

Original article

Features of Echographic Parameters of the Pubic Symphysis in the Second Trimester of Pregnancy Depending on Body Mass Index

[Ainur Amanzholkyzy](#)¹, [Arailym Altyмова](#)^{2*}, [Yersulu Sagidanova](#)³,
[Zhumaziya Muratova](#)⁴, [Dinara Kulzhanova](#)⁵

Received: March 28, 2026

Revised: April 21, 2026

Accepted: May 07, 2026

Published: June 30, 2026

Citation: Ainur Amanzholkyzy, Arailym Altyмова, Yersulu Sagidanova, Zhumaziya Muratova, Dinara Kulzhanova. Features of echographic parameters of the pubic symphysis in the second trimester of pregnancy depending on body mass index. Trauma & Ortho Kaz, 2026, 77 (3), jto051.

<https://doi.org/10.52889/1684-9280-2026-77-3-jto051>

This work is licensed under a Creative Commons Attribution 4.0 International License



¹ Associate Professor, Normal Physiology Department, West Kazakhstan Medical University named after Marat Ospanov, Aktobe, Kazakhstan. E-mail: a.ainur.82@mail.ru

² PhD student, Department of Normal Physiology, West Kazakhstan Medical University named after Marat Ospanov, Aktobe, Kazakhstan. E-mail: arailym_altyмова@mail.ru

³ PhD student, Department of Normal Physiology, West Kazakhstan Medical University named after Marat Ospanov, Aktobe, Kazakhstan. E-mail: sagidanova.e@mail.ru

⁴ Ultrasound diagnostics physician in the perinatal profile, Medical Center "Ultramed", Aktobe, Kazakhstan. E-mail: zhumaziya.muratova@mail.ru

⁵ Assistant professor, Normal Physiology Department, West Kazakhstan Medical University named after Marat Ospanov, Aktobe, Kazakhstan. E-mail: kulzhanova.dinara@bk.ru

*Corresponding author: arailym_altyмова@mail.ru

Abstract

The second trimester of pregnancy is considered a clinically significant period when pelvic structural changes and early signs of possible complications begin to manifest. Although body mass index is an important anthropometric factor influencing the course of pregnancy, its relationship with echographic parameters of the pubic symphysis has not been sufficiently studied.

Objective. To determine the features of echographic parameters of the pubic symphysis in women during the second trimester of pregnancy depending on body mass index.

Methods. A descriptive and comparative analysis of physical and echographic parameters was performed in 172 women in the second trimester of pregnancy. Echographic parameters of the pubic symphysis in all participants were assessed using ultrasound examination in groups with normal body weight, overweight, and obesity according to body mass index.

Results. According to body mass index, the groups were: normal weight - 109, overweight - 48, and obesity - 15 women. Women with normal body weight were statistically significantly younger than those in the other groups ($p=0.044$), while no differences in height were observed. Separation of the pubic bones and the thickness of the superior ligament did not differ between body mass index groups. The thickness of the left anterior ligaments was statistically significantly higher in the overweight and obese groups compared with the normal-weight group ($p=0.022$) and showed a weak positive correlation with body mass index ($r=0.159$; $p=0.037$).

Conclusions. Echographic parameters of the pubic symphysis in the second trimester of pregnancy present differences according to body mass index, but the impact of increased body weight in pregnant women on these echographic parameters is limited. Among these parameters, the thickness of the anterior pubic ligament was significantly higher in pregnant women classified as overweight or obese compared to those with normal body weight, and this thickness was positively correlated with body mass index. Further research findings will be used to evaluate the changes in the pubic symphysis gap during

pregnancy and to assess the significant impact of body mass index on the primary echographic characteristics during physiological pregnancy.

Keywords: pubic symphysis, ultrasound examination, body mass index, pregnant women.

1. Introduction

During pregnancy there are noticeable morphological and functional changes in the musculoskeletal system, notably in the structures of the pelvic ring. It is known that during pregnancy, under the influence of hormones (relaxin, estrogen, and progesterone), the pubic symphysis physically relaxes and its mobility increases. These changes are recognized as a natural aspect of preparing for delivery, but in rare cases they can become pathological in nature and contribute to the development of symphysiopathy. They are also associated with various issues with a worse quality of life [1–7]. Studies indicate that the incidence of pubic symphysis and pelvic discomfort during pregnancy is 20–70%, and around 10% of women suffer from this pain for more than 3 months following delivery [8].

