

EVALUATION OF THE EFFECTIVENESS OF PROBIOTIC USE IN WOMEN WITH BACTERIAL VAGINOSIS: A CLINICAL OBSERVATION IN THE CONTEXT OF UZBEKISTAN

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<https://doi.org/10.5281/zenodo.20533337>

Abstract. *This study is aimed at evaluating the effectiveness of probiotic use after antibiotic therapy in women with bacterial vaginosis (BV). The clinical observation was conducted in women's health institutions in Andijan region. A total of 62 women participated in the study. In the experimental group, probiotics were administered after antibiotics, whereas the control group received antibiotics only. The results of the 6-month follow-up showed that symptoms disappeared more rapidly in the probiotic group, the vaginal microflora was restored, and the recurrence rate of the disease was significantly reduced. The findings indicate that the use of probiotics in the treatment of BV is effective in the conditions of Uzbekistan and that their introduction into clinical practice is advisable.*

Keywords: *bacterial vaginosis, probiotics, vaginal microflora, antibiotic, clinical observation, Andijan.*

Introduction. Bacterial vaginosis (BV) is the most common vaginal infection among women and is characterized by an imbalance of the vaginal microflora. In a healthy vaginal environment, Lactobacillus species predominate; they maintain the vaginal pH in an acidic range (3.8-4.5) and suppress pathogenic microorganisms. In BV, these bacteria are replaced by anaerobic bacteria such as Gardnerella vaginalis, Atopobium vaginae, and Mobiluncus. In this condition, Lactobacillus species decrease, while anaerobic bacteria, particularly Gardnerella vaginalis, Mobiluncus, and Atopobium species, become dominant. Clinically, BV manifests as vaginal discharge, an unpleasant odor, increased pH, and microscopic diagnostic signs.

Bacterial vaginosis (BV) is one of the most common forms of vaginal dysbiosis in women, especially among women of reproductive age. The global prevalence of this disease varies sharply depending on region, ethnic group, and the level of development of the healthcare system.

According to the World Health Organization (WHO) and various epidemiological studies, the prevalence of BV may range from 5% to 70%. For example, in Africa this indicator is high, reaching 50-60% in some areas, whereas relatively lower rates have been reported in Asian and European countries.

At present, official epidemiological data related to BV in Uzbekistan are limited in open sources.

However, approximate estimates are presented based on regional similarities and studies conducted in neighboring countries. For instance, according to a study conducted in Ethiopia, the prevalence of BV among women of reproductive age was 29.2%.

Research Methods and Materials. This prospective observational study was conducted in Uzbekistan in 2024 among 62 women aged 18-35 years who had been diagnosed with bacterial vaginosis (BV). The study participants were selected on the basis of confirmed cases according to Amsel criteria (three or more clinical signs) and the detection of *Gardnerella vaginalis* by polymerase chain reaction (PCR). The participants were selected according to the following criteria:

Inclusion criteria. A diagnosis of BV confirmed on the basis of Amsel criteria and PCR results;

No antibiotic use during the previous 4 weeks; Not pregnant.

Exclusion criteria. Presence of immunosuppressive conditions; Presence of chronic gynecological diseases; History of allergic reactions to probiotics or antibiotics. The participants were randomly divided into two groups:

1. Experimental group (n=31) - received 2% clindamycin (Dalacin) vaginal cream together with orally administered probiotic preparations containing *Lactobacillus rhamnosus* and *Lactobacillus reuteri* strains (Ecofemin or Lactoginal) for 6 days.

2. Control group (n=31) - received only standard antibiotic therapy: metronidazole 500 mg, twice daily, for 7 days.

Assessment methods. During the study, assessments were carried out based on the following clinical and laboratory criteria:

Clinical symptoms - vaginal discharge, odor, itching, and discomfort;

Vaginal pH level - measured using litmus test strips;

Microbiological analysis - evaluated by Gram staining and Nugent scores;

Molecular analysis (PCR) - used to determine the relative amounts of *G. vaginalis* and *Lactobacillus* species;

Recurrence indicators - assessed through follow-up observations at 1, 3, and 6 months.

