

Parvana A.J.

Azerbaijan Medical University, Baku, Azerbaijan

## CLINICAL CHARACTERISTICS, DIAGNOSIS, AND REPRODUCTIVE OUTCOMES OF ENDOMETRIAL POLYPS

e-mail: parvana@javanshir.com

Endometrial polyps are common benign endometrial lesions that may impair female reproductive function and are often asymptomatic, leading to delayed diagnosis. This study assessed the clinical features of endometrial polyps, their impact on reproductive outcomes, and diagnostic and therapeutic effectiveness. Sixty-eight women with histologically confirmed endometrial polyps and twenty-four controls were examined. Evaluation included transvaginal ultrasonography, sonohysterography, and hysteroscopy. Treatments consisted of hormonal therapy and expectant management, with outcomes measured by polyp regression and recurrence. Abnormal uterine bleeding was the most frequent symptom, while some patients were asymptomatic. Multiple and larger polyps were associated with more severe clinical manifestations. Hormonal therapy showed variable efficacy, with combined oral contraceptives more effective than progestins. Hysteroscopy demonstrated the highest diagnostic accuracy, and recurrence was common. Endometrial polyps significantly affect reproductive health, especially in multiple lesions, emphasizing the need for accurate diagnosis and individualized management.

**Key words:** endometrial polyps, reproductive function, infertility, hysteroscopy, hormonal therapy, diagnosis, clinical characteristics.

Парвана А.Дж.

## КЛІНІЧНІ ХАРАКТЕРИСТИКИ, ДІАГНОСТИКА ТА РЕПРОДУКТИВНІ РЕЗУЛЬТАТИ ПРИ ПОЛІПАХ ЕНДОМЕТРІУ

Поліпи ендометрія – це поширені доброякісні утворення, які можуть негативно впливати на репродуктивну функцію жінок і часто протікають безсимптомно, що призводить до пізньої діагностики. Метою дослідження було вивчення клінічних особливостей поліпів ендометрія, їхнього впливу на репродуктивні результати, а також оцінка ефективності діагностичних і лікувальних підходів. Було обстежено 68 жінок із гістологічно підтвердженими поліпами ендометрія та 24 жінки контрольної групи. Діагностика включала трансвагінальне ультразвукове дослідження, соногістерографію та гістероскопію. Лікування проводилося з використанням гормональної терапії та вичікувальної тактики, ефективність оцінювалася за регресією поліпів та частотою рецидивів. Частим симптомом були аномальні маткові кровотечі, при цьому частина пацієнок залишалася безсимптомною. Множинні та великі поліпи асоціювалися з більш вираженою клінічною симптоматикою. Гормональна терапія показала варіабельну ефективність, при цьому комбіновані оральні контрацептиви були ефективнішими, ніж прогестини. Гістероскопія продемонструвала найвищу діагностичну точність, а рецидиви спостерігалися досить часто. Поліпи ендометрія суттєво впливають на репродуктивне здоров'я, особливо за множинних уражень, що підкреслює необхідність точної діагностики та індивідуалізованого підходу до лікування.

**Ключові слова:** поліпи ендометрія, репродуктивна функція, безпліддя, гістероскопія, гормональна терапія, діагностика, клінічні особливості.

Endometrial polyps represent one of the most common pathologies of the endometrium and constitute an important subject of research in gynecology and reproductive medicine. According to various epidemiological studies, the prevalence of endometrial polyps ranges from 7.6 % to 34.9 %, which can be attributed to differences in diagnostic approaches, imaging techniques, inclusion criteria, and the characteristics of the studied populations [13, 15]. Despite their relatively high prevalence, a substantial proportion of endometrial polyps remain asymptomatic, complicating timely diagnosis and potentially leading to delayed intervention, which may negatively affect female reproductive function. The clinical significance of endometrial polyps is determined by their ability to cause abnormal uterine bleeding, lower abdominal pain, and fertility disorders, including infertility. It has been demonstrated that the presence of endometrial polyps increases the risk of reproductive disorders by 2–3 times, particularly in women over the age of 35, making this condition especially relevant in the context of delayed childbearing and the perimenopausal period [3, 5, 13].

