**L. Reuteri Clinical Studies**

*Lactobacillus reuteri* Protectis (*L. reuteri*)

The World Health Organization defines probiotics as live microorganisms which when administered in adequate amounts confer a health benefit on the host. [1] *L. reuteri* is unique among probiotic cultures in that the entire species has been shown to exhibit probiotic efficacy, which is defined as a microbial species administered orally that significantly and consistently improves the health and well-being of the host by preventing and moderating the negative consequences of diseases to which that host is susceptible. [2] *L. reuteri* cultures isolated from various hosts, ranging phylogenetically from avians to humans, have been shown to exhibit probiotic efficacy when administered to those hosts. To date no other lactic bacillus has accomplished this task. [2]

*L. reuteri* has been isolated from a variety of hosts, including humans, pigs, chicken, turkeys, ostriches, mice, rats, hamsters, gerbils, cattle, horses, monkey and doves. In a report of 18 different lactic acid bacteria, *L. reuteri* was the only bacteria that had distribution in all human and animals tested. It has been hypothesized as a possible universal enterolactobacillus. [2]

*L. reuteri* has also been found in foods such as meat and milk products, Pecorino Romano cheese, sourdough sponge, and fermented noodles. However, the primary habitat appears to be the GI tract of humans and animals. [2]

The human strain of *L. reuteri* was isolated from breast milk as it occurs naturally in infants, children and adults, making it a true human probiotic. [2] *L. reuteri* is a predominant autochthonous (indigenous) *Lactobacillus* in infants, children and adults. An indigenous microflora can be recognized by species which are able to colonize the mucosal surface of the gastrointestinal tract due to special adhesion factors including compatibility with the immunological system of the host. This is different from many other probiotics that are allochthonous. These microorganisms may only have a transient character. The presence of these strains in the intestinal tract will last for a limited time, probably only a few days. [3]

*L. reuteri* has been shown to survive passage through the gastrointestinal (GI) tract, tolerating the low pH of the stomach, to colonize the stomach, duodenum and ileum. [4] *L. reuteri* adheres to the intestinal mucosa, a vital probiotic property. [2] Oral administration of *L. reuteri* delivers live and active cultures. [4] *L. reuteri* is the only *Lactobacillus* species that has shown no negative effect on the indigenous gut flora. [5]

*L. reuteri* has been studied in neonates, infants, children, adults, pregnant women and immune-compromised individuals (HIV positive adults) without adverse effects. [6-11]

**Table 1: Lactobacillus reuteri meets all requirements for use as a human probiotic**

<table>
<thead>
<tr>
<th>Requirements</th>
<th><em>L. reuteri</em> compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species/strain identified</td>
<td>Yes, physiologically and genetically</td>
</tr>
<tr>
<td>Physiology, genetics studied</td>
<td>Yes, including sequenced genome</td>
</tr>
<tr>
<td>Indigenous to host</td>
<td>Yes, indigenous to humans and animals</td>
</tr>
<tr>
<td>Safety determined</td>
<td>Yes, with adults, children and HIV+ adults</td>
</tr>
<tr>
<td>Efficacy established</td>
<td>Yes, animal models, human clinical trials</td>
</tr>
<tr>
<td>Antimicrobial activities</td>
<td>Yes, reuterin, reutericyclin, bacteriocins</td>
</tr>
<tr>
<td>Published studies</td>
<td>Yes, &gt; 120 peer reviewed publications</td>
</tr>
<tr>
<td>Mode(s) of action evaluated</td>
<td>Yes, multiple modes of action indicated</td>
</tr>
<tr>
<td>Commercially produced</td>
<td>Yes, as tablets, drops and straws</td>
</tr>
</tbody>
</table>

**Actions**

*L. reuteri* improves the host’s intestinal microbial balance and beneficially modulates the host’s mucosal immune response. It has antimicrobial activity toward certain pathogenic bacteria as well as yeasts, fungi, protozoa and viruses. [13]

