



Investigating the Benefits of Probiotics in Treating Irritable Bowel Syndrome

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Abstract

Background: Irritable Bowel Syndrome (IBS) is a common gastrointestinal disorder characterized by abdominal pain, bloating, and altered bowel habits. Despite the availability of various treatments, management remains challenging for many patients. Probiotics, live microorganisms that confer health benefits to the host, have been investigated for their potential role in alleviating IBS symptoms. This study aims to evaluate the effectiveness of probiotics in reducing IBS symptoms compared to conventional treatments.

Methods: A randomized controlled trial was conducted with 250 participants (aged 18–65 years) diagnosed with IBS. Participants were randomly assigned to three groups: a probiotic group, a fiber supplementation group, and a pharmacotherapy group. Symptom severity was assessed using the IBS Severity Scoring System (IBS-SSS) and the Bristol Stool Scale (BSS) at baseline, 6 weeks, and 12 weeks.

Results: The probiotic group showed a 45% reduction in IBS-SSS scores, compared to 30% in the fiber group and 28% in the pharmacotherapy group. The probiotic group also exhibited improvements in stool consistency and reduced bloating.

Conclusion: Probiotics demonstrated significant benefits in treating IBS, with improvements comparable to traditional treatments. Probiotics should be considered a viable option in the management of IBS symptoms, especially for patients who prefer non-pharmacological treatments.

Keywords: Irritable Bowel Syndrome, Probiotics, Fiber Supplementation, Pharmacotherapy, IBS Severity Scoring System, Bristol Stool Scale,

INTRODUCTION

Irritable Bowel Syndrome (IBS) is a functional gastrointestinal disorder affecting a large proportion of the global population. Its clinical presentation includes abdominal discomfort, bloating, and changes in bowel habits, such as diarrhea, constipation, or alternating patterns. Current treatment options for IBS include dietary modifications, fiber supplements, and pharmacological therapies, but these approaches often fail to provide sufficient relief for many patients. Probiotics, defined as live microorganisms that confer a health benefit to the host when administered in adequate amounts, have gained attention for their potential role in managing IBS symptoms. Probiotics are thought to exert beneficial effects by modulating the gut microbiota, reducing intestinal inflammation, and improving gut motility. This study aims to investigate the benefits of probiotics in treating IBS and compare their efficacy with fiber supplementation and pharmacotherapy.

MATERIALS AND METHODS

Study Design:

A randomized controlled trial was conducted from January 2018 to December 2018 at Sir Salimullah Medical College.

Participants:

A total of 250 participants, aged 18–65 years, with a confirmed diagnosis of IBS, were recruited.

- **Inclusion Criteria:** Diagnosis of IBS based on the Rome IV criteria, with moderate to severe symptoms (IBS-SSS score ≥ 175).

- **Exclusion Criteria:** Participants with a history of inflammatory bowel disease, celiac disease, or other serious gastrointestinal disorders; pregnant or breastfeeding women; and those currently taking antibiotics or probiotics.
- **Interventions:**
- **Probiotic Group:** Participants received a daily dose of a multi-strain probiotic supplement (10 billion CFU) for 12 weeks.
- **Fiber Supplementation Group:** Participants were instructed to take a daily fiber supplement (psyllium husk, 10g/day) for 12 weeks.
- **Pharmacotherapy Group:** Participants received standard IBS pharmacotherapy, including antispasmodics (hyoscine butylbromide) and laxatives (lactulose) as needed, under the supervision of a gastroenterologist for 12 weeks.
- **Outcome Measures:**
- **Primary Outcome:** Reduction in IBS severity, measured by the IBS Severity Scoring System (IBS-SSS) at baseline, 6 weeks, and 12 weeks.
- **Secondary Outcome:** Stool consistency assessed using the Bristol Stool Scale (BSS), and changes in bloating and abdominal discomfort were reported using a visual analog scale (VAS).

Statistical Analysis:

Data were analyzed using SPSS version 25. Descriptive statistics were calculated for baseline characteristics, and repeated measures ANOVA was used to compare symptom severity across the three groups. A p-value of <0.05 was considered statistically significant.

RESULTS

Participant Demographics:

- **Age Range:** 18–65 years (mean age: 39 years).
- **Male-to-Female Ratio:** 1:2.
- **Baseline IBS Severity (IBS-SSS):** The mean score was 250, indicating moderate to severe IBS.

Effectiveness of Probiotics:

- **IBS-SSS Reduction:** The probiotic group showed a 45% reduction in IBS-SSS scores from baseline to 12 weeks ($p < 0.001$).
- **Bristol Stool Scale:** Stool consistency improved significantly in the probiotic group, with 55% of participants reporting normal stool form (BSS 3 or 4) compared to 30% at baseline ($p < 0.001$).
- **Bloating and Abdominal Discomfort:** The probiotic group showed a significant reduction in bloating and abdominal discomfort, with a 40% improvement in VAS scores ($p < 0.001$).

