



Probiotics & Prebiotics' Role in Treating Constipation and Hemorrhoid Pain

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Abstract

The prevalence of constipation is increasing day by day in today's world because of unhealthy lifestyle patterns and stress, which result in hard stools slowing the gut transit time. Hemorrhoids, also known as piles, have swollen veins around the anus and can occur because of chronic constipation. Probiotics and prebiotics present today can be very useful in treating gut problems. Functional gastrointestinal problems have been linked to the existence of gut microbiota such as *Bifidobacterium*, *Clostridium*, *Bacteroidetes*, and *Lactobacilli*, and prebiotics may contribute to this presence. Prebiotics, when combined with probiotics, can increase the benefits, and improve the consistency of the stool. Many prebiotic and probiotic marketed formulations are available, and many of them demonstrated improvement in stool consistency, colon cancer, IBD, hemorrhoids, and other conditions. There are some disadvantages, like headaches due to the presence of amines, an increase in the histamine level, bloating, and a risk of infection. If this symptom occurs, the probiotics should be stopped immediately.

Introduction

Probiotics are live, nonpathogenic microbes that are given to patients to help with microbial balance, especially in the digestive system. They are utilized as dietary supplements and foods and are made of *Lactobacillus* and *Bifidobacterium* species or *Saccharomyces boulardii* yeast [1]. The term "probiotics" has changed over time from referring to a living, active culture that balances the composition of the gut microbiota to more precise effects, particularly the immunomodulatory potential of well-characterized strains [2]. Live bacteria known as probiotics can help the host's health when given in sufficient doses. Probiotics work in relation to constipation through a number of methods, including altering the gut microbiota, fermentation, neurological system, and immune system [3]. A decrease in the population of beneficial bacteria in our gut can result in constipation. Therefore, the consumption of probiotics can replenish deficient bacteria in our gut [4]. Prebiotics stimulate the growth of a healthy gut and act as fertilizer [5].

Prebiotics & Probiotics

Probiotics are live bacteria that are present in several meals and supplements. They can offer a variety of health advantages. These chemicals originate from carbohydrate types (mostly fiber) that are indigestible to humans [6]. This fiber is consumed by the helpful bacteria in your gut. To maintain a healthy balance of these bacteria in your gut microbiota, it can be helpful to consume a balanced diet that includes both probiotics and prebiotics. Probiotic products commonly provide CFU counts. The quantity of live bacteria contained in each serving of a dietary supplement is referred to as "colony-forming units." They typically range from 1 to 50 billion, depending on the substance and the number of strains present [7]. Prebiotics are present mainly as fructooligosaccharides and galactooligosaccharides in foods like bananas, onions, garlic, beans, and other root vegetables. It is also noticed that prebiotics can treat various disorders like colon cancer, improve the digestion process in the gut, improve the function of the brain, and increase the absorption of calcium [8]. Prebiotics are non-viable dietary components that the good bacteria in your intestine preferentially break down. By increasing the numbers and/or activity of bifidobacteria and lactobacilli through dietary modification of the gut microbiota, prebiotics aims to improve health. An "ideal" gut microflora can boost immunity, lower blood ammonia, stimulate the immune system more, and lower cancer risk. It can also raise resistance to dangerous bacteria [9], (Image 1).

