CLINICAL VIGNETTE

Concomitant Clostridioides *difficile* and Salmonella Infection

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Case Presentation

A 39-year-old female presented for long standing chronic diarrhea present for more than 15 years. The diarrhea was previously intermittent but increased in the last 18 months. She described 3-4 bowel movements per day without mucus. She occasionally had blood upon wiping, but denied blood mixed with stools, steatorrhea, or nocturnal bowel movements. She also noted increased abdominal bloating, but denied weight loss.

Around two weeks prior to presentation, she developed diffuse abdominal pain, worsening diarrhea, and fever and chills. She was seen at an emergency room and was placed on ciprofloxacin and metronidazole. She was evaluated at gastroenterology where stool studies for bacterial enteric pathogens (Shigella, Salmonella, Campylobacter, and Escherichia coli) using real-time polymerase chain reaction (RT-PCR) and Clostridioides *difficile* (C. diff) using RT-PCR were ordered. The stool studies were positive for C. diff infection and Salmonella *enterica*. The patient was treated with oral vancomycin 250 mg four times per day for 10 days. After four weeks, the patient was still symptomatic, with 3-4 bowel movements per day. Stool studies revealed negative C. diff PCR and ongoing Salmonella infection as per RT-PCR results.

Given that the patient was symptomatic the Salmonella was treated with Rifaximin for 7 days. Vancomycin was also added to reduce risk of C. diff recurrence. Treatment was effective and she remained asymptomatic at 4-week follow up.

Discussion

Acute diarrhea is defined as the passage of greater than normal number of stools of decreased form lasting <14 days. Persistent diarrhea is defined as diarrhea lasting between 14 and 30 days and chronic diarrhea is diarrhea persistent for greater than a month. The American College of Gastroenterology recommends that stool diagnostic studies may be used if available in cases of dysentery, moderate-to-severe disease, and symptoms lasting >7 days.[1]

Salmonella is a gram-negative rod which belongs to the Enterobacteriaceae family. It is generally transmitted after consumption of contaminated food of animal origin (mainly eggs, meat, poultry, and milk). Nontyphoidal Salmonella accounts for 11% of all foodborne illnesses and 35% of hospitalizations for foodborne illnesses.[2] Person to person transmission may occur via fecal-oral transmission. Salmonellosis is a disease which is characterized by fever, abdominal pain, diarrhea, nausea, and vomiting, usually acute in onset occurring 6-72 hours after injection of salmonella. The symptoms are usually self-limiting, but in children and the elderly the infection can be life threatening secondary to dehydration. Treatment generally consists of rehydration and electrolyte replacement with antimicrobial therapy for high risk groups (infants, elderly, and immunocompromised patients).

Clostridium *difficile* is a Gram-positive, anaerobic, spore-forming, toxin-producing bacillus. The bacterium was officially renamed as Clostridioides *difficile* in 2016. The infection may result in asymptomatic carrier status, various degrees of diarrhea, or severe life-threatening colitis. Approximately 5% of adults and 15–70% of infants are colonized by *C. difficile.* The estimated national burden of *C. difficile* infection in 2017 was 462,100 cases (95% CI, 428,600 to 495,600).[3]

Literature view, identified four previous reports demonstrating co-existing Clostridioides *difficile* infection (CDI) and Salmonella infection.[4-7] Lal A et al described a 45-year-old nurse who was hospitalized with abdominal pain, fever, and diarrhea, one week after being treated with nitrofurantoin for cystitis. The patient was diagnosed with CDI and Salmonella infection, and responded to a 10-day treatment with oral vancomycin.[4] Brettle et al reported four adults with coexisting CDI and Salmonella infection ages 24 years, 65 years, 75 years, and 79. All four had a recent antibiotic use. Two of the patients were treated with vancomycin and three of the four patients survived.[5] Grinblat et al similarly reported two patients ages 80 and 86 with CDI and Salmonella infection. Neither had previous antibiotic treatment. The 86-year-old patient was treated with metronidazole and the 80-year-old patient was treated with metronidazole and ciprofloxacin and both survived.[6] Finally, Halvorson et al described a 20-year-old female with CDI and Salmonella infection. The patient had not previously been treated with antibiotics and was treated aggressively with imipenem, cilastatin, vancomycin, and metronidazole but unfortunately died.[7]

The detection of these two pathogens in the same patient raises management considerations into whether one or both pathogens should be treated, and specifically with which antibiotic.

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