First Pulmonary Case Reported in Argentina of Infection with Mycobacterium szulgai, a Rare Pathogen

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Mycobacterium szulgai is a rare pathogen. Nontuberculous mycobacteria usually produce disease in people with some kind of immunosuppression or another predisposing condition. A case of pulmonary Mycobacterium szulgai infection is described.

CASE REPORT

A 70-year-old male patient had lived in the United States for the previous 30 years. He had traveled to Argentina and presented to the Hospital Carlos Durand 2 months later due to weight loss, abdominal pain, a cough with the excessive production of mucus, and asthenia. He explained that the symptoms appeared some months before his journey to Argentina. He first presented due to increased symptom intensity and was referred for abdominal pain. He was a heavy smoker (110 packs/year) and alcoholic and had completed treatment for pulmonary tuberculosis 2 years before visiting Hospital Carlos Durand. He did not have diabetes or a history of other comorbidities. He had worked as a car body painter for the previous 25 years, had lived in the suburbs of New York City, and had no other relevant history. A chest X ray, routine laboratory tests, and a sputum smear were required. Blood tests evidenced a hemoglobin level of 11.1 g/dl (normal level, 12 to 16 g/dl) and a white blood cell count of 27,600/mm³ (70% polymorphonuclear leukocytes). Enzyme-linked immunosorbent assays for both human immunodeficiency virus (HIV) types 1 and 2 were nonreactive. The chest X ray revealed heterogeneous opacity on both upper fields and on the left medium field. Sputum samples were sent to the microbiology unit of the Hospital Enrique Tornu. Positive smears (+ + with auramine O stain) for acid-fast bacilli were obtained for three of three sputum samples. Therefore, treatment with isoniazid, pyrazinamide, ethambutol, and rifampin (at the usual doses, according to the patient’s weight and age) was started, after a diagnosis of pulmonary tuberculosis was presumed. The patient was taken to the operating room due to the worsening of his abdominal pain. Neither bleeding nor a tumor was evidenced during surgery. Only signs of intestinal inflammation were observed. A biopsy sample of the large intestine was taken. The patient was hospitalized for 5 days and was then discharged. However, outpatient treatment and follow-up at the surgery service and the pulmonary medicine service were indicated. The biopsy sample revealed adipose fibroconnective tissue with mononuclear inflammatory infiltrates and vascular congestion (unfortunately, biopsy material was not submitted to the bacteriology laboratory). Twenty-five days after culture, the development of a scotochromogen mycobacterium was observed in the three sputum samples (the MGIT 960 system [Becton Dickinson] and Lowenstein-Jensen medium were used). The mycobacterium was identified as Mycobacterium szulgai by biochemical tests: positivity for nitrate reduction, Tween 80 hydrolysis, catalase at 68°C, and urease (as confirmed by the Instituto Nacional de Enfermedades Infecciosas Dr. Carlos Malbrán, Buenos Aires, Argentina).

Adequate treatment for the infection caused by this mycobacterium was prescribed, including clarithromycin at 500 mg every 12 h, ethambutol at 25 mg/kg of body weight/day, and rifampin at 600 mg/day, since the isolate was reported to be sensitive to macrolides and experts recommend treatment with three-drug regimens like the one indicated here.

In our case, good progression and treatment adherence were observed: the patient’s clinical condition improved, as the patient gained weight and progressively stopped coughing. The culture became negative at 6 months. Computed tomography of the chest, performed 7 months after treatment was initiated, showed that the lingula airspace was minimally affected, in contrast to the first scan, on which considerable compromise could be seen (Fig. 1C). The patient was discharged 12 months later. He returned to the United States as soon as he finished his treatment, so no follow-up could be done after his departure.

Environmental mycobacteria have a wide distribution in the environment, with water being their main reservoir (1). These are nonpathogenic bacteria, provided that there is no mycobacterium-host interaction favoring disease development. Despite their ubiquitous distribution, their spread from person to person has not been reported (2). The most widely accepted type of transmission is aerosolization through the respiratory tree. The species of nontuberculous mycobacteria most frequently cultured from clinical specimens are Mycobacterium avium complex and Mycobacterium kansasii (respiratory pathology).

Mycobacterium szulgai was described in 1972 (3). Thereafter, very few cases have been reported in the literature (4).
FIG. 1. Computed tomography of the chest showing subpleural blebs in the biapical region, bronchiectasis in the posterior segment of the right upper lobe, and a cavitated image of thin walls in the left upper lobe (A and B), as well as the affected airspace in the lingula, as detected with an air bronchogram (C).
This rare pathogen may cause pulmonary disease in patients with a history of alcoholism, cigarette smoking, obstructive pulmonary disease, any type of immunosuppression (5), etc. Our patient had a history of daily exposure to a constantly aerosolized environment (as a result of his job), which, as it has been largely described in the literature, is suitable for the access of environmental mycobacteria to the respiratory tree, especially in immunocompetent patients. Investigators have reported another case of environmental mycobacteriosis in an immunocompetent patient with a work history of floor polishing (6). Pulmonary infection by this pathogen cannot be clinically distinguished from pulmonary tuberculosis. Therefore, the decision to start antituberculous treatment was, to our knowledge, wise, since 98% of the positive sputum smears in our setting are associated with tuberculous infections (and their epidemiological implications).

Microbiologically, Mycobacterium szulgai is a unique pathogen. The production of its characteristic pigment depends on the incubation temperature. Thus, it is a scotochromogen (forming a pigment when it is incubated in light and darkness) at 37°C, and it is a photochromogen (forming a pigment only when it is exposed to light) when it is incubated at 25°C. This mycobacterium forms smooth or rough colonies on solid medium within the first 3 weeks of incubation. It is characterized by reducing nitrates into nitrites, by Tween 80 hydrolysis, and by having arylsulfatase activity, among other tests.

The case described here is consistent with the description reported in the scarce literature on the clinical management of pulmonary disease caused by this mycobacterium. Some questions remain unanswered: was the first episode of pulmonary disease caused by the mycobacterium (which was diagnosed as pulmonary tuberculosis) really tuberculosis, or was it already the manifestation of the pulmonary mycobacteriosis that we diagnosed on our service? Was the abdominal condition caused by mycobacterial disease itself?

Wide clinical suspicion and personal experience with the treatment of patients with mycobacteriosis is required in order to reach a diagnostic suspicion for this type of low-prevalence disorder. This is particularly so for HIV-negative patients, since in our setting there is the incorrect belief that environmental mycobacterioses are associated only with AIDS (7). The use of state-of-the-art automated culture systems, such as the one that we have at the Hospital Enrique Tornú, and the work of qualified mycobacteriologists are of the utmost importance for reaching the correct diagnosis, since only through use of the appropriate bacteriological tests could a final diagnosis be made.

REFERENCES