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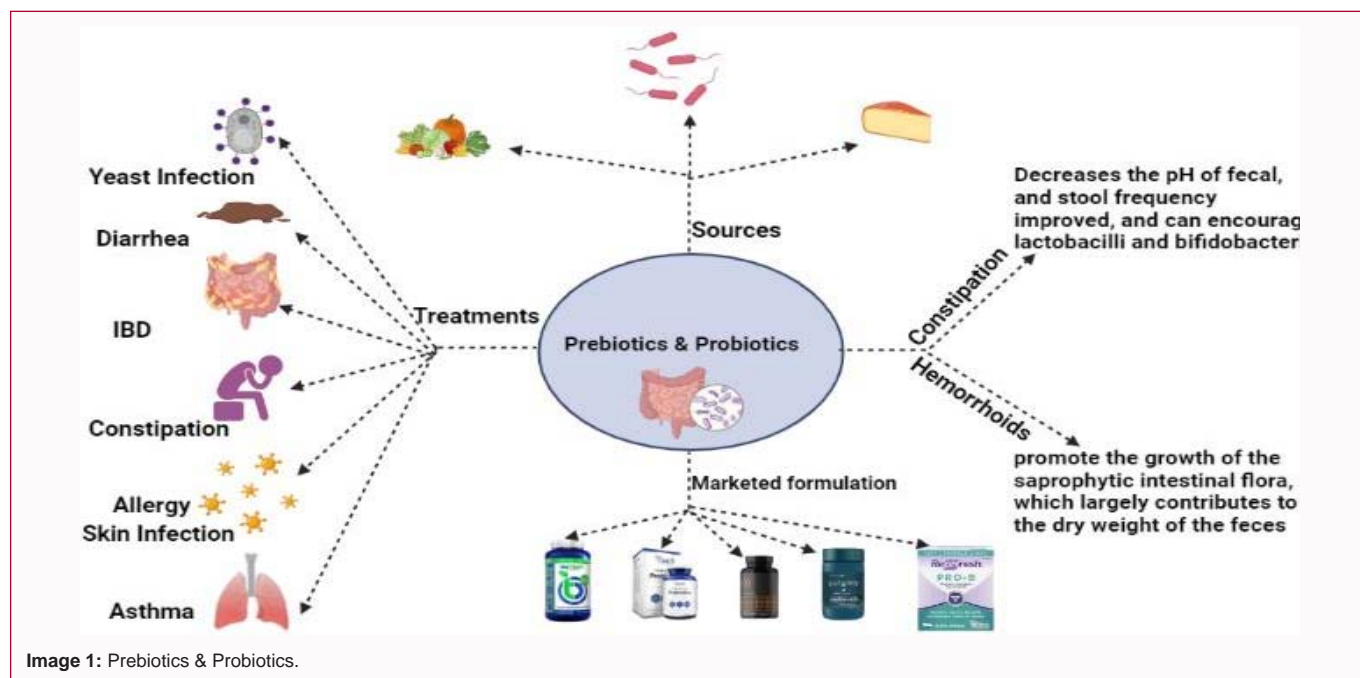


Image 1: Prebiotics & Probiotics.

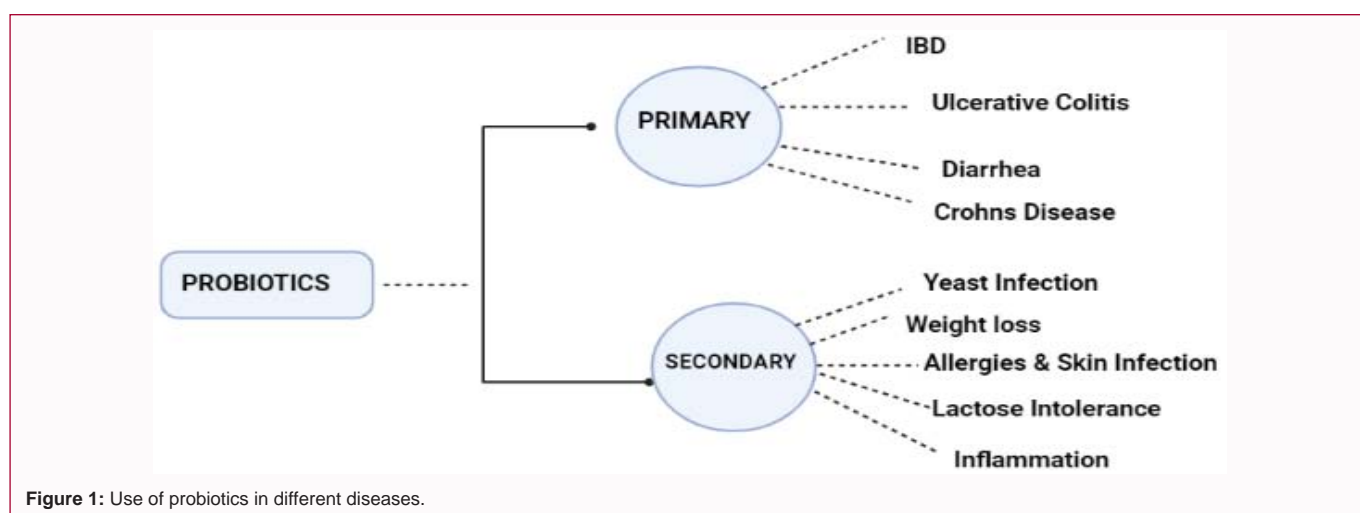


Figure 1: Use of probiotics in different diseases.

