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Does high-dose steroid therapy support health issues by mucormycosis in India?

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Mucormycosis is due to pathogens from order Mucorales and is accompanied by high mortality and morbidity [1]. Its prevalence in India is approximately 70 times higher than that in the world [1]. The major risk factors are diabetes mellitus, hematological malignancy, and solid-organ transplant [1]. In India, patients suffering from post-pulmonary tuberculosis and chronic kidney disease have more threat of mucormycosis [1]. Cutaneous mucormycosis can occur after trauma [1 of lower immunity owing to COVID-19 treatment. Isolated renal mucormycosis in an immune-competent host is unusual in India [1]. Moreover, the most common agent of mucormycosis is *Rhizopus arrhizus* but *Rhizopus homothallicus, Rhizopus microsporus,* and *Apophysomyces variabilis* may contribute to an infection. In contrast, *Mucor irregularis, Saksenaea erythrospora,* and *Thamnostylum lucknowense* have been seldom reported [1]. Mononuclear cells, tissue macrophages, neutrophils, platelets, and natural killer cells are important in host defense mechanisms [2]. To add, immune suppression and neutropenia hinder the host defenses and allow fungal growth [2].

Unlike COVID-associated pulmonary aspergillosis, patients acquire invasive mucormycosis through SARS COV-2 (mild to moderate) infections [3]. Hyperglycemia is the strongest predisposing factor

in patients with undiagnosed or uncontrolled diabetes [3]. Use of corticosteroids in susceptible hosts enhances the growth of Mucorales [3]. COVID-19 associated mucormycosis can be COVID-19-associated (concomitant) or can occur sequentially weeks or months after recovery (sequential) [3]. Early diagnosis and antifungal as well as surgical therapies for mucormycosis are urgently required for survival of patients [3].

In individuals with early-stage or mild COVID-19 infection, mucormycosis can be prevented by limiting steroid usage [4]. The recommended corticosteroids for hyperimmune stage of coronavirus infection comprise methylprednisolone, predsolone, dexamethasone, and hydrocortisone [5]. In India, rise in mucormycosis cases appears due to diabetes and non-judicious use of corticosteroids to treat COVID-19[4].

The Indian Council of Medical Research (ICMR) guidelines for the hospitalized patients with COVID-19 recommended administration of 0.5–1 mg/kg and 1–2 mg/kg methylprednisolone (two divided doses) for patients with moderate and severe diseases, respectively [6]. According to National Institute of Health (NIH) COVID-19 management guidelines, clinicians should manage the patients with COVID-19 who are receiving steroid therapy for adverse effects. The combination of anti-SARS-CoV-2 monoclonal antibodies casirivimab and imdevimab have been granted by Emergency Use Authorization (EUA) by the US Food and Drug Administration for the treatment of non-hospitalized individuals with COVID-19 [7].

Considering the current situation of COVID-19-associated mucormycosis, attempts to increase awareness, early diagnosis, and treatment must be made and only sensible evidence-based use of corticosteroids in patients with COVID-19 is suggested to diminish the load of deadly mucormycosis.

Evidence-based medicine can ensure “the right care at the right time to the right patient” and has a substantial role in saving us in this situation.

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