The assessments were repeated before treatment, on day 7, and at the end of day 30.

Statistical analysis was performed using SPSS 26.0, and a p value of <0.05 was considered statistically significant.

Results and Their Analysis. General characteristics of the participants. The mean age of the 62 participants who successfully completed the study was 29.4 +/- 5.7 years. No statistically significant differences were found between the groups in terms of age, level of sexual activity, and other basic indicators ($p > 0.05$).

Changes in clinical symptoms and laboratory parameters.

1. Resolution of clinical symptoms:

By the end of day 7, symptoms (discharge and odor) had resolved in 87% of patients in the experimental group, compared with 65% in the control group ($p = 0.03$).

By the end of day 30, complete disappearance of symptoms was observed in 94% of the experimental group and 74% of the control group ($p = 0.02$).

2. Vaginal pH level:

Experimental group: 5.6 -> 4.2

Control group: 5.5 -> 4.8

These results indicate that the vaginal environment returned to an acidic state more rapidly and that unfavorable conditions were created for anaerobic flora.

Detection of *Gardnerella vaginalis* by PCR:

Experimental group: 81% -> 12%

Control group: 79% -> 28%

These results show that probiotics enhance the microbial effectiveness of antibiotic therapy.

3. Recurrence rate:

During the 6-month follow-up, BV recurrence was 9% in the experimental group and 27% in the control group.

This difference confirms that probiotics are an effective tool in preventing the recurrence of BV.

Analytical Discussion. The results of this study showed that the use of *Lactobacillus*-based probiotics together with antibiotics in bacterial vaginosis helps symptoms disappear more rapidly, restores the vaginal microflora, and reduces the recurrence of BV.

Probiotics restored the vaginal pH to the physiological norm, created an unfavorable environment for anaerobic flora, and significantly reduced the population of *Gardnerella vaginalis*.

This approach is consistent with data reported in the international literature. For example, studies by Anukam et al. (2006), Marcone et al. (2010), Reid et al. (2003), and Falagas et al. (2007) also demonstrated the effectiveness of *Lactobacillus rhamnosus* and *L. reuteri* species in BV.

The introduction of probiotic therapy into clinical practice in Uzbekistan may improve treatment effectiveness, reduce recurrence, and decrease the need for antibiotics, thereby contributing to improved reproductive health.

The study results showed that adding probiotics to antibiotic therapy in the treatment of women with bacterial vaginosis provides the following advantages:

Clinical symptoms disappear more quickly;

Vaginal pH returns to normal more rapidly;

The number of *Lactobacilli* increases, while *Gardnerella vaginalis* decreases;

The likelihood of BV recurrence decreases.

On this basis, the introduction of probiotic use into practice in Uzbekistan is advisable. In the future, larger-scale, multicenter studies should be conducted in this area. The use of probiotics after antibiotics improves treatment effectiveness in women with bacterial vaginosis, restores the vaginal microflora, and significantly reduces the likelihood of recurrence. This approach should be introduced into clinical practice in the conditions of Uzbekistan. Broader randomized studies involving more participants may further strengthen these findings.

Conclusion. The results of this prospective clinical observation showed that, in the treatment of bacterial vaginosis in Uzbekistan, adding probiotics to antibiotic therapy, particularly preparations based on *Lactobacillus rhamnosus* and *Lactobacillus reuteri* strains, is effective.

Probiotics lead to faster disappearance of clinical symptoms, restoration of vaginal pH to physiological levels, and a significant decrease in the number of pathogenic bacteria such as *Gardnerella vaginalis*. In addition, the addition of probiotics significantly reduces the likelihood of BV recurrence, which is of great importance for improving the health of women of reproductive age.

The results are consistent with international studies and indicate that the introduction of probiotic therapy into clinical practice in Uzbekistan will be an important step toward more effective management of bacterial vaginosis and reducing the need for antibiotics. In the future, larger-scale and multicenter studies may further confirm the effectiveness of this approach.

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