

Oral Mucormycosis: A Brief Review

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Abstract

COVID-19, the novel human corona virus discovered in China in December 2019 and later dubbed SARS-CoV-2, triggered a pandemic in a short amount of time. COVID-19 commonly presents with dry cough, fever, dyspnea, myalgia, joint pain, exhaustion, gastrointestinal symptoms, and anosmia/ dysgeusia. Increasing data suggest that the virus can be found in multiple other organ systems, including the heart, blood vessels, kidneys, gastrointestinal tract, oral cavity, eyes, and brain. Patients that survive and recover COVID-19 will reportedly suffer problems with their overall health state after their acute phase recovery and also experience symptoms such as weariness, dyspnea, dry coughing, congestion, loss of taste or smell, loss of hearing, body aches, diarrhea, nausea, chest or stomach discomfort. One such complication is Mucormycosis. This review discusses the condition, its symptoms, and prevention.

Keywords: Mucormycosis, covid-19, Black fungus, coronavirus

Introduction

Coronavirus disease 2019 (Covid-19) is an infection caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2).[1] The Covid-19 symptom spectrum has expanded since the first days of the disease's presentation, which initially included only dry cough and high-grade fever, to additionally include various multisystem problems such as shortness of breath, anosmia, ageusia, diarrhoea, generalized malaise, acute cardiac injury, and secondary infections. Early identification of these high-morbidity conditions is crucial for optimal treatment and improved outcomes.

Otorhinolaryngology has been relevant to corona virus pandemic from the start, beginning with nasopharyngeal swab sampling for diagnosis to the declaration of anosmia as a typical symptom marker or the detection of virus isolates from the middle-ear cavity. [2] Recently, another association has been observed between ENT and corona virus, fungal sinusitis resulting from mucormycosis. India is recording several cases, most of them suffering from severe COVID-19 and its complications and attributing to dysfunction of the immune system. Also, those patients who recovered from COVID-19 again land up in hospitals

with odd facial deformities. Mucormycosis is a fungal infection triggered by Corona virus. The country has recorded 11,717 cases of Mucormycosis so far, with Gujarat, Maharashtra, Andhra Pradesh, Madhya Pradesh, and Telangana lodging the highest number of rare fungal infection, according to the latest government data. While Maharashtra has reported 2,770 cases, Gujarat has logged 2,859 cases, Andhra Pradesh has registered 768 cases, Madhya Pradesh has 752 cases, and Telangana has 744 cases so far.[3]

Mucormycosis is an uncommon aggressive opportunistic infection that can produce widespread or facial tissue necrosis.[4] Coming in contact with the fungal spores in the environment, the fungus enters the skin through a cut, scrape, burn, or other types of skin trauma. [5]

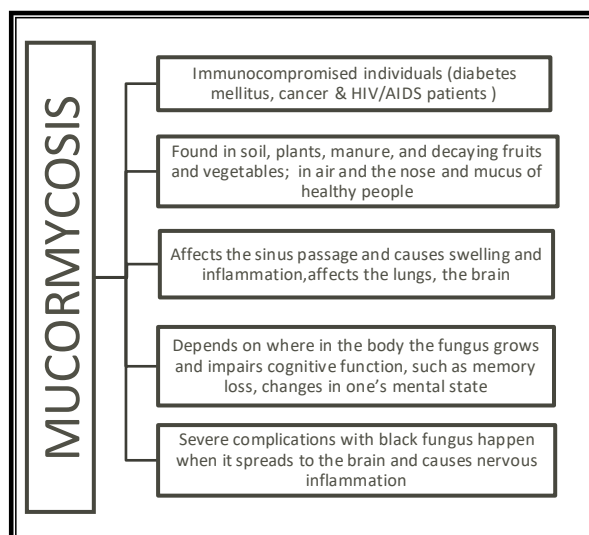


Figure: 1 Summary of Mucormycosis

How does it work?

