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Questions and Answers

1. The classic biochemical abnormalities in a patient with small bowel bacterial overgrowth syndromes are:
 - A. Decrease in serum vitamin C and B12 levels.
 - B. Decrease in serum Vitamin B12 and Folic acid.
 - C. Decrease in serum Vitamin B12 level, and stool fat of >7 g in 24 h.
 - D. Low levels of serum iron and vitamin B12.
 - E. Increase in serum triglycerides, and low serum vitamin B12.

Answer: C.

Bacterial overgrowth syndromes of the small bowel occur whenever there is stasis of small bowel contents, often as a result of blind loops resulting from surgery or diseases such as jejunal diverticulosis or scleroderma. Bacteria deconjugate the primary bile acids and decrease their levels in the proximal intestine interfering with fat absorption. Along with fat malabsorption, vitamin B12 deficiency develops because some strains of bacteria utilize ingested B12. Often folic acid is synthesized by the bacteria, and hence serum folate levels are normal or increased. Iron and vitamin C absorption are not affected.

2. The easily available test for the diagnosis of small bowel bacterial overgrowth is:
 - A. Small bowel aspirate and anaerobic culture.
 - B. CLO test to check for *Helicobacter pylori*.
 - C. Breath hydrogen test.
 - D. Small bowel mucosal biopsy.
 - E. D-xylose test.

Answer: C.

Jejunal aspirate and anaerobic culture are not always available for clinical testing since they are technically difficult and unreliable in most laboratories. CLO test is only for the diagnosis of *H. pylori* and has nothing to do with small bowel bacterial overgrowth. Breath hydrogen test is simple

and easily available, noninvasive, and reproducible. Small bowel mucosal biopsy is not indicated in stagnant loop syndromes. D-xylose test is essentially to evaluate the integrity of proximal jejunal mucosa. Tests d and e are ideal to evaluate small intestinal mucosal diseases.

3. The true statement with regards to small bowel bacterial overgrowth syndrome in the older adult is that:
 - A. A prior history of small bowel surgery is needed.
 - B. A recent history of travel to a developing country is often available.
 - C. A history of recent antibiotic use is notable.
 - D. SIBO can occur in the absence of an anatomical blind loop.
 - E. SIBO is less common in the old than in the younger adult.

Answer: D.

Although in the younger individuals often the SIBO occurs in the setting of an anatomical blind loop caused by previous surgery such as Billroth II, in older patients bacterial overgrowth in the small bowel can occur in settings without an anatomical blind loop. Often in diabetics, small bowel motility can be markedly reduced encouraging bacterial overgrowth. Along with hypoacidity from gastric mucosal atrophy or prolonged use of proton pump inhibitors, a greater tendency for bacterial overgrowth exists. While a recent history of antibiotic use is not a prerequisite, antibiotics do reduce bacterial contamination in the small bowel.

4. Small bowel bacterial overgrowth syndrome in the older adult can be seen in the presence of:
 - A. Jejunal diverticula.
 - B. Colonic diverticula.
 - C. Esophageal diverticula.
 - D. Metformin therapy.
 - E. Tube feedings.

Answer: A.

Although tube feedings predispose to intestinal infections, the scenario is not the typical small bowel overgrowth syndrome, which is a chronic disease. Colonic diverticula play no role in the syndrome of SIBO. Jejunal diverticulosis is a good setting for overgrowth of bacteria

contributing to steatorrhea and vitamin B12 malabsorption. While many medications may reduce gastric acid levels and promote bacterial overgrowth, and SIBO occurs in diabetics, it does not result from the use of metformin.