



Original Article

Prevalence of allergic fungal sinusitis in refractory chronic rhinosinusitis in Saudi Arabia

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Introduction: Allergic fungal sinusitis (AFS) is a common disease in Saudi Arabia. It is considered the most common type of fungal sinusitis in this area. It is highly destructive to the bone of the nose and Para nasal sinuses.

Material and methods: This is a retrospective hospital based study during the period from May 1989 to December 2009. It involved 700 cases of immune competent chronic rhinosinusitis (CRS) who underwent surgery. Specimens were sent for histopathology and mycology and culture for identification of fungi and elastic fungal mucin.

Diagnosis was made by endoscopic findings in outpatient clinics and operating theaters, CT scan + - MRI, histopathology and cultures.

Results: The study included 700 patients presented with symptoms and signs of CRS. Age was between 9 to 50 years old. Ninety one patients from 700 were diagnosed as cases of AFS (13%). Culture was positive in 43%, histopathology results were positive in 57% for fungal hyphae and allergic musin. The most common causative organism was aspergillus spaces (flavus). More than of 50% of cases were associated with asthma.

Conclusion: AFS does exist in Saudi Arabia. It mostly affects young adults, females more than males. The usual presentation is by nasal obstruction, disturbed smell, nasal polyposis. The disease is mainly caused by aspergillus species.

Keywords: Allergic Fungal Sinusitis in Saudi Arabia.

INTRODUCTION

The etiology of AFS in cases of CRS is not clear, some studies discuss role of fungal process as a cause of CRS.⁽¹⁾ In AFS, it is not uncommon to see extension of the disease to the eye and the brain (extradural, Dural irritation).^(2,3)

Diagnosis of AFS is extremely difficult.⁽³⁾ Histopathology and culture to isolate fungal hyphae and to identify the type of fungus together with clinical findings is highly important in diagnosis.⁽³⁾

Katzenstein et al., and Cody et al., reported that incidence of AFS in cases of CRS has been between 6% to 7%.^(10,4) Cody et al., noted that AFS is more commonly found among adolescent and young adult in warm humid climates.^(4,5)

Ferguson et al., reported that the most common regions in U.S.A is in Mississippi, the south east and the south west of U.S.A.⁽¹¹⁾ He reported that eosinophilic mucinous rhinosinusitis (EMRS) is similar to AFS histopathologically except for the absence of hyphae.⁽⁵⁾

Manning et al.,⁽¹²⁾ has reported that 50% of patients with AFS have history with asthma. Cody et al.,⁽⁴⁾ has reported 54% of patients with AFS were asthmatic.

Bent and Kuhn⁽⁹⁾ propose criteria for diagnoses of AFS:

- 1) Nasal polyposis.
- 2) Allergic fungal mucin.
- 3) C T scan characteristic finding.
- 4) Positive fungal histopathology and/or culture.
- 5) Type 1 hypersensitivity (atopy).

Deshazo and Swain presented cases of AFS without atopy, and only two thirds of patients had positive skin test for fungi.⁽⁷⁾

Cody et al.,⁽⁴⁾ has diagnosed AFS by:

1. Allergic musin containing hyphae with no evidence of tissue invasion.
2. Positive culture for fungi.

Ponikau has suggested for diagnosis of AFS:

1. CRS.
2. Mucin contains hyphae.
3. Atopy with or without polyyps.
4. Characteristic C T scan.⁽¹⁾

PATIENTS AND METHODS

Our study was a retrospective study from 1989 to 2009. We found that 13% of the 700 cases CRS requiring surgery were cases of AFS. We found that atopy is characteristic in AFS (60%).

Our diagnoses of AFS had depended on:

- 1) Nasal polyposis.
- 2) Characteristic C T scan.
- 3) Positive histopathology or culture.
- 4) CRS.
- 5) Allergic fungal mucin.

All patients came with nasal obstruction, nasal discharge, disturbed smell, some patients came with headache, proposes. Data was collected according to clinical finding in our patient's clinics, pre-operative CT, operative findings and specimen's results. Patients were considered positive according to the presence of fungal elements, allergic mucin and or positive culture.

