Management of Mycobacterium Other than Tuberculosis in Solid Organ Transplantation

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KEYWORDS

• Mycobacterium other than tuberculosis • Solid organ transplantation • Treatment

KEY POINTS

- Owing to immunosuppressive agents, impairment of host defenses in solid organ transplant recipients increases the risk of infections owing to mycobacteria other than tuberculosis.
- Mycobacteria other than tuberculosis is uncommon, but carries significant morbidity and mortality in the solid organ transplant population.
- Lung transplant recipients are at higher risk compared with other solid organ transplant recipients.
- Treatment of mycobacteria other than tuberculosis requires appropriate selection of antimicrobial agents, management of side effects, and consideration of drug–drug interactions.

INTRODUCTION

Mycobacteria other than tuberculosis (MOTT) are ubiquitous in the environment. To date, there are more than 150 different species of MOTT that have been described as a result of improved culturing and sequencing techniques and differentiation of species.[1] Owing to impaired T-cell–mediated immunity, solid organ transplant (SOT) recipients are at an increased risk for MOTT. The incidence of MOTT in SOT is low; however, it is essential to recognize the complexity of diagnosis and treatment of MOTT in this population. The latter involves awareness of drug combinations specific for MOTT species and drug–drug interactions between antimycobacterial drugs and immunosuppressive medications. This review focuses on relevant MOTT infections in SOT recipients and its management.

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OVERVIEW OF MYCOBACTERIUM OTHER THAN TUBERCULOSIS

Only about one-half of the MOTT infections can potentially cause disease in humans and animals. MOTT are classified by growth rate and colony pigmentation in culture media. MOTT are found in the soil, water, plant material, animals, and birds.[2] Only a few species that are known to cause disease have been recovered from the environment.[3,4] Tap water is considered a common reservoir for common human MOTT pathogens. Biofilm in pipes allows growth of MOTT and may render them less susceptible to disinfectants and antibacterial therapy.[5,6] MOTT have been implicated in healthcare-acquired outbreaks. A recent outbreak of *Mycobacterium abscessus* has shown that more than one-half of the patients who developed an infection or colonization were SOT recipients, with the majority being lung transplant recipients.[7] Person-to-person[8] and donor-derived transmission of MOTT are rare.[9,10]

SOT recipients with prior colonization or environmental exposure are at increased risk for clinical disease progression owing to T-cell–mediated immunity impairment and an overall net state of immunosuppression. **Table 1** summarizes the MOTT reported in SOT recipients. There are limited data on the incidence of infections owing to MOTT in SOT. The incidence is higher compared with the general population. He incidence of MOTT varies depending on type of organ transplanted, which are as follows: 0.1% in liver transplantation,[11] 0.16% to 0.55% in kidney transplantation,[12–20] 0.24% to 2.80% in heart transplant,[21,22] and 0.46% to 4.40% in lung transplantation.[23–26] To date, the incidence in the pancreas and small bowel transplant recipients is unknown. Lung transplant recipients, as expected, have a higher overall risk estimated at 1.1 per 100 person-years in contrast with non–lung transplant recipients at 0.02 per 100 person-years.[27] Factors that may predispose lung transplant recipients

Table 1
***Mycobacterium* species other than tuberculosis that cause infection in solid organ transplant recipients**

Slow-Growing Mycobacteria (Growth >7 d)	Rapid-Growing Mycobacteria (Growth <7 d)
M asiaticum	*M abscessus*[a]
M avium complex (includes avium and intracellulare)[a]	*M boletti*
M celatum	*M fortuitum*[a]
M gastri	*M chelonae*[a]
M genavense	*M mageritense*
M gordonae (commonly a contaminant)	*M massiliense*
M haemophilum	*M mucogenicum*
M kansasii[a]	*M neoaurum*
M malmoense	
M marinum[a]	
M scrofulaceium	
M simiae	
M szulgai	
M terrae	
M triplex	
M xenopi	

[a] Most common species.

Data from Patel R, Roberts GD, Keating MR, et al. Infections due to nontuberculous mycobacteria in kidney, heart, and liver transplant recipients. Clin Infect Dis 1994;19(2):263–73; and Doucette K, Fishman JA. Nontuberculous mycobacterial infection in hematopoietic stem cell and solid organ transplant recipients. Clin Infect Dis 2004;38(10):1428–39.