

CASE REPORT

Ochrobactrum anthropi Bacteremia with Variable Clinical Course: Report of Two Cases

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ABSTRACT

Ochrobactrum anthropi is a rare nosocomial pathogen that is manifesting itself mostly in immunocompromised patients and those with indwelling catheters. Identification of the microorganism is challenging and the ability to survive in aquatic surroundings have made it a clinically significant pathogen. Furthermore, the clinical picture of *O. anthropi* infection, is not well described. It may manifest in any form of clinical infections though bacteremia is the most common mode of presentation reported in the limited literature. We report here two cases of *O. anthropi* bacteremia presenting in an immunocompetent and an immunocompromised host respectively with different clinical manifestation and response. In view of the highly variable presentation of *O. anthropi*, a high index of suspicion must be given to at risks patients to ensure the timely diagnosis and optimal clinical outcome.

Keywords: *Ochrobactrum anthropi*; bacteremia; nosocomial

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INTRODUCTION

Ochrobactrum anthropi is an aerobic, motile, gram negative, urease positive, non – lactose fermenting bacillus which belongs to the *Brucellaceae* family (1). It was previously known as the “Achromobacter group Vd”. The current name is derived from the Greek word ochros; this refers to the pale – yellow color of the bacterial colonies. It lives in various habitats and is an emerging nosocomial pathogen due to its affinity for aquatic sources (2). Though perceived to be of low virulence, it can cause significant infection primarily in immunocompromised hosts, particularly when there is a presence of a foreign body or an indwelling catheter. We describe here two rare cases of *O. anthropi* bacteremia that we encountered and their clinical courses.

CASE REPORT

The first case is a 24-year-old Nepalese gentleman, an ice factory worker who was previously well and was admitted to our intensive care unit for severe dengue viral fever complicated with warning signs. Apart from fever he had abdominal pain, vomiting, diarrhea and gum bleeding. In the emergency department, he showed evidence of plasma leakage with reduced air entry and evidence of hemoconcentration in his blood results. He also had transaminitis from acute liver failure and non-

oliguric acute kidney injury. Upon admission to intensive care unit, he was started on piperacillin – tazobactam for possible hospital acquired pneumonia as he had spiking temperature despite being in the critical phase of dengue. After three days of this antibiotic, his blood cultures taken on admission grew *O. anthropi* which was sensitive to gentamicin, meropenem, imipenem and tigecycline with resistance to ceftazidime, cefepime, piperacillin – tazobactam, trimethoprim – sulphamethoxazole and polymyxin B. Decision was made to treat this opportunistic infection as his fever had not settled on the previous antibiotic regime and his infective markers (total white cell count and C – reactive protein) were noted to be in increasing trends. His antibiotic was subsequently changed to meropenem 2g thrice a day for a total of fourteen days and he responded clinically and became afebrile. However three subsequent blood cultures repeated persistently grew *O. anthropi* cultures despite the patient was on the course of meropenem. The patient was noted to have a central line that was inserted during admission to intensive care unit. The central line was removed upon repetitive positive culture results but this did not result in resolution of the bacteremia. In view of the recurrent positive cultures, he was investigated extensively for any specific foci of infection. Echocardiogram, bronchoscopy alveolar lavage with biopsy and computed topography of thorax, abdomen and pelvis turned up to be negative. The subsequent positive cultures demonstrated in vitro sensitivity to ciprofloxacin in addition to imipenem and meropenem. Case was discussed with the infectious disease team and decided to attempt a trial of ciprofloxacin. He was started on intravenous ciprofloxacin 400mg thrice a

day for two further weeks to which he responded and further two blood cultures were negative for *O.anthropi*. He was then discharged well and returned to his home country.

