

## BLASTOMYCOSIS

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Blastomycosis is a fungal infection caused by *Blastomyces dermatitidis*. The organism is inhaled and typically causes an acute pulmonary infection. However, cutaneous and disseminated forms can occur, as well as asymptomatic self-limited infections.

### Epidemiology

The disease is transmitted by inhaling spore-laden dust. Person-to-person transmission does not occur. Endemic areas in the United States include the southeast and south-central states, and the Great Lakes region.

In Louisiana, the majority of cases have been reported from Washington Parish (a total of 30 cases were detected during 1976-1985). Washington Parish is one of the few predominantly forested parishes; given its other attributes (acidic soil, low elevation, relatively high rainfall), environmental conditions seem particularly favorable for growth of *B. dermatitidis*.

Sporadic cases indicated that middle-aged men with outdoor occupations that exposed them to soil were at greatest risk for blastomycosis. Analysis of demographics of foci indicates that there is no sex, age, race, occupational, or seasonal predilection for blastomycosis. Exposure to soil, whether at work or at play, appears to be the common link in reports of sporadic disease and outbreaks.

The rarity of both natural disease and laboratory-acquired infections suggest that man is relatively resistant.

Symptoms are usually more severe in people with a weakened immune system (e.g. organ transplants, HIV/AIDS, or on medications that suppress/overpower the immune system).

The incubation period for blastomycosis is approximately 30 to 45 days.

### Clinical Description

*Blastomyces dermatitidis* causes a systemic pyo-granulomatous disease: blastomycosis. Initial infection is through the lungs and is often subclinical. Hematogenous dissemination may occur, culminating in a disease with diverse manifestations.

Infection may be asymptomatic or associated with acute, chronic, or fulminant disease.

#### Pulmonary disease

- A self-limited flu-like illness with fever, chills, myalgia, headache, and a nonproductive cough
- An acute illness resembling bacterial pneumonia, with high fever, chills, a productive cough, and pleuritic chest pain; sputum is mucopurulent or purulent
- Chronic illness, with low-grade fever, a productive cough, night sweats, and weight loss

- Acute Respiratory Distress Syndrome (ARDS) rapidly progressive and severe (fever, shortness of breath, tachypnea, hypoxemia, and diffuse pulmonary infiltrates)

Extrapulmonary features may include the following:

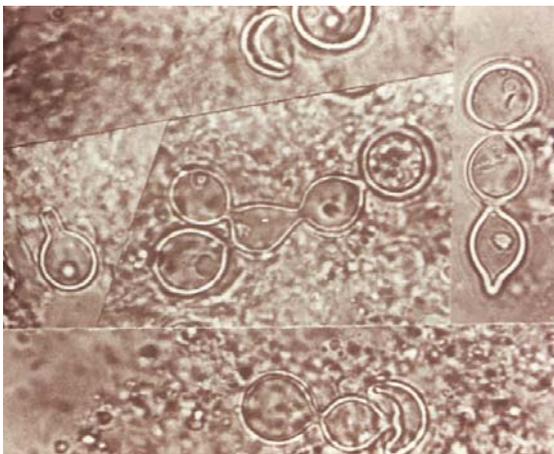
- Skin lesions - Usually asymptomatic; may be the presenting complaint
- Bone lytic lesions - Cause bone or joint pain; soft-tissue swelling may be present; any bone may be involved, but the vertebrae and pelvis are common sites
- Prostatitis or epididymitis - May be asymptomatic or may cause pain on urinating
- Central nervous system involvement - Intracranial or epidural abscesses; rarely, meningitis

Blastomycosis may present as a community-acquired pneumonia; in addition, it should be considered in any patient with pneumonia that is not resolving, or one who presents with acute respiratory distress syndrome. Other pulmonary disorders to consider in the differential diagnosis are sarcoidosis and other endemic mycoses.

Blastomycosis has a propensity to mimic carcinoma. Pulmonary blastomycosis may resemble lung cancer, while the typical verrucous or ulcerative cutaneous lesions of blastomycosis may mimic skin cancers, such as basal cell carcinoma and squamous cell carcinoma. Central nervous system blastomycosis may resemble brain neoplasm.

## Laboratory Tests

### Microscopic examination



Sputum or pus is easily examined by wet preparation. A drop of the specimen is placed on a microscope slide, covered with a coverslip, and examined under the high, dry objective.

Although 10% potassium hydroxide has been recommended to aid in finding the organism, it is usually not necessary, as the large, characteristic yeast cell is easily seen despite cellular debris. Body fluids such as urine, pleural fluid, or cerebrospinal fluid should be centrifuged and the sediment evaluated in the same way. The yeast looks like a thick-walled, figure-of-eight, broad-based, single-budding cell form.

*From CDC PH Library*

### Immunoassay:

An enzyme immunoassay (EIA) for antibodies to the A antigen of *Blastomyces dermatitidis* is a more sensitive test but lacks specificity.

In patients with extrapulmonary disease, percutaneous needle or surgical biopsy of the affected organ (eg, skin, subcutaneous nodule, bone) may be helpful. Histology and culture of biopsy specimens may reveal the organism. DNA probe may be useful in identifying *B dermatitidis* in formaldehyde-fixed tissue samples.

### Culture of sputum or tissue specimens:

Isolation and identification of the organism on sputum culture provides absolute confirmation of the diagnosis.

## **Surveillance**

Blastomycosis is a reportable condition in Louisiana because of concerns about the focus in Southeast Louisiana. Since Louisiana appears to have a potential high-risk area and because of a lack of sufficient data, blastomycosis was added to the list of reportable diseases as of September 1988.

## **Case Definition**

A case of blastomycosis is defined as an illness characterized by clinical manifestations relating to pulmonary, cutaneous, or disseminated disease and is laboratory confirmed.

A case of blastomycosis is confirmed by:

- Identification of the organism from a culture of sputum, cerebrospinal fluid (CSF), urine, or lesions
- Positive immunodiffusion test, or
- Chemiluminescent DNA probe.

## **Report, Confirmation and Investigation**

The purpose of investigation is to identify cases, to facilitate the identification of potential high-risk areas, and to assist the private physician in recommendations for appropriate treatment.

- Upon receipt of a report of a case of blastomycosis, contact the physician and/or hospital to confirm the diagnosis. Make sure the diagnosis is laboratory confirmed.
- Since the disease is prevalent in dogs, it may be advantageous to document whether the patient has a pet dog that was recently diagnosed as having blastomycosis.
- Attempt to verify whether the patient had lived in, or moved from an area where other cases have been identified.

## **Treatment**

Amphotericin B is the drug of choice for severe infections. Ketoconazole or oral itraconazole can be used for mild to moderate infections.

**Isolation of the Hospitalized Patient:** Standard precautions are recommended.