Nontuberculous Mycobacterial Infections

Nontuberculous mycobacteria are pathogens found in the environment that can cause a variety of infections.

Nontuberculous mycobacteria are a group of bacteria that can affect many body sites. Although these bacteria are related to Mycobacterium tuberculosis, the species that causes tuberculosis, they are a distinct group of mycobacteria. The most common site of infection is the lungs. Infection involving skin and soft tissue, lymph nodes, and blood can occur, but it is rare for nontuberculous mycobacterial infection to cause disease both within and outside of the lungs at the same time. Some nontuberculous mycobacterial infections are caused by contaminated medical devices such as pacemakers or catheters inserted into veins or arteries.

Symptoms
Symptoms depend on the type of nontuberculous mycobacterial infection and what part of the body is affected. With lung infection, common symptoms are cough, shortness of breath, and weight loss. With infection outside of the lungs, symptoms depend on the site of involvement (skin infection can produce nodules; bone infection can produce bone pain; and more widespread infection can cause fever, weight loss, and sweating). Without treatment, some nontuberculous mycobacterial infections may result in death.

How Is Nontuberculous Mycobacterial Infection Acquired?
Nontuberculous mycobacteria are found in the environment, particularly in water and soil. Unlike with tuberculosis, these bacteria are generally acquired from exposure to the environment, not from infected people. However, among patients with cystic fibrosis, a specific nontuberculous mycobacterium may be transmitted to other patients with cystic fibrosis. Infection can be acquired after inhalation of soil or dust, contact with natural and municipal water sources, and exposure to contaminated equipment or tools. Risk factors for infection of the lung include lung scarring (bronchiectasis), chronic obstructive pulmonary disease, cystic fibrosis, and other underlying lung disease. For infection outside of the lungs, HIV/AIDS and severe immunosuppression are risk factors. Infections of the skin and soft tissue can affect healthy people due to contaminated surgical equipment or equipment at nail salons and tattoo parlors.

Diagnosis and Treatment
Diagnosis of nontuberculous mycobacterial infections can be challenging and depends on the suspected site of involvement. For lung disease, diagnosis is made by identifying the bacterium in lung secretions or from deeper samples in the lung. For disease outside of the lungs, biopsies of the affected area are often required. Treatment is complex because nontuberculous mycobacterial infection requires multiple antibiotics for prolonged periods (months, and in some patients, years) and can be difficult to cure. Surgery may be required to attempt to remove infected tissue.

Preventing Infection
Because many types of nontuberculous mycobacteria exist in the environment, prevention can be challenging, especially for patients with lung disease such as bronchiectasis, cystic fibrosis, or chronic obstructive pulmonary disease. Certain nontuberculous mycobacterial infections of the skin have been linked to cosmetic surgeries (in particular outside the US), so it is important to be aware of these risks when considering these procedures. Outbreaks of nontuberculous mycobacterial infection associated with contaminated tattoo ink have also occurred. To reduce risk for infection, ensure that a tattoo parlor follows strict hygienic practices and use parlors registered by local jurisdictions.

FOR MORE INFORMATION
Centers for Disease Control and Prevention
www.cdc.gov/hai/organisms/nontuberculous-mycobacteria.html

Authors: Angel N. Desai, MD, MPH; Rocio Hurtado, MD, DTM&H
Author Affiliations: Associate Editor, JAMA Network Open (Desai); Infectious Disease Division, Massachusetts General Hospital, Boston (Hurtado).
Conflict of Interest Disclosures: None reported.