ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 08 | August - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

STUDY OF ENDOSCOPIC SURGICAL MANAGEMENT OF FUNGAL RHINO SINUSITIS

ENT

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ABSTRACT

Objective
1. This study was done to assess clinical, radiological and microscopic features of fungal rhinosinusitis in 50 patients who attended Government general hospital, Guntur in a period of two years i.e from December 2017 to December 2019.
2. To study the outcome of endoscopic surgical management of fungal rhinosinusitis in 50 patients.

Methods: This study is prospective observational study done in the Department of otorhinolaryngology, GGH, Guntur in fifty patients who attended OPD, with clinical features and investigations suggestive of fungal rhinosinusitis who were selected after applying inclusion and exclusion criteria.

Results: This is a prospective study of fifty cases done in GGH, Guntur between age group 20 to 60 years. The prevalence of fungal rhinosinusitis was higher in younger age group 20-30 years (32%) with Female preponderance. Female: Male ratio was 2.3:1. The most common symptoms were nasal obstruction, head ache and nasal discharge. Majority of patients were immunocompetent (84%). Aspergillus was the most common fungus detected. Maxillary sinus was the most common sinus involved.

Conclusion: The patients of fungal rhinosinusitis who were managed by endoscopic surgical management had successful outcome with minimal complications and minimal recurrence.

KEYWORDS

INTRODUCTION

Fungi are ubiquitous in nature. Fungal infections of the nose and paranasal sinuses are not common in industrialized countries. However, in the recent past, the fungal infections have been increasing due to opportunistic infections in consequence of the use of powerful cytotoxic drugs (as applied to the treatment of neoplasms) and also steroid and antibiotic therapy. In an era of AIDS, broad spectrum antibiotics, cytotoxic drugs and the organ transplantations, fungal infections are becoming increasingly common and very diverse. The most common site of fungal infections in man is the lung with or without hematogenous spread to other organs. But localised fungal infections can also occur in the upper respiratory tract and is more common than was previously suspected.

Most fungal species which are pathogenic to humans, causing opportunistic infections. Only dermatophytes are transmissible from host to host. The incidence of infections and deaths due to fungi has been grossly underestimated. Moreover the list of fungal species capable of producing diseases in immunocompromised persons is increasing rapidly.

MATERIALS AND METHODS

This study is prospective observational study done in the Department of otorhinolaryngology, GGH, Guntur for a period of two years i.e, December 2017- December 2019. Fifty patients who attended OPD, with clinical features and investigations suggestive of fungal rhinosinusitis were selected after applying inclusion and exclusion criteria.

INCLUSION CRITERIA

Patients of fungal rhinosinusitis of age between 20-60 years in department of otorhinolaryngology who gave consent for endoscopic surgical management are taken into study

EXCLUSION RITERIA

1. Patients of age below 20 years and above 60 years
2. Patients who refuse to give consent for surgery
3. Debilitated patients

Subsequently all the selected patients were worked up on the following pattern

1. A detailed history
2. General examination
3. ENT examination
4. Investigations

a) Routine haematological and biochemical examinations were carried out along with Chest x-ray and ECG
b) X-ray PNS Water's view
c) Diagnostic nasal endoscopy under local anaesthesia
d) CT PNS

In our study the patients suspected with mucormycosis were given IV liposomal Amphotericin B 1- 1.5 mg/kg per day and surgical debridement (until clear bleeding margins were observed) was done as early as possible. The patients with uncontrolled diabetes mellitus were managed in collaboration with the department of medicine.

Once the diagnosis and extent of the disease was established, the patients were taken up for FESS, after pre anesthetic evaluation.

The surgery was done either under local or general anesthesia, depending on the following factors:

1) Extent of disease
2) General condition of the patient, and
3) Patient's choice for the type of anesthesia

The surgical procedures were carried out in operation theatre under strict aseptic precautions using the endoscopes. The surgical procedures were performed according the guidelines described by Messerklinger and Stammberger. The various procedures performed were uncinectomy, middle turbinate reduction,(if concha bullosa) Middle Meatal Antrostomy, anterior ethmoidectomy, posterior ethmoidectomy, sphenoidotomy and frontal recess clearance based on extent of the disease. Septoplasty done if gross DNS present. The debris and polyp tissue if present were sent for histopathological examination.

