

ANALYSIS OF THE RELATIONSHIP BETWEEN VAGINAL MICROBIOOCENOSIS COMPOSITION AND VARIOUS DISEASES OF THE FEMALE REPRODUCTIVE SYSTEM

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Abstract. The human vaginal microbiota plays a central role in maintaining the health of the female reproductive system. Imbalances in vaginal microbiocenosis have been increasingly associated with gynecological and obstetric disorders, including bacterial vaginosis, candidiasis, pelvic inflammatory disease, endometriosis, and infertility. This review analyzes current scientific evidence on the relationship between alterations in the vaginal microbiota and reproductive system pathologies. Understanding these associations is key for developing targeted diagnostics and preventive strategies.

Keywords: Vaginal microbiota, reproductive health, dysbiosis, endometriosis, infertility, pelvic inflammation, bacterial vaginosis

Introduction. The vaginal microbiota, predominantly composed of Lactobacillus species, is a crucial factor in female reproductive system stability. These bacteria maintain an acidic pH environment, produce antimicrobial substances, and prevent pathogen colonization. Dysbiosis, or disruption in this

ecosystem, has been linked to various gynecological diseases and adverse reproductive outcomes [1,2].

Understanding how specific microbial shifts contribute to or result from reproductive system disorders is essential for modern gynecology and reproductive medicine. This article reviews key findings on the correlation between microbiocenosis composition and common reproductive pathologies.

Vaginal dysbiosis and common gynecological conditions

1. Bacterial vaginosis (BV)

BV is characterized by a significant decrease in *Lactobacillus* spp. And an overgrowth of anaerobic bacteria such as *Gardnerella vaginalis*, *Atopobium vaginae*, and *Mobiluncus* spp. This dysbiotic state disrupts immune homeostasis and increases vulnerability to STIs, including HIV [3].

2. Vulvovaginal Candidiasis

Although *Candida* species are part of the normal flora in some women, overgrowth due to microbiota imbalance—especially after antibiotic use—can lead to symptomatic infection. An inverse correlation between *Lactobacillus* density and *Candida* virulence has been observed [4].

3. Pelvic Inflammatory Disease (PID)

Studies have demonstrated that women with a dysbiotic vaginal profile are more prone to ascending infections leading to PID. The presence of BV-associated bacteria is a known risk factor for uterine and fallopian tube inflammation [5].

Reproductive Disorders and Microbial Shifts

1. Endometriosis.

Recent studies indicate that women with endometriosis exhibit altered vaginal and endometrial microbiota, with increased prevalence of *Gardnerella* and *Streptococcus* species, and reduced *Lactobacilli*. This suggests a possible role of microbiota in the pathogenesis or progression of the disease [6].

2. Infertility

A balanced vaginal microbiome is associated with improved sperm viability and embryo implantation. Dysbiosis, particularly low levels of *L. Crispatus*, correlates with reduced IVF success rates and higher miscarriage risk [1,6].

3. Pregnancy Complications

Microbiota composition affects risks of preterm birth, miscarriage, and preeclampsia. BV and vaginal inflammation are particularly significant in early pregnancy loss, often mediated by microbial metabolites and local immune disruption [3].

Diagnostic and therapeutic implications. Assessment of vaginal microbiota via modern techniques such as 16S rRNA sequencing enables early detection of dysbiotic profiles. Interventions like probiotic therapy, prebiotics, and microbiota transplantation are emerging as adjuncts to classical treatment protocols [2,7].

Personalized medicine, focusing on microbiota profiling, may allow individualized risk assessment and management strategies for women at risk of reproductive dysfunctions.

Conclusion. The composition of vaginal microbiocenosis is closely linked to the health of the female reproductive system. Dysbiosis is not merely a marker but often a contributing factor to the onset and progression of several reproductive

disorders. Future research should focus on microbiota-targeted therapies and integrating microbial profiling into routine gynecological care.

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