

Burden of Fungal Rhinosinusitis in Rhinology unit of Tribhuvan University Teaching Hospital, Kathmandu

Thapa N, Pradhan B

Rhinology unit, Dept. of ENT-Head and Neck surgery, Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu.

Corresponding author: Dr. Narmaya Thapa, Assoc. Professor, Rhinology unit, Dept. of ENT-Head and Neck surgery, Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu.

Emai: naramayat@yahoo.com

Abstract

Introduction: This longitudinal, prospective, descriptive study was carried out to find out frequency and types of fungal rhinosinusitis, clinicopathologic features, its association with systemic disease and outcome of treatment.

Method: Patients who underwent endoscopic sinus surgery and fulfilled any of the following two criteria were included in the study: unilateral sinonasal polyps, CT Scan showing soft tissue density with hyperdense areas, presence of fungal mucin or mud during surgery, histopathological report showing fungal infection. Surgical specimens were sent for KOH preparation, fungal culture and histopathological analysis.

Results: Out of 284 patients of chronic rhinosinusitis, 41(14.44%) patients had fungal rhinosinusitis, allergic fungal rhinosinusitis (40) and acute fulminant invasive fungal rhinosinusitis (1). Age ranged from 14-63 years, 26 males and 15 females. Sixteen patients had unilateral disease. The common symptoms were nasal obstruction (41), decreased smell (24) and sneezing (21). Eight patients had hypertension, bronchial asthma (5), COPD (1), pulmonary tuberculosis (1), diabetes mellitus (2) of which 1 patient had mucormycosis. All the patients had nasal polyps, 1 patient with mucormycosis also had mucopurulent discharge from left middle meatus and diffuse swelling of left periorbital and maxillary area. *Aspergillus fumigatus* was isolated in 1 patient. Histopathological examination reported fungal polyp in 5 and mucormycosis in 1 patient. There is no recurrence till date.

Conclusion: Fungal rhinosinusitis is a common pathological entity. It affects both genders and common in age group of 21-60 years. It presents as bilateral as well as unilateral nasal polyps. Nasal obstruction is the most common symptom followed by decreased smell and sneezing. Seventeen patients had systemic disease. The treatment protocol used was effective.

Key words: fungal rhinosinusitis, endoscopic sinus surgery, Kathmandu.

Introduction

Chronic rhinosinusitis (CRS) is an inflammatory disorder affecting the nose and paranasal sinuses. Although bacteria have long been implicated as pathogens in most forms of CRS, it has been recognized that fungi may be responsible for some forms of CRS. The frequency of fungal sinusitis varies between 9 and 49 % according to different authors. ¹ Depending upon the immune status of the host, fungus-related sinus disease can take several forms such

as allergic, chronic non-invasive (sinus mycetoma), chronic invasive, granulomatous invasive and acute fulminant.^{2,3} According to Challa et al. the characteristic histological features are allergic mucin in allergic, fungal ball in chronic non-invasive, sparse inflammation and numerous hyphae in chronic invasive, non-caseating granulomas with dense fibrosis in granulomatous invasive, and infarction with suppuration in acute fulminant fungal

rhinosinusitis(AFFRS).¹Allergic fungal rhinosinusitis (AFRS) may present with or without polyps. Several fungal organisms may be involved in these pathologies, such as *Aspergillus*, *Scedosporium*, *Alternaria*, *Curvularia*, *Cladosporium*, *Bipolaris* and *Mucor*⁴. Mucormycosis is the invasive form of rhinosinusitis. The current prospective study was carried out to find out frequency and types of fungal rhinosinusitis, clinicopathologic features, its association with systemic disease and outcome of treatment. To the best of our knowledge, this type of study has not been published in our context so far.

Methods

Those patients who were subjected for functional endoscopic sinus surgery (FESS) and fulfilled any of the following criteria were included in the study: (a) Unilateral sinonasal polyposis; (b) CT scan of nose and paranasal sinuses showing soft tissue density with hyperdense areas; (c) Presence of fungal (tenacious) mucin or fungal mud during surgery; (d) Histopathological report showing fungal infection.

