

STUDY OF MUCORMYCOSIS - AN EMERGING FUNGAL INFECTION IN POST COVID PATIENTS AT CIVIL HOSPITAL

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Abstracts: INTRODUCTION: Mucormycosis (BLACK FUNGUS) also known as bread molds & lid lifters. It is a rare angioinvasive fungal infection. Fungal spores found in soil (all Mucorales are soil saprophytes) and organic matter, usually inhaled by humans from the air. The mold enters the body and manifests around the nose and eye sockets, causing the nose to blacken, and if not stopped will move fatally into the brain. The prevalence of mucormycosis in India is approximately 0.14 cases per 1000 population, about 70 times higher in India than that in global data. **AIMS & OBJECTIVES:** To study the prevalence of mucormycosis in post covid patients at civil hospital, Ahmedabad. To study sex, age and site wise distribution of mucormycosis. **MATERIAL & METHOD:** Present study was carried out on patients which were admitted in CHA (Civil Hospital, Ahmedabad) during the time period of April 2021 to May 2021. Specimens of nasal cavity, maxilla and eyeball were received in the Department of Histopathology, Ahmedabad. Smears of all specimen were examined and reports were analyzed. **RESULT & DISCUSSION:** Out of 461 cases, 324 males were affected, comprising 70 % of the total cases & 137 females were affected comprising 30% of total cases. Man in the middle age group of 41-60 years affected were 172 out of total 324. Those who present earlier, out of total 80% involved infection in nasal cavity, 18 % involved maxilla and only 2% had reached infection to the orbits. **CONCLUSION:** Covid-19 infection significantly associated with secondary infection like bacterial and fungal infection due to immune dysregulation. Excessive use of steroids and broad-spectrum antibiotics may lead to exacerbation of fungal infection. So, we should make all the efforts to maintain optimal blood sugar levels and only evidence based limited use of corticosteroids in patients with covid 19 is highly recommended to decrease burden of mucormycosis.

Key Words: Mucormycosis, covid-19 infection, blood sugar level.

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Introduction:

Mucormycosis also known as Black Fungus, Bread molds & lid lifters. It is a fungal infection which is belonging from a group of molds called phylum-Aseptate mold having order of mucoromycetes. Fungal spores found in soil and organic matter, usually inhaled by humans from the air. The mold enters the body and manifests around the nose and eye sockets, causing the nose to blacken, and if not stopped will move fatally into the brain. So, It act as rare angioinvasive fungal infection-70 times more prevalent in India as compare to another region globally. It has case scenario around 0.14 cases per 1000 population.[1] As per current scenario covid 19 patients having moderate to severe category of infection are treated with corticosteroids as treatment which will lead to reduce inflammatory mediators like IL-1, IL-6 & TNF- α which will lead to reduce cytokine storm and also lead to reduce mortality in cases

which is beneficial but it also leads to reduce cell mediated immunity of covid 19 patients. So patients are more vulnerable to opportunistic infections like mucormycosis, aspergillosis and candidiasis. Mucorales spores are more prone to germinate in covid 19 patients with low O₂ levels (hypoxia), high glucose level [in case of patient already having diabetes or new onset of hyperglycemia or patients having steroids induced hyperglycemia], acidic medium of the body (seen in Metabolic Acidosis, DKA), patients with high Iron levels (increase ferritin levels) and patients having decrease phagocytic activity of WBC due to immunosuppression. All mentioned conditions patients having more chances of mucormycosis infection.

Material and Methods:

A Cross sectional observational study was carried out on a series of patients admitted in Civil

Hospital, Ahmedabad during the time period of April 2021 to May 2021. Study included 461 cases suffering from Mucormycosis after COVID-19 infection. Specimens of nasal cavity, maxilla and eyeball were received in the Department of Histopathology, Ahmedabad. Sections were taken, fixed with 10 % Formalin solution, processed in automatic tissue processor and stained with Hematoxylin & Eosin and PAS stain. Microscopic Examination Smears showed fungal hyphae, which were aseptate, branching with 90 degrees, irregularly wide, and areas of necrosis and hemorrhage.

