International Journal of Research and Review
www.ijrrjournal.com E-ISSN: 2349-9788; P-ISSN: 2454-2237

Original Research Article

Incidence of Fungal Rhinosinusitis in Bihar and Its Management

Shelendra Kumar Gupta[a], Ranjeet Singh[b], Anjali Gupta[c]

[a]Assistant Professor, Department of ENT, KM Medical College and Hospital, Sonkh Road, Mathura, Uttar Pradesh, India.
[b]Assistant Professor, Department of Medicine, KM Medical College and Hospital, Sonkh Road, Mathura, Uttar Pradesh, India.
[c]Lecturer, Department of Anatomy, SN Medical College, Agra, Uttar Pradesh, India.

Corresponding Author: Ranjeet Singh

ABSTRACT

Introduction: Chronic rhinosinusitis is a clinical syndrome manifested by a prolonged inflammatory response of the nasal and sinus mucosa and the underlying bone. This entity is often associated with the presence of allergic and non-allergic rhinitis as well as nasal polyposis
Aims and objectives: To evaluate the incidence of fungal rhinosinusitis in Bihar and its management.
Materials and methods: 50 patients of Chronic rhino-sinusitis undergoing Functional endoscopic sinus surgery, Caldwell Luc operation, Antral Puncture wash and treated post-operatively with oral corticosteroid and topical anti fungal drugs were studied to find out incidence of fungal rhino-sinusitis among the Chronic sinusitis patients.
Results: The maximum number of cases was in age group of 11-30 years of age. Male to female ratio was 24:26 in CRS and 5:7 in FRS. Hindu patient were more common than Muslims. Most of the patient belongs to low socio-economic group. The role of personal history of allergic rhinitis in the precipitation of disease was appeared in 48% cases of CRS and 83.3% cases of FRS. Nasal obstruction, nasal discharge, headache, post nasal discharge and nasal polyposis are the commonest clinical presentation. The duration of symptoms ranged from 6 month to 3 years. Radiological finding especially CT scan and histopathological examination are major basis for the diagnosis.
Conclusion: Although the result of oral & intranasal steroid and topical antifungal agents in our study is good, more study needs to be performed.

Key words: Fungal rhinosinusitis, nasal and sinus mucosa, allergic and non-allergic rhinitis, nasal polyposis.

INTRODUCTION

Chronic rhinosinusitis is a clinical syndrome manifested by a prolonged inflammatory response of the nasal and sinus mucosa and the underlying bone. This entity is often associated with the presence of allergic and non-allergic rhinitis as well as nasal polyposis.

Fungal sinusitis may occur in patients with chronic sinusitis, who usually have a predisposing cause such as neutropenia, AIDS, prolonged use of corticosteroids / broad spectrum antibiotics, uncontrolled diabetes, malnutrition or are immunosuppressed. A variety of different causative organisms could be responsible for fungal sinusitis. Aspergillus and mucor mycosis are the commonest. *Non-invasive* fungal sinusitis is usually due to aspergillosis. It mimics sinusitis but there is no response to antibiotics. Local clearance of fungus is required with medical

treatment. In *invasive* fungal sinusitis, patients will complain of fever, local pain, swelling, discharge and foul smell. Fungal sinusitis is often detected after the onset of an orbital complication or cranial nerve palsy and the sinus involvement seen on CT scan. While imaging will undoubtedly help in the diagnosis and assessment of the extent of fungal involvement, nasal swabs or tissue must be sent for fungal culture in all patients with the slightest doubt of fungal infection to confirm the diagnosis. Early diagnosis, correction of any underlying cause and aggressive treatment is the key to a successful outcome.

The treatment of choice for all types of fungal sinusitis is surgical. Medical treatment depends on the type of infection and the presence of invasion. Treatment will require wide debridement of the affected areas and anti-fungal medication.

