

A battle within the war - Mucormycosis: The Black fungus disease in India during COVID -19

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Dear Editor,

The second wave of COVID 19 infection hit India in the mid of March 2021, with a sudden exponential surge in the number of active cases. The newly reported cases, which were approximately 17000 per day between the months of January and March, catapulted to 1.5 lakhs per day in the mid of April and reached a record peak of 4.1 lakhs per day in the first week of May 2021.¹ As the nation gasped for oxygen and the healthcare system was stretched to its limit, an unanticipated problem emerged. Mucormycosis, a life-threatening fungal infection now commonly referred to as 'Black fungus', which typically infects immunocompromised and diabetic individuals, found its ideal environment for growth in patients recovering from COVID 19. The fungi usually gets transmitted by traumatic inoculation.

COVID-19 patients with Acute Respiratory Distress Syndrome in severe forms require high doses of steroids with oxygen supplementation. The steroids compromise the immune system making it a suitable habitat, and the improperly sanitised oxygen delivery systems and hospital linens act as a vehicle for the transmission of the fungi.²

Although the incidence of rhino-orbito-cerebral mucormycosis amongst COVID 19 affected patients remain unknown, there are few studies related to mucormycosis in COVID 19 individuals from India. One is a multicentric, retrospective, interventional study conducted between August 2020 and December 2020, where the authors reported six patients with simultaneous COVID 19 and mucormycosis infection. The mean duration between diagnosis of COVID 19 and development of the symptoms of fungal infection was 15.6 ± 9.6 (3-42) days. All the patients underwent endoscopic sinus surgery; two required exenteration, and no deaths were reported.³ Sarkar et al. reported a cluster of 10 cases of mucormycosis with COVID 19 infection between November and December 2020. All were treated with intravenous dexamethasone for COVID-19 and liposomal amphotericin B for mucormycosis. Four patients died within a month, and five patients had satisfactory systemic outcomes with irreversible vision loss, while only one patient had both ocular and systemic favourable outcomes.⁴ A multi centric collaborative retrospective, observational study by Sen et al of 2826 patients revealed that corticosteroids and Diabetes mellitus (DM) (78% cases) are the most important predisposing factors in the development of COVID-19-associated mucormycosis.⁵

This was noted in another study, where authors presented

15 patients cases where orbital spread of mucormycosis were mostly found in non-COVID uncontrolled diabetics.⁶ However, both these reports were from the first wave of COVID 19, and with the exponential rise in the number of COVID 19 cases, the number of mucor cases had also gone up. In the present day scenario, a tertiary care hospital in north India receives nearly ten new cases of rhino-orbito-cerebral mucormycosis every day. At this juncture, there is an epidemic amidst the ongoing pandemic.

The management of rhino-orbito-cerebral mucormycosis requires a multidisciplinary approach involving oto-rhino laryngology, ophthalmology, neurosurgery, endocrinology, and even the medicine department. The conventional management options revolve around aggressive usage of intravenous, Amphotericin B coupled with surgical debridement and, at times, exenteration of the orbit. Apart from the conventional amphotericin B deoxycholate, three lipid formulations, namely amphotericin B lipid complex (ABLC), liposomal amphotericin B (L-AmB), and amphotericin B colloidal dispersion (ABCtD), are also available. All three drugs have different pharmacokinetics due to difference in the composition of lipids. Recommended therapeutic dosage for ABLC is 5 mg/kg/day, L-AmB is 3-6mg/kg/day and ABCtD is 3-4 mg/kg/day. Posaconazole is a triazole antifungal, given at a dose of 800mg daily in two to four divided doses. To enhance its rate of absorption, it has to be given along with high fatty meals. Though Posaconazole has a lesser side effect profile, its efficacy is comparable with Amphotericin B.⁵ Moreover, low dose amphotericin B combined with Posaconazole had similar efficacy compared with standard-dose amphotericin B alone. Isavuconazole is a water-soluble second-generation triazole with broad-spectrum antifungal activity; for both intravenous and oral administration recommended dose is 200 mg every 8th hourly for 48 hours followed by a maintenance dose of 200mg once daily. Major advantage of azole over amphotericin B is lesser toxicity and availability for oral administration. Intraorbital injections of Amphotericin B has yet to be proven by large scale randomised studies.

The rise in the number of rhino-orbito-cerebral mucormycosis has also led to an unprecedented increase in the demand for antifungal medications, and many tertiary centres are running out of supplies, and the country is facing an acute shortage of antifungal drugs.

As more and more cases reach the hospital, oculoplasty surgeons and otorhinolaryngologist are busy performing

repeated surgical debridements and exenterations every day. screening and stringent management guidelines before the deadly fungus causes further damage. The formulation of high-risk group criteria and screening protocols are the need of the hour.

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