Endometrial polyps are also considered a potential risk factor for the development of endometrial carcinoma, especially when associated with hormonal imbalances and metabolic disorders, which underscores the importance of timely diagnosis and appropriate management. The mechanisms by which endometrial polyps affect fertility are multifactorial and include mechanical interference with embryo implantation, alterations in the local hormonal and cytokine milieu of the endometrium, impaired endometrial blood supply, and the development of subclinical inflammatory processes [6–9]. Furthermore, multiple and large polyps are associated with a higher risk of reproductive dysfunction, necessitating an individualized approach to patient evaluation and treatment.

Modern reproductive medicine offers a wide range of instrumental diagnostic modalities for the detection of endometrial polyps, including transvaginal ultrasonography, sonohysterography, and office hysteroscopy. Hysteroscopy remains the gold standard, as it allows not only direct visualization of intrauterine pathology but also

simultaneous removal of polyps during the same procedure, thereby increasing treatment efficacy and reducing the risk of recurrence. The combined use of these diagnostic methods improves diagnostic sensitivity to up to 94 %, which is particularly important in the evaluation of women with infertility and in preparation for assisted reproductive technologies [10].

The relevance of studying endometrial polyps is further emphasized by their impact on assisted reproductive technology outcomes. Several studies have shown that removal of endometrial polyps prior to intrauterine insemination or in vitro fertilization significantly increases pregnancy rates, especially in cases of polyps larger than 1.5 cm and in the presence of multiple lesions [11–15]. At the same time, evidence regarding the necessity of removing small asymptomatic polyps remains controversial, highlighting the need for further research and an individualized patient-centered approach.

Thus, the investigation of endometrial polyps represents an important and timely issue in contemporary gynecology and reproductive medicine. Identification of the clinical, morphological, and functional characteristics of endometrial polyps, determination of risk factors for their development, and evaluation of their impact on fertility may help optimize diagnostic strategies, guide rational treatment decisions, and improve reproductive outcomes in women of reproductive age [3–10]. Further in-depth research into the pathogenesis of endometrial polyps and their influence on reproductive function is essential for the development of effective preventive and therapeutic strategies aimed at reducing infertility risk and improving women's quality of life.

**The purpose** of the study was to investigate the clinical characteristics of endometrial polyps, assess their impact on female reproductive function, and analyze the effectiveness of diagnostic and therapeutic approaches.

**Materials and methods.** The study was conducted as part of a research program of the Department of Obstetrics and Gynecology II of the Azerbaijan Medical University during 2024–2025. The study group included 68 women aged 35–55 years with morphologically confirmed endometrial polyps. The mean age of the patients was  $45.0 \pm 1.7$  years, the mean body mass index (BMI) was  $23.5 \pm 3.4$  kg/m<sup>2</sup>, and the median parity was 2 (range: 0–6). The control group consisted of 24 healthy women of reproductive age with regular ovulatory menstrual cycles and no gynecological disorders. To assess the impact of age on clinical course and reproductive outcomes, patients were stratified into the following age groups:  $\leq 40$  years, 41–45 years, and  $> 45$  years.

Patients with menopause, ovarian masses, malignant neoplasms, and hormone-secreting tumors were excluded from the study. All participants provided written informed consent. The study was conducted in accordance with the Declaration of Helsinki (2013). The study protocol (No. AMU/EC-2026-055/O) was approved by the Local Ethics

Committee of Azerbaijan Medical University on 20 February 2026. To minimize the influence of confounding infertility factors, patients with confirmed tubal factor infertility and couples with established severe male factor infertility, based on semen analysis, were excluded from the analysis.

Classification of reproductive aging was performed according to the STRAW+10 (Stages of Reproductive Aging Workshop) criteria, with postmenopause defined as the period following 12 consecutive months of amenorrhea not associated with pregnancy, lactation, or endocrine disorders.

