Journal of Cardiovascular Disease Research

ISSN:0975-3583,0976-2833 VOL14,ISSUE05,2023

ORIGINAL RESEARCH

A Study of Correlation of Covid Antibody Titre in Patients of Mucormycosis During Second Wave of Covid-19 in Western Part of Uttar Pradesh

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ABSTRACT

Objective: Mucormycosis is an opportunistic fungal infection that typically affects immunocompromised patients, particularly patients with uncontrolled diabetes mellitus. India has reported a surge in cases of post covid 19 mucormycosis patients due to the increasing frequency of risk factors in the patients. To study the correlation of inflammatory markers and covid antibody titre in mucormycosis mucormycosis patients.

Materials and Method: The work was conducted in L.L.R.M MEDICAL COLLEGE and associated SVBP HOSPITAL, MEERUT. All the mucormycosis Patients attending medicine OPD/ IPD/ COVID HOSPITAL/ EMERGENCY WARD/ MUCORMYCOSIS WARD were included.

Results: A maximum (32.3%) of cases were in the age group of 41-50 while the least (5.3%) were less than 30 years of age.most of the study participants were male (61.3%) and the majority of the patients (90.3%) were diabetic. On analysis, inflammatory markers level was found to be elevated in those participants who received oxygen therapy during study period.; whereas covid antibody titre doesn't seems to be correlate with inflammatory markers level.

Conclusion: There has been an upsurge of mucormycosis cases in India in the second wave of COVID-19. A major portion of cases has been of rhino-orbit-cerebral mucormycosis affecting those who have co-existent COVID-19 or have recently recovered from COVID-19.

Keywords: Covid antibody titre, mucormycosis, Covid 19

INTRODUCTION

Mucormycosis is an opportunistic fungal infection that typically affects immunocompromised patients, and particularly patients with uncontrolled diabetics mellitus. The fungi that cause mucormycosis belong to the order Mucorales: Rhizopus, Mucor, Rhizomucor, Cunninghamella and Absidia.[1] Broad, irregularly branched with rare septations are seen on microscopy. These fungi are ubiquitously found everywhere, particularly in soil and decaying vegetation and are routinely exposed to humans without causing any infections.[2] Mucormycosis is a formidable angioinvasive infection with a spectrum involving rhino-orbital-cerebral, pulmonary, disseminated, cutaneous, gastrointestinal and disseminated form of disease.[3] Traditional risk factors that increase the chances of acquiring mucormycosis include diabetes mellitus, hematological malignancies, stem cell transplant, organ transplant, iron overload, treatment with deferoxamine, malnutrition, burns, extensive use of broad-spectrum antibiotics, critical care admissions.[4] occurs both concomitantly with COVID-19 as well as post-recovery.[5] The most common symptoms observed in CAM patients were facial pain, ptosis, proptosis, visual acuity, and vision loss.[6] Contrast-enhanced MRI is the imaging modality of choice. It allows delineation of soft tissue involvement earlier and is better than a CT scan, especially in the setting of orbital and cerebral involvement. Contrast-enhanced CT scan is relatively faster and can be used for patients where MRI is not feasible. Mucormycosis leads to tissue necrosis, and bone erosion is not a common finding.[5]

The salient imaging findings in mucormycosis patients include lack of normal sinonasal mucosal enhancement, perisinus inflammation, ischemic optic neuropathy, perineural spread, pachymeningeal enhancement, and presence of strokes.[7] The management of mucormycosis essentially involves control of hyperglycemia or any other risk

ISSN:0975-3583,0976-2833 VOL14,ISSUE05,2023

factor, optimal surgical debridement, and medical management with antifungal agents.Amphotericin B is the antifungal drug of choice for mucormycosis.[5] In a study conducted by Joung Ha Park et al it shown that SARS-CoV-2 antibody titers were higher in patients with COVID-19 who were elderly, presented with pneumonia, and required oxygen supply.It seems that severe clinical manifestations of COVID-19 resulted in high titers of SARS-CoV-2 antibodies.[8]

MATERIALS AND METHOD

Patient source: We conducted this study in L.L.R.M MEDICAL COLLEGE AND ASSOCIATED SVBP HOSPITAL, MEERUT.

