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A Case of Delayed Bacteremia from an Unusual Pseudomonas Species

Atul V. Palkar*, Anjali Budhatoki, Priyamvada Singh

***Atul V Palkar, MD**

Department of Pulmonary & Critical Care Medicine, North Shore University Hospital, 300 Community Drive, Manhasset, NY 11030, USA. Email: Apalkar@NSHS.edu

Abstract

A 32 year old woman with history of intravenous drug abuse with last reported use of heroin about a month prior, presented with fever for 1 week. She reported re-using the same needle and water for injections. Blood cultures grew Pseudomonas *fluorescence* in all four bottles. P. *fluorescens* is a gram negative rod that thrives in moist environments and can be difficult to grow at standard incubation temperature. It is considered as a low virulent organism and is a rare cause of human infection. P. *fluoresecence* has rarely been reported to cause delayed bacteremia as in our patient. Our patient had resolution of bacteremia and symptoms following treatment with intravenous ceftazidime for two weeks.

Keywords

Pseudomonas fluoresecens; Drug abuse; Bacteremia

Introduction

Pseudomonas *fluorescens* is an aerobic, gram negative psychrophilic bacterial rod that grows best at temperatures of approximately 77°F--86°F (25°C-30°C). The identification of *P. fluorescens* can be difficult due to poor growth at the standard hospital microbiology incubation temperature (36°C). (1,2) The bacteria typically thrive in moist environments (including water, soil, and foods) and are very infrequently implicated as a cause of human infections. In experimental studies on cultured human pulmonary cells, the bacteria induce inflammatory mediators at 28°C and form biofilm at 37°C that may contribute to its pathogenic potential.(3) We hereby report a case of P. *fluorescens* bacteremia in the setting of intravenous drug abuse.

Case Report

A 32 years old white female presented to the emergency department with high grade intermittent fever, chills, night sweats and low back pain for 1 week. She had recovered from an upper respiratory tract infection 3 weeks prior to presentation that was treated with prednisone and azithromycin. She reported use of intravenous heroin, using the same needle and water from a small plastic bottle lying in her car for

several days. Her last reported use of intravenous heroin was about a month prior to presentation. Her past medical history was significant for anxiety, post-traumatic stress disorder, May Heggling syndrome, chronic low back pain and endometriosis. She was unemployed, had no health insurance and lived with her husband. She smoked 1 pack of cigarettes a day for the past 10 years and denied drinking alcohol. Her family history was not contributory.

Physical examination revealed temperature of 102° F and heart rate of 110 beats per minute on presentation. Skin exam showed few needle track marks over her both upper extremities. Rest of the physical examination was unremarkable. Laboratory investigations showed a white blood cell count of 4500/mm^3, hemoglobin of 11.3 g/dL, and a platelet count of 69,000/mm^3. Basic metabolic panel and urinalysis were normal. Urine toxicology screen was negative for opiates and for other commonly tested illicit drugs. Serologies for HIV and Hepatitis C were negative. She was started on empiric antibiotic therapy with intravenous Vancomycin 1 gram every 12 hours and intravenous Ceftazidine 1 gram every 8 hours. Blood cultures showed growth in all four bottles for Pseudomonas species. With the availability of preliminary blood culture results, Vancomycin was discontinued, Ceftazidime dose was increased to 2 grams every 8 hours intravenously and intravenous Tobramycin was added at a dose of 60 mg every 8 hours. Blood cultures finally grew Pseudomonas *fluorescence* that was sensitive to Ceftazidime. A transesophageal echocardiography was performed that did not show any vegetations. MRI of her lumbar spine did not reveal any abnormality. Blood cultures repeated after 48 hours of antibiotic therapy showed no growth. On day 3 of antibiotic therapy, her fever resolved. With the availability of antibiotic sensitivity pattern for P. *fluorescens*, intravenous Tobramycin was stopped and she was continued on intravenous Ceftazidime at prior dosage and was discharged home on day 4. She completed a course of intravenous Ceftazidime for 2 weeks.

She continues to remain asymptomatic. She was counselled to stop using intravenous drugs and was offered social support.

Discussion

P. *fluorescens* is an environmental microorganism that has been increasingly identified as a cause of nosocomial infections. It has been reported to cause occasional cases of transfusion-associated septicemia in blood recipients, including fatal reactions (4), and catheter-related bacteremia in patients with cancer.(5) Interestingly, it has been reported to cause substantially delayed bloodstream infections (i.e., up to 14 months) after exposure to a contaminated intravenous heparin flush in patients with implantable venous ports.(1) The outbreak of P.*fluoresences* in bone marrow transplant unit through contaminated drinking water has been reported in literature.(6) Although, the history obtained from patients abusing illicit drugs is often unreliable and the timing of last heroin use cannot be verified, the unusual finding of bacteremia due to P. *fluorescens* in the setting of intravenous drug use makes this case unique. While the exact source of infection was unclear in our patient, contaminated water used for drug injection was the most likely medium of acquisition of this rare microorganism. P. *fluorescens* has been decribed to thrive in moist environment. The mechanism of delayed bacertemia due to P. *fluorescens* is not quite well understood. However it is quite possible that percutaneous or blood stream inoculation of the organism may cause transient bacteremia and potential seeding to distant organs. Due to its indolent growth patten, P. *fluorescens* may lead to delayed bacteremia. No case of P. *fluorescens* bacteremia related to intravenous drug abuse has been reported in literature to date.

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Authors Information: Atul V. Palkar[1*]; Anjali Budhatoki[2]; Priyamvada Singh[3]
[1] Pulmonary & Critical Care Medicine Fellow, Department of Medicine, Hofstra-North Shore-LIJ School of Medicine, New Hyde Park, NY.
[2] Fellow, Division of Hematology and Oncology, Montefiore Medical Center and Albert Einstein College of Medicine, Bronx, NY.
[3] Fellow, Division of Nephrology, Boston University School of Medicine, Boston, MA.

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