RESULTS

Table 1: Showing Age Incidence Of Fungal Rhino Sinusitis

Age group	Number of patients	Percentage
20-30 yrs	16	32%
31-40 yrs	11	22%

41-50 yrs	12	24%
51-60 yrs	11	22%

In our study majority of patients are in 20 – 30 years age group, i.e 16 patients (32%) followed by 41-50 years(24%),followed by 31-40 years and 51-60 years(22%).

Table 2 : Showing Sex Distribution

Sex	Number of patients	Percentage
Male	15	30%
Female	35	70%

In our study group majority were females i.e, 35 cases(70%) and males are 15 cases(30%). Female to male ratio in this study is 2.3:1.

Table 3 : Clinical Symptoms And Signs (pretreatment)

Symptoms and signs	Number of patients	Percentage of patients
Nasal obstruction (polyps/allergic mucin)	43	86%
Head ache	17	34%
Nasal discharge	16	32%
Sneezing	10	20%
Post nasal discharge	11	22%
Bleeding	2	4%

In our study nasal obstruction is seen in 43 patients (86%), head ache in 17 patients (34%), nasal discharge in 16 patients (32%), post nasal discharge in 11 patients (22%), sneezing in 10 patients (20%) and bleeding in 2 patients (4%). Percentage not related to 100% as some patients are having multiple symptoms.

Table 4 : Immunity Status

Immunity status	No. of patients	Percentage
Immunocompetent	42	84%
Immunocompromised	8	16%

In our study 42 patients (84%) were immunocompetent and 8 patients (16%) were immunocompromised .

Table 5: Ct Pns Findings

Sinus involved	Number of patients	Percentage of patients
Maxillary	47	94%
Ethmoid	39	78%
Frontal	22	44%
Sphenoid	15	30%

In our study maxillary sinus was involved in majority of patients i.e 47 (94%), followed by ethmoidal sinus 39 patients (78%), followed by frontal sinus 22 patients (44%) , followed by sphenoid sinus 15 patients (30%).

Table 6: Unilateral/bilateral Comparison

Sinus	Number of patients	Percentage %
Right	10	20%
Left	12	24%
Unilateral	22	44%
Bilateral	28	56%

In our study unilateral sinuses are involved in 22 patients (44%) and bilateral sinuses are involved in 28 patients (56%).

Table 7: Post Operative Symptom Improvement

Symptoms	Number of cases	Very good relief (80%)	Good relief (50-80%)	Average or same (<50%)	Worse
Nasal obstruction	43	32	9	2	-
Head ache	17	14	2	1	-
Nasal discharge	16	10	4	2	-
Sneezing	10	8	1	1	-
Post nasal discharge	11	5	2	4	-
Bleeding	2	2	-	-	-

In our study symptoms were evaluated by subjective ordinal scale.

Table 7a: Ordinal scale

Percentage of relief	Scale
>80%	Very good relief
50-80%	Good relief
<50%	Average relief or same

Relief of nasal obstruction was found to be most responsive to management by functional endoscopic sinus surgery. Post nasal discharge was the symptom least responsive to treatment with functional endoscopic sinus surgery.

Table 8: Histopathological Examination

Fungus	No. of patients	Percentage
Aspergillus	36	72
Mucor	5	10
Aspergillus+ Mucor	1	2
No growth	8	16

Aspergillus was the most common fungus isolated (72%) followed by Mucor (10%). Both Aspergillus and Mucor were isolated in one patient (2%). No organism was isolated in 8 patients (16%).

Aspergillus species have narrow hyphae with regular septations and 45O branching Mucormycosis show broad ribbon like irregular hyphae which are rarely septate.

Hyphae are seen in eosinophilc rich mucin without evidence of tissue invasion. So we should assess mucin, not polyp in HPE.

Allergic mucin contains necrotic inflammatory cells, eosinophills and charcot – leyden crystals which are biproduct of eosinophil degranulation.

DISCUSSION

The fungal rhinosinusitis encompasses a wide variety of fungal infections that range from merely irritating to rapidly fatal**.** Fungal rhinosinusitis is on rise. Non invasive fungus remain asymptomatic for months to years (fungal ball) and may become invasive if patient becomes immune compromised.

Allergic fungal rhino sinusitis is hypersensitivity response by the patient to fungus. Clinical features are allergy, polyps and allergic mucin in sinuses. CT PNS shows heterogeneity of tissue densities within sinuses. It responds to systemic steroids.

