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A Brief Note on Coccidioidomycosis

Daniel W*

Department of Dermatology, Yale University School of Medicine, New Haven, USA

Commentary

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***For Correspondence:**
Daniel W, Department of Dermatology, Yale University School of Medicine, New Haven, USA
E-mail: Daniel12@iel.edu

ABOUT THE STUDY

Coccidioidomycosis is a dimorphic saprophytic fungus that develops in the soil as a mycelium and generates a spherule form in the host organism. It is found in the soil of the south western United States, most notably in California and Arizona. It's also prevalent in northern Mexico, as well as regions of Central and South America. *C. immitis* lies latent during extended periods of dryness, and then emerges as a mould with long filaments that break off into airborne spores when it rains.

The spores, known as arthroconidia, are carried into the air by soil upheaval, such as that caused by construction, farming, low-wind or solitary dust episodes, or an earthquake. Windstorms can potentially spread disease far from endemic areas. A windstorm in an endemic region near Arvin, California, in December 1977, caused several hundred cases, including deaths, in non-endemic locations hundreds of miles distant.

In endemic parts of the United States, coccidioidomycosis is a prevalent cause of community-acquired pneumonia. Infections are mainly caused by inhaling arthroconidial spores after soil disturbance. The sickness is not spreadable. The infection may reoccur or become chronic in some circumstances.

Signs and symptoms

An estimated 60% of patients infected with the fungus that cause coccidioidomycosis have no or few symptoms, whereas 40% have a variety of clinical signs. Among those who do develop symptoms, the primary infection is most typically respiratory, with symptoms similar to bronchitis or pneumonia that disappear within a few weeks. Coccidioidomycosis is responsible for 20% of community-acquired pneumonia cases in endemic areas. Signs and symptoms of coccidioidomycosis include extreme weariness, loss of smell and taste, fever, cough, headaches, rash, muscular discomfort, and joint pain. Fatigue might last for months after the original illness. Fever, joint aches, and erythema nodosum are the characteristic symptoms of coccidioidomycosis known as "desert rheumatism.

A small percentage of infected people (3–5%) do not recover from the first acute infection and acquire a chronic illness. This might manifest as a persistent lung infection or a widely distributed illness (affecting the tissues lining the brain, soft tissues, joints, and bone). The majority of morbidity and death is caused by chronic infection. Chronic fibrocavitary illness is characterized by coughing (occasionally with mucus production), fevers, night sweats, and weight loss. Osteomyelitis, including spinal involvement and meningitis can develop months to years after the original infection. In HIV-infected people, severe lung illness can occur.

Diagnosis

The diagnosis of coccidioidomycosis is based on a combination of an infected person's signs and symptoms, radiographic imaging findings, and test results. The condition is frequently misdiagnosed as bacterial community pneumonia. The fungal infection can be proven by using Papanicolaou or Grocott's methenamine silver staining to identify diagnostic cells in bodily fluids, exudates, sputum, and biopsy tissue. These stains might show spherules and the surrounding inflammation. *C. immitis* DNA may be amplified by Polymerase Chain Reaction using particular nucleotide primers (PCR). In culture, it may also be recognised *via* morphological identification or molecular probes that hybridise with *C. immitis* RNA. *C. immitis* and *C. posadasii* can only be identified by DNA PCR, not by cytology or symptoms.

Serologic study identifying fungal antigen or host IgM or IgG antibodies generated against the fungus can also provide an indirect indication of fungal infection. Tube-Precipitin (TP) assays, complement fixation assays, and enzyme immunoassays are among the diagnostics available. Cerebrospinal Fluid has no TP antibodies (CSF). The TP antibody is specific and is used as a confirmation test, whilst the ELISA is sensitive and is utilised for preliminary testing.

Risk factors

Several communities are at a higher risk of catching coccidioidomycosis and developing the disease's advanced disseminated form. Workers in agriculture and construction who are exposed to airborne arthroconidia are at a higher risk. Earthquakes, windstorms, and military training activities that disrupt the ground have also been connected to outbreaks. Historically, males have been more likely to get an illness than females, albeit this might be due to occupation rather than a sex difference. Women who are pregnant or just gave birth are at a significant risk of infection and spread. There is also a link between the stage of pregnancy and the severity of the condition, with women in their third trimester being more prone to have dissemination. This is most likely due to substantially raised hormone levels, which encourage spherule development and maturation and the consequent release of endospores.

Certain ethnic groups are more prone to disseminated coccidioidomycosis. Filipinos are 175 times more likely to be infected than non-Hispanic whites, and African Americans are 10 times more likely to be infected than non-Hispanic whites. People who have a weaker immune system are also more vulnerable to the sickness. Individuals with HIV and illnesses that decrease T-cell activity, in particular. People who have pre-existing diseases, such as diabetes, are also at a higher risk. The severity of the disease is also affected by age, with more than one-third of fatalities occurring between the ages of 65 and 84.