YERSINIA ENTEROCOLITICA SEPSIS IN AN ADOLESCENT WITH COOLEY’S ANEMIA

Shun Chiu,1 Yhu-Chering Huang,1 Lin-Hui Su,2 and Tzou-Yien Lin1

Abstract: Human infections due to Yersinia enterocolitica have been reported worldwide, predominantly in Europe. However, there have been few reports of Yersinia enterocolitica infection in Taiwan. We report a case of Y. enterocolitica sepsis in a 15-year-old Taiwanese girl with Cooley’s anemia and insulin-dependent diabetes mellitus. She presented at admission with fever, shock and consciousness disturbance. She had symptoms of abdominal pain, vomiting and diarrhea for three days before admission. Blood pressure stabilized after intravenous normal saline rescue. Blood culture yielded Y. enterocolitica 2 days later and ceftriaxone was administered according to the results of sensitivity tests. She recovered well after a course of antibiotic treatment. Though Y. enterocolitica sepsis is rare in Taiwan, clinicians should be aware of its tendency to develop in patients with Cooley’s anemia, fever and enterocolitis and that its clinical course may include sepsis leading to shock.

Key words: Yersinia enterocolitica; Yersinia infections; Shock, septic; beta-Thalassemia; Taiwan

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Yersinia enterocolitica is a Gram-negative bacillus that may cause illness ranging from self-limited enteritis to potentially life-threatening systemic infection.1,2 Y. enterocolitica appears to be a common cause of diarrhea among children in Europe and Canada.3 Septicemia caused by Y. enterocolitica may occur in normal hosts as well as in those with underlying disorders.4 Septicemia has been reported in young infants and in children with iron overload.5,6

We report a case of Y. enterocolitica sepsis in an adolescent with Cooley’s anemia. To our knowledge, this is the first reported case of Y. enterocolitica sepsis in Taiwan. Since similar cases have never been reported in Taiwanese children, this report may be useful to draw attention to this clinical condition.

Case Report

A 15-year-old girl was admitted to Chang Gung Children’s Hospital on 26 January, 2002 with an 8-day history of fever. She had vomiting, diarrhea and abdominal pain for the first 3 days of illness. She denied having had any suspicious food, such as chitterlings (pork intestines). Her medical history included Cooley’s anemia and insulin-dependent diabetes mellitus. The treatment included transfusion protocol, chelation therapy with deferoxamine (desferrioxamine), and insulin injection. On admission, physical examination revealed a pale girl with consciousness disturbance and blood pressure of 74/35 mm Hg. To stabilize her vital signs, intravenous normal saline resuscitation was given immediately. Laboratory investigation showed a peripheral leukocyte count of 13,400 cell/mm3 with 71% neutrophils, 20% lymphocytes, and 6% monocytes. Platelet count was 453 x 10⁹/L and hemoglobin was 10.1 g/dL. The C-reactive protein concentration was 179.4 mg/L (normal, < 10 mg/L). Serum biochemical tests revealed the following values: creatinine, 0.6 mg/dL; sodium, 137 mEq/L; potassium, 3.9 mEq/L; glucose, 217 mg/dL; and asparate aminotransferase, 122 U/L. Urinary analysis was normal.

Septic shock was strongly suspected. Empiric antibiotic therapy consisting of cefuroxime and gentamicin was initiated immediately. On the third hospital day, blood culture collected at the time of admission grew Y. enterocolitica. The minimum inhibitory concentration (MIC) values of antimicrobial agents were as follows: cefazolin, > 256 µg/mL; cefuroxime, 8 µg/mL; ceftriaxone, 0.064 µg/mL; cefepime, 0.064 µg/mL; ciprofloxacin, 0.032 µg/mL;
Yersinia enterocolitica isolation from feces in Taiwanese children. These organisms accounted for 10.5% of enteric pathogens. No cases of Y. enterocolitica bacteremia have been reported from Taiwan. It is still unexplained why Y. enterocolitica infection is rare in Taiwan.

