doi: 10.48095/cccg2024102

Fecal incontinence risk factors and pregnancy

Faktory rizika fekální inkontinence a těhotenství

S. Vasyliuk[1], A. Cheredarchuk[1], M. Rymarchuk[1], R. Bondarev[2], O. Proshchenko[3], A. Mykytyuk[4]

[1] Ivano-Frankivsk National Medical University, Ivano-Frankivsk, Ukraine
[2] International European University, Kyiv, Ukraine
[3] Bogomolets National Medical University, Kyiv, Ukraine
[4] Vasyl Stefanyk Precarpathian National University, Ivano-Frankivsk, Ukraine

Summary: **Materials and methods:** We conducted an analysis on 231 pregnant women. A proctologist examined the patients three times: in the 1st trimester (within the first 15 weeks), in the 3rd trimester (29–40 weeks), and 12 months after childbirth. **Results:** The total number of fecal incontinence observations among women included in the study was 66 cases (28.6%), detected at the final visit. Risk factors for fecal incontinence with a high probability were age over 36 years (P = 0.001), low physical activity (P = 0.034), three or more pregnancies resulting in childbirth (P = 0.022), history of hemorrhoids (P = 0.027), perianal discomfort on the first visit (P = 0.045), and constipation on the first visit (P = 0.006). Factors such as being overweight, marital status, education, living conditions, living area, and infant size did not have significance for fecal incontinence. **Discussion:** Pregnancy- and obstetric-related risk factors contributing to fecal incontinence are multifactorial, including factors such as multiple childbirths with trauma to the pelvic muscles or anal sphincter muscles, chronic constipation, age, and vaginal deliveries. However, currently, there is no clear concept for the prevention of fecal incontinence in pregnant women. **Conclusion:** The prevalence of fecal incontinence among pregnant women is 12.9%, which increases to 28.6% one year after childbirth. The most common complaint was involuntary passage of intestinal gas. Risk factors for fecal incontinence with a high probability included being over 36-years old, low physical activity, three or more pregnancies resulting in childbirth, a history of hemorrhoids, perianal discomfort, and constipation in the 1st trimester of pregnancy.

Key words: pregnancy – childbirth – fecal incontinence – constipation – risk factors

Souhrn: **Materiály a metody:** Provedli jsme analýzu na 231 těhotných ženách. Proktolog provedl vyšetření pacientek třikrát: v I. trimestru (během prvních 15 týdnů), ve III. trimestru (29–40 týdnů) a 12 měsíců po porodu. **Výsledky:** Celkový počet pozorování fekální inkontinence u žen zapojených do studie byl 66 případů (28,6 %) zjištěných během poslední návštěvy. Rizikovými faktory pro fekální inkontinenci byl s vysokou pravděpodobností věk > 36 let (p = 0,001), nízká fyzická aktivita (p = 0,034), tři a více těhotenství s porodem (p = 0,022), anamnéza hemoroidů (p = 0,027), perianální diskomfort při první návštěvě (p = 0,045) a zácpa při první návštěvě (p = 0,006). **Diskuze:** Rizikové faktory spojené s těhotenstvím a porodem, které přispívají k výskytu fekální inkontinence, jsou multifaktoriální a zahrnují např. vícečetné porody spojené s poškozením pánevních svalů nebo svalů análního svěrače, chronickou zácpu, věk a vaginální porody, nicméně momentálně neexistuje jasný koncept prevence fekální inkontinence u těhotných žen. **Závěr:** Prevalence fekální inkontinence u těhotných žen činí 12,9 % a po roce od porodu stoupá na 28,6 %. Nejběžnějším symptomem byl nepřirozený únik střevních plynů. Rizikové faktory spojené s výskytem fekální inkontinence zahrnovaly věk > 36 let, nízkou fyzickou aktivitu, tři nebo více těhotenství vedoucích k porodu, anamnézu hemoroidů, perianální nepohodlí a zácpu v I. trimestru těhotenství.

Klíčová slova: těhotenství – porod – fekální inkontinence – zácpa – rizikové faktory

Introduction

Risk factors for pelvic floor disorders are often associated with pregnancy and childbirth. Sequential evidence is necessary for the development of preventive strategies targeting these risk factors [1–3]. The frequency of fecal incontinence occurring during pregnancy or in the postpartum period is higher than commonly believed. Disorders of anal sphincter function are diagnosed by ultrasound in 26% of women who have had vaginal deliveries, and clinical signs of fecal incontinence are present in 19–30.5% [4,5]. According to expert estimates, fecal incontinence, including the inability to control solid or liquid stool or involuntary leakage, affects 7 to 15% of women in the general population. This condition is associated with reduced quality of life, negative psychological consequences, and social stigma. However, many women do not report their symptoms or seek treatment. Less than 3% of women who self-report fecal incontinence will have this diagnosis documented in their medical records [6].

