A Fatal Case of Acute Respiratory Failure Caused by *Mycobacterium massiliense*

Kyoung Hwa Choi, M.D., Ph.D., Hae Min Yu, M.D., Jae Seok Jeong, M.D., So Ri Kim, M.D., Ph.D., Yong Chul Lee, M.D., Ph.D.

1Division of Pulmonology, Department of Internal Medicine, Presbyterian Medical Center, 2Department of Internal Medicine, 3Research Center for Pulmonary Disorders, Chonbuk National University Medical School, 4Research Institute of Clinical Medicine of Chonbuk National University—Biomedical Research Institute of Chonbuk National University Hospital, Jeonju, Korea

Few recent reports have indicated that *Mycobacterium massiliense* causes various infections including respiratory infection. However, there is scarce information on the clinical significance, natural history of the infection, and therapeutic strategy. This report describes a case of an immunocompetent old man infected by *M. massiliense* that causes acute respiratory failure. In light of the general courses of non-tuberculous mycobacterium infections, rapid progression and fatality are very rare and odd. In addition, we discuss the biological and pathological properties of *M. massiliense* with the review of cases reported previously including our fatal one.

**Key Words:** *Mycobacterium; Mycobacterium Infections, Nontuberculous; Respiratory Insufficiency*

Introduction

*Mycobacterium massiliense* was originally classified as the *Mycobacterium abscessus-chelonae* complex. Although, to date, the knowledge of clinical manifestations of the infectious diseases caused by *M. massiliense* is limited, *M. massiliense* is known to attack various organs in our body such as skin and lung. As for the pulmonary infection, according to one recent study, microbiologic response to the antibiotic therapy was more favorable in patients with *M. massiliense* (88%) than in those with *M. abscessus* lung disease (25%). However, there are few reports describing the fatal case of pulmonary infection by *M. massiliense*.

Herein, we report a fatal case of acute respiratory failure in an immunocompetent old man infected by *M. massiliense*.

Case Report

A 75-year-old man visited our hospital to treat pulmonary non-tuberculous mycobacterium (NTM) disease. He had complained productive cough for two months, and his diagnosis was confirmed by bacteriological analysis using sputum specimen. He was non-smoker and had no specific history of chronic diseases. His vital signs were normal. On physical examination, inspiratory crackles were heard on the right lower lung field. The results of blood test showed no definitive abnormality. A serologic test for human immunodeficiency virus was negative.

Chest X-ray revealed increased opacities in the right lower lobe (Figure 1A). Computed tomography scan of chest showed consolidation with air-bronchogram in the right lower lobe and focal centrilobular nodules on the right middle lobe (Figure 1B, C). On the bacteriological test, we verified the positive reactivity of acid fast stain-
Figure 1. (A) Chest X-ray showed increased opacities in the right lower lobe. (B, C) Contrast-enhanced computed tomography scan of chest demonstrated consolidation within air-bronchogram in the right lower lobe.

Figure 2. Chest X-ray during medical treatment in the intensive care unit showed diffuse bilateral infiltration, resulting in his death.

Discussion

NTM are found in the environment ubiquitously and are formerly considered to be minor clinical significance. Recently, the incidence of diseases caused by NTM is increased and they relatively often cause pulmo-
nary infection than other organ infection. Lung disease by NTM has been reported to progress very slowly, and the majority of pulmonary NTM diseases can resolve spontaneously without specific treatment. In addition, most of patients susceptible to NTM are in an immunocompromised state or have underlying structural disease of lung such as bronchiectasis.

*M. massiliense* is newly classified into rapid growing NTM, sharing an identical 16S rRNA sequence with *M. abscessus*. A study showed that nearly half (47%) of all *M. abscessus* complex are identified as *M. massiliense*. However, to date, the clinical manifestations of the *M. massiliense* infection are not well known. As for the therapeutic response rate to clarithromycin-based antibiotic therapy, it is higher in patients infected with *M. massiliense* than in those with *M. abscessus*. Actually, pneumonia of an immunocompetent patient caused by *M. massiliense* improved after treatment with clarithromycin and minocycline. On the other hand, a fatal case of bacteremia caused by *M. massiliense* was also reported. In this case, *M. massiliense* was isolated from the blood of a kidney transplant patient, and the *M. massiliense* bacteremia led to sudden death of the patient like our current case. Therefore, the clinical manifestations of *M. massiliense* infection, in particular pulmonary infection, seem to be a precautionous issue.

In light of the general courses of NTM infection, our current case is not only very unfamiliar but also fatal. His pulmonary disease progressed very fast and showed no response to any antibiotic therapy including clarithromycin. This unusual case indicates that specialized physicians for respiratory and/or infectious diseases should pay attention for the possibility of a fatal course of the NTM pulmonary disease even in an immunocompetent and relatively healthy subject although this entity of NTM infection has a favorable prognosis in general.

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