

Submission No.: PG13-5356

Session : Postgraduate Course 13 (Infection)

Date & Time, Place : November 17 (Thu), 15:00-16:30, Room 5F-2

Session Title : Tuberculosis in Solid Organ Transplant

---

## Non-tuberculous mycobacterial infection in transplant field

**Byung Woo Jhun**

*Samsung Medical Center, Republic of Korea*

---

### **Non-tuberculous mycobacterial infection in solid organ transplantation patients**

Byung Woo Jhun Division of Pulmonary and Critical Care Medicine, Department of Medicine, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, South Korea

**Background** Solid organ transplantation (SOT) has been established as the definitive treatment for patients with end-organ dysfunction caused by various diseases (1). Advances in SOT have occurred rapidly over the past few decades in terms of the variety of solid organs transplanted (which now includes the liver, kidney, and lung), and the number of patients receiving immunosuppressive agents is increasing commensurately. Because of the burden of lifelong immunosuppression, SOT patients are vulnerable to microbes, such as bacteria, fungi, and viruses, which could be non-pathogenic in a normal host.

Nontuberculous mycobacteria (NTM) infection is an important disease of SOT patients (2). NTM are ubiquitous organisms found in the natural environment and human communities. NTM infection is caused by complex interactions among a patient's immune status, microbiological factors, and environmental factors. Most (80–90%) NTM infections cause pulmonary disease (PD), and the burden of NTM-PD is increasing globally. The demographic characteristics of patients vary by geographic region (3). Among the > 200 species of NTM, *Mycobacterium avium* complex, which is mainly composed of *M. avium* and *M. intracellulare*, is the most common pathogen, with *M. abscessus* being the second most common in many countries (4). This lecture describes the epidemiology, and provides a clinical overview, of NTM-PD, and also discusses the treatment options for several major NTM-PD causative species. In addition, the application of the NTM-PD treatment guidelines to SOT patients is discussed. **Challenges to the management of NTM-PD patients who received SOT**

Appropriate management of NTM-PD is challenging in SOT patients. One of the most important reasons for this is the lack of detailed guidelines for the diagnosis and treatment of NTM-PD in SOT patients. Currently available evidence-based guidelines include the 2007 American Thoracic Society (ATS), 2017 British Thoracic Society (BTS), and 2020 ATS/European Respiratory Society (ERS)/European Respiratory Society (ESCMID)/Infectious Diseases Society of America (IDSA) guidelines (5-7). These guidelines were published based on studies of non-immunocompromised host rather than SOT patients. Detailed studies on the epidemiology, diagnosis, and treatment of NTM infections in SOT patients are limited.

Unlike tuberculosis, accurate large-scale epidemiological data are lacking for SOT patients because the reportage of NTM infection is not mandatory. As NTM are ubiquitous organisms in the natural environment, even if NTM species are detected only once in airway secretions, it is difficult to definitively determine that they are the causative agents. NTM are occasionally detected during routine surveillance bronchoscopy before lung transplantation; however, it is not clear that antibiotics must be used even in this case. Physicians should be aware that immunosuppressants used after SOT can interact with the antibiotics used to eradicate NTM, and that the antibiotics for NTM-PD have adverse effects. Furthermore, there is insufficient evidence as to whether the treatment period or criteria for curing NTM-PD are applied to SOT patients in the same way as to non-immunocompromised hosts (8).

### **Application of the 2020 ATS/ERS/ESCMID/IDSA guidelines to transplant patients**

Based on the above, it is reasonable to temporarily apply the 2020 ATS/ERS/ESCMID/IDSA guidelines to SOT patients for managing NTM-PD. The overall treatment strategy for NTM-PD in SOT patients is similar to that in non-immunocompromised hosts. However, multidisciplinary consultation is required for medical decision-making in clinically ambiguous situations that are not mentioned in the guidelines, or if there is a lack of evidence. Thus, the epidemiology, diagnostic criteria, and natural course of NTM-PD, antibiotic regimen (tailored according to the major causative NTM species) and drug interactions and common side effects will be reviewed based on the 2020 ATS/ERS/ESCMID/IDSA guidelines.

**Reference** 1. Longworth SA, Daly JS. Management of infections due to nontuberculous mycobacteria in solid organ transplant recipients-guidelines from the american society of transplantation infectious diseases community of practice. *Clin Transplant* 2019;33:e13588. 2. Prevots DR, Marras TK. Epidemiology of human pulmonary infection with nontuberculous mycobacteria: A review. *Clin Chest Med* 2015;36:13-34. 3. Lee H, Myung W, Koh WJ, Moon SM, Jhun BW. Epidemiology of nontuberculous mycobacterial infection, south korea, 2007-2016. *Emerg Infect Dis* 2019;25:569-572. 4. Hoefsloot W, van Ingen J, Andrejak C, Angeby K, Bauriaud R, Bemer P, et al. The geographic diversity of nontuberculous mycobacteria isolated from pulmonary samples: An ntm-net collaborative study. *Eur Respir J* 2013;42:1604-1613. 5. Griffith DE, Aksamit T, Brown-Elliott BA, Catanzaro A, Daley C, Gordin F, et al. An official ats/idsa statement: Diagnosis, treatment, and prevention of nontuberculous mycobacterial diseases. *Am J Respir Crit Care Med* 2007;175:367-416. 6. Haworth CS, Banks J, Capstick T, Fisher AJ, Gorsuch T, Laurenson IF, et al. British thoracic society guidelines for the management of non-tuberculous mycobacterial pulmonary disease (ntm-pd). *Thorax* 2017;72:ii1-ii64. 7. Daley CL, Iaccarino JM, Lange C, Cambau E, Wallace RJ, Jr., Andrejak C, et al. Treatment of nontuberculous mycobacterial pulmonary disease: An official ats/ers/escmid/idsa clinical practice guideline. *Eur Respir J* 2020;56:2000535. 8. Friedman DZP, Doucette K. Mycobacteria: Selection of transplant candidates and post-lung transplant outcomes. *Semin Respir Crit Care Med* 2021;42:460-470.