Mucormycosis is an invasive disease caused by a group of filamentous molds. The most

common causative organism associated with Mucormycosis is *Rhizopus* species.[6,7] As it is the deadliest and most rapidly progressing type of human-affecting fungal infection, it has a poor prognosis. It is a rare terminal complication of uncontrolled diabetes and another chronic debilitating disease. The incidence of the disease increased due to the widespread use of antibiotics and steroids. The fungi usually are avirulent and can invade the tissue only when the general resistance is low. The pathogenesis of mucormycosis involves inhalation or ingestion of sporangiospores of *conidia* (Non-motile spore of fungus). The nosocomial outbreaks of mucormycosis have been associated with medical waste, contaminated bandages, medical equipment, and ventilation systems.[8] By oxidative and non-oxidative killing mechanisms, the mononuclear cells eliminate the fungal spores in healthy individuals. Mucormycosis can be classified based on anatomical location as rhino - orbital - cerebral - mucormycosis, pulmonary, cutaneous, gastrointestinal tract, disseminated and uncommon sites (bones, peritoneum, heart). [9,10]

Risk Factors [8, 13]

- Diabetes mellitus (poorly controlled and ketoacidosis)
- Organ transplantation
- Autoimmune disorders
- Immunosuppressive therapy

- HIV
- Burns
- Iron overload
- Malnutrition

What should you look out for?[5,6]

- Eye swelling
- Jaw or teeth pain
- Bloody discharge from nose
- Severe headache or
- Visual changes like double vision or sudden blindness
- One-sided facial swelling
- Nasal or sinus congestion
- Black lesions on nasal bridge
- Fever
- Cough
- Chest pain
- Shortness of breath
- Abdominal pain
- Nausea and vomiting
- Gastrointestinal bleeding

Do's?[5,6,14]

- Controlling hyperglycemia-blood sugar levels in diabetics.
- Monitoring blood glucose levels post-COVID-19.
- Using antibiotics/antifungals judiciously.
- Using masks at dusty construction sites. Used masks to be washed daily.
- Maintaining personal hygiene, including thorough scrub showers.

- Dental practitioners should take appropriate personal protective measures against different types of patients, including wearing goggles, masks, gloves, disposable protective clothing, etc.
- Hospital management system of hand hygiene, hospital management system of disinfection and sterilization, environmental disinfection should be done.

Don't's? [5,6]

- Alert in signs and symptoms of black fungus
- All the cases with the blocked nose are not bacterial sinusitis, particularly in the immunosuppression and COVID-19 patients.
- After recovering from coronavirus, closely monitor warning signs and symptoms mentioned above.

How do you prevent it?

- Control of diabetes in diabetics
- Control of glycaemic levels during Covid-19 infection
- In the recovery phase of Covid, examination by ENT specialist in preventing or doing early treatment of mucormycosis
- Vaccination to reduce the severity of covid.⁴

How do we treat it?

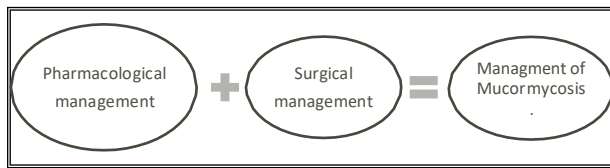


Figure:- 2 Management of Mucormycosis

The treatment recommendations can be supported by the global guideline for the diagnosis and management of Mucormycosis in 2019 by the European Confederation of Medical Mycology (ECMM) and Mycoses Study Group Education and Research Consortium that the therapeutic and alternative medication of mucormycosis has been given more detailed guidance opinions.[11] Generally, it strongly supports an early complete surgical treatment for mucormycosis whenever possible, in addition to systemic antifungal treatment. Amphotericin B lipid complex, liposomal Amphotericin B, and posaconazole oral suspension are treated as the first-line antifungal monotherapy, while isavuconazole is strongly supported as salvage treatment. Primary prophylaxis with posaconazole may be recommended in neutropenic patients, those with graft-versus-host disease or high-risk factors. There are no convincing data to guide the use of antifungal combination therapy of polyenes and azoles or polyenes plus echinocandins. [12]

Conclusion

Since the first case in December 2019 in Wuhan, China, various turns and twists

regarding its pathophysiology, diagnosis, management, sequelae, and complications have arisen.

Mucormycosis is NOT black fungus. Mucormycosis causes tissue blackening by devitalizing its blood supply, and this black appearance has been misreported as a black fungus. There is no scientific evidence that oxygen pipes, oxygen supply, or humidifiers are responsible for its spread or origin. Unlike Covid-19, it is not contagious and does not spread from one person to another. All Covid patients are not susceptible to it, and it is extremely uncommon in Covid patients who did not receive steroids or had their diabetes under perfect control. The most important factor for patient survival tends to be the management of the underlying disease with early detection and active surgical and antifungal action. Therefore, the dental profession must be familiar with the possibility of potentially severe and possibly fatal complications.

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