

Allergic Fungal Rhinosinusitis: LRH Experience

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Abstract

Objective: To determine the characteristics of allergic fungal rhinosinusitis experienced at a tertiary care hospital.

Material and Methods: This study was conducted at the Department of ENT, Head and Neck surgery, PGMI / LRH Peshawar Pakistan. All the patients fulfilling the inclusion criteria were properly evaluated in terms of detailed history, thorough examination and appropriate investigations. Biopsy was taken and on getting diagnosis necessary surgical intervention was carried out followed by medical therapy. Data was analyzed using SPSS version 17.

Results: A total of twenty five patients enrolled were in age range from 10 – 70 years with mean age of $40.36 \pm S.D 17.26$ years. These patients constitute 15 male and 10 female with male: female ratio of 1.5:1.

Most of the patients (44%) had lower socioeconomic status and mainly they were from rural area (68%) with only 48% were educated. The commonest symptom was nasal blockage (88%). In majority of cases (92%) disease was limited to nose and paranasal sinuses radiologically. Dematiaceous fungi were the commonest isolates (76%).

Conclusion: Allergic Fungal Rhinosinusitis (AFRS) was a common finding in middle age poor people living in humid climate. Nasal discharge was the commonest presentation of this disease. *Aspergillus* sp. was the commonest isolates of AFRS.

Key Words: Rhinosinusitis, Fungal sinusitis, Allergic sinusitis, Allergic mucin.

Introduction

Allergic Fungal Rhinosinusitis (AFRS) was first described in 1981 as “allergic aspergillosis”. A subsequent study in 1983 by Katzenberg, Greenberger and colleagues from Chicago significantly expanded the number of reported cases and confirmed the definitive histopathologic description of this condition.¹ AFRS is an increasingly recognized type of chronic rhinosinusitis (CRS). The overall incidence of AFRS is estimated at 5% to 10% of all patients with CRS.² It is possibly a non-tissue invasive disease, representing an allergic hypersensitivity response to the presence of extra mucosal fungi within the sinus cavity.³ Patients often have asthma, allergic rhinitis, eosinophilia, and an elevated total and fungus – specific IgE concentration.⁴ The involved sinuses contain brown or greenish black material, which has been called allergic mucin, and

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intact and degenerating eosinophils, Charcot – Leyden crystals, cellular debris, and sparse fungal hyphae.⁵ The diagnosis of AFRS is primarily histopathologic. The diagnosis of allergic fungal rhinosinusitis is based on following criteria. 1) Surgically obtained characteristic inspissated allergic mucin must be seen histopathologically or grossly at surgery. 2) The allergic mucin must be positive for fungal hyphae on fungal staining, or properly obtained surgical sinus fungal cultures must be positive in an otherwise characteristic patient. 3) There must be no histopathologic evidence for mucosal fungal invasion, including nonmucosal necrosis, granulomas, or giant cells. 4) Other fungal rhinosinusitis disorders must be excluded. Patients with AFRS commonly present with chronic rhinosinusitis with nasal polyps, inhalant atopy, elevated total serum immunoglobulin E (IgE), and sinus – obstructing inspissates of a characteristic extramucosal “peanut buttery” eosinophil – rich material called allergic mucin.^{6,7} Allergic mucin typically cultures positive for either dematiaceous fungi such as *Bipolaris spicifera* or *Curvularia lunata*, or *Aspergillus* species such as *A. fumigatus*, *flavus* or *Niger*.² However, up to 13% of AFRS sinus fungal cultures return negative despite histopathologic confirmation of AFRS.³ Therapeutic options available to achieve relief from symptoms of allergic rhinosinusitis include avoidance measures, oral antihistamines, intranasal corticosteroids, leukotriene receptor antagonists, and allergen immunotherapy.⁵ The use of postoperative oral corticosteroids and aggressive antiallergic therapy is also recommended.⁸ Systemic antifungal treatment has not been shown to modify the course or severity of AFRS. The use of follow-up measurements of total serum IgE during treatment of AFRS patients can help to monitor disease activity.⁹

The objective of this study is to explore the characteristics of allergic fungal rhinosinusitis occurring in out part of the country.