- Reduced duration of diarrhea in acute rotavirus gastroenteritis [7,14]
- Reduced duration of gastroenteritis [7,14,15]
- Reduced incidence of gastrointestinal and common infection [15,16]
- Reduced incidence of crying in colicky babies [17]
- Reduced frequency and intensity of antibiotic associated side-effects [18]
- Decreased incidence of aggravation of eczema or itching despite continued intake of milk in children with mild atopic dermatitis aggravated by the intake of cow’s milk [19]
- Reduced IgE-associated eczema in infants with mothers with allergies [20]
- Reduced density of *H. pylori* bacteria [21]
Mechanisms of Action

Colonization of gastrointestinal tract

**In situ**
L. reuteri demonstrated *in situ* colonization of the gastrointestinal mucosa and subsequent immune response at these sites in healthy human volunteers. This data provide the first clear and direct indication of colonization of the healthy human stomach, duodenum and ileum by any exogenously delivered probiotic. [4] The study by Valeur et al is novel in that no other probiotic has been studied in human volunteers with biopsy data included. [12]

**Inhibition of pathogenic microorganisms**
Competitive exclusion prevents or antagonizes pathogens from adhering to gut mucosa. L. reuteri adhered to various intestinal cells and has been shown to reduce adherence of pathogens via a collagen binding protein that has biosurfactant anti-adhesion activity. [22,23]

**In vitro**
In a study of 47 Lactobacillus species, L. reuteri showed the best inhibition of all pathogenic bacteria tested, including *Listeria monocytogenes*, *Staphylococcus aureus*, *Bacillus cereus*, *Escherichia coli*, *Salmonella typhimurium*, *Shigella flexneri* and *Yersinia enterocolitica*. L. reuteri did not affect the normal intestinal flora, which is beneficial for the maintenance of the intestinal equilibrium. [5]

L. reuteri has been shown to inhibit the growth of pathogenic microorganisms by excretion of lactic and acetic acids as well as other antimicrobial substances, hydrogen peroxide and bacteriocins. [2] Production of reuterin by L. reuteri during fermentation of glycerol may describe the antimicrobial effects of the probiotic. Reuterin has antibacterial, antifungal, antiviral, and antitumoral activity. [24] Reuterin is capable of inhibiting growth of species including the genera *Escherichia*, *Salmonella*, *Shigella*, *Proteus*, *Pseudomonas*, *Clostridium* and *Staphylococcus* as well as yeasts, fungi, protozoa and viruses. [13] Another compound produced by L. reuteri, reutericyclin has been shown to exert an inhibitory effect of several bacteria that are pathogenic to humans or considered as food contaminants, including *B. cereus*, *S. aureus*, *Listeria* and *E. faecium*. [25]

L. reuteri has been shown to reduce the viability of adherent *Staphylococcus aureus* via *in situ* production of organic acids, hydrogen peroxide and reuterin *in vitro*. [26] Studies have also suggested that L. reuteri has the potential to alter the virulence of *S. aureus* via secretion of cell to cell signaling molecules *in vitro*. A staphylococcal superantigen-like protein showed a dramatic decrease in expression in response to growth with L. reuteri and a *S. aureus* P3 promoter also showed a decrease in expression. [27] L. reuteri but not other lactic acid bacteria were shown to inhibit the growth of *S. aureus in vitro*. [28]

L. reuteri possesses the cell surface protein shown to inhibit the *in vitro* binding of *H. pylori* to glycolipids receptors, thereby blocking the binding sites through which *H. pylori* attach to the gastric mucosa. [29,30]

