyed women (over 35 years old) was dominated by women (63.6%) who did not report back pain.

The absence of back pain according to the VAS scale was declared by 24.3% of women aged 18 to 25 years, 42.9% of women aged 26 to 35 years and 63.6% of women aged over 35 years. In the youngest group of respondents (18 to 25 years old), 29.7% of women declared very severe pain, and 27.0% — severe pain. In the age group 26 to 35 years, 17.1% of respondents declared severe pain, and 14.3% reported moderate

pain. However, in the group of women over 35 years of age, 27.3% of respondents declared mild back pain, and 9.1% reported moderate back pain.

Statistical analysis confirmed significant differences ($p<0.05$) in the qualitative assessment of back pain intensity among pregnant women. Younger respondents were more likely to report experiencing more severe pain than older women, thus age significantly differentiated pain levels assessed on the VAS scale ($p=0.0152$). The final correlation variable selected for analysis was the pregnant women's self-reported sexual activity. Bilateral tests were performed for this variable, examining the relationship between the level of back pain and the level of sexual activity of pregnant women, and vice versa, i.e., sexual activity depending on the level and intensity of back pain. The qualitative analysis of the RMDQ revealed that in the groups of pregnant women reporting normal and low sexual activity, 43.4% and 43.2% of respondents reported no back pain, respectively, while in the group of women reporting no sexual activity, only 19.1% reported no back pain.

The distribution according to the qualitative analysis of the RMDQ and VAS confirmed the lack of significant differences between the groups, therefore the level of back pain was not dependent on the level of sexual activity of the surveyed pregnant women and vice versa (two-sided test).

The study was approved by the Bioethics Committee (approval No. 5067/2024).

Discussion

Back pain is a common health problem, and pregnancy is a significant risk factor predisposing to back pain. Our study showed that back pain of varying severity related to functional capacity, according to the RMDQ, affected 61.1% of the pregnant women participating in the study. Of these, severe pain and high functional capacity affected 18.6% of the women surveyed, and mild pain with a low impact on functional capacity affected 14.4%. Moderate pain and moderate functional capacity, according to the RMDQ, affected 27.9% of the pregnant women participating in the study. Our own research showed that back pain and functional capacity were significantly dependent on the trimester of pregnancy ($p<0.001$; $r=0.69$). According to the VAS scale assessing the intensity of back pain in the group of surveyed women in the third trimester of pregnancy, the highest percentage of respondents reported experiencing severe back pain (41.3%) and very severe pain (36.9%). Similar results regarding pain intensity and level have been reported in the literature. In a study by Amayri et al., conducted between May 2020 and December 2022 at the University Hospital of Obstetrics and Gynecology in Damascus, the prevalence of back pain was estimated at 62% using clinical interviews [6].

According to research by Arce-Gálvez et al., back pain is one of the most common complications of pregnancy, with an incidence ranging from 50% to 70%. In the cited studies, its incidence increased with the course of pregnancy and most often occurred in the third trimester of pregnancy, however, the onset of symptoms occurred earlier and as many as 62% of patients reported pain already in the second trimester of pregnancy [7]. In our own research, the occurrence of back pain was recorded already in the first trimester of pregnancy, with the level and intensity of pain increasing significantly with the advancement of pregnancy (16.13% in the first trimester, 58.54% in the second trimester and 93.48% in the third trimester, respectively trimester).

Some authors have indicated a lower incidence of back pain during pregnancy. For example, in the study by Chandiralingam P. and Sri Divya K., the prevalence of low back pain was 27.82%, and the majority of women studied (40%) suffered from mild to moderate disability due to pain according to the RMDQ. The average time of symptom onset in the cited studies was 26 weeks of pregnancy, and the average age of respondents with low back pain was 26 years [8]. In our own research, the average age of women was slightly higher and amounted to 28.29±5.08 years.

In a meta-analysis by Salari et al. examining the global incidence of back pain in pregnancy was determined to be 40.5% (95% CI: 33–48.4), with the incidence of back pain in the first trimester of pregnancy being 28.3% (95% CI: 10.5–57.1), in the second trimester — 36.8% (95% CI: 30.4–43.7), and in the third trimester of pregnancy 47.8% (95% CI: 37.2–58.6) [9].

