ORIGINAL RESEARCH

Assessment of ophthalmic manifestations of patients with allergic fungal sinusitis

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ABSTRACT
Background: Sinusitis is a prevalent condition that impacts roughly 20% of individuals at various points in their lives. The present study was conducted to assess ophthalmic manifestations of patients with allergic fungal sinusitis (AFS). **Materials & Methods:** 54 cases of allergic fungal sinusitis (AFS) of both genders were selected. Patients were divided into 2 groups. Group I were patients with ophthalmic manifestations and group II were Patients without ophthalmic manifestations. Parameters such as clinical manifestation, immune condition, sinus involvement, ophthalmic findings, treatment approach, and outcome were recorded. **Results:** Out of 54 patients, 30 were males and 24 were females. In group I (20) and group II (34), history of asthma was seen in 10 and 18, history of allergy in 11 and 15, nasal polyposis in 20 and 34, positive fungal stain in biopsy specimen in 8 and 21, high total IgE in 17 and 28 and peripheral eosinophilia in 18 and 31 patients respectively. The difference was significant (P< 0.05). CT findings were unilateral sinus disease in 8 and 15, bilateral sinus disease in 12 and 19, multiple sinuses affected in 15 and 32, sinus wall expansion in 18 and 30, heterogeneous opacity in 17 and 31, lamina papyracea erosion in 9 and 14, intraorbital extension in 4 and 0, intracranial extension in 2 and 0 in group I and group II respectively. The difference was significant (P< 0.05). **Conclusion:** To diagnose AFS, one must be highly suspicious of it; thus, it should be part of the differential diagnosis for patients suffering from proptosis and sinusitis.As ophthalmologists may be the first to meet these patients, it is essential for them to be familiar with AFS presentations and complications.

Keywords: Fungal, aspergillosis, Sinusitis

INTRODUCTION
Sinusitis is a prevalent condition that impacts roughly 20% of individuals at various points in their lives. Fungal sinusitis, a rare type of sinusitis, has seen an increase in reported cases over the past 30 years. Fungal sinusitis is divided into two categories: 1) invasive forms, which can be granulomatous, acute fulminant, or chronic invasive, and 2) noninvasive forms, which include allergic fungal sinusitis (AFS) and a localized type known as mycetoma. The histologic detection of mucosal invasion determines the invasiveness.[1]

In immunocompetent patients, allergic fungal sinusitis represents a chronic noninvasive autoimmune reaction to a fungal element.[2] It occurs in individuals with high levels of atopy who have sinusitis and nasal polyposis. Serological tests often reveal increased levels of IgE and IgG, which are commonly linked to eosinophilia. It constitutes roughly 7% of patients with sinus disease who need surgery. The complete understanding of AFS pathophysiology is lacking.[3] The assumption is that these fungi settle in the sinuses and multiply under the anaerobic conditions caused by mucous blockage and ostiomeatal complex obstruction. These patients exhibit an allergic response to the fungal components, resulting in the buildup of eosinophil-rich allergic thick mucin that contains sparse fungal elements.[4]

Type I and type III hypersensitivity reactions to fungal antigens significantly contribute to AFS. This

mechanism was considered to resemble that of allergic bronchopulmonary aspergillosis. Subsequent reports of similar cases involving Dematiaceous molds indicated that they represent a separate entity; as a result, the name was altered to AFS.[5] Ophthalmic manifestations may occur in approximately 17% of patients with AFS. Earlier AFS case series identified that ophthalmic symptoms and signs can manifest to differing extents; the most frequent symptoms include proptosis, diplopia, blepharoptosis, epiphora, visual loss, and ophthalmoplegia, all of which can complicate AFS. In most instances, the selected management options were surgery and oral steroids, followed by an intranasal steroid spray.[6]The present study was conducted to assess ophthalmic manifestations of patients with allergic fungal sinusitis (AFS).