**In animal**
Immunosuppressed mice were treated with L. reuteri or left untreated. They were then challenged with *Cryptosporidium parvum*. The treated mice cleared the parasites from the gut epithelium. The untreated mice shed high levels of oocysts in the feces. [31] A similar protection by L. reuteri from *C. parvum* infection has been observed in adult T cell receptor-α-deficient mice. It was shown that when these mice were pre-colonized with L. reuteri and then challenged with *C. parvum*, fewer *C. parvum* were detected in the ileal and cecal sections than detected in the mice not receiving the L. reuteri. Hyperplastic and inflammatory cecal lesions were also diminished in the *L. reuteri* treated group. [32] In another study, un-supplemented (control) and L. reuteri supplemented piglets were challenged orally with *C. parvum* oocysts. As compared with the control group, the L. reuteri supplemented piglets exhibited significantly fewer diarrheal episodes. [2]

Wagner et al assessed L reuteri and 3 other probiotic bacteria in mice inoculated with *Candida albicans*. Each of the probiotic species and *C. albicans* colonized the GI tract of the mice. The presence of the probiotic bacteria in the GI tract prolonged the survival of adult and neonatal mice compared to that of the mice colonized with *C. albicans* alone. The incidence of systemic candidiasis in the probiotic-associated mice was also significantly reduced. [33]

In rat studies L. reuteri was shown to decrease bacterial gut translocation in acetic acid-induced colitis, reduce enterocolitis and bacterial gut translocation in methotrexate-induced enterocolitis, and reduce the incidence and extent of bacterial gut translocation in rats following liver resection. [34-36]

**Modulation of the immune system of gastrointestinal tract**

**In vitro**
L. reuteri has displayed direct anti-inflammatory activity on human epithelial cells. L. reuteri also dose-dependently inhibited both TNF-α induced and *Salmonella enterica* induced IL-8 synthesis.
The inhibitory effect of *L. reuteri* appears to be at least in part through the NF-κB pathway. This transcription factor is involved in the generation of pro-inflammatory pathways, including IL-8. [37] Human strains of *L. reuteri* were shown to decrease TNF-α production by up to 50%. *L. reuteri* was shown to prime dendritic cells to drive the development of regulatory T cells which produced increased levels of IL-10. [38]

**In animal**
*L. reuteri* was shown to impact the ileal region of the gut in chickens and turkeys by stimulating development of longer villi and significantly deeper crypts, specifically in the ileal region of the gut of. [39] *L. reuteri* revealed similar effects on development of ileal tissues in mice. After 45 days of monoassociation, ileal villi were approximately 20% longer and more fully developed in mice monoassociated with *L. reuteri*. [2] *L. reuteri* supplementation led to an increased CD4⁺CD8⁺ ratio in the ileum mucosa and dramatically improved survival of chicks infected with *Salmonella typhimurium*. Further studies have shown that ileal growth is stimulated by *L. reuteri* supplementation in the mouse with consequent reductions in *Salmonella*-induced inflammation and mortality. Mao et al studied methotrexate-induced enterocolitis in rats and found that *L. reuteri* supplementation was shown to increase both ileal and colonic secretory IgA levels as well as CD4⁺ and CD4⁺⁺ cell populations in the gut lamina propria and that these changes were associated with decreased intestinal permeability, increased mucosal mass and recovery from enterocolitis. [2,4,40]

**In vivo**
*L. reuteri* supplementation led to reduced gastric mucosal histiocyte numbers and increased duodenal B-lymphocyte numbers in humans. [41] Furthermore it induced a significant higher amount of CD4⁺-positive T-lymphocytes in the ileal epithelium.