Material and Methods

This study was conducted at the Department of ENT, Head and Neck surgery, Postgraduate Medical Institute (PGMI) Lady Reading Hospital (LRH) Peshawar Pakistan. This was a prospective descriptive study. The duration of the study was three years from June 2008 to May 2011. Twenty five patients were enrolled in this study. The patients in age range of 10 – 70 years and both gender presented to ENT Department and diagnosed as cases of allergic fungal rhinosinusitis

were included in the study. The patients who had non-allergic fungal rhinosinusitis and those who were not willing for registering in study were excluded from the study. A detailed history was taken; thorough examination of ENT and other systems was carried out. Besides baseline investigations CT scan and MRI of nose and paranasal sinuses were performed to know the exact sites and extent of disease. Biopsy of nasal mass was performed and biopsy specimens were studied by same histopathologist. A well informed consent was taken. All the patients underwent nasal polypectomy under general or local anesthesia. Surgically evacuated materials included mucus together with inflamed tissue and pieces of polyps were kept in sterile tube containing normal saline solution for direct microscopic examination. The remaining parts of surgical specimens were kept in another bottle containing formalin and both the specimens sent to pathology department for histopathological and direct microscopic examination. The specimen mixed with normal saline was examined under direct microscope for the presence of fungal element. The size, morphology and quantity of any fungal element were noted. Tissues sent for histopathological examination were stained with hematoxylin and eosin (H&E) stain for identification of the allergic mucin with hyphae. If each sample is positive for fungal element in direct microscopic examination and histopathological examination, we considered it as a positive mycological criterion. The study was approved by the ethical committee of the institute. These patients were put on topical and oral steroids therapy depending upon the extent of the disease and they were followed for six months. The data was collected on preformed proforma and was analyzed using SPSS version 17.

Table 1: Age and gender distribution of patients with allergic fungal rhinosinusitis (n = 25).

Age (Years)	Male	Female	Total
10 – 19	3	2	5
20 – 29	3	4	7
30 – 39	4	3	7
40 – 49	3	1	4
≥ 50	2	0	2
Total	15	10	25

Table 2: Socio-demographic characteristic of the patients (n = 25).

Characteristic	Frequency	Percentage
Lower Socioeconomic Class*	11	44%
Middle Socioeconomic Class**	08	32%
Upper Socioeconomic Class***	06	24%
Rural	17	68%
Urban	08	32%
Illiterate	13	52%
Educated	12	48%
Allergic rhinitis with associated asthma	14	56%
Allergic rhinitis without associated asthma	11	44%
Patients already used medications for rhinitis	15	60%
Patients used no medications for rhinitis	10	40%

Note: *Patients having income ≤ Rs: 10,000/ month. **Patients having income Rs: 10,000 – 20,000 / month. ***Patients having income ≥ Rs: 20,000 / month.

Table 3: Clinical features of patients in this study (n = 25).

Clinical Features	Frequency	Percentage
Nasal blockage	22	88%
Anterior Nasal discharge	19	76%
Polyps unilateral	18	72%
Headache and facial pain	17	68%
Post-nasal discharge	16	64%
Nasal congestion	14	56%
Asthma	12	48%
Polyp bilateral	11	44%
Sneezing	10	40%
Cough	09	36%
Periorbital Swelling	07	28%
Blurred Vision	05	20%
Proptosis	03	12%

Results

In this study a total of twenty five patients were enrolled. These patients were in age range from 10 – 70 years with mean age of $40.36 \pm S.D 17.26$ years. These patients constitute 15 male and 10 female with male: female ratio of 1.5:1. Majority of male patients (56%) belonged to the group of patients in the age range 20 – 40 years with mean age $30.64 \pm S.D 6.03$

years (Table 1). In this study most of the patients (44%) had lower socioeconomic status and mainly they were from rural area (68%) with only 48% were educated (Table 2). The commonest symptoms of these patients were nasal blockage (88%), nasal discharge (76%) followed nasal polyps in 72% patients (Table 3). CT scans were performed in 16 cases (64%) and MRI was carried out in 11 cases (44%). In majority of cases (92%) disease was limited to nose and paranasal sinuses and only in 32% cases there was intracranial extension radiologically (Table 4).

