Black Fungus Development in SARS-COVID-19 Patients

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Abstract

Mucormycosis refers to a fungal infection resulting from fungus that belong to the order Mucorales and was first described in 1885 by Paltauf. Being the third most prevalent opportunistic fungal infection after candidiasis and aspergillosis, it causes significant endothelial damage by invading the vascular wall. Multiorgan failure and sepsis develop owing to its spread toward the brain. It usually has poor prognosis and it is impacted by the time it takes to diagnose and most significantly the patient’s overall condition. Severe acute respiratory syndrome Coronavirus disease 2019 (COVID-19) resulting from coronavirus 2 (SARS-CoV-2) is related to different fungal and bacterial opportunistic infections. Over the world, recently, in India in particular, numerous mucormycosis cases have been rapidly reported in COVID-19 patients. Taking corticosteroids to treat COVID-19 was observed in 76.3% of cases, followed by remdesivir (20.6%) and tocilizumab (4.1%). This retrospective study aims to analyze the association between SARS-COVID-19 and mucormycosis.

Keywords

Black fungus, Mucormycosis, SARS-COVID-19, Treatment

Material and Methods

PubMed articles were retrospectively evaluated. Studies were evaluated from to .... A combination of medical subject heading (MeSH) terms and keywords was searched. Research inclusion criteria were“ Black Fungus, Mucormycosis, SARS-COVID-19, Treatment”. The primary outcome measure were “Covid-19 association, diagnosis and treatment”. Two authors (DC, SL) analyzed the articles. Randomized controlled trials (RCTs), cohort studies, case-control studies, randomized studies, prospective and retrospectives studies were searched. No search limits of languages and all languages were included. We excluded case reports, articles not focused on surgical management. The object...
of this retrospective study is to analyze the association between SARS-COVID-19 and Mucormycosis.

Results

Awadhesh Kumar Singh, et al. [15] systematically reviewed 101 mucormycosis cases in SARS-COVID-19-infected subjects, 82 of which are from India whereas 19 are from other countries. Mucormycosis was predominant in men (78.9%), in active (59.4%) people and those who recovered from Covid-19 (40%). 80% of cases had DM, whereas 14.9% had concomitant diabetic ketoacidosis (DKA) and 76.3% of cases reported corticosteroid intake for COVID-19 treatment. In 2019, Prakash, et al. [16] conducted a national multicenter study which confirmed or suspected 388 zygomycosis cases in India prior to COVID-19, and they found that 18% had DKA and 57% were out of control. I have found that it is DM.

Likewise, Patel, et al. [17] examined the data of 465 mucormycosis cases without COVID-19 in India and found that the common diseases among Indians include DM (73.5%), malignancies (9.0%), and organ transplantation (7.7%). Having DM significantly raises the chances of contracting Rhino-orbital-cerebral by a factor of 7.5, as Bala, et al. [18] proved in their prospective study in India prior to the COVID-19 pandemic. John, et al. [19] reported the results of 41 confirmed mucormycosis cases in COVID-19-infected subjects, of which 93% of cases had DM, whereas most cases (80%) received corticosteroids.

Discussion

Severe acute respiratory syndrome Coronavirus disease 2019 (COVID-19) resulting from coronavirus 2 (SARS-CoV-2) is linked with many fungal and bacterial opportunistic infections. Recently, worldwide, particularly in India, several mucormycosis cases have been rapidly reported in people with COVID-19. Phycomycosis or zygomycosis was first introduced in 1885 by Paltauf [2]. Then, in 1957, Baker [20] called it mucormycosis. Mucormycosis is a rare yet fatal fungal infection usually impacting immunocompromised people. It is an angio-invasive disease caused by molds of the genera Rhizomucor, Mucor, Rhizopus, Cunninghamella, and Absidia of order Mucorales, class Zygomycetes [21]. The global spread of mucormycosis is between 0.005 and 1.7 per million population, but it is nearly 80 times higher (0.14 per 1000) in India than in developed countries Cause resulting in high glucose levels in Mucorales spores (first-time hyperglycemia, diabetes, and steroid-induced hyperglycemia) (metabolic acidosis, DKA, decreased leukocyte phagocytic activity (WBC) because of SARS-CoV-mediated suppression Long-term hospitalization with or without a ventilator seems to be a contributing factor to the cause [22,23]. The most common organs associated with mucormycosis were the nose and sinuses (88.9%), followed by the rhino-orbit-
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Author’s Contribution

AKS conceptualized the study, performed the literature search, and wrote the first draft; RS conducted the tables, the data analysis, and the first draft’s revision, and SRJ and AM edited the final draft. All authors mutually agreed to submit this study for publication.

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