The second case is a 64-year-old Malay gentleman with multiple co-morbidities (diabetes, end stage renal disease (ESRF) on dialysis, hypertension and ischemic dilated cardiomyopathy) who came in with one day history of fever and chills during hemodialysis. His dialysis was done via his right internal jugular dialysis catheter while awaiting maturation of his arteriovenous fistula. During the current admission, he was started on piperacillin – tazobactam as he was treated as presumed hospital acquired pneumonia. Three days later, his blood culture taken on admission showed *O.anthropi*. Sensitivity pattern was towards trimethoprim - sulphamethoxazole and ciprofloxacin. He was then started on intravenous ciprofloxacin for two weeks for which he responded well. Repeated blood culture was negative and patient was discharged well after completing two weeks on antibiotics.

DISCUSSION

The genus *Ochrobactrum* belongs to the *Brucellaceae* family and has nine species out of which only three have been discovered to have clinical significance. This includes *O.anthropi*, *O.intermedium* and *O.pseudointermedium* (3). *O.anthropi* is a strictly oxidative Gram – negative bacillus with a special affinity for aquatic surroundings (1). This is particularly important in a hospital setting as it can survive within intravenous fluids and dialysis liquids. In addition, it also has the ability to adhere to foreign objects making it a rather effective nosocomial pathogen despite its low virulence (2). *O.anthropi* bacteremia has been seen in both immunocompetent and immunocompromised hosts. Factors involved in perpetuating the infection are indwelling catheters, impaired host immunity, prior history of antibiotic exposure, previous surgical procedure with allografts, an accidental wound and concomitant infection with another bacterium (4). Due to the fact that it is a rare pathogen that is only now being recently clinically recognized, it has been misidentified as organisms such as *Ralstonia paucula* and *Brucella* spp in the past (3).

The most common manifestation of *O.anthropi* infection is in the form of bacteremia; however other infections such as infective endocarditis, meningitis, peritonitis, endophthalmitis, septic arthritis and soft tissue infections have been reported (5). Most cases of bacteremia have an indwelling catheter present (4). However, community acquired bacteremia is also possible as the first case worked in an ice factory (1). He also had a central venous catheter which could have acted as an entry point for the opportunistic pathogen. The second is an immunocompromised ESRF patient with a dialysis catheter which puts him into the at-risk

group of contracting this opportunistic infection. His usual dialysis center monthly bacteriology count and endotoxin level for the water distribution system were normal. Certificate of analysis for the dialysate was performed from an accredited laboratory and it was reported as normal as well. There were no other cases from the patient's dialysis center. His infection was cleared rather easily despite his immunocompromised status, suggesting it behaved more like a transient bacteremia than a true line related sepsis. Notably, both patients had not come into contact with each other during their stay in the hospital.

Despite its perceived low virulence, *O.anthropi* is resistant to chloramphenicol and various B – lactams. Both cases were detected via Vitek® method by the microbiology laboratory and tested for the same antibiotics panel. However, for the second case the carbapenem results were not released as part of the general sensitivity list in order to prevent carbapenem misuse. Our first case however demonstrates a possible failure with carbapenem treatment as patient did not achieve clearance of the organism from his repeated blood cultures and required a fluoroquinolone which eventually proved to be effective. The second case also had a different clinical course as he responded to fluoroquinolones. It is worth noting that case of clinical failure with fluoroquinolone despite showing in vitro sensitivity has been reported (5). Also, of note is that there have been reports of patients who have improved despite having received no antibiotics treatment. Mortality risks are relatively low but have mortality as high as 50% has been reported (1,5). Nevertheless the cause of death is usually not directly related to the *O.anthropi* infection.

CONCLUSION

We have put forth two cases of *O.anthropi* bacteremia that are contrasting in predisposing factors, immune status, clinical presentation, sensitivity to carbapenem and course of the illness. From these two cases, we conclude that *O.anthropi* is an emerging nosocomial pathogen that deserves medical attention due to the varied habitat it resides in and its clinical significance in immunocompromised patients with indwelling catheters. Treatment may or may not be required depending on patient's clinical condition and failure of carbapenem though rare, must be kept in mind as a possible sequela. In view that majority of our patients fall into the at-risk group for this infection, this microorganism should be kept in consideration when treating these patients. In addition, infection control measures should be in place to prevent the spread of this organism.

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