



## EFFECTIVENESS OF PROBIOTICS IN THE MANAGEMENT OF VAGINAL DISCHARGE

## Dermatology

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## ABSTRACT

Vaginal discharge is a common complaint affecting women worldwide. Probiotics have been proposed as a potential intervention to restore vaginal microbiota balance and alleviate symptoms. **Aims and objectives:** To compare the effectiveness of probiotics on vaginal discharge severity and recurrence. **Materials and methods:** Comparative study comprising a total of 50 participants with vaginal discharge were enrolled, with 25 receiving probiotics and 25 serving as controls. Outcome measures included symptom severity and recurrence rates. **Results:** It indicated a significant reduction in discharge severity and recurrence among the probiotic group compared to controls. **Conclusion:** These findings support the use of probiotics as an adjunct therapy for vaginal discharge management.

## KEYWORDS

Vaginal discharge, probiotics, case-control study, symptom severity, recurrence rates

## INTRODUCTION:

Vaginal discharge, characterized by abnormal secretion from the female genital tract, is a common gynecological complaint affecting women worldwide. It is often associated with discomfort, itching, odor, and irritation, leading to a significant impact on quality of life. Under physiological conditions, this Lactobacillus-dominant arrangement has been regarded as an indicator of vaginal health<sup>[1]</sup>. The production of lactic acid, biosurfactants, bacteriocin-like chemicals, and hydrogen peroxide by these Gram-positive bacilli varies from strain to strain which can acidify the vaginal microenvironment and inhibit the proliferation of other pathogenic microorganisms promoting the maintenance of a eubiotic vaginal microbiome<sup>[2]</sup>.

Bacterial vaginosis (BV) and vaginal candidiasis are the most prevalent causes of abnormal vaginal discharge, affecting millions of women globally. BV is characterized by a decrease in lactobacilli and an overgrowth of pathogenic bacteria such as *Gardnerella vaginalis*, *Atopobium vaginae*, and *Prevotella* species. Similarly, vaginal candidiasis is caused by overgrowth of *Candida* species, particularly *Candida albicans*, leading to inflammation and discomfort. Conventional treatment approaches for vaginal discharge typically involve antibiotics for BV and antifungals for vaginal candidiasis. However, these treatments may disrupt the delicate vaginal ecosystem, leading to recurrence, antibiotic resistance, and adverse effects. In fact, Lactobacillus SAMs has been proved to antagonise a plethora of bacterial and fungal pathogens such as *Candida albicans*, *Staphylococcus aureus*, *Streptococcus mutans*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Salmonella typhimurium*<sup>[7,8,9]</sup>. Therefore, there is growing interest in using probiotics aimed at restoring vaginal microbiota balance without adverse consequences.

Probiotic lactobacilli have been used as alternatives and adjuncts to antibiotics, reducing antimicrobial resistance caused by the overuse of antibiotics in the treatment of illnesses<sup>[3]</sup>. Probiotics exert their effects through various mechanisms, including competitive exclusion, production of antimicrobial substances, and modulation of immune responses. Lactobacillus species, particularly *Lactobacillus crispatus*, *Lactobacillus jensenii*, and *Lactobacillus iners*, are predominant in the healthy vaginal microbiota and play a crucial role in maintaining vaginal health.

In recent years, clinical research and development of lactobacilli for the prevention and treatment of vaginal infections in women has advanced rapidly<sup>[4]</sup>. Despite the growing body of evidence supporting the efficacy of probiotics in vaginal discharge management, there remains a need for well-designed clinical studies to validate these findings and elucidate the optimal probiotic strains, dosages, and treatment regimens. Therefore, this case-control study aims to evaluate the effectiveness of probiotics in the management of vaginal discharge and explore their impact on symptom severity and recurrence rates. Furthermore, keen understanding of the potential benefits of probiotics in managing vaginal discharge is essential for informing evidence-based treatment approaches and improving women's reproductive health outcomes. Hence, this study seeks to contribute to the existing literature by providing valuable insights into the effectiveness of probiotics as a therapeutic intervention for vaginal discharge. By

addressing these research gaps, we aim to facilitate the development of more targeted and personalized approaches to managing this common gynaecological condition.

## MATERIALS AND METHODS:

**Study Design:** This case-control study enrolled participants with symptomatic vaginal discharge from Karuna Medical College and Hospital between January 2022 and May 2022. The study protocol was approved by the institutional ethical committee and all participants provided informed consent.

## Inclusion Criteria:

1. Female participants aged 18-45 years.
2. Complaints of abnormal vaginal discharge, including odor, itching, and irritation.
3. Confirmation of vaginal infection through clinical examination and laboratory tests.

## Exclusion Criteria:

1. Pregnancy or breastfeeding.
2. History of immunodeficiency disorders or chronic illnesses.
3. Use of antibiotics, antifungals, or probiotics within the past month.

**Participants:** A total of 50 participants were recruited, with 25 allocated to the probiotic group and 25 serving as controls. Participants in the probiotic group received, while controls received standard care. A thorough history taking followed by systemic and genital examination using Cusco's bivalve self-retaining vaginal speculum was done. For unmarried females speculum examination was not done. Smears were taken from the genital discharge taken from the posterior fourchette in unmarried patients and from the posterior blade of the vaginal speculum in married patients. Both gram stain and KOH were done to identify infections. They were given probiotic one capsule twice daily for 4 weeks and assessed after that. Again probiotics was continued once daily for the next 4 weeks and assessed. Recurrence were assessed after 2, 4 and 6 months. Before and at the end of the treatment period, the presence of pain, itch, dyspareunia, dysuria, vaginal discharge, and vulvovaginal erythema were checked. Signs and symptoms were quantified according to the scale: absent = 0, mild = 1, moderate = 2 and severe = 3. The overall symptoms were summarized for severity assessment score.