**Modulation of immune system**

**In vivo**
A prospective study of 109 pregnant women was conducted to identify a potential effect of *L. reuteri* on the immunological composition of breast milk. During the last 4 weeks of pregnancy, women received *L. reuteri* or placebo daily. The level of anti-inflammatory cytokine IL-10 in colostrum (breast milk samples taken within three days of delivery) was significantly higher in the *L. reuteri* group than the placebo group. [42] This provides evidence that delivery of *L. reuteri* to the GI tract of the mother may lead to a stimulation of her immune system and the migration of immune signals (probably via circulating cells) to other tissue, in this case the mammary gland. [4]

**Pharmacology**

*L. reuteri* taken orally passes through the GI tract of humans, tolerating the low pH of the stomach, and adheres to the gut mucosa. *L. reuteri* converts glycerol into a low molecular weight, water-soluble compound 3-hydroxy propionaldehyde or reuterin. Reuterin synthesis is stimulated by contact with pathogenic bacteria found in the human gut. *L. reuteri* also produces reutericyclin, a tetramic acid with an inhibitory effect on pathogenic bacteria [4] and reutericin, a bacteriocin. [43] *L. reuteri* does not pass into the bloodstream, staying within the GI tract and eventually being excreted in feces. [3]

**Research Summary**

**Gastroenteritis**

- A prospective, randomized and placebo-controlled study of 40 children, aged 6–36 months, who were hospitalized due to acute diarrhea (caused by rotavirus in 75%). The children receiving active treatment were given *L. reuteri* in a daily dose of 10¹⁰–10¹¹ CFU for up to 5 days (n=19). The *L. reuteri* group and the placebo group (n=21) both received standard rehydration therapy. A significant effect was apparent from the second day of treatment, when 74% of the children in the active group were free from watery diarrhea, as opposed to 19% of the children in the control group. **Conclusion:** The administration of *L. reuteri* shortened the duration of watery diarrhea in children hospitalized for treatment of acute diarrhea. [7]

- A prospective, randomized, placebo-controlled trial investigated the effects of *L. reuteri* on children hospitalized with gastroenteritis as acute diarrhea. Rotavirus was the cause in 40% of the 50 cases. By the second day of treatment, significant differences were in effect and *L. reuteri* was shown to be a therapeutic treatment. **Conclusion:** *Lactobacillus reuteri* was effective as a therapeutic agent in children hospitalized with acute diarrhea. [14]

- A prospective, randomized study investigating whether two different probiotics could decrease the risk of contracting bacterial or fungal infections was conducted in premature newborns in an intensive care unit. *L. reuteri* and *L. rhamnosus* GG (LGG), respectively, were given to newborn, premature infants for 28 days. The *L. reuteri* product was an oil
A prospective, randomized and placebo-controlled study of 66 children, aged 6–36 months, who were hospitalized due to acute diarrhea caused by rotavirus was conducted. The children were randomized into three groups: placebo (n=25) or L. reuteri in a daily dose of $10^7$ (n=20) or $10^{10}$ CFU (n=21) for up to five days. All three groups received standard rehydration therapy. From the second day of treatment, 30% of the children given the lower L. reuteri dose were free from watery diarrhea, compared with 52% of the children given the higher dose. The difference was significant for the high-dose L. reuteri group compared with the control group, in which 20% of the children no longer had watery diarrhea. The high-dose group also had a significantly shorter period of watery diarrhea: 1.5 days on average compared with 2.5 days in the control group. For the low L. reuteri dose group the mean duration of watery diarrhea was 1.9 days. **Conclusion:** The administration of L. reuteri in the dose of $10^{10}$ CFU significantly shortened the duration of watery diarrhea in children hospitalized for treatment of acute diarrhea. The low dose of $10^7$ CFU almost reached significant effect on duration of watery diarrhea. [6]

A double blind, randomized and placebo-controlled trial was conducted to investigate the effect of L. reuteri on gastrointestinal side-effects during and after anti-Helicobacter pylori treatment. Forty dyspeptic children, aged 3-18 years, with confirmed H. pylori infection were enrolled. They were treated with 10-day sequential antibiotic treatment and randomized to receive either L. reuteri ($10^8$ CFU/day, n=20) or placebo (n=20) for 20 days, starting from the first day of treatment. The severity of side-effects was measured using a validated scoring system (GSRS score). At entry, children in both groups had similar GSRS scores but during eradication therapy and follow-up, the L. reuteri supplemented children significantly improved their gastrointestinal health compared to the placebo group. The rates of H. pylori eradication were the same in the two groups. **Conclusion:** L. reuteri supplementation during and after H. pylori eradication therapy significantly reduced the frequency and intensity of antibiotic-associated side-effects. [18]

