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Mucormycosis in COVID-19 Pandemic

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Abstract: ***Background and objective: Mucormycosis is a deadly opportunistic fungal infection. Recently mucormycosis made severe chaos in India during the second wave of COVID-19 pandemic (between April and June 2021). Our aim was to delineate the clinico-epidemiological profile and identify risk factors of mucormycosis patients presenting to VIMSAR, Burla. Materials and methods: A prospective, cross sectional study of suspected mucormycosis patients presented to VIMSAR, Burla was done. Samples were collected with all aseptic precaution. KOH mount and fungal culture was done for confirmation of mucormycosis. Result and discussion: During study period of May 2021 to November 2021 147 samples for suspected mucormycosis was received in microbiology department of VIMSAR, Burla. Out of 147 samples 19 were KOH mount positive, 37 were culture positive and 15 were both KOH mount and culture positive. 80% were male and 20% were post COVID. The most commonly seen risk factor was diabetes. 60% nasal sample and 40% sputum sample were found positive. Among isolated positive culture reports 60% Rhizopus species, 6% Aspergillus species and 33% Candida species were found. 4 deaths have been recorded. Conclusion: From our study we concluded that diabetes is the main risk factor for mucormycosis. A multidisciplinary approach is essential to improve the conditions facilitating the emergence of mucormycosis during COVID-19 pandemic.***

Keywords: Mucormycosis, COVID-19, rhizopus species, rhino cerebral mucormycosis, culture, koh mount

1. Introduction

Coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome Corona virus2 (SARS-CoV-2) has been associated with a wide range of opportunistic bacterial and fungal infections. There are increasing case reports of rhino-orbital mucormycosis in people with coronavirus disease 2019 (COVID-19), especially from India. Diabetes mellitus and mucormycosis. We aim to conduct a systematic review of literature to find out the patient's characteristics having mucormycosis and COVID-19. Several cases of mucormycosis in people with COVID-19 have been increasingly reported worldwide, in particular from India. Our aim was to delineate the clinico-epidemiological profile and identify risk factors of mucormycosis patients presenting to VIMSAR, Burla

2. Materials and Methods

We searched the electronic database of PubMed and Google Scholar from inception until May 13, 2021 using keywords. We retrieved all the granular details of case reports/series of patients with mucormycosis, and COVID-19 reported world-wide. Subsequently we analyzed the patient characteristics, associated comorbidities, location of mucormycosis, use of steroids and its outcome in people with COVID-19. A prospective, cross sectional study of suspected mucormycosis patients presented to VIMSAR, Burla was done. Samples were collected with all aseptic precaution. KOH mount, fungal culture and slide culture was done for confirmation of mucormycosis.

3. Result

During study period of May 2021and Nov 2021, 147 samples of suspected mucormycosis were received. Out of which 19 samples were KOH positive, 37 samples were culture positive and 15 samples were found both KOH mount and culture positive. 80% were male and 20% were post COVID. The most commonly seen risk factor is diabetes. 60% nasal sample and 40% sputum sample were found positive. Among isolated positive culture reports 60% Rhizopus species, 33% Candida species and 6% Aspergillus species were found. 4 deaths have been recorded.

Samples	KOH-Mount	Culture
Positive	19	37
Negative	128	110

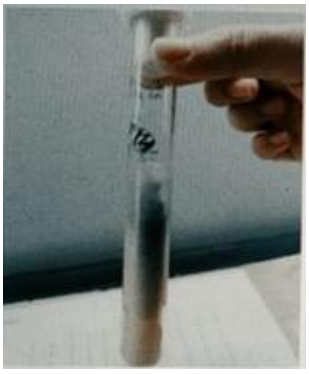

Figure 1: Rhizopus on SDA Media

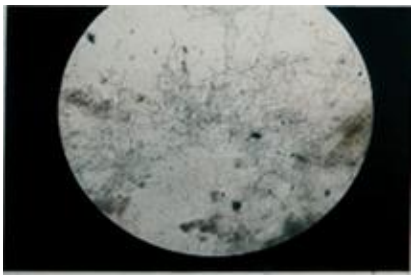

Figure 2: KOH mount of Rhizopus

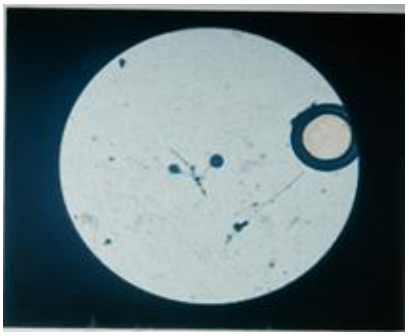

Figure 3: LPCB staining of Rhizopus

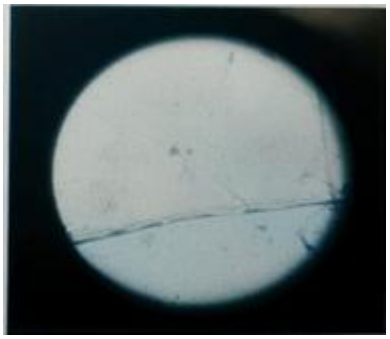

Figure 4: Slide culture of Rhizopus

4. Discussion

In our study most of the cultures positive patients are male (80%) and most of the patients have history of previous history of COVID-19 (80%). All the mucormycosis is an extremely rare in healthy individuals but several immunocompromised conditions predisposeit. This includes uncontrolled DM with or without DKA, hemato-logical and other malignancies, organ transplantation, prolonged neutropenia, immunosuppressive and corticosteroid therapy, iron overload or hemochromatosis, deferoxamine or desferrioxamine therapy, voriconazole prohylaxis for transplant recipients, severe burns, acquired immunodeficiency syndrome (AIDS), intravenous drug abusers, malnutrition and open wound following trauma. Mucormycosis can involve nose, sinuses, orbit, central nervous system (CNS), lung (pulmonary), gastrointestinal tract (GIT), skin, jaw bones, joints, heart, kidney, and mediastinum (invasive type), but ROCM is the commonest variety seen in clinical practice world-wide. It should be noted that term ROCM refers to the entire spectrum ranging from limited sino-nasal disease (sino-nasal tissue invasion), limited rhino-orbital disease (progression to orbits) torhino-orbital-cerebral disease (CNS involvement). The area of involvement may differ due to underlying condition. For example, ROCM is frequently observed in association with uncontrolled diabetes and DKA, whereas pulmonary involvement is often observed in patients having neutropenia, bone marrow and organ transplant, and hematological malignancies, while GIT gets involved more in malnourished individuals.

5. Conclusion

Diabetes is main risk factor for mecormycosis. A multidisciplinary approach is essential to improve the conditions facilitating the emergence of mucormycosis during COVID-19 pandemic. An unholy trinity of diabetes, rampant use of corticosteroid in a background of COVID-19 appears to increase mucormycosis. All efforts should be made to maintain optimal glucose and only judicious use of corticosteroids in patients with COVID-19.

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