Culture of *Mycobacterium kansasii* in the blood of an HIV negative patient

D Veale, D Fishwick, J E S White, A D Gascoigne, K Gould, P A Corris

**Abstract**

A 23 year old man with a congenital myelodysplastic disorder and fibrosing lung disease received treatment with prednisolone. After nine months his condition deteriorated and *Mycobacterium kansasii* was isolated from blood cultures and lymph node biopsy specimens. He responded to antituberculous treatment. *M kansasii* has not previously been isolated from the blood stream of HIV negative patients.

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Mycobacterial bacteraemia with organisms other than *M tubercolosis* (mycobacteria other than tuberculosis, MOTT) is not unusual in patients with acquired immunodeficiency syndrome (AIDS),1 and the *M avium* complex is the most frequently isolated subtype.2 There are few reports of isolation of non-tuberculous mycobacteria from blood cultures in non-HIV patients.3 We report a young man with a familial myelodysplasia and persistent Epstein-Barr virus infection who developed widespread *M kansasii* infection with isolation of the organism from blood cultures.

**Case report**

A 23 year old man developed fever and rigours five weeks after returning from a holiday in Spain. He then developed a cough with clear sputum and nausea. In his past history he had suffered severe varicella and recurrent herpes simplex infections and a persistent Epstein-Barr virus infection from the age of 20 years. An older brother had died of refractory anaemia with excess lymphoblasts. Genetic studies had determined familial dysplasia with constitutional inversion of chromosome 1.4 Immunological studies had shown leucopenia with a profound lymphopenia but no other abnormality. On examination he had gross digital clubbing and generalised lung crackles. White blood cell count (WBC) was 0·9 × 10^9/l and he was HIV antibody negative. Chest radiography showed diffuse patchy parenchymal shadow-
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ing. He was treated with broad spectrum antibiotics but showed no clinical response and was referred to the regional respiratory centre. Open lung biopsy samples showed desquamative pneumonitis typical of Hamman-Rich syndrome. Specimens were cultured and examined on a weekly basis, but there was no evidence of fungi, mycobacteria, or pneumocystis pneumonia after eight weeks. He was treated with high dose steroids and showed an immediate clinical and functional improvement.