REVIEW OF LITERATURE

The first report of human rhino-cerebral mucormycosis was made by Paltauf in 1885. The more specific diagnosis of nasal and para-nasal sinus aspergillosis was reported by Schubert in 1885, this was non-invasive aspergillosis of para-nasal sinus. The first published attempt to classify FRS came in 1965, when Hora recognized two categories: one was non-invasive, behaving clinically like chronic bacterial sinusitis, and the other invasive, in which the infection results in a mass that behaves like malignant neoplasm, eroding bone and spreading into adjacent tissue.

In 1976, Safirstein noted a combination of nasal polyposis, crust formation, and sinus cultures yielding *Aspergillus* species, and observed the clinical similarity that this constellation of findings shared with allergic bronchopulmonary aspergillosis (ABPA). Similarly, in 1981, Miller et al., and in 1983, Katzenstein et al., independently recognized a pathophysiologic resemblance among a few cases of CRS associated with a mucosal plug in the sinuses of patients with ABPA, which led to a description of a fourth type of FRS, namely allergic *Aspergillus* sinusitis.

In recent years, the definition of AFRS has faced a greater challenge with the demonstration of fungi in eosinophilic mucin independently from type I hypersensitivity in most cases of CRS. Ponikau et al in 1999, proposed a new term for this condition, namely eosinophilic fungal rhinosinusitis (EFRS), to reflect the striking role of eosinophils. In the late 1990s, deShazo et al. proposed a new classification for tissue invasive FRS based on the clinical condition, immune status, histopathology, and fungus infection: acute (fulminant) invasive, granulomatous invasive, and chronic invasive types. To resolve the controversies in nomenclature of different form of rhinosinusitis, the fungal rhinosinusitis group participated in a workshop at Chandigarh to categorized different form of non-invasive fungal sinusitis and similar non-fungal disease in 2008.

MATERIALS AND METHODS

The cases for the present study were taken from the outpatient and emergency department of ENT, PMCH, Patna from a period of February 2010 to September 2011. Detailed local and systemic examination will be done under these headings:

LOCAL EXAMINATION:

Nose: External- Any Deformity**,** Airway- Nasal Obstruction**,** Anterior Rhinoscopy**,** Posterior Rhinoscopy

Oral Cavity: Teeth, Hard Palate, Gingivo Buccal Sulcus, Tongue

Oropharynx: Soft Palate, Posterior Pharyngeal Wall, Tonsils And Pillars

Ear: Pinna, Eac, Tm, Otoscopic Examintion, Tuning Fork Test

SYSTEMIC EXAMNINATION:

Pallor, Icterus, Pulse, BP, Cyanosis, RS, CVS, Per Abdomen, CNS

INVESTIGATIONS:

- Cbc, Hb%, BT, CT, Blood Grouping
- Elisa For HBsAg And HIV
- Blood Sugar

- Routine Urine & Routine Stool
- Audiometry
- X-Ray Nose & PNS: Om & Lateral View
- X-Ray Chest: Pa View
- Ct Scan Nose & PNS: Axial And Coronal Cuts
- MRI Of Nose & PNS
- ECG

METHODS OF TREATMENTS: Medical And Surgical

PATHOLOGY: Macroscopic examination was done to note size, colour and consistency of specimen. Microscopic examination (HPE) and culture to see the fungal hyphae, eosinophils etc.

FOLLOW UP: The cases were followed up to record any post- operative complication and recurrence of disease.

RESULTS

1. INCIDENCE OF FUNGAL RHINO-SINUSITIS:

TABLE NO-1 showing the incidence of chronic rhino-sinusitis (n=50)

CHRONIC RHINO-SINUSITIS	No. of Cases	Percentage
FUNGAL RHINO-SINUSITIS	12	24%
NON-FUNGAL RHINO-SINUSITIS	38	76%

Out of a total 50 cases 0f chronic rhino-sinusitis 12 were of fungal rhino-sinusitis which constituted 24%.

