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Cronobacter Sakazakii Bacteremia in a 76-year-old Woman: A Case Report

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Abstract

Cronobacter sakazakii, commonly found in contaminated infant formula and thereby causes infantile bacteremia, is rarely associated with adult bacteremia. We present the tenth case of C. sakazakii bacteremia in adults. The patient is a 76-year-old woman who resides in a skilled nursing facility and presents with risk factors including bullous pemphigoid, Type II diabetes mellitus, hypertension, hyperlipidemia, chronic kidney disease, and anemia. The therapy was started with intravenous ciprofloxacin and vancomycinempirically. After consultation with an Infectious Diseases specialist, ciprofloxacin and vancomycin was replaced with meropenem based on the patient's extensive bullous lesions, history of ESBL infections, and possible pneumonia. Later, the therapy was de-escalated to intravenous ceftriaxone and vancomycin after culture and sensitivity testing were available and clinical signs of improvements were evident. She was sent back to her skilled nursing but was re-admitted 10-days later. She was placed on dialysis for altered mental status secondary to acute renal failure. Blood and urine cultures were repeated and had no evidence of bacterial growth.

Keywords: Cronobacter sakazakii; Bacteremia; antibiotics; empiric therapy

1. Introduction

Cronobacter (Enterobacter) sakazakii related infections are infrequently seen in adults, but can be serious among people with immunocompromising conditions and the elderly. Only nine cases of bacteremia have been previously published in the medical literature (Emery & Weymouth, 1997; Hawkins, Lissner, & Sanford, 1991; Jimenez & Gimenez, 1982; Lai 2001; Pribyl et al., 1985; See, Than, & Tang, 2007).

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We present a case of C. sakazakii bacteremia in a 76-year-old female who was brought to the emergency department in December 2013 from a skilled nursing facility (SNF) with increased confusion, left abdominal pain, and reports of fever per family member. This patient had various co-morbid conditions including bullous pemphigoid, Type II diabetes mellitus, hypertension, hyperlipidemia, chronic kidney disease, anemia, and a history of *Clostridium difficile* and extended-spectrum beta-lactamase (ESBL) Enterobacteriaceae urinary tract infections, and uterine cancer with a vague history of penicillin and sulfa allergies. Of note, she has been receiving chronic steroid therapy for bullous pemphigoid and finishing a tapering dose of oral vancomycin. At presentation, she had confusion, left upper quadrant abdominal tenderness and guarding, right-sided rhonchi, and 2+ edema with notable oozing from her lower extremities without other significant findings. Laboratory results revealed normal leukocyte (10.3/mm^3) and lowered platelet counts (82,000/mm^3), but had elevated band neutrophils (36%), elevated potassium (5.2-mEq/L), blood urine nitrogen (105-mg/dL), creatinine (2-mg/dL), and procalcitonin (0.16-ng/mL). Urinalysis was positive for nitrites, leukocyte esterase (3+), protein (1+), and white blood cells (18/mm^3). The chest radiograph showed a new infiltrate on the right middle lung field. On admission, intravenous ciprofloxacin and vancomycin was started empirically considering the patient's allergy profile. The following morning, the patient was seen by an Infectious Diseases specialist. The extensive bullous lesions, history of ESBL infections, and possible pneumonia prompted the replacement of ciprofloxacin with meropenem.

Urine, nares, and two sets of blood cultures were obtained on admission. The urine culture had $>10^5$ colony-forming units of *Proteus mirabilis*, and the nares culture identified methicillin-resistant *Staphylococcus aureus*presence. After one day of incubation, two of four blood culture bottles were positive for bacterial growth, C. sakazakii and diphtheroid group bacteria. The Cronobacter was susceptible to the following antibiotics: amikacin, cefepime, ceftazidime, ceftriaxone, ciprofloxacin, ertapenem, gentamicin, meropenem, piperacillin-tazobactam, tobramycin, and trimethoprim/sulfamethoxazole. The Cronobacter was resistant to cefazolin and cefoxitin. The open leg wounds and probable pneumoniawere the most probable sources of the bacteremia. The remaining chief complaint for left upper quadrant pain was evaluated for a gastric ulcer perforation and the computerized tomography (CT) scan of the abdomen and pelvis did not find evidence of an acute abnormalities.

After microbiology susceptibilities were available and a clinical response to antimicrobial therapy was evident, the patient was de-escalated to intravenous ceftriaxone and vancomycin. Therapy was changed to account for the fluoroquinolone-resistant, cephalosporin-sensitive *Proteus mirabilis* in the urine, and possible pneumonia. Repeat blood cultures were negative for any bacterial growth.
After aggressive hydration, antibiotics, and intravenous steroids, the patient stabilized and improved. She was sent back to her SNF to complete her antimicrobial therapy. The patient was re-admitted 10-days later for altered mental status secondary to acute renal failure and placed on dialysis. Blood and urine cultures were repeated and had no evidence of bacterial growth.

2. Discussion

Previous reports of Cronobacter bacteremia resulted in mixed success. Five of the nine previous cases resulted in patient mortality (Table 1). It has been suggested that empiric treatment of Cronobacter infections should be include either a carbapenem or a later generation cephalosporin (Dennison & Morris, 2002). Effective empiric therapy is important as well as de-escalation to appropriate directed therapy based on susceptibilities. This current case demonstrates the potential for clinical cure with a third generation cephalosporin, and reinforces common characteristics seen in Cronobacter bacteremia.

Table 1: Cronobacter (Enterobacter) Sakazakii Bacteremias in Adults

Age/Gender	Co-morbid Condition(s)	Treatment	Outcome	Reference
76/ male	Rectal adenocarcinoma	Ampicillin + gentamicin	Successful	Jimenez, 1982
55/ male	Diabetes	Aztreonam	Successful	Pribyl, 1985
75/ female	Chronic atrial fibrillation, CVA, hypertension	Cefuroxime; ceftriaxone; ciprofloxacin	Successful	Hawkins, 1991
68/ male	CLL, alcohol abuse	Ceftriaxone + gentamicin	Died	Emery, 1997
39/ male	Tonsillar carcinoma	Ceftazidime + clindamycin; cefuroxime axetil + clindamycin	Successful	Lai, 2001
73/ female	Klatskin tumor	Piperacillin-tazobactam+ gentamicin; imipenem	Died	Lai, 2001
82/ female	Abdominal aortic aneurysm	Piperacillin-tazobactam + ofloxacin	Died	Lai, 2001
76/ female	Fungemia, cecal volvulus	Ceftazidime + tobramycin; ofloxacin + tobramycin	Died	Lai, 2001
75/ female	Schizophrenia, splenic abscess	Ceftriaxone +metronidazole; imipenem; ciprofloxacin	Successful	See, 2007

Semicolons denotes division of initial and subsequent therapies
CVA: Cerebrovascular Accident, CLL: Chronic Lymphocytic Leukemia

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