

# Detection and Improvement of Diagnostic Criteria for Postpartum Endometritis in Modern Obstetrics

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**Abstract:** This study presents the results of a prospective cohort study involving 30 pregnant women at high risk of infectious complications. In the postpartum period, they were divided into two groups: the main group (n=14), which received a combined preventive approach, and the comparison group (n=16), which received standard antibiotic prophylaxis. Both groups were comparable in terms of age, somatic health, and obstetric and gynecological history. Comprehensive diagnostics included anamnesis analysis, clinical examination, microbiological testing, and instrumental diagnostic methods. The proposed combined prevention strategy, including intrauterine administration of a molded sorbent, significantly reduced bacterial contamination of the uterine cavity and improved outcomes compared to antibiotic prophylaxis alone.

**Keywords:** Intrauterine infection, postpartum endometritis, antibiotic prophylaxis.

## Introduction

Infectious complications in obstetrics remain one of the leading causes of maternal morbidity and adverse perinatal outcomes. Numerous domestic and international studies highlight the significant role of infectious diseases of the female reproductive tract as a key risk factor for miscarriage, placental dysfunction, premature birth, and adverse neonatal outcomes.

Previously, much attention was focused on infections of the lower genital tract. However, recent studies emphasize the importance of intrauterine infections (IUI) in the development of preterm birth and neonatal complications. These infections can ascend from the lower genital tract or develop in women with chronic endometritis.[3] Since a definitive diagnosis of IUI requires histological examination of the placenta, there are currently no standardized criteria for diagnosing and managing such cases. This highlights the need for non-invasive diagnostic methods and timely therapeutic interventions to improve pregnancy outcomes.[2]

**Purpose of the work:** To develop predictive methods and improve preventive strategies aimed at reducing the incidence of postpartum endometritis in women at high risk of infection.[1]

## Materials and methods

This prospective cohort study included 30 pregnant women classified as high risk for infectious complications based on their medical history, clinical findings, and laboratory data. After delivery, they were divided into two groups: main group (n=14) received standard antibiotic prophylaxis combined with intrauterine administration of a molded carbon sorbent; comparison group (n=16) received only standard antibiotic prophylaxis.

The groups were comparable in age, somatic health, and obstetric and gynecological history. Comprehensive diagnostics included analysis of medical history, clinical examinations, microbiological testing, and instrumental diagnostics (including ultrasound and immune status assessment).

The inclusion criteria for this study focused on high-risk pregnant women with a history or current exacerbation of infectious conditions. Specifically, the study included women with exacerbations of genital infections during pregnancy, as well as those with exacerbations of extragenital infections. Additionally, participants had a documented history of chronic endometritis or pelvic inflammatory disease, conditions that are known to significantly influence the risk of complications during pregnancy and delivery. These criteria were established to identify a cohort of women most vulnerable to infections and subsequent postpartum complications, allowing for a focused examination of microbiological and immunological factors that contribute to adverse pregnancy outcomes.

Microbiological testing was a central component of the study. Samples were collected from participants between the 13th and 17th week of pregnancy to analyze the microbial composition of the genital and extragenital areas. Specifically, vaginal secretions, cervical canal secretions, and uterine aspirates were obtained under strict aseptic conditions using sterile silicone tubing. This method of collection was chosen to prevent any potential contamination and to ensure the accuracy of the microbiological data. The study aimed to identify the presence of pathogenic microorganisms, including both bacterial and viral agents, that may contribute to the development of infections during pregnancy and increase the risk of complications such as preterm labor, preeclampsia, and postpartum endometritis.

The analysis of immune responses and microbial infections in pregnant women was conducted using advanced diagnostic methods. Lymphocyte subpopulations, which play a critical role in immune regulation, were analyzed using flow cytometry. This method enabled the precise identification of various lymphocyte populations, including T-helper cells, cytotoxic T cells, and natural killer (NK) cells. Additionally, cytokine levels, particularly those associated with inflammation such as IL-1 $\beta$ , were measured using enzyme-linked immunosorbent assay (ELISA), providing quantitative data on the inflammatory response in the women studied. To analyze and interpret the data, statistical methods were employed using STATISTICA-6 software and Microsoft Excel. Fisher's exact test, along with other statistical tools, was used to assess associations between clinical variables and outcomes, allowing for the identification of significant predictors of infection and inflammatory responses in the study cohort.