Y. enterocolitica bacteremia occurs most often in patients with chronic illnesses or iron-overloaded states. Thalassemia is the most common associated condition in children. Iron is an essential factor for the growth of bacteria. Hemachromatosis, cirrhosis, and other diseases may facilitate Y. enterocolitica bacteremia, also on the basis of excess availability of serum iron. Deferoxamine therapy itself is a risk factor for Y. enterocolitica sepsis because of the ability of the organism to extract iron from this compound. The patient reported here had all of the risk factors stated above. Exposure to chitterlings has also been recognized as a factor predisposing to bacteremia. Whether such exposure might have occurred in this case was not clear.

Antibiotics usually are reserved for the patient with a more severe disease presentation. In general, antibiotics active against enteric Gram-negative rods would be expected to have similar activity against Y. enterocolitica. In patients with Y. enterocolitica bacteremia, effective treatment with fluoroquinolones and third-generation cephalosporins alone or in combination with aminoglycosides has been reported in adults. The duration of treatment that proved effective varied between 2 and 6 weeks (median, 22 days). Previously, Abdel-Haq et al also reported successful treatment without sequelae in 7 children with Y. enterocolitica bacteremia (6 treated with cefotaxime, 1 with cefotaxime, ampicillin and metronidazole).

Transmission of Y. enterocolitica has been associated with consumption of contaminated food, water, and milk. The patient had enteritis before the onset of sepsis. The source for bacteremia might have been the invasion of bacteria from the intestinal mucosa into the bloodstream. The most common bacterial pathogens of enterocolitis species in recent years in our hospital have included Salmonella species and Campylobacter (data not published). However, in cases of Salmonella or Campylobacter bacteremia, hypotension and shock are seldom encountered as clinical presentations. The possibility of Salmonella or Campylobacter infection may be low in such patients in Taiwan, and other pathogens should be considered. Despite the rarity of Y. enterocolitica sepsis in Taiwan, this condition should be considered in the differential diagnosis of patients with Cooley’s anemia, fever and enterocolitis who subsequently develop a septic appearance or shock.

**Microbiological identification**

One bottle (for both aerobic and anaerobic culture) from 1 blood culture set was positive in our BACTEC 9240 system, growing Gram-negative rods that were subsequently sent for conventional biochemical classification. The culture yielded pure, gray, and smooth colonies on blood agar plate and eosin-methylene blue agar. The isolate was motile at room temperature (22 to 25°C) but not at 37°C and positive for urease and ornithine decarboxylase test. Citrate utilization and Voges-Proskauer (VP) test were negative. The MIC of antimicrobial agents was determined by E-Test (AB Biodisk, Solna, Sweden). The isolate was also identified as Y. enterocolitica using an automatic identification system, API 20E (identification code, 0114522, bioMerieux Vetek Inc, Hazelwood, MO, USA). To ensure the identity of the isolate, a recently published polymerase chain reaction (PCR) assay targeting the 16S rRNA gene of Y. enterocolitica was also used and confirmed the identification.

To specifically amplify the Y. enterocolitica 16S rRNA gene, a primer set, Y1 (5’-AATACCGCATAACGTC-3’) and Y2 (5’-CTTCTTCTGCGAGATACGTC-3’), was used, resulting in a PCR product of 330 bp. Cycling conditions started with a denaturation step at 94°C for 5 minutes, followed by 36 subsequent cycles of heat denaturation at 94°C for 45 seconds, primer annealing at 62°C for 45 seconds, and extension at 72°C for 45 seconds. A final extension was performed at 72°C for 7 minutes to complete the synthesis of all strands. The PCR products were visualized on 1.5% agarose gel stained with ethidium bromide.

**Discussion**

Y. enterocolitica can produce several manifestations of disease. The most common syndromes are acute enteritis with fever and diarrhea that may mimic appendicitis, reactive arthritis, erythema nodosum, and bacteremia. Focal extraintestinal infections are uncommon. There have been 2 reported cases of Y. enterocolitica iso
References


