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Study Of Clinical, Labarotary And Imaging Profiles Of Patients With Mucormycosis: A Retrospective Study

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ABSTRACT:
Background: Rhino-orbital-cerebral mucormycosis is an invasive fungal infection The fungal order Mucorales consists of seven families that are known to cause mucormycosis [1]. Rhizopus oryzae and R. delemar (both in the family Mucoraceae) are by far the most common causes of mucormycosis. It is a rare but potentially life-threatening infection associated most commonly with uncontrolled diabetes mellitus, diabetic ketoacidosis and immunocompromised states. The annual incidence of mucormycosis is estimated to be around140 cases per 1,000,000 in India. The pandemic brought along with it a raging havoc in the form of disseminated mucormycosis infection
Methods: This was a single centre hospital-based retrospective observational time bound study conducted in subjects admitted to our institute over a period of 36 months from January 2021 to December 2023. SARS CoV-2 PCR test and CT paranasal sinus(PNS) were carried out on patients with mucormycosis.
Results: Of total 44 patients with mucormycosis, 31 (70.40%) were males and 13 (29.54) were females diagnosed to have mucormycosis during the study period. Males were outnumbered as compared to females amongst the study population.
The mean age for the patient was 49.52 (+/- 12.95)
Total 31 patients (70.40%) had Type 2 Diabetes mellitus. Total 12 patients had Hypertension (27.27%). Total 22 (50%) had COVID 19 and presented in 2020 and 2021. COVID-19-associated mucormycosis (CAM) surged during the pandemic in India, with multiple studies linking the outbreak to high-dose steroid use and poorly controlled diabetes [9,10].
Of total 44 patients with mucormycosis, 24 (54.54%) had underwent operative intervention in the form of functional endoscopic sinus surgery.
A total of 7 (15.90%) patients had pulmonary complications and 5 (11.36%) had cerebral/cortical venous sinus thrombosis. Of them 1 (20%) had Cavernous venous Sinus Thrombosis .
A total 9 (20.45%) patients had laboratory evidences of acute kidney Injury. A total 23 (52.27%) had Maxillary Sinus with intracranial involvement.
Conclusion: In the present study we observed that conventional risk factors like uncontrolled diabetes mellitus with or without ketoacidosis added by COVID-19 disease and steroid intake directly affected the incidence of occurrence of mucormycosis.
Keywords: PNS – Para nasal sinus, PCR – Polymerase Chain Reaction, FESS – Functional Endoscopic Sinus Surgery

INTRODUCTION

Mucorales are ubiquitous fungi usually found in soil, decaying organic matter, compost and contaminated foods [4]. The rapidly growing saprophytic fungi release a large number of spores into the environment. These sporangiospores are commonly inhaled by the host, and in hosts with normal immune status, the ciliary system directs the spores towards the pharynx, thereby eliminating them via the gastrointestinal system. The spores might also get colonized in the oral mucous membranes, nose, throat, and paranasal sinuses causing rhino-orbito-cerebral mucormycosis. The initial site of infection in rhino-orbital cerebral mucormycosis is the nasal turbinates.
Mucormycosis is considered a rare infection – diabetes remains the most prominent underlying medical comorbidity in infected patients, and was identified as an independent risk factor for rhino-orbital-cerebral mucormycosis in a meta-analysis of 851 cases [5,6].

Our study aimed at finding the correlation between mucormycosis and comorbidities like type 2 diabetes mellitus, hypertension, hypothyroidism. We further researched the risk of developing invasive mucormycosis requiring operative management.

