Traveler Information

FUNGAL DISEASE

INTRODUCTION

Fungi are found in soil and on vegetation, as well as on many indoor surfaces and human skin. More than 1.5 million different species of fungi exist, but only several hundred are known to cause human infection. In healthy persons, fungal disease is generally asymptomatic or self-limited. However, infection can lead to significant disease, particularly in persons who are immune compromised.

In travelers, important fungal infections to be aware of include coccidioidomycosis, histoplasmosis, and paracoccidioidomycosis. These fungal diseases are acquired by the respiratory route and often affect the respiratory system. Infections occur after inhalation of spores found in dust, soil, bird/bat guano, or decaying vegetation following excavation, construction, landscaping, earthquakes, dirt bike riding, spelunking, and other activities.

GEOGRAPHIC DISTRIBUTION

Coccidioidomycosis, also known as valley fever, is a fungal infection caused by fungi that grow in the soil, mainly in the southwestern United States, parts of Mexico, and Central and South America. Coccidioidomycosis is a growing health concern and a common cause of pneumonia in endemic areas. At least 30-60% of people who live in an endemic region are exposed to the fungus at some point during their lives. In most people the infection will resolve spontaneously, but for those who develop severe infections or chronic pneumonia, medical treatment is necessary. Exposures of concern include arid regions and places where excavation is occurring.

Histoplasmosis is an infection caused by a fungus that grows as a mold in soil and as yeast in animal and human hosts. It is distributed worldwide (except in Antarctica) but is most often associated with river valleys. It is particularly well recognized in the central and eastern United States and parts of Central and South America. Histoplasmosis can cause illness in healthy people but can cause particularly serious disease in immunocompromised people. In developing areas of the world that are endemic for histoplasmosis, it is one of the most common infections among persons with HIV/AIDS. A notable histoplasmosis outbreak associated with a hotel undergoing construction occurred in 2001 among more than 200 U.S. college students who visited Acapulco, Mexico. Other outbreaks have occurred in travelers who visited caves with bats in Nicaragua, Costa Rica, Ecuador, and Peru, as well as other Central and South American countries. Exposures of concern include contact with bat or bird dropping and spelunking.

Paracoccidioidomycosis is found in tropical Americas from Mexico to Argentina, with the majority of cases occurring in Brazil. Cases concentrate in areas with forests and waterways, high rainfall, short winters, and rainy summers. The infection primarily occurs in forest and agricultural workers, but a few cases have occurred in travelers to endemic areas after many years of latency (even 30 or more years after exposure). More cases occur in males than females. Exposures of concern include tropical and subtropical forest and agricultural work.

RISK FACTORS

Travelers to endemic areas are at increased risk if participating in activities that expose them to dust, such as construction, landscaping, mining, agriculture, archeological excavation, military maneuvers, or recreational pursuits such as dirt biking. Additional specific risks include:

- **Coccidioidomycosis**: Persons of African-American or Filipino descent have increased risk.
- **Histoplasmosis**: Exposures in travelers also include spelunking, demolition, roofing, chimney cleaning, gardening, and installing heating and air-conditioning systems. Outbreaks have occurred in association with travel to countries in Central and South America, often with visiting caves.
- **Paracoccidioidomycosis**: Particular risk activities include forestry work, woodcutting, and rural agricultural work.

Persons at risk for more severe disease or disseminated disease include the elderly, pregnant women, and persons with immune-compromising conditions such as HIV/AIDS.

SYMPTOMS

Coccidioidomycosis: Approximately 60% of people who are infected show no symptoms. If symptoms do appear, it is usually 1-3 weeks after exposure. Symptoms range from an influenza-like illness (characterized by fever, chest pain, headache, muscle aches, rash, dry cough, weight loss, and malaise) to primary pulmonary coccidioidomycosis, characterized by pneumonia. In rare cases, severe lung disease or spread to the central nervous system, joints, bones, or skin may develop.

Most persons recover spontaneously and retain lifelong immunity. Chronic or disseminated disease occurs in approximately 5% of infected persons. While rare, meningeal infection is a dangerous form of the disease that presents with a chronic headache weeks to months after initial exposure and is always fatal within 2 years.

Histoplasmosis: Most infections are asymptomatic or present as mild influenza-like illness and spontaneously resolve (approximately 90%); however, severe and systemic disease may develop. For acute disease, the incubation period is typically 3-17 days. Some infections may result in acute pulmonary histoplasmosis with fever, headache, dry cough, shortness of breath, chills, weakness, chest pain, and fatigue. Most people spontaneously recover 2-3 weeks after onset of symptoms, although fatigue may persist longer. In immunocompromised persons, the disease can spread to the gastrointestinal tract and central nervous system. One type of disease, African histoplasmosis, affects the bone, skin, and soft tissue but does not affect the lungs.

Paracoccidioidomycosis: Most disease occurs in adult males, progressing over months to years with pulmonary lesions, cough, weight loss, and difficulty breathing. Infection can involve adrenal glands, spleen, liver, central nervous system, gastrointestinal tract, genitourinary tract, bone, and bone marrow, and can spread to multiple organs. A juvenile form can occur, affecting the spleen, liver, lymph nodes, lungs, and bone marrow.

PREVENTION

Travelers should limit exposure to outdoor dust, bird and bat guano, caves, and decaying vegetation when traveling in endemic areas.

Persons at risk for severe disease (especially immunocompromised travelers) should:

- Avoid travel to risk areas during the dry season.
- Avoid travel to arid regions, bat-inhabited caves, or forested areas in risk areas.
- Wear an N95 respiratory mask if exposure is unavoidable.
- Clean any skin injuries well with soap and water.

NEED FOR MEDICAL ASSISTANCE

Travelers who experience symptoms described above that last longer than a week following exposure in an endemic area should seek medical attention. Some medical practitioners opt to treat coccidioidomycosis and histoplasmosis with an antifungal drug to prevent more serious infection from developing, especially for those at risk for severe disease.
