ASSOCIATION OF RECURRENT BACTERIAL VAGINOSIS WITH EARLY PREGNANCY COMPLICATIONS

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Abstract: This article systematically analyzes the clinical significance of recurrent bacterial vaginosis (RBV) during pregnancy and its association with early pregnancy complications, including spontaneous abortion, preterm birth, premature rupture of membranes (PPROM), chorioamnionitis, and postpartum endometritis. Although research findings indicate that recurrent bacterial vaginosis is associated with adverse perinatal outcomes, the degree of this association and the effectiveness of treatment strategies vary across different clinical and epidemiological studies. Based on the available evidence, this article discusses contemporary clinical approaches for the diagnosis, treatment, and prevention of recurrent bacterial vaginosis.

Keywords: recurrent bacterial vaginosis, early pregnancy complications, preterm birth, vaginal microbiota dysbiosis, perinatal risk factors.

INTRODUCTION

Bacterial vaginosis (BV) is one of the most common microbiological imbalances affecting the female genital tract, characterized by structural and functional disruption of the vaginal ecosystem. In this condition, a decrease in the population of physiologically dominant lactobacilli is observed alongside an increase in anaerobic microorganisms, leading to changes in the physicochemical properties of the vaginal environment. Consequently, local immune mechanisms and epithelial barrier functions are impaired.

The clinical significance of recurrent bacterial vaginosis during pregnancy lies in its

occurrence against the backdrop of maternal hormonal and immunological adaptations, which complicates the maintenance of vaginal microbiota stability. Therefore, a detailed study of the pathogenetic mechanisms of bacterial vaginosis in pregnant women and the analysis of its progression remain critical scientific issues in modern obstetric and gynecological practice.

LITERATURE REVIEW AND RESEARCH METHODOLOGY

Within the scope of this article, systematic reviews, meta-analyses, population-based cohort studies, and national and international clinical guidelines (ACOG, CDC, and other official recommendations) published between 2018 and 2025 were analyzed. Priority was given to studies assessing the association between recurrent bacterial vaginosis (RBV) and early pregnancy outcomes.

The literature search was conducted using PubMed/PMC, MDPI, and ScienceDirect databases with keywords such as “bacterial vaginosis,” “recurrent bacterial vaginosis,” “pregnancy outcomes,” and “preterm birth.” The analysis included studies published in 2023–2024 with large sample sizes, as these studies provide reliable insights into the clinical significance of recurrent bacterial vaginosis.

DISCUSSION AND RESULTS

Pathophysiology of Recurrent Bacterial Vaginosis and Mechanisms Affecting the Fetus.

In recurrent bacterial vaginosis, the reduction of lactobacilli and the proliferation of anaerobic flora increase the vaginal pH (pH > 4.5) and are accompanied by elevated levels of sialidases, proteases, and proinflammatory cytokines (IL-6, IL-8). These factors can adversely affect the upper reproductive tract, inducing inflammation in the endometrium and fetoplacental tissues, thereby increasing the risk of chorioamnionitis, amniotic infection, and membrane instability. Research indicates that disturbances in the vaginal microbiota (dysbiosis) during early pregnancy interact complexly with maternal and placental immune systems. This process may elevate the risk of fetal loss (spontaneous abortion) and preterm birth.

Clinical Course and Complications: Evidence Analysis.

1. Preterm Birth and Recurrent Bacterial Vaginosis.

Numerous systematic reviews and meta-analyses have demonstrated that pregnant women diagnosed with recurrent bacterial vaginosis have an increased risk of preterm birth, particularly when the diagnosis is made in the early stages of pregnancy (≤20 weeks), strengthening the association. Some studies report that the risk of preterm birth in women with recurrent bacterial vaginosis may double. However, the effectiveness of interventions to prevent preterm birth varies across studies.

2. Premature Rupture of Membranes (PROM).

The association between recurrent bacterial vaginosis and premature rupture of fetal membranes has been reported in multiple studies: vaginal dysbiosis affects the chorion-amniotic membranes, reducing their stability and increasing the likelihood of early rupture. In clinical practice, the risk of premature rupture of membranes should be carefully considered in pregnant women with recurrent bacterial vaginosis.

3. Chorioamnionitis and Intraamniotic Infection.

Bacteria associated with recurrent bacterial vaginosis may ascend to the upper reproductive tract, causing chorioamnionitis, which increases the risk of neonatal infections and perinatal complications. Several cohort studies have reported a higher incidence of intraamniotic infection and postpartum endometritis in pregnant women with recurrent bacterial vaginosis.