MATERIALS & METHODS

The study was carried out on 54 cases of allergic fungal sinusitis (AFS) of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. A thorough clinical examination was carried out by eye & ENT surgeon. Patients were divided into 2 groups. Group I were patients with ophthalmic manifestations and group II were Patients without ophthalmic manifestations. Parameters such as clinical manifestation, immune condition, sinus involvement, ophthalmic findings, treatment approach, and outcome were recorded. All patients were subjected to CT scan. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 54		
Gender	**Male**	**Female**
Number	30	24

Table I shows that out of 54 patients, 30 were males and 24 were females.

Table II Assessment of parameters

Parameters	Group I (20)	Group II (34)	P value
History of asthma	10	18	0.05
History of allergy	11	15	0.92
Nasal polyposis	20	34	0.05
Positive fungal stain in biopsy specimen	8	21	0.01
High total IgE	17	28	0.03
Peripheral eosinophilia	18	31	0.04

Table II, graph I shows that in group I (20) and group II (34), history of asthma was seen in 10 and 18, history of allergy in 11 and 15, nasal polyposis in 20 and 34, positive fungal stain in biopsy specimen in 8 and 21, high total IgE in 17 and 28 and peripheral eosinophilia in 18 and 31patients respectively. The difference was significant (P< 0.05).

Graph I Assessment of parameters

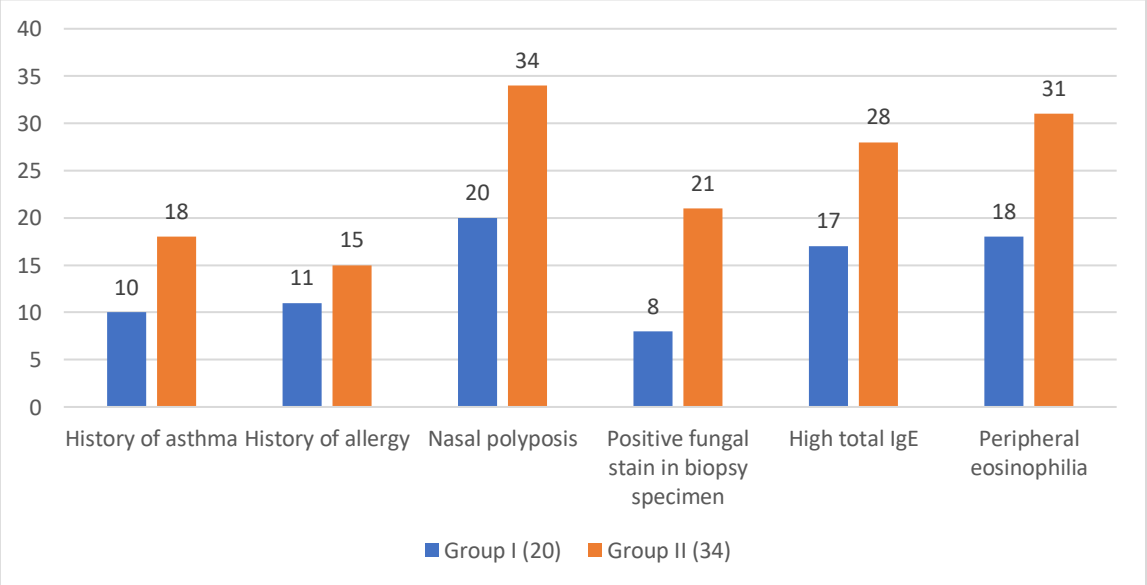

Table III Assessment of CT findings

CT findings	Group I	Group II	P value
Unilateral sinus disease	8	15	0.04
Bilateral sinus disease	12	19	0.21
Multiple sinuses affected	15	32	0.01
Sinus wall expansion	18	30	0.02
Heterogeneous opacity	17	31	0.02
Lamina papyracea erosion	9	14	0.05
Intraorbital extension	4	0	0.03
Intracranial extension	2	0	0.18

Table III shows that CT findings were unilateral sinus disease in 8 and 15, bilateral sinus disease in 12 and 19, multiple sinuses affected in 15 and 32, sinus wall expansion in 18 and 30, heterogeneous opacity in 17 and 31, lamina papyracea erosion in 9 and 14, intraorbital extension in 4 and 0, intracranial extension in 2 and 0 in group I and group II respectively. The difference was significant (P< 0.05).