In contrast to radiography approaches, ultrasonography testing is extensively utilized to evaluate the state of the pubic symphysis at the present time. The use of echographic parameters makes it possible to estimate the breadth of the symphyseal gap, the structural homogeneity, and its dynamics at different stages of pregnancy. The second trimester of pregnancy has particular clinical importance, as during this period changes in the structures of the pelvis become more pronounced and the first signs of possible complications appear [5,7,9,10].

Additionally, anthropometric characteristics of pregnant women, such as body mass index (BMI), are one of the main variables affecting the course of pregnancy and the state of the musculoskeletal system.

It is known that overweight and obesity increase the risk of pregnancy problems developing, but their link with the echographic parameters of the pubic symphysis has not been explored enough [11].

In the literature, there is much research on the morphological alterations of the pubic symphysis during pregnancy, the clinical symptoms of symphysiopathy, and pain syndrome [1–4]. There is also data on the link between maternal anthropometric factors, including BMI, and alterations in the area of the pelvic girdle [6,11]. However, most of these research studies deal with the assessment of risk factors for pelvic girdle pain or with the clinical features of symphysiopathy.

Only a small number of studies to date have examined the association between BMI and certain echographic parameters of the pubic symphysis, and their results are conflicting [6,11,12]. In particular, there is no detailed analysis of ultrasonography parameters of the pubic symphysis interosseous gap and ligamentous apparatus depending on BMI in the second trimester of pregnancy. In this respect, the investigation of the link between the echographic parameters of the pubic symphysis and the BMI is of scientific and practical value for early diagnosis and identification of risk groups.

This study aimed to determine the features of echographic parameters of the pubic symphysis in women during the second trimester of pregnancy depending on BMI.

2. Materials and methods

Design. This was a cohort study conducted in 2024–2025.

Study group. In the study participated 172 pregnant women of the second trimester from the Aktobe region.

Inclusion criteria: singleton pregnancy in the second trimester.

Exclusion criteria: Multiple pregnancy, congenital foetal malformations and women registered at a psychoneurological dispensary.

Ethics approval and consent to participate

The study protocol and all data collection documents, including informed consent forms, were reviewed and approved by the Local Ethics Committee

of the Marat Ospanov West Kazakhstan Medical University (meeting protocol No. 1, November 24, 2023, approval No. 11.33/03). Informed consent was obtained from all participants voluntarily agreeing to take part in the study.

Anthropometric measurement

BMI was calculated using the World Health Organization criteria as $\text{BMI} = \frac{\text{body weight (kg)}}{(\text{height (m)})^2}$, and the participants were divided into 3 groups of normal weight (18.5–24.99 kg/m²), overweight (25.0–29.99 kg/m²) and obese (30.0–40.0 kg/m²).

Ultrasound scanning

The following parameters of the pubic symphysis in the second trimester were assessed with an expert-class Samsung Medison HS50 ultrasound device with support for a 3D mode: pubic symphysis distance (PSD); thickness, shape, structure and echogenicity of the superior pubic ligament (SPL); thickness of the right and left parts of the superior pubic ligament (SPL-R, SPL-L); thickness, shape, structure and echogenicity of the anterior pubic ligament (APL); and thickness of the right and left parts of the anterior pubic ligament (APL-R, APL-L). The following cut-off values were applied: Superior pubic ligament thickness ≤ 5 mm was considered not thickened and ≥ 5 mm thickened, and

anterior pubic ligament thickness ≤ 7 mm was considered not thickened and ≥ 7 mm thickened.

Statistical analysis: The statistical processing of the results of the study was carried out in SPSS 26, GraphPad Prism (version 10.0), and Microsoft Excel 2021. Qualitative (categorical) variables are described by absolute numbers and percentages. Quantitative variables are expressed as mean (M) and standard deviation (SD). Comparison of three or more independent groups was performed with general linear models (GLM). Pearson's correlation coefficient was applied to determine the relationship between two variables. Statistical significance was considered when $p < 0.05$.

3. Results

A descriptive analysis of physical and echographic parameters was conducted among women in the second trimester of pregnancy, and a comparative

analysis was performed to assess differences between normal weight, overweight, and obese BMI groups.

