Original Research Article

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Our experience of 30 cases of mucormycosis of nose and paranasal sinuses

Vilas R. Kirdak, Sambhaji G. Chintale*, Sajit Shaikh, Kaleem Shaikh, Sonali Jatale

Department of otorhinolaryngology, JIIUS IIMSR, Warudi, Badnapur, Jalna, Maharashtra, India

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*Correspondence:

Dr. Sambhaji G. Chintale,

E-mail: drsamchinto@gmail.com

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ABSTRACT

Background: Mucormycosis is life threatening fungal infection that occurs in immunocompromised patient. These infections are becoming increasingly common in yet survival remains very poor a great understanding of the pathogenesis of the disease may lead to future therapies.

Methods: In present study we have made an attempt to evaluate a standard method of management of mucormycosis of nose and para nasal sinuses. Total 30 cases of mucormycosis of nose and Para nasal sinuses were studied JIIUS IIMSR Warudi, Badnapur, Jalna a tertiary center from June 2014 to June 2017 thoroughly on the basis of clinical behavior, histopathological report and radiological investigation, we have tried to formulate a standard method of treatment in the form of medical and surgical debridement or combination in order to achieve the best possible results. **Results:** In this study male patient were 18 (50%) cases and female were 12 (40%). Most common predisposing factor was diabetes mellitus in 24 (80%) cases and other factors were tuberculosis 4 (13.33) and chronic renal failure 5 (16.66). Most commonly presented age group was 4th decade to 5th decade 11 (36.66) and 8 (26.66%) respectively. Most common symptom was nasal obstruction and sign was maxillary swelling 21 (70%). Most common radiological finding was cloudiness of sinuses 27 (90%) least common finding was intracranial extension 6 (20%). Most common used treatment modalities was amphotericin B24 (80%) and least used was surgical debridement by FESS 16 (53%). **Conclusions:** In the management of mucormycosis and its different pathological forms and most aggressive form like rhino cerebral mucormycosis prompt diagnosis based on clinical examination, reversal of predisposing condition and aggressive surgical debridement along with medical treatment remain corner stone of the therapy for this deadly disease.

Keywords: Fungi, Mucormycosis, Surgical debridement, Amphotericin B

INTRODUCTION

Mycology is study of fungi, a diverse group that comprises if moulds, yeast, mushrooms and related organism. Over 100000 species are recognized as of which 100 are identified as pathogenic for human and animals. Fungi are eukaryotic organism which differ from bacteria and other prokaryotic organism in many ways. Mycosis, an infection caused by fungi, generally depends on the state of the host defense system, the route of

exposure and the virulence of the fungus. Amongst the mycosis, mucormycosis is the most invasive form of leading to higher morbidity and mortality.¹

Several novel therapeutic strategies are available. These options include combination therapy using lipoidal bases amphotericin within an echinocardin or with azole or with all three. The underlying principle of therapy for this disease remains rapid diagnosis, reversals of underlying predisposing cause and urgent surgical debridement. This

fungus is ordinarily saprophytic, but can become an aggressive pathogen under the appropriate condition, usually a series predisposition in the host. Mucor is almost always seen in the patient with immunodeficient status. The most common risk factor in these patients is diabetes mellitus. These patients comprise almost 70% of patient with Mucor. These patients are usually keratoacidotic from poorly controlled diseases. The second most common underlying predisposing conditions are renal diseases which are either chronic renal failure or that patient who are post-transplant and desferoxamine an iron or aluminum chelating agents. Other predisposing conditions are patient on steroid therapy for underlying immunosuppressive therapy after transplantation and other hematological disorders.²

Mucormycosis can manifest itself in five distinct syndromes as rhino cerebral, pulmonary, cutaneous, and gastrointestinal disseminated and miscellaneous. The most common is rhino cerebral form seen in 35 to 45% of cases. The second common form is the pulmonary form or disseminated form.³

METHODS

In this study of mucormycosis of nose and para nasal sinuses 30 cases were studied at JIIUS IIMSR, Warudi, Badnapur, Jalana. A tertiary referral center over period of 3 years from June 2014 to June 2017. Detailed clinical evaluation was done and patient were assessed for age, gender, predisposing factor, symptoms and signs site of extension, number and site of debridement and the outcome.

Inclusion criteria

- The entire patient having sinusitis with immunocompromised state including diabetes mellitus, old debilitated patient also included in study.
- Those patients having tuberculosis, chronic renal failure, patient on steroid therapy also included in study.

Exclusion criteria

- Those patients having nasal mass with sinusitis like antrochoanal polyp, ethmoidal polyp, and nasal mass with suspected malignancy were excluded from study.
- Those patients who are not willing to admit and not giving consent for operation are also excluded from study.

All the results of this study were obtained by using chi square study as statistical method. The following investigation were done in all cases

1. Blood CBC, blood sugar, blood urea, VDRL, HIV, blood grouping, serum electrolytes and serum creatinine.

- 2. Urine examination.
- Radiological examination.
 X-ray PNS waters view and Caldwel luc view, X-ray chest PA view, CT scan nose and Para nasal sinuses.
- 4. Histopathology

In all patients diagnostic nasal endoscopy was carried out using 0, 30 degree nasal endoscope under local anesthesia. The biopsy material obtained was sent for histopathological examination for H & E staining and Gomori methanamine staining. Those planed for surgical debridement were assessed preoperatively for anesthesia. General anesthesia with portex cuffed endotracheal tube was the preferred method. In all patients nasal endoscopy was performed six patient underwent maxillectomy with two undergoing orbital exenteration. Rest of the cases was treated by nasal endoscopic sinus clearance.

