CLINICAL AND PATHOGENETIC ANALYSIS OF THE CAUSES OF SYMPHYSIOPATHY DURING PREGNANCY

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Аннотация: Было обследовано 107 беременных женщин, разделённых на две группы: основную (n = 73) — с диагностированной симфизипатией во втором и третьем триместрах, и контрольную (n = 34) — без данной патологии. Симфизипатия чаще выявлялась у женщин молодого возраста (средний возраст 20,8 ± 3,28 лет), у повторнородящих с коротким межродовым интервалом (в среднем 1 ± 0,9 года), а также у пациенток с избыточной массой тела или ожирением. В основной группе до беременности избыточный вес имели 68% женщин, ожирение I степени — 18%, ожирение II степени — 14%. Средняя масса плода у женщин с симфизипатией составила 3800 ± 500 грамм. По данным ультразвукового исследования у 80% женщин выявлен симфизит I степени, у 15% — II степени, и у 5% — III степени. Лабораторные анализы показали снижение уровня магния (0,72 ± 0,10 ммоль/л) и ионизированного кальция (1,61 ± 0,8 ммоль/л), при этом уровень фосфора оставался в пределах нормы (1,08 ммоль/л). Дефицит витамина D (<12 нг/мл) был выявлен у 36,6% женщин, а недостаточность (12–20 нг/мл) — у 63,4%, что статистически значимо чаще, чем в контрольной группе ($p < 0,05$).

Ключевые слова: симфизит, симфизиопатии, витамина D, ожирение, послеродовые осложнения, повреждения таза, кальций ионизированный, магний, фосфор.

Abstract: A total of 107 pregnant women were examined and divided into two groups: the main group (n = 73) with symphysiopathy during the second and third trimesters, and the control group (n = 34) without the pathology. Symphysiopathy was more common among younger women (mean age 20.8 ± 3.28 years), multiparous patients

with a short interbirth interval (mean 1 ± 0.9 years), and those with excessive body weight or obesity. Among the main group, 68% had pre-pregnancy overweight, 18% had class I obesity, and 14% had class II obesity. The average fetal weight was 3800 ± 500 g. Ultrasound findings revealed first-degree symphysitis in 80% of the main group, second-degree in 15%, and third-degree in 5%. Laboratory tests showed low magnesium (0.72 ± 0.10 mmol/L), ionized calcium (1.61 ± 0.8 mmol/L), with normal phosphorus levels (1.08 mmol/L). Vitamin D deficiency (<12 ng/mL) was found in 36.6% of patients, and insufficiency (12–20 ng/mL) in 63.4%, significantly more frequent than in the control group ($p < 0.05$).

Keywords: symphysitis, symphysiopathies, vitamin D, obesity, postpartum complications, pelvic injuries, ionized calcium, magnesium, phosphorus.

Aim: objective of this study was to assess clinical and anamnestic characteristics, ultrasound findings, and serum levels of ionized calcium, magnesium, phosphorus, and vitamin D in pregnant women diagnosed with symphysiopathy.

Materials and Methods: The study included 107 pregnant women aged 18 to 38 years with clinical manifestations of symphysiopathy, who sought medical care at the "RSSPMCHMandChH" and Qibray Maternity Hospital. Clinical and anamnestic data, the nature of clinical manifestations of symphysisitis, ultrasound findings, and laboratory results were analyzed, including the determination of magnesium, ionized calcium, phosphorus, and vitamin D levels in the blood.

Ultrasound examinations were performed using the state-of-the-art Mindray DC-70 expert-class ultrasound machine with a sensor sensitivity of 3–3.5 MHz. Laboratory tests were conducted on the Biosystem A15 automatic biochemical analyzer (Spain). Statistical analysis of the results was performed using standard methods on a personal computer with Microsoft Word and Microsoft Excel software.

Results: The participants were divided into clinical groups: Group I consisted of 73 pregnant women with symphysiopathy during the second and third trimesters, while Group II, the control group, included 34 pregnant women without this pathology.

