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A Brief Note on Mucormycosis and Its Risk in COVID-19 Patients

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Description

A life-threatening fungal infection known as Mucormycosis occurs in immunocompromised patients like patients having Diabetic ketoacidosis, Neutropenia, organ transplantation, increased serum levels of available iron etc. Mucormycosis is an emerging fungal infection worldwide, with devastating disease symptoms and diverse clinical manifestations. The most important underlying risk factors are immunosuppression, poorly controlled diabetes, iron overload and major trauma. The aetiological agents involved in the disease have been re-classified due to changes in taxonomy and nomenclature, which also led to appropriately naming the disease 'mucormycosis'. This article shortly explains the new nomenclature, clinical manifestations and risk factors and focuses on putative virulence traits associated with mucormycosis, mainly in the group of diabetic ketoacidosis patients.

A wide range of bacterial and fungal infection is seen in the patients with coronavirus disease 2019 (COVID-19). The use of steroids, monoclonal antibodies, broad-spectrum antibiotics may lead to the development of a pre-existing fungal disease. Investigating pathogenesis and host response to invading hyphae of mucormycosis eventually will provide targets for novel therapeutic interventions. Physicians should be aware of the risk of resulting invasive fungal infections in patients with COVID-19 infection and diagnose the infections in such patients at earlier. The global mortality rate is high regardless of aggressive therapy, which consist of disfiguring surgical debridement and adjunctive toxic antifungal therapy. Newer attempts to prevent and treat mucormycosis are crucial, coronavirus disease 2019 (COVID-19), caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), has been sweeping across the globe.

Mucormycosis is an infection caused by fungi belonging to the order Mucorales. *Rhizopus oryzae* is the most common organism isolated from patients with mucormycosis and is responsible for 70% of all cases of mucormycosis. The major risk factors for mucormycosis include uncontrolled diabetes mellitus in ketoacidosis, other forms of metabolic acidosis, treatment with corticosteroids, organ or bone marrow transplantation, neutropenia, trauma and burns, malignant hematologic disorders, and deferoxamine therapy in patients receiving hemodialysis. Because of the increasing prevalence of diabetes mellitus, cancer, and organ transplantation in the aging US population, the number of patients at risk for this deadly infection is dramatically increasing.

The logical extension of the observations of the roles of key virulence factors is to develop therapeutic strategies that will translate to interventional studies. The possible benefits of interventions that would complement existing therapies would be profound for patients with mucormycosis. COVID-19 is associated with a significant incidence of secondary infections, both bacterial and fungal probably due to immune dysregulation.

The widespread use of steroids/monoclonal antibodies/ broad-spectrum antibiotics as part of the armamentarium against COVID-19 may lead to the development/exacerbation of pre-existing fungal diseases. Physicians should be aware of the possibility of invasive secondary fungal infections in patients with COVID-19 infection especially in patients with pre-existing risk factors and should enable early diagnosis and treatment with the subsequent reduction of mortality and morbidity. The use of therapeutic agents should be monitored to achieve a therapeutic effect at the lowest dose and shortest durations. The use of broad-spectrum antibiotics, especially in the absence of infection, should be re-evaluated.