

Black Fungus as an Epidemic Triggers in Covid-19 Patient's: A New Challenges in India

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Abstract

India is belligerent against a rapid increase in Covid-19 cases, but a revolting and unusual fungal illness known as Mucormycosis (black fungus) has emerged in patients suffering from or recovering from COVID-19. Unfortunately, depending on the severity of the illness, it has high rate of mortality.

Keywords: *Mucormycosis (Black Fungus); Covid-19; Challenges; Epidemic*

Introduction

India is currently going through a great panic due to COVID-19 infection. A crushing second wave of Covid-19 is very aggressive and mortality is also increased compare to first wave. India is observing more than 400000 lakh new infection in a day and it required effective intervention to reduce the number of cases. Anecdotal reports reveal that unnoticed and uncounted death are rising in the India.

Severity of COVID-19 depend on several associated bacterial and fungal infections. Some time it may lead to life threatening condition. Many diseases condition like diabetes, chronic obstructive pulmonary disease and immunosuppressive condition may lead to opportunistic infection. There are reports of the development of severe opportunistic infections such as oropharyngeal candidiasis, pneumocystis jiroveci pneumonia and pulmonary aspergillosis, etc. in patients affected with COVID19 disease [1,2]. Although rare, recently, mucormycosis, a serious fungal infection commonly known as mucormycosis and colloquially as "black fungus", has been observed among patients hospitalized or improving from COVID-19, with few may requiring urgent surgery [3].

Mucormycosis is an opportunistic infection caused by organisms in the order Mucorales. These organisms are abundant in nature but, those who are it can cause devastating rhino-orbito-cerebral infection in susceptible patients [4].

Eye surgeons, who frequently have to remove an eye to treat mucormycosis, have been observed a significant increase in cases [5]. In 15 days, Surat, a city of 6 million people in Gujarat, reported 40 cases and eight lost eyes [6]. Rajesh Tope, Maharashtra's health minister, said on May 11 that "there may be over 2000 mucormycosis patients in the state right away" [7].

Clinical impact of black fungus in patients

Sarkar, *et al.* has reported that in month of October and November 2020 around 10 cases of orbital mucormycosis with concurrent COVID19 illness at his institute. On routine screening they were evaluated and diagnosed with orbital mucormycosis and COVID19. Medical diagnosis of mucormycosis was confirmed in six patients. RT-PCR for COVID-19 was tested positive for all the patients. All patients were known case of diabetics. Diabetic ketoacidosis (DKA) was identified in four patients during admission while five more patients developed DKA after the initiation of corticosteroid therapy for COVID19 disease. All patients had received intravenous dexamethasone for COVID19

disease as per institute protocol. Four patients in our series expired within 1 month of the diagnosis, five patients had satisfactory systemic outcomes, but with irreversible vision loss, while only one patient had both ocular and systemic favourable outcomes [8].

Karimi-Galougahi M., *et al.* (2021) has reported the clinical pathway of 61-year-old patient who was hospitalized due to infection of COVID-19. During hospitalization she has received remdesivir and corticosteroids. After a week of discharge, she had a symptoms of right hemi facial pain with nasal congestion and discharge. All the symptoms were progressively increased with severity like hemi facial numbness and reduce in visual acuity. Patient was readmitted in hospital, on screening black eschar on right lateral nasal wall and malar and periorbital regions was assessed. CT scan and MRI of the paranasal sinus and orbits report revealed fungal infection of the right maxillary sinus and right intraorbital fat adjacent to the lamina papyracea without signs of abscess. Initially she was treated with insulin and anti-fungal therapy. Later on debridement of endonasal of necrotic tissue was done [4].

Waizel-Haiat S., *et al.* (2021) remarked that Mucormycosis is an infectious fungal infection that occurs in patients with an underlying condition. It is often acute and extremely serious. Coinfection, mostly bacterial, has been confirmed in patients with coronavirus disease 2019 (COVID-19). A 24-year-old woman is diagnosed with COVID-19 and acute fatal rhino-orbital mucormycosis. First case of rhino-orbital mucormycosis was observed which was associated with COVID-19. It is also seen that most of diabetes case were having black fungus infection in COVID -19 patients [9].

Mekonnen ZK., *et al.* (2021) describe a case of acute invasive fungal rhino-orbital mucormycosis in a 60-year-old man with COVID-19, as well as the occurrence, diagnosis, and treatment of fungal coinfections in COVID-19 patients. Patient survival can be improved by early detection, treatment, and understanding of the challenges of rapidly changing COVID-19 therapy guidelines. These diseases share risk factors, have independently high mortality rates, but currently have conflicting management principle [10].