Analysis revealed that symphysiopathy was more common in younger women, with a mean age of 20.8 ± 3.28 years, and in multiparous women with a short interbirth interval

(mean 1 ± 0.9 years). Additionally, it was more frequent among women who gave birth to larger babies, with an average fetal weight of 3800 ± 500 grams. The diagnosis was based on clinical symptoms, with the primary signs being pubic symphysis pain and separation of the pubic joint. Almost all women with symphysiopathy (91.3%) reported pain upon palpation of the pubic symphysis and when changing body position. About one in ten women with symphysiopathy exhibited swelling and tenderness above the pubis, a "duck-like" gait, pain with bilateral pelvic compression, and tension in the gluteal and adductor muscles. In cases with severe clinical manifestations, a positive Trendelenburg sign (19.1%), Patrick's sign (47.5%), and a positive test for the inability to actively alternate raising straight legs (7.82%) were frequently observed.

Among women in Group I, 49 (68%) were overweight, 13 (18%) had class I obesity, and 11 (14%) had class II obesity, compared to the control group (see Table 1).

Table 1

Results of body mass index assessment in women of the main group

Parameters studied Body mass index	I-basic group n=73	
	abs	%
Overweight	49	68
Obesity 1 degree	13	18
Obesity 2 degree	11	14

Thus, the results of the examination revealed that in Group I (main group), 49 (68%) women were overweight before pregnancy, 13 (18%) had grade I obesity, and 11 (14%) had grade II obesity, compared to Group II (control group).

To assess the severity of symphysiopathy, in addition to the intensity of pain, it is important to evaluate the degree of pubic bone separation and the extent of anatomical changes in the pubic symphysis and adjacent pubic bones. We conducted an ultrasound examination of the pubic symphysis. The study began by examining the upper edge of the pubic symphysis, gradually moving downward. Measurements were taken at several points

within the clearly visible boundaries of the pubic bones. The maximum pubic symphysis diastasis was determined from the results. As pregnancy progresses, the separation of the pubic symphysis increases, reaching 5.22 ± 0.54 mm at term, and 4.5 ± 0.9 mm on days 4–5 postpartum. According to the ultrasound findings and the classification of L.V. Vanin (1954) and L.S. Persianinov (1964), pubic symphysis separation was observed as follows in Group I: first-degree in 53 (80%), second-degree in 11 (15%), and third-degree in 4 (5%), compared to the control group (see Table 2).

Table 2

Results of the ultrasound examination

Parameters studied	Groups studied			
	Basic group n=73		Control group n=34	
	abs	%	abs	%
Physiologic divergence	-	-	34	100
Symphysitis 1 degree	58	80	-	-
Symphysitis of the 2nd degree	11	15	-	-
Syphysitis 3 degree	4	5	-	-

Ultrasound examination results of the pubic symphysis revealed significant changes and separations in the pubic symphysis in the main group (Group I): first-degree symphysitis (0.6–0.9 mm) was observed in 58 (80%) patients, second-degree (10–18 mm) in 11 (15%), and third-degree (more than 20 mm) in 4 (5%), compared to the control group.

In contrast, in the control group (Group II), all 34 (100%) women exhibited physiological separation of the pubic symphysis (5.22 ± 0.54 mm).

The next stage of the examination involved analyzing the levels of magnesium, ionized calcium, phosphorus, and vitamin D. The analysis of microelements and vitamin D levels revealed that in the main group, 66 (91%) patients had low levels of magnesium (0.72 ± 0.10 mmol/L) and ionized calcium (1.61 ± 0.8 mmol/L), while the phosphorus level remained unchanged at 1.08 mmol/L. A vitamin D deficiency (<12 ng/mL) was found in 27 (36.6%) women, and insufficiency (12–20 ng/mL) was observed in 46 (63.4%) women, compared to the control group (see Table 3).

Table **3**

Results of the determination of magnesium, phosphorus, ionized calcium, and vitamin D levels.

Studied parameters	Examined groups	
	I-basic group n=73	II-control group n=34
Magnesium [mmol/L]	0,72±0,10 *	1,01±0,10
Ionized calcium [mmol/L]	1,61±0,8*	3,8±0,8
Phosphorus [mmol/L]	1,08*	2,01
Vitamin D [ng/mL]	9,1±0,13*	39±2,3

Note: * - differences relative to the main group and control group data ($p < 0.05$).