DISCUSSION

A form of colonization of the paranasal sinuses due to different saprophytic fungi is known as allergic fungal sinusitis.[7] This is a chronic, non-invasive type of sinusitis that is often observed in young, atopic patients with a competent immune system.[8] Nasal polyposis is present in most patients and constitutes about 7% of those with sinus disease that necessitates surgery.[9,10] The illness is marked by the development of allergic mucin that contains a large number of eosinophils and Charcot-Leyden crystals. It occurs more frequently in warm and humid climates.[11,12]The present study was conducted to assess ophthalmic manifestations of patients with allergic fungal sinusitis (AFS).

We found that out of 54 patients, 30 were males and 24 were females. Daghistani et al[13] in their study all presented with proptosis, signs and symptoms of allergic rhinitis and radiological evidence of expansile masses with calcification and bony erosions involving multiple sinuses. Greenish cheesy material was seen at surgery. Histologically the lesions contained eosinophils, Charcot-Lyden crystals and fungal septate hyphae. Aspergillus fumigatus was grown from all cases. Surgical removal with drainage and aeration were performed. The follow-up period ranged between three to 18 months. Recurrence occurred in one patient. Allergic aspergillus sinusitis can mimic malignant disease and should be considered in the differential diagnosis of lesions involving multiple sinuses. It should also be considered in all cases of proptosis.

We found that in group I (20) and group II (34), history of asthma was seen in 10 and 18, history of allergy in 11 and 15, nasal polyposis in 20 and 34, positive fungal stain in biopsy specimen in 8 and 21, high total IgE in 17 and 28 and peripheral eosinophilia in 18 and 31 patients respectively. Marfani MS et al[14] found that allergic fungal rhinosinusitis usually occurred in the second decade of life (51.06 per cent) in males (70.21 per cent), allergic rhinitis (100 per cent) and nasal polyposis (100 per cent). Nasal obstruction (100 percent), nasal discharge (89.36 per cent), postnasal drip (89.36 per cent), and unilateral nasal and paranasal sinus involvement (59.57 per cent) were significant features. Aspergillus (59.57 per cent) was the most common aetiological agent. Combined orbital and skull base erosion was seen in 30.04 per cent of cases, with male preponderance 6.8:1. Endoscopic sinus surgery was performed in all cases, and recurrent or residual disease was observed in 19.14 per cent.

We found that CT findings were unilateral sinus disease in 8 and 15, bilateral sinus diseasein 12 and 19, multiple sinuses affected in 15 and 32, sinus wall expansion in 18 and 30, heterogeneous opacity in 17 and 31, lamina papyracea erosion in 9 and 14, intraorbital extension in 4 and 0, intracranial extension in 2 and 0 in group I and group II respectively. Al-Swiahb JN et al[15]reported the allergic fungal sinusitis (AFS) in children. Hospital charts of 45 children reviewed retrospectively. Clinical presentation, radiological and operative findings, management and outcomes studied. Twenty-five patients had at least 4 criteria for AFS. All patients underwent functional endoscopic sinus surgery (FESS) with high recurrence rate, 44%. Twenty-eight percent needed revision surgery even with medical treatment post operatively. Moreover, no other complications were reported in this study. Aspergillus spp. is the most common fungal type in our review.Allergic fungal sinusitis in children is underestimated and understudied associated with poor outcome and high recurrence rate because of difficulty in management. Therefore, the most effective approach of AFS management in children is to have a high index of suspicion, adequate preoperative evaluation, medical preparation preoperatively, meticulous surgery, medical management, postoperative including topical and systemic corticosteroids and close clinical follow-up with endoscopically guided debridement.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that to diagnose AFS, one must be highly suspicious of it; thus, it should be part of the

differential diagnosis for patients suffering from proptosis and sinusitis.As ophthalmologists may be the first