

## Severe Gastroenteritis and Hypovolemic Shock Caused by *Grimontia (Vibrio) hollisae* Infection<sup>∇</sup>

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***Vibrio hollisae* is a halophilic species that was recently reclassified as *Grimontia hollisae*. This organism is known to cause moderate to severe cases of gastroenteritis. We report a case of an individual who suffered a more severe form of this disease, presenting with profound hypotension and acute renal failure, secondary to hypovolemic shock.**

### CASE REPORT

A previously healthy, 43-year-old, Vietnamese male presented to the emergency room with several days of persistent severe diarrhea associated with nausea, vomiting, and diffuse, cramping abdominal pain. He denied recent travel, contacts with sick people, or ingestion of raw food. Although initially denying recent consumption of seafood, he later recalled consumption of shellfish. On physical exam, his blood pressure was 60/48 mm Hg, heart rate 120 beats/min, and temperature 98.1°F. He looked acutely ill and was dehydrated. His abdomen had diffuse tenderness to palpation without rebound or guarding, and his stools were positive for occult blood. The remainder of his physical exam was unremarkable. Laboratory results included a leukocyte count of 15,510/mm<sup>3</sup> with 67% polymorphonucleocytes and 17% bands. Blood chemistry results were consistent with acute renal failure and anion gap metabolic acidosis. Two blood cultures, a stool culture, an exam for ova and parasites, a *Clostridium difficile* toxin assay, and a fecal leukocyte exam were ordered. A computerized axial tomography scan of the abdomen revealed diffusely dilated and edematous small bowel wall. The patient was admitted to the hospital, treated initially with intravenous fluids, and prescribed ciprofloxacin (800 mg/day) and metronidazole (1.5 g/day). He improved significantly, his renal failure resolved, and his vomiting and diarrhea stopped. He was discharged 2 days later on oral antibiotics.

Stool test results were positive for fecal leukocytes and negative for ova and parasites and *C. difficile* toxin A/B. A routine stool culture was negative for *Salmonella*, *Shigella*, and *Campylobacter* spp. However, moderate growth of non-lactose-fermenting gram-negative bacilli on MacConkey agar plates and moderate growth of beta-hemolytic, oxidase-positive gray colonies on sheep blood agar plates were noted after overnight incubation. Poor growth of these colonies was noted upon subsequent subculture to thiosulfate-citrate-bile salts-sucrose (TCBS) agar. An identification of *Vibrio hollisae* was obtained

with a Vitek 2 GNI card (bioMérieux, Inc., Durham, NC) and the BBL Crystal E/NF ID kit (Becton Dickinson Microbiology, Cockeysville, MD). This identification was confirmed by Sharon Abbott, Microbial Disease Laboratory, Division of Communicable Disease Control, California Department of Public Health, Richmond, CA.

Susceptibility testing was performed as described for *Vibrio* species (3) using a MicroScan (Dade Behring, West Sacramento, CA) negative type 30 MIC panel. The MIC test was initially performed using inoculum water with Pleuronic as specified in the Microscan product insert. When the isolate failed to grow, 0.9% sterile saline was substituted for inoculum water with Pleuronic. MIC results were recorded after 24 h, and the panel was reincubated for an additional 24 h. The MICs recorded at 24 h remained unchanged at 48 h. By using published interpretive criteria (3), the isolate was susceptible to cefazolin, cephalothin, ceftazidime, cefoxitin, cefepime, cefotaxime, ampicillin, amoxicillin-clavulanate, ampicillin-sulbactam, piperacillin, piperacillin-tazobactam, imipenem, meropenem, amikacin, gentamicin, ciprofloxacin, levofloxacin, tetracycline, chloramphenicol, and trimethoprim-sulfamethoxazole.

*Vibrio hollisae* is a halophilic vibrio species first described by Hickman et al. (6) and recently reclassified as *Grimontia hollisae* by Thompson et al. (10). It is primarily known to cause moderate to severe cases of gastroenteritis in healthy people and is rarely isolated from extraintestinal sites, such as from blood samples (4). *Grimontia hollisae* bacteria are gram negative, motile by a polar flagellum, and oxidase positive. Strains are negative for the Voges-Proskauer reaction, arginine dihydrolase, and lysine and ornithine decarboxylase, but indole production and nitrate reduction are positive (10). The organism is reported to not usually grow on TCBS agar or MacConkey agar but does grow well on sheep blood agar and marine agar (6).

In the study by Morris et al. (8), *G. hollisae* was mainly associated with cases of gastroenteritis. The chief medical complaints included diarrhea and abdominal pain. Most of the patients developed vomiting, low-grade fever, and mild leukocytosis and required admission to the hospital. All patients

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successfully recovered (8). Gastrointestinal disease associated with *Vibrio* species is generally associated with consumption of seafood (4). Thirty-two cases of *G. hollisae* infection have been reported in some detail in the literature. The majority of the cases of enteric disease have involved otherwise healthy individuals who had consumed raw oysters, clams, or shrimp (1, 2, 5–9). In our case, the patient suffered from more severe symptoms, including profound hypotension and acute renal failure due to hypovolemic shock that were corrected successfully with aggressive intravenous hydration.

Only four cases of septicemia associated with *V. hollisae* have been reported in the literature. Three cases occurred in patients with underlying liver disease (5, 7–9).

Epidemiologically, most of the cases of *G. hollisae* infection have been restricted to the Atlantic and Pacific coasts of the United States. Only one reported case has occurred in Europe (5). Our case occurred in central Pennsylvania, 150 miles from the Atlantic coast. This report indicates the importance of clinical microbiologists being aware of the possibility of *Vibrio* and *Vibrio*-like organisms, including *G. hollisae*, not only as enteric pathogens but also as possible agents of extraintestinal disease, especially in laboratories serving coastal areas or in individuals with exposure to seafood or shellfish. A second important point is that the incidence of *G. hollisae* infections is likely underestimated, and further attempts should be made to improve the microbiological diagnosis of intestinal infections. TCBS agar is used as the selective medium for isolation of *Vibrio* species in most clinical laboratories, but unfortunately, *G. hollisae* grows poorly on this medium. The best growth of our isolate occurred on a sheep blood agar plate. Microbiolo-

gists need to work up beta-hemolytic, oxidase-positive, gram-negative bacilli from stool cultures. Finally, obtaining a thorough patient history and recent culinary habits can often be an invaluable clue to the accurate identification of these organisms and thereby result in the prompt and proper treatment of the patient.

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