MYCOBACTERIUM FORTUITUM BACTERAEMIA IN AN IMMUNO COMPROMISED PATIENT

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Abstract

A case of Mycobacterium fortuitum bacteraemia in an immunocompromised patient confirmed by four positive serial blood cultures is reported here. The patient was a known case of acute lymphoblastic leukemia (ALL) on intensive chemotherapy. The source of bacteraemia was most probably a peripherally inserted vascular catheter. After initiation of treatment with amikacin to which the strain was sensitive and clarithromycin and removal of the central line the patient’s fever defervesced and repeat blood cultures were negative. This is the first time we have encountered an immunocompromised patient with M. fortuitum septicaemia in our hospital. The possibility of an infection with rapidly growing mycobacteria is important to consider when conventional organisms are not isolated in culture especially in the context of patients with malignancy.

Key words: Mycobacterium fortuitum, Bacteraemia, Immunocompromised

Case Report

Atypical mycobacteria are known human pathogens and can cause disease in both healthy and immunocompromised individuals. According to Runyon’s classification, there are four groups, Group IV being termed as Rapid growers with Mycobacterium fortuitum and M. chelonae being the commonly isolated pathogens in this group. They most often cause cutaneous disease but rarely cause disseminated infections.1

In the department of microbiology at CMC Hospital, Vellore, we have isolated M. fortuitum from a variety of specimens, mainly from pus and tissue biopsy (unpublished data). We have earlier reported an isolation from blood and CSF culture2 in a patient who developed endocarditis and meningitis following a balloon mitral valvotomy. We report presently an immunocompromised patient who had M. fortuitum bacteraemia as confirmed by four positive serial blood cultures.

Case Report

A 27 year old lady, a known case of acute lymphoblastic leukaemia (ALL) on intensive chemotherapy using the ALL-BFM86 relapse protocol, presented with fever of one week’s duration following recovery from chemotherapy related neutropenia. There were no localizing symptoms except for a mild non-productive cough. Clinical examination was unremarkable except for a fever of 101°F. There was no sinus tenderness, no evidence of skin or soft tissue infections.

Laboratory investigations showed haemoglobin: 9.5G/L; total white blood cell (WBC) count, 3.1 x 10⁹/L; differential WBC count, neutrophils 62%, lymphocytes 32%, band forms 3%, monocytes 1%, eosinophils: 2%; platelet count, 249 x 10⁹/L. Liver function tests and renal function test were normal; ultrasound abdomen and X-ray of the paranasal sinuses were normal. Initial blood cultures (3 in number) sent on the first day of fever were sterile and Chest X-ray was unremarkable. Since she had a peripherally inserted catheter (PICC), a diagnosis of probable line infection was considered and the catheter was removed, tip sent for routine culture and patient was started on single agent cefotaxime; there was defervescence of fever in 72-96 hours. Smear and routine culture from the tip of the central venous catheter remained sterile.

Mycobacterium fortuitum was isolated from four consecutive blood cultures sent three weeks after the initial blood cultures. The patient was given a combination of clarithromycin (500 mg twice daily) for four weeks, ciprofloxacin (750 mg twice daily) and amikacin (15 mg/kg/day) for two weeks. A repeat blood culture sent at the end of two weeks of therapy was sterile.

Blood culture was carried out in the BacT ALERT (bioMerieux Pvt. Ltd.) automation system. The media used was the Fan Aerobic medium provided by the manufacturers. When the machine gave a positive signal, a smear was made and subculture on blood agar and MacConkey agar was done. Detailed microbiological characterization was carried out using standard procedures.3 The catheter tip was cultured on blood agar, MacConkey agar and thioglycollate broth.3

Smears of colonies from blood agar revealed gram positive bacilli. which were negative for metachromatic granules with Alberts and Ponders stain. They were catalase positive, oxidase negative and did not produce H₂S on triple sugar iron medium. Acid fast staining showed short regularly stained acid...
Discussion

Results of tests carried out for speciation of rapidly growing mycobacteria are given in the table. The organism was susceptible to ciprofloxacin, gentamicin, amikacin, ofloxacin and tetracyclin and resistant to chloramphenicol, erythromycin, vancomycin, cotrimoxazole, rifampicin, piperacillin and triple sulphadiazine.

Disseminated infection with the rapidly growing Mycobacterium fortuitum is rare, although cutaneous infections are known to occur. At the CMC Hospital, Vellore, we have isolated M. fortuitum from patients with skin and subcutaneous infections. We have also earlier reported a case of M. fortuitum endocarditis and meningitis after balloon mitral valvotomy. This is the first time we have encountered an immunocompromised patient with M. fortuitum septicemia. Although four consecutive blood cultures grew the organism, the central venous catheter tip did not culture the same organism. This is difficult to explain since a review of medical literature shows that bacteraemia is most often secondary to a catheter infection. However, we have only carried out qualitative and not semiquantitative culture as suggested. Also culture plates were discarded after 48 hours and not held for more than one week the thioglycollate broth was kept for one week and subcultured. The PICC catheter used in the patient was a single lumen non-tunneled polyurethane (Braun cava fix) type and there was no evidence of catheter site or track inflammation.

An underlying immunosuppressed condition and presence of a long term central venous catheter are predisposing risk factors for M. fortuitum septicemia as was seen in our patient. The patient presented with fever with no localizing symptoms. A catheter infection was suspected but routine cultures were negative. Four consecutive blood cultures positive for M. fortuitum, when three blood cultures taken three weeks earlier were negative, suggests an aetiological significance. The patient can be considered to have probable catheter related bacteraemia due to M. fortuitum.

Treatment directed at this cleared the bacteraemia and a repeat blood culture, taken two weeks after initiation of treatment with amikacin and clarithromycin and removal of the central venous catheter, was negative. Awareness of possible infection with rapidly growing mycobacteria is important, especially when there are underlying conditions. Vascular catheters should be considered as a source of bacteraemia due to M. fortuitum in patients with cancer when cutaneous lesions compatible with dissemination are absent. The laboratory needs to be alerted so that appropriate procedures can be included. Appropriate treatment prompted by antibiotic susceptibility test results and catheter removal (if present) helps to successfully eradicate infection.

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![Figure: Acid fast bacilli seen in smear of colonies from blood agar](x1000)

Fast bacilli (Fig.).

Table: Speciation of the atypical mycobacteria

| Test                  | Result   |
|-----------------------|----------|
| 1. Rate of growth     | 2 days   |
| 2. Growth at 25°C     | +        |
| 3. 37°C               | +        |
| 4. 45°C               | +        |
| 3. Aryl Sulphatase test 3 days | +        |
| 4. 14 days            | +        |
| 5. Nitrate reduction  | not pigmented |
| 6. Growth on MacConkey agar | + |
| 7. Citrate utilization| -       |
| 8. Tolerance to 5% NaCl| +        |
| 9. Urease production  | -       |
| Identification        | Rapidly growing Mycobacteria |
| Identification        | Mycobacteria |
| Identification        | Mycobacterium fortuitum |