Table 1 - Descriptive and comparative analysis of physical and echographic parameters of the pubic symphysis according to BMI groups of the study participants

Parameters	Normal weight	Overweight	Obesity	p - value
Physical parameters				
Age (years)	28,56 $\pm$ 5,76	30,92 $\pm$ 5,60	31,00 $\pm$ 4,63	p=0,031* p1-2=0,044
Height (cm)	161,92 $\pm$ 6,14	161,96 $\pm$ 6,16	162,93 $\pm$ 3,97	p=0,825
Weight (kg)	57,5 $\pm$ 6,66	70,90 $\pm$ 6,05	90,53 $\pm$ 14,24	p=0,0001*
Echographic parameters				
Pubic symphysis distance	5,91 $\pm$ 1,97	6,35 $\pm$ 1,64	6,08 $\pm$ 1,21	p=0,379
Superior pubic ligament thickness – right	4,84 $\pm$ 0,87	5,07 $\pm$ 0,87	5,21 $\pm$ 1,07	p=0,148
Superior pubic ligament thickness – left	5,02 $\pm$ 0,99	5,14 $\pm$ 0,86	5,22 $\pm$ 1,07	p=0,622
Anterior pubic ligament thickness – right	5,58 $\pm$ 0,94	5,87 $\pm$ 0,74	5,91 $\pm$ 1,08	p=0,120
Anterior pubic ligament thickness – left	5,63 $\pm$ 0,84	5,95 $\pm$ 0,80	6,10 $\pm$ 0,78	p=0,022* p1-2=0,045

Note: * - statistically significant differences according to GLM (General Linear Models); p1-2 – post hoc test between groups 1 and 2 according to Tukey's criterion.

Group 1 – normal weight, Group 2 – overweight, Group 3 – obesity.

During the descriptive and comparative analysis of physical and echographic parameters of pregnant women at the time of participation in the study, the results obtained are presented in accordance with Table 1. When categorized by BMI, the normal weight group consisted of 109 women, the overweight group comprised 48 women, and the obesity group included 15 women. A comparative analysis of the physical parameters of the pregnant women participating in the study showed a significant difference in age between the BMI groups; for example, the age of women in the

normal weight BMI group was significantly lower compared to the overweight BMI group ($p=0.031$). As for height, it was uniform across all groups, showing no differences.

Regarding the echographic parameters, i.e., the condition of the pubic symphysis obtained from ultrasound examination, the following description was made.

The measurement of the pubic symphysis interosseous gap showed no comparative differences between the normal weight, overweight, and obesity BMI groups.

The thickness measurements of the right and left superior pubic ligaments had uniform values, with no differences detected between the BMI groups.

For the left anterior ligament thickness, a significant difference was found between the normal weight and overweight BMI groups ($p=0.022$).

The next analysis—specifically, the result of assessing the correlation between the ultrasound parameter, i.e., the thickness of the left portion of the anterior ligament, and body mass index—was presented in the form of a graph.

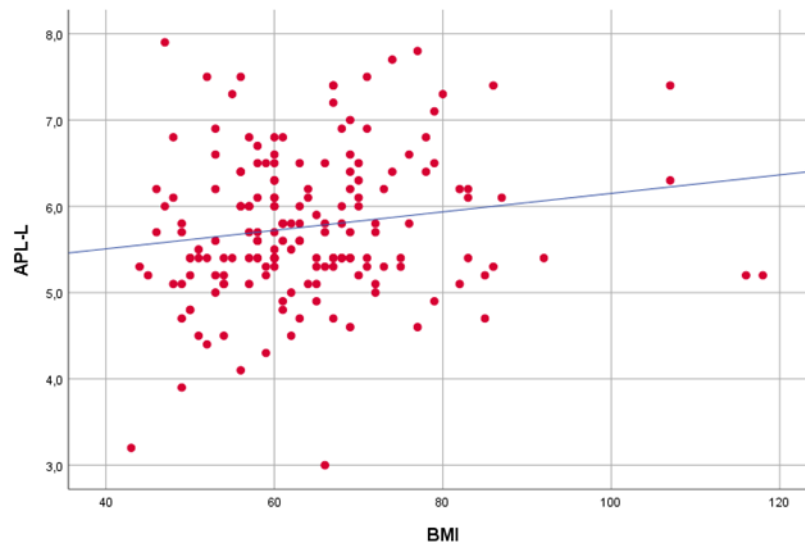


Figure 1 - Correlation between the thickness of the left portion of the anterior ligament and body mass index

The analysis showed a clear weak positive correlation between the body mass index of the participants and the left anterior ligament thickness ($r=0.159$; $p=0.037$).

The subsequent frequency analysis calculated the proportion in each group as a percentage of the total number of pregnant women examined in that group.

