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Letter to Editor

COVID-19 Exposure and Fungal Infections: Associated Clinical Aspects

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Letter to Editor

The period of the COVID-19 pandemic shows emerging evidences associated with worsen clinical outcomes. This unprecedented situation creates new challenges day by day in the field of medical sciences and clinical research. The etiology of COVID-19 is complex and not restricted to respiratory distress syndrome alone but rather arises as a consequence of numerous interconnected pathogenesis and risk factors.

Potentially the negative outcome developed with aging, sex, obesity, diabetes mellitus, smoking, and other comorbidities likely for the severity associated with the infectious and non-infectious disease. Individually the rate of fatality and mortality increase across the world whereas the co-existing medical condition with fungal infections will increase the mortality rate exponentially.

Fungal infections are evidently recounted in post COVID-19 infected patients due to prolonged intake of high doses immunosuppressive drugs [1]. Patients with pre-existing medical conditions like uncontrolled diabetes mellitus, prolonged ICU stay (with or without ventilators), organ transplant recipients etc are more prone to get opportunistic fungal infections than other individuals [1]. Thus requires special assistance and the management of COVID-19 should be incorporated for prevention and control (Figure 1). Mucormycosis (black fungus) and candidiasis are the most common opportunistic fungal infections, and probably high risk to develop in moderate to severe COVID-19 patients [2]. Mucormycosis become a most thought-provoking and serious fungal infection in COVID- 19 infected patients worldwide mainly India. However, mucormycosis is a rare, and non-communicable fungal infection caused by exposure to group of mucor mold called mucormyecetes [3]. Mucormycosis spread by inhaling of fungal spores from air which affects the nasal sinus and spreads rapidly around the facial area, including the brain and vision loss from glaucoma permanent loss of eyesight owing to damage of the optic nerve [4]. Decaying fruits, plants, vegetables, soil, etc are the most common condition to develop the mucor molds. Mostly *Rhizopus oryzae* and Rhizopus microspores were found in patients with SARS-CoV-2 in present study which is confirmed by Maldi-TOF [5]. Germination of Mucorales spores in human with COVID- 19 having high glucose level (steroid-induced hyperglycemia and diabetes), low oxygen level (hypoxia), diabetic ketoacidosis, high ferritins, metabolic acidosis and decreased phagocytic activity of White Blood Cells (WBC) due low immune response, which occur by the use of steroids [6].

Although the nosocomial contamination is also a common risk factor to get infected by the variabilities of fungal infections. Similarly, the Candidiasis infection risk increases due to obstruction of mucosal barrier which is caused by COVID-19, by promoting the translocation of candida species from gut lumen to bloodstream. The warning signs and symptoms of mucormycosis are, bleeding from nose, redness of eyes, headache, blocked nose and foul discharge [3]. Unfortunately, it is reported that individual with no any pre-existing medical conditions are also get infected by mucormycosis after the COVID-19 exposure.

Herewith, we comprised the plausible intermediary aspects of COVID-19 and fungal infection. The advanced applications and modern techniques should be incorporated to facilitate the new findings and considerably minimize the development risk of fungal infection in COVID-19 patients. Accordingly, the aim and objective of this communication to enhance the efforts of prevention, treatment, management for better patient care. Furthermore, beneficial for health care professionals and organizations in general by reducing COVID-19transmission and risk of fungal infections through the promotion of control measures in nosocomial infection.

Keywords: COVID-19; Fungal infection; Mucormycosis; Diabetes; Candidiasis; Nosocomial infection

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