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A Synopsis of the Bacterial Vaginosis and Infertility

Ramesh Baradaran Bagheri[1*]

Ramesh Baradaran Bagheri is a board-certified obstetrician and gynecologist with a fellowship in infertility treatment. She has approximately 22 years of clinical experience, including seven years dedicated to teaching and research at Iranian academic institutions. Currently, she serves as a full-time assistant professor and Deputy for Research in the Department of Obstetrics and Gynecology at Alborz University of Medical Sciences in Iran, where she also supervises the Infertility Treatment Center.

Bacterial vaginosis (BV), the most common vaginal infection among women of reproductive age, is a polymicrobial condition characterized by dysbiosis (1),a shift from a *Lactobacillus*-dominant vaginal flora to a diverse community (2) dominated by anaerobic bacteria, including *Gardnerella vaginalis*, *Atopobium vaginae*, and *Prevotella* species (3). Characterized by vaginal discharge, odor, and itching, BV is often asymptomatic. BV prevalence varies across countries and population groups, but a recent systematic review and meta-analysis of the global BV prevalence among women of reproductive age range from 23%–29% (4).

The diagnosis of BV is typically based on clinical criteria and laboratory tests and can be challenging, particularly in asymptomatic cases. The Amsel criteria, including vaginal pH >4.5, positive whiff test, presence of clue cells, and homogenous discharge, are commonly used. However, these criteria have limitations in sensitivity and specificity. Molecular diagnostic techniques, such as PCR and 16S rRNA gene sequencing, offer more accurate and comprehensive assessment of the vaginal microbiome, allowing for the identification of specific BV-associated bacteria and the quantification of microbial diversity. A review discusses the advantages and limitations of various diagnostic methods for BV, emphasizing the potential of molecular methods for improved detection and management (5).

BV, pelvic inflammatory disease, and endometritis are infections of the genital tract that can lead to many adverse health outcomes, including infertility (6). While numerous factors contribute to infertility (7-9), emerging research suggests a possible detrimental effect of BV on fertility outcomes, potentially mediated through inflammation, oxidative stress, altered vaginal micro-environment, and increased susceptibility to sexually transmitted infections (10-14). The disruption of endometrial immune balance is an important reason for the decline of endometrial receptivity (15). A meta-analysis found that women with BV had a significantly higher risk of acquiring *Chlamydia trachomatis*, highlighting the indirect impact of BV on fertility through enhanced sexually transmitted infections (STIs) susceptibility (14). The exposure of endometrial cells to BV-associated bacterial products in vitro demonstrated in decreased expression of genes involved in endometrial receptivity (16).

The standard treatment for BV involves antibiotics, typically metronidazole, clindamycin or tinidazole orally or intravaginally (17). However, recurrence rates are high, and antibiotic resistance is a growing concern. Alternative and adjunctive therapies 18, such as probiotics (19-22), prebiotics (23), and vaginal antiseptics, are being investigated as potential strategies for restoring and maintaining a healthy vaginal microbiome.

Further research, particularly well-designed prospective studies and intervention trials, is crucial to clarify the causal relationship and develop evidence-based management strategies for women with BV planning conception. It is important for clinicians to consider BV as a potential contributing factor in infertile women and to implement appropriate screening and treatment strategies. The field of vaginal microbiome research is rapidly evolving, and continued investigation will undoubtedly provide further insights into the complex interplay between BV and reproductive health.

Competing Interests

None.

Ethical Issues

Not applicable.

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[1]Department of Obstetrics and Gynecology, Alborz University of Medical Sciences, Karaj, Iran
***Corresponding Author:** Ramesh Baradaran Bagheri, Email: dr.rameshbb@gmail.com

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