REFERENCE SHEET:

Saccharomyces Boulardii

Pronunciation

Saccharomyces boulardii (Sack-arr-oh-my-seez B-oo-l-arr-d-ee)

Summary

S. boulardii is a non-pathogenic yeast microbe with properties that protect it against antibiotics. It was first discovered in lychee and mangosteen fruit, and is now cultivated for use in supplements as lyophilized powders, capsules, or liquid beverages. Lyophilized S. boulardii powders are stable for up to one year, when stored at room temperature without exposure to moisture.

Main Medical Uses

Evidence supports the use of S. boulardii in the treatment of acute, antibiotic-associated, HIV-related, and traveler's diarrhea. It has also been used in the treatment of Helicobacter pylori, irritable bowel syndrome (IBS), and inflammatory bowel disease (IBD). Furthermore, studies support the use of S. boulardii in preventing nutrient-associated diarrhea and recurrence of Clostridium difficile infection.

Dosing and Administration

Condition	Dosing (per day)	Outcome	Class of Evidence
Acute Diarrhea	500-750 mg w/ concurrent therapy, 8-10 days	↓ diarrhea severity score, Entamoeba histolytica dysentery	A
Antibiotic-associated Diarrhea (AAD)	500-1000 mg w/ concurrent therapy, + 2 additional weeks	↑ prevention of AAD	A
	Children: 250-500 mg w/ concurrent therapy Adults: up to 1000 mg w/ concurrent therapy	↓ risk of AAD from 20.9% to 8.8% ↓ risk of AAD from 17.4% to 8.2%	A
Nutrient-associated Diarrhea	2000 mg, 8-28 days	↓ occurrence of diarrhea and number of days	A
Clostridium difficile	1000 mg w/ concurrent therapy, 4 weeks	↓ C. difficile recurrence post-eradication	A
Helicobacter pylori	1000 mg w/ concurrent therapy, 2 weeks	↓ epigastric distress, global dyspepsia symptom scores, AAD	A
Inflammatory Bowel Disease (IBD)	750-1000 mg w/ concurrent therapy, 7 weeks to 6 months	↓ ulcerative colitis, Crohn's bowel movements, relapse in Crohn's treatment	A
	100 mg w/ concurrent therapy, 3 months	↓ intestinal permeability in Crohn's	C
Irritable Bowel Syndrome (IBS)	500 mg, 4 weeks	↓ bowel movements, global IBS symptoms	A
HIV-related Diarrhea	3000 mg, 7 days	↓ diarrhea frequency	A
Giardiasis	500 mg w/ concurrent therapy, 4 weeks	↓ giardia cyst count	B

For an explanation of the classes of evidence, please see the Rating Scales for Evidence-Based Decision Support.

Adverse Effects

S. boulardii is generally regarded as safe, however, an increased risk of non-infectious adverse effects, such as biliary tract stenosis, fistulas, lienalis-steal syndrome, abdominal hemorrhage, and acute renal failure, has been found in specific groups (i.e., transplant patients or patients with pancreatitis). Rare cases of fungemia associated with S. boulardii have also been reported.

Mechanism of Action and Metabolism

S. boulardii reaches stable concentrations within three days of oral ingestion and is cleared from the body within three to five days if discontinued. S. boulardii is not absorbed or metabolized by the body and is excreted in feces.

Action	Mechanism
Enzyme expression and activity	↑ protease that digests C. difficile endotoxins A & B ↑ phosphatase that increases dephosphorylation of E. Coli endotoxins ↑ systemic & local IgG & IgA that do not target S. boulardii
Inflammatory response	↓ proinflammatory gene secretion (e.g IL-8) via inhibition of MAP kinase ERK & p38 pathways ↓ proinflammatory gene secretion (e.g IL-8) via inhibition of NF-kB signaling pathways ↓ inflammatory cytokines via deactivation of MAPK, phospho-I κ B, p65-RelA, phospho-jun & c-fos signaling pathways
Metabolic processes	↑ nutrient digestion & transport (via ↑ sucrase, lactase, maltase, spermine, & spermidine) ↑ adenosine triphosphatase, gamma-glutamyl transpeptidase, lipase & trypsin activities in the duodenum ↑ macronutrient conversion, vitamin synthesis ↑ villus height, width, & number of goblet cells ↑ liver cytochrome activity ↑ renal metabolite profiles

Associated Depletions and Interactions

S. boulardii may decrease the side effects of standard triple therapy in the treatment of H. pylori (e.g. clarithromycin, amoxicillin, acid suppressors lansoprazole or omeprazole). S. boulardii may also decrease the occurrence of diarrhea associated with other antibiotics such as β-lactams. Theoretically, an inhibitory interaction exists between S. boulardii and antimycotics, fluconazole, itraconazole, and amphotericin B. S. boulardii may also induce a theoretical potentiating effect with certain antibiotics, specifically ampicillin and clindamycin. S. boulardii can increase the expression of the sodium/glucose cotransporter-1 (SGLT-1) and the uptake of glucose by brush border membranes. Therefore, caution is recommended when taking S. boulardii with hypoglycemic drugs.