Our study Include participants who were diagnosed with mucormycosis irrespective of covid 19 status . Patients attending medicine OPD/ IPD/ COVID HOSPITAL/ EMERGENCY WARD/ MUCORMYCOSIS WARD were included in the study following approval of institute's ethical committee

Eligibility Criteria

Inclusion Criteria

Mucormycosis patients with covid-19 positive status with or without comorbidities.

Mucormycosis patients with covid-19 negative status with or without comorbidities.

Exclusion Criteria

Patients less than 18 years of age.

We conducted an observational study for assessing the relation of covid 19 antibody titre other inflammatory markers such as serum ferritin,d dimerand CRP levels in patients of mucormycosis during the study period of March 2021 to December 2021.

Study participants of our observational study include all patients who fulfilled the criteria of mucormycosis who were admitted to LLRM Medical College and associated SVBP Hospital between March 2021 and December 2021

Sample size

Our study enrolled 300 MUCORMYCOSIS patients in the time period of March 2021 to December 2021.

RESULTS

We randomly selected 300 participants with mucormycosis who were satisfying the eligiblility criteria . It was observed that a maximum (32.3%) of cases were in the age group of 41-50 years followed by 23.0% (31-40 years), 22.7% (51-60 years), 13.0% (61-70 years), 5.3% (less than 30 years of age). The least (3.7%) of the study population belonged to those who had age of more than 70 years of age. [Table 1]

Table 1: showing age wise distribution of study participants.

Age group	No. of cases	Percentage
< 30	16	5.3%
31-40	69	23.0%
41-50	97	32.3%
51-60	68	22.7%
61-70	39	13.0%
> 70	11	3.7%
Total	300	100.0%

ISSN:0975-3583,0976-2833 VOL14,ISSUE05,2023

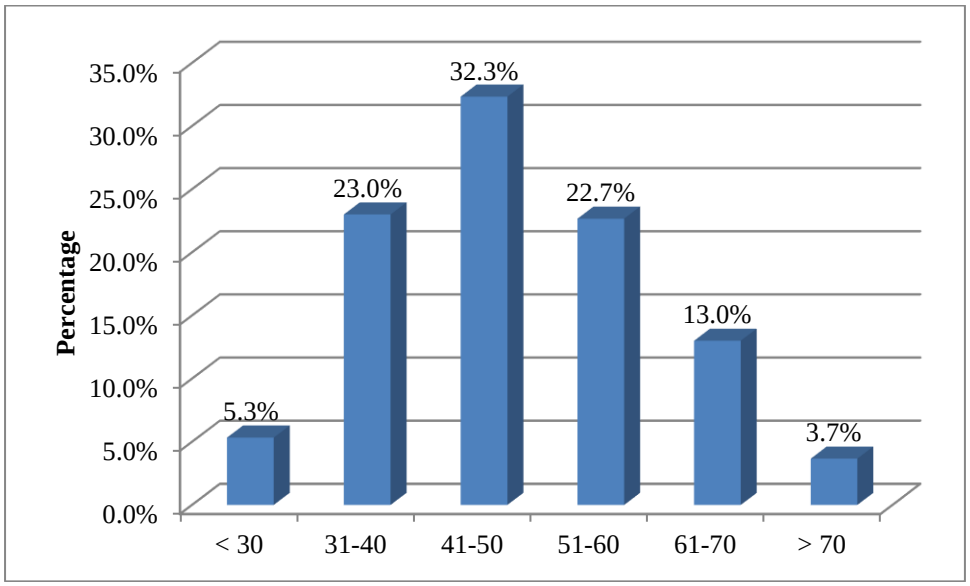


Fig (1) age wise distribution of study participants

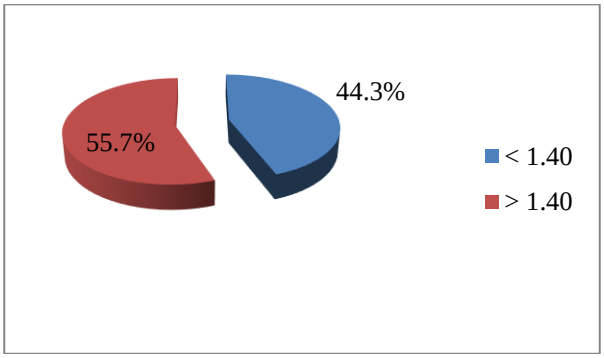
In the present study, it was found that the majority of them were males. (184)(61.3%) while116 participants were females (38.7%) study population..Out of 300 sample size majority (63.0%) of the study population tested covid positive whereas 37.0% of the study population tested covid negative. Table (2) shows general characteristics of study participants.

