

## Gastrointestinal Infections: Review Questions

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### QUESTIONS

Choose the single best answer for each question.

1. A 45-year-old man is admitted to the hospital for an elective cholecystectomy. The surgery is complicated by a bile leak and an infected biloma requiring drainage and fluoroquinolone antibiotics. On hospital day 8, the patient develops profuse watery diarrhea with leukocytosis and a low-grade fever. *Clostridium difficile* is the suspected cause of his diarrhea. What is the next best step in the management of this patient?  
(A) Empirically begin metronidazole therapy  
(B) Empirically begin vancomycin therapy  
(C) Observation to see if the diarrhea is self-limited  
(D) Obtain a colonoscopy to evaluate for colonic pseudomembranes  
(E) Send stool samples for *C. difficile* toxin analysis
2. A 19-year-old man on vacation with his family drinks water from a stream in Yellowstone National Park. Forty-eight hours later, the patient develops profuse watery, malodorous diarrhea, severe abdominal cramps, vomiting, and fatigue. The patient is clinically diagnosed with *Giardia lamblia* and treated empirically with metronidazole. The patient improves initially, but over the next 4 weeks, he develops a more chronic picture of intermittent bloating, gas, and watery diarrhea after eating and returns for further management. What is the most likely cause of this patient's ongoing symptoms?  
(A) Chronic *Giardia* infection  
(B) Crohn's disease  
(C) Lactose intolerance  
(D) Misdiagnosis with ongoing parasitic infection from a non-*Giardia* organism  
(E) Ulcerative colitis



**Figure.** Worm extracted from the lumen of the ampulla of Vater in the patient referred to in questions 3 and 4.

Questions 3 and 4 refer to the following case.

A 34-year-old woman from Mexico presents with a history of right upper quadrant pain and jaundice. A right upper quadrant ultrasound demonstrates common bile duct dilation to 15 mm and an echogenic structure, which is interpreted as a stone. The patient is referred for endoscopic retrograde cholangiopancreatography. After inserting the duodenoscope into the second duodenum, a large worm is seen partially obstructing the lumen of the ampulla of Vater. The worm is retrieved endoscopically (**Figure**), and no other worms are seen in the biliary or pancreatic ducts. The patient's liver function tests rapidly improve.

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3. What is the most likely causative organism in this case?

- (A) *Ascaris lumbricoides*
- (B) *Diphyllobothrium latum*
- (C) *Necator americanus*
- (D) *Plasmodium falciparum*
- (E) *Plasmodium ovale*

4. How should this patient be managed?

- (A) Biliary sphincterotomy to prevent further worms from obstructing the biliary tree
- (B) Capsule endoscopy to evaluate for more worms in the small bowel
- (C) Colonoscopy to evaluate for more worms in the large bowel
- (D) Empiric treatment with albendazole
- (E) No further treatment is required

5. A 22-year-old man presents to the emergency department with severe abdominal cramping and bloody stools. He states that he initially had nonbloody diarrhea for several days. He has mild, diffuse abdominal pain and a low-grade fever. He has marked leukocytosis and is also found to be in acute renal failure, likely from dehydration. He is admitted to the intensive care unit where aggressive supportive therapy is instituted. Studies of stool specimens demonstrate infection with enterohemorrhagic *Escherichia coli* 0157:H7. Which of the following antibiotics should be used to treat this organism?

- (A) Ceftriaxone
- (B) Ciprofloxacin
- (C) Levofloxacin
- (D) Trimethoprim-sulfamethoxazole
- (E) No antibiotic therapy should be instituted

6. A 45-year-old woman presents for evaluation of dysphagia. The patient states that she often has a sensation of food sticking in her throat, has very foul breath, and on several occasions has awakened with undigested food on her pillow in the morning. Upper endoscopy reveals a dilated esophagus with copious amounts of old food and a tight lower esophageal sphincter. A thorough review of systems reveals that 25 years ago when the patient was a college student, she traveled to Argentina for a semester abroad, during which time she toured urban and rural areas extensively. Which of the following organisms is the likely cause of her symptoms?