The results of the laboratory examination of microelements showed that in the main group (Group I), the magnesium concentration averaged 0.72 ± 0.10 mmol/L, which was 1.5 times lower than in the control group (Group II). The ionized calcium level in Group I was 1.61 ± 0.8 mmol/L, 2.5 times lower than in Group II, where it was 3.8 ± 0.8 mmol/L. The phosphorus level remained unchanged in both groups. In Group I, a pronounced deficiency of vitamin D was observed in 27 (36.6%) patients, with the average vitamin D concentration being 9.1 ± 0.13 ng/mL, which was four times lower compared to the control group. Vitamin D insufficiency was found in 46 (63.4%) women, with the average concentration of 16.1 ± 0.13 ng/mL, which was 2.5 times lower compared to the control group.

Thus, the obtained data indicate a higher frequency of obesity, particularly of grade I and II, in the first main group compared to the control group. This suggests the need for the development of specialized programs aimed at correcting body weight and metabolic indicators in pregnant women before conception. Furthermore, the decrease in microelement and vitamin D levels requires replenishment through diet or the use of supplements before pregnancy, during pregnancy, and in the postpartum period.

Conclusions:

Ultrasound examination revealed pubic symphysis separation in 58 patients (80%) of the first degree, 11 patients (15%) of the second degree, and 4 patients (5%) of the third degree, which significantly differs from the control group results.

Magnesium levels in Group I were 1.5 times lower than in Group II, averaging 0.72 ± 0.10 mmol/L.

Ionized calcium levels in Group I were 2.5 times lower than in Group II, averaging 1.61 ± 0.8 mmol/L.

Vitamin D levels were 4 times lower in Group I compared to Group II, with low levels of vitamin D potentially being one of the causes of symphysiopathy development.

References:

1.Petrushin A.L., Pryalukhina A.V. Pubic Symphysis Separation during Pregnancy and Childbirth. Traumatology and Orthopedics of Russia. 2018;24(3):145-156. DOI: 10.21823/2311-2905-2018-24-3-145-156.

2.Incidence and Risk Factors of Symptomatic Peripartum Diastasis of Pubic Symphysis. J Korean Med Sci. 2014;29:281-286. DOI: 10.3346/jkms.2014.29.2.281.

3.Academician of the Russian Academy of Medical Sciences, Prof. V.N. Serov, Dr. E.V. Ananyev. Assessment of the Severity of Pubic Symphysis Dysfunction and the Choice of Delivery Method. Russian Obstetrician-Gynecologist Journal. 2011;3.

4.Gudushauri Ya.G., Lazarev A.F., Verzin A.V. Surgical Correction of Obstetric Pubic Symphysis Ruptures. Vestnik of Traumatology and Orthopedics named after N.N. Priorov. 2014;(4):15-21.

5.Shnaekel K.L., Magnan E.F., Ahmadi S. Pubic Symphysis Rupture and Separation during Pregnancy. Obstet Gynecol Surv. 2015;70(11):713-718. DOI: 10.1097/OGX.0000000000000247.

6.Pires R.E.S., Labronici P.J., Giordano V., Kojima K.E., Kfuri M., Barbisan M. et al. Impartium Pubic Symphysis Disruption. Ann Med Health Sci Res. 2015;5(6):476-479. DOI: 10.4103/2141-9248.177980.

7.Yoo J.J., Ha Y.C., Lee Y.K., Hong J.S., Kang B.J., Koo K.H. Incidence and Risk Factors of Symptomatic Peripartum Diastasis of Pubic Symphysis. J Korean Med Sci. 2014;29(2):281-286. DOI: 10.3346/jkms.2014.29.2.281.

8.Urraca-Gesto M.A., Plaza-Manzano G., Ferragut-Garcias A., Pecos-Martin D., Gallego-Izquierdo T., Romero Franco N. Diastasis of Symphysis Pubis and Labor: Systematic Review. J Rehabilit Research Develop. 2015;52(6):629-640. DOI: 10.1682/JRRD.2014.12.0302.

9.Palvia V., Kim S., Warholic H., Anasti J. Severe Pubic Symphysis Diastasis Managed Conservatively: Case Report and Review. Case Rep Clin Med. 2017;6:120-126. DOI: 10.4236/crcm.2017.64010.

10.Ultrasound Diagnosis of Pubic Symphysis Condition in Women - Russian Medical Journal.