Vijay K, Sowmya A., *et al.* presented a case of 72 year of old patient who was having history of hypertension, hypothyroidism and steroid induce diabetes. He was infected with COVID-19 and received anti-viral medicine (remdesivir), corticosteroids and plasma therapy in ICU. He was on high flow oxygen therapy. After the treatment patient presented with streaky haemoptysis. Patient was undergone the procedure of PET CT and result showed, 2.5 cm nodule in right upper lobe with hypermetabolic mediastinal nodes hypermetabolic soft tissue nodules in right arm and thigh. Histopathology also suggested the broad non-septate fungal hyphae with mucormycosis. This study conclude that the risk factors of fungal infections may include, diabetes, long term stay in hospital, oxygen therapy and corticosteroids medicines. Clinical course of mucormycosis depend on the stages of disease and it required long term use of antifungal medications [11].

Tabarsi P., *et al.* (2021) presented a COVID-19 case who was admitted with uncontrolled diabetes in hospital. As a part of treatment she had received corticosteroids and remdesivir. The patient was readmitted a few days later due to facial swelling and numbness, and PCR and DNA tests confirmed a diagnosis of COVID-19 related rhinosinusitis mucormycosis caused by *Rhizopus oryzae*. Follow up is necessary with the patient of COVID-19 who has received the corticosteroids and having predisposing conditions. Early detection and aggressive treatment of fungal infection will help in fast recovery [12].

Garg D., *et al.* (2021) reported a case and conducted a systematic analysis on Covid-19 Associated Mucormycosis (CAM). They identified a case of possible pulmonary mucormycosis in a 55-year-old man with diabetes, end-stage kidney disease and COVID-19 who was admitted 21 days after being diagnosed with severe COVID-19. He was treated with antiviral therapy and discharged after 54 days from the hospital. In systematic analysis of the literature they discovered seven more cases of COVID-19-related mucormycosis (CAM). Diabetes mellitus was the most common risk factor in the eight cases. Other than glucocorticoids, three participants had no risk factors for COVID-19. Mucormycosis normally appears 10 - 14 days after being admitted to the hospital. With the exception of the case listed, everybody deceased. CAM was discovered post-mortem in two of subjects. Mucormycosis is a rare but fatal infection that is associated as complicates of the COVID-19. It is more likely to occur in people who have diabetes mellitus and other risk factors and exacerbated by concurrent glucocorticoid treatment. To improve results, a high index of suspicion and aggressive management are needed [13].

Clinical warning signs [14]

Clinical warning signs may be vary in patients. Few patient will visit the hospital with complain of redness and little pain near to eye and nose. This complain may be associated with fever, vomiting with blood and shortness of breath. Sometime patient may appear with altered mental status. According to the advisory, infection with mucormycetes should be suspected when there is:

- Sinusitis - nasal blockade or congestion, nasal discharge (blackish/bloody).
- Local pain on the cheek bone, one-sided facial pain, numbness or swelling.
- Blackish discoloration over bridge of nose/palate.
- Loosening of teeth, jaw involvement.
- Blurred or double vision with pain.
- Thrombosis, necrosis, skin lesion.
- Chest pain, pleural effusion, worsening of respiratory symptoms.

Treatment [14]

Mucormycosis is treated with antifungals therapy but most of cases may be require surgical intervention. Medical treatment includes the infusion of normal saline before administration of amphotericin B and antifungal therapy, for at least 4 - 6 weeks.

Preventive measures [15]:

- Immediately report to physician at early stage of any symptoms of mucormycosis.
- Control the blood sugar during COVID-19 with or without steroids.
- Use steroid judiciously with correct time, correct dose and correct duration if required.
- Use of antibiotics and antifungal judiciously.
- Use of sterile or distilled water for humidifiers during the oxygen therapy and change on daily bases.
- Never use un-boiled tap water nor mineral water.
- Fill up the distilled water 10 mm below the maximum line in humidifiers.
- Monitor the water level and topped up as required.
- Every weekly all part of humidifier should be deep in antiseptic solution for at least 30 minutes and rinse with water and dry in air.
- Discontinue immunomodulating drugs.

Conclusion

Mucormycosis (black fungus) is not a new disease; in fact, a surge in cases was documented during the COVID era [16]. COVID-19-related mucormycosis instances are still linked to a weakened immune system in infected patients, diabetes and corticosteroid medication [4]. Consultant should be aware with the symptoms of the deadly invasive mucormycosis in order to diagnose it quickly in susceptible patients.

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Conflict of Interest

There is no conflicts of interest.

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