Symptoms grading was done. Sum of values of nasal polyposis, nasal discharge and elastic mucin (100%), nasal mud, eye dysfunctions , bad smell, disturbed smell 75%, CT findings were evaluated in (Table 1).

Table 1 (CT Grading)

0	No obacity
2	Uni lateral pathology
3	Bilateral pathology

Inclusion criteria were age 9 and above, Nasal polyposis, and CT characteristic finding. Exclusion criteria were Immunocompromised and immunosu presed patients. Chronic debilitated diseases, long term oral steroids, cytotoxic drugs.

RESULTS

On the base of Bent and Kuhn criteria,⁽⁹⁾ 91cases of 700 CRS were diagnosed as having AFS according to histopathology and culture and clinical finding.

Mycology and histopatology results are described in (Table 2), and sites of involvement in (Table 3). The most common fungal culture was *Aspergilla's flatus* then *Niger* and *fumigates*, fungal hyphae and allergic mucin found 56%histopathologecaly, *aspergillus* species found in 43% according to culture.

Table 2 (Lab results)

Laboratory investigation results		
	+ve	_ve
Mycology	43%	57%
Histopathology	57%	43%

Table 3 (Affected sites)

	Percentage	Number of patients
Nasal cavity and ethmoids	100%	91
Nasal cavity, ethmoid and maxillary	83%	71
Nasal cavity Ethmoids, sphenoids	45%	45
Nasal cavity, ethmoids, frontal and maxillary sinuses	38%	37

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Bilateral pathology was more than unilateral (55%), Extension to the eye, destruction of lamina paper aecia found in 60%. Nasal polyposis and elastic mucin found in 100%. Neurological extension, extra dural was found in only 15%.

The most common affected age group was between 20 and 40. The symptom and sign were mainly nasal obstruction, nasal discharge, disturbed smell.

DISCUSSION

In general, fungal diseases of the nose and para nasal sinuses represented a big challenge for management and diagnoses in the last 30 years. We should differentiate between AFS and other types. Extensive surgical debridement, removal of all fungal mucin and fungal mud and nasal polyps together with building of wide para nasal sinuses ostia and wide middle meatus is highly effective in decreasing rate of recurrence. Post-operative regular follow up in the clinics, if possible every week in the first one month then every month for one year to do good suction and saline irrigation and to remove all debris and crust. It is very important to detect any polyps or polypoidal nasal mucosa, oral and topical steroids is highly effective in decrease recurrence of the disease.⁽¹⁻⁶⁾

We found that system of staging presented in (Table 4) according to Kupferberg 1997 is very helpful.⁽⁸⁾

Table 4 (Staging system)

Stage	
0	No mucosal edema and fungal mucin.
1	Mucosal edema with or without mucin.
2	Polypoidal mucosa.
3	Nasal polyps and debris.

Preoperative preparation is highly important in the form of: doing good surgery, oral steroids, prednisone low dose for three weeks, it decrease the size and number of polyps and edema.

AFS is now believed to be an allergic reaction to fungi in immunocompetent patients. In our study, the prevalence of AFS in 700 CRS patients was 13%. We strongly believe that AFS does exist in Saudi Arabia. In diagnosis, we should consider clinical and radiological data together with histopathology and culture. Allergic mucin remains the most reliable indicator of AFS (100%). *Aspergillus* species was the most common in our study, however report from Asia and other middle eastern countries. Some authors reported that *Aspergillus* species were 96%. Others reported 12 patients AFS in

which only 4 patients has allergic mucin in histopathology.^(3,4,9)

CONCLUSION

- 1) The prevalence of AFS in refractory CRS was 13%.
- 2) The most common fungus was *Aspergillus flavus*.
- 3) AFS cases were associated with asthma in 60%.
- 4) Handling of specimens and direct sent to lab is highly important to get correct diagnosis.
- 5) Regular follow up post-operative with good debridement is highly important.
- 6) Topical and oral steroids post-operative is important to decrease recurrence.
- 7) AFS is more in female and young age.

Significance: I want to thank all staff in our center, especially in OR and filing room and in the lab for their strong supports.

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