Table 2 - Frequency ratio of ultrasound parameters of pregnant women depending on body weight groups

Parameters	Normal weight		Overweight		Obesity		p - value
	Abs.	%	Abs.	%	Abs.	%	
Superior ligament thickness							0,934
not thickened	55	64,7	23	27,1	7	8,2	
thickened	54	62,1	25	28,7	8	9,2	
Superior ligament shape							0,748
unchanged	108	63,2	48	28,1	15	8,8	
changed	1	100,0	0	0,0	0	0,0	
Superior ligament structure and echogenicity							0,073
heterogeneous	0	0,0	2	100,0	0	0,0	
homogeneous	109	64,1	46	27,1	15	8,8	
Anterior ligament thickness							0,424
not thickened	99	64,7	42	27,5	12	7,8	
thickened	10	52,6	6	31,6	3	15,8	
Anterior ligament shape							-
unchanged	109	63,4	48	27,9	15	8,7	
changed	0	0,0	0	0,0	0	0,0	

Table 2 (Continuation) - Frequency ratio of ultrasound parameters of pregnant women depending on body weight groups

Parameters	Normal weight		Overweight		Obesity		p - value
	Abs.	%	Abs.	%	Abs.	%	
Anterior ligament structure and echogenicity							0,708
heterogeneous	3	50,0	2	33,3	1	16,7	
homogeneous	106	63,9	46	27,7	14	8,4	

As shown in Table 2, a frequency analysis of the echographic parameters of the pubic symphysis ligaments was performed according to BMI groups (normal weight, overweight, and obesity). Based on the obtained results, a comparative statistical analysis was conducted between the groups regarding the thickness, shape, structure, and echogenicity of the superior and anterior ligaments.

According to the ultrasound results of the pubic symphysis, the echographic superior ligament thickness was unchanged in 49.4% of cases, while thickening was observed in 50.6% of cases. No significant differences were noted between the designated BMI groups. When assessing superior ligament thickness, the distribution of non-thickened and thickened cases was relatively similar across all BMI groups.

Accordingly, changes in superior ligament thickness were increased in the normal weight group compared to the anterior ligament, whereas in the overweight and obesity groups, thickening of the

anterior ligament was increased compared to superior ligament thickness.

Changes in the shape of the superior ligament were detected in only one case (i.e., in a single pregnant woman), who belonged to the normal BMI group, whereas the shape of the anterior ligament was recorded as unchanged in all study participants.

Regarding the combined parameter of structure and echogenicity: the superior and anterior ligaments were homogeneous in 100% and 98.8% of cases, respectively. Heterogeneity of the anterior ligament structure and echogenicity was recorded in 1.2% of cases.

Similarly, no significant differences were observed between groups in the frequency of changes in superior ligament shape. No differences were found in ligament structure and echogenicity, as this parameter was predominantly homogeneous in all groups. Thus, the obtained results indicate that body mass index does not have a pronounced effect on the main echographic characteristics of the pubic symphysis ligaments.

4. Discussion

In our study we evaluated the relationship between BMI and echographic parameters of pubic symphysis in women in the second trimester of pregnancy. The results showed no statistically significant differences between the normal weight, overweight, and obesity groups in the pubic interosseous gap and in the thickness of the right and left superior pubic ligament portions. This suggests that the changes observed in the pubic symphysis during pregnancy are not only a consequence of body weight but also of the combined effect of hormonal, biomechanical, and anamnestic factors.

There was also a statistically significant difference between the BMI groups for the thickness of the left and right anterior pubic ligaments ($p=0.004$). The correlation analysis demonstrated a weak positive correlation between the body mass index and the thickness of the left anterior ligament ($r=0.159$; $p=0.037$). This can be explained by the increasing mechanical load on the anterior pelvic ring with increasing body weight. However, as the correlation found is weak, the effect of BMI on the ligamentous apparatus may be considered to be limited.

Our results are consistent with the findings of Wozniak et al. [13], who observed that ultrasound parameters of the pubic symphysis changed during pregnancy, but there was no clear and consistent relationship between these changes and body weight. The authors showed that widening of the pubic symphysis is a physiologic change mostly related to increasing gestational age. Similarly, in our study, the pubic interosseous gap indicator was not different between groups of BMI.