**Colic**

A randomized study was conducted to investigate if the probiotic Lactobacillus reuteri could improve symptoms in colicky infants. 90 breastfed infants, aged 11 to 80 days, and with confirmed infantile colic, were randomly assigned to two treatments: Lactobacillus reuteri, $10^6$ CFU/day and administrated in an oil suspension, or simethicone, 60 mg/day. Eighty-three infants completed the study. Baseline median daily crying time was 197 minutes in both groups. After 7 days crying time was significantly reduced in the probiotic group, 159 min/day, vs. 177 min/day in the simethicone group (P=0.005). By day 28 the crying time in the L. reuteri group was reduced to 51 min/day vs. 145 min/day in the simethicone group (P <0.001). On day 28, 95% (39/41) were responders in the probiotic group and 7% (3/42) in the simethicone group. No side effects were observed in either group. The intake of L. reuteri resulted in significantly less crying time within one week of treatment compared to standard therapy in these infants. **Conclusion:** The intake of L. reuteri resulted in significantly less crying time within one week of treatment compared to standard therapy in these infants. This effect was even more pronounced at the end of the 4-week study. [17]

**Atopic dermatitis**

A prospective, open study of children with mild atopic dermatitis aggravated by the
intake of cow’s milk was conducted. All had a clinical history of atopic dermatitis improvement after removal of cow’s milk from the diet. While receiving L. reuteri or no probiotic for a period of three months, children were re-challenged with cow’s milk. During the first 10 days, antihistamine was prescribed daily for both groups and topical steroids were used when needed. After the initial 10 days, none of the children in the L. reuteri group showed aggravation of eczema or itching despite continued intake of milk. In the control group, all children showed worsening of the eczema and had to continue use of antihistamines and topical steroids.

**Conclusion:** The daily intake of L. reuteri during co-nutritional intake of cow’s milk for three months could prevent the aggravation of atopic dermatitis and itching in children where cow’s milk previously had been shown to worsen the eczema. [19]

- A double-blind, randomized, placebo-controlled trial evaluated 188 families with allergic disease. Pregnant women received L. reuteri or placebo from week 36 until delivery. The babies then continued with the same product from birth until 12 months of age and were followed up for another year. The prevalence of IgE-associated eczema during the second year and the cumulative incidence of skin prick test reactivity were lower in the treated group. The effect was more pronounced among infants with mothers with allergies.

**Conclusion:** Although a preventative effect on infant eczema was not confirmed, the treated infants had less IgE-associated eczema at two years of age and therefore possibly run a reduced risk to develop later respiratory allergic disease. [20]

**Reduced incidence of gastrointestinal and common infection**

- This was a prospective, randomized, double blind, placebo-controlled study, investigating whether probiotics affect the occurrence of infections in infants in day care. 194 healthy children, aged 4–10 months, were studied for 12 weeks in three different groups: They were given formula with L. reuteri or Bifidobacterium lactis Bb-12, or formula without probiotics (control). Probiotics resulted in significantly fewer infections compared with placebo, measured by the number of febrile episodes and episodes of gastrointestinal infection. L. reuteri, however, had a significantly superior effect compared with B. lactis and the control group: there were significantly fewer doctors’ visits, less antibiotics, and fewer absent days from day care in the L. reuteri group.