Ovarian reserve was assessed by measuring serum anti-Müllerian hormone (AMH) and follicle-stimulating hormone (FSH) levels on days 2–3 of the menstrual cycle. Endocrine disorders, including polycystic ovary syndrome (PCOS) and thyroid diseases, were diagnosed based on clinical, ultrasonographic, and laboratory criteria.

The examination protocol included medical history collection, assessment of clinical symptoms, gynecological and general physical examination, evaluation of menstrual cycle characteristics, and ultrasound assessment. Diagnosis of endometrial polyps was performed using transvaginal ultrasonography, sonohysterography, and office hysteroscopy. The sensitivity of each diagnostic method was 88 %, 92 %, and 97 %, respectively, while the combined use of all three modalities provided an overall diagnostic sensitivity of 94 %.

Treatment modalities included oral contraceptives, progestins, cyclic combined estrogen–progestin therapy, as well as expectant management without pharmacological intervention. Treatment effectiveness was evaluated based on the rate of polyp regression assessed by follow-up ultrasonography and hysteroscopy.

Statistical analysis was performed using Microsoft Excel 2010, Statistica 6.0, and SPSS Statistics version 22.0. Quantitative variables are presented as mean  $\pm$  standard deviation, while categorical variables are expressed as proportions with 95 % confidence intervals. Group comparisons were performed using Student's *t*-test and the  $\chi^2$  test. Statistical significance was defined as  $p < 0.05$ .

**Results of the study.** The clinical presentation of endometrial polyps among the examined women was highly heterogeneous. The most common manifestation in the cohort of 68 patients was abnormal uterine bleeding, which was observed in 41 women (60 %) and had a substantial negative impact on quality of life. Pelvic pain and lower abdominal discomfort were reported by 23 patients (34 %), contributing to additional physical and psychological burden. At the same time, 6 women (10 %) were completely asymptomatic, highlighting the latent nature of this pathology and the importance of thorough instrumental evaluation.

Single endometrial polyps predominated in the study population, being detected in 49 patients (72 %), whereas multiple polyps were identified in 19 women (28 %), reflecting considerable morphological variability of the disease (Table 1).

Table 1

**Distribution of clinical manifestations of endometrial polyps in 68 women according to polyp type**

Polyp type	Number of patients (n)	Abnormal uterine bleeding, n (%)	Pain/discomfort, n (%)	Asymptomatic course, n (%)
Single polyps	49	28 (57 %)	15 (31 %)	6 (12 %)
Multiple polyps	19	13 (68 %)	8 (42 %)	1 (5 %)
Total	68	41 (60 %)	23 (34 %)	7 (10 %)

Particular attention should be paid to asymptomatic cases: 6 women (12 %) with single polyps and only 1 patient (5 %) with multiple polyps reported no complaints, indicating the hidden risk of this pathology and the potential for delayed diagnosis without instrumental evaluation. Overall, the findings demonstrate that multiple polyps are associated with more pronounced clinical symptoms, whereas single polyps often remain silent but can still exert a significant negative impact on a woman's reproductive potential by creating mechanical, hormonal, and inflammatory barriers to embryo implantation and pregnancy. These results emphasize the need for thorough endometrial assessment in women of reproductive age, especially in cases of infertility or menstrual disorders, with a focus on identifying multiple and large polyps for timely therapeutic intervention.

No significant differences were observed in ovarian reserve indicators or the frequency of endocrine disorders between patients with single and multiple polyps ( $p>0.05$ ). There was a tendency for increased clinical manifestations and reduced reproductive potential with advancing age; however, no statistically significant differences were found between the age groups ( $p>0.05$ ).

Analysis of the clinical data revealed that endometrial polyps were more commonly observed in women in the late postmenopausal period – 18 patients (26.4 %) fell into this age category. Interestingly, polyps were predominantly detected in women without fertility impairments – 95.3 % of those examined. More than one-third of the women had a history of inflammatory diseases of the uterus and adnexa, and 25 patients (36.8 %) had vaginal infections. The frequency of medical abortions and intrauterine contraceptive use was high – 83.7 %, suggesting a potential influence of prior interventions on endometrial morphology (Fig. 1).