Chen and Lin demonstrated that the morphology of the pubic symphysis and superior pubic ligament change dynamically during pregnancy [14]. These changes were attributed by the authors to the action of relaxin and other hormones and to biomechanical adaptation of the pelvic ring. In our study, the absence of differences between BMI groups for most of the parameters of the superior and anterior ligaments suggests that these changes are mainly physiological.

Anastasio et al. showed that obesity, increased mechanical load in pregnancy, and excessive stretching of the ligamentous apparatus are factors leading to widening of the pubic symphysis [15]. But the authors

pointed out that the development of symphysiopathy is not only dependent on the weight of the body, and not all overweight women suffer from pubic symphysis pathology. Our results support this conclusion, as we observed significant changes in the right and left anterior ligament thickness when there was no difference in the pubic interosseous gap with an increase in BMI.

In the study of Akhmetova and colleagues, it was shown that increased parity, large size of the fetus, connective tissue characteristics, and functional state of the ligamentous apparatus play an important role in the development of symphysiopathy [10]. The authors considered body weight as an additional risk factor but did not evaluate it as an independent primary predictor. This is in line with our results, as the majority of the echographic parameters did not show any effect of BMI.

No statistically significant differences were observed in the thickness, shape, structure, or echogenicity of the superior and anterior ligaments in the frequency analysis performed according to BMI groups. In approximately half of the study participants, the superior ligament was thickened but distributed similarly in all groups. Moreover, the structure and

echogenicity of the ligaments were homogeneous in almost the entire number of the cases. This suggests that these changes could be physiological adaptations to pregnancy and not a pathological process.

Vorobyev et al. also pointed out that the development of symphysiopathy is influenced by the combined effect of multiple factors [6]. The authors believe that although mechanical load plays a certain role, hormonal changes and features of calcium-phosphorus metabolism, as well as individual properties of connective tissue, are of primary importance. Our literature review also showed similar conclusions, stating that the pathogenesis of pubic symphysis dysfunction is not fully understood and is multifactorial [3]. The results of our study thus reveal a weak association of body mass index, particularly with the thickness of the anterior ligament. However, BMI had no significant influence on the majority of the main ultrasound parameters of the pubic symphysis. Therefore, when assessing the condition of the pubic symphysis in the second trimester of pregnancy, in addition to body weight, it is necessary to comprehensively consider obstetric history, hormonal changes, and the status of bones and connective tissues, as well as other risk factors.

5. Conclusions

Echographic parameters of the pubic symphysis in the second trimester of pregnancy present differences according to body mass index, but the impact of increased body weight in pregnant women on these echographic parameters is limited. Among these parameters, the thickness of the anterior pubic ligament was significantly higher in pregnant women classified as overweight or obese compared to those with normal body weight, and this thickness was positively correlated with body mass index. Further research findings will be used to evaluate the changes in the pubic symphysis gap during pregnancy and to assess the significant impact of body mass index on the primary echographic characteristics during physiological pregnancy.

Conflict of interest. The authors declare that there is no conflict of interest.

Acknowledgments. We express our gratitude to the management of the non-commercial joint-stock

company "Marat Ospanov West Kazakhstan Medical University".

Funding. This study was conducted within the framework of the internal university scientific and technical project "Comprehensive assessment of the physiological condition of the pubic symphysis in women during pregnancy" funded by a grant for 2023–2025.

Author contributions. Contribution to concept development and scientific design – A.A., A.A.; Execution of the planned scientific research – A.A., A.A., Zh.M.; Interpretation of the results of the planned scientific research – A.A., A.A., D.K.; Preparation of the scientific article – A.A., A.A., E.S.

All authors have read, agreed with, and signed the final version of the manuscript.

AI declaration. The authors declare that no generative AI or AI-assisted technologies were used in the writing, editing, or preparation of this manuscript.

References

1. Kakabadze, Y. G., Lazarev, A. F., Konovalov, V. V., Kalinin, E. I., & Marychev, I. N. (2022). Total resection of the pubic symphysis in a patient with postpartum symphysisitis: A clinical case. *N. N. Priorov Journal of Traumatology and Orthopedics*, 29(3), 289–296. <https://doi.org/10.17816/vto108842>
2. Norvilaite, K., Kezeviciute, M., Ramasauskaite, D., Arlauskienė, A., Bartkeviciene, D., & Uvarovas, V. (2020). Postpartum pubic symphysis diastasis: Conservative and surgical treatment methods, incidence of complications:

Two case reports and a review of the literature. World Journal of Clinical Cases, 8(1), 110–119. <https://doi.org/10.12998/wjcc.v8.i1.110>