RESULTS

This study was carried out in the department of otorhinolaryngology at JIIUS IIMSR, Warudi, Badnapur, Jalana. A tertiary referral center between June 2014 to June 2017. The study materials comprised of 30 cases, all basically admitted to medical intensive care unit and referred to otorhinolaryngology department for sinosasal and rhino cerebral problem.

In the present study 18 (60%) male and 12 (40%) female were observed among the sexes (Table 1).

Table 1: Showing sex incidence in 30 cases of mucormycosis.

Sex	No. of cases	Percentage (%)
Male	18	60
Female	12	40

Table 2: Etiological predisposing conditions.

Underlying conditions	No. of cases	Percentage (%)
Diabetes's mellitus	24	80
Tuberculosis	4	13.33
Chronic renal failure	2	6.66

The commonest predisposing condition for the disease is diabetes mellitus seen in 24 cases tuberculosis and renal failure were least predisposing factor (Table 2).

The most common affected age group was 4th and 5th decade with increased incidence of diabetics detected in same group (Table 3).

In present study nasal obstruction 27((90%) was main symptoms and least symptoms was visual impairment 8 (26%) (Table 4).

Table 3: Showing age distribution.

Age group (years)	No of cases	Percentage (%)
0-10	1	3.33
11-20	1	3.33
21-30	1	3.33
31-40	8	26.66
41-50	11	36.66
51-60	8	26.66

Table 4: Showing of symptoms.

Symptoms	No of cases	Percentage (%)
Nasal obstruction	27	90
Nasal discharge	25	83
Nasal mass	24	80
Facial pain	18	60
Nasal bleeding	12	40
Watering from eye	10	33
Visual impairment	8	26

Table 5: Showing sign.

Signs	No of cases	Percentage (%)
Maxillary swelling	21	70
Palatal bulge	17	55
proptosis	17	55
Papilledema	11	33
Altered sensorium	7	23

In this study most common sign presented was maxillary swelling 21 (70%) and least common sign was altered sensorium 7 (23%) (Table 5).

Table 6: Showing radiological findings based on x-ray CT scan and MRI studies.

Radiological findings	No of patients	Percentage (%)
Clouding of sinuses	27	90
Mucosal thickening	18	60
Bone erosion	19	63
Intracranial extension	6	20

In this study most common radiological finding was cloudiness of sinuses 27 (90%) and least common radiological finding was intracranial extension 6 (20%).

Amphotericin B was the drug of choice and in all patient suitable dosage of the drug was given in almost 24 (80%) followed by surgical debridement in 16 (53%) and least

common done was maxillectomy with orbital exenteration 6 (20%) cases.

Table 7: Showing the treatment modalities used.

Treatment modality	No of	Percentage
	cases	(%)
Amphotericin B	24	80
Surgical debridement	16	53
(FESS)	10	<i>JJ</i>
Maxillectomy+orbital	6	20
exenteration	U	20

DISCUSSION

In the present study we evaluated the clinical picture and treatment modalities of patient with rhino cerebral mucormycosis The incidence was found to be male 60% with female 40% in ratio of 1.5:1 in study by Manning et al ratio was 1.6:1 [male: female].

Nasal symptoms such as nasal obstruction with rhinorrhea, headache were present in 85% cases Scott manning found that headache, congestion of nasal mucosa and obstruction were common symptoms in 90% cases Radiological findings such as mucosal thickening and clouding of sinuses in 90% bone erosion in 65% unspecified findings s in 15% of cases were consists with findings of Blister et al.¹

For the drug treatment of mucormycosis of nose and Para nasal sinuses, amphotericin B is the drug of choice. Starting dose of amphotericin B was 1mg to 10mg escalated to 1 mg per kg body weight for total dose of 2 gm, which were administered over period of 6 weeks The use of amphotericin B in lyophilic drug carried form liposome has been shown to be effective and less toxic than amphotericin B. 80% survival rate was observed in the present study with amphotericin B as compared with 79% survival rate quoted by Bliter et al.¹

In our study we had about 80% survived rate with medical and surgical line of treatment compared with 84% survival rate reported by Harold et al Uncontrolled diabetes mellitus because of ketoacidosis can alter the normal immunological response of patient to infection. Such patients have decreased granulocyte phagocytic activity with altered polymolphonuclear leukocyte response.in diabetic patient rhizopus arrizus produces the enzymes ketoreductage which allow them to utilize the patient ketone bodies. The increase risk of mucormycosis in patient with ketoacidosis may also be due to the release of iron bound to protein. 4-9

Four factors are critical for eradicating mucormycosis rapidity of diagnosis reversal of underlying cause if possible appropriate surgical debridement of infected tissue appropriate antifungal treatment. 10,11

CONCLUSION

In the management of mucormycosis and its different pathological forms and most aggressive form like rhino cerebral mucormycosis prompt diagnosis based on clinical examination, reversal of predisposing condition and aggressive surgical debridement along with medical treatment remain corner stone of the therapy for this deadly disease

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