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A contemporary intimidation for COVID-19 patients coinfected with mucormycosis in India

Abstract

India is now seeing an uptick in COVID-19-induced Mucormycosis or "black fungus" cases in certain regions, despite still grappling with a crippling second wave of coronavirus infections. Mucormycosis, also known as black fungus, is a severe but rare fungal infection caused by the mucormycetes, a group of moulds. It usually affects those with health problems or who are taking drugs that limit the body's ability to combat germs and illness. The resurgence in black fungus infections may be attributed to the use of steroids in the management of COVID infection, as well as the fact that many COVID patients had diabetes as co-morbidity. Despite its occurrence since the beginning of the pandemic, there are still unanswered concerns regarding the origin of this fungal infection. The author existing report of black fungus morbidity during the latest COVID-19 crisis in this selective study are early detection of this potentially life-threatening illness and timely care was critical in lowering mortality rates.

Keywords: mucormycosis, black fungus, COVID-19

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Introduction

As the second wave of COVID-19 spreads through India, cases of COVID-19-induced "black fungus" are increasing in some regions. In December of last year, doctors saw 12 such cases in 15 days, indicating an uptick in such cases. This fungal infection, which left several patients blind last year, has resurfaced in many hospitals in Delhi and Gujarat this week. Though Aspergillus and Candida are more common fungi, this fungus is particularly harmful because it affects the sinuses and the brain, and it appears in immunocompromised patients and/or those taking steroids, available information from (The Economic Times, May 09, 2021).[1] Mucormycosis cases have a 54 percent all-cause mortality rate, according to the Centres for Disease Control and Prevention (CDC). Mucormycosis cases have a 54 percent all-cause mortality rate, according to the Centre for Disease Control and Prevention (CDC). This rate, however, varies depending on the underlying medical condition, fungus type, and infected body location. The black fungus has moved many COVID-recovered patients back into ICUs since the onset of the pandemic.[2] According to studies, the virus causes intense pain which has led to the blindness of 20-30% of those affected. When the infection emerges behind the retina and compresses the optic nerve, vision loss occurs.[3]

Methodology

The authors independently scanned PubMed and news channel research using the search words "COVID-19" and "Black Fever." Many manuscripts were identified by the publishers, and our search was limited to manuscripts written in English and published within a certain time frame (till May 8th, 2021). We inserted complete specific manuscripts listed for the final analysis after eliminating duplications and non-relevant cross-references.

What exactly is black fungus?

Mucormycosis (previously known as zygomycosis) is a severe but rare fungal infection caused by the mucormycetes, a group of moulds. These fungi can be found in a variety of places, but they're most found in soil and rotting organic matter like leaves, compost piles, and rotten wood.[4] Mucormycosis is a fungal infection that mostly affects individuals that have health issues or who take medications that decrease the body's resistance to infection. Since inhaling fungal spores from the air, it most often damages the sinuses or lungs. It may also happen because of a wound, a burn, or some form of skin injury.[5]

Types of mucormycosis

Rhino cerebral Mucormycosis (sinus and brain infection) is a form of infection that can spread to the brain. Diabetics and individuals who have undergone a kidney transplant are more likely to develop this form of mucormycosis. Pulmonary (lung) mucormycosis is the most common form of mucormycosis in cancer patients and individuals who have undergone an organ transplant or a stem cell transplant. Gastrointestinal mucormycosis is more prevalent in children than in adults, particularly in premature and low-birth-weight babies under the age of one month who have undergone antibiotics, surgery, or drugs that decrease the body's capacity to resist germs and illness. Fungi invade the body from a skin split, causing Cutaneous (skin) mucormycosis. This is the most common type of mucormycosis in people who don't have a compromised immune system. Disseminated mucormycosis occurs as an infection travels from one part of the body to another through the bloodstream. The brain is the most often affected organ, but the spleen, heart, and skin may also be affected.[6–9]

Epidemiology of mucormycosis

Mucormycosis is contracted as people encounter fungal spores in the atmosphere. With the increase in prevalence, new causative agents, and a vulnerable population, the epidemiology of mucormycosis has changed in recent years. The rising has been seen all over the world, but it is especially noticeable on the Asian continent. After inhaling spores, for example, the virus may manifest itself in the lungs or sinuses. This types of mucormycosis are most common in individuals that have health issues or who take medications that reduce the body's capacity to combat germs and illness. After the fungus reaches the skin through a slash, scratch, burn or other form of skin trauma, mucormycosis may develop.[10,11]

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Diversity of fungi caused mucormycosis

