

## TO PREVENT CASE FATALITY AND REDUCING OCULAR MORBIDITY THROUGH EARLY DIAGNOSIS AND PROMPT MANAGEMENT OF ORBITAL MUCORMYCOSIS IN DIABETES MELLITUS

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### Abstract

**Background & Method:** This study was conducted in Amaltas Institute of Medical Sciences, Dewas, M.P. for a period of 12 months. 30 patients were selected based upon the inclusion criteria. Patients were admitted and evaluated clinically and radiologically. All the patients were given similar medical and appropriate surgical therapy and closely monitored for changes in the subjective symptoms and objective signs throughout the treatment period. Patients will be followed up at 1, 4, 6 weeks and 3, 6, 12 months. On each follow up visit, visual acuity, slit lamp examination, IDO, IOP measurement will be recorded and also assessed for development of possible complications which will be managed accordingly.

**Result:** As recorded in our study, uncontrolled diabetes (50%) was the most common cause for deterioration of the general condition of the patient, followed by poor compliance (33%) to treatment and death (17%). In our study, pre septal cellulitis (67%) was the most common orbital manifestation of mucormycosis followed by orbital cellulitis (17%) and cavernous sinus thrombosis (10%). Very few had a sub periosteal or an orbital abscess.

**Conclusion:** All the patients were subjected to similar treatment strategy of systemic anti-fungal therapy followed by appropriate surgical methods with respect to the stage of presentation. The changes in the subjective symptoms and objective signs after treatment were evaluated, along with the assessment of development of possible complications. Residual morbidity and high mortality occurs if clinical diagnosis is delayed.

**Keywords:** fatality, morbidity, mucormycosis & DM.

### Introduction

Perspective study on Mucormycosis shows that mucormycosis is a life endangering fungal infection that occurs in immunocompromised patients. Even though, these infections are increasing day by day, survival rate is very poor.

Only by proper understanding of the species of fungi and the various pathogenic mechanisms involved we can find a solution to this condition. From these studies we can very well come to know that iron, is important in regulation of mucormycosis and deferoxime supplement the needed iron to the organism and enhance its growth. So therapy with iron chelator is used in treating the dreadful condition. Recent studies have shown the use of liposomal amphotericin in higher dose. Lipid based amphotericin, an echinocandin, an azole or a combination of all three can be used. The principle therapy of Rhino Orbital Cerebral Mucormycosis is early diagnosis, identifying the various risk factors and taking measures to reverse them and intervene at proper time by surgical measures.

There is a sex predisposition and men are affected. The affected patients are in the age group of fifty. Two weeks is the duration between the entry of organism and its manifestation. *R. Oryzae* is one of the most common fungal organisms.

Mucormycosis is an angioinvasive infection caused by filamentous fungi, of mucorales order belonging to zygomycetes class. The patients with poor glycemic status are more prone for this disease. Epidemiology, various symptoms and signs and cause for deterioration of vision are studied.

### Material & Method

This prospective study was conducted in Amaltas Institute of Medical Sciences, Dewas, for a period of 12 months. 30 patients were selected based upon the inclusion criteria. Patients were admitted and evaluated clinically and radiologically. All the patients were given similar medical and appropriate surgical therapy and closely monitored for changes in the subjective symptoms and objective signs throughout the treatment period. Patients will be followed up at 1, 4, 6 weeks and 3, 6, 12 months. On each follow up visit, visual acuity, slit lamp examination, IDO, IOP measurement will be recorded and also assessed for development of possible complications which will be managed accordingly.

### Inclusion Criteria

1. Age >40yrs
2. Type II Diabetes Mellitus

3. Histopathologically confirmed diagnosis of Mucormycosis

4. Similar treatment strategy of systemic antifungal therapy followed by surgical debridement and adjuvant treatment.

#### Exclusion Criteria

1. Age <40yrs
2. Juvenile/ Type I Diabetes Mellitus

3. Other associations of orbital mucormycosis like

- a. Malignant haematological disorders
- b. Chronic renal failure, metabolic acidosis,
- c. Prolonged glucocorticoid or desferoxamine therapy

4. Participants who discharged themselves against medical advice and lost to follow up.

#### Results

##### Observation and Results

**Table 1: Age incidence of orbital mucormycosis**

AGE GROUP	INCIDENCE	PERCENTAGE
40-45	2	6.67
46-50	2	6.67
51-55	18	60
56-60	5	16.67
61-65	3	10

Of the thirty patients in our study, majority of patients (18) were in 50-55 years age group, 5 were in 55-60 years age group, 3 were in 60-65 years age group and 2 were in age group 45-50 and remaining 2 in 40-45 years. Persons above fifty years of age are the most affected because of their increased susceptibility to infections.

**Table 2: Causes for deterioration of condition**

CAUSES	NUMBER OF PATIENTS	PERCENTAGE
POOR COMPLIANCE	2	33.33
UNCONTROLLED DIABETES	3	50.00
DEATH	1	16.66

As recorded in our study, uncontrolled diabetes (50%) was the most common cause for deterioration of the general condition of the patient, followed by poor compliance (33%) to treatment and death (17%).

**Table 3: Varied orbital manifestation of mucormycosis**

ORBITAL MANIFESTATION	NUMBER OF PATIENTS	PERCENTAGE
PRESEPTAL CELLULITIS	17	56.67
ORBITAL CELLULITIS	8	26.67
SUBPERIOSTEAL ABSCESS	1	3.33
ORBITAL ABSCESS	1	3.33
CAVERNOUS SINUS	3	10.00
THROMBOSIS		

In our study, pre septal cellulitis (67%) was the most common orbital manifestation of mucormycosis followed by orbital cellulitis (17%) and cavernous sinus thrombosis (10%). Very few had a sub periosteal or an orbital abscess.

#### Discussion

A study conducted by Maureen M .Roden et al, states that there is increased prevalence of zygomycosis in male population when compared to female population which supports our study in which male patients outnumber the female. Lanternier et al, study also explains the same. A

paper submitted in University of Wales Institute Cardiff shows similar data in age group in par with our study.

This study also tells that, diabetics are more prone for orbital mucormycosis and uncontrolled blood sugar is important etiological factor which predispose to this condition. The infection spreads mainly through the sinuses and involvements of various sinuses are documented in our study.

Variable presentations of zygomycosis are studied, and found isolated rhino- orbital-mucormycosis is commonest of all, which is proved in our study. As per George

Petrikkos et al, various symptoms and signs in mucormycosis were studied and causes of visual deterioration were identified. Early intervention decreased the ocular morbidity and mortality of the affected individual which is similar to our study.

Orbit develops around the eyeball. It is derived from the mesenchyme which encircles the optic vesicle and the optic stalk, above from the mesodermal capsule of the forebrain, below and laterally from the maxillary process, medially from fronto-nasal process and posteriorly from pre and orbito-sphenoid. The differentiation of the bones starts by the third month and later undergoes ossification and fusion. Though the eyeball reaches adult size by three years of age, the orbit continues to grow until puberty.

### Conclusion

All the patients were subjected to similar treatment strategy of systemic anti-fungal therapy followed by appropriate surgical methods with respect to the stage of presentation. The changes in the subjective symptoms and objective signs after treatment were evaluated, along with the assessment of development of possible complications. Residual morbidity and high mortality occurs if clinical diagnosis is delayed.

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