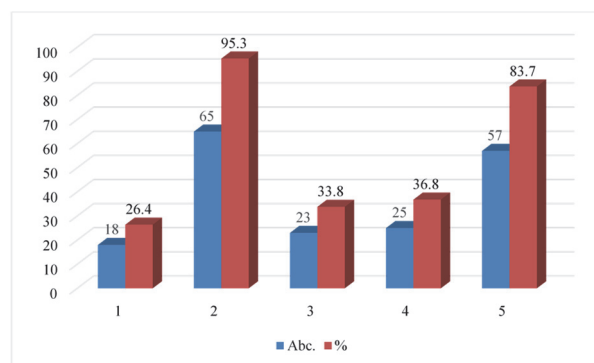


Fig. 1. Characteristics of concomitant factors in women with endometrial polyps (n=68).

Notes: 1. Age category: late postmenopausal period. 2. Women without fertility impairments. 3. History of inflammatory diseases of the uterus and adnexa. 4. Vaginal infections. 5. Medical abortions and/or use of intrauterine contraceptives.

Table 2 shows that among the 68 women examined, single polyps predominated (72 %); however, multiple polyps were associated with more pronounced clinical manifestations: abnormal uterine bleeding was observed in 68 % of patients with multiple polyps versus 57 % in those with single polyps, and pain/discomfort occurred in 42 % versus 31 %, respectively. Asymptomatic cases were more frequent in women with single polyps. Late postmenopausal age, a history of inflammatory diseases, vaginal infections, medical abortions, and the use of intrauterine contraceptives were observed with high frequency, indicating a significant influence of concomitant factors on endometrial status. Despite apparent differences in clinical manifestations, no statistically significant differences were found between groups ( $p>0.05$ ), highlighting the need for a comprehensive and individualized approach when assessing the risk of reproductive disorders in women with endometrial polyps.

Table 2

**Clinical manifestations of endometrial polyps and concomitant factors in women (n=68)**

Parameter	Total (n=68)	Single polyps (n=49)	Multiple polyps (n=19)	P (significance)
Abnormal uterine bleeding	41	28 (57 %)	13 (68 %)	0.37
Lower abdominal pain/discomfort	24	15 (31 %)	8 (42 %)	0.42
Asymptomatic course	9	6 (12 %)	1 (5 %)	0.51
Late postmenopausal age	18	13 (26.5 %)	5 (26.3 %)	0.98
Women without fertility disorders	65	47 (95.9 %)	18 (94.7 %)	0.79
History of inflammatory diseases of the uterus and adnexa	23	17 (34.7 %)	6 (31.6 %)	0.78
Vaginal infections	25	18 (36.7 %)	7 (36.8 %)	0.99
Medical abortions and/or use of intrauterine contraceptives	57	41 (83.7 %)	16 (84.2 %)	0.93

The clinical course of polyps was similar in both early and late postmenopausal periods. Abnormal uterine bleeding was observed in 19 women (27.9 %), and lower abdominal pain/discomfort in 17 patients (25.0 %). After polypectomy, the recurrence rate remained high: every third patient required repeat surgical intervention. In addition, the examined women presented with concomitant cardiovascular and metabolic disorders: arterial hypertension was registered in 49 women (72.1 %), and lipid metabolism disorders in 57 patients (83.8 %). These findings highlight the association between endometrial polyps and systemic pathological processes in postmenopausal women (Fig. 2). Polyp sizes ranged from less than 1 cm to more than 2 cm (Fig. 3).