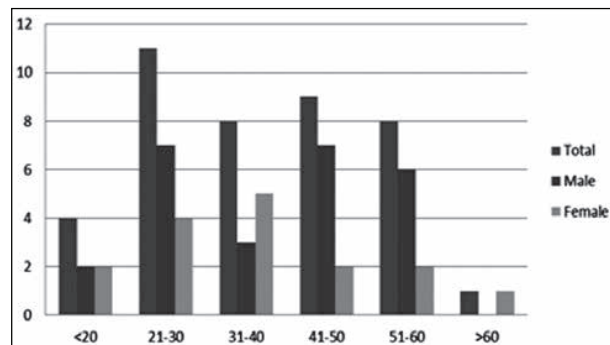
Forty one cases of fungal rhinosinusitis (FRS) who fulfilled the above mentioned criteria and underwent functional endoscopic sinus surgery (FESS) in the Department of Otorhinolaryngology Head and Neck Surgery, Tribhuvan University Teaching Hospital, Kathmandu, Nepal from August 2008 to July 2011 were analyzed. CT Scan was done in all the patients. After admission for surgery detailed history was taken and thorough examination was done. Routine blood and biochemical test were done. Serological test for HIV, HbsAg and VDRL was also done prior to surgery. Surgical specimens were sent for KOH preparation, fungal culture and histopathological analysis. However, due to lack of laboratory facility IgE and specific fungal stains eg. Gomori Methamine Stain could not be done. The clinical features, systemic disease, findings of imaging and peroperative findings were noted. Antibiotic (tablet Cefixime 200 mg.) was given BD for 1 week preoperatively and for 2 weeks post-operatively. It was followed by tablet ciprofloxacin 500 mg BD for 2 more postoperative weeks. Oral steroid (tablet prednisolone 1mg/kg body wt.) was given 1 week preoperatively and was continued postoperatively for 2 weeks in tapering doses. Steroid nasal spray was given for 3 months following oral steroid. Antifungal agent (tablet itraconazole) 200 mg was given for first 2 postoperative days then 100 mg once a day for 6 months. However, patient with mucormycosis received IV antibiotic inj. ceftriaxone and amphotericin B preoperatively. He did not tolerate IV amphotericin B, therefore, tablet fluconazole 150 mg. OD was given in postoperative period for 3 months. Saline irrigation was

advised for 2 postoperative weeks. Patients were followed up in 2, 4, and 8 postoperative weeks then every month.

Results

Out of 284 patients of chronic rhinosinusitis with or without polyps who underwent FESS during above mentioned period, 41(14.44%) patients were diagnosed having fungal rhinosinusitis. Out of 41 patients, 40 patients had allergic fungal rhinosinusitis, and 1 patient had acute fulminant invasive fungal rhinosinusitis. Age of the patients ranged from 14-63 years with mean age of 38.73 ± 13.47 SD years. The most common age group affected by the disease was 21-30 years (Fig.1). Male female ratio was 1.73:1 (26 males and 15 females). Twenty five patients had bilateral disease whereas 16 patients had unilateral disease.

Figure 1 Distribution of Age Group



Duration of the symptoms varied from 2 months to 22 years. The most common symptom was nasal obstruction (25 bilateral and 16 unilateral) followed by decreased smell (24), sneezing (21), nasal discharge (18) and nasal voice (16). Other complaints were facial pain (6), headache (5), epiphora (1), nasal bleeding (1) and swelling of left cheek (1) (Table 1). Eight patients were suffering from hypertension, 5 patients had bronchial asthma, 1 patient was having COPD, 1 patient had pulmonary tuberculosis and had completed antitubercular therapy recently, 2 patients had diabetes mellitus, of which 1 patient had mucormycosis (Table 2). Nine patients had undergone intranasal polyp avulsion (INPA) previously, 1 patient 4 times somewhere else, 1 patient had similar surgery thrice, 1 patient twice and 6 patients once. One patient had bilateral antral wash out. In all the patients serological tests were non-reactive.