3. Altyмова, A. K., Amanzholkzy, A., Gubasheva, G. K., Donayeva, A. E., Kulzhanova, D. S., Karimsakova, B. K., & Kosmuratova, S. B. (2025). Symphysis pubis dysfunction: What we know and still have to learn (a literature review). Reproductive Medicine (Central Asia), (1), 57–66. <https://doi.org/10.37800/RM.1.2025.435>

4. Petrushin, A. L., & Pryaluchina, A. V. (2018). Raskhozhdenie lonnogo sochleneniya pri beremennosti i rodakh (obzor literatury) (Pubic symphysis diastasis in pregnancy and delivery (review)) [in Russian]. Travmatologiya i ortopediya Rossii, 24(3), 145–156. <https://doi.org/10.21823/2311-2905-2018-24-3-145-156>

5. Yavorskaya, S. D., Plotnikov, I. A., Bondarenko, A. V., Olimova, A. O., & Plotnikova, I. V. (2018). Lechenie akusherskikh razryvov lobkovogo simfiza i disfunktsii lonnogo sochleneniya (Treatment of obstetric pubic symphysis ruptures and pubic symphysis dysfunction) [in Russian]. Akusherstvo i ginekologiya, (9), 68–72. <https://doi.org/10.18565/aig.2018.9.68-72>

6. Vorobyev, A. A., Selikhova, M. S., Ilina, O. V., & Yakovenko, M. S. (2020). Simfiziopatiya kak mezhdistsiplinarnaya problema (Symphysiopathia as an interdisciplinary problem) [in Russian]. Journal of Volgograd State Medical University, 17(3), 20–25. [https://doi.org/10.19163/1994-9480-2020-3\(75\)-20-25](https://doi.org/10.19163/1994-9480-2020-3(75)-20-25)

7. Stolarczyk, A., Stępiński, P., Sasinowski, Ł., Czarnocki, T., Dębiński, M., & Maciąg, B. (2021). Peripartum pubic symphysis diastasis—Practical guidelines. Journal of Clinical Medicine, 10(11), 2443. <https://doi.org/10.3390/jcm10112443>

8. Halliday, B., Chatfield, S., Hosking, J., & Freeman, J. (2024). The prevalence of depression in women with pregnancy-related pelvic girdle pain: A systematic review and meta-analysis. Health Science Reports, 7(8), e2308. <https://doi.org/10.1002/hsr2.2308>

9. Noskova, O. V., Churilov, A. V., Sviridova, V. V., & Litvinova, E. V. (2020). Osobennosti techeniya simfiziopatii vo vremya beremennosti (Features of the course of symphysiopathy during pregnancy) [in Russian]. Bulletin of Hygiene and Epidemiology, 24(1), 64–66. <https://doi.org/10.31612/0869-448X-2020-24-1-64-66>

10. Akhmetova, E. S., Mochalova, M. N., & Galeeva, A. I. (2025). Symphysis pubis dysfunction: Analysis of risk factors and basic diagnostic criteria. Journal of Obstetrics and Women's Diseases, 74(2), 5–10. <https://doi.org/10.17816/JOWD641770>

11. Wuytack, F., Begley, C., & Daly, D. (2020). Risk factors for pregnancy-related pelvic girdle pain: A scoping review. BMC Pregnancy and Childbirth, 20(1), 739. <https://doi.org/10.1186/s12884-020-03442-5>

12. Ianniello, S., Cozzi, D., Albano, D., Messina, C., Sconfienza, L. M., & Sardanelli, F. (2022). Ultrasound assessment of the pubic symphysis during pregnancy: A useful tool in the evaluation of pelvic girdle disorders. Journal of Ultrasound, 25(3), 321–329. <https://doi.org/10.1007/s40477-021-00620-8>

13. Wozniak, S., Piatek, A., Kurc-Darak, B., Domagala, Z., Paulsen, F., & Florjanski, J. (2025). Sonographic evaluations of the pubic symphysis at different stages of pregnancy. Journal of Clinical Medicine, 14(11), 3898. <https://doi.org/10.3390/jcm14113898>

14. Chen, P., & Lin, W. (2025). Dynamic changes in pubic symphysis and superior pubic ligament during pregnancy: A study using ultrasound shear-wave elastography. International Journal of Women's Health, 17, 2195–2204. <https://doi.org/10.2147/IJWH.S520999>

