



Nutritional
News



Supporting Immunity and Treating Helicobacter with Probiotics

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Probiotics are defined as live, non-pathogenic microbial supplements that exert a positive influence on their host by altering microbial balance. Probiotic supplementation is now widely recommended by complementary and mainstream healthcare practitioners alike. It is well recognised that the sensitive ecosystem of beneficial bacteria in the human digestive tract plays an important role in not only the healthy functioning of the gastrointestinal system but also of the immune system. It seems monotonous to repeat the fact that there are over 400 different species of bacteria residing in the human gastrointestinal system, but this is an important factor, on which practitioners should educate their patients. Through modulation and enhancement of immune function, and also through direct antimicrobial activity, probiotic bacteria may assist in the treatment of infection caused by detrimental organisms.

Helicobacter pylori

Helicobacter pylori is an organism found in the GIT of many of the human population. Once believed a harmless commensal organism, thanks to the work of Marshall and Warren, H. pylori is now generally accepted as the cause of most gastroduodenal diseases including peptic ulcers.¹

H. pylori is commonly treated with a combination of antibiotics that may include clarithromycin, amoxicillin or metronidazole. Recent data have demonstrated that triple therapy with two antibiotics plus a proton pump inhibitor has an eradication rate of only 74-76%.² It has been suggested that probiotic therapy may improve eradication rates and also reduce side effects associated with triple therapy. A number of studies have investigated this.

In a recent randomised prospective study of 206 patients with H. pylori, 101 patients (group A) underwent standard triple eradication therapy while 105 patients (group B) underwent standard triple therapy plus lactoferrin and probiotics. Significantly less side effects were reported from group B than group A. Furthermore 73 patients from group A were shown to be successfully treated, compared with 93 patients from group B.²

A 2007 meta-analysis echoed the above conclusions. Fourteen randomised trials like the one described above that compared probiotic supplementation to placebo or no treatment during anti-H. pylori regimens were examined. Pooled eradication rates were 83.6% and 74.8% for patients with or without probiotics respectively. The occurrence of total side effects were 24.7% and 38.5% for groups with or without probiotics. The meta-analysis concluded that supplementation with probiotics could be effective in increasing eradication rates of anti-H. pylori therapy and could be considered helpful for patients with eradication failure.³

Specific probiotic strains used in such studies include Lactobacillus rhamnosus, L. casei, L. acidophilus, Bifidobacterium breve and B. lactis.⁴⁻⁶ Specific probiotic bacteria shown to directly inhibit H. pylori include B. bifidus,⁷ B. lactis,⁸ L. acidophilus⁷ and L. rhamnosus⁷.

Supporting Immunity

The mucosal surfaces of the gastrointestinal tract provide a first line defence against pathogens and are protected primarily by secretory IgA. As H. pylori bacteria reside in the mucus layer covering the gastric epithelium, protective measures such as secretory IgA may be limited in individuals infected with the organism. Available data suggest that breast milk IgA can reduce and prevent infection amongst children.^{9, 10}

Lactic acid bacteria can affect protective immunity against pathogens and have the ability to increase the mucosal immune response. *L. casei*, *L. plantarum*, *L. bulgaricus* and *Streptococcus thermophilus* are able to increase the number of IgA cells in the lamina propria of the Gut Associated Lymphoid Tissue.¹¹

Studies have also highlighted probiotic supplementation to enhance natural killer cell activity, stimulate IgG antibody responses, and affect the production of cytokines including IL-2, IL-6 and IL-10.^{11, 12} All of these actions confer therapeutic benefits to humans and may assist in the prevention and treatment of a number of pathogenic situations such as *H. pylori* infection.

¹ Marshall, B., *Helicobacter* connections. *ChemMedChem*, 2006. 1(8): p. 783-802.

² Bortoli, N.d., et al., *Helicobacter pylori* eradication: a randomised prospective study of triple therapy versus triple therapy plus lactoferrin and probiotics. *Am J Gastroenterol.*, 2007. 102(5): p. 951-6.

³ Tong, J.L., et al., Meta-analysis: the effect of supplementation with probiotics on eradication rates and adverse events during *Helicobacter Pylori* eradication therapy. *Aliment Pharmacol Ther.*, 2007. 25(2): p. 155-68.

⁴ Madden, J.A., et al., Effect of probiotics on preventing disruption of the intestinal microflora following antibiotic therapy: a double blind, placebo controlled pilot study. *Int Immunopharmacol.*, 2005. 5(6): p. 1091-7.

⁵ Myllyluoma, E., et al., Probiotic supplementation improves tolerance to *Helicobacter pylori* eradication therapy - a placebo controlled, double blind randomised pilot study. *Aliment Pharmacol Ther.*, 2005. 21(10): p. 1263-72.

⁶ Myllyluoma, E., et al., Effects of anti-*Helicobacter pylori* treatment and probiotic supplementation on intestinal microbiota. *Int J Antimicrob Agents*, 2007. 29(1): p. 66-72.

⁷ Midolo, P.D., In vitro inhibition of *Helicobacter pylori* NCTC 11637 by organic acid and lactic acid bacteria. *J Appl Bacteriol.*, 1995. 79(4): p. 475-479.

⁸ Sheu, B., et al., Impact of supplement with lactobacillus and bifidobacterium containing yoghurt on triple therapy for *Helicobacter pylori* eradication. *Aliment Pharmacol Ther.*, 2002. 16(9): p. 1669-1675.

⁹ Weaver, L., Royal society of Tropical Medicine and Hygiene Meeting at Manson House, London 16 February 1995. Aspects of *Helicobacter pylori* infection in the developing and developed world. *Helicobacter pylori* infection, nutrition and growth of West African Infants. *Trans R Soc Trop Med Hyg.*, 1995. 89(4): p. 347-50.

¹⁰ Feldman, R., Prevention of *Helicobacter pylori* infection. *Baillieres Clin Gastroenterol.*, 1995. 9(3): p. 447-65.

¹¹ Perdigon, G., et al., Study of the possible mechanisms involved in the mucosal immune system activation by lactic acid bacteria. *Journal of Dairy Science.*, 1999. 82: p. 1108-1114.

¹² Roller, M., et al., Consumption of prebiotic inulin enriched with oligofructose in combination with the probiotics *Lactobacillus rhamnosus* and *Bifidobacterium lactis* has minor effects on selected immune parameters in polypectomised and colon cancer patients. *British Journal of Nutrition*, 2006. 97: p. 676-684.