

# Role of probiotics as dietary supplements for eradication of *Helicobacter pylori* infection in children

Yulia Pavlikova

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## ABSTRACT

For many years, both researchers and healthcare professionals have been deeply interested in the treatment of infectious illnesses. Numerous disorders, including stomach adenocarcinoma, mucosa-associated lymphoid tissue (MALT) lymphoma, and ulcer disease have been linked to chronic *Helicobacter pylori* (*H. pylori*) infection. If *H. pylori* infection is not properly treated, it can last forever and is typically acquired during childhood. Unfortunately, therapy for the *H. pylori* infection fails in roughly 25%–30% of affected infants, despite the fact that various techniques have had highly effective outcomes.

The main reason for *H. pylori* infection is the excessive use of antibiotics, which is responsible for making bacteria antibiotic-resistant, associated with other adverse effects as well. Finding new

approaches to fight this resistance and improve treatment outcomes is therefore essential. It has been discovered that probiotics, which are living bacteria taken orally, are an effective therapy for children's *H. pylori* infections. Children's *H. pylori* infections were treated more successfully and with fewer adverse effects when these supplements were used alone or in conjunction with antibiotics. Asymptomatic children have not been the subject of any studies, either. Therefore, in order to assess the effectiveness and safety of probiotics as an adjuvant treatment for *H. pylori* infection, extensive, well-conducted studies are required.

**Key Words:** *Helicobacter pylori* infection; Eradication treatment; Dietary supplements; Children

## INTRODUCTION

A gram-negative bacteria called *Helicobacter pylori* infects the human stomach. Peptic ulcer, gastric adenocarcinoma, and extranodal marginal cell lymphoma of the stomach have been linked to this pathogen. The infection is typically contracted as a kid and is accompanied by a variety of gastrointestinal symptoms, such as recurrent stomach discomfort, chronic hemorrhagic gastritis, and follicular gastritis. One of the most typical upper gastrointestinal problems, dyspepsia, is commonly linked to *H. pylori*. It is critical to pay attention to this illness, especially in children, because persistent follicular gastritis might raise the chance of developing gastric neoplasia in adulthood.

Doctors often advise using antibiotics as a first line of therapy. Antibiotics may frequently effectively cure infections, but there are several significant drawbacks to this approach, including the issue of drug-resistant strains, unpleasant side effects, and expensive costs. 2. Different Therapies Probiotics as possible anti-infective microorganisms have recently been advocated as an alternative therapy for the *H. pylori* infection because they have a number of

benefits, including less side effects, lower resistance, and a variety of methods of action. Probiotics are beneficial, living microorganisms that can be taken as a single species or as a combination with several different species.

Probiotics tend to have positive benefits that vary depending on the strain and dosage. It has been demonstrated that probiotic monotherapy successfully reduces *H. pylori* density (expired  $13\text{CO}_2$ ) by 2%–64%. Additionally, probiotic monotherapy has been demonstrated to eliminate *H. pylori* in up to 32.5% of infected individuals, but recurrence is probably inevitable.

The most frequently used strains in the majority of in vivo or human studies were *Lactobacillus johnsonii* La1 and *Lactobacillus rhamnosus* GG (either in a fermented milk preparation containing live bacteria, or as a cell-free culture supernatant), followed by other commonly used probiotics, such as *Lactobacillus acidophilus*, *Lactobacillus gasseri* OLL2716, *Lactobacillus casei*, *Lactobacillus reuteri*, *Lactobacillus brevis*, and *Bifidobacterium breve*, *Bifidobacterium animalis*, *Bifidobacterium lactis*, *Propionibacterium freudenreichii*, along with the probiotic yeast *Saccharomyces boulardii*. The impact of probiotics on the *H. pylori*

Managing Editor, *Current Research.: Integrated. Medicine, UK*

Correspondence: Yulia Pavlikova, Managing Editor, *Current Research.: Integrated. Medicine, UK*, Email: [integrativemedicine@jpeerreview.org](mailto:integrativemedicine@jpeerreview.org)

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infection may be assessed using a variety of techniques, including urea breath testing, fast urease testing, stool antigen testing, histological inspection of stomach biopsies, and serological assays. Probiotics have undergone a number of clinical trials to assess if they may be used in addition to *H. pylori* therapy in children.

For instance, a randomised double-blind placebo-controlled study was conducted to assess the effectiveness of triple therapy (amoxicillin, clarithromycin, and omeprazole) in treating *H. pylori* in 86 dyspeptic children. The triple therapy was supplemented with a fermented milk product containing the *Lactobacillus casei* (*L. casei*) DN-114 001 strain. The impact of probiotics on the *H. pylori* infection may be assessed

using a variety of techniques, including urea breath testing, fast urease testing, stool antigen testing, histological inspection of stomach biopsies, and serological assays. Probiotics have undergone a number of clinical trials to assess if they may be used in addition to *H. pylori* therapy in children. For instance, a randomised double-blind placebo-controlled study was conducted to assess the effectiveness of triple therapy (amoxicillin, clarithromycin, and omeprazole) in treating *H. pylori* in 86 dyspeptic children. The triple therapy was supplemented with a fermented milk product containing the *Lactobacillus casei* (*L. casei*) DN-114 001 strain. In a different randomised clinical trial (RCT), 65 kids received a one-week course of treatment that included amoxicillin, clarithromycin with omeprazole,

and probiotic meal made up of 250 mL of a commercial yoghurt containing 107 CFU/mL of *Bifidobacterium animalis*. The findings showed that treating children's *H. pylori* infections with antibiotics and probiotic food effectively eliminated the condition.

Four RCT meta-analyses have also been conducted to assess the effectiveness of probiotics in treating children for *H. pylori* infection. The findings demonstrated that, in comparison to a monotherapy of two antibiotics plus a proton pump inhibitor, the addition of probiotic strains (such as *Saccharomyces boulardii*, *Lactobacillus*, or *Bifidobacterium strains*) to triple therapy (amoxicillin, clarithromycin, and omeprazole) significantly increased the rate of *H. pylori* eradication. Additionally, the use of probiotics lessened the major variability of the antibiotic regimens' adverse effects, notably diarrhoea.

Finally, a few words When used appropriately as a supplement to the first- or second-line eradication therapy, products containing probiotic strains may be a beneficial tool to speed up the eradication of an *H. pylori* infection in children. Additionally, probiotic combinations can lessen the negative side effects brought on by antibiotics, though ongoing research involving a larger patient population is required to fully assess the effectiveness of probiotics as a supplement to antibiotic therapy in the treatment of *H. pylori* infection. It is greatly appreciated in this case that patients (children) and their parents cooperated with researchers, healthcare professionals, and patients.