4. Spontaneous Abortion and Recurrent Pregnancy Loss.

The relationship between recurrent bacterial vaginosis and disturbances in the reproductive tract microbiota has also been associated with an increased risk of abortion and recurrent pregnancy loss (RPL). Recent analyses confirm this association; however, in RPL, the underlying causes are complex, and microbial factors represent only one component of the multifactorial etiology.

Recurrent Bacterial Vaginosis and Early Pregnancy Complications: Which Evidence Is Reliable?

Study findings are heterogeneous, as outcomes are influenced by population characteristics of women, diagnostic methods used to identify recurrent bacterial

vaginosis (Amsel, Nugent, PCR), gestational age, and additional factors such as maternal age, surrogate markers, diabetes mellitus, smoking, and a history of previous preterm birth.

Systematic reviews demonstrate an overall trend indicating that when recurrent bacterial vaginosis is diagnosed, particularly during early pregnancy, the risk of preterm birth and preterm premature rupture of membranes increases. However, several studies have shown that treatment of recurrent bacterial vaginosis does not significantly reduce the risk of preterm birth. Therefore, clinical decision-making should incorporate an individualized assessment of each woman's risk factors and pregnancy status.

Treatment and Prevention: Clinical Approaches During Pregnancy.

Treatment in Symptomatic Pregnant Women.

The CDC and many national guidelines recommend treating recurrent bacterial vaginosis in symptomatic pregnant women, as symptoms and certain complications are known to increase. The effect of treatment on preventing preterm birth is complex: benefits are observed in some groups, while others show no significant improvement. Clinical decisions should be based on an individualized approach.

Asymptomatic Women and Universal Screening.

According to the 2020 USPSTF recommendations, routine screening is not advised for pregnant women without additional risk factors; evidence for high-risk women is considered insufficient (I/D).

Recurrent Bacterial Vaginosis and Preventive Strategies.

In recurrent cases, long-term or intermittent therapy, local clindamycin, oral metronidazole, and combinations with probiotics have been tested. Probiotics may be promising for restoring vaginal flora, but robust, conclusive evidence regarding their prophylactic effectiveness in pregnancy is lacking.

New or Understudied Observations from Recent Research:

Molecular Diagnostics.

Subtypical microbial profiles in recurrent bacterial vaginosis are being identified using molecular diagnostics (metagenomics, PCR), which may differentially impact pregnancy outcomes. This suggests that a simple binary classification of “BV+” or “BV−” may be insufficient, and future risk stratification could be individualized.

Microbiota-Immune Interactions.

Interactions between microbiota and immune responses (e.g., NK cell activity, IL cytokine profiles) are considered key mechanisms associated with fetal loss and recurrent pregnancy loss (RPL). Therefore, future research may explore immunomodulatory approaches and microbiota restoration strategies (probiotics/systemic interventions) alongside antibacterial therapy.

Clinical Recommendations:

1. In symptomatic pregnant women with recurrent bacterial vaginosis, diagnostic evaluation (Amsel or Nugent; PCR/metagenomics if available) and treatment initiation are recommended.
2. Routine screening of asymptomatic women is not recommended (USPSTF), but individual risk assessment is warranted in high-risk patients.
3. In recurrent bacterial vaginosis, local clindamycin or oral metronidazole regimens, as well as probiotics, may be used. Therapy should be individualized, taking pregnancy risk into account.
4. Pregnant women with recurrent bacterial vaginosis require close monitoring (ultrasonography, laboratory evaluation for infection markers) and early recognition of potential intrauterine infectious complications.

CONCLUSION

Recurrent bacterial vaginosis (RBV) during pregnancy has been shown to be associated with several early perinatal complications. These include preterm birth (PTB), preterm premature rupture of membranes (PPROM), chorioamnionitis, and fetal loss (spontaneous abortion). At the same time, existing scientific evidence is heterogeneous, with significant variations influenced by diagnostic methods (Amsel,

Nugent, PCR), study design, population characteristics, and applied treatment strategies.

In clinical practice, symptomatic pregnant women are recommended for treatment, as intervention may reduce the risk of complications during pregnancy. High-risk patients—such as those with a history of previous preterm birth, recurrent pregnancy loss, or immunological and surrogate factors—should be evaluated individually and provided with appropriate treatment and monitoring strategies.

Future research is expected to focus on molecular diagnostic methods and microbiota-restorative approaches (including probiotics and other microbiota-restorative interventions) to prevent perinatal complications associated with recurrent bacterial vaginosis and to reduce related risks. This may open new prospects for individualized risk assessment during pregnancy and the development of advanced preventive strategies.

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