



Probiotics

Do They Work?

Mel Borins, MD, CCFP, FCFP



The normal gastrointestinal (GI) system contains hundreds of different bacteria which protect the body from disease. With the common use of antibiotics and other medications, the normal intestinal flora is disrupted, resulting in harm.

There are many probiotics that seem to have a beneficial effect on GI symptoms. These include, *Lactobacillus* (found in yoghurt), *Bifidobacterium bifidum* (found in non-fermented acidophilus milk) and *Saccharomyces boulardii*.

Clostridium difficile

Clostridium difficile is an anaerobic bacillus that has been colonizing the large intestine of people treated with broad-spectrum antibiotics, especially in hospital populations. It has been a frequent cause of severe pseudomembranous colitis, as well as mild diarrhea.

A double-blind, placebo-controlled trial looked at patients who were receiving antibiotic therapy. Sixty-nine patients received *Lactobacillus* and *Bifidobacterium* and 69 received placebo within 72 hours of being given a prescription of antibiotics.

An equal number of patients developed diarrhea; however, the incidence of positive samples for *C. difficile*-associated toxins was 2.9% in the probiotic group compared to 7.25% in the placebo-controlled group.⁶ *S. boulardii*, 500 mg twice

Dr. Raylene Reimer's review of the research¹

Dr. Raylene Reimer reviewed the research in the area of pro- and prebiotics and believes the future is very positive for the use of these agents in disease.

- A metaanalysis of 9 randomized, double-blind, placebo-controlled trials found the use of the bacterial strain, *Lactobacillus rhamnosus*, and the nonpathogenic yeast, *S. boulardii*, useful in preventing antibiotic-associated diarrhea, compared to placebo.²
- Another metaanalysis of 18 trials reviewed the use of probiotics in the treatment of acute pediatric diarrhea. Probiotics reduced the duration of diarrhea by about 1 day. Early intervention seems to be important.³
- Although the preventive impact of probiotic therapy against rotavirus is not clear, a mixture of *Bifidobacterium bifidum* and *Streptococcus thermophilus* was used in 29 hospitalized children to prevent rotavirus diarrhea. Only 10% of those getting the treatment developed rotaviral diarrhea compared to 38% in the placebo group.⁴
- Similarly, using probiotics to prevent traveller's diarrhea is not yet proven conclusively. However, in 1 study of 1,016 tourists, 29% of those who were given *S. boulardii* developed diarrhea, compared to 39% of those given placebo. No significant side-effects were noted.⁵

Dr. Borins is an assistant professor, faculty of medicine, University of Toronto, and a staff member, St. Joseph's Health Centre, Toronto, Ontario.

a day, reduced the recurrence rate of *C. difficile*-associated diarrhea by 50%.⁷

Infectious diarrhea

A Cochrane Review of 23 trials with a total of 1,917 participants concluded probiotics reduced the risk of diarrhea at three days and the mean duration of diarrhea by 30.48 hours. Reviewers concluded probiotics are useful adjuncts to rehydration therapy in treating acute, infectious diarrhea in adults and children; however, they also stated more research is needed to recommend the use of particular probiotic regimens in specific patient groups.⁸

Another metaanalysis concluded *Lactobacillus* was useful in treating infectious diarrhea in infants and children, especially those infected with rotavirus.⁹

Eczema and vulvovaginitis

There is also evidence probiotics may be useful in the prevention of eczema.

When high-risk infants were given *Lactobacillus rhamnosus* during their first six months of life, they had half the development of atopic eczema of the placebo group. The four-year followup of this study found, of the children taking probiotics, significantly less developed eczema.¹⁰


With regard to vulvovaginitis, a randomized, placebo-controlled trial failed to show that use of oral or vaginal forms of *Lactobacillus* prevents post-antibiotic vulvovaginitis.

Which preparation should be taken?

There are significant differences in the active ingredients of various probiotics.

Sometimes no active ingredients can be found when analyzed. There are also reports of contamination with extraneous strains not listed on the label.

Many experts say it is important to buy from stores that keep probiotics in the fridge and to store the containers in the fridge at home, as these agents are only effective as live bacterial cultures.

Since there have been reports of infection complications in immunocompromised patients, there is a suggestion probiotics should not be used in immunosuppressed patients. 

References

1. Reimer R: Pro- and prebiotics: Significance and impact in clinical practice. *Clinical Nutrition Rounds* 2004; 4(3).
2. D'Souza AL, Rajkumar C, Cooke J, et al: Probiotics in the prevention of antibiotic-associated diarrhea in humans: Metaanalysis. *BMJ* 2002; 324(7350):1361.
3. Huang JS, Bousavaros A, Lee JW, et al: Efficacy of probiotic use in acute diarrhea in children: A metaanalysis. *Dig Dis Sci* 2002; 47(11):2625-34.
4. Saavedra JM, Bauman NA, Oung I, et al: Feeding of *Bifidobacterium bifidum* and *Streptococcus thermophilus* to infants in hospital for prevention of diarrhea and shedding of rotavirus. *Lancet* 1994; 344(8929):1046-9.
5. Kollaritsch H, Holst H, Grobara P: Prevention of travelers' diarrhea with the *Saccaromyces boulardii*: Results of a placebo-controlled, double-blind study. *Fortschr Med* 1993; 111(9):152-6.
6. Plummer S, Weaver M, Harris J, et al: *Clostridium difficile* pilot study: Effects of probiotic supplementation on the incidence of *C. difficile* diarrhea. *Int Microbiol* 2004; 7(1):59-62.
7. McFarland LV, Surawicz CM, Greenberg RN: A randomized-control trial of *Saccaromyces boulardii* in combination with standard antibiotics for *Clostridium difficile* disease. *JAMA* 1994; 271(24):1913-8.
8. Allen SJ, Okoko B, Martinez E, et al: Probiotics for treating infectious diarrhea. *Cochrane Database Syst Rev* 2004; (2):CD003048.
9. Szajewska H, Mrukowicz JZ: Probiotics in the treatment and prevention of acute infectious diarrhea in infants and children: A systematic review of published randomized, double-blind, placebo-controlled trials. *J Pediatr Gastroenterol Nutr* 2001; 33 Suppl 2:S17-25.
10. Kalliomaki M, Salminen S, Poussa T, et al: Probiotics and prevention of atopic disease: Four-year followup of a randomized, controlled trial. *Lancet* 2003; 361(9372):1869-71.

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