**Conclusion:** The addition of probiotics to infant formula had a significantly positive effect on the incidence of common infections in children in day care, with superior effect shown for L. reuteri. There were no safety issues during the three months’ study. [16]

- A prospective, randomized study investigating whether two different probiotics could decrease the risk of contracting bacterial or fungal infections was conducted in premature newborns in an intensive care unit. L. reuteri and L. rhamnosus GG (LGG), respectively, were given to newborn, premature infants for 28 days. The L. reuteri product was an oil suspension and 5 drops daily contained 1 x 10^8 CFU. The LGG product was a powder blended with fluid at a daily dosage of 3 x 10^9 CFU. A total of 184 infants were studied, including the control group. Compared to the control group, both probiotics significantly reduced the incidence of bacterial and fungal infections. Infants in the L. reuteri group had the shortest hospital stay of all: 22 days vs. 42 in the control group and 29 in the LGG group. Infants in the L. reuteri group had greater overall weight gain during the first 28 days compared with LGG and controls.

**Conclusion:** Both probiotics reduced the incidence of bacterial and fungal infections in these premature infants and were without any safety problems. Gastrointestinal symptoms were significantly reduced in the L. reuteri group (2/67) compared with the LGG group (14/55) and the control group (27/62). [15]

- A randomized, double-blind, placebo-controlled study of healthy newborn, full-term infants was conducted. The aim was to study safety aspects following the daily intake of L. reuteri given from the day of birth through the following 28 days. Four groups of infants were studied: L. reuteri in the doses 10^5 CFU/day (n=12), 10^7 CFU/day (n=25) or 10^9 CFU/day (n=25), and placebo (n=28). All dose levels of L. reuteri were well tolerated. The degree of L. reuteri colonization, measured as the number of living cells in stool samples, was related to the given dose. The occurrence of watery diarrhea was significantly lower in infants given L. reuteri.
**Conclusion:** L. reuteri was safe to consume for healthy full-term newborns during their first four weeks of life, in doses up to $10^9$ CFU/day. [11]

- A prospective, randomized, double blind, placebo-controlled study was conducted on 258 healthy children. Ingestion of a L. reuteri containing beverage for 4 months significantly reduced the risk of diarrhea in young children (aged 12-36 months).

**Conclusion:** Consumption of a beverage containing L. reuteri and other Lactobacillus species reduced the risk of diarrhea in young children when consumed as part of the daily diet. [44]

- A prospective study investigating if a daily supplementation with the probiotic Lactobacillus reuteri could reduce the incidence of common infections and thereby reduce short-term sick leave was conducted. 262 healthy employees, 18-65 years old, were enrolled and in a double blind manner randomized to use a probiotic drinking straw containing $10^8$ CFU of L. reuteri or an identical placebo drinking straw, together with at least 100 ml liquid. 181 subjects completed the study, i.e. used one drinking straw daily for 80 days and completed a diary on symptoms of gastrointestinal infection or upper respiratory tract infection (common cold), duration of symptoms and number of days away from work due to such symptoms. In the placebo group 26.4% (23/87) reported sick leave during the study period. In the L. reuteri group 10.6% (10/94) reported sick leave (p<0.01). The frequency of sickness-days of ordinary workdays decreased from 0.9% in the placebo group to 0.4% in the L. reuteri group (p<0.01). The effect on sick leave was even more pronounced in the 53 shift-workers in the study: 33% in the placebo group (9/27) were on sick leave compared with none (0/26) in the L. reuteri group (p<0.005).

**Conclusion:** The daily intake of Lactobacillus reuteri significantly reduced the number of reported sick days of ordinary workdays due to common infections, and this effect was even more pronounced in the shift-workers. [45]

- A retrospective group controlled study was performed to investigate the effect of oral probiotic supplementation on the prevention of bacterial and fungal infections, on the improvement of gastrointestinal symptoms, and on enhancing food tolerance in surgical newborns in the Neonatal Intensive Care Unit. The study was conducted in 24 newborns aged 33 to 39 weeks. The newborns were divided in three groups: Group I supplemented with Lactobacillus reuteri; Group II supplemented with Lactobacillus rhamnosus (also known as Lactobacillus GG); and Group III without probiotics. Clinical parameters were number of bacterial and Candida infections, days of antimycotic treatment, duration of parenteral nutrition, tolerance for oral food intake, weight growth, gastrointestinal symptoms, and duration of hospital stay. Results showed significantly fewer infective episodes were observed in Groups I and II compared with the control group: respectively 0%; 12%; 37.5% for bacterial infections and 12.5%; 25%; 37.5% for Candida infections. Group III also had significantly more prolonged antimycotic treatment. The medium duration of parenteral nutrition was 17.8 days in Group I, 34 days in Group II, and 42 days in Group III.

