

Epidemiology of Mucormycosis Cases Admitted at Tertiary Care Hospital Northern Western Rajasthan

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Conflict of interest: Nil

Abstract

Background: This study was thus conducted with an objective to describe the epidemiological aspects of mucormycosis cases presenting to a tertiary care centre in Northern Western Rajasthan, India, as well as to identify potential risk factors for mucormycosis.

Methods: This ambispective study is conducted at government medical college associated tertiary care center in Bikaner, Northern Western Rajasthan. It is an effort to describe the epidemiology, predisposing risk factors, presenting symptoms, and mucormycosis disease outcome in admitted patient at PBM hospital during and after second wave of COVID-19 epidemic in India. This ambispective study was conducted on 161 mucormycosis positive cases admitted in PBM Hospital, Bikaner, Rajasthan from 1st Jan to 31st Dec. 2021. Study is based on medical records and telephonic interview of mucormycosis positive cases.

Results: Majority of study population (28.57%) belong to 61-70 years followed by (19.25%) in 51-60 years, (17.39%) in 41-50 years and (14.91%) in 31-40 years, thus constituting 80.12% in 31-70 years. Mean age was 49.4 ± 16.8 . Majority of study population 60.87% were male and 39.13% patients female. Male to female being 3:1. 52.80% of study population resided in urban area. Hindus were maximum (86.33%), (7.45%) patients were Muslim and (6.21%) patients were Sikh. 93.78% study population were married and 6.21% unmarried. 66.45% of study population lived in joint family and 33.54% in nuclear family. Majority of study population 52.17% and 44.73% respectively belong to SES class II and III, 91.77% of study population literate and 8.22% illiterate.

Conclusion: Majority of patients were young Hindu Male belong to socio-economic status class-II and living in joint family.

Keywords: Age, Sex, Epidemiology.

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Introduction

Mucormycosis, or zygomycosis, is a rare disease caused by a filamentous fungus. The nose, paranasal sinuses, and brain are the most common areas affected. It's an

opportunistic infection that flourishes in persons who have their immune systems impaired. The causative agents are saprophytic fungus from the Phycomyetes

class, order Mucorales, and family Mucoraceae. These fungi include Mucor, Rhizopus, Absidia, Cunninghamella, and Apophysomyces elegans. [1]

Reduced host immunity, as well as conditions like hyperglycemia and iron overload, favour fungal invasion. [2] In immunocompromised patients, the most common route of infection is inhalation of spores from fungi found in soil or organic debris. [3]

The fungus develops swiftly and aggressively in those cases, generating a well-defined fulminant and life-threatening disease. To avert long-term neurological disorders and save lives, early intervention is critical. In the majority of instances, it is an acute fungal infection, but chronicity, which is gradual and indolent, has also been recorded. It is said to thrive in hot, humid temperatures and surroundings, especially in tropical locations and throughout the summer. Long-term corticosteroid medication, severe burns, solid organ transplantation, hemochromatosis, HIV, neutropenia, malnutrition, hematologic malignancies, and other disorders are commonly linked. According to earlier research, about 9% of rhinocerebral mucormycosis patients were free of any predisposing factors [3-5]

Mucormycosis has an incidence rate of 0.005 to 1.7 per million people worldwide. [6] In India, the prevalence is 0.14 per 1000 people, which is almost 80 times greater than in wealthy countries. [7] Mucormycosis has a global mortality rate of 46%. [8] The disease is not new but in the context of the COVID-19 pandemic, particularly during and after the second wave in India, an increase in the number of cases has been seen, which necessitates more investigation. This study was thus conducted with an objective to describe the epidemiological aspects of mucormycosis cases presenting to a tertiary care centre in Northern Western Rajasthan, India, as well

as to identify potential risk factors for mucormycosis.

Material and method

Study design: Ambispective study

Study place: PBM Hospital Bikaner, Rajasthan

Study population: Study population include all mucormycosis positive cases admitted in PBM Hospital Bikaner Rajasthan during the year 2021 (1stJan. - 31st Dec.2021).

Sample size: All mucormycosis positive cases admitted in PBM Hospital Bikaner Rajasthan during the year 2021. Thus 161 mucormycosis cases formed the sample size.

Inclusion criteria:

Laboratory confirmed Mucormycosis positive case admitted in PBM Hospital Bikaner Rajasthan during the year 2021.

Exclusion criteria:

Mucormycosis cases admitted before and after study period of 1st Jan. to 31st Dec. 2021.

Study tool:

Pre-structured pre-tested questionnaire used. Purpose of study explained to all participants and verbal informed consent obtained.

Proforma A. Socio demographic profile of participants

Proforma B. (1) Type of Mucormycosis (2) Presenting complaints

Proforma C. Risk factor

Proforma D. Outcome

Method:

The study started after obtaining permission from Institutional research board and Principal Controller of Sardar Patel medical college, Bikaner. A list of all mucormycosis positive cases admitted in PBM Hospital, Bikaner, Rajasthan formed

as per study design. The retrospective data of patients admitted before study approval collected from hospital records and where needed interviewed telephonically after explaining purpose of study and had their consent. Prospective data of patients admitted after approval of study collected from their inpatient clinical records and by interviewing in person the cases admitted in PBM Hospital Bikaner after taking informed verbal consent. Every effort was made to complete proforma.

Data Analysis:

Collected data entered into Microsoft Excel spreadsheet and presented in the form of

tables, figures, graphs, diagram. Epi-Info Software (7.2.5.0 version) was used for data analysis. Quantitative variables were presented as a mean and standard deviation. Qualitative variables were presented as frequencies and percentages using the descriptive statistical method. To analyze the data, the inferential statistical method was used. For qualitative variables chi-square was applied to examine the significance of the association between two or more categorical variables and for comparing mean between two groups the student t test was applied.