Tab. 1. Baseline characteristics of pregnant women included in the study.
Tab. 1. Základní charakteristiky těhotných žen zahrnutých do studie.

Baseline characteristics	Total (N = 231)
age (mean ± SD), years	30.3 ± 4.5
BMI, median (Q1; Q3)	22.1 (20.7; 25.0)
married, N (%)	185 (80.1%)
partnership, N (%)	26 (11.3%)
lonely, N (%)	20 (8.7%)
secondary education, N (%)	43 (18.6%)
special secondary education, N (%)	40 (17.3%)
unfinished higher education, N (%)	31 (13.4%)
higher education, N (%)	117 (50.6%)
living conditions: satisfactory, N (%)	92 (39.8%)
living conditions: good, N (%)	139 (60.2%)
rural, N (%)	71 (30.7%)
urban, N (%)	160 (69.3%)
physical activity: too low, N (%)	127 (54.9%)
physical activity: enough, N (%)	104 (45.0%)
menarche, median (Q1; Q3), years	13.0 (12.0; 14.0)
first pregnancy, N (%)	103 (44.6%)
second pregnancy, N (%)	68 (29.4%)
three and more pregnancies, N (%)	60 (25.9%)
history of perianal disorders, N (%)	70 (30.3%)
history of perianal surgery, N (%)	21 (9.1%)

BMI – body mass index, N – number, SD – standard deviation

Gynecologists have a unique opportunity to identify women with fecal incontinence since pregnancy, childbirth, obstetric anal sphincter injuries (OASIS), and pelvic floor dysfunction are important risk factors contributing to fecal incontinence in women [7].

In this study, we attempted to identify the most significant risk factors for fecal incontinence related to pregnancy and childbirth. We hope that this will allow the prediction of a risk group among pregnant women and aid in the development of diagnostic and therapeutic strategies.

Materials and methods

We analyzed 231 pregnant women. The inclusion criteria for the study were pregnant women (up to 12 weeks of gestation) aged 18 to 45 years who planned to continue their pregnancy and provided written consent to participate in the study. A proctologist examined the patients three times: in the 1st trimester (within the first 15 weeks), in the 3rd trimester (weeks 29–40), and 12 months after childbirth. During each visit, we conducted a proctological examination and a questionnaire survey. The main characteristics of the patients are presented in Tab. 1.

Prior to implementation, this study was approved by the ethics committee of the Ivano-Frankivsk National Medical University (principles in accordance with the 1975 Declaration of Helsinki).

For statistical analysis of the data, we utilized the Microsoft Office Excel software program. We calculated the mean, standard deviation (SD), probability of differences in the research results (P) relative to the indicators of different groups (the results were considered probable when the reliability coefficient was less than or equal to 0.05), median of the series, quartiles, criterion Pearson consistency (χ^2), and odds ratio (OR); we set the confidence interval (CI) at 95%, and we defined it as ± 1.96 standard error.

Results

The total number of fecal incontinence observations at the final visit in women included in the study was 66 cases (28.6%) (Fig. 1). We did not observe any symptoms of fecal incontinence in women aged 18 to 26 years. In the 1st trimester of pregnancy, 11 patients (4.8%) had complaints related to fecal incontinence. In the 3rd trimester, we identified an additional 19 patients (8.2%) with similar complaints (a total of 30, or 12.9%). Twelve months after childbirth, during the proctological examination, we identified an additional 36 patients (15.6%) with fecal incontinence (a total of 66 cases).

The odds ratio (OR) between the 3rd trimester of pregnancy and the 1st trimester of pregnancy was 2.99; 95% CI 1.46–6.11 (P = 0.003); between postpartum and the 3rd trimester of pregnancy it was 2.68; 95% CI 1.66–4.32 (P = 0.0001); and between postpartum and the 1st trimester of pregnancy it was 8.00; 95% CI 4.10–15.63 (P = 0.0001). This indicates a statistically significant association between the development of fecal incontinence and pregnancy.