MATERIALS AND METHODS

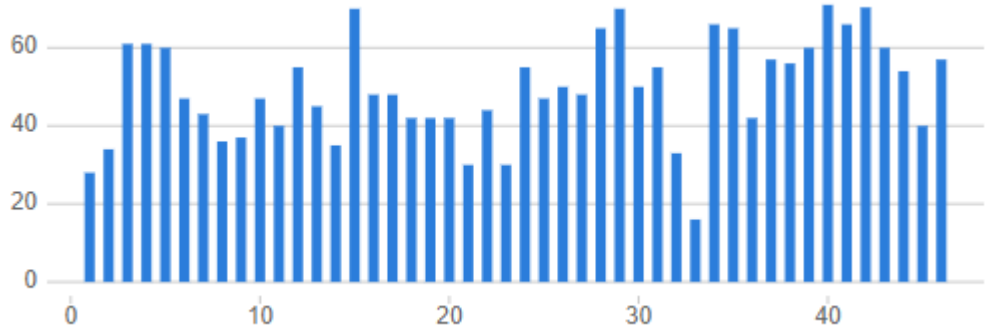
Retrospective observational time bound study conducted over a period of 36 months from January 2021 to December 2023.

Ethics Committee approval: The clearance for the study was taken from institutional ethics committee after discussion of the study protocol with committee, patients were included in the study only after they give written informed consent to participate.

GENDER DISTRIBUTION

Total number of case- 44
Male N = 31 (70.45%)
Female N = 13 (29.54%)

MEAN AGE



Mean age of the patients were 49.52 +/-12.95

CORRELATION WITH COMORBIDITIES

Of total 44 patients, 31 were associated with diabetes mellitus (70.45%), with type 2 diabetes mellitus being more common than type 1 diabetes mellitus as only 2.27 % patients had type 1 diabetes mellitus. Uncontrolled and poorly controlled diabetes mellitus appeared to be associated with mucormycosis and it was directly proportional to the complications seen in mucormycosis which required operative management [7,8] .

Hypertension was another comorbiditiy frequently associated with patients with mucormycosis. 8 out of the 44 cases studied had long standing hypertension (40.90%) and 4 patients were diagnosed after admission to the hospital.

Renal injury was seen as a complication as well as a risk factor for developing rhino-orbito-cerebral mucormycosis.

CORRELATION WITH COVID-19

Covid-19 associated mucormycosis was frequently encountered during the peak of the pandemic especially in countries like India. In our study, out of the 44 cases, 22 were diagnosed with COVID -19 positive by nasal and oropharyngeal swabs making up for 50% of the patients. Out of these patients, 14 (63.63%) underwent operative procedures like FESS, Turbinectomy, maxillectomy and debridement procedures for the complication that had occurred secondary to Mucormycosis.

