A study on Socio-demographic profile and risk factors associated with Mucormycosis among patients admitted in a tertiary care center at Mysuru, Karnataka

Dr Thulasi M1, Dr Siddarth G R2, Dr Ravi Chethan Kumar A N3 Dr Harshini S4 Dr Snehalatha B M5, Dr Mudassir Azeez Khan *6

Department of Community Medicine& Department of General medicine

Mysore Medical College & Research Institute, Mysore

INTRODUCTION

Mucormycosis is an rare fungal infection occurs in individuals with immune-compromised conditions such as uncontrolled diabetes, hematological and other malignancies, organ transplantation, prolonged neutropenia, immunosuppressive or corticosteroid therapy, iron overload or hemochromatosis, deferoxamine therapy, severe burns, acquired immunodeficiency syndrome (AIDS), intravenous drug abusers, malnutrition and open wound following trauma.

There are increasing case reports of mucormycosis in people with coronavirus disease 2019 (COVID-19), especially in India. These case reports highlighted mainly in-hospital outcome and morbidity in COVID 19 and Mucormycosis.

OBJECTIVES

1. To identify the socio-demographic factors associated with Mucormycosis
2. To study the risk factors present in patients with Mucor-mycosis.

METHODS

A retrospective descriptive study was conducted among in-patients diagnosed to have mucormycosis during the period of April 2021 to June, 2021 in a tertiary care hospital in Mysore Karnataka.

A semi structured questionnaire was used to extract the information from the patients and their attenders. Socio- demographic information and clinical information obtained from the patients' medical records. Descriptive statistics represented using frequency and percentages, Chi square test is used to test the association between various risk factors.

RESULTS

A total of 61 patients with mucormycosis who were admitted in our hospital during **April 2021 to June, 2021** were included in this study. There were 43 males and 18 females (sex ratio of 2.4:1). Mean age of the patients was 50.38 ±10.7 (range 21 years- 71 years). The various socio-demographic factors of the patients are shown in Table 1.

Table 1: Socio-demographic factors associated with Mucormycosis

S.no	Variables	Categories	Frequency (%)
1.	Age	21-30	3 (4.9%)
		31-40	8 (13.1%)
		41-50	18 (29.5%)
		51-60	22 (36.1%)
		years60	10 (16.4%)
2.	Gender	Male	43 (70.5%)
		Female	18 (29.5%)
3.	Literacy	Illiterate	12 (19.7%)
		Primary school	12 (19.7%)
		High school	24 (39.3%)
		PUC	6 (9.8%)
		Graduate	6 (9.8%)
		Postgraduate	1 (1.6%)
4.	Socioeconomic status	Upper class	2 (3.3%)
		Upper middle class	9 (14.8%)
		Middle class	18 (29.5%)
		Lower middle class	20 (32.8%)
		Lower class	12 (19.7%)
5.	Family Size	1-4	28 (45.9%)
		5-7	30 (49.2%)
		>8	3 (4.8%)

The most important risk factor we assessed in our study was history of COVID 19 infection in the past. The variables related to previous COVID 19 infection are listed in **table 2.**

Out of 61 patients 54(88.5%) had a history of COVID 19 infection in the past. 23% of the patients were asymptomatic and majority of the patients who developed mucormycosis had mild to moderate symptoms. Most of the patients were managed at hospital for COVID infection (67.2%).

Treatment for COVID 19 infection

The treatment provided to patients for COVID infection includes antibiotics, steroids anticoagulants, vitamin c, zinc and immune-modulators according to the severity and guidelines. Co morbidities

Most common co morbidity found among the patients was diabetes mellitus. 55% of them reported diabetes mellitus and 17% reported history of hypertension.

The covid 19 treatment related risk factors associated with mucormycosis are discussed in **table 3.**

Table 2: Characteristics of previous COVID infection

S.no	Variables	Categories	Frequency (%)
1.	History of COVID 19 infection	Yes	54 (88.5%)
		No	7 (11.5%)
2.	Presentation	Asymptomatic	14 (23%)
		Mild	21 (34.4%)
		Moderate	19 (31.1%)
		Severe	7 (11.5%)
3.	Managed at	Hospital	41 (67.2%)
		Home isolation	20 (32.8%)
4.	Duration of stay in hospital	<1-5 days	10 (16.4%)
		6-10 days	12 (19.7%)
		11-15 days	10 (16.4%)
		16-20 days	5 (8.2%)
		25 days	2 (3.3%)
		>26 days	2 (3.3%)
5.	Admission in ICU	Yes	5 (8.2%)
		No	56 (91.8%)
6.	Duration in ICU stay (n=5)	1 day	
		5 days	
		7 days	
		14 days	

Table 3: Treatment of COVID 19 between survivors and non survivors

	Survivors	Non survivors	P value
Steroid			0.321
Yes	28(54.9%)	7(70.0%)	
No	24(52.9%)	3(30.0%)	
Duration of steroid			0.478
7-10 days	20(71.4%)	6(85.7%)	
>10 days	8(28.5%)	1(14.3%)	
Type of steroid			0.443
MP	13(25.5%)	2(20.0%)	
DEXA	15 (29.4%)	5(50.0%)	
Antibiotics			0.977
Yes	41(80.4%)	8(80.0%)	
No	10(19.6%)	2(20.0%)	
Vitamin C			0.750
Yes	44(86.3%)	9(90.0%)	
No	7(13.7%)	1(10.0%)	
Zinc	43(84.3%)	7(70%)	0.282
Ivermectin	17(33.3%)	3(30%)	0.837
Anticoagulants	23(45.1%)	4(40%)	0.767
Required o2	21(75.0%)	7(25.0%)	0.094

Prognosis, treatment option, duration of symptoms and the duration between development of mucormycosis and COVID 19 infection were taken as outcome factors and checked for the association between various risk factors.

Duration between COVID infection and development of mucormycosis had significant association with severity of COVID, use of steroid, type of steroid used, use of antibiotics, Zinc, use of oxygen and route of its delivery(p= 0.009, 0.019, 0.016, 0.004, 0.015, 0.015, 0.008 respectively).

DISCUSSION AND CONCLUSIONS

In a recent systematic review conducted until April 9, 2021 by John et al. reported the findings of 41 confirmed mucormycosis cases in people with COVID-19, 88% were receiving corticosteroids. Presence of DM significantly increases the odds of contracting ROCM by 7.5-fold (Odds ratio 7.55, P <0.001) as shown in a prospective Indian study, prior to COVID-19 pandemic

The underlying causes for the upsurge of cases in can be state of immunosuppression including diabetes mellitus, long term of cortico-steroid and use of oxygen therapy. In our study non-compliance of diabetic treatment, presence of diabetic keto-acidosis was the significant risk factors associated with the outcome of mucormycosis patients. Diagnosis of mucormycosis remains challenging.