The prevalence of involuntary passage of solid or liquid stool was observed in 13 patients out of 66 (19.7%) (P = 0.220). The highest prevalence of fecal incontinence with solid stool was found on the final visit (P = 0.019), while the highest frequency of involuntary passage of liquid stool was reported during the second visit (P = 0.471). In patients indicating fecal incontinence, defecation occurred no more than once a week. Involuntary passage of gas was more common, reported by 9 out of 11 patients (81.8%) on the first visit (P = 0.010), 21 out of 30 patients (70.0%) on the second visit (P = 0.719), and 38 out of 66 patients (57.6%) on the final visit

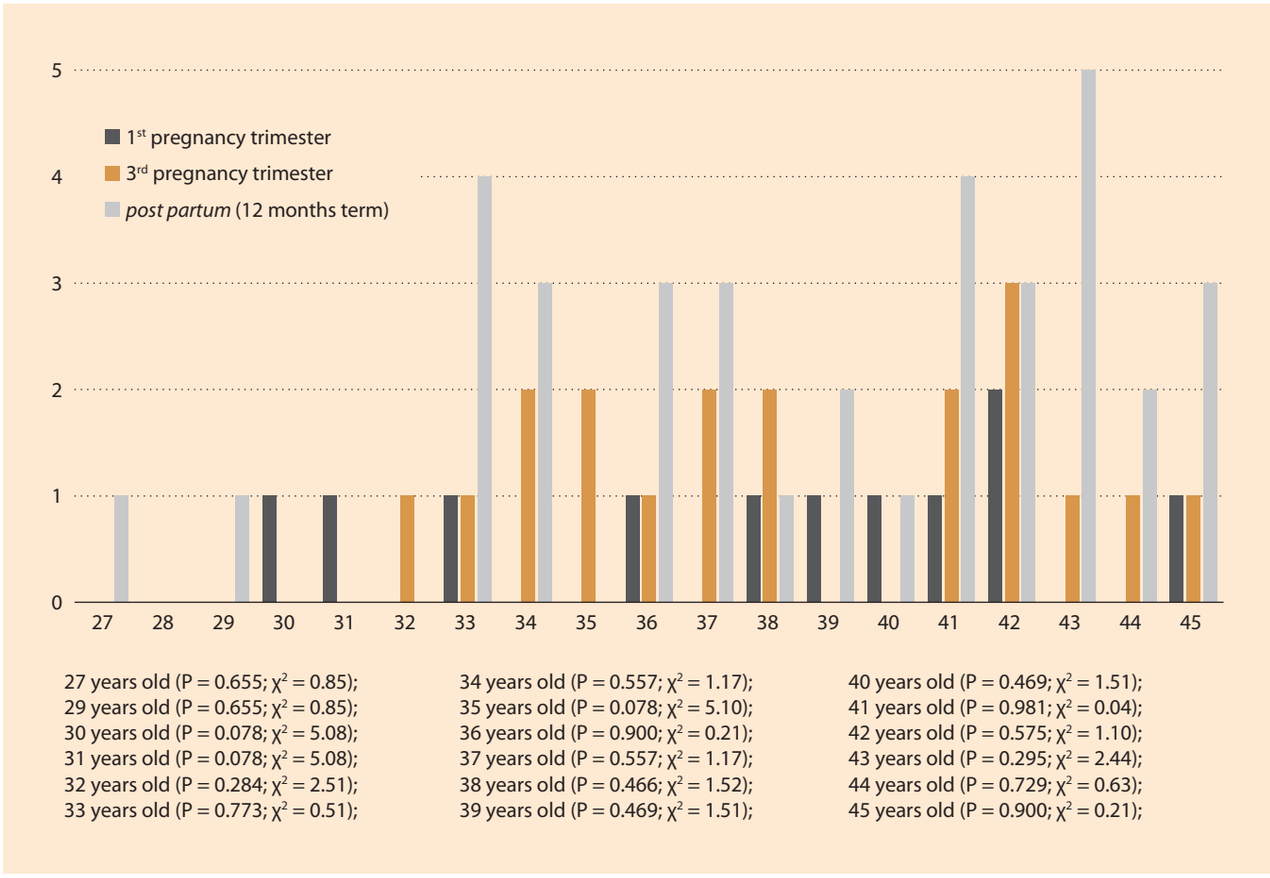

Fig. 1. Prevalence of fecal incontinence at specific observation points stratified by age.
Obr. 1. Prevalence fekální inkontinence ve specifických pozorovacích bodech, stratifikovaná podle věku.

(P = 0.350). Most patients reported that involuntary gas passage occurred no more than once a week.

