



April 2011 Issue, Vol. 13 No. 4 P. 46

Small Intestinal Bacterial Overgrowth — What to Do When Unwelcome Microbes Invade

By Kate Scarlata, RD, LDN

Small intestinal bacterial overgrowth (SIBO) is a condition in which excessive amounts of bacteria (typically the colonic type) infiltrate the small intestine.¹ Under normal conditions, the small intestine shelters far fewer and different types of bacteria compared with the colon. While gastrointestinal microflora confer many healthful benefits, including vitamin synthesis, enhanced digestion, and improved immune function, bacterial overgrowth is an increasingly recognized contributor to gastrointestinal symptoms, malabsorption, and malnutrition. Dietitians should be well versed in this disorder and subsequent nutritional intervention.

Clinical Features

SIBO produces myriad gastrointestinal symptoms, including excess intestinal gas, bloating and abdominal distention, diarrhea, and pain. Constipation may also be present but appears to be less common in this disorder. The symptoms of SIBO vary depending on the type and amounts of microbes present in the small intestine. Microbes that metabolize bile salts to insoluble compounds may lead to fat malabsorption and inflammation, while bacteria that prefer to metabolize carbohydrates produce marked bloating. Some bacteria produce toxins that damage the intestinal mucosa.² Bacterial overgrowth has been associated with increased intestinal permeability and bacterial translocation.³ Chronic diarrhea due to fat maldigestion and malabsorption may contribute to vitamin A, D, and E deficiencies. Vitamin K deficiency is rare as bacterial microflora produce this vitamin.⁴ Elevated serum folate levels may present as the result of bacterial synthesis. Low levels of B12 are common as anaerobic bacteria utilize this vitamin.⁵

In regard to SIBO and its impact on weight and nutritional status, Gerard Mullin, an associate professor of medicine and director of integrative GI nutrition services at Johns Hopkins Hospital, says, “Small intestinal bacterial overgrowth can cause malabsorption and wasting.”

Predictors

Diminished gastric acid secretion and disordered gastrointestinal motility of the small intestine are likely the most common contributors to SIBO. Normally, the small intestine involves complex and coordinated movements to properly digest foods. This process involves the migrating motor complex (MMC), which produces a cleansing wave to help remove waste from the small intestine, often referred to as the “housekeeper of the gut.” The MMC occurs about every 90 to 120 minutes during times of fasting. Because the MMC is deactivated when eating, Mark Pimentel, MD, director of the gastrointestinal motility program at Cedars-Sinai Medical Center and author of *A New IBS Solution*, suggests, “Those prone to SIBO should avoid in-between meal snacking to allow the cleansing wave to adequately divert unwanted waste from the small intestine.”

Research at Cedars-Sinai reveals that those with irritable bowel syndrome (IBS) experience 70% reduction, on average, in cleansing waves compared with normal controls.⁶ Pimentel adds, “The prevalence of SIBO is 40% to 80% in those with IBS, more likely on the higher end of the percentage.” Many conditions increase the risk of SIBO due to their impact on digestion, motility, microflora, and gastric acid production.

Diagnosing SIBO

While diagnosing SIBO with a direct culture has been considered the gold standard, Pimentel notes, “When overgrowth is in the lower part of the small intestine, the flora may be out of reach for the instruments.”

More commonly used to test for SIBO is the lactulose breath test. Measurements of hydrogen and methane gas production are collected at baseline and then at 15- to 20-minute intervals. As bacteria will feed off the lactulose and produce gas, the gas expelled through the lungs is measured. A lactulose breath test is preferred over glucose, which only measures overgrowth of the proximal small intestine.⁵ A lactulose breath test is positive if the patient produces at least 20 ppm of hydrogen and/or methane within the first two hours. Measuring both hydrogen and methane gas production is preferred as different bacteria produce different gas. Interestingly, methane-producing microbes are commonly associated with constipation.⁶

Medical Treatment

Antibiotic therapy is the cornerstone of treatment for bacterial overgrowth. Rifaximin is commonly prescribed, yet the FDA has not approved its use for this purpose. A double-blind, placebo-controlled trial published in January in *The New England Journal of Medicine* revealed a modest but statistically significant improvement in IBS symptoms in those with IBS without constipation treated with rifaximin.⁷ Other antibiotics utilized for treatment include metronidazole or ciprofloxacin, neomycin, and tetracycline.

Evaluating and treating causes of diminished acid production or motility issues as well as the use of probiotics to avoid a reoccurrence of SIBO are areas of further research. “Since our intestines are a 500-bug system, it’s unlikely that just one type of probiotic strain will be the best treatment,” Pimentel notes.

The RD’s Role

Maintaining adequate nutritional intake, correcting nutrient deficiencies (particularly B12 and fat-soluble vitamins), and maximizing adequate digestion to avoid overfeeding the microbes are prime concerns for RDs working with clients with SIBO. As cleansing waves may be less frequent in this population, encourage three to five hours between eating to allow the body’s cleansing actions to occur. Foods commonly maldigested, such as FODMAPs (an acronym used for a group of fermentable carbohydrates), may be minimized in the diet to avoid providing substrate for the microflora to overgrow and flourish. “A diet low in FODMAPs is important to starve off these microbes,” Mullin says.

Splenda has been shown to reduce beneficial gut bacteria in animal studies and increase fecal pH, so eliminating this sweetener from the diet may also be prudent.⁸

SIBO should be on RDs’ radar when evaluating clients with gastrointestinal complaints. Nichole Schaldone, MS, RD, a New Jersey-based gastroenterology nutrition specialist, notes, “Many patients come to see me believing that they may have food allergies or sensitivities but actually have SIBO.

Because bacteria ‘feed’ off of carbohydrates, resulting in a production of gas, a reduction in carbohydrates can aid patients in reducing symptoms.”

Bottom Line

Bacterial overgrowth is an oft-neglected disorder that can deleteriously impact nutritional status and quality of life. Nutrient malabsorption, intestinal inflammation, and gastrointestinal distress along with altered food intake all contribute to diminished nutritional status. RDs should be an integral part of the SIBO treatment plan.

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Conditions and Circumstances Associated With SIBO^{2,5,6}

- Aging
- Celiac disease
- Chronic pancreatitis
- Crohn’s disease
- Diabetes
- Fibromyalgia
- Gastric acid suppression medication use
- Gastric resection
- Hypothyroidism
- Interstitial cystitis
- Irritable bowel syndrome
- Recurrent antibiotic use
- Renal failure
- Rosacea
- Small intestinal diverticula
- Surgical removal of the ileocecal valve

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