15. Anastasio, M. K., Anastasio, A. T., & Kuller, J. A. (2023). Peripartum pubic symphysis diastasis. Obstetrical and Gynecological Survey, 78(6), 369–375. <https://doi.org/10.1097/OGX.0000000000001156>

Жүктіліктің екінші триместріндегі қасаға симфизі эхографиялық көрсеткіштерінің салмақ индексі бойынша ерекшеліктері

[Аманжолқызы А.](#) ¹, [Алтымова А.К.](#) ^{2*}, [Сағиданова Е.К.](#) ³,
[Муратова Ж.Б.](#) ⁴, [Кульжанова Д.С.](#) ⁵

¹ Қалыпты физиология кафедрасының профессоры, Марат Оспанов атындағы Батыс Қазақстан медицина университеті, Ақтөбе, Қазақстан.
E-mail: a.ainur.82@mail.ru

² PhD докторант, қалыпты физиология кафедрасы, Марат Оспанов атындағы Батыс Қазақстан медицина университеті, Ақтөбе, Қазақстан.
E-mail: arailym_altyмова@mail.ru

³ PhD докторант, қалыпты физиология кафедрасы, Марат Оспанов атындағы Батыс Қазақстан медицина университеті, Ақтөбе, Қазақстан.
E-mail: sagidanova.e@mail.ru

⁴ Перинаталдық профиль бойынша ультрадыбыстық диагностика дәрігері, «Ultramed» медициналық орталығы, Ақтөбе, Қазақстан.

E-mail: zhumaziya.muratova@mail.ru

⁵ Қалыпты физиология кафедрасының ассистент профессоры, Марат Оспанов атындағы Батыс Қазақстан медицина университеті, Ақтөбе, Қазақстан. E-mail: kulzhanova.dinara@bk.ru

Түйіндеме

Жүктілік кезінде тірек-қимыл жүйесінде, әсіресе жамбас сақинасы құрылымдарында гормоналды өзгерістерге байланысты морфологиялық және функционалдық қайта құрулар жүреді. Бұл босануға физиологиялық дайындықтың бір бөлігі болғанымен, кейде симфизіопатияның дамуына әкелуі мүмкін. Қасаға симфизінің жағдайын бағалауда қауіпсіз әрі ақпаратты әдіс ретінде ультрадыбыстық зерттеу кеңінен қолданылып, нәтижесінде симфиз саңылауының ені, құрылымы және жүктілік кезеңдеріндегі динамикасы анықталады. Жүктіліктің екінші триместрі жамбас құрылымдарындағы өзгерістер айқындалатын және ықтимал асқынулардың алғашқы белгілері көрінетін маңызды кезең болып саналады. Дене салмағы индексі жүктілік ағымына әсер ететін маңызды антропометриялық фактор болғанымен, оның қасаға симфизінің эхографиялық көрсеткіштерімен байланысы жеткілікті зерттелмеген.

Зерттеудің мақсаты: жүктіліктің екінші триместріндегі әйелдерде қасаға симфизінің эхографиялық көрсеткіштерінің дене салмағы индексіне тәуелді ерекшеліктерін анықтау

Әдістері. Жүктіліктің II триместріндегі 172 әйелдің физикалық және эхографиялық көрсеткіштеріне сипаттамалық әрі салыстырмалы талдау жүргізілді. Барлық зерттеуге қатысушылар қасаға симфизінің эхографиялық көрсеткіштері ультрадыбыстық зерттеу қалыпты, артық салмақ және семіздік дене салмағы индексі топтарында бағаланды.

Нәтижесі. Дене салмағы индексі бойынша қалыпты салмақ - 109, артық салмақ - 48 және семіздік - 15 әйел анықталды. Жасы бойынша қалыпты салмақ тобындағы әйелдер басқа топтарға қарағанда едәуір жас болды ($p=0,044$), ал бой ұзындығында айырмашылық байқалмады. Қасаға симфизі сүйектері арасындағы ажырау мен жоғарғы байлам қалыңдығы дене салмағы индексі бойынша бөлінген топтар арасында ерекшеленбеді. Алдыңғы байламның сол жақ қалыңдығы қалыпты салмақ тобымен салыстырғанда артық салмақ және семіздік топтарында мәнді жоғары болды ($p=0,022$) және дене салмағы индексі көрсеткішімен әлсіз оң корреляция көрсетті ($r=0,159$; $p=0,037$).