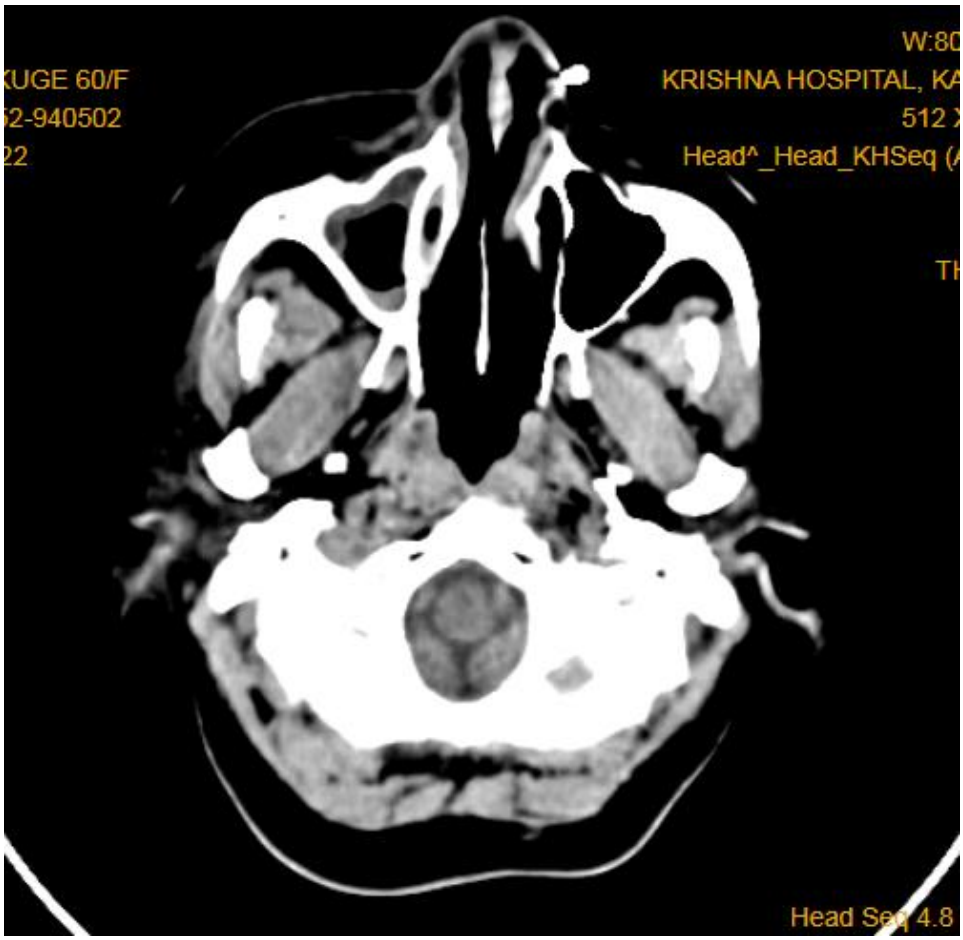
CLINICAL PRESENTATION AND DIAGNOSIS

Rhino-orbital-cerebral mucormycosis with intracranial extension especially cavernous venous sinus thrombosis stood as a common presentation as seen in a case of 28 year old female admitted to the tertiary centre under critical care unit with 5 days history of breathlessness at rest, fever, dryness of perioral region. On MRI brain with angiography and venography, cavernous venous sinus thrombosis of the left side with complete occlusion of extracranial and intracranial part of internal carotid artery from its origin upto supraclinoid segment was noted.

Out of the 44 cases, 24 (54.54%) had to undergo operative management for Rhino orbital cerebral mucormycosis with Functional Endoscopic Sinus Surgery being the most common operative procedure for the patients.

Pulmonary complication especially pneumonia was the second most common presentation. Functional endoscopic sinus surgery with debridement under local anaesthesia was the most common surgical procedure performed in such patients. Acute kidney injury was seen as a complication of mucormycosis as well as a complication of treatment of mucormycosis.

RADIOIMAGING



CT PARA NASAL SINUS OF 60 YEAR OLD FEMALE DIAGNOSED WITH RIGHT MAXILLARY, SPHENOIDAL, EHTMOIDAL SINUSITIS DUE TO MUCORMYCOSIS FOLLOWED BY FUNCTIONAL ENDOSCOPIC SINUS SURGERY

SOFT TISSUE THICKENING NOTED IN RIGHT FRONTAL, ETHMOIDAL AND MAXILLARY AND RIGHT HALF OF SPHENOID SINUS CAUSING OBLITERATION OF OSTEOMATAL COMPLEX WITH EROSION OF MEDIAL WALL OF RIGHT MAXILLARY SINUS

XRAY PARA NASAL SINUS- WATER'S VIEW OF 60 YEAR OLD FEMALE DIAGNOSED WITH MUCORMYCOSIS AND UNDERWENT DEBRIDEMENT FOR THE SAME

CONCLUSION

Of total 44 patients with mucormycosis, 31 (70.40%) were males and 13 (29.54) were females diagnosed to have mucormycosis during the study period. Males were outnumbered as compared to females amongst the study population.

The mean age for the patient was 49.52 (+/- 12.95)

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A total of 7 (15.90%) patients had pulmonary complications and 5 (11.36%) had cerebral/cortical venous sinus thrombosis. Of them 1 (20%) had Cavernous venous Sinus Thrombosis .

A total 9 (20.45%) patients had laboratory evidences of acute kidney Injury. A total 23 (52.27%) had Maxillary Sinus with intracranial involvement.

In conclusion, it has been observed that conventional risk factors like uncontrolled diabetes mellitus with or without ketoacidosis added by COVID-19 disease and Steroid intake during 2020 and 2021 are seen in patients with mucormycosis in present study.

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