Results

Table 1: Distribution of study population according to age

Age group	No of cases	Percentage
0-10	3	1.86
11-20	4	2.48
21-30	11	6.83
31-40	24	14.91
41-50	28	17.39
51-60	31	19.25
61-70	46	28.57
>70	14	8.69
Total	161	100.00

Mean age- 49.4 ± 16.8 years, Median age- 52 years, Range 1-88 years. Table depicts that majority of cases (80.12%) belong to the age interval between 31-70 years age. Distribution of mucormycosis between middle age group i.e., 41- 60 years and old age group i.e., >60 years were almost same, 36.64% and 37.26% respectively. Maximum number of cases (28.57%) was

seen in 61-70 years age group followed by (19.25%) in 51-60 and (17.39%) in 41-50 years. Least number of cases (1.86%) seen in 0-10 years age group. Table is depicting that proportion of study population affected with disease is increasing from above downwards in table i.e. increasing with increasing age groups.

Table 2: Distribution of study population according to gender

Gender	No of cases	Percentage
Male	98	60.87
Female	63	39.13
Total	161	100.00

Table shows that majority of study population (60.87%) were male, females were (39.13%). Male to female ratio being 3:2.

Table 3: Distribution of study population according to Area of residence

Area	No of cases	Percentage
Rural	76	47.20
Urban	85	52.80
Total	161	100.00

Table shows that (52.8%) of study population resided in urban area and remaining (47.2%) in rural area.

Table 4: Distribution of study population according to Religion

Religion	No of cases	Percentage
Hindu	139	86.33
Muslim	12	7.45
Sikh	10	6.21
Total	161	100.00

Majority of cases (86.33%) were Hindu while remaining nearly (13.5%) were from Sikhs and Muslim community with almost equal proportion.

Table 5: Distribution of study population according to Marital status

Marital status	No of cases	Percentage
Married	151	93.78
Unmarried	10	6.21
Total	161	100.00

Table shows that 93.78% study population is married, unmarried constituted only 6.21%.

Table 6: Distribution of study population according to type of family

Type of family	No of cases	Percentage
Joint family	107	66.45
Nuclear family	54	33.54
Total	161	100.00

Table depicts that cases living in joint family are almost double to that of number of cases having nuclear family. 66.45% of study population having joint family while 33.54% live in nuclear family

Table 7: Distribution of study population according to socioeconomic status

SES	No of cases	Percentage
I	0	0
II	84	52.17
III	72	44.73
IV	5	3.11
V	0	0
Total	161	100.00

Table shows that none of the case belongs to either SES I or SES V. 97% of cases are from SES II and SES III (52.2% and 44.7% resp.), remaining 3% to SES IV.

Discussion

This ambispective study is conducted at government medical college associated tertiary care center in Bikaner, Northern Western Rajasthan. It is an effort to describe the epidemiology, predisposing risk factors, presenting symptoms, and

mucormycosis disease outcome in admitted patient at PBM hospital during and after second wave of COVID 19 epidemic in India. This ambispective study was conducted on 161 mucormycosis positive cases admitted in PBM Hospital, Bikaner, Rajasthan from 1st Jan to 31st Dec. 2021. Study is based on medical records and telephonic interview of mucormycosis positive cases.

In my study majority of study population (28.57%) belong to 61-70 years followed by (19.25%) in 51-60 years, (17.39%) in 41-50 years and (14.91%) in 31-40 years, thus constituting 80.12% in 31-70 years. Least proportion of study population (1.86%) belongs to 0-10 years. Mean age of cases was 49.4 years \pm 16.8 years and Median age 52 years. Joshi et al. (2022)⁸ found to have similar result to our study, the median age was 51 years in their study population. In study by Toppo M et al. (2022) [9] mean age \pm standard deviation (years) was 50.95 \pm 11.79. In Patel AK et al. (2022) [10] study mean age of mucormycosis patients was 55.7 \pm 11.9 years. In Wahid F et al. (2022) [11] study mean age was 51.2 \pm 1.41 years. A possible explanation for this could be that presence of impaired fasting glucose is more in 31-70 years age group. Immune system of body is also weakened in old age.

In my study population (60.87%) were male and (39.13%) patients were female with male to female ratio of 3:2. Similar results were found in study by Wahid F, Saleem M et al. (2022) [10], males were 14(60.9%), females were 9 (39.1%) with a male: female ratio of 1.5:1. In Karthik Shamanna et al (2019) [12] study males (65%) were affected more frequently than females. Patel AK et al. (2022) [10] study found that (69.90%) patients were male and (30.10%) patients were female. Joshi S et al. (2022)⁸ found that (70%) were male and (30%) patients were female. Male gender has also been found to be associated with greater severity of COVID-19 infection. Greater outdoor exposure and, therefore, to

fungal spores may be the possible reason for this majority.

In my study (52.80%) patients resided in urban area and (47.20%) patients resided in rural area. Toppo M et al. (2022) [9] study found similar results in their study population, cases from urban area (56%) and from rural area (44.1%). A possible explanation for this could be that during covid-19 pandemic majority patients belonged to urban area.

In my study Hindus are maximum (86.33%), (7.45%) patients were Muslim and (6.21%) patients belonged to Sikh religion. A possible explanation for this could be that according to census 2011, in India 79.8% of the population were Hindu, 14.2% were Muslim and 1.7% were Sikh.

In my study population (93.78%) were married and (6.22%) patients were unmarried. A possible explanation for this could be that maximum patients in my study population were more than 21 years of age group.

Conclusion

Majority of patients were young Hindu Male belong to socio-economic status class-II and living in joint family

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