

Mucormycosis Surge with the Second Wave of COVID-19 in India

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To the editor:

In recent times, we have seen a steep rise in cases of invasive mucormycosis infection in patients of COVID-19 (Coronavirus infection disease 2019) in India. We reviewed literature to find plausible cause of this association. Considering the pathogenesis, fungal spores need to evade the innate immune system and germinate, leading to angioinvasion and tissue destruction. Literature states that mucorales are able to downregulate several host defense mechanisms and attach to the endothelium via specific receptors, GRP78 facilitating their endocytosis and angioinvasion. Factors such as hyperglycemia, elevated iron concentrations, and acidosis have been shown to contribute to the pathogenesis in experimental setup and animal models. The antifungal properties of platelets and natural killer cells have been demonstrated (1). But reasons for mucormycosis happening post covid19 are still not clear.

Review of literature published till April of 2021 revealed 68 cases of mucormycosis in patients of COVID-19. Rhino-ocular-cerebral infections comprised the majority (60/68). Less common sites included pulmonary mucormycosis (5/68), and 1case each of cutaneous, gastrointestinal tract and fulminant mucormycosis. India accounted for 75% of published cases (51/68) (2-10), followed by United States of America (9/68) (11-18), Iran (4/68) (19-21) and 1 case each from Brazil (22), Mexico (23), Italy (24) and Austria (25). Most patients suffering this complication of mucormycosis had some underlying co-morbidity mainly diabetes mellitus, but infections in immunocompetent persons have also been seen.

The second wave of COVID-19 pandemic in India has seen a sudden surge in cases of mucormycosis and associated complications of vision loss, brain abscess and stroke. Both morbidity and mortality are on a rise post this fungal infection. Maharashtra, a state in India with a population of approximate 114 million has documented 1500 cases of mucormycosis post covid-19 with 52 death in last 1-month (26). As per one report, India has a total of 8,848 mucormycosis cases post covid19 after many states have made it's a notifiable disease (27).

Why such a steep rise in cases of mucormycosis post second wave of covid-19? In second wave India has had too many cases of covid-19 which hospital system could handle so many patients were prescribed steroids early and given longer in the hope of avoiding need for oxygen and hospital admission. India is the diabetes capital of India. Severe Covid-19 causes activation of immune system which raises ferritin. Covid-19 is frequently associated with lymphopenia. So, a combination of steroids, diabetes, high ferritin and lymphopenia might be contributing to this sudden and steep rise (1,3). Another factor could be that new strain of SARS-COV-2, B.1.617 reported in this second wave in India is more infectious so more cases and also it is somehow promoting entry of mucorales into the patients. With such rapid rise in cases there is an urgent need to identify patients at risk of this infection and start urgent treatment to save lives and avoid debilitating complications. Mucormycosis post covid19 in India has reached epidemic proportions and more research is needed about this association.

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