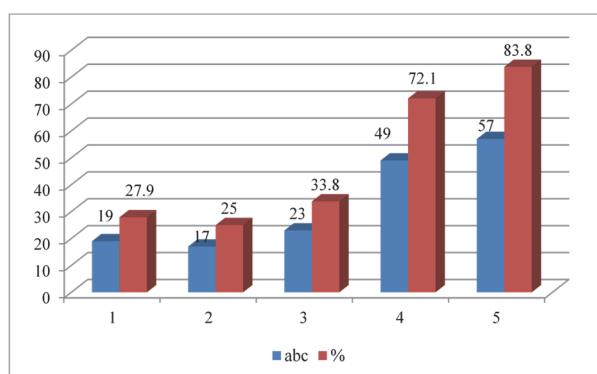


Fig. 2. Clinical course of endometrial polyps and concomitant disorders in postmenopausal women (n=68).

Notes. Abnormal uterine bleeding; 2. Lower abdominal pain/discomfort; 3. Recurrences after polypectomy; 4. Arterial hypertension; 5. Lipid metabolism disorders.

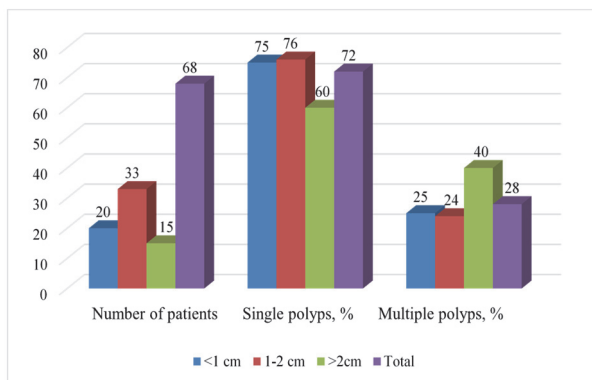


Fig. 3. Distribution of endometrial polyps by size and type (single and multiple) in patients (n=68).

Smaller polyps were more often asymptomatic, whereas medium and large polyps were associated with abnormal uterine bleeding. Multiple polyps were accompanied by more frequent bleeding and pain, although differences between groups did not reach statistical significance. Among women with infertility, the prevalence of polyps was 25.9 %, with a mean age of  $44.6 \pm 2.1$  years, which did not differ significantly from women without infertility ( $46.3 \pm 1.5$  years). Women with multiple polyps had a slightly higher risk of infertility compared to those with single polyps, suggesting a potential dose-

dependent relationship between the number of polyps and impaired reproductive function.

Analysis of treatment efficacy showed that the use of progestin was associated with a significantly lower likelihood of polyp regression compared to oral contraceptives (OR = 0.346; 95 % CI: 0.224–0.532;  $p < 0.001$ ), whereas combined estrogen-progestin therapy demonstrated a trend toward higher regression rates (OR = 1.462; 95 % CI: 0.648–3.276;  $p = 0.362$ ), although this did not reach statistical significance, likely due to the limited sample size. The overall regression rate of endometrial polyps in the cohort was 51.9 %, with regression observed in 78.6 % of patients receiving hormonal therapy and only 20.7 % of women under a watchful waiting approach. The combined use of ultrasound, sonohysterography, and hysteroscopy confirmed high diagnostic accuracy, with hysteroscopy remaining the gold standard, allowing simultaneous polyp removal.

**Discussion.** The results of our study confirm the high clinical significance of endometrial polyps in women of reproductive age as well as in postmenopausal women, which is fully consistent with previously published research. The frequency of abnormal uterine bleeding and pain observed in our cohort is comparable to figures reported by authors such as Lee J.Y. et al. [6], where abnormal bleeding was observed in 58–65 % of patients with endometrial polyps, and lower abdominal pain in 30–35 %. The high proportion of asymptomatic cases (approximately 10 %) also aligns with other studies, emphasizing the need for comprehensive instrumental diagnostic methods, including transvaginal ultrasound, sonohysterography, and hysteroscopy, which remain the gold standard for the detection and treatment of polyps.

Our data on the predominance of single polyps (72 %) and the more pronounced clinical symptoms in cases of multiple polyps (increased frequency of bleeding and pain) are supported by studies such as Clark T.J. et al. [3], which demonstrated that multiple polyps are significantly more often associated with severe symptoms and poorer reproductive outcomes. Despite the tendency toward more severe manifestations in multiple polyps, statistical significance was not achieved in our sample, likely due to the limited sample size.

