

***Rothia mucilaginosa* bacteremia in end-stage renal disease and solid organ transplant: the need for raised awareness**

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SUMMARY

Rothia mucilaginosa, previously known as *Stomatococcus mucilaginosus*, is a Gram-positive coccus that is a part of the oropharyngeal and upper respiratory tract microbiota. Although this organism is believed to be of low virulence, it is increasingly being recognized as an opportunistic pathogen mostly affecting immunocompromised hosts. In this article, we describe a case of *Rothia mucilaginosa* bacteremia in an immunocompro-

mised heart transplant recipient with end-stage renal disease, who was getting maintenance hemodialysis via a tunneled catheter. To the best of our knowledge, no cases of *Rothia mucilaginosa* bacteremia have been reported previously in heart transplant patients.

Keywords: *Rothia mucilaginosa*, dialysis, heart transplant, bacteremia.

■ INTRODUCTION

The majority of bacteremias in hemodialysis patients is secondary to vascular access infection. The incidence of bacteremia is greater in patients with indwelling tunneled catheters than in those with either fistulas or synthetic grafts [1]. Gram-positive organisms are responsible for most of these infections. *Staphylococcus aureus* and Coagulase-negative staphylococci together account for up to 40 to 80 percent of cases [2, 3]. On the other hand, non-staphylococcal dialysis catheter-associated bacteremias are predominantly due to enterococci and Gram-negative rods [4]. *Rothia mucilaginosa*, previously known as *Stomatococcus mucilaginosus*, a Gram-positive coccus member of the family Micrococcaceae, is considered a part of the normal microflora of the human mouth and

the upper respiratory tract. Although this organism is believed to be of low virulence, it is increasingly being recognized as an opportunistic pathogen mostly affecting immunocompromised hosts [5]. Herein we present and discuss a case of *Rothia mucilaginosa* bacteremia in an end stage renal disease (ESRD) patient with heart transplant.

■ CASE REPORT

A 60-year-old woman with a history of orthotopic heart transplant secondary to idiopathic cardiomyopathy 8 years prior to presentation and ESRD secondary to chronic calcineurin inhibitor nephrotoxicity on hemodialysis (HD) for a year presented to a local hospital with a non-productive cough and progressive shortness of breath for about a week. She was receiving dialysis via internal jugular tunneled cuffed catheter. Physical examination was significant for bilateral rhonchi and crackles at lung bases. Chest radiography and Computed tomography of the chest did not

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show any evidence of pneumonia. She was diagnosed with tracheobronchitis with bronchospasm and admitted for bronchodilator and antimicrobial therapy. Only one blood culture was performed from a peripheral vascular catheter and it was positive for *Rothia mucilaginosa*. *Rothia mucilaginosa* was detected using Verigene Gram-positive blood culture nucleic acid test and no further culture and sensitivity test was performed by the lab. Blood cultures were not obtained from the dialysis catheter. She received 1 dose of 500 mg intravenous vancomycin and transferred to our facility for further evaluation and specialty consultation with transplant infectious diseases. At the time of presentation, she was afebrile, and the vital signs were stable. Laboratory data showed a normal white blood cell count. On physical exam, her dialysis catheter site was clean without any tenderness or drainage. It had been placed a year ago and had functioned well the entire time that it was in place.

She denied any fever or chills during dialysis sessions. Transthoracic echocardiogram did not show any significant valvular dysfunction or vegetations. The dialysis catheter was exchanged after a negative culture and she received 14-day therapy with intravenous vancomycin 500 milligrams three times weekly after dialysis starting from the day of last negative blood culture. Infectious Diseases did not recommend catheter tip culture due to various reasons:

- the patient was already receiving intravenous vancomycin
- follow up blood cultures prior to catheter removal were negative
- the test had a low predictive value for diagnosis
- the catheter tip culture test would not change management. Her respiratory symptoms resolved completely by day 5 of hospital admission.

■ DISCUSSION

Risk factors for *Rothia mucilaginosa* bacteremia and infection include neutropenia, malignancy, immunocompromised state, and indwelling vascular foreign body such as a catheter [5, 6]. In a study that reviewed 25 patients from 2002 to 2012 with positive blood cultures for *Rothia*, 88%

(22/25) were neutropenic, and 76% (19/25) had leukemia [5]. In a literature review encompassing more than 40 years, Maraki et al. studied a total of 20 patients with *Rothia mucilaginosa* pneumonia and found that the patients with hematologic malignancies (7/20), profoundly neutropenic with central line catheters (7/20) are at higher risk of developing the infection. Interestingly, immunocompetent hosts with impaired pulmonary defenses were infected less frequently (4/20) [6]. *Rothia mucilaginosa* is reported to cause pneumonia in a patient with head and neck cancer and impaired pulmonary defenses secondary to chronic obstructive pulmonary disease. This patient did not have the above-stated risk factors such as hematologic malignancy or neutropenia [7]. There is one case reported of *Rothia mucilaginosa* bacteremia in an immunocompetent pediatric patient with no identifiable risk factors [8]. The optimal antimicrobial treatment of *Rothia mucilaginosa* infection has not been determined. The organism is generally susceptible to penicillin, ampicillin, cefotaxime, imipenem, rifampin, and vancomycin. It is frequently resistant to clindamycin and aminoglycosides, as well as to trimethoprim-sulfamethoxazole and ciprofloxacin [9]. Unfortunately, we did not have the antibiotic sensitivity testing available in our patient. Nevertheless, she showed an excellent response to vancomycin therapy.

Our patient did not have any of the commonly reported risk factors such as hematologic malignancy or neutropenia. However, she was on post-transplant maintenance immunosuppression with mycophenolate mofetil, prednisone, and tacrolimus. Otherwise, she had been in good health without hospitalizations in the last 1 year. While cardiac transplant recipients are most likely to succumb to infections caused by cytomegalovirus, Epstein-Barr virus and bacterial organisms, especially staphylococcus, physicians need to keep fewer common infections in the differential diagnosis [10]. This is the first reported case of *Rothia mucilaginosa* bacteremia in a patient with orthotopic heart transplant to the best of our knowledge. The source of infection in our patient is not clear though presumably, it's endogenous from the respiratory tract. However, she did not have any recent history of oral lesions or dental procedures. Though there were no obvious signs of catheter infection, we exchanged the dialysis

catheter in our patient as this organism has the ability to form biofilms and the catheter seeding can lead to recurrent bacteremia [11].

Conflict of interest

None

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