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POST COVID FUNGAL SINUSITIS WITH SPECIAL REFERENCE TO MUCOR – CLINICAL ANALYSIS IN A TERTIARY CARE HOSPITAL

Otolaryngology

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ABSTRACT

COVID-19 associated complications like invasive fungal sinusitis are emerging as significant problem worldwide.we studied the available data of 199 Post covid fungal sinusitis patients admitted in in our tertiary care hospital from june – july of 2021 with special reference to mucor. Males of age group 41-60 are most commonly affected. Most of the patients (86%) presented with Rhino Orbital involvement Except 9 patients, all were diabetic. Extensive nasal endoscopic surgical debridement was done in all cases .Out of 199 cases, 18% (36) were positive by culture. All patients received IV Amphotericin B 6mg/ kg for 7days & continued on Posaconazole.For all the cases, blood sugar level was monitored strictly. All patients improved symptomatically and discharged. Early diagnosis and multidiscipilanary treatment with surgical debridement, antifungal agent and control of underlying predisposition is important for improving outcomes for patients with mucormycosis.

KEYWORDS

Post Covid Fungal Sinusitis, mucormycosis.

INTRODUCTION

COVID-19 associated complications are emerging as significant problem worldwide. Among all, the fungal infection due to mucor is becoming a serious issue in patients diagnosed and treated for covid 19. There are clear evidences of its sudden increase in incidence with high morbidity[1]. Post covid mucormycosis is reported in many states of India, including Tamilnadu[2]. Mucormycosis is an Angio invasive fungal disease caused by mould of the genus Mucorale.The spores of this fungi are ubiquitously found in air, soil, dead & decaying material. Infection is acquired by inhalation of the spores .Though all humans are exposed to the risk of this fungal infection, the innate immunity of our body strongly fights and prevents this infection.

Uncontrolled diabetes mellitus is already a known risk factor for mucormycosis because of its altered immune function.The covid 19 infection also damages the immune system of the patient leading to the increase incidence of fungal infection following covid[2]. In persons with such decreased defence mechanisms, these fungal spores colonize in the oral, nasal, pharyngeal mucosa, including paranasal sinuses and readily spread to palate, orbit and to skull[3]. The disease progression can be prevented by early surgical debridement and removal of the infected tissue with fungal components. Additional treatment with systemic or local irrigation with AmphotericinB, can also help to improve the morbididty.

In this background, we studied the available data of Post covid fungal sinusitis patients admitted in in our tertiary care hospital with special reference to mucor, hoping this will give better insight to its incidence, clinical spectrum, radiological evidences, treatment & outcome

METHODOLOGY:

This study was conducted in a tertiary care hospital in south Tamilnadu.

The patients with clinical/radiological features suggestive of fungal sinusitis who are confirmed post covid cases are included in this study.

The details of 199 patients admitted in the mucor special ward from june – july of 2021 were analysed with available record details.

Various factors including the basic demographic details, clinical features with type of involvement, radiological evidences, underlying predisposing diseases like diabetes mellitus, H/o steroid intake etc., laboratory investigations, treatment with its outcome are analysed for their significant association.

RESULTS :

Among the 199 patients with clinical features suggestive of post covid fungal sinusitis, 135(68%) were male & 64(32%) were female. The age wise distribution of the cases are as follows

Table 1- Age wise distribution of post covid fungal sinusitis

	Male		Female	
Age group (years)	Number	Percentage (%)	Number	Percentage (%)
11-20	0	0	1	0.5
21-30	4	2	0	0
31-40	17	8	11	5.5
41-50	40	20	12	6
51-60	45	23	29	14.5
61-70	23	12	8	4
≥ 71	6	3	3	1.5
Total	135		64	

Most of the patients 86% (171) presented with symptoms suggestive of Rhino Orbital involvement. The most common symptoms included nasal block,nasal discharge, headache, facial pain, periorbital pain & periorbital swelling. There were 11 patients with cranial nerve involvement (7 with facial palsy;1 with trismus; 3 with ptosis) & Loss of vision was a complaint in 10 patients. Facial eschar was present in 3 patients, while palatal erosion was noted in 3 patients. 3 patients presented with dental involvement One patient was a post covid case with acute right medial temporal lobe infarct.

Except 9 patients, all patients 96% were diabetic. Only one patient was PLHA.

Out of 199 cases, 54 (27%) had received O2 during hospital stay for Covid & 84 (42%) received Steroid therapy. Extensive nasal endoscopic Surgical debridement was done in all the cases and sample sent for microbiological examination. 36 (18%) patients with this clinical features of fungal sinusitis turned out to be positive for mucormycosis with growth of mucorales in the specimen.

Table 2- Age wise distribution of postcovid mucormycosis

Age group (years)	Male	Female
11-20	0	1
21-30	0	0
31-40	4	0
41-50	12	3
51-60	10	1
61-70	4	0
≥ 71	1	0
Total	29	5

Most common presentation in mucormycosis was symptoms suggestive of Rhino Orbital involvemen .The most common symptoms included nasal block,nasal discharge, headache, facial pain, periorbital pain & periorbital swelling.