Risk factors for fecal incontinence with a high probability were over 36 years of age (OR 2.84; 95% CI 1.83–4.66; P = 0.001), low physical activity (OR 1.68; 95% CI 1.06–2.65; P = 0.034), three or more pregnancies resulting in childbirth (OR 2.05; 95% CI 1.14–3.67; P = 0.022), a history of hemorrhoids (OR 1.96; 95% CI 1.12–3.44; P = 0.027), perianal discomfort on the first visit (OR 1.94; 95% CI 1.06–3.54; P = 0.045), and constipation on the first visit (OR 2.79; 95% CI 1.37–5.71; P = 0.006) (Fig. 2).

Furthermore, pregnant women with two pregnancies resulting in childbirth required careful attention, although the associations were not statistically significant. This includes women with complaints of perianal pain (OR 2.00; 95% CI 0.52–7.68; P = 0.513) and/or bleeding on the first visit (OR 1.25; 95% CI 0.22–6.99; P = 0.839), patients with perianal lumps (OR 1.54; 95% CI 0.61–3.88; P = 0.504), a history of proctological procedures (OR 1.25; 95% CI 0.48–3.24; P = 0.834), gestational diabetes (OR 1.43; 95% CI 0.40–5.04; P = 0.828), preterm birth (OR 1.07; 95% CI 0.39–2.91; P = 0.902), and complicated vaginal deliveries (OR 1.67; 95% CI 0.46-6.10; p=0.671). Factors such as being overweight, marital status, education, living conditions, living area, mode of delivery (vaginal or operative), and infant size did not appear to be significant for fecal incontinence.

Discussion

The etiology of fecal incontinence is multifactorial, involving various demographic, pregnancy-related, obstetric, and proctological factors [8]. In our study, the strongest risk factors were the age of pregnant women and complaints of constipation on the first visit.

Unfortunately, there is currently no clear understanding of the etiology of fecal incontinence. Theoretically, during pregnancy, there are several factors that may potentially contribute to this condition [9]. Firstly, multiple childbirths can be accompanied by trauma or stretching of the pelvic floor muscles. Women who have a history of childbirth-related injuries to the pelvic floor muscles or sphincter may be more prone to developing fecal incontinence in future pregnancies [10,11]. The most critical risk factor was forceps delivery [12]. The increase in uterine size and pressure on the pelvic organs during preg-

