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# Mucromycosis (Black Fungus)

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## Black Fungus

Fungi Mucromycosis, commonly called as black fungus is a life threatening infection usually found in people with weak immunity because of organ transplantation, neutropenia, and diabetes or due to increased serum levels of available iron. Mucromycosis is caused by exposure to mucor and is a very rare infection. It is commonly found in soil, plants, manure, decaying fruits and vegetables and even in the nose and mucous of healthy people.

Mucromycosis is fungal infection caused by fungi belonging to the order Mucorales. Species in the Mucor, Rhizopus, Absidia and Cunninghamella genera are most often implicated. This infection is usually characterized by hyphae growing in and around blood vessels and is life-threatening I case of diabetes or immunocompro -mised individuals.

## Types of Mucromycosis

**Rhinocerebral mucromycosis**: Sinuses that can spread to the brain common in people with diabetes or patient who has undergone kidney transplant.

**Puolmonary mucromycosis:** It is most common infection in lungs and most common in people who had an organ transplant or stem cell transplant.

**Gastrointestinal mucromycosis**: It is most common among young children than adults, especially premature and low birth weight infants less than 1 month of age, who have had antibiotics, surgery, or medications that lower the body's ability to fight germs and sickness.

**Cutaneous mucromycosis:** Mainly affects skin as the fungus enter the body through a break in the skin can appear even in people with healthy immune system.

**Disseminated mucromycosis:** The infection spreads through the bloodstream to affect another part of the body. This infection most commonly affects the brain, but also can affect other organs such as the spleen, heart, and skin.

## COVID Associated Mucromycosis

COVID associated Mucromycosis (referred to as black fungus) is an aggressive fungal infection that is associated with COVID-19 infection. A clinical manifestation sometimes referred to it as the 'rhino-orbital- cerebral mucromycosis' as it has been reported around the nose, eyes and brain. 8 cases were reported in January 2021 throughout the world. The most common risk for mucromycosis was diabetes. Early aggressive treatment is essential in this case. 70% of all mucromycosis cases are due to Rhizopus oryzae, the most common organism isolated from patients with mucromycosis. There is 100% mortality rate among patients with disseminated disease or those with persistent neutropenia. The major risk factors apart from diabetes include bone marrow transplantation, neutropenia, trauma and burns, malignant hematologic disorders, and deferoxamine therapy in patients receiving hemodialysis. Individuals who lack phagocytes or have impaired phagocytic function are at higher risk for mucromycosis.

## Symptoms

Symptoms of rhino cerebral mucromycosis include One-sided facial swelling, Headache, Nasal or sinus congestion, Black lesions on nasal bridge or upper inside of mouth that quickly become more severe, Fever.

Symptoms of pulmonary mucromycosis include Fever, Cough, Chest pain, Shortness of breath.

## Diagnosis

High index of suspicion, recognition of host factors and assessment of clinical manifestations are prerequisites for the diagnosis of mucromycosis. Histology, microbiology and other advanced molecular methods have been used for testing the samples. Signs of this infection include diplopia in patient with diabetes. The most common clinical presentations of Mucorales infection are rhino cerebral, pulmonary, soft tissue, and disseminated disease. Even though infection is confined to particular areas, virtually any organ can be affected. Multiple nodules and pleural effusion are most commonly reported in mucromycosis radiologically. Reverse halo sign (RHS) finding on computerized tomography scan indicates the strong presence of mucromycosis. RHS was more common in patients with mucromycosis whereas clusters of centrilobular nodules, peribronchial consolidations are common in Aspergillosis.. These cannot be taken as conclusions so they may be used as indicators to start aggressive diagnostic laboratory tests. Positron emission tomography-computed tomography (PET/CT) with [18F]- Fluorode oxyglucose (FDG) is another imaging technique that is used in diagnosis and management of mucromycosis.

## Precautionary Measures

To avoid this infection, certain precautionary measures need to be followed. Use N95 masks, wash the reusable mask regularly, dry them properly, avoid frozen food and avoid eating preserved foods.

## Treatment

This infection needs to be treated with anti-fungal drugs usually Amphotericin B, Posconazole or isavuconazole through IV administration or posaconazole, isavuconazole are administered orally. Other medications like voriconazole, fluconazole do not work against mucromycosis. In order to cut the infected tissue, surgery may be required.

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