The radiological findings of the above are as follows;

All patients had CT findings showing features suggestive of Invasive

fungal sinusitis, with predominant maxillary sinus involvement. One patient had osteolysis of premaxilla.Along with this sinus involvement, 9 patients had orbital involvement. Radiological evidences of frontal lobe abscess was noted in1 patient. Palatal erosion was noted in 1 patient. Involvement of Pterigopalatine fossa @ Infratemporal fossa was seen in 1 case .Out of 36 cases, only 10 patients had received O2 more than 5 days during hospital stay for Covid.& 6 patients received Steroid therapy for more than 5 days.Though fungal culture was positive, KOH mount was positive for broad aseptate hyphae only in 19 cases.

All patients received IV Amphotericin B 6mg/ kg for 7days & continued on Posaconazole 300mg IV BD for a day followed by oral Posaconazole 300mg OD for 4 weeks. Retrobulbar amphotericin B was given by Opthalmologist to the patients with vision less than 6/60, clinical or radiological orbital cellulitis with vision loss, restricted extra ocular movements. For all the cases, blood sugar level was monitored regularly and good glycemic control was maintained in diabetic patients.All patients recovered / improved symptomatically and discharged and no mortality was reported. After surgery & medical management,one patient was transferred to dental department for further management (maxillectomy).One patient had gone against medical advice.

DISCUSSION

Covid-19 virus damages the innate immune system of the patient leading to more chance of post covid infections. Invasive fungal rhino sinusitis (IFRS) is one among the serious post covid infection reported all over India [4]. This is mostly caused by fungi belonging to Mucorale family.

India has the maximum burden of mucormycosis cases even before the outbreak of covid 19, [5] contributing around 40% of global burden.

In this scenario of high number of mucor and worst hit covid in India, all post covid invasive fungal sinusitis cases were considered to be due to mucor unless proved otherwise. Immediate treatment has to be started not waiting for the microbiological or pathological reports as it might take 3-7 days.

In this study, out of 199 post covid invasive fungal sinusitis admitted, 68% were men and 32% were women (Table 1). The incidence was significantly more in male compared to female. The most common age group was from 41-60 for both male & female. This was similar to the findings observed in previous studies [6].The increased incidence in this age group & sex parallels the higher prevalence of Diabetes which is the most common predisposing factor for IFRS [7].

The most common clinical presentation of the patients with post covid IFRS were related to Rhino orbital type of involvement (86%). Rhino-orbital form is the most common variety of IFRS seen in the patients with altered immunity globally.[8]

In this study, Except 9 patients all the other (96%) had diabetes mellitus showing strong correlation. Diabetes is India's fastest growing epidemic [5] and it is the already known risk factor associated with fungal infections in India [9].

Early surgical intervention was done in all patients followed by anti fungal medical treatment as advised by WHO [10]. Out of 199 post operative specimen sent for microbiological examination, KOH mount was positive for broad aseptate hyphae in 19 patients & 36 were positive with growth of mucorales in fungal culture. These cases were considered as post covid mucormycosis cases.

As per Table 2, mucormycosis was common in male of 41-60 years age group,which is similar to any other invasive fungal sinusitis cases. All the patients were diabetic.

Covid 19 infection also causes pancreatic injury [11] thus contributing more to the uncontrolled hyperglycaemic state. Steroids used to treat severe covid infections also contribute to this hyperglycemia.

In this study nearly half of post covid mucormycosis patients had either history of treatment with O2 or steroid or both.

Post covid pancreatic damage, diabetes mellitus and treatment with steroids has led to hyperglycemia with ketoacidosis .This hyperglycaemic acidic state enhances the adhesion & invasion of mucor hyphae into the endothelial cell lining of blood vessels [2] .The angioinvasive abitity of the fungus is critical to its rapid spread leading to thrombosis & tissue necrosis .

In this study, apart from the most common maxillary sinus involvement radiologically, orbital involvement was seen in 9 patients. This is due to the rapid invasiveness nature of the fungus.

Treatment principles included extensive surgical debridement, antifungal agents, reversal of underlying predisposing factors. Early surgical intervention was done in all the cases even before the microbiological reports, as it is very important in the management of mucormycosis. Clearing the fungal elements along with dead & devitalised tissues will help in better penetration of amphotericin B which is given sequentially.

The use of high-dose liposomal amphotericin B as a first-line treatment is strongly suggested which can be followed by less nephrotoxic posaconazole [12].

The combination of surgery and antifungal therapy was associated with better survival among mucormycosis patients, as observed in previous studies [13].

Control of blood sugar level in all these patients was achieved all through the treatment as, this is an important factor in improving the outcome [14]

In our study, all the patients improved and discharged with no mortality reported in this patients.

CONCLUSION

Mucormycosis has been declared as a notifiable disease by the Government of India.Early diagnosis and prompt treatment with surgical debridement, appropriate antifungal agent and control of underlying predisposition such as diabetes are important for improving outcomes for patients with mucormycosis thus necessitating a multidisciplinary team approach in a health care centre.Standard operating procedures are required to be developed, applied and updated regularly for diagnosis & management of post covid mucor mycosis cases. Covid patients who are discharged from the hospital should be made aware of early warning symptoms of mucor as it is important to recognise at an early stage this infection, so as to potentially reduce complications of this life threatening infection.

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