

COVID-19 associated mucormycosis a deadly disease within the pandemic



COVID-19 pandemic affected India and world substantially and as health care system was trying to achieve control and stability over the difficult situation, another dreadful threat emerged as a challenge to our country in the form of Coronavirus disease associated mucormycosis (C. A. M) especially during second wave. Mucormycosis was seen occasionally in our country and in few places incidence was more. Most of the maxillofacial units across the country had seen cases prior to pandemic. Commonest underlying predisposing disease was invariably diabetes mellitus although other disease and drugs have been reported but rarely.^[1] The disease affected maxillofacial region most commonly followed by intestine and pulmonary regions.^[2] There was no difference between the prepandemic mucormycosis and CAM except for the severity and aggressiveness of the disease and its predisposing disease so much so that glycosylated haemoglobin in all CAM patients was as high as 11%, many crossing 13%. CAM also progressed more rapidly to involve skin, eye and cranial cavity. Most patients had history of hospitalisation during COVID and developed CAM soon after discharge or within a month or two after discharge. There was another category of patients who came to hospital with mucormycosis only to be diagnosed with COVID as well during screening although small in number. This disease was seen typically in the Rhino-orbital-cerebral form in COVID-19 patients. Although majority of the patients had their maxilla involved with extension to the sinuses, orbits, cranial cavity and skin. The aggressive and invasive nature of the disease combined with steep rise and long hospital stay, lead to massive load of cases. With mortality rate of almost 31%–50%,^[1,3,4] the disease turned out to be a challenge to the doctors fighting against it and devastating to the patients due to its deadly outcomes. Many patients lost their lives and many had to undergo aggressive surgeries involving resection of jaws and exenteration of eyes.

Many retrospective, cohort, interventional studies were carried out documenting cases and suggesting and sharing treatment protocols at various centres throughout the country.

The assessment of CAM outbreak revealed the following reasons for increase in mucormycosis in COVID–19 patients:^[5]

- Hyperglycaemia due to uncontrolled preexisting diabetes and high prevalence rates of mucormycosis in India *per se*
- Rampant overuse and irrational use of steroids in management of COVID–19
- New onset diabetes due to steroid overuse or severe cases of COVID–19 *per se*.
- Prolonged intensive care unit stay and irrational use of broad-spectrum antibiotics
- Preexisting co-morbidities such as haematological malignancies, use of immunosuppressants, solid organ transplant etc
- Breakthrough infections in patients on Voriconazole (anti-fungal drug) prophylaxis.

Hyperglycaemia, injudicious use of steroids and immunosuppression were the leading factors associated with higher incidence of CAM. This becomes clinically important, especially in India that has an increased prevalence of undiagnosed and uncontrolled diabetes.

The disease presented with various overlapping signs and symptoms like facial pain (commonly over sinuses), pain in teeth and gums, paraesthesia over half of face, blackish discolouration of skin, nasal crusting and nasal discharge which could be blackish or blood tinged, loosening of teeth, blackish discoloration of palate, conjunctival infection and periorbital swelling etc. As these symptoms are nonspecific and often mimic other oral conditions, it is important

to diagnose early and initiate prompt and correct early management of the disease. In a pandemic, history, clinical examination and a diabetic state should immediately alert clinicians to CAM, and immediately start antifungal drugs, further a biopsy and culture should be used to confirm the diagnosis. Diagnostic methods include biopsy and fungal staining (KOH mount), fungal culture and susceptibility testing. Imaging tests such as a computed tomography scan of lungs, sinuses, or other parts of body, depending on the location of the suspected infection, may also be used to assess extent of the disease. Treatment initiation, however, should not wait for fungal culture results. Waiting is devastating!

An appropriate IV antifungal therapy coupled with surgical debridement (as needed) and aggressive medical management of underlying diseases like diabetes, immunosuppression due to various causes, monitoring of vital signs and assessment of renal function every 3rd day (because of amphotericin and diabetes) are important for improving outcomes for patients with mucormycosis. These demands necessitating a multidisciplinary team approach in a facility setting. Liposomal amphotericin B is the drug of choice and needs to be initiated early.^[4] However conventional Amphotericin B is equally effective, unavailability of liposomal amphotericin B should not prevent initiation of the treatment. Other antifungals like Posaconazole, or Isavuconazole have also have been described for treatment. After resection of the affected jaws reconstruction may be taken up at a later date once the disease is well under control.

MY EXPERIENCES WITH CAM

Working in a government dental institute inside a hospital (which was a COVID hospital) attached to medical college presented unique opportunity of treating patients with mucormycosis and COVID-19, while most patients present with mucormycosis after recovering from COVID-19, the patients in our hospital were diagnosed with both the diseases simultaneously. All the patients had maxillary involvement. Depending on the need underwent maxillectomy (partial, complete or bilateral) functional endoscopic sinus surgery, orbital exenteration. Some of the patients had intracranial extension. Its surprising how quickly disease had spread to intracranial cavity considering they were diagnosed with COVID 19 just then. One patient reported with a complaint of nasal bleed and diagnosed with CAM and COVID-19 He had erosion of the internal

carotid and bled profusely on the table after maxillectomy the site was packed and orally closed so as to apply pressure over the vessel. He was later taken up for embolization of internal carotid artery.

Going to a COVID hospital, wearing 2 layers of complete overall personal protective kit to operate presented challenges. Eyewear used to get foggy very quickly and PPE used cause lot of sweating. Donning and doffing too was challenging we had to be alert all the time not let our guard down, always a doubt was there if a breach in protocol happened. The fear that one may contract COVID-19 always lingered around. Personal protective equipment kit prevented patient knowing the doctor examining and operating, there was no patient doctor relation. Even during subsequent follow-up visits it didn't develop. Posttreatment many patients are returning with acceptable results, few recurrences are noted too.

With the world still battling COVID-19, and mucormycosis one of the deadliest complications associated with the disease, we need to understand our role in creating awareness, early detection and management with greater emphasis on diabetes in a COVID-19 patient. We along with the regulatory authorities need to be prepared for future spikes till we win this battle against this vicious virus and its complications.

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REFERENCES

1. Corzo-León DE, Chora-Hernández LD, Rodríguez-Zulueta AP, Walsh TJ. Diabetes mellitus as the major risk factor for mucormycosis in Mexico: Epidemiology, diagnosis, and outcomes of reported cases. *Med Mycol* 2018;56:29-43.
2. Petrikkos G, Skiada A, Lortholary O, Roilides E, Walsh TJ, Kontoyiannis DP. Epidemiology and clinical manifestations of mucormycosis. *Clin Infect Dis* 2012;54 Suppl 1:S23-34.
3. Hussain S, Baxi H, Riad A, Klugarová J, Pokorná A, Slezáková S, *et al.* COVID-19-Associated Mucormycosis (CAM): An updated evidence mapping. *Int J Environ Res Public Health* 2021;18:10340.
4. Reid G, Lynch JP 3rd, Fishbein MC, Clark NM. Mucormycosis. *Semin*

Respir Crit Care Med 2020;41:99-114.

5. Guidelines for Management of Mucormycosis in COVID 19 Patients. Available from: <https://dghs.gov.in/WriteReadData/News/202105171119301555988MucormycosismanagementinCovid-19.pdf>. [Last accessed on 2021 May 26].

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