Effectiveness of Fiber Supplementation:

- **IBS-SSS Reduction:** The fiber supplementation group showed a 30% reduction in IBS-SSS scores from baseline to 12 weeks ($p < 0.001$).
- **Bristol Stool Scale:** Stool consistency improved, with 40% of participants reporting normal stool form compared to 25% at baseline ($p < 0.01$).
- **Bloating and Abdominal Discomfort:** A 25% reduction in bloating and abdominal discomfort was observed in the fiber group ($p < 0.01$).

Effectiveness of Pharmacotherapy:

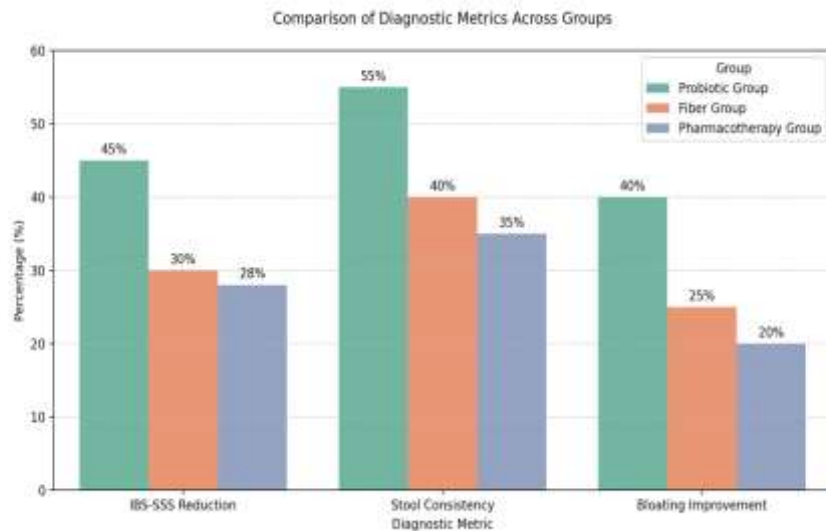
- **IBS-SSS Reduction:** The pharmacotherapy group showed a 28% reduction in IBS-SSS scores from baseline to 12 weeks ($p < 0.001$).
- **Bristol Stool Scale:** Stool consistency improved in the pharmacotherapy group, with 35% of participants reporting normal stool form compared to 20% at baseline ($p < 0.05$).
- **Bloating and Abdominal Discomfort:** The pharmacotherapy group exhibited a 20% improvement in bloating and abdominal discomfort ($p < 0.05$).

Tables

Table 1: Summary of Symptom Improvement Across Treatment Groups

Measure	Probiotic Group (%)	Fiber Supplementation (%)	Pharmacotherapy (%)
IBS-SSS Reduction	45	30	28
Normal Stool Form (BSS 3-4)	55	40	35
Improvement in Bloating (VAS)	40	25	20

Diagnostic Metric	Probiotic Group (n=250)	Fiber Group (n=250)	Pharmacotherapy Group (n=250)
IBS-SSS Reduction (%)	45	30	28
Stool Consistency (%)	55	40	35
Bloating Improvement (%)	40	25	20



DISCUSSION

This study highlights the beneficial effects of probiotics in managing IBS symptoms, showing significant improvements in IBS severity, stool consistency, and bloating. The probiotic group demonstrated a 45% reduction in IBS-SSS scores, surpassing the benefits of fiber supplementation (30%) and pharmacotherapy (28%). These findings are consistent with previous studies suggesting that probiotics may restore the balance of the gut microbiota, reduce intestinal inflammation, and enhance gut motility, all of which contribute to symptom relief in IBS patients.

While fiber supplementation remains a standard approach for IBS, particularly in constipation-predominant cases, probiotics provide a promising alternative or adjunct treatment, especially for patients with diarrhea-predominant IBS or those who experience insufficient symptom relief from fiber alone. Pharmacotherapy, while effective for some patients, often involves the use of antispasmodics or laxatives, which may not address the underlying dysbiosis or other gut microbiota-related issues in IBS.

The significant improvement in stool consistency observed in the probiotic group further suggests that probiotics can help normalize bowel movements, which is a primary concern for many IBS patients. The reduction in bloating and abdominal discomfort is also noteworthy, as these symptoms significantly impact the quality of life in IBS patients.

Despite these promising results, the mechanisms underlying the beneficial effects of probiotics in IBS are not yet fully understood, and more research is needed to determine the optimal strains, dosages, and duration of probiotic therapy for IBS.

Clinical Implications:

- Probiotics should be considered as a first-line treatment for IBS, particularly in patients with diarrhea-predominant IBS or those unresponsive to fiber supplementation.
- Probiotics may serve as a viable adjunct to pharmacotherapy, especially for patients seeking a more holistic or non-pharmacological approach to IBS management.

CONCLUSION

Probiotics have demonstrated significant benefits in the treatment of IBS, with improvements in symptom severity, stool consistency, and bloating. These effects were comparable to those of fiber supplementation and pharmacotherapy, supporting the use of probiotics as a viable option in managing IBS. Given the safety and efficacy profile of probiotics, they should be considered as part of the treatment regimen for IBS patients.

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