**Mycobacterium shinjukuense** Lung Disease that was Successfully Treated with Antituberculous Drugs

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**Abstract**

An 80-year-old woman was referred to our hospital due to a persistent productive cough. Acid-fast staining and a commercial *Mycobacterium tuberculosis* identification kit with TRC (TRC kit) were positive. However, a false-positive result on the TRC kit was suspected because *Mycobacterium tuberculosis* was not detected in the sputum culture. Finally, *Mycobacterium shinjukuense* was detected in an analysis of the rpoB and hsp65 gene sequences. As the diagnostic criteria proposed by the American Thoracic Society were met, a diagnosis of *Mycobacterium shinjukuense* lung disease was made. Following treatment with isoniazid, rifampicin and ethambutol with drug susceptibility, the patient’s acid-fast culture became negative, and the areas of opacity improved.

**Key words:** *Mycobacterium shinjukuense* lung disease, antituberculous drugs

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**Introduction**

Nontuberculous Mycobacteria (NTM) lung disease is a common infectious lung disease, and many studies suggest that the incidence of NTM lung disease is increasing in developed countries (1-3). Many NTM pathogens have been identified thus far. Recently, Saito et al. reported a novel NTM pathogen, *Mycobacterium shinjukuense* ([*M. shinjukuense*]) (4); however, its clinical features and treatments have not yet been established.

We herein report a case of *M. shinjukuense* pulmonary infection that was successfully treated with antituberculous drugs.

**Case Report**

An 80-year-old woman was referred to our hospital due to a persistent productive cough. Her symptoms had appeared when she was approximately 72 years old, and she visited a neighborhood clinic in May 2010. Although NTM lung disease was suspected based on her history and radiological findings, she had been followed without medication because the areas of opacity on chest computed tomography (CT) had not changed. In September 2010, however, due to deterioration of her respiratory symptoms, she was referred to our hospital for a further examination. She was afebrile, and her vital signs were normal. The lymph nodes were not palpable, and pulmonary auscultation was normal. Chemical and hematologic laboratory tests were unremarkable. A chest X-ray showed granular and nodular shadows in the bilateral middle and lower lung fields. CT of the chest (Fig. 1a) revealed ground-glass opacity and nodes with bronchiectasis primarily in the middle and lingual lobes. Acid-fast staining of the sputum and a commercial *Mycobacterium tuberculosis* (*M. TB*) identification kit with TRC (TRCRapid M. TB Tosoh corporation; Tokyo, Japan) (TRC kit) were positive. Therefore, a diagnosis of pulmonary tuberculosis was made, and the patient received antituberculous therapy with isoniazid (INH) (300 mg/day), rifampicin (RFP) (450 mg/day) and ethambutol (EB) (750 mg/day).

However, *M. TB* was not detected in her sputum culture, instead *M. shinjukuense* was detected in an analysis of the rpoB and hsp65 gene sequences (Fig. 2). The diagnostic cri-
Figure 1. CT of the chest revealed ground-glass opacity and nodes with bronchial ectasia primarily in the middle and lingual lobes (a). The areas of ground-glass opacity and nodes improved following the administration of chemotherapy with isoniazid, rifampicin and ethambutol (b).

Figure 2. Results of the analysis of the rpoB (a) and hsp65 (b) gene sequences showed that the isolate was M. shinjukuense. Query: reference gene sequence of M. shinjukuense. Sbjct: gene sequence of the present case.

Discussion

*M. shinjukuense* was first reported by Saito et al. in 2010 (4). In their study, only two of seven cases met the diagnostic criteria for NTM lung disease proposed by the ATS. In addition, the clinical course, such as medications and treatment efficacy, was not mentioned. Regarding the treatment of *M. shinjukuense*, there exists only one case report describing the efficacy of chemotherapy with clarithromycin (CAM), RFP and EB (6). Therefore, this is the first case report to describe a case of *M. shinjukuense* lung disease that was successfully treated with standard antituberculous drugs. The 64-year-old woman described in the previous case report received CAM, RFP and EB because the isolate was sensitive to CAM, RFP and EB (6). Meanwhile, in our case, the isolate was sensitive to antituberculous...
Based on these reports, making the diagnosis of Mycobacterium tuberculosis Complex assay (10). Somoskovi et al. reported the cross-reaction of false-positive results with the Hain Geno type CM kit (9). To elucidate the clinical features of lung disease that responded to standard antituberculous drugs. It is necessary to accumulate more cases in order to keep the possibility of false-positive results in mind.

Initially, the patient was thought to have pulmonary tuberculosis because the TRC kit was positive. This kit is comparable in sensitivity and superior in specificity to commercial polymerase chain reaction (PCR) kits for detecting M. TB in sputum samples (7). It also has high sensitivity and specificity for detecting M. TB in non-respiratory specimens (8), such as gastric aspirate, cerebrospinal fluid and so on, and can detect M. TB faster than PCR kits (within three hours). However, the disadvantage is that the kit works by detecting the 16S rRNA gene sequence of M. TB, which has been reported to be similar between M. TB and M. shinjukuense (4). This similarity is believed to be the cause of false-positive results obtained with the TRC kit (4). In addition to M. shinjukuense, some NTM pathogens have been reported to cross-react with commercial M. TB identification kits. van Ingen et al. reported that M. riadyhense exhibits false-positive results with the Hain Geno type CM kit (9). Somoskovi et al. reported the cross-reaction of M. celatum in the AcubeProbe M. tuberculosis Complex assay (10). Based on these reports, making the diagnosis of M. TB using commercial M. TB identification kits requires attention, keeping the possibility of false-positive results in mind.

In summary, we herein reported the first case of M. shinjukuense lung disease that responded to standard antituberculous drugs. It is necessary to accumulate more cases in order to elucidate the clinical features of M. shinjukuense. It is also important to note that making the diagnosis of M. TB using commercial M. TB identification kits must be done cautiously, while carefully paying attention to the possibility of false-positive results.

The authors state that they have no Conflict of Interest (COI).

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References


Table. Results of Drug Susceptibility Test of M. shinjukuense in This Case

<table>
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<tr>
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<th>concentration (µg/mL)</th>
<th>sensitivity</th>
<th>drug</th>
<th>concentration (µg/mL)</th>
<th>sensitivity</th>
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The proportion method.