

Burkholderia Cepacia: A Case Report

Oyeniya Oyesina^{a, b}, William C. Anthony^a

Abstract

We present a case of a 60-year-old male with chronic kidney disease, stage V, hemodialysis-dependent, who was admitted to the hospital because of the occurrence of chills during hemodialysis. *Burkholderia cepacia* was identified in multiple blood cultures, temporally spaced. Analysis of the water supply at the dialysis center revealed no *Burkholderia* contamination.

Keywords: *Burkholderia cepacia*; Chronic kidney disease; Sepsis; Dialysis

Introduction

Burkholderia cepacia was discovered in onion roots by Walter Burkholder in 1949 at Cornell University [1, 2]. *B. cepacia* refers to a group of several species of catalase-negative, non-lactose fermenting aerobic, motile, Gram-negative bacilli [2]. These organisms thrive in soil and aquatic environments [3, 4]. *B. cepacia* has antifungal activities, and for this reason it is used as a biological control against plant-fungi [1, 4]. In humans *B. cepacia* is a nosocomial organism that primarily affects patients with immune dysfunction or with preexisting damage to their respiratory epithelium. It is often resistant to multiple antibiotics and has been shown to grow in penicillin medium. It is known to contaminate intravenous fluids, bronchoscopes and urinary catheters [4]. In 2005, the Centers for Disease Control was notified of a multi-state mouthwash contamination from *B. cepacia* [3, 4].

Objective

To demonstrate a case of *B. cepacia* sepsis in a dialysis-dependent patient who had no pneumonia or any other identifiable source of infection. Analysis of the water supply at the dialysis center revealed no *Burkholderia* contamination.

Case Report

A 60-year-old African-American male came to the emergency room with chills. The chills began two days prior after he completed his regular hemodialysis. He denied any neurological, cardiovascular, respiratory, gastrointestinal or musculoskeletal symptoms. His past medical history includes chronic kidney disease stage V secondary to rapidly progressive glomerulo nephritis, hypertension, anxiety and coronary artery disease. He has no significant surgical history other than cardiac catheterization for his coronary artery disease.

In the emergency room he had a temperature of 99.4 °F, heart rate of 100, respiratory rate of 16 and blood pressure of 120/77 mmHg. On examination he is well built, well nourished in no distress. His abdominal exam was normal, no tenderness or organomegaly with peritoneal catheter in place. His neurological, respiratory and cardiovascular exams were normal. His laboratory tests showed abnormal complete blood count; leukocytes were particularly elevated (Table 1). His urine cultures and X-ray of the chest were negative. He was hydrated with intravenous fluids, and three sets of blood were collected and sent for cultures. The peritoneal catheter was immediately removed and catheter tip was cultured and some blood culture was collected after removal of the catheter. He was then started on broad-spectrum antibiotics and given Tylenol.

Infectious disease was consulted. On day 5, blood culture grew *B. cepacia*. Infectious disease recommended that the patient be treated with ciprofloxacin and piperacillin/tazobactam. His chills and fever had subsided. Blood cultures were again obtained and they were negative. The antibiotics had eradicated the disease. On further follow-up in the clinic he was asymptomatic and his leukocyte count was within normal limits. The dialysis center water was tested

Manuscript accepted for publication July 10, 2013

^aUniversity of Maryland medical Center Midtown Campus, 827 Linden Ave, Baltimore, Maryland, USA

^bCorresponding author: Oyeniya Oyesina, University of Maryland medical Center Midtown Campus, 827 Linden Ave, Baltimore, Maryland, USA. Email: boyetolu@yahoo.com

doi: <http://dx.doi.org/10.4021/jmc1425e>

Table 1. Complete Blood Count

	Day 1	Day 3	Day 4	Day 6
White blood cells ($10^3/\text{mm}^3$)	16.6	19.7	13.6	10.1
Red blood cells ($10^6/\text{mm}^3$)	3.50	3.42	10.5	3.72
Hemoglobin (g/dL)	10.1	9.9	10.5	10.6
Hematocrit (%)	31.9	31.4	33.3	33.9
MCV (10^{-15} L)	91.1	91.8	91.7	91.1
MCHC (g/dL)	31.4	31.5	31.5	31.3
RDW (%)	16.2	16.4	16.2	16.2
Platelet ($10^3/\text{mm}^3$)	118	109	142	183

MCV, mean corpuscular volume; MCHC, mean corpuscular hemoglobin concentration; RDW, red blood cell distribution width.

and it was negative for *B. cepacia*.

Discussion

In order to ascertain cases of *B. cepacia* sepsis without pneumonia or no source was ever reported, we searched the American literature from 2007 to 2012. We did not find a single case reported. There were many reports of *B. cepacia* sepsis in patients with cystic fibrosis and some reports of catheter-induced *B. cepacia* bacteremia in hemodialysis patient [5]. Our case differs because the hemodialysis catheter tip in our patient was removed and cultured before antibiotics were started, and the culture was negative for *B. cepacia*.

Immunocompromised patients, patients with cystic fibrosis and dialysis-dependent patients are particularly vulnerable. Clinical manifestations are varied and run the gamut from asymptomatic colonization to necrotizing pneumonia and sepsis. Colonization in cystic fibrosis patients has been reported to be 3% [2].

Burkholderia species are often multi-drug-resistant, and treatment is challenging. The organisms are often sensitive to trimethoprim-sulfamethoxazole, meropenem and ceftazidime [6]. The optimal treatment regimen is not established. Intravenously administered antibiotic therapy, often in combination, has been successful.

In conclusion we report a case of sepsis associated with *B. cepacia* without any identifiable source of infection. It is our belief that this is the first reported case. The occurrence of *B. cepacia* sepsis in a dialysis-dependent patient with no obvious source requires additional study.

Conflicts of Interest

None.

Funding

None.

References

1. Bayram M, Babalik M, Bakan ND, Dongel I. Community-acquired *Burkholderia cepacia* pneumonia: a report of two immunocompetent patients. *Tuberk Toraks*. 2011;59(4):380-383.
2. Zuckerman JB, Seder DB. Infection control practice in cystic fibrosis centers. *Clin Chest Med*. 2007;28(2):381-404.
3. Centers for Disease Control and Prevention: *Burkholderia cepacia* in Healthcare Settings-Maryland, July 2012.
4. Long. *Principles and Practice of Pediatric Infectious Diseases* Revised reprint, 3rd ed. Churchill Livingstone, An Imprint of Elsevier. 2009.
5. Mandell. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*, 7th ed. Churchill Livingstone, An Imprint of Elsevier. 2009.
6. Zhou J, Chen Y, Tabibi S, Alba L, Garber E, Saiman L. Antimicrobial susceptibility and synergy studies of *Burkholderia cepacia* complex isolated from patients with cystic fibrosis. *Antimicrob Agents Chemother*. 2007;51(3):1085-1088.