Dematiaceous fungi were the commonest isolates (76%) in this study.

Discussion

Allergic Fungal Rhinosinusitis (AFRS) is now believed to be an allergic reaction to aerosolized environmental fungi in an immunocompetent host. With heightened awareness and sophisticated laboratory diagnostic techniques, an increased number of reports have been published.¹⁰ A full consensus among rhinologists worldwide concerning diagnostic criteria for AFRS is much awaited. It is believed that the incidence of AFRS appears to be influenced by geographic factors. Literature review reveals that the majority of regions reporting cases of AFRS are sited in temperate regions of relatively high humidity.¹¹ AFRS can affect any gender; however in this study males were dominant which is in agreement with result of Bashir¹² who had male: female ratio of 1.4:1 while it is at variance from

Table 4: Radiological features of allergic fungal rhinosinusitis and types of fungal isolates (n = 25).

Sites Involved by Fungal Infection	Frequency	Percentage
Nasal cavity with paranasal sinuses only	23	92%
Above with orbital extension	17	68%
Above with intracranial extension	08	32%
Dematiaceous fungi	19	76%
Aspergillus sp.	14	56%

result of Karthikeyan¹³ who had equal sex ratio. AFRS has no predilection for specific age, anyhow in this study majority of patients (56%) with allergic fungal rhinosinusitis were in age range of 20 – 40 years which is in accordance to study of Shrestha¹⁴ who had 60% patients belonged to middle age group. The reason may be that people in middle age have more active life that is prone to the risk factors of environment. Socioeconomic status of life may have some association with fungal allergic sinusitis as in this study most of the patients (44%) had low socioeconomic condition which is comparable to national studies.^{7,12} In general, individual symptoms of AFRS include anterior or posterior mucopurulent drainage; nasal obstruction; facial pain, pressure, or fullness but may be milder or less dramatic and variable in presentation. In this study the commonest symptoms of the patients were nasal blockage (88%), nasal discharge (76%) followed by nasal polyps (72%) which are keeping with results of Thahim¹⁵ where the commonest presenting features were nasal obstruction (100%), nasal discharge (90%) and postnasal drip (90%). Similarly Shrestha¹⁴ revealed clinical features of headache and facial pain (82%), nasal blockage (90%), nasal congestion (50%) and nasal discharge (56%). These patients may present with symptom of asthma. In this study patients having allergic fungal rhinosinusitis and concomitantly asthma were 56%. This association is greater than study of Telmesani¹⁶ who reported 27.5% patients having associated asthma and Shrestha¹⁴ had 34% patients with asthma. Meltzer¹⁷ advocated that imaging techniques (CT or magnetic resonance imaging) are useful in confirming a diagnosis in patients with vague symptoms or if symptoms persist despite optimal medical treatment. A sinus CT may also be useful to identify structural abnormalities in the sinuses, bony erosion, or extrasinus involvement. Magnetic resonance imaging, which provides an excellent display of the mucosa rather than of the bony anatomy, may be particularly useful in distinguishing bacterial or viral inflammation

from fungal concretions. In this study CT scans were performed in 64% and MRI was carried out in 44% which were helpful in diagnosing of fungal sinusitis as supported by study of Chakrabarti¹⁸ and Small¹⁹. In this study the commonest fungal isolates were dematiaceous fungi (76%) and aspergillus sp. (56%) which is in agreement with study of Tang²⁰ and Kaur²¹. Likewise in Saravanan²² study the most common culture isolate was *Aspergillus flavus* (n = 26; 81%), followed by *Aspergillus fumigatus* (n = 3; 9%).

Conclusion

AFRS is relatively a new disease entity which needs great deal of interest to explore the gray areas of this clinical condition. AFRS was a common finding in middle age poor people living in humid climate. Nasal discharge was the commonest presentation of this disease. *Aspergillus sp.* was the commonest isolates of AFRS.

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