Probiotics in Constipation

Over 90% of occurrences of constipation in children and adolescents fall within the category of functional gastrointestinal disorders. Constipation is regarded as a public health issue, and its prevalence varies based on the diagnostic criteria utilized [10]. By increasing the generation of short-chain fatty acids, lowering the pH of the colon, and enhancing bile salt metabolism, probiotics help relieve constipation by promoting peristalsis. The most found bacteria in the large intestine are *Lactobacillus* and *Bifidobacterium*, and probiotics with specific strains and species are helpful in treating constipation [8]. There are various probiotic strains available to treat constipation, like *Bifidobacterium animalis* subsp. *lactis* BB-12¹, which has been demonstrated to enhance bowel function, protect against diarrhea, and lessen antibiotic adverse effects, such as antibiotic-associated diarrhea [11]. *Lactobacillus rhamnosus* GG (LGG), a well-known probiotic, has been shown to improve bowel function in GIT disorders like constipation by increasing goblet cells, upregulating the expression of 5-HT4R, promoting MUC production, and modulating gut microbiota [12], (Figure 1, 2).

Probiotics in Constipation

Prebiotics are non-viable dietary components that the good bacteria in your intestine preferentially break down. By increasing the numbers and/or activity of bifidobacteria and lactobacilli through dietary modification of the gut microbiota, prebiotics aim to improve health [13]. Prebiotics are used to modify the gut flora, which may be advantageous for people who experience constipation symptoms. Lowering the pH of the gut, increasing fecal bulk, and creating an osmotic action that increases water in the large bowel were all advantages [14]. The prebiotics Galactooligosaccharides (GOS), Xylooligosaccharides (XOS), inulin, lactulose Fructooligosaccharides (FOS), and Oligofructose (OF) have been demonstrated to be helpful in selectively encouraging the native bifidobacteria and lactobacilli [15], (Table 1).

Probiotics in Hemorrhoids Pain

Fermented milk containing *Lactobacillus casei* strain Shirota (LcS) on continuous consumption of probiotics for 5 to 6 weeks decreased hemorrhoids by reducing the symptoms of constipation,