It is noteworthy that there was a high frequency of inflammatory diseases of the uterus and adnexa, as well as vaginal infections in the history of women with polyps, suggesting the potential involvement of chronic inflammatory processes in polyp pathogenesis, which is also supported by findings from Raz N. et al. [10]. Furthermore, the frequent use of intrauterine devices and the high incidence of medical abortions in the patient history may indicate damaging effects on the endometrium, promoting polyp development, highlighting the need for careful monitoring of patients with such histories.

Of particular importance are the results demonstrating the high recurrence rate of polyps after polypectomy – one in three patients underwent repeat surgery. This is consistent with publications by Munro M.G. et al. [8], which reported a high recurrence rate and emphasized the importance of long-term follow-up after surgical treatment.

The presence of cardiovascular diseases and lipid metabolism disorders in a significant portion of our patients correlates with data on the association between metabolic syndrome and gynecological pathologies, including endometrial polyps. This aligns with observations described by Ren H. et al. [12], underscoring the multifactorial nature of the disease and the necessity of a comprehensive approach to the examination and treatment of women with endometrial polyps.

Regarding the influence of polyp size on clinical manifestations, our data are consistent with results reported by Li X. et al. [7], which showed that polyps larger than 1,5 cm are more often associated with symptoms such as bleeding and pain. Conversely, asymptomatic courses are more characteristic of small polyps, emphasizing the importance of thorough instrumental examination even in the absence of obvious clinical symptoms.

With respect to the impact of endometrial polyps on reproductive function, our findings support the conclusions of most authors, including Rotenberg O. et al. [13], who note that polyps can create mechanical and biochemical barriers to implantation, leading to an increased risk of infertility. We also observed a dose-dependent relationship between the number of polyps and the likelihood of reproductive impairment, which is confirmed by similar findings in the study by Li X. et al. [7].

Finally, the efficacy of hormonal therapy demonstrated in our study aligns with conclusions from several clinical studies, where the use of oral contraceptives provided a higher likelihood of polyp regression compared to progestin monotherapy. This indicates the need for individualized selection of hormonal therapy, taking into account the patient's clinical characteristics. Overall, our results supplement the existing body of evidence and emphasize the importance of a comprehensive, individualized approach to the diagnosis and treatment of endometrial polyps, aiming to optimize reproductive outcomes and improve women's quality of life.

## Conclusion

Endometrial polyps are a common and clinically significant endometrial pathology that may negatively affect female reproductive function. In this study, abnormal uterine bleeding and pelvic pain were the most frequent symptoms, especially in cases of multiple polyps, which were associated with more severe clinical manifestations and a higher risk of infertility. A considerable proportion of polyps were asymptomatic, emphasizing the importance of comprehensive instrumental diagnostics for timely detection. An association was observed between endometrial polyps and pelvic inflammatory processes, as well as factors affecting endometrial morphology, including prior abortions and intrauterine device use. High recurrence rates after polypectomy indicate the need for long-term follow-up and individualized management. Polyps were also frequently associated with systemic conditions such as hypertension and dyslipidemia, supporting their multifactorial nature. Hormonal therapy, particularly combined oral contraceptives, demonstrated effectiveness in promoting polyp regression. These findings highlight the importance of early diagnosis and individualized treatment to improve reproductive outcomes.

