

Mucormycosis: A Fungal Infection Affecting Coronavirus Patients

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Received: May 21, 2021; Accepted: May 26, 2021; Published: May 31, 2021

Editorial

There is increase in cases because of mucormycosis in people with coronavirus disease 2019 (COVID-19). Especially in patients with Diabetes Mellitus (DM), it is an independent risk factor for both severe COVID-19 and mucormycosis. Mucormycosis is life-threatening bacterial and fungal infections who are associated to immunocompromised conditions (e.g. corticosteroid therapy, ventilation, intensive care unit stay), these patients are prone to develop severe opportunistic infections. Pre-existing Diabetes Mellitus (DM) was present in most of cases, while associated Diabetic Ketoacidosis (DKA) was present in 15%. Corticosteroid intake for the treatment of COVID-19 was recorded in 75% of cases. Mucormycosis encompassing nose and sinuses was most common followed by rhino-orbital. Mucormycosis often termed "black fungus" was mostly seen in males, both in people who were active or who are recovering from the coronavirus.

Mucormycosis, previously known as Phycomycosis/zygomycosis, is the aggressive infection caused by *Rhizopus* that belongs to the fungal family "Mucorales". Fungi in this family are usually found in the environment - in soil, for example – and are often associated with decaying organic material such as fruit and vegetables. This rare fungal infection can be classified into rhino-orbito-cerebral, cutaneous, disseminated, gastrointestinal, and pulmonary types. The *Rhizopus oryzae* is most often responsible for infections in humans.

The primary cause that appears to be expediting Mucorales spores to germinate in people with COVID-19. Use of drugs which overturn the immune system such as corticosteroids can lead to impaired immune function. Damaged tissue can occur after trauma or surgery that is the cause human disease grows well at body temperature and in acidic environments. Mode of contamination occurs through the inhalation of fungal spores. Every day we actually breathe in the spores of many fungi if healthy, generally prevent them from causing an infection.

Three ways humans can contract mucormycosis

1. By inhaling spores,
2. By swallowing spores in food or medicines,

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Tel: +91 9559500485**Citation:** Zeytun D (2021) Mucormycosis: A Fungal Infection Affecting Coronavirus Patients. Arch Med Vol. 13 No. 5: 27

3. When spores contaminate wounds

Mucormycosis can visible in the lungs, but the nose and sinuses are the most common site of mucormycosis infection. From there it can spread to the eyes, potentially causing blindness, or the brain, causing headaches or seizures. There are few cases of mucormycosis resulting from even a short span of steroid therapy, particularly in people with Diabetes Mellitus. Mucormycosis is categorized by the presence of hyphal invasion of sinus tissue and a time course of less than four weeks. Clinically, rhinocerebral mucormycosis can present with atypical signs and symptoms similar to complicated sinusitis, such as crusting, nasal blockade, proptosis, facial pain and oedema, chemosis, ptosis, and even ophthalmoplegia, with headache and fever and various neurological signs and symptoms if intracranial extension is present. A black eschar is often seen in the nasal cavity or over the hard palate region, but is not characteristic. Histological features include mycotic infiltration of blood vessels, vasculitis with tissue infarction, thrombosis, haemorrhage and acute neutrophilic infiltrate.

Diagnosis and intervention as early as possible is essential. This contains control of blood sugar, immediate removal of dead tissue, and anti-fungal drug treatment. Hence, it is significant to be aware that COVID-19 patients can develop further fungal infections during the middle and latter stages of this disease, especially severely ill individuals.