## Results

Among the women studied, gynecological disorders were prevalent, with pelvic inflammatory disease being the most common, affecting 49.6% of participants. This condition is associated with an increased risk of ectopic pregnancy, infertility, and preterm labor. Acute vaginitis was diagnosed in 38.5% of cases, and cervicitis in 23.9%. A smaller percentage of women had a history of fallopian tube surgery (8.5%) or menstrual irregularities (7.7%). Uterine fibroids were present in 3.4% of the women, while 3.4% also reported a history of infertility, further complicating their reproductive health.

**Table 1. Comparing results**

| Result                     | Parameters                       | Percentage/Data |
|----------------------------|----------------------------------|-----------------|
| Gynecologic pathology      | Pelvio-peritonitis               | 49,6%.          |
|                            | Acute vaginitis                  | 38.5%           |
|                            | Cervicitis                       | 23.9%           |
| Extragenital diseases      | Anemia                           | 59%             |
|                            | Chronic urinary tract infections | 27,4%           |
|                            | Obesity                          | 17,1%           |
| Complications of pregnancy | Recurrent threat of miscarriage  | 46,7%           |
|                            | Premature shedding of water      | 42,7%           |

|                        |                            |       |
|------------------------|----------------------------|-------|
|                        | Preeclampsia               | 41,9% |
| Microbiologic findings | Vagina — Enterococcus spp. | 33,9% |
|                        | Vagina — Escherichia coli  | 27,4% |

Extragenital diseases were also frequently observed in the study population. Anemia was the most widespread condition, affecting 59% of the women. This could contribute to fatigue, reduced oxygenation of tissues, and overall weakened immune responses, making these women more susceptible to infections. Chronic urinary tract infections were diagnosed in 27.4% of the participants, while 17.1% of the women were classified as obese, a condition that is linked to both metabolic and immune system dysfunctions. Hypertension was present in 10.3% of cases, thyroid disorders in 5.1%, and diabetes mellitus in 2.6%, all of which are known to complicate pregnancy and increase the risk of infection.

Pregnancy complications were common in the cohort, with recurrent threatened miscarriage being the most frequent, observed in 46.7% of women. Premature rupture of membranes occurred in 42.7% of cases, and preeclampsia was diagnosed in 41.9% of participants, with 26.5% of these cases further complicated by fetal growth restriction. The presence of these complications highlights the vulnerability of the study group and the need for close monitoring and intervention. Exacerbations of urinary tract infections were noted in 17.9% of cases, further contributing to the risk of preterm labor and postpartum infections.

Ultrasound findings revealed significant markers of intrauterine infection. Oligohydramnios, or reduced amniotic fluid, was found in 42.9% of cases, which can indicate placental insufficiency or fetal infection. Impaired placental blood flow, another important marker of infection or poor fetal well-being, was seen in 39.5% of women. Polyhydramnios, or excessive amniotic fluid, was present in 17.9% of cases, while placental thickening, which may suggest inflammation or infection, was observed in 15.5%.

Microbiological analysis revealed a high prevalence of bacterial infections in the genital tract. The most common pathogen identified in vaginal secretions was Enterococcus spp., found in 33.9% of cases. Escherichia coli was detected in 27.4% of samples, followed by Staphylococcus spp. in 17.4%, Candida spp. in 15.8%, and Ureaplasma urealyticum in 12.7%. Mixed infections, where multiple pathogens were identified simultaneously, were common, present in 83.2% of cases. A similar pattern was observed in cervical canal secretions, with Enterococcus spp. and Escherichia coli being the most frequently detected pathogens.

Viral infections were also prevalent, with PCR analysis detecting viral DNA in 33% of cases. The Epstein-Barr virus was the most commonly detected, identified in 17.2% of participants. Other herpesviruses, including type 6 herpes simplex virus (8.0%) and type 1 herpes simplex virus (4.6%), were also found, as was cytomegalovirus in 2.3% of cases. These viral infections can exacerbate the inflammatory response and contribute to pregnancy complications, particularly in high-risk populations.

## Discussions

A critical aspect of this study was the assessment of the immune status of high-risk pregnant women. Immune strain was evident in the women studied, with altered lymphocyte subpopulation ratios and a decreased immunoregulatory index ( $p=0.0040$ ). This suggests a weakened immune response that may make the women more susceptible to infections during pregnancy. Elevated levels of IL-1 $\beta$ , a pro-inflammatory cytokine, were particularly noted in women with viral reactivation. The increased presence of T-NK cells ( $p=0.001$ ) also indicated an enhanced cytotoxic immune response, which may be associated with the body's attempt to control infections but also contributes to the inflammatory environment.

