

Evaluation of Allergic Fungal Sinusitis Occurrence in Patients with Nasal Polyps

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ABSTRACT

Aim: To evaluate allergic fungal sinusitis occurrence in patients with nasal polyps.

Methods: This was a prospective descriptive study, conducted at ENT Department of Nawaz Sharif Social Security Hospital Multan Road Lahore, from January 2013 to June 2015. A total of 125 patients with nasal polyps were examined and surgery performed followed by histopathology and culture examination of surgical specimens.

Results: Allergic fungal sinusitis (AFS) was found in 28/125 (22.4%) nasal polyp patients. In 28 cases of allergic fungal sinusitis, mean age was 30 years. Majority of patients (67.8%) were in the age range 20 – 40 years. Male to female ratio was 1.4:1. Most (53.5%) of AFS patients belonged to lower social class. Concomitant asthma was noted in 06 (21.4%) patients.

Conclusion: Allergic fungal sinusitis is common aetiology seen among nasal polyp patients. Slightly more than one fifth of cases with nasal polyp (22.4%) had AFS in this study, While treating chronic rhinosinusitis patients, this disease entity must be kept in mind. AFS was seen to effect mainly young adults and middle aged poor people living in hot humid conditions. Aspergillus was the commonest organism responsible for AFS. Results are good if it is diagnosed early and treated properly.

Keywords: Allergic fungal sinusitis (AFS), Nasal polyp, Allergic mucin.

INTRODUCTION

Allergic fungal sinusitis is an allergic reaction of the sinonasal mucosa to aerosolized environmental fungal allergens in an immunocompetent person¹. Safirstein in 1976 described a clinical condition in which there were nasal polypi and crust formation and sinus culture producing aspergillus, having similar histopathological findings to allergic bronchopulmonary aspergillosis (ABPA)². Allergic fungal sinusitis (AFS) was first described by Millar in 1981 as "allergic aspergillosis". A subsequent study was done by Robson and colleagues³ in 1989 and they introduced the term "allergic fungal sinusitis". Allergic fungal sinusitis is associated with nasal polyps in every case.⁴ The overall incidence of allergic fungal sinusitis is estimated at 5% to 10% of all patients with chronic rhinosinusitis and nasal polyps^{1,4,5}. The geographic⁶ and social factors appear to have a significant impact on the incidence and frequency of allergic fungal sinusitis, typically patient is a young adult from warm regions with high humidity^{1,4,7} and belonging to poor social class⁸.

It is a non-invasive disease, representing an allergic hypersensitivity response to the presence of extra mucosal fungi within the sinus cavity.⁹ Patients often have asthma, allergic rhinitis, eosinophilia, and an

elevated total and fungus specific IgE concentration^{5,10}. The involved sinuses contain brown or greenish black material, which has been called allergic mucin, and intact and degenerating eosinophils, Charcot Leyden crystals, cellular debris, and sparse fungal hyphae^{4,5,11}.

The diagnosis of AFS is primarily based on histopathologic findings.⁵ Patients with AFS commonly present with chronic rhinosinusitis with nasal polyps, inhalant atopy/ IgE mediated hypersensitivity, elevated total serum immunoglobulin E (IgE), eosinophilia and sinus obstructing inspissates of a characteristic extramucosal "peanut butter" or "axle grease" eosinophil rich material called allergic mucin^{4,5}. Allergic mucin typically cultures positive for fungi but the diagnosis of AFS is made even if culture is negative^{4,5,12}. Up to 13% of AFS sinus fungal cultures prove to be negative in AFS confirmed on histopathology⁹. Allergic mucin is responsible for characteristic CT scan finding of central area of hyperattenuation in the sinus cavity which is one of the diagnostic criteria for AFS^{2,4}.

Mainstay of treatment of AFS is both medical and surgical debridement of polypi and allergic mucin^{1,7}. External radical approaches were used previously but now used rarely, these days we use tissue preserving endoscopic approach.^{4,5} The use of postoperative oral corticosteroids^{1,2,5} and aggressive antiallergic therapy is also recommended¹³ to decrease recurrence after surgery^{4,7,14}. Other therapeutic options available include allergen

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avoidance measures, oral antihistamines, intranasal corticosteroids, leukotriene receptor antagonists, and allergen immunotherapy^{4,11}. Role of systemic or local antifungal treatment is limited and controversial^{4,5}.