Mucormycosis is a fungal infection that is angio-invasive and is associated with a high rate of morbidity and mortality. that can be caused by a number of fungi. Mucormycetes are fungi belonging to the Mucorales scientific order. Mucormycosis is caused by Rhizopus and Mucor species, which are the most widespread. Other examples include *Rhizopus arrhizus*, *Rhizopus homothallicus, Mucor irregularis, Syncephalastrum* species, *Cunninghamella bertholletiae*, *Apophysomyces variabilis*, *Thamnostylum lucknowense, Lichtheimia* (formerly *Absidia*) and *Saksenaea*.[12,13]

Proliferation of mucormycosis infection

Mucormycosis is not contagious, so it cannot be passed from one person to another. When people come into contact with fungal spores in their atmosphere, they become infected. If inhaled, the spores will invade the lungs or sinuses. If the fungus enters the body through a bite, scratch, or burn, a fungal infection may form on the skin.[14] The infection will then spread to organs mostly the eye, brain, heart, and spleen via the bloodstream. Even though most cases are intermittent, mucormycosis outbreaks have occurred in the past. Mucormycosis outbreeding has been attributed to adhesive bandages, wooden tongue depressors, hospital linens, negative pressure spaces, water leaks, inadequate air filtration, and non-sterile equipment in healthcare. Natural disasters have also been attributed to community-onset outbreaks.[15]

Symptoms of mucormycosis with COVID-19

After a person recovers from the Covid-19 infection, signs of mucormycosis or black fungus, occur two to three days later. This fungal infection starts in the sinus and progresses to the eyes in two to four days after the patient has been cleared of Covid-19. In the next 24 hours, the black fungus will spread to the brain.[16] According to the CDC, the symptoms of mucormycosis differ based on where the infection develops in the body. One-sided facial swelling, cough, nasal or sinus inflammation, fever, and dark lesions on the nasal bridge or upper interior of the mouth that quickly escalate are all signs of rhinocerebral (sinus and brain) mucormycosis. Fever, cough, chest pressure, and shortness of breath are all symptoms of pulmonary (lung) mucormycosis. Improved results in mucormycosis patients include early identification and diagnosis of the infection, as well as timely delivery of effective antifungal therapy.[17]

Susceptibility to mucormycosis infection

Black fungus has slight effect on most individuals who have a strong immune system. Individuals with a deprived level of immunity, on the other hand, are particularly susceptible to the fungus. Indeed, it has long been a source of illness and mortality of transplant and intensive care unit patients. COVID-19 patients with compromised immunity and elevated blood sugar are especially susceptible to infection in the current case. COVID-positive people with comorbidities including diabetes, cancer, kidney or heart disease as well as COVID patients on steroids, have recently been added to the list of black fungus cases that are steadily increasing.[18]

Treatment of COVID-19 with black fungal infection

The Drug Controller General of India authorised Bharat Serums and Vaccines Limited, a Mumbai-based biopharmaceutical company, to use the anti-fungal medication Liposomal Amphotericin B, or LAmB, as a medical intervention in Mucormycosis patients in March of this year. By restricting the use of steroids for a prolonged period, the risk of this fungus may be minimised. Antifungal medicine and if possible, surgery to remove the affected region are both part of the procedure. Steroids and immunosuppressive medications must be used with caution during therapy, particularly in aged, immunocompromised, cancer, and diabetic patients with COVID.[19,20] As of May 09, 2021, the COVID-19 pandemic had caused worldwide hysteria and major economic harm, with the infection-causing virus SARS-CoV-2 accounting for 157,289,118 cases and 3,277,272 deaths reported to WHO. In India, the central government has shared five steps to prevent black fungal infection in COVID-19 patients: Overall sanitation, blood sugar management, the prudent use of steroids, the use of clean water in humidifiers for patients on oxygen assistance, and the timely treatment of oral ulcers are all critical.[21–23]

Conclusion

Nowadays, a novel Coronavirus causes a global pandemic that affects nearly the whole world, resulting in a deadly condition. As of now no major outbreak of mucormycosis, a lethal black fungal infection, have been seen in COVID-19 patients. The COVID-19 with black fever or mucormycosis is also emerging, posing a significant threat to the medical community. Community-onset infections have also been linked to natural disasters. One-sided facial swelling, fever, nasal or sinus inflammation, and other symptoms that differ depending on the condition of mucormycosis are all common symptoms of this infection. Infection is most likely in patients on steroids, diabetics, or others who have had a transplant. As a result, early diagnosis, antifungal therapy, and prevention steps can be used to cure the infection.

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Conflicts of interest

The authors declare that they have no potential conflict of interests.

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