CLINICAL VIGNETTE

Small Intestinal Bacterial Overgrowth (SIBO): Is it an Increasingly Common Diagnosis?

Scott Hahm, MD

Case

A thirty-two-year-old male presented to his primary care physician with constipation, flatus, bloating, burping and abdominal pressure. The patient reported having similar episodes every couple of years. He denied any blood in the stool and characterized his stool as small and hard despite taking a fiber supplement. He had had been evaluated with an upper endoscopy and colonoscopy 6 years prior for similar complaints and was told everything was normal.

The patient was referred back to his gastroenterologist for further testing. Prior gastric and duodenal biopsies were negative for Helicobater pylori and Celiac disease. The gastroenterologist sent the patient for a lactulose breath test which returned positive for both hydrogen and methane predominate small intestinal bacterial overgrowth (SIBO). He was treated with rifaximin 550mg three times daily and neomycin 500mg twice daily for 10 days with improvement in his symptoms. He was then placed on erythromycin 125mg nightly to enhance gut motility to avoid recurrence of overgrowth. After 5 years of chronic antibiotics the patient reported return of the same symptoms and his primary care physician referred the patient to a new gastroenterologist. He was again given a combination of rifaximin 550mg three times daily and neomycin 500mg twice daily x 14 days but told to stop the erythromycin. The patient's symptoms resolved for another 1 year before developing the same symptoms. This time he was treated with rifaximin 550mg three times daily and erythromycin 250mg twice daily x 14 days. Symptoms improved but remained in remission for only 6 months. Another course of rifaximin 550mg three times daily x 14 days. By day 12 his symptoms persisted and he was given additional rifaximin 550mg to complete a 28 days course.

Discussion

Small intestinal bacterial overgrowth (SIBO) is an increasingly common diagnosis seen in patients with gastrointestinal complaints. Patients with SIBO most commonly present with: bloating, diarrhea and abdominal discomfort. Steatorrhea has been documented in severe cases.[1] The actual definition of SIBO and true prevalence remain difficult to identify. This is in part relates to poor understanding of "normal small bowel microbiome". Research studies define SIBO as $>10^{3-5}$ CFUs/mL. Correct quantitation is difficult due to mucoid nature of small intestinal aspirates. Mucolytic agents such as dithiothreitol are needed to improve the sample yield.[2] In clinical practice, SIBO is defined as rise in >20ppm within 90 minutes on a breath test after ingesting a solution or either glucose or lactulose.[1] Variable orocecal transit time, further complicates the diagnosis. These factors explain why the definition of SIBO remains vague decades after it was first described in the literature and why the diagnosis often remains in question even after a positive test result. Lactulose breath tests are thought to have a higher positivity rate than glucose breath tests.[3] Oral glucose loads of >40g have been clearly shown to be incompletely absorbed in the duodenum and will undergo fermentation in the colon. This calls into question the validity of the "early peak" when reading a breath test.[4] Contamination with oral flora during collection of duodenal aspirates during an upper endoscopy also contributes to poor analysis.[1] Improved understanding of SIBO first requires agreement on the specific definition and accurate testing to meet this definition.

Risk factors for SIBO include: surgically created blind loops, intestinal fistulas, jejunal diverticulosis and intestinal pseudo-obstruction.[1] SIBO is also found in patients with other diagnoses, including inflammatory bowel disease, including Crohn's disease with involvement at the ileocecal valve.[1] Other associated diseases include: irritable bowel syndrome (IBS), chronic pancreatitis and liver cirrhosis. Others identified as higher risk for SIBO include the very elderly, obese and patients with chronic narcotic or PPI.

The pathophysiology of SIBO appears to be multifactorial. Overgrowth is thought to cause mucosal injury resulting in a loss of brush border enzymes leading to carbohydrate malabsorption. Damage to the epithelial layer can also result in protein losing enteropathy. Bacteria also can outcompete the host for luminal protein resulting in hypoproteinemia.[1] Bacteria also have the ability to deconjugate bile acids which results in bile acids depletion with maldigestion of fat and fat-soluble vitamins.

Treatment of SIBO involves antibiotics. Antibiotics used to treat SIBO need to cover both aerobic and anaerobic bacteria. While there are no specific algorithms for specific antibiotics based on the test results, rifaximin is the most frequently cited in the literature. Rifaximin is reported to have a 70% success

rate in eradicating SIBO after a 10 – 28 days which persists up to 9 months in 44% of patients.[5] If symptoms from SIBO improve after a course of antibiotics, it is not recommended to repeat breath test. Research studies report negative breath tests in 20-75% of patients retested after antibiotic treatment.[6]

Conclusion

SIBO is increasingly recognized in the field of gastroenterology. However, lack of a precise definition and uniform testing criteria impair prevalence estimate. Treatment involves a variety of antibiotic regimens. However as seen in our patient, the ability of the antibiotics to give lasting remission has diminishing returns. The question remains: are physicians accurately diagnosing SIBO or do the constellation of symptoms represent other diseases? More research is needed to better characterize the gut microbiome so specific abnormalities can be better identified and appropriately treated.

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