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Case Report *Comamonas testosteroni* Blood Stream Infection in A Patient with End-stage Renal Failure on Hemodialysis

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Abstract

We report for the first time in Jordan and probably Arab countries a very rare case of *Comamonas testosteroni* causing blood stream infection in a Sudanese patient with renal failure on hemodialysis whom was waiting for a living-related renal transplant. He was successfully treated with cefepime and had his transplant ten days into his treatment. Post-transplant he did well and was discharged home.

Keywords: *Comamonas testosteroni*, Renal failure, kidney transplant, cefepime, blood stream infection

Introduction

Comamonas testosterone (formerly *Pseudomonas testosteroni*) is a ubiquitous aerobic gram-negative bacillus, motile, glucose non-fermenter, do not form spores. It is found in soil, plants, water saprophytes, and also may be found in humidifier reservoir water, even isolated from dromedary rumen fluid (1). Although it is frequently considered a commensal, it is a potential human pathogen. Attention was drawn to *Comamonas testosteroni* since1987 when reports were accumulating on human infections at different sites, such as cellulitis (2), peritonitis especially with a perforated appendix (3), bloodstream infection (4,5), infective endocarditis (6), purulent meningitis, (7) postoperative endophthalmitis (8) and hemodialysis catheter-related bacteremia (9). It

2013
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may express a putative protein that exhibits similarity to *Pasteurella multocida* (10). Furthermore, some strains of *Comamonas testosteroni* acquired plasmid mediated *bla*NDM1, hampering treatment options in the event this bacterium causes human infections (11). An interesting finding is that a related species i.e. *Comamonas acidovorans* isolated from water pond in South Jordan was found to have an antifungal activity against filamentous fungi and yeasts (12).

The Case

A 47 year old male patient from Sudan, he suffered from end-stage renal disease and maintained on hemodialysis for the last three months through a subclavian central venous catheter before he presented to us. He presented to outpatient clinic for assessment as a kidney transplant candidate. He had been having chills during dialysis session, but no documented fever. Two sets of blood cultures including aerobic and anaerobic bottles grew *Comamonas testosteroni*. Patient hemodialysis catheter (PermaCath) was removed and replaced with a temporary central venous hemodialysis catheter. He was treated with parenteral cefepime (one gram daily for 14 days). Day 4 on treatment, blood culture was sterile. The patients was transplanted from a living-related Kidney donor, meanwhile he was on cefepime without complications. He was maintained on oral cyclosporine 200mg twice daily, Mycophenolate mofetil 360mg twice daily by mouth and prednisone 30mg by mouth twice daily. Also, he was started on oral INH 300mg once daily.

Culture and Identification of *Comamonas testosteroni*

Patients' Blood samples were inoculated into blood culture bottles (BD BACTEC Aerobic/F, Shannon , Ireland). One droplet of the positive growth blood culture was inoculate into BD BACTEC 9120 Blood culture system (Becton, Dickinson and company Franklin Lakes, NJ, USA) was placed on sheep blood agar, chocolate blood agar and Maconkey agar plates (Oxoid Diagnostic Company Ltd, Basingstoke, Hampshire, England) and pricked by sterile needle. Chocolate-agar plates were incubated in micro-aerophilic conditions prepared by a candle jar at $37C^0$. Sheep blood agar plates and MacConkey agar plates were aerobically incubated at $37C^0$ for 24-48 hours. Gram-negative bacterial colonies appeared on blood, chocolate, and MacConkey agar after 24 hours of incubation. Gram staining was performed for both single colonies and patient's blood sample showed gram-negative bacilli. The isolate was catalase negative and oxidase positive. The complementary identical tests were performed using biochemical test (Vitek 2 system, Biomerieux, France, Europe).

Antimicrobials susceptibility tests were performed based on Kirby-Bauer disk-diffusion method on Mueller-Hinton agar plates, antibiotic disk (OXOID Company,England), double-checked by MIC method using Vitek II system (Biomerieux, France, Europe). Finally, this strain was identified as *Comamonas testosterone* with high certainty. The isolated organism was sensitive to cefepime, ciprofloxacin, cotrimoxzole, levofloxacin, ofloxacin, polymyxin B and tigecycline, and was resistant to amikacin, gentamicin, Imipenem, meropenem, and pipracillin/tazobactam with intermediate sensitivity for ceftazidime.

Discussion

Comamonas testosterone has been reported infrequently as a cause of different infections. It was given this name due to its characteristic of utilizing carbon from the metabolism of testosterone (13). Main points worth consideration is that most infections took place in community, rarely occurring

2013
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in nosocomial setting (8), and that most reported patients have somehow immune suppression such as malignancy (4), on hemodialysis patients, (9) alcoholic patient, patient with hepatitis B infection with liver cirrhosis and hepatocellular carcinoma (2), and cholesteatoma (7). This patient has end-stage renal disease, possibly got the infection while he is under outpatient medical care on hemodialysis i.e. healthcare-associated infection, like few previously reported cases.

Comamonas testosteroni treatment is reported mostly utilizing cephalosporins including cefepime, cefoxitine, ceftazidime, ciprofloxacin, imipenem, meropenem and ampicillin once susceptible (4). One case of meningitis was reported to have had failed on ceftriaxone treatment though was *in vitro* susceptible, the patient was switched to meropenem with response (7).

This case report was treated with parenteral cefepime one gram daily with success, adjusted for renal failure before and after kidney transplantation. He was successfully transplanted with a kidney from a living-related donor and was discharged home on immunosuppressive therapy in good health condition.

Conflict of interest

non for all authors.

2013
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