The primary outcome measures included changes in symptom severity assessed using standardized questionnaires, microbial composition determined through vaginal swab analysis and recurrence rates during follow-up visits.

## RESULTS:-

Participants on probiotics were of mean age 30 years with mean BMI of 25. Control group with a mean age of 32 and BMI of 27.

Table 1: Baseline Characteristics of Participants

| Characteristics                      | Probiotic Group | Control Group |
|--------------------------------------|-----------------|---------------|
| AGE (YEARS)                          | 30(28-35)       | 32(30-36)     |
| BODY MASS INDEX (kg/m <sup>2</sup> ) | 25(23-28)       | 27(25-30)     |

Severity reduced in both groups but it was reduced from 20 to 5 in probiotic group, whereas control group showed reduction from 20 to 8.

**Table 2: Symptom Severity Scores at Baseline and Follow-up**

| Time Point         | Probiotic Group | Control Group |
|--------------------|-----------------|---------------|
| BASELINE           | 20              | 20            |
| FOLLOW-UP (WEEK 4) | 10              | 15            |
| FOLLOW-UP (WEEK 8) | 5               | 8             |

**Table 3: Microbial Composition Analysis**

| Microorganism    | Control Group | Probiotic Group |
|------------------|---------------|-----------------|
| LACTOBACILLUS    | 40%           | 70%             |
| GARDNERELLA      | 20%           | 10%             |
| CANDIDA ALBICANS | 15%           | 5%              |

Recurrence rates were reduced in both after 6 months but substantially reduced in probiotic groups.

**Table 4: Recurrence Rates in the Probiotic and Control Groups**

| Time Period | Probiotic Group | Control Group |
|-------------|-----------------|---------------|
| 2 MONTHS    | 8               | 15            |
| 4 MONTHS    | 12              | 20            |
| 6 MONTHS    | 18              | 25            |

## DISCUSSION:

The findings of this study support the effectiveness of probiotics in the management of vaginal discharge. Participants receiving probiotics demonstrated a significant reduction in symptom severity, favorable changes in microbial composition, and lower recurrence rates compared to controls. These results are consistent with previous studies highlighting the role of probiotics in restoring vaginal microbiota balance and alleviating symptoms of vaginal infections. Like our study, participants taking daily oral probiotic lactobacilli capsules can lead to a substantial improvement in the vaginal flora in terms of an increase in lactobacilli and a decrease in enterococci, staphylococci, Gardnerella spp., and Candida spp. in mixed vaginal infected patients<sup>[11]</sup>. One of the first reports of probiotic effectiveness by using well-characterized probiotic strains in treating BV was provided by Anukam et al<sup>[5]</sup>.

The observed decrease in symptom severity can be attributed to the ability of probiotics to inhibit the growth of pathogenic microorganisms and promote the colonization of beneficial lactobacilli. The Lactobacillus species produces lactic and acetic acid and H<sub>2</sub>O<sub>2</sub>, maintains the vaginal pH around 4.5 or less, hampers the growth of pathogenic bacteria and C. albicans and is thus considered protective against VVC and BV<sup>[6]</sup>. Furthermore, the restoration of vaginal microbiota balance may contribute to a decrease in inflammatory responses and enhanced host defense mechanisms against recurrent. Similar to our study, a narrative review had concluded that the administration of selective probiotic strains resulted in enhanced host's ability to fight existing infection, restoration of normal vaginal flora and prevention of further BV recurrence when given for 2 months<sup>[10]</sup>. It is essential to note that the efficacy of probiotics may vary depending on the specific strains and formulations used. Further research is needed to determine the optimal probiotic strains, dosages, and treatment durations for different types of vaginal infections. Additionally, long-term follow-up studies are warranted to assess the sustainability of probiotic effects and potential adverse effects.

Furthermore, ongoing research efforts are needed to explore potential synergistic effects of probiotics with other therapeutic modalities and to address any remaining gaps in our understanding of their mechanisms of action. Overall, our study highlights the promising role of probiotics in improving vaginal health and stresses on the importance of continued investigation in this area.

## CONCLUSION:

In conclusion, this case-control study provides evidence supporting the effectiveness of probiotics in the management of vaginal discharge. Probiotic supplementation was associated with a significant reduction in symptom severity, favorable changes in microbial composition, and lower recurrence rates compared to standard care. These findings underscore the potential of probiotics as a safe and alternative therapy for women with vaginal infections. Further research is warranted to elucidate the optimal probiotic regimens and long-term effects on vaginal health. Additionally, future studies should also investigate the optimal dosage, formulation, and duration of probiotic treatment to

maximize its therapeutic benefits. Overall our study contributes to the growing body of evidence supporting the role of probiotics in women's health and underscores the importance of considering probiotic supplementation as part of the holistic approach to managing vaginal discharge and related conditions.

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## Conflicts of Interest:-

The authors declare that they have no conflicts of interest to disclose.

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