



Mucormycosis Secondary to Coronavirus Disease a Case Series from a Tertiary Care Hospital in Maharashtra

Rahul T Thakur*, Kirti Salunke, Anand Meher, Vaibhav Madane and Keshav Zargad

Department of Anesthesiology, Government Medical College and General Hospital, Baramati, Maharashtra, India

*Corresponding e-mail: dr.rahul_thakur@yahoo.com

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ABSTRACT

Background: As the pandemic of Coronavirus disease (COVID-19) progresses, health care remains a new challenge. The recent rise in second wave possess a different challenge of opportunistic infections especially mucormycosis in COVID-19 recovered patients. It is complicating their future outcomes and making quality of life more morbid. Mucormycosis was well known to infect patients with immunocompromised conditions, as the treatment of COVID-19 largely rests on systemic steroids and other immunosuppressant's the risk of invasive fungal infection has increased.

Methodology: Here, we present a case series of 07 patients with individual clinical characteristics along with the demography and treatment details studied during 3 months June 2021 to August 2021. The data was collected in a single center that caters to a large population of COVID-19 patients with varying severity in taluka places of Maharashtra.

Results: Seven patients were presented with COVID-19 associated rhino cerebral mucormycosis. The median age was higher in non-survivors (59.5 years), with a higher odds ratio of death (23.8) in those with severe COVID, having overall mortality of 57%. Moreover, diabetes mellitus was present in 70% of patients with a mortality of 57%. All patients had received prior steroids for COVID-19 management. The incidence of hyperglycemia at admission was equal among both survivors and non-survivors.

Conclusion: The prevalence of mucormycosis seems to be more among COVID-19 patients which may be due to with increased use of systemic steroids and immunocompromised state because by SARS-Co V-2 or conditions such as diabetes mellitus. As the mortality of mucormycosis is remarkably high and apart from preventive practices and rational use of immunomodulators, a high index of suspicion with early diagnosis is needed.

Keywords: Mucormycosis, COVID-19, Diabetes

INTRODUCTION


Coronavirus disease 2019 (COVID-19) pandemic continues to be a major health issue worldwide. The clinical presentation of COVID-19 patients has been very diverse, ranging from asymptomatic to mild flu to severe life


threatening conditions with multi-organ involvement [1]. Being more than 2 years of pandemic, the definitive treatment of COVID-19 is yet to be framed. Rather systemic steroids have shown some survival benefits. On the other side, rampant use of steroids rather glucocorticoids has resulted in superadded bacterial and fungal infections [2]. This increased incidence of infections may also be linked to preexisting co morbidities such as poorly or UN controlled diabetes mellitus, respiratory diseases and the immunocompromised state. In the early part (first wave) of the pandemic, less than 1% of secondary infections were fungal [3]. Recent reported cases of a rise in systemic fungal infections, particularly mucormycosis, in India have raised a lot of concern. In the general population, in the pre-COVID era, the incidence of mucormycosis is very low, varying from 0.005 to 1.7 per million [4]. In the 2003 outbreak of SARS-CoV infection, the incidence of fungal infection was 14.8-27% and was the main cause of death for severe acute respiratory syndrome patients, accounting for 25-73.7% of all causes of death [5-7]. Here, we present a case series of 17 patients having COVID-19 infection along with mucormycosis its treatment and management.

MATERIALS AND METHODS

Ever since the cases of rhino cerebro orbital mucormycosis started after outbreak of corona virus disease COVID-19 in Maharashtra, our hospital started a dedicated mucormycosis ward which started treatment and management of patients with mucormycosis. We found 7 patients with mucormycosis during 3 months June 2021 to August 2021. The diagnosis of mucormycosis was confirmed on KOH mount and relevant data was collected which is noted as follows Table 1.

Table 1 Cases of rhino cerebro orbital mucormycosis started after outbreak of COVID-19 disease.

