Lactobacillus Sporogenes

Description

*Lactobacillus sporogenes* is a gram-positive, spore-forming, lactic-acid producing bacillus. It was originally isolated and described in 1933. The organism requires a complex mixture of organic substrates for growth, including fermentable carbohydrates and peptides.

Pharmacokinetics

Subsequent to oral administration, *L. sporogenes* passes through the stomach in its spore form and upon arrival in the duodenum, germinates and multiplies rapidly.1 Estimates suggest the average duration of time between oral dosing and germination is four hours.1 After germination, *L. sporogenes* is metabolically active in the intestines, producing lactic acid.

*L sporogenes* is considered a semi-resident, indicating it takes up only a temporary residence in the human intestines. Spores of *L. sporogenes* are excreted slowly via the feces for approximately seven days after discontinuation of administration.1
Mechanisms of Action

Despite the transient nature of this organism in the digestive tract, the changes this lactic acid bacillus produces shift the environment in support of a complex gastrointestinal flora.1,2 The mechanism of action is presumed to be a result of improving gastrointestinal ecology by replenishing the quantity of desirable obligate microorganisms and antagonizing pathogenic microbes.2,3

Two isomeric forms of lactic acid can be produced by lactic acid-producing bacteria – dextrorotatory (D(-)) lactic acid and levorotatory (L(+)) lactic acid. L(+) lactic acid is completely metabolized in the body; however, D(-) lactic acid is not completely metabolized, resulting in a degree of metabolic acidosis. L. sporogenes produces only L(+)-lactic acid.1 L. sporogenes is assumed to produce bacteriocins2 and short chain fatty acids. As the organism grows, it assimilates and incorporates cholesterol into its cellular structure.1

L. sporogenes possesses significant β-galactosidase (lactase) activity in vitro.4

Clinical Indications

Lipid Disorders

Administration of L sporogenes to rabbits resulted in a 90-percent inhibition in the rise of serum cholesterol secondary to feeding of high cholesterol diets.3 Oral L. sporogenes supplementation (360 million spores/day) decreased total serum cholesterol from an average of 330 mg/dL to 226 mg/dL in 17 subjects with type II hyperlipidemia over a three-month time interval. HDL-cholesterol increased slightly. No changes in serum triglyceride levels were observed.6

Digestive Disorders

In laboratory animals with bacterial dysbiosis, L. sporogenes supplementation inhibits growth of pathogenic microorganisms and results in renewal of desirable obligate gastrointestinal organisms to normal levels.3 Reports suggest that supplementation produces a rapid resolution of acute gastrointestinal infection induced by pathogenic bacteria in calves.3

It has been reported that the efficacy of treatment in patients with bacterial dysbiosis receiving L sporogenes was 20-30 percent higher than traditional probiotics such as Lactobacillus acidophilus of Bifidobacteria.2 Seventy percent of individuals suffering from chronic constipation treated with 300-750 million spores per day of L. sporogenes for two to 10 days experienced an amelioration of abdominal distention and a normalization of stools.7 Reports suggest a benefit in neonatal diarrhea.7

Aphthous Stomatitis

Reports suggest efficacy in the treatment of aphthous stomatitis with resolution occurring within two to three days.8,9

Vaginitis

Vaginal administration of L. sporogenes was investigated in non-specific vaginitis. Subjects with Trichomonas or Candida vaginitis were excluded from the study. Complete relief of pruritis and discharge was reported by 93 percent of subjects. Postmenopausal subjects had a slower response to therapy.10

Toxicity and Side Effects

Acute toxicity studies in animals have been conducted with doses as high as 50 g/kg for seven days. No abnormalities, either during supplementation or in the period after withdrawal of the supplement, were observed. Chronic supplementation of doses as high as 5 g/kg for 15 months in animals results in no observed toxicity. In humans, adverse reactions following supplementation have not been reported.

Dosage

A reasonable dose is 100 mg two to three times daily. Each 100 mg contains approximately 1.5 billion colony-forming units.
References