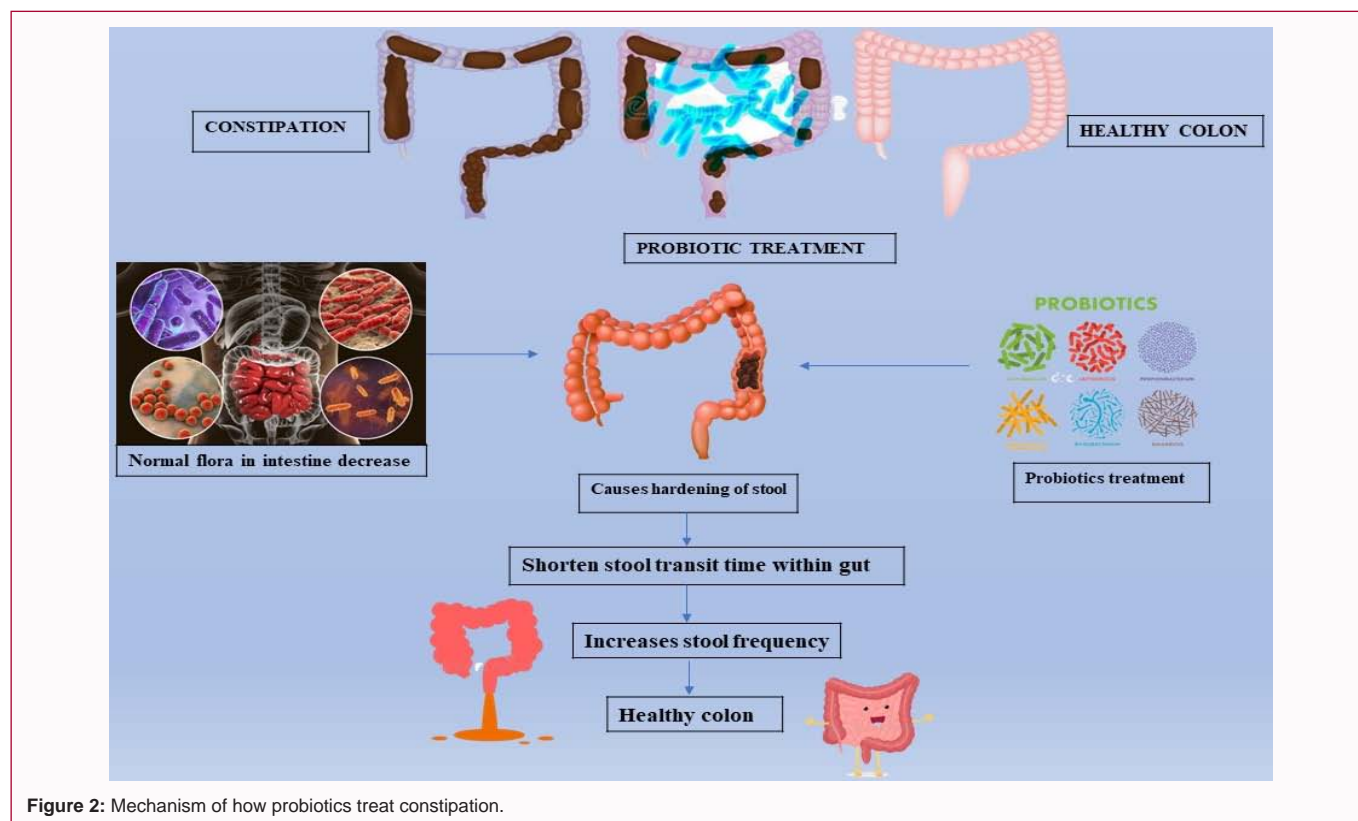


Figure 2: Mechanism of how probiotics treat constipation.

Table 1: Prebiotics and its mechanism of action.

Prebiotics	Mechanism
GOS (Galactooligosaccharides)	Decreases the pH of fecal, and stool frequency improved, and can encourage lactobacilli and bifidobacterial [16].
Inulin	Enhance the absorption of calcium in the body, encourage higher overall bacterial counts while promoting bowel motions [16].
Fructooligosaccharide	Changes the gut microbiota's composition dramatically, which benefits the development of softer stools and the average number of bowel movements per day [17,18].
XOS (Xylooligosaccharides)	Decreases the cecal pH & decreases the level of lipids in the blood [17,18].

promoting regular bowel movements, and helping women who were experiencing puberty heal from hemorrhoids sooner [19]. The first line of treatment for hemorrhoids includes drinking more water, using stool softeners, and eating a high-fiber diet containing psyllium and yogurt, which provide a cooling effect [20]. The soluble fibers (such as guar or psyllium, which are fermented in the colon with the final production of butyric acid, favoring saprophytic bacterial growth) are ispaghula husk, sterculia, or unprocessed bran [21]. Moreover, further benefits could be obtained using pre/probiotics which can [22,23].

Marketed Formulations of Probiotics & Prebiotic

Some of the recently marketed probiotics and prebiotics are as follows:

Biotrust's Pro-X10 probiotic: It is designed to alleviate constipation by addressing the digestive and immune systems. 50 billion CFU are included in each dose [24].

Complete Probiotic Platinum by IMD: Every serving of Complete Probiotics Platinum contains 51 billion CFUs. For added effectiveness, the solution contains a proprietary prebiotic in addition to 11 probiotic strains that are extremely strong. The capsules have

also been thoughtfully created for a delayed release [25].

RepHresh Pro-B: Although this probiotic was created to enhance vaginal health, it also has additional advantages. For instance, it can be used by women to relieve constipation, and it works within 7 days of use [26].

Biotics 8- Best probiotic, contains 10 strains of bacteria that collectively can improve gut health and treat constipation [27].

Gut Army probiotics by zero harm have a 100 billion CFU count, and various strains of *Lactobacillus plantarum*, *Bifidobacterium lactis*, *Lactobacillus acidophilus*, *Bifidobacterium longum*, *Streptococcus thermophilus*, *Bacillus coagulans*, *Saccharomyces boulardii*, *Bifidobacterium breve*, *Lactobacillus rhamnosus*, and *Bacillus clausii* are beneficial and introduce good bacteria to the gut [28,29].

Conclusion

The role of prebiotics and probiotics showed improvement in many gastrointestinal-related disorders, including constipation and hemorrhoids. All these research studies showed positive effects with minimal side effects. They maintain balance and treatment by giving them food that contains probiotics and adding live microbes directly. Bloating and gas are the most frequent side effects of probiotics, which are frequently regarded as safe and effective. Systemic infections can

rarely occur, so they should be administered with caution in patients who are critically ill, have impaired immune systems, or have central venous catheters.

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