[Fig: 1 = Glomeruloid spongiphore (black arrow), (H&E, 40X)]

[Fig: 2 = Mucor hyphae branching at right angle, (H&E, 40X)]

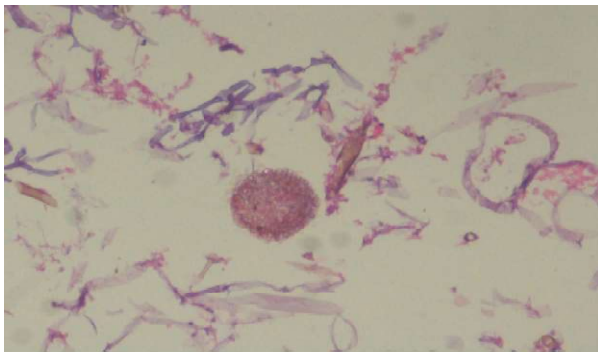


Fig: 1



Fig: 2

Result:

Chart: 1 shows Age and Sex wise distribution of mucor cases. This chart shows that Middle aged Man in the age group of 41-60 affected were 172 out of 324.

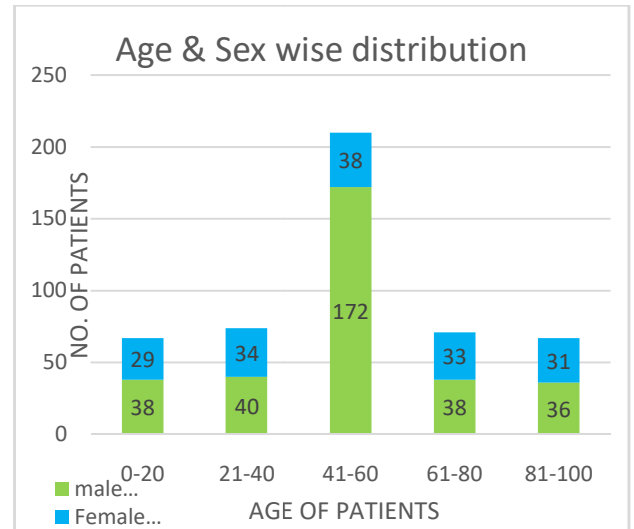


Chart: 1

Chart: 2 shows Sex wise distribution of mucor cases. This chart shows that out of 461 cases, Males affected were 324 comprising 70 % of the total cases & Female affected were 137 comprising 30%.

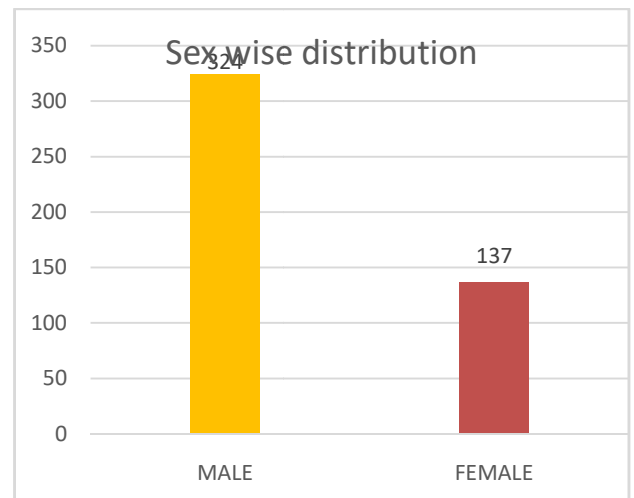


Chart:2

Chart: 3 shows age wise distribution of mucor cases. This chart shows that middle aged Man in the age group of 41-60 were affected more 172 out of 324.

