A Case of Urinary Tract Infection Caused by *Providencia stuartii* in a Sterile Mid-Stream Urine Sample

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Introduction: Urinary tract infections (UTI) are frequently caused by enterobacteria and most commonly caused by Escherichia coli both in the community and hospital settings. UTIs are diagnosed microbiologically by culturing mid-stream urine sample in non-catheterized patients. Significant bacteriuria is defined as having pure growth of >105 colony forming units/ml of urine. Treatment of UTIs is guided by antibiotic sensitivity testing of the isolated pathogen. Herewith, we report a case of upper UTI with no growth in midstream urine sample.

Case report: A 65-year-old male was admitted to a Private Hospital, Ragama with high spiking fever and left, low backache for four days. His past medical history was unremarkable and renal calculi were not known previously. On examination, he was febrile but systemic examination was uneventful except left loin tenderness. Urine full report was normal except having red cells of 10-5/high power filed. Blood and urine cultures were sterile. Serum creatinine was rising (2.9, 3.01, 4.16 mg/dL). Full blood count showed leukocytosis (11,400–15,900/ mm3) - with neutrophilia (75%-87%). His C-reactive protein levels were rising at 81,93,133 mg/L. Abdominal ultrasound scanning revealed dilated pelvicalyceal system filled with echogenic debris, suggestive of pyonephrosis. Further, left upper ureter was dilated due to obstruction by a 10mm sized calculus.

Ultrasound-guided percutaneous nephrostomy (PCN) was performed and a 7F pigtailed catheter was inserted. Drain fluid was cultured on blood and MacConkey agar and incubated overnight at 370C yielding a heavy growth of Gram-negative bacilli, which were oxidase negative. The pathogen was identified into species level using the RapID™ ONE system as Providencia stuartii. As per antibiotic sensitivity test, the organism was resistant to amoxicillin, gentamicin, cefuroxime, cefotaxime, co-amoxiclav, ciprofloxacin, ceftazidime, co-trimoxazole, piperacillin-tazobactam, and ticarcillin-clavulanic acid. It was sensitive only to amikacin, imipenem & meropenem.

The patient was treated with intravenous ceftriaxone 1g (only one dose) and intravenous ciprofloxacin 400mg twice a day for 2 days. However, the patient did not improve clinically. Since the pathogen was resistant to empiric therapy, the patient was treated with meropenem 1g 8 hourly for one week and the patient had an uneventful recovery.

Conclusion: It is important to note that UTI is a possibility even though urine culture is sterile since bacterial cultures may be negative due to many reasons. Hence, it is important to probe with other means of investigations such as interventional procedures to evacuate possible foci of infection and obtain relevant samples for microbiological identification to confirm the clinical diagnosis and thereby streamline antibiotic therapy.

Keywords: Urinary Tract Infection, Renal Calculi, Mid-Stream Urine Sample

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