*Prospects for further research. Future research should focus on large-scale prospective studies to clarify the pathophysiological mechanisms underlying endometrial polyp development and recurrence and to optimize individualized diagnostic and treatment strategies aimed at improving reproductive outcomes.*

## References

1. Bouchet J, Pluchino N, Wenger JM, et al. Recurrence and risk factors of endometrial polyps after hysteroscopic resection: a systematic review. *Arch Gynecol Obstet.* 2023;308(6):1715-1726. doi:10.1007/s00404-023-07082-5.
2. Bougie O, Randle E, Thurston J, Magee B, Warshafsky C, Rittenberg D. Diagnosis and management of endometrial polyps: guideline No. 447. *J Obstet Gynaecol Can.* 2024;46(3):102402. doi:10.1016/j.jogc.2024.102402.
3. Clark TJ, Stevenson H. Endometrial polyps and abnormal uterine bleeding (AUB-P): What is the relationship, how are they diagnosed and how are they treated? *Best Pract Res Clin Obstet Gynaecol.* 2017 Apr;40:89-104. doi: 10.1016/j.bpobgyn.2016.09.005.
4. Khalafli KhN, Taghieva FSh, Ragimov DzA. Main tendencies in the dynamics of the population of Azerbaijan. *Azerbaijan Medical Journal,* 2024, No. 2, p.116-122 DOI: <https://doi.org/10.34921/amj.2024.4.018>.
5. Koduru P, Sahoo SS, Aguilar M, Bishop JA, SoRelle JA, Castrillon DH. Endometrial polyps—are they characterized by HMGA rearrangements or not? *Mod Pathol.* 2023;36(2):100058. doi:10.1016/j.modpat.2022.100058.
6. Lee JY, Kim YS, Park SY, Kim SJ. Risk of endometrial polyps, hyperplasia, carcinoma, and uterine cancer after tamoxifen treatment in premenopausal women with breast cancer. *JAMA Netw Open.* 2022;5(11):e2243951. doi:10.1001/jamanetworkopen.2022.43951.
7. Li X, Zhao X, Wang B, Bai J, Qi Q, Li D, et al. Analysis of factors influencing endometrial polyp recurrence after hysteroscopic polypectomy. *J Obstet Gynaecol Res.* 2025;51(7):e16352. doi:10.1111/jog.16352.
8. Munro MG. Uterine polyps, adenomyosis, leiomyomas, and endometrial receptivity. *Fertil Steril.* 2019 Apr;111(4):629-640. doi: 10.1016/j.fertnstert.2019.02.008.
9. Ozyurt R, Turktekin N. Endometrial polyps prevent embryo implantation via creatine and lactate pathways. *Eur Rev Med Pharmacol Sci.* 2022 May;26(9):3278-3281. doi: 10.26355/eurrev\_202205\_28746.

10. Raz N, Feinmesser L, Moore O, Haimovich S. Endometrial polyps: diagnosis and treatment options—a review of the literature. *Minim Invasive Ther Allied Technol.* 2021;30(5):278–287. doi:10.1080/13645706.2021.1948867.
11. Reinikka S, Mehine M, von Nandelstadh P, Ahvenainen T, Khamaiseh S, Nousiainen S, et al. Genomic landscape of endometrial polyps. *Genome Med.* 2025;17:132. doi:10.1186/s13073-025-01556-z.
12. Ren H, Duan H, Wang S, Chang Y. Hysteroscopy combined with laser vaporessection for endometrial polyps. *J Invest Surg.* 2022;35(10):1772-1778. doi:10.1080/08941939.2022.2116134.
13. Rotenberg O, Doulaveris G, Fridman D, Renz M, Kaplan J, Xie X, Goldberg GL, Dar P. Risk of endometrial polyp and surgical intervention in postmenopausal women with proliferative endometrium. *Maturitas.* 2023;178:107847. doi:10.1016/j.maturitas.2023.107847.
14. Tekin S, Ocal A, Sisman E, Bilginer C, Cetin A. Histological assessment of endometrial polyps resected by hysteroscopy. *Eur Rev Med Pharmacol Sci.* 2024 Apr;28(8):3241-3250. doi: 10.26355/eurrev\_202404\_36052
15. Sharon A, Zidane M, Aiob A, Apel-Sarid L, Bornstein J. Nonelectric shaving of endometrial polyp by hysteroscopy: a new technique to eliminate thermal damage. *Eur J Obstet Gynecol Reprod Biol.* 2023;285:170-174. doi:10.1016/j.ejogrb.2023.04.018.