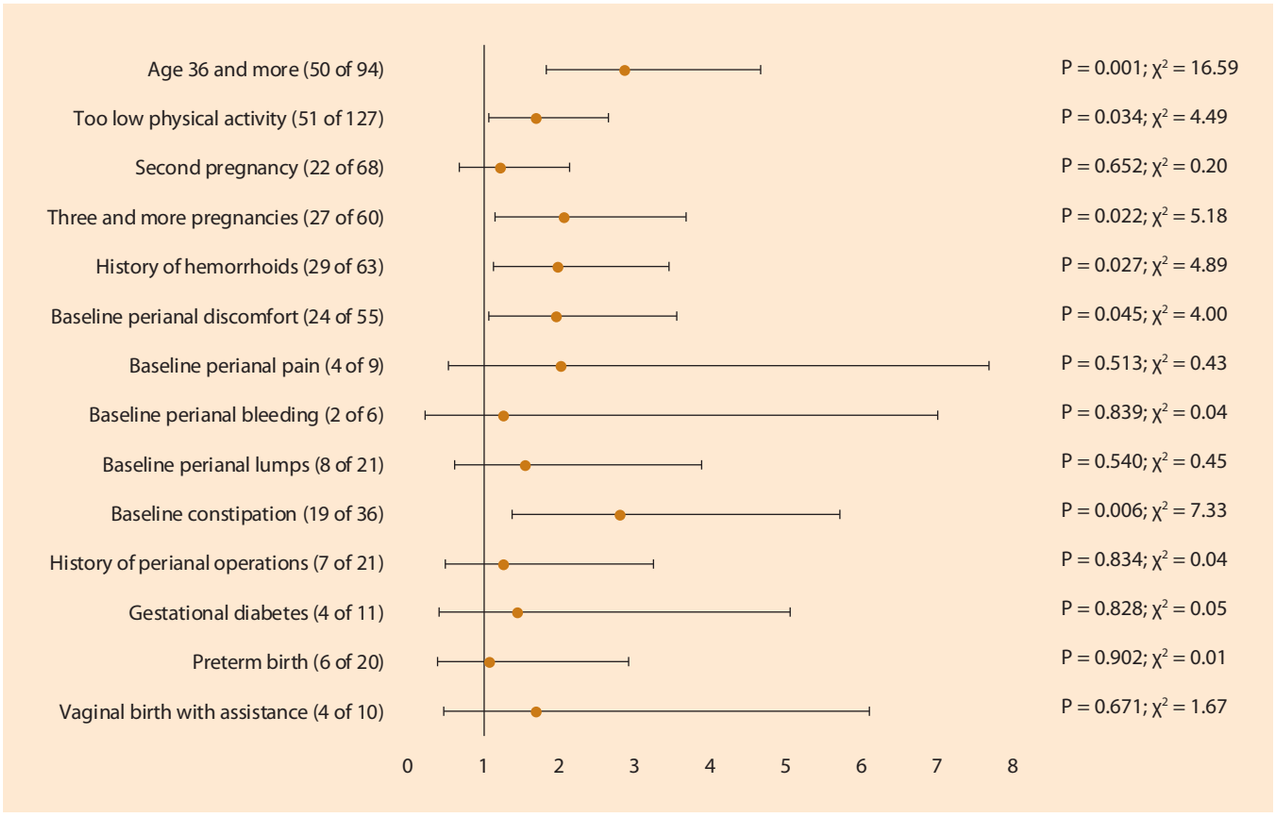

Fig. 2. Demographic, pregnancy, obstetric, and proctological risk factors associated with fecal incontinence in women (OR, 95%).

Obr. 2. Demografické, těhotenské, porodnické a proktologické rizikové faktory spojené s fekální inkontinencí u žen (OR, 95%).

nancy can affect anal sphincter function (which can be a problem in pregnancies with multiple fetuses or large fetuses). Chronic constipation is a well-established risk factor, not only in this study but also in many others. Functional constipation is quite common in pregnant women, but there is currently insufficient data on the effectiveness and safety of medications widely used in non-pregnant women. Therefore, the primary prevention of constipation remains a high-fiber diet, adequate hydration, and physical activity. Lastly, the prevalence of fecal incontinence typically increases with age, which may be a risk factor for pregnant women over the age of 36 years [13].

In the study [14], it was found that risk factors for the development of anal zone disorders during pregnancy and the postpartum period include: a woman's body mass index > 25 kg/m² (P < 0.001), a high birth weight of the child (> 3,800 g; P < 0.001), a family history of anal zone disorders (P < 0.001), constipation during pregnancy (P < 0.001), a history of anal zone disorders (P < 0.001), and prolonged excessive straining during labor for more than 20 min (P < 0.001).

In our study, we did not observe a decreased risk of fecal incontinence with cesarean section delivery (possibly due to a small sample size). However, there is a higher risk of fecal incontinence in women who have had vaginal deliveries compared to those who underwent cesarean section delivery [15,16]. This does not mean that women in the high-risk group should be recommended cesarean section delivery as there is no direct evidence of a protective effect of planned cesarean section delivery [13,16].

Conclusions

The frequency of fecal incontinence among pregnant women is 12.9%, and it increases to 28.6% one year after delivery. The most common complaint was involuntary passage of intestinal gas. Factors significantly associated with a higher likelihood of fecal incontinence include age over 36 years (P = 0.001), low physical activity (P = 0.034), three or more pregnancies resulting in childbirth (P = 0.022), history of hemorrhoids (P = 0.027), perianal discomfort (P = 0.045), and constipation in the 1st trimester of pregnancy (P = 0.006).

Reference

1. Hage-Fransen MA, Wiezer M, Otto A et al. Pregnancy- and obstetric-related risk factors for urinary incontinence, fecal incontinence, or pelvic organ prolapse later in life: a systematic review and meta-analysis. Acta Obstet Gynecol Scand 2021; 100(3): 373–382. doi: 10.1111/aogs.14027.