2. AGE INCIDENCE:

TABLE NO-2 showing the age incidence in CRS (n=50) and FRS (n=12)

AGE GROUP	CHRONIC RS n (%)	FUNGAL RS n (%)
0-10 yrs.	4(8%)	0(0%)
11-20 yrs.	16(32%)	1(8.33%)
21-30 yrs.	14(28%)	6(50%)
31-40 yrs.	7(14%)	3(25%)
41-50 yrs.	7(14%)	2(16.6%)
51 and above	2(4%)	0(0%)

3. DURATION OF SYMPTOMS:

TABLE NO-3 showing duration of symptoms in CRS (n=50) & FRS (n=12)

DURATION OF SYMPTOMS	CHRONIC RS (N=50)	FUNGAL RS (n=12)
1 month-12 month	17(34%)	4(33.4%)
13 month-24 month	19(38%)	5(41.6%)
25 month-36 month	11(22%)	2(16.6%)
37 month & Above	3(6%)	1(8.3%)

4. CLINICAL PRESENTATION:

TABLE NO-4 showing the clinical features in CRS (n=50) & FRS (n=12)

CLINICAL FEATURES	CHRONIC RS n (%)	FUNGAL RS n (%)
Nasal obstruction	44(88%)	10(83.4%)
Nasal discharge	43(86%)	9(75%)
Post nasal discharge	28(56%)	7(58.3%)
Headache	29(58%)	8(66.6%)
H/o of allergic rhinitis	24(48%)	10(83.4%)
Decrease/loss of smell	22(44%)	4(33.3%)
Facial pain	9(18%)	3(25%)
Nasal bleeding	7(14%)	3(25%)
Impaired vision	2(4%)	1(8.3%)
Polyposis	41(82%)	10(83.4%)
Facial asymmetry	2(4%)	2(16.6%)

5. CT SCAN FINDINGS

TABLE NO-5 showing the CT SCAN finding in CRS & FRS

CT SCAN FINDING	CHRONIC RS n (%)	FUNGAL RS n (%)
U/L INVOLVEMENT OF NOSE & PNS	39(78%)	7(58.4%)
SB/L INVOLVEMENT OF NOSE & PNS	19(38%)	5(41.7%)
DOUBLE DENSITY SIGN	9(18%)	8(66.6%)
DEVIATE NASAL SEPTUM	17(34%)	5(41.7%)
BONY EROSION	4(8%)	3(25%)

6. SURGICAL APPROACH:

TABLE NO-6 showing the type of surgery used in this study

TYPE OF SURGERY	No. Of cases
ANTRAL PUNCTURE WASH	4
SIMPLE POLYPECTOMY WITH PARTIAL FESS	18
CALD WELL LUC OPERATION	14
FUNCTIONAL ENDOSCOPIC SINUS SURGERY	14

DISCUSSION

During the period between March 2010 to September 2011, we studied Fungal rhino-sinusitis in 50 consecutive patient of Chronic rhino-sinusitis undergoing Functional endoscopic sinus surgery, Caldwell Luc operation, Antral Puncture wash and treated post-operatively with oral corticosteroid and topical anti fungal drugs at Ear, Nose and Throat Department of Patna Medical College & Hospital, Patna to find out incidence fungal rhino-sinusitis among the Chronic sinusitis patient.

Incidence: In our study, 24% (12 of 50 cases) of patients with chronic rhino -

sinusitis showed fungal rhinosinusitis. One such study was published by Granvillae et al. and included 47 cases of FRS, which constituted 12% of cases of CRS. Another study by Taxy reported only 60 cases of fungal sinusitis over a period of 35 years. Wise et al. showed that African Americans are more prone to fungal sinusitis than whites.

Age Incidence: As for as the age incidence in cases of fungal rhinosinusitis is concerned, the commonest age group in the present study was 21-30 years (50%), followed immediately by the 31 -40 years age group (25%). The average age recorded was 31.5 years. A. Das and A. Chakrabarti observed that the average age fungal rhinosinusitis presentation was 31 years.

Sex Incidence: In present study out of 12 cases of fungal rhinosinusitis, female were 7 (58.3%) in number while male were 5 (41.7%). Our finding of male female ratio is 1:1.4, similar to male female ratio reported by Scott C Manning. Nicolai et al. also showed a higher prevalence in women. Wise et al. did not report any sex difference in chronic fungal sinusitis.