Sr No	Age	Sex	Comorbidities	Complaints	Type of Mucormycosis	Days of diagnosis	Steroids given	Surgery done	Days in hospital	Final outcome
1	63	M	DM,HTN,CKD	RT facial pain, numbness, swelling and chemosis of the right eye.	Rhino orbital	16	Yes	Surgery + Ampho B (28 days) +Posa (2 weeks)	28	Death
2	45	M	HTN	Rt facial numbness, orbital chemosis 	Para nasal sinuses	14	No	Surgery + Ampho B (28 days)	28	Discharged
3	58	F	DM	Rt facial numbness, rhinorrhoea, orbital swelling.	Rhino orbital	12	Yes	Surgery +ampho B 28 d +posaconazole	31	Death
4	52	M	DM	Orbital chemosis, facial numbness	Rhino orbital	10	Yes	Surgery +ampho B	24	Discharged
5	57	F	DM HTN	RT Orbital oedema	Rhino orbital	14	Yes	Surgery +ampho B	20	Death

6	59	M	DM HTN	Lt decrease of vision, Lt palatal blackening 	Rhino cerebral orbital	17	Yes	Surgery +ampho B	18	Death
7	53	M	DM	Lt facial numbness, orbital chemosis.	Rhino orbital	14	Yes	Surgery +ampho B	20	Discharged

RESULTS

A total of 07 patients admitted with confirmed RTPCR positive for COVID-19 and diagnosed with mucormycosis over three months. Out of 07, five patients had rhino-orbital involvement, one patient had rhino-cerebral involvement and one had only para-nasal sinus involvement. Out of 07 patients only 02 patients were diagnosed with symptoms of rhino-orbital mucormycosis during the treatment at our hospital, others were diagnosed on symptoms of mucormycosis post discharge on subsequent follow up and confirmed on Koh mount. For comparison, we divided the sample into discharged and deaths also other parameters were taken into consideration. The mean age of patient who died was higher mean 59.5, p-value of 0.011). All the patients who died had severe COVID and the need ICU management at the time of admission. Those categorized as severe COVID had an odd of death of 23.8 ((0.89-633.56), p<0.05). The overall mortality was 57%, all the patients were treated by conventional inj. amphotericin B and experienced electrolyte dis-balance, deranged kidney function tests which was temporary. All the patients received inj. methylprednisolone as a line of management for COVID pneumonia. The numbers presented are purely for descriptive reasons and the generalizability of these findings is limited considering the small sample size. The mean hospital stay was 14.75 among those who expired and 24 days among survivors.

DISCUSSION

Huge span of time has passed from the start of pandemic and still the only reasonably effective treatment for COVID-19 are oxygen therapy and immunosuppressant's such as steroids and tocilizumab [8,9]. However, the use of steroids is known to raise the risk of secondary infection [10]. Maini reported a sole case of a 38 years old male with rhino-orbital mucormycosis in COVID-19 in May 2021 [11]. A two-case report of mucormycosis was also published in April 2021, where both the patients had received corticosteroids therapy during COVID-19 [12]. Similar case reports have been published by Werthman-Ehrenreich, Mehta and Pandey and Revannavar on rhino-orbital mucormycosis [13]. In our study, a total of 07 cases were reported. There was a male predominance in our study population 11 (78.5%) which is similar to previous studies. The mean age of patients who died was 59.5, indicating high mortality in the older age group. Our overall mortality (57%, 4 out of 7 patients died) was also high. Like our results, Patel also found an increased risk of death in age >54 years in their study [14]. Diabetes mellitus has been associated with severity in COVID-19. Also diabetics have more risk of dying after mucormycosis [15]. In our case series also, diabetes mellitus was the most common predisposing factor as 6 out of 7 had diabetes and mortality was higher in diabetic patients. Similar findings were reported in the study by Garg. about diabetes mellitus [16]. Steroids especially glucocorticoids have been advocated in the management of COVID-19 [17]. All the patients in our study had received steroids for COVID-19 treatment. The route of the spread of mucormycosis is mainly through inhaled fungal spores. Use of face masks to prevent COVID-19 may decrease the spread of mucormycosis. So, high risk populations such as diabetic's patients given steroid therapy, immunocompromised should be encouraged for wearing masks at least till the pandemic of COVID-19 and mucormycosis is there. The sample size is small and the data have been collected retrospectively [18]. Therefore, there may be inaccuracies concerning the timing of starting and duration of treatment with antifungal treatment.

CONCLUSION

All treating clinicians must be aware of the risk of Mucormycosis in patients suffering or recovering from COVID-19. Those treated with steroid therapy and with uncontrolled diabetes mellitus, immunosuppressants should be monitored post discharge from hospital. Judicious use of glucocorticoids should be there in management of COVID-19 associated pneumonia. Early diagnosis of mucormycosis, starting of antifungal therapy, early debridement and surgical intervention has been key for the management of mucormycosis. Amphotericin B is the drug of choice but other drugs such as posaconazole and isavuconazole can also add to the management. Wearing of masks should be promoted.

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