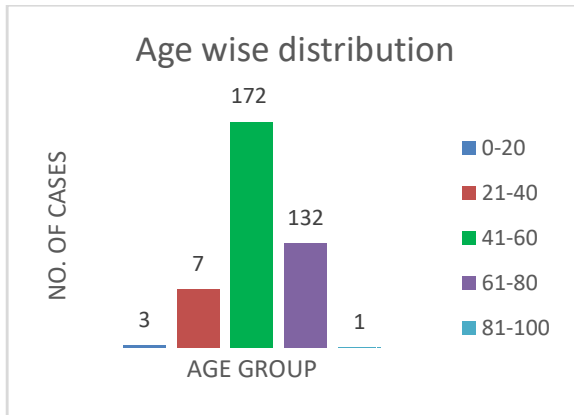


Chart:3

Chart: 4 shows site wise distribution of mucor cases. Patients with initial presentation in nasal cavity comprise total 369 out of 461(80%) followed by maxilla (18%) and rest 2% include eyeball and orbital tissue.

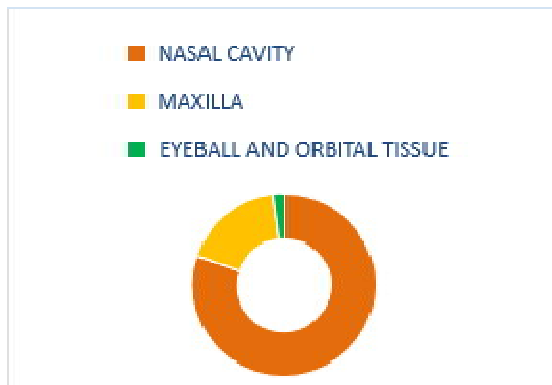


Chart:4

Above study shows that mucormycosis is more common in males, more common in 41-60- years of age group and more common site involved is nasal cavity. **Discussion:**

Mucormycosis act as opportunistic fungal infection. The very first case of mucormycosis was reported in 1885. [2] Again mucormycosis cases were on a peak in May 2021, which is the post-covid period. Even if adequate antifungal therapy or

any surgical interventions are given to mucormycosis patients, the mortality rate still >47% which shows serious importance of the disease. [3] If we do delay in initiation of treatment within minimum 6 days. This will in return doubles the 30-day mortality from 35% to 66%. This also leads us towards seriousness of disease. [4] Different comorbid conditions lead to secondary infection like mucormycosis. Immune dysregulation due to covid-19, reduced no. of T lymphocytes alter innate immunity, make patients more susceptible to secondary infections like mucormycosis. Free available iron is an ideal resource for mucormycosis. Hyperglycemia causes glycosylation of transferrin and ferritin, and reduces Total iron binding capacity allowing increased free iron. Increase in cytokines in patients with COVID-19 especially interleukin-6, increases free iron. High glucose, low pH, free iron, and ketones in presence of decreased phagocytic activity of WBC, enhances the growth of mucor. [5] A cumulative prednisone dose of >600 mg or a total methyl prednisone dose of 2–7 g given during the month before, predisposes immunocompromised people to mucormycosis. [6] Mainly clinical features like nasal blockage, facial pain, headache, eyelid drooping Simple tests for vision, pupil, ocular motility and sinus tenderness can be part of routine physical evaluation of a patient with COVID-19, hospitalized with moderate to severe infection or diabetics with COVID-19. The mean duration between COVID-19 infection and symptoms of Mucormycosis was 17 ± 5 days. In our study, the most common age group which is involved is 41-60 years of age group which is similar to some previous reports. [7][8] Also, Saegeman et al [9] and Dai et al. [10] have reported the mean ages of 60 and 58.8 years, respectively. In our study, the most common site involved is nasal cavity (80%). In contrast S Sharma et al. have reported that most common site involved is ethmoidal sinus. [11]

Conclusion:

Covid-19 infection is associated with a significant incidence of secondary infection, both bacterial and fungal probably due to immune dysregulation. Additional use of steroids, monoclonal and broad-spectrum antibiotics as a part of treatment against COVID-19 may lead to

increased risk of fungal diseases. All efforts should be made to maintain optimal hyperglycemia and only judicious evidence-based use of corticosteroids in patients with COVID-19 is recommended in order to reduce the burden of fatal mucormycosis.

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No conflict of Interest

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