The immuno compromised patients (Diabetis, Transplant, Leukemia and AIDS) are more at risk for invasive fungus. They need quick evaluation and aggressive management. Steroid administration may be one of the precipitating factor. Clinical features of invasive fungal sinusitis are palatal erosion, impairment of vision, fever, nasal and facial anaesthesia and nasal necrosis. Most current treatment protocols for fungal rhinosinusitis include surgery combined with medical therapy. Endoscopic sinus surgery has revolutionised the management of this disease.

Saprophytic fungal infection grows on mucocrusts after FESS, treatment is removal of crusts. Prevention is by irrigation with sterile saline and wearing mask in moldy environment.

Age and Sex: The majority of cases in our study were between the age group of 20-30 years. 32% with female preponderance (70%).

Symptoms: In our study most common symptom was nasal obstruction (polyps) and is seen in 43 patients (86%) followed by headache in 17 patients.

CT PNS: All our patients underwent CT scan preoperatively, MRI scan was not considered due to high cost factor and relatively low amount of extra information in cases of fungal diseases of nose and paranasal sinuses. Majority CT PNS of patients in our study demonstrated areas of total or partial sinus opacification (hyper dense area) indicating polyps. In some cases heterogenous densities were present within the sinus cavity indicating thick allergic mucin. CT PNS has been very useful in defining the full extent of the disease. A plain radiograph of paranasal sinuses may reveal a double density appearance of maxillary antrum due to deposition of calcium salts like calcium phosphate and calcium sulphate which is pathognomonic of fungal sinusitis. This was described by Stammberger et al. in 1984.

In our study maxillary sinus (94%) was most commonly involved, followed by ethmoidal sinus (78%), frontal sinus(44%) and sphenoid sinus(30%).

IMMUNITY STATUS:

In our study 42 patients (84%) were immunocompetent and 8 patients (16%) were immunocompromised.

Surgical procedure:
Georgia Nasal and Sinus institute formulated treatment strategy for AFRS which comprised of FESS, tapering doses of oral steroids like prednisolone and intranasal steroid spray. Ferguson proposed that fungal balls must be managed surgically either, endoscopic or Caldwell luc approach. Cap. Itraconazole 200 mg BD was given as a step down oral treatment when clinical improvement is seen to enable long term treatment. The patients with uncontrolled or high blood glucose levels were referred to department of medicine. The outcome was successful. Only one patient had recurrence.

The mainstay of treatment of Mucor mycosis include reversal of immunocompromised state of the effected individual, systemic Amphotericin B and surgical debridement.

In our study the patients suspected with mucormycosis were given IV liposomal Amphotericin B 1-1.5 mg/kg per day and endoscopic surgical debridement was done as early as possible.

In our study cases were operated by endoscopic sinus surgery with less morbidity and mortality. We treated our patients with topical steroids in allergic fungal rhinosinusitis. It is our experience that the topical intranasal steroid when taken regularly is effective in preventing recurrence of disease. For patients in whom fungal infection was confirmed by histopathological examination, KOH smear examination, fungal growth sabouraud dextrose agar were given cap Itraconazole 200 mg BD for 3 months along with steroid nasal spray by monitoring liver function tests.

In our study of 50 patients only one patient had complication i.e, periorbital emphysema and two patients had recurrence.

SUMMARY AND CONCLUSION

This study was done on 50 cases of fungal rhinosinusitis patients who underwent endoscopic sinus surgery in department of Otorhinolaryngology, GGH, Guntur

In our study the prevalence of fungal rhinosinusitis was higher in younger age group 20-30 years (32%) with female preponderance 2.3:1.

The most common symptoms were nasal obstruction due to polyps, head ache and nasal discharge. Majority of patients were immunocompetent (84%). Aspergillus was the most common fungus detected. On CT PNS, maxillary sinus was the most common sinus involved.

Endoscopic sinus surgery was done and post operatively patients were prescribed antibiotic, NSAID, antacid, local decongestants, saline nasal douching. Patients in whom fungus was isolated by histopathological examination were prescribed antifungals and local steroid spray successfully with minimal complications and minimal recurrence.

ABBERVIATIONS: FESS (Functional Endoscopic Sinus Surgery**)**
HPE (Histopathological Examination)

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