In our own research, the Visual Analogue Scale (VAS) and the Roland Morris Disability Questionnaire (RMDQ) were used. Based on the results for the entire study group of women, it was found that the level of pain and the level of functional capacity according to the RMDQ on average was 7.8±7.8. Feeling mild or moderate pain intensity according to the VAS scale was declared by 12.7% and 10.2% of respondents, respectively. Severe pain affected 19.5% of respondents, very severe pain — 16.9% of women, and the worst pain — 1.7% of pregnant women. The average spine pain in the study group of pregnant women according to VAS was 3.1±3.2 points. A similar aim of the study by Popescu A. and Lee H. was to determine the incidence of low back pain during pregnancy and its impact on quality of life. The study on a group of 400 pregnant women used a back pain assessment form, a visual analogue scale (VAS) and the Oswestry Disability Index (ODI). The cited studies indicated that 75.3% of respondents experienced back pain during pregnancy. The average VAS score for back pain was slightly higher than that shown in our own

research and amounted to 4.91±1.88. According to the authors of the study, back pain most often occurred in the third trimester of pregnancy (85.5%), of which 45.5% occurred in the lumbar region. The average percentage result on the ODI scale, which assesses the impact of back pain on the functional status, was 31.87% ±15.56%. For 45.7% of the surveyed women, it was found that spine pain slightly limited their physical activity and daily life [10]. Similarly, in the studies by Bryndal et al., the diagnosis of lower back pain during pregnancy was based on the authors' questionnaire, Visual Analogue Scale (VAS), Oswestry Disability Index (ODI) and Roland Morris Disability Questionnaire (RMDQ). The research group consisted of 1,112 women. In pregnant women, the pain intensity was 5.0±2.0 on the VAS scale, and the degree of disability in the ODI was 5.5±4.4, while the impact of pain on functioning according to the RMDQ was 3.9±3.3 [11]. In our own research, the RMDQ result was much higher (7.8±7.8), while the VAS result was lower (3.1±3.2) [11]. In another study by Bryndal et al., 1,510 pregnant women were studied, also using VAS (Visual Analogue Scale) to assess the intensity of pain and the RMDQ questionnaire to assess the impact of low back pain on the functional capacity of pregnant women. Spinal pain disability was measured using the ODI (Oswestry Disability Index) questionnaire. According to the authors, back pain was reported by 54.4% of pregnant women. The mean pain intensity score in women with back pain was determined to be 5.59±1.72 on the VAS scale, and the onset of pain was determined to be at a mean gestational age of 26.8±7.6 weeks. The mean disability score in pregnant women with pain measured by the ODI was 11.6±7.43, while the impact of back pain on the daily functional activity of pregnant women was 8.2±4.34 as measured by the RMDQ. The majority of respondents with back pain experienced minimal disability (55.5%) according to the ODI score and mild disability (59.1%) according to the RMDQ. A significant correlation was observed between the intensity of pain and the degree of disability (ODI; $p<0.001$) and the impact of pain on the functional capacity of pregnant women (RMDQ; $p<0.001$) [12]. Our own research showed that the level and intensity of back pain were significantly dependent on the trimester of pregnancy ($p<0.001$, $r=0.69$) and the age of the examined women ($p<0.05$, $r=-0.41$), but it was not dependent on the level of sexual activity of the surveyed women ($p>0.05$). Severe pain (high impact on functionality according to RMDQ) was reported by 41.3% of women in the third trimester of pregnancy, 4.9% of women in the second trimester of pregnancy and 3.2% of women in the first trimester of pregnancy. The highest average score for spine pain according to the RMDQ was found among women aged 18 to 25 years (11.4±8.4 points), while the lowest average score according to the RMDQ scale was recorded for women over 35 years of age, which was 2.0±3.7 points. For the youngest age group (women aged 18 to 25 years), the average perceived back pain according to VAS was assessed at the level of 4.7±3.4 points, with a median of 5 points, and for the oldest age group (women over 35 years of age) the average pain was estimated at 0.8±1.5 points. VAS, with a median of 0 points. However, there was no relationship between the level and intensity of back pain and the sexual activity of pregnant women and vice versa.

In many studies, the authors tried to find factors and variables that had a significant impact on the level and intensity of back pain during pregnancy. The list of determinants was very diverse. Other factors related to spine pain include, for example, Berber M.A. and Satılmış İ.G. included economic status, trimester of pregnancy, weight gain during pregnancy, frequent urinary tract infections, body posture, experience of back pain in previous pregnancies and history of back pain [13].

Conclusions

Back pain was a common complaint among pregnant women. Based on the RMDQ and VAS scores, the severity of pain and its impact on daily functioning were assessed as moderate. As pregnancy progressed, the intensity of back pain increased. It was also observed that younger women experienced greater pain intensity than older participants. However, no relationship was found between the level of back pain and the sexual activity of pregnant women.

Implications for Nursing Practice

Back pain is common during pregnancy, and the most important risk factors include: obesity or previous back pain. We can determine risk factors based on an interview with the patient in order to gradually implement preventive measures in the form of an appropriate diet, weight control, physical exercises, massages, physiotherapy treatments, or practicing appropriately selected physical activities, e.g. swimming. During pregnancy, women should not take pharmacological agents that could potentially have a negative impact on the development of the fetus, therefore the basis for prevention is the education of pregnant women in this area by medical staff, and in particular by midwives who take care of future mothers on a daily basis.

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