Postpartum monitoring revealed significant differences between the groups receiving different treatments. Cultures from the uterine cavity on day 1 postpartum showed bacterial growth in 67.3% of

the main group (those receiving sorbent therapy) versus 55.9% in the comparison group. Notably, persistent pathogenic microflora was present in 66.2% of the comparison group after three days, compared to only 21.7% in the main group, indicating the efficacy of sorbent therapy in clearing bacterial colonization.

Resistance to antibiotics was a significant issue in this population. *Enterococcus faecalis* exhibited 66.7% resistance to azithromycin, while *Staphylococcus haemolyticus* demonstrated 72.2% resistance to benzylpenicillin. This highlights the challenge of treating infections in high-risk pregnant women, underscoring the importance of alternative therapeutic strategies, such as the use of sorbent therapy, which demonstrated superior outcomes in terms of bacterial eradication.

Intrauterine sorbent therapy emerged as a promising approach to reducing bacterial colonization and inflammation. After three applications of the sorbent, all patients in the main group achieved sterile cultures. This was in contrast to the comparison group, where bacterial colonization persisted. Inflammatory markers, such as IL-1 $\beta$  and lactoferrin, decreased significantly (2.3 and 1.3 times, respectively) in the main group compared to those receiving antibiotics alone ( $p < 0.05$ ). Furthermore, uterine involution, or the return of the uterus to its pre-pregnancy size, was faster in the main group, suggesting that sorbent therapy accelerates recovery following delivery.

## Conclusion

The results of this study indicate that intrauterine infections play a significant role in the development of postpartum endometritis, particularly among women with high-risk pregnancies. The combination of antibiotics and intrauterine sorbent therapy demonstrated superior efficacy compared to antibiotics alone, significantly improving bacterial clearance, reducing local inflammation, and accelerating uterine recovery. Given the challenges posed by antibiotic resistance and the high burden of infections in this population, the combination therapy should be considered as an essential component of prophylaxis in high-risk pregnancies to reduce the incidence of postpartum complications. This approach provides a promising solution for improving maternal outcomes and preventing long-term health issues associated with postpartum infections.

## References

1. Singh N, Verma R, Gupta S. Endometritis: Diagnosis, treatment and its impact on fertility. *J Obstet Gynaecol Res.* 2022;48(9):2301-2310.
2. Nandagopal N, Sahoo S, et al. Revolutionizing chronic endometritis diagnosis: Real-time PCR versus traditional culture methods. *Front Reprod Health.* 2024;6:1523812.
3. de Oliveira Ferreira L, et al. Defining bacterial panels associated with postpartum endometritis: A molecular approach. *Microorganisms.* 2025;13(1):56-68.
4. Klimasyk M, et al. Comparative analysis of RT-PCR, culture, and next-generation sequencing in endometrial samples. *Arch Gynecol Obstet.* 2025;311(2):491-503.
5. Riemma G, et al. Diagnostic test accuracy of histological and molecular markers in chronic and acute endometritis: A systematic review and meta-analysis. *Am J Obstet Gynecol.* 2025;232(3):303-318.
6. Jwa SC, et al. Variations in diagnosis and treatment of chronic endometritis among reproductive centers: A national survey. *Reprod Med Biol.* 2024;23(2):e12543.
7. World Health Organization. *Operational guidance: Prevention and management of postpartum infections and maternal sepsis.* Geneva: WHO; 2023.
8. American College of Obstetricians and Gynecologists (ACOG). Intrapartum management of intra-amniotic infection and postpartum infection prevention. *ACOG Practice Bulletin.* 2023; No. 234.
9. Royal College of Obstetricians and Gynaecologists (RCOG). *Green-top Guideline No. 64a: Bacterial sepsis following pregnancy.* London: RCOG; 2022.

10. MSD Manual. Postpartum Endometritis — Symptoms, Diagnosis and Management. *MSD Professional Edition*. Updated 2024.
11. StatPearls Publishing. Endometritis. In: *StatPearls [Internet]*. Treasure Island (FL): StatPearls Publishing; 2024 Jan.
12. Medscape. Endometritis — Treatment and Management. *Medscape Reference*. Updated June 2023.
13. Open Forum Infectious Diseases. Getting with the times: A review of peripartum infections. *Open Forum Infect Dis*. 2024;11(Suppl 1):S45–S55.
14. California Maternal Quality Care Collaborative (CMQCC). *Sepsis Toolkit: Improving diagnosis and treatment of maternal sepsis*. Stanford, CA; 2022.
15. Frontiers in Microbiology. Chronic endometritis: Pathogenesis, diagnosis and treatment — A modern perspective. *Front Microbiol*. 2025;16:1452235.