

Mucormycosis: Causes of the Black Fungal Infection in Covid-19 Patients

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We now have to cope with another until not so prevalent opportunistic opponent, the so-called 'Black fungus' infection, academically dubbed mucormycosis," said Dr Dhananjaya I Bhat, senior consultant, neurosurgery, Aster RV Hospital. "The most cruel, vicious expression is Rhino-orbito-cerebral mucormycosis," he continued (ROCM). With this in mind, we'll look at a lesser-known organism: the fungus, and its relevance in these volatile and unpredictable times." These are organisms that do not belong to the plant or animal kingdoms. They can be found in the soil, plants, decaying organic materials, water, air, and wet locations, as well as in humans and animals. They, together with bacteria, serve a crucial function in our environment by reducing organic matter into simpler forms for plant use. "These include home yeast, moulds, mushrooms, and a variety of other organisms. There are approximately 1,44,000 fungi (plural for fungus), some of which are pathogenic to humans. *Candida*, *Aspergillus*, *Cryptococcus*, *Histoplasma*, *Pneumocystis*, and *Mucormycetes* are the most common," he stated [1].

People with a weakened immune system are more prone to illness, as previously stated. Immune deficiency is caused by a variety of factors, including Diabetes: The combination of high blood sugar and an acidic environment, as seen in diabetic ketoacidosis, is ideal for rapid growth of these organisms. Diabetes is also linked to a weakened immune system, Steroid medicine raises blood sugar levels and lowers the body's immunological response, Blood cancers, which result in a faulty immune system once again, Patients on immunosuppressants, such as organ recipients and haematologic stem cell recipients and Patients with too much iron or using deferoxamine (a drug used to treat iron overload) [2].

Mucormycosis (formerly known as Zygomycosis) is a deadly but uncommon fungal infection caused by micromycetes, a type of mould. Molds of the order Mucorales induce rhino-orbital-cerebral-mucormycosis (ROCM). There are a few subgroups that are most typically engaged in this infection, including as *Rhizopus*, *Mucor*, and *Rhizomucor*. These fungi are angioinvasive, meaning they enter and damage the surrounding blood vessels, causing tissue necrosis and death. Molds can be found all throughout the environment, and their spores can be found in the air. They become trapped in the nasal cavity and the sinuses that surround it. Mucormycosis can develop at any time after a COVID-19 infection, whether while in the hospital or several days to weeks after release. "The COVID-19 alters the internal environment of the host in a way that benefits the fungus, and the medical treatment unknowingly aids fungal growth. COVID-19 causes harm to the mucosa of the airways and blood vessels. It also causes a rise in serum iron, which is necessary for the fungus to thrive. Steroids, for example, raise blood sugar levels. Broad-spectrum

antibiotics kill not just the potentially harmful bacteria, but also the beneficial microorganisms [3,4].

Mucormycosis is characterised by nasal obstruction, haemorrhage, and discharge. An unmistakable black eschar (slough or dead tissue) coated mass will be evident on endoscopic viewing of the nasal cavity, indicating the diagnosis. The palate may be damaged as the disease proceeds, as evidenced by a massive black necrotic mass visible when the mouth is opened. Proptosis (eyeball protrusion), lack of eyeball motions, and resultant double vision occur when the orbit is implicated. Eye pain, redness, and blindness are all possible outcomes. There will be strokes, haemorrhages, and even death if the brain is invaded due to blood vessel blockage. Patients may also experience headaches and drowsiness. *Mucor* has not created as much devastation in Western countries as it has in India. Other fungal infections, such as aspergillosis and candidiasis, have been found to be more common in COVID-19 patients. In clinical terms, fungus-caused lung infections are difficult to detect. The patient has a fever, cough, and shortness of breath, which are symptoms of COVID [5].

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How to cite this article: Taslima, Sadia. "Mucormycosis: Causes of the Black Fungal Infection in Covid-19 Patients". *J Infect Dis Med* 6 (2021).194

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Received 06 September, 2021; **Accepted** 20 September, 2021; **Published** 27 September, 2021