Actinobaculum Schaalii Pyelonephritis in a Kidney Allograft Recipient

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We present a case of a 64-year-old man, a kidney transplant recipient with acute pyelonephritis and acute graft deterioration. He was diagnosed with *Actinobaculum schaalii* infection in urine cultures. He was treated with antibiotics for 3 weeks and recovered well. The case describes an unusual pathogenic infection in a kidney transplant patient.

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Case Report

INTRODUCTION

Kidney transplantation is an immunocompromised state and these individuals are susceptible to numerous bacterial, viral, and fungal infections. The most common ones include bacterial urinary tract infection (UTI) and lung infection. We herein report an interesting pathogenic cause of UTI in a kidney transplant recipient.

CASE REPORT

A 64 year-old-male kidney transplant recipient presented to us with burning in urine and low-grade fever for 1 day. He had a good baseline graft function (serum creatinine 1.2 mg/dL) on oral prednisolone, 5 mg/day, tacrolimus, 3.5 mg/d, and mycophenolate mofetil 1g/d after 25 months of transplantation. He denied any history of hematuria, chills, pyuria or cough. He did not have any history of UTI in the past. Examination showed a body temperature of 37.5°C, respiratory rate of 19 per minute, pulse rate of 82 per minute, and blood pressure of 118/68 mm Hg. Abdominal examination did not reveal any graft tenderness. Chest, cardiovascular, and neurological examinations were normal. He was advised blood and urine investigations including cultures and started on oral ciprofloxacin, 500 mg twice daily, on outpatient clinic basis for presumed UTI.

Investigations showed total leukocyte count of 14.2×10^9/L with 82% polymorphonuclear cells, blood urea of 67 mg/dL, serum creatinine of 2.1 mg/dL, and normal plasma glucose, electrolytes, and liver function tests. Tacrolimus trough level was 7.1 ng/mL. Urinalysis showed protein 1+, and leukocyte esterase 2+. Urine microscopy revealed 50 to 100 leukocytes per high-power field, 5 to 20 erythrocytes per high-power field, and 1 to 5 leukocyte casts. Urine gram stain showed gram-positive rods.

In the next 48 hours, his condition deteriorated. He became tachycardic, hypotensive, and was hospitalized. Ultrasonography of the urinary tract system showed enlarged, hypoechoic kidney allograft. A diagnosis of acute graft pyelonephritis was made. The patient was given intravenous fluids. Ciprofloxacin was stopped and piperacillin-tazobactum, 2.25 g every 6 hour, was instituted. Tacrolimus was reduced to 2.0 mg/d and Mycophenolate mofetil to 500 mg/d.

Blood cultures were negative, but urine grew *Actinobaculum schaalii*, which was sensitive to piperacillin-tazobactum. The patient responded clinically, repeat cultures were sterile, and therapy was given for 1 week, followed by oral amoxicillin, 500 mg every 6 hour, for 2 more weeks. On follow-up after 2 weeks, serum creatinine was 1.3 mg/dL

and tacrolimus trough level was 4.0 ng/mL. The patient was being regularly followed and did not have any recurrence in the next 6 months.

DISCUSSION

The case is first report of *Actinobaculum schaalii* infection in a renal transplant recipient. *A schaalii* was first described in 1997 by Lawson and coworkers and named after Klaus P Schaalii, a German microbiologist specializing in actinomycete microbiology.[1] Currently, genus *Actinobaculum* includes 4 species: *A schaalii, A massiliae, A suis*, and *A urinale*. These bacteria are nonmotile, nonspore-forming, small, gram-positive, and facultative anaerobic rods inhabiting human genitourinary tract system. The property that it resembles skin and mucosal bacterial and grows relatively slow in culture media, often causes omission of its detection. It is often overlooked if urine is cultured in ambient air or if there is growth of conventional species. Another, clue to its diagnosis comes from gram stain of urine without which it could have been easily missed. Recently, a Danish study of 252 routine urine samples showed that real-time polymerase chain reaction is a good tool for its diagnosis.[2] This infection increases with age and is more common than what the culture results often indicate.[3] Our case too, was an elderly man, however, there are cases of pyelonephritis in pediatric age group also. There is no sex predilection reported for this bug. In another Danish study of 10 cases, 9 were of age older than 60 years and presented with UTI.[4] Only one was an infant with cauda equine syndrome and presented with intradural abscess with fistulation to skin. However, all these patients had structural and functional abnormalities of the genitourinary system, but none of them were post renal transplant or on immunosuppressive agents.

The manifestations caused by this organism include asymptomatic bacteriuria and UTI (most common), osteomyelitis, endocarditis, abscesses, Fournier gangrene, and septicemia.[5-7] We know that the most common causes of UTI in kidney transplant setting is gram negative bacteria like members of family *Enterobacteriaceae*. The usual prescribed antibiotics are flouroquinolones like ciprofloxacin, and co-trimoxazole. However, this organism is usually resistant to them and requires treatment with beta-lactam antibiotics.[8] Thus, whenever, an immunosuppressed patient with UTI episode worsens clinically on conventional treatment, other causes including *A schaalii* should be kept as differential diagnosis in mind. The other issue in its management is optimal duration of its treatment. There are as such no recommendations for duration. We feel that prolonged course of antibiotic for at least 2 to 3 weeks should be given followed by close supervision, lest it may result in fatal complications. In our case, we showed that treating for 3 weeks resulted in successful clinical and laboratory resolution.

To conclude, *A schaalii* could be an important pathogen in renal transplant recipients presenting with UTI and septicemia. Proper management of infection by this overlooked organism warrants correct identification and sensitivity testing of such isolates. Early institution of adequate antibiotic cover is warranted. Though, trimethoprim-sulfamethoxazole prophylaxis in early post transplant period protects against numerous infections, it may not be the case with this organism. The same hold true for ciprofloxacin, which is another commonly used drug for prophylaxis and treatment especially in patients allergic to sulfa drugs. Renal physicians and microbiologists should be careful not to overlook this bacterial pathogen.

CONFLICT OF INTEREST

None declared.

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