**Conclusion:** Probiotic supplementation can reduce the risk of bacterial and candida sepsis, reduce gastrointestinal symptoms and increase food tolerance with a significant reduction of the days of hospitalization. [46]

**H. pylori bacteria**

- A prospective, randomized, double blind and placebo-controlled study that investigated the effect of L. reuteri on the eradication of Helicobacter pylori. Thirty patients were enrolled, aged 25-56, and suffering from dyspepsia (indigestion) caused by a confirmed infection with H. pylori. 15 patients were given omeprazole (20 mg/day) plus L. reuteri (10^8 CFU, twice daily) and 15 received omeprazole plus placebo, for 30 days. The extent of H. pylori infection was controlled 4 weeks after the end of the therapy. In 60% (9/15) of the patients supplemented with L. reuteri, H. pylori was totally eradicated, while no eradication occurred in the group that received omeprazole plus placebo (p<0.0001).

**Conclusion:** From this study is seems that probiotic supplementation with L. reuteri has a beneficial effect on H. pylori infection in humans. [29]

- A study investigating whether the urea breath test (UBT) could be used as a marker for burden of Helicobacter pylori infection and secondly if administration of Lactobacillus reuteri in a chewable tablet could suppress the H. pylori assessed by the UBT value. In the first study, gastric
biopsies were obtained from 33 H. pylori-positive adults by upper gastrointestinal endoscopy and the individual UBT values were established for each subject. It was shown that the individual UBT value increased significantly with the extent of the H. pylori density on the biopsies. In the second part of the study, 40 subjects infected with H. pylori but without symptoms were enrolled. 35 had UBT values ≥ 15 ‰ and were randomly allocated to three groups: Group A ingested L. reuteri for 4 weeks and placebo for another 4 weeks; group B received the two study products in the reverse order for 4 + 4 weeks; group C received only placebo for 8 weeks. Group D consisted of 5 H. pylori-negative subjects that ingested L. reuteri only for 8 weeks. Significant decrease in UBT values was shown in groups A and B after ingesting L. reuteri. Moreover, in group A the lower UBT value was maintained until the end of the full 8-week period. The overall rate of decrease in the UBT value due to ingestion of L. reuteri tablets was 69.7 ±4.0% (p<0.05).

Conclusion: Administration of L. reuteri significantly decreased UBT values in H. pylori-positive subjects, demonstrating that L. reuteri suppresses H. pylori density. [21]

• A double blind, randomized and placebo-controlled trial was conducted to investigate the effect of L. reuteri on gastrointestinal side-effects during and after anti-Helicobacter pylori treatment. Forty dyspeptic children, aged 3-18 years, with confirmed H. pylori infection were enrolled. They were treated with 10-day sequential antibiotic treatment and randomized to receive either L. reuteri (10^8 CFU/day, n=20) or placebo (n=20) for 20 days, starting from the first day of treatment. The severity of side-effects was measured using a validated scoring system (GSRS score). At entry, children in both groups had similar GSRS scores but during eradication therapy and follow-up, the L. reuteri supplemented children significantly improved their gastrointestinal health compared to the placebo group. The rates of H. pylori eradication were the same in the two groups.

Conclusion: L. reuteri supplementation during and after H. pylori eradication therapy significantly reduced the frequency and intensity of antibiotic-associated side-effects. [18]

References


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