The purpose of this study was to find out frequency and clinical/demographic characteristics of allergic fungal sinusitis in patients with nasal polyps treated surgically in this part of the world.

MATERIAL AND METHODS

This was a prospective, cross-sectional descriptive study, conducted at Nawaz Sharif Social Security Hospital (NSSSH) Lahore from January 2013 to June 2015. NSSSH is a tertiary care and teaching hospital for University College of Medicine, University of Lahore.

The study subjects included 125 patients who presented with nasal polyps at NSSSH during the period under study. Both male and female patients having nasal polyps were included in the study. We excluded those particular patients from the study who had friable nasal mass (bleed to touch) or did not give consent for surgery and histopathology.

These patients were received through casualty, Out-patient department (OPD) and as referral from other departments. A detailed history was taken; thorough examination of ENT and other systems was carried out by using well illuminated head light and nasal speculum followed by fibroptic flexible or rigid endoscope for detailed inspection. Laboratory investigations included complete blood count, blood urea etc. Besides baseline investigations CT scan and MRI of nose and paranasal sinuses were performed to know the exact site and extent of disease. A well informed consent was taken. All the patients underwent nasal polypectomy under general or local anesthesia, mainly by doing endoscopic sinus surgery and in few cases by external ethmoidectomy.

After surgery collected material which included mucus together with inflamed tissue and pieces of polyps was divided into two parts. One part was kept in sterile tube containing normal saline solution for direct microscopic examination. The remaining part of surgical specimen was kept in another bottle containing formalin and both the specimens were sent to pathology department for histopathological and direct microscopic examination. These patients were put on topical and oral steroids therapy postoperatively and they were followed up for one year. The data was collected using a pre-tested, structured proforma prepared for the purpose and SPSS version 17 was used for analysis.

RESULTS

During the study period, we happened to manage 125 patients with nasal polyps, among them, 85 were male and 40 female patients, having mean age of 33 years (range 09 - 82 years). The patients with allergic fungal sinusitis were 28(22.4%) and remaining 97 were found to have some other cause for the nasal polyps. Among 28 cases of allergic fungal sinusitis cases, proved on final histopathology, mean age was 30 years (range 11-48 years). Male to female ratio was 1.4:1(Table 1).

Table 1: Gender among patients with nasal polyps:

Gender	AFS*	%age	Non AFS**	%age
Male	17/28	60.7	68/97	70.1
Female	11/28	39.3	29/97	29.9

*allergic fungal sinusitis

**non-allergic fungal sinusitis

Table 2: Age and gender distribution of patients with allergic fungal sinusitis (n=28).

Age (Years)	Male	Female	Total
10-19	03	02	05
20-29	05	04	09
30-39	06	04	10
40-48	03	01	04
Total	17	11	28

Majority of patients (67.8%) belonged to the group of patients in the age range 20 – 40 years with mean age 30.64±S.D 6.03 years (Table 2).

Table 3: Social history of the patients (n=28).

Status	n	%age
Lower Socioeconomic Class*	15	53.5
Middle Socioeconomic Class**	08	28.6
Upper Socioeconomic Class***	05	17.9
Rural	20	71.4
Urban	08	28.6

Note:

*Patients having income ≤ Rs: 15,000/ month.

**Patients having income Rs: 15,000–45,000/ month.

***Patients having income ≥ Rs: 45,000 / month.

Majority (53.5%) belonged to low socioeconomic class and from rural (71.4%) area. Unilateral nasal polyps were more frequently seen (64.2%) as compared to bilateral nasal polyps (35.8%). There were 6(21.4%) patients with proptosis, and 3(10.7%) cases complained of blurred vision whereas 6(21.4%) patients were found to have concomitant asthma (Table 4).

Table 4: Clinical presentation in allergic fungal sinusitis

Clinical features.	n	%age
Bilateral polyps.	10	35.8
Unilateral polyps.	18	64.2
Nasal obstruction	28	100
Proptosis	06	21.4
Blurred Vision	03	10.7
Asthma	06	21.4

All patients had surgical treatment. Out of 125, 28 (22.4%) patients were reported as non-invasive allergic fungal sinusitis on final histopathology. For patients ultimately diagnosed as allergic fungal sinusitis (AFS), functional endoscopic sinus surgery was the procedure performed in 20/28 (71.4%) cases while in 08(28.6%) cases external frontoethmoidectomy was required (Table: 5).

