

Achromobacter denitrificans Bacteremia, as PUO in a Immunocompetent Individual, with False Positive Malaria

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Abstract

We are reporting a case of PUO in a young male with no underlying co-morbidities, which was managed as plasmodium malaria due to false positive card test initially but later found to be due to a gram negative bacteria *Achromobacter denitrificans* (*A. denitrificans*), which was sensitive to cephalosporin. The patient was treated with ceftriaxone and got cured. To our knowledge *A. denitrificans* bacteremia with sensitivity to cephalosporin's in a immunocompetent person with no underlying illness, hospitalization or in person who has never underwent any medical procedure has never been described in medical literature before.

Keywords: *Achromobacter denitrificans*; PUO; Cephalosporin sensitive

Case Report

We report a case of 23 year old unmarried male graduate student with no underlying co morbidities who presented as fever with chills of 22 days duration. Fever was continuous, high grade with no specific diurnal variation and was relieved only by antipyretics. There was no obvious source of infection. There was no history of prior admission to any hospital or healthcare institution. On general examination, patient was conscious, well-oriented. He had a pulse rate of 110/min, blood pressure of 100/60 mmHg, respiratory rate of 24 cycles/min. Room air oxygen saturation was around 95%. Rest of the systemic examination was unremarkable. Hemogram was normal and manual peripheral blood film did not reveal any atypical cells or evidence of malaria. Liver functions, kidney function, LDH, CPK, serum electrolytes, ESR, CRP, stool and urine examination were within normal range. Stool, urine cultures were sterile. Serology for hepatotropic, EBV, CMV and retrovirus were negative. Chest X-ray, ECHO was normal. Tuberculin skin test was negative. Serum and urine electrophoresis was normal. Acid fast bacilli were not seen in three consecutive early morning samples of urine. Ultrasound abdomen and neck was normal. MAT for Brucella revealed low titres and widal serology was repeated which didn't show any rising titre. There was no evidence of any malignancy as whole body scan was normal. Bone marrow aspirate and Biopsy and gut screening was also negative. Tumour markers were also negative. The patients initially presented to OPD where *Plasmodium falciparum* card test was done which was positive and patient received oral Artesunate, Doxycycline and Clindamycin but didn't show improvement. Initial blood cultures were sterile multiple times. Repeat Blood culture was carried out with the help of calorimetric VITEK-2 card identified *A. denitrificans*, repeatedly on two samples without any concurrent infection. It was sensitive to ceftriaxone, imipenem, piperacillin, ticarcillin, trimethoprim-sulfamethoxazole and third generation cephalosporins. It was resistant to Amikacin, Gentamicin, fluoroquinolones, tigecycline and colistin.

Injection ceftriaxone 2 g intravenously every 12 hrly was started. He showed symptomatic improvement after 5 days. Blood culture repeated after 7 days was sterile. Ceftriaxone was deescalated to 1 g 24 hrly and continued for 7 more days. Blood culture repeated 14 days after starting of ceftriaxone did not detect growth of any pathogen.

Discussion

Most febrile illnesses either resolve before a diagnosis can be made or develop distinguishing characteristics that lead to a diagnosis. PUO

was originally defined by Petersdorf and Beeson in 1961 as illness of >3week's duration with fever of >38.3°C (101 F) on two occasions and an uncertain diagnosis despite 1 week of inpatient evaluation in a Immunocompetent as well as in a immunosuppressant individual. This definition of PUO has been modified by the exclusion of immunocompromised persons and inpatient evaluation as former requires a completely different diagnostic and therapeutic approach and in case of latter most of the PUO patients are now hospitalised not for diagnostic purposes only. Accordingly, PUO is now defined as fever of >38.3°C (101 F) occurring in a Immunocompetent individual documented on at least two occasions with diagnosis remaining uncertain after a thorough history taking, physical exam and certain obligatory investigations. These investigations include erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), haemoglobin, leukocyte count and differential, platelet count, electrolytes, creatinine, total protein, alkaline phosphatase, alanine aminotransferase, aspartate aminotransferase, lactate dehydrogenase, creatine kinase, ferritin, antinuclear antibodies, rheumatoid factor, protein electrophoresis, urine analysis, urine culture blood culture (n=3) chest x-ray, abdominal ultrasonography and tuberculin skin test. *A. denitrificans* causing PUO a young patient with false positivity with malaria and sensitivity to cephalosporin's is not known. *A. denitrificans* is a gram negative bacterium previously known as *A. denitrificans* and only recently classified as *Achromobacter* [1]. *A. denitrificans* are mobile, strictly aerobic, ubiquitous bacteria not fermenting glucose, catalase and oxidase positive. These bacteria are present in soil and water and only rarely cause human infections. The micro-organism has been associated with the infusion of contaminated IV solutions or with the use of Humidifiers and incubators [2]. In immunocompromised patients and in patients with underlying co morbidities, this bacterium has occasionally been isolated from the blood, peritoneum, pleural liquid, sweat, respiratory secretions and urine [3] and almost all isolates were resistant to cephalosporins. The identified risk factors for *Achromobacter* infection are: immunodeficiency, HIV infection,

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malignancy, Cystic fibrosis and hospitalization [4]. Community acquired infections are rarely observed in patients with cystic fibrosis [5]. Most of the infections are asymptomatic. The symptomatic cases range from natural-valve or prosthetic valve endocarditis to meningitis, pneumonia, peritonitis, conjunctivitis, osteomyelitis, intra-abdominal abscess, and prosthesis infections [6]. To our knowledge *A. denitrificans* bacteremia with sensitivity to cephalosporin's in a immunocompetent person with no underlying illness, hospitalization, or in person who has never underwent any medical procedure has never been described in medical literature before. Bacteremia, often seen in patients who are catheterised, is the most common infection caused by this organism and is sometimes polymicrobial. In 28% of cases it presents as co-infection with coagulase-negative staphylococci [7]. The mortality rate of *Achromobacter* infections ranging from 3% for primary bacteriemia or catheter-related infections, to 80% in severe neonatal infections [8]. It is increased in patients over 65 years old, in neutropenic subjects and in nosocomial and/or polymicrobial infections. Although high levels of resistance to cephalosporin's, aminoglycoside, and quinolone have been reported *Achromobacter* is usually sensitive to common antibiotics like cotrimoxazole, piperacillin-tazobactam, meropenem and ceftazidime.

Conclusion

The problem that is being addressed here in this case is the occurrence of fever in a young Immunocompetent male in developing country like India where other causes of fever like Malaria, TB and Typhoid are common causes, PUO can be due to *A. denitrificans* with false positivity with malaria and sensitivity to cephalosporin's and

the aim this report is to consider this entity while treating PUO in a developing country and not to treat these patients for malaria.

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