2. Lawson S, Sacks A. Pelvic floor physical therapy and women's health promotion. J Midwifery Womens Health 2018; 63(4): 410–417. doi: 10.1111/jmwh.12736.
3. Sigurdardottir T, Steingrimsdottir T, Geirsson RT et al. Can postpartum pelvic floor muscle training reduce urinary and anal incontinence? An assessor-blinded randomized controlled trial. Am J Obstet Gynecol 2020; 222(3): 247.e1–247.e8. doi: 10.1016/j.ajog.2019.09.011.
4. Sideris M, McCaughey T, Hanrahan JG et al. Risk of obstetric anal sphincter injuries (OASIS) and anal incontinence: a meta-analysis. Eur J Obstet Gynecol Reprod Biol 2020; 252: 303–312. doi: 10.1016/j.ejogrb.2020.06.048.
5. Subki AH, Fakeeh MM, Hindi MM et al. Fecal and urinary incontinence associated with pregnancy and childbirth. Mater Sociomed 2019; 31(3): 202–206. doi: 10.5455/msm.2019.31.202-206.
6. Dunivan GC, Heymen S, Palsson OS et al. Fecal incontinence in primary care: prevalence, diagnosis, and health care utilization. Am J Obstet Gynecol 2010; 202(5): 493.e1–493.e6. doi: 10.1016/j.ajog.2010.01.018.
7. ACOG Practice Bulletin No. 210 Summary: fecal incontinence. Obstet Gynecol 2019; 133(4): 837–839. doi: 10.1097/AOG.0000000000003188.
8. Menees SB, Lembo A, Charabaty A. Fecal incontinence and diarrhea during pregnancy. Am J Gastroenterol 2022; 117(10S): 26–32. doi: 10.14309/ajg.0000000000001964.
9. Ugwu EO, Iferikigwe ES, Obi SN et al. Effectiveness of antenatal perineal massage in reducing perineal trauma and post-partum morbidities: a randomized controlled trial. J Obstet Gynaecol Res 2018; 44(7): 1252–1258. doi: 10.1111/jog.13640.
10. Turawa EB, Musekiwa A, Rohwer AC. Interventions for preventing postpartum constipation. Cochrane Database Syst Rev 2020; 8(8): CD011625. doi: 10.1002/14651858.CD011625.pub3.
11. Thubert T, Cardaillac C, Fritel X et al. Definition, epidemiology and risk factors of obstetric anal sphincter injuries: CNGOF Perineal Prevention and Protection in Obstetrics Guidelines. Gynecol Obstet Fertil Senol 2018; 46(12): 913–921. doi: 10.1016/j.gofs.2018.10.028.
12. Urbankova I, Grohregin K, Hanacek J et al. The effect of the first vaginal birth on pelvic floor anatomy and dysfunction. Int Urogynecol J 2019; 30(10): 1689–1696. doi: 10.1007/s00192-019-04044-2.
13. López-López AI, Sanz-Valero J, Gómez-Pérez L et al. Pelvic floor: vaginal or caesarean delivery? A review of systematic reviews. Int Urogynecol J 2021; 32(7): 1663–1673. doi: 10.1007/s00192-020-04550-8.
14. Poskus T, Buzinskiene D, Drasutiene G et al. Haemorrhoids and anal fissures during pregnancy and after childbirth: a prospective cohort study. BJOG 2014; 121(13): 1666–1671. doi: 10.1111/1471-0528.12838
15. Dvořák J, Mašata J, Švabík K et al. Poranění análního sfinkteru při porodu a anální incontinence. Ceska Gynekol 2021; 86(2):118–122. doi: 10.48095/cccg2021118.
16. Ferrari A, Bonciani M, Russo E et al. Patient-reported outcome measures for pregnancy-related urinary and fecal incontinence: a prospective cohort study in a large Italian population. Int J Gynaecol Obstet 2022; 159(2): 435–443. doi: 10.1002/ijgo.14132.

ORCID authors

S. Vasyliuk 0000-0002-6738-6951
A. Cheredarchuk 0000-0002-3109-8018
M. Rymarchuk 0000-0002-4678-8193
R. Bondarev 0000-0002-7832-3999
O. Proshchenko 0000-0002-2187-4562
A. Mykytyuk 0000-0003-4360-7948

Submitted/Doručeno: 23. 8. 2023
Accepted/Přijato: 24. 10. 2023

Professor Serhii Vasyliuk, MD, PhD
Department of Traumatology
Orthopaedics and Emergency
Military Surgery
Ivano-Frankivsk National Medical
University
Shevchenka St, 57
76000 Ivano-Frankivsk Oblast
Ukraine
surifnmu@gmail.com

Publication ethics: The Editorial Board declares that the manuscript met the ICMJE uniform requirements for biomedical papers.
Publikační etika: Redakční rada potvrzuje, že rukopis práce splnil ICMJE kritéria pro publikace zasílané do biomedicínských časopisů.
Conflict of interests: The authors declare they have no potential conflicts of interest concerning the drugs, products or services used in the study.
Konflikt zájmů: Autoři deklarují, že v souvislosti s předmětem studie/práce nemají žádný konflikt zájmů.