Table 5: Surgical approaches used in allergic fungal sinusitis (n=28)

Procedures	n	%age
External frontoethmoidectomy	08	28.6
Functional endoscopic sinus surgery.	20	71.4
Total	28	100

Culture of surgical material grew aspergillus in 18(64.3%) cases whereas there was no fungal growth in 10(35.7%) cases. Remaining 97 patients were diagnosed as non-allergic fungal sinusitis / simple inflammatory ethmoidal nasal polyps.

DISCUSSION

Allergic fungal sinusitis has become well known medical condition. The incidence of AFS has been reported in international literature to be approximately 6 - 7% of chronic rhinosinusitis cases treated by surgery.^{2,15} This study was done with the purpose to evaluate this entity in our region as locally, not much work has been done on the subject.

We found AFS in 22.4% of the patients with nasal polyps in this study, this is higher when compared with some of the local studies^{16,17}. Akhtar MR¹⁶ reported 14% frequency whereas Irshad-ul-Haq M¹⁷ reported 11% frequency of AFS among patients with nasal polyps. Another local study by Baloch ZA¹⁸ reported 38% frequency of AFS, which is quite high compared to our results. Internationally Telmesani LM¹⁹, in his study found AFS in 12.1% of nasal polyp patients. These results show that there is great variation in AFS frequency among patients with chronic sinusitis with nasal polyp and it's increasing when compared to previously reported incidence of 7% in international literature^{2,15}. Geographic factors seem to influence the incidence of AFS. Review of

literature reveals that incidence of AFS is higher in warm regions with relatively high humidity^{2,4,20}.

Any gender may be affected; however in this study males were affected more which is like the result of Bashir²¹ who had male: female ratio of 1.4:1 while it is different from Baloch ZA¹⁸, where females were predominant and Karthikeyan²² who had equal sex ratio. AFS may affect any age patient, but in our study most of patients (67.8%) with AFS were in age range of 20 – 39 years which is in agreement with Shrestha's study²³ who had 60% patients belonging to middle age group. It may be that people in middle age are more prone to the risk factors of environment as they have more active life. In this study most of the patients (53.5%) belonged to low socioeconomic class which is comparable to national studies^{21,24}. It seems that socioeconomic status of person may have some association with AFS.

As far as symptomatology is concerned, in this study all the patients with AFS were found to have nasal obstruction (100%) followed by nasal discharge (86%), which are similar to the results of Thahim⁸, where the commonest presenting symptom was nasal obstruction (100%) followed by nasal discharge (90%) and postnasal drip (90%). The disease was unilateral in 64.2% and in 35.8% it was bilateral. While on presentation 6 (21.4%) cases with AFS had proptosis. In this study patients having AFS and concomitantly asthma were 21.4% which is less than study of Telmesani¹⁹ who had 27.5% patients and Shrestha²³ who reported 34% patients with associated asthma.

CT scan showed in majority of patients with AFS, involvement of more than one sinus with areas of attenuation surrounded by an area of hypodensity. Culture of surgical material grew aspergillus in 18 (64.3%) cases with AFS. This was within culture yield range of 60-100% reported in other international studies^{4,17}. It is important to realize that diagnosis of AFS is not established or eliminated on the basis of the results of fungal cultures⁴.

Mainstay of treatment of AFS is surgical mostly endoscopic sinus surgery. We had done endoscopic surgery in 71.4% of the cases. External frontoethmoidectomy was done in 08(28.6%) cases where the disease was extensive, extending into orbit or intracranially.

Oral prednisolone in dose of 0.5 mg/kg body weight was used for 03 months and topical nasal steroids for 6 months. Three monthly follow up was arranged up to a period of 1 year after surgery. Recurrence was reported in 4(14.3%) cases in our study, which is within the range of 10 to 100 % recurrence, reported in literature⁴.

CONCLUSION

Allergic fungal sinusitis is common aetiology seen among nasal polyp patients. Slightly more than one fifth of cases with nasal polyp (22.4%) had AFS in this study. While treating chronic rhinosinusitis patients, this disease entity must be kept in mind. AFS was seen to affect mainly young adults and middle aged poor people living in hot humid conditions. *Aspergillus* was the commonest organism responsible for AFS. Results are good if this disease is diagnosed early and treated properly.

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