Twelve months later, while taking 20 mg prednisolone and acyclovir 200 mg three times a day, he became unwell and had a recurrence of fever. No lymph nodes were palpable but he had persistence of lung crackles. His haemoglobin was 9.2 g/dl and his WBC $1.4 \times 10^9$/l. One week later repeat chest radiography showed the new development of mediastinal adenopathy and a diagnosis of Epstein-Barr driven lymphoma was suspected. Large fleshy lymph nodes were found at mediastinoscopy, and histological examination revealed numerous acid fast bacilli which proved to be M kansasii on culture. He also developed a large pericardial effusion which required drainage. He was initially treated with standard antituberculous chemotherapy comprising rifampicin, isoniazid, and pyrazinamide, but ciprofloxacin with gradual and sustained improvement. M kansasii was isolated from blood cultures, sputum, pericardial fluid, and mediastinal tissue. All specimens were inoculated onto Lowenstein Jensen slopes and tissue specimens into Kirchner's broth. Blood cultures were inoculated directly into the broth, then saponised. The organism was sensitive to rifabutin, rifampicin, ethambutol, and ciprofloxacin with gradual and sustained improvement. M kansasii was isolated from blood cultures, sputum, pericardial fluid, and mediastinal tissue. All specimens were inoculated onto Lowenstein Jensen slopes and tissue specimens into Kirchner's broth. Blood cultures were inoculated directly into the broth, then saponised. The organism was sensitive to rifabutin, rifampicin, ethambutol, and ciprofloxacin with gradual and sustained improvement. M kansasii was isolated from blood cultures, sputum, pericardial fluid, and mediastinal tissue. All specimens were inoculated onto Lowenstein Jensen slopes and tissue specimens into Kirchner's broth. Blood cultures were inoculated directly into the broth, then saponised. The organism was sensitive to rifabutin, rifampicin, ethambutol, and ciprofloxacin with gradual and sustained improvement. M kansasii was isolated from blood cultures, sputum, pericardial fluid, and mediastinal tissue. All specimens were inoculated onto Lowenstein Jensen slopes and tissue specimens into Kirchner's broth. Blood cultures were inoculated directly into the broth, then saponised. The organism was sensitive to rifabutin, rifampicin, ethambutol, and ciprofloxacin with gradual and sustained improvement. M kansasii was isolated from blood cultures, sputum, pericardial fluid, and mediastinal tissue. All specimens were inoculated onto Lowenstein Jensen slopes and tissue specimens into Kirchner's broth. Blood cultures were inoculated directly into the broth, then saponised. The organism was sensitive to rifabutin, rifampicin, ethambutol, and ciprofloxacin with gradual and sustained improvement. M kansasii was isolated from blood cultures, sputum, pericardial fluid, and mediastinal tissue. All specimens were inoculated onto Lowenstein Jensen slopes and tissue specimens into Kirchner's broth. Blood cultures were inoculated directly into the broth, then saponised. The organism was sensitive to rifabutin, rifampicin, ethambutol, and ciprofloxacin with gradual and sustained improvement. M kansasii was isolated from blood cultures, sputum, pericardial fluid, and mediastinal tissue. All specimens were inoculated onto Lowenstein Jensen slopes and tissue specimens into Kirchner's broth. Blood cultures were inoculated directly into the broth, then saponised. The organism was sensitive to rifabutin, rifampicin, ethambutol, and ciprofloxacin with gradual and sustained improvement. M kansasii was isolated from blood cultures, sputum, pericardial fluid, and mediastinal tissue. All specimens were inoculated onto Lowenstein Jensen slopes and tissue specimens into Kirchner's broth. Blood cultures were inoculated directly into the broth, then saponised. The organism was sensitive to rifabutin, rifampicin, ethambutol, and ciprofloxacin with gradual and sustained improvement. M kansasii was isolated from blood cultures, sputum, pericardial fluid, and mediastinal tissue. All specimens were inoculated onto Lowenstein Jensen slopes and tissue specimens into Kirchner's broth. Blood cultures were inoculated directly into the broth, then saponised. The organism was sensitive to rifabutin, rifampicin, ethambutol, and ciprofloxacin with gradual and sustained improvement. M kansasii was isolated from blood cultures, sputum, pericardial fluid, and mediastinal tissue. All specimens were inoculated onto Lowenstein Jensen slopes and tissue specimens into Kirchner's broth. Blood cultures were inoculated directly into the broth, then saponised. The organism was sensitive to rifabutin, rifampicin, ethambutol, and ciprofloxacin with gradual and sustained improvement.

**Discussion**

M kansasii has been isolated from many environmental sources including tap water and grows best at $37^\circ$C. It is usually sensitive to rifampicin and ethambutol. In immunocompetent patients treatment for between three and 24 months resulted in cure in all cases with no relapses after a mean follow up of five years. M kansasii has been recorded in pericardial effusion in one previous report. Disseminated infection with MOTT was first reported by Koch and Rabinowitch in 1907. There have been numerous reports of disseminated M avium complex infection in patients with AIDS, but a study of 134 patients who were immunosuppressed from causes other than HIV showed no isolation of MOTT. Disseminated infection with M kansasii has been reported in patients with AIDS. Pierce et al isolated MOTT from blood in eight patients with non-HIV related immunodeficiency disorders, all of whom were on long-term steroids for a variety of conditions including preleukaemia, but in none of these was the organism M kansasii.

Bacteraemia with mycobacteria other than M avium complex is a rare event and occurs most commonly in immunosuppressed patients. Isolation of M kansasii from blood is rare in HIV patients and previously unknown in non-HIV patients. It may be that this organism is seldom present in blood, but it is most probably because blood culture specimens are taken too infrequently. Technical inadequacies may also play their part, but the development of radiotracers for detection methods may improve the yield of positive results. As MOTT in immunosuppressed patients may well be more responsive to treatment in non-HIV patients than in those with HIV, it is important to culture specimens including frequently obtained blood samples for a prolonged period with appropriate media in relevant clinical situations.

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