**Conflict of interest.** The authors have no conflicts of interest to declare.

**ORCID:** Parvana A.J. <https://orcid.org/0009-0000-2707-7452>.

Article received: 27.06.2025

DOI 10.26724/2079-8334-2026-2-96-107-110

UDC 616.94-053.31:577.112.6:612.017.1

**Polukhova A.E., Kerimova N.T.**

**Scientific Research Institute of Pediatrics named after K.Y. Farajova, Baku, Azerbaijan**

## CHANGES IN ALPHA-DEFENSIN AS AN INFLAMMATORY MARKER DURING NEONATAL SEPSIS IN TERM AND PRETERM INFANTS

e-mail: etplaboratoriya@mail.ru

Neonatal sepsis remains one of the most important causes of infectious morbidity in newborns, especially among infants born prematurely. The study evaluated alpha-defensin as an inflammatory marker in 130 newborns, including term and preterm infants with sepsis and healthy newborns in the control group. The concentration of alpha-defensin was markedly higher in septic newborns than in healthy infants and decreased during repeated assessment, reflecting attenuation of the inflammatory process. In term infants with sepsis, alpha-defensin exceeded control values by more than fifteenfold, and a similar increase was observed in preterm infants with both early and late disease onset. Positive associations with interleukin-6 and interleukin-8 indicate that alpha-defensin reflects activation of innate immune mechanisms. The findings support the use of alpha-defensin as an additional laboratory marker for assessing the severity of inflammation and immune status in neonatal sepsis.

**Key words:** neonatal sepsis, alpha-defensin, innate immunity, inflammatory markers, preterm infants, term infants.

**Полухова А.Є., Керімова Н.Т.**

## ЗМІНИ РІВНЯ АЛЬФА-ДЕФЕНЗИНУ ЯК МАРКЕРА ЗАПАЛЕННЯ ПРИ НЕОНАТАЛЬНОМУ СЕПСИСІ У ДОНОШЕНИХ ТА НЕДОНОШЕНИХ ДІТЕЙ

Неонатальний сепсис залишається однією з найважливіших причин інфекційної захворюваності новонароджених, особливо серед дітей, що народилися передчасно. У дослідженні оцінювали альфа-дефензин як маркер запалення у 130 новонароджених, включаючи доношених і недоношених дітей із сепсисом та здорових новонароджених контрольної групи. Концентрація альфа-дефензину у дітей із сепсисом була значно вищою, ніж у здорових новонароджених, і знижувалася під час повторного обстеження, що свідчило про зменшення активності запального процесу. У доношених дітей із сепсисом рівень альфа-дефензину перевищував контрольні значення більш ніж у п'ятнадцять разів; подібне підвищення виявлено у недоношених дітей при ранньому та пізньому початку захворювання. Позитивні зв'язки з інтерлейкіном-6 та інтерлейкіном-8 вказують на те, що альфа-дефензин відображає активацію вродженого імунітету. Отримані дані підтверджують можливість його використання як додаткового лабораторного маркера тяжкості запалення та імунного статусу при неонатальному сепсисі.

**Ключові слова:** неонатальний сепсис, альфа-дефензин, вроджений імунітет, запальні маркери, недоношені діти, доношені діти.

Current understanding of the pathophysiology of sepsis is based mainly on studies conducted in mature adult populations. However, both experimental and clinical studies demonstrate that newborns have immune responses to infection that differ substantially from those of adults and older children [17]. These differences are especially important in preterm infants, whose survival and long-term outcomes depend on timely recognition of generalized inflammatory disease.

The immature immune system is a major factor contributing to increased susceptibility to sepsis in the neonatal period. Polymorphonuclear neutrophils, macrophages, T lymphocytes, and B lymphocytes in newborns have functional features that limit the ability to mount a quantitatively and qualitatively adequate inflammatory response. In addition, transplacental transfer of immunoglobulins is reduced in preterm infants, further increasing the risk of severe infection [1, 2].