Religion: In the present series 1 case, out of 12 cases of fugal rhinosinusitis was Muslim which constitutes 8.4 % and 11 cases were Hindus which constituting 91.6%. It is due to in general population too Hindus in outnumber Muslim and other religion**.**

Immunity Status: In present series, all cases were immune-competent. No immune-compromised and diabetic patient encountered in this study**.**

Duration of Complaints: Duration of symptoms in fungal rhinosinusitis patient in present study varied 6 month to 2 years. Maximum duration of 5 years recorded one patient. Our finding of duration of symptoms in fungal rhinosinusitis patient fell into criteria of diagnosis for chronic rhinosinusitis. This is similar to finding in review of world's literature.

Clinical Presentation: This present study clearly shows that outstanding complaints of the fungal rhinosinusitis patient were nasal obstruction (83.3%), purulent nasal discharge (75%), headache (66.6%), post nasal discharge (58.3%), history of allergic rhinitis (83.3%), nasal polyposis (83.3%) and other symptoms like facial pain, nasal bleeding, decrease or loss of smell, impaired vision, facial asymmetry etc. Study carried out by Zakhirullah et al in 2010 shows that nasal obstruction, nasal discharge, symptoms of allergic rhinitis or sinusitis and headache were the main presentation.

CT Scan Finding: In the present study, the main radiological investigation carried out was CT scan. It was helpful in the assessment of extension of disease, bony erosion, calcification in the lesion and condition of septum. In our study out off 12 cases of fungal rhinosinusitis U/L involve of nose and PNS seen in 7 cases which constituted 58.3% and B/L involvement in 5 cases (41.7%). The finding in our study near to study carried out by Zakhirullah et al which shows unilateral involvement in 16 (70%) patients and bilateral in 7 (30%) patients. Bent & Kuhn, Sohail *et al* and Thahim *et al* also reported unilateral predominance in allergic fungal sinusitis.

Surgical Treatment: In present study, the primary aim of the surgical treatment are; eradicate all allergic mucin and fungal debris, provide permanent drainage to the paranasal sinuses, provide adequate ventilation route for paranasal sinuses. This was done by various type of surgery depending upon CT scan finding, includes FESS, Caldwell luc operation, simple polypectomy with partial FESS, antral puncture wash. FESS and simple polypectomy with partial FESS commonly performed in our study. Endoscopic removal of polyp and inflammatory material to establish aeration and drainage of involved sinus as essential first step. Repeated endoscopic surgery obliterates anatomic land marks and increase the risk of complication and that may necessitate open surgery in some patients (de Shazo et al 1997).

Medical Treatment: In our study after surgical removal of polyp and inflammatory material we used oral corticosteroids

followed by intranasal steroids and topical amphotericin B in all cases of AFRS and intra nasal steroids in cases of fungal wall and saw the improvement in subjective and clinical findings. There was no recurrence of disease in our study. Our finding are similar to Ponikau et al, in a group of 51 patients with CRS, including polyposis patients, treated patients with topical amphotericin B as nasal/sinus washing, without placebo or other control treatment. The treatment resulted in 75% subjective improvement and 74% endoscopic improvement.

Post-Operative & Recurrence: In our study there is no mortality. There is morbidity in some patient in the form of dental pain, facial swelling in 3-4 patients and blurring of vision with dilation of pupil in one patient. There is no recurrence in our study**.**

CONCLUSIONS

Having observed all the above factors regarding fungal rhinosinusitis, we came to following conclusion.

1. It should be considered in all patients with intractable sinusitis and a history of atopy or asthma. Early diagnosis of noninvasive sinusitis may prevent multiple surgical procedures and lead to effective treatment also to prevent progression of the disease into the more serious and destructive invasive forms.
2. The results of our study in concordance to results of other studies from warm and humid regions, showed that AFRS is common disorders in patients with CRS.
3. FESS, simple polypectomy and Caldwell Luc operation in this study give satisfactory result.
4. Although the result of oral & intranasal steroid and topical antifungal agent in our study is good, more study needs to be performed.

REFERENCES

- International Rhinosinusitis Advisory Board. Infectious rhinosinusitis in adults: classification, etiology and management. Ear Nose Throat J. 1997;76:5–22.
- Hora JF. Primary aspergillosis of the paranasal sinuses and associated areas. Laryngoscope. 1965;75:768–773.
- Safirstein B. Allergic broncho-pulmonary aspergillosis with obstruction of the upper respiratory tract. Chest. 1976;70:788–790.
- Katzenstein AA, Sole SR, Greenberger PA. Allergic Aspergillus sinusitis: a newly recognized form of sinusitis. J Allergy Clin Immunol. 1983;72:82–93.
- Granvillae L, Chirala M, Cernoch P, Ostrowski M, Truong LD. Fungal sinusitis: Histologic spectrum and correlation with culture. Human Pathol. 2004;35:474–81.
- Allphin AL, Strauss M, Abdul Karim FW. Allergic fungal sinusitis: problems in diagnosis and treatment. Laryngoscope. 1991;101:815–820.
- Chakrabarti A, Das A, Mandal J, et al. The rising trend of invasive zygomycosis in patients with uncontrolled diabetes mellitus. Med Mycol. 2006;44:335–342.
- Chakrabarti A, Sharma SC, Chander J. Epidemiology and pathogenesis of paranasal sinus mycoses. Otolaryngol Head Neck Surg. 1992;107:745–750.
- Zakirullah, Ghareeb Nawaz, Syed Fazle Sattar. Presentation and diagnosis of allergic fungal sinusitis. J Ayub Med Coll Abbottabad. 2010;22(1);53-57.
- Bent JP 3rd, Kuhn FA. Diagnosis of allergic fungal sinusitis. Otolaryngol Head Neck Surg 1994;111:580–8.
- Sohail MA, Al Khabori MJ, Hyder J, Verma A. Allergic fungal sinusitis: Can we predict the recurrence? Otolaryngol Head Neck Surg 2004;131:704–10.
- Thahim K, Jawaid MA, Marfani MS. Presentation and management of allergic fungal sinusitis. J Coll Physicians Surg Pak 2007;17:23–7.
- deShazo RD, O'Brien M, Chapin K, Soto-Aguilar M, Gardner L, Swain R. A new classification and diagnostic criteria for invasive fungal sinusitis. Arch Otolaryngol Head Neck Surg. 1997;123:1181–88.
- Ponikau JU, Sherris DA, Kern EB, et al. The diagnosis and incidence of allergic fungal sinusitis. Mayo Clin Proc. 1999; 74:877–884.
- Ferguson BJ. Definitions of fungal rhinosinusitis. Otolaryngol Clin North Am. 2000;33:227–235.

- Grosjean P, Weber R. Fungus balls of the paranasal sinuses: a review. Eur Arch Otorhinolaryngol. 2007;264:461–470.
- Horst M, Hejjaoni A, Horst V, Michel FB, Bonsquent J. Double-blind, placebo controlled rush immunotherapy with a standardized Alternaria extract. J Allergy Clin Immunol. 1990;85:460–472.
- Marple BF. Allergic fungal rhinosinusitis: current theories and management strategies. Laryngoscope. 2001;111:1006–1019.
- Rao AK, Mathers PH, Ramadan HH. Detection of fungi in the sinus mucosa using polymerase chain reaction. Otolaryngol Head Neck Surg. 2006;134:581–585.
- Kim ST, Choi JH, Jeon HG, Cha HE, Hwang YJ, Chung YS. Comparison between polymerase chain reaction and fungal culture for the detection of fungi in patients with chronic sinusitis and normal controls. Acta Otolaryngol. 2005;125:72–75.

How to cite this article: Gupta SK, Singh R, Gupta A. Incidence of fungal rhinosinusitis in Bihar and its management. International Journal of Research and Review. 2018; 5(11):196-201.

******