- (A) *Ancylostoma caninum*
- (B) *Enterobius vermicularis*

- (C) *Isospora belli*
- (D) *Opisthorchis sinensis*
- (E) *Trypanosoma cruzi*

#### ANSWERS AND EXPLANATIONS

1. (E) Send stool samples for *C. difficile* toxin analysis.

This patient has several risk factors for *C. difficile* diarrhea, including ongoing antibiotic use and prolonged hospitalization, and his clinical picture is highly suggestive of this infection. Enzyme immunoassay of 3 stool samples to look for *C. difficile* toxin A or B is usually sufficient to make the diagnosis. Although a colonoscopy may confirm the presence of pseudomembranes, a stool assay is easier and safer to obtain. Initiation of empiric antibiotic therapy for diarrhea presumed to be due to *C. difficile* should wait until the etiology of the infection is known. Given this patient's significant symptoms and comorbid illness, observation is inadequate.

2. (C) Lactose intolerance. This patient's initial diagnosis of *G. lamblia* infection is likely correct given his history and clinical presentation. Chronic infection with *Giardia* is uncommon, as metronidazole therapy is usually curative. Lactose intolerance, which can be prolonged, frequently develops following *Giardia* infection and has very similar symptoms. Ulcerative colitis and Crohn's disease would likely have a more severe symptom profile and are not associated with *Giardia* infection.

3. (A) *A. lumbricoides*. *A. lumbricoides* infection occurs worldwide, especially in underdeveloped nations. Accidentally ingested eggs hatch in the duodenum, penetrate the bowel wall to enter lymphatic channels and venules, pass through the liver and right heart, molt in the lungs, and ascend the tracheobronchial tree. Once in the hypopharynx, the worms are again swallowed and enter the bowel. Worms can grow to 50 cm in length and can cause bowel obstruction if present in large numbers. *A. lumbricoides* is well known to enter the pancreatobiliary tree via the ampulla of Vater, where the infection can cause jaundice, cholangitis, and pancreatitis. *N. americanus* (hookworm) does not invade the biliary tree. *D. latum* causes malnutrition and vitamin deficiencies but not biliary symptoms. *P. ovale* and *P. falciparum* are causative organisms of malaria.

4. (D) Empiric treatment with albendazole. If a patient has a confirmed *A. lumbricoides* infection, it is very

possible that multiple worms are present. Therefore, observation would be inadequate. Further evaluation of the bowel is not likely to be helpful because it will not change management; thus, colonoscopy and/or capsule endoscopy are not warranted. Biliary sphincterotomy would not preclude additional worms from migrating into the pancreatic or bile ducts. A single dose of 400 mg of albendazole is usually sufficient to treat *A. lumbricoides* infection.

5. **(E) No antibiotic therapy should be instituted.** The patient is infected with *E. coli* 0157:H7. In general, antibiotic therapy has not been shown to be helpful in such cases. Antibiotic therapy does not appear to shorten the clinical course of the infection and also does not appear to reduce the incidence of hemolytic uremic syndrome, which can develop in patients with this particular infection. Thus, treatment of *E. coli* 0157:H7 infection is largely supportive.

6. **(E) *T. cruzi*.** The patient has Chagas' disease caused by *T. cruzi*, likely acquired during her trip to Argentina, where the disease is commonly encountered. Chronic Chagas' disease can lead to megaesophagus with a nonrelaxing lower esophageal sphincter and can have a clinical presentation identical to that seen in classic achalasia. Some patients can also develop megacolon with chronic constipation. *I. belli* typically causes acute watery diarrhea in immunocompetent individuals and chronic diarrhea and malabsorption in immunocompromised individuals. *E. vermicularis* (pinworm) infection is often asymptomatic but can cause vulvovaginitis in some women. *A. caninum* is a hookworm commonly found in cats and dogs; when it infects humans, it can produce colicky abdominal pain and peripheral eosinophilia. *O. sinensis* is a liver fluke that can cause chronic biliary tract disease and predispose patients to cholangiocarcinoma.

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