Table 2: Showing general characteristics of study participants

Characteristics	No. of cases	Percentage
Female	116	38.7%
Male	184	61.3%
Covid Negative	111	37.0%
Covid Positive	189	63.0%
Diabetes	271	90.3%
Patient on steroid therapy	270	90.0%
Patient on oxygen therapy	230	76.7%

Table (3) shows the number of cases with above and below mid value (1.40) of Covid antibody titre and it was noticed that majority (55.7%) of the study subjects had covid antibody titre more than 1.40.

Covid ab titre	No. of cases	Percentage
< 1.40	133	44.3%
> 1.40	167	55.7%
Total	300	100.0%



ISSN:0975-3583,0976-2833 VOL14,ISSUE05,2023

Fig. 2: Covid 19 Antibody titre of the study subjects

Table (4) depicts correlation of various inflammatory markers such as serum ferritin ,crp and d- dimer with covid antibody level. It is inferred that there is no statistically significant association between these parameters.

Table 4: Showing correlation of various inflammatory markers with covid antibody level

	Correlation coefficient with covid antibody titre	P value
Serum ferritin	0.081	0.161
CRP level	-0.011	0.849
D dimer	0.083	0.154

Table (5) depicts the comparison of various parameters (CRP, S. ferritin, D-dimer and Covid Antibody titre) with oxygen therapy status of study subjects. It was observed that CRP, S.ferritin and D-dimer association with the factor that patient was oxygen therapy found statistically significant (p<.05).

Table 5: Comparison of various parameters with Patient on Oxygen therapy

Parameters	Patient On Oxygen Therapy	N	Mean	Std. Deviation	Std. Error Mean	T	p-value
CRP	Yes	230	54.15	23.04	1.52	2.722	0.007
	No	70	45.46	24.54	2.93		
S. Ferritin (ng/ml)	Yes	230	929.74	264.79	17.46	2.696	0.007
	No	70	832.24	265.48	31.73		
Ddimer	Yes	230	917.49	192.94	12.72	4.204	0.001
	No	70	806.93	191.76	22.92		
covid ab titre	Yes	230	1.70	1.05	0.07	-0.972	0.332
	No	70	1.84	1.04	0.12		

DISCUSSION

Mucormycosis is an uncommon but serious infection that complicates the course of severe COVID-19. Subjects with diabetes mellitus and multiple risk factors may be at a higher risk for developing mucormycosis.[9] A major portion of cases have been of rhino-orbito-cerebral mucormycosis affecting those who have co-existent COVID-19 or have recently recovered from COVID-19. In present study we found that most of the patients affected by mucormycosis were males constituting 61.3% of the cases. The mean age of presentation was 48.8±12.3. majority of the study population 63.0% tested COVID- RTPCR positive or had a recent/past history of infection with the covid-19 virus whereas 37% of the study population tested covid-19 negative and had no recent /past infection with covid-19 virus. Majority of our study participants were diabetic (90%). It was found in our study that the most (55.7%) of the study subjects had covid antibody titre more than 1.40.

There is no statistically significant association between the level of inflammatory markers and covid antibody titre. The values of inflammatory markers were significantly higher in patients of mucormycosis those who were received oxygen therapy during hospital stay.The levels of inflammatory markers found to be have a statistically significant association with comorbid conditions in patients with mucormycosis.

CONCLUSION

We conduct a study on mucormycosis patients during second wave of covid pandemic to assess the role of covid 19 antibody titre. The study participants were mostly male with a median age of 48±12. Most of patient have an antibody titre of >1.40.however It was found in our study that there is no relation between inflammatory markers level and covid 19 antibody titre.

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