Қорытынды. Жүктіліктің екінші триместріндегі қасаға симфизі эхографиялық көрсеткіштерінің салмақ индексі бойынша ерекшеліктері бар екенін, дегенмен жүкті әйелдердің дене салмағының артуы эхографиялық көрсеткіштердің ішінде әсері шектеулі екенін көрсетті. Соның ішінде алдыңғы байлам қалыңдығы қалыпты дене салмағындағы жүкті әйелдерге қарағанда, артық салмақ және семіздік топтарындағы жүкті әйелдерде мәнді статистикалық тұрғыдан қалыңдауымен және оң корреляциямен ерекшеленді. Жалпы алғанда, физиологиялық жүктілік кезіндегі дене салмағы индексіне байланысты негізгі эхографиялық сипаттамаларына айқын ықпалын қасаға симфизі ажырауы байқалатын, яғни өзгерістері бар жүктілік кезінде тереңірек зерттеу нәтижелерімен бағаланатын болады.

Түйін сөздер: қасаға симфизі, ультрадыбыстық зерттеу, дене салмағы индексі, жүктілік.

Особенности эхографических показателей лонного симфиза во втором триместре беременности в зависимости от индекса массы тела

[Аманжолқызы А.](#) ¹, [Алтымова А.К.](#) ^{2*}, [Сағиданова Е.К.](#) ³,
[Муратова Ж.Б.](#) ⁴, [Кульжанова Д.С.](#) ⁵

¹ Профессор кафедры нормальной физиологии, Западно-Казахстанский медицинский университет имени Марата Оспанова, Актөбе, Казахстан. E-mail: a.ainur.82@mail.ru

² PhD докторант, кафедра нормальной физиологии, Западно-Казахстанский медицинский университет имени Марата Оспанова, Актөбе, Казахстан. E-mail: arailym.altymova@mail.ru

³ PhD докторант, кафедра нормальной физиологии, Западно-Казахстанский медицинский университет имени Марата Оспанова, Актөбе, Казахстан. E-mail: sagidanova.e@mail.ru

⁴ Врач ультразвуковой диагностики перинатального профиля, Медицинский центр «Ultramed», Актөбе, Казахстан. E-mail: zhumaziya.muratova@mail.ru

⁵ Ассистент профессор кафедры нормальной физиологии, Западно-Казахстанский медицинский университет имени Марата Оспанова, Актөбе, Казахстан. E-mail: kulzhanova.dinara@bk.ru

Резюме

Второй триместр беременности считается клинически значимым периодом, когда начинают проявляться структурные изменения таза и ранние признаки возможных осложнений. Хотя индекс массы тела является важным антропометрическим фактором, влияющим на течение беременности, его взаимосвязь с эхографическими параметрами лонного сочленения изучена недостаточно.

Цель исследования: определить особенности эхографических параметров лонного сочленения у женщин во втором триместре беременности в зависимости от индекса массы тела.

Методы. Проведен дескриптивный и сравнительный анализ физических и эхографических параметров у 172 женщин во втором триместре беременности. Эхографические параметры лонного сочленения у всех участниц оценивались с помощью ультразвукового исследования в группах с нормальной массой тела, избыточной массой тела и ожирением в соответствии с индексом массы тела.

Результаты. В зависимости от индекса массы тела группы распределились следующим образом: нормальный вес — 109, избыточный вес — 48, ожирение — 15 женщин. Женщины с нормальной массой тела были статистически значимо моложе участниц из других групп ($p=0.044$), в то время как различий по росту обнаружено не было. Расхождение лонных костей и толщина верхней связки не отличались между группами с разным индексом массы тела. Толщина левых передних связок была статистически значимо выше в группах с избыточным весом и ожирением по сравнению с группой с нормальным весом ($p=0.022$) и продемонстрировала слабую положительную корреляцию с индексом массы тела ($r=0.159$; $p=0.037$).

Выводы. Эхографические параметры лонного сочленения во втором триместре беременности имеют различия в зависимости от индекса массы тела, однако влияние повышенной массы тела беременных на эти параметры ограничено. Среди исследованных показателей толщина передней лонной связки была значимо выше у беременных с избыточной массой тела или ожирением по сравнению с женщинами с нормальным весом, и эта толщина положительно коррелировала с индексом массы тела. Результаты дальнейших исследований будут использованы для оценки изменений ширины лонной щели во время беременности и определения степени значимости влияния индекса массы тела на основные эхографические характеристики при физиологическом течении беременности.

Ключевые слова: лонное сочленение, ультразвуковое исследование, индекс массы тела, беременные.