On examination, all the patients had nasal polyps, 1 patient with mucormycosis also had mucopurulent discharge from left middle meatus and diffuse swelling of left periorbital and maxillary area.

Table 1 Distribution Symptoms

Symptoms	No. of patients
Nasal obstruction	41
Decreased smell	24
Sneezing,	21
Nasal discharge	18
Nasal voice	16
Facial pain	6
Headache	5
Epiphora	1
Nasal bleeding	1
Swelling of left cheek	1

Table 2 Frequency of Systemic diseases

Systemic disease	No.of patient
Hypertension	8
Asthma	5
Diabetes mellitus	2
COPD	1
Pulmonary tuberculosis	1

Peroperatively there was only polyps in 16 patients, thick viscid secretion with polyps in 11 patients, fungal debris and polyps in 11 patients, fungal debris and oedematous mucosa in 2 patients, and whitish cheesy material with necrotic bone in left maxillary antrum with destruction of anterolateral and medial walls in 1 patient. Fungal culture showed *Aspergillus fumigatus* in 1 patient and no growth in other patients. In 5 patients histopathological examination reported fungal polyp and in another patient it showed mucormycosis. Duration of follow up ranged from 2 months to 4 years. Till date there was no recurrence of the disease.

Discussion:

Fungal rhinosinusitis was once considered a rare disorder but is now reported with increasing frequency throughout the world⁵. The frequency of fungal rhinosinusitis varies between 9 and 49 %.¹ This large difference found in different studies is due to different techniques of sampling (swab, irrigation, aspiration) and identification (histopathology,

culture, PCR)^{6,7,8,9}. Our study revealed it 14.44 % of the patients who were diagnosed having rhinosinusitis with or without polyp and underwent FESS. Allergic fungal rhinosinusitis is the commonest form of fungal rhinosinusitis¹⁰. In our study out of 41 patients, 40 had this kind of disease. Age of the patients varied from 14–63 years which is more or less similar to the study by Piao et al. in China.¹¹ In their study 21 were males and 15 were female patients. In our study, there were 26 male and 15 female patients. The study by Soontrapa et al. included 43 cases of invasive fungal rhinosinusitis and 68 cases of non-invasive fungal rhinosinusitis. There were 44 male and 67 female patients. The mean age at diagnosis was 54.6 years (5 to 86 years). In our study clinical features included nasal obstruction nasal obstruction (25 bilateral and 16 unilateral) followed by decreased smell (24), sneezing (21), nasal discharge (18) and nasal voice (16). Other complaints were facial pain (6), headache (5), epiphora (1), nasal bleeding (1) and swelling of left cheek (1). In the study by Soontrapa et al. the clinical presentations of fungal rhinosinusitis included nasal stuffiness (27.9%), nasal discharge (27.9%), facial pain (27.9%), fever (24.3%) and headache (19.8%). One-fifth of cases had an underlying hematologic malignancy and invasive fungal rhinosinusitis¹². In our study fungal culture was positive only in 1 patient of allergic fungal rhinosinusitis and invasive fungal rhinosinusitis was present in only 1 patient who was having diabetes mellitus. In the study by Soontrapa et al. a total of 70 (63.1%) were attributed to aspergillosis. Cultures from sinonasal tissues were positive for fungus in 37 of 87 cases (42.5%)¹².

Conclusion

Fungal rhinosinusitis is a common pathological entity. It may affect both genders and common in age group of 21–60 years. It may present as bilateral as well as unilateral nasal polyps. The most common symptom was nasal obstruction followed by decreased smell, sneezing (21), nasal discharge (18) and nasal voice (16). Seventeen patients had systemic disease. Till date there is no recurrence of the disease, however, the study will be continued to find out the exact outcome of the treatment.

The limitation of this study is that it was done only in one center with limited number of patients. Diagnosis of fungal rhinosinusitis could be limited due to lack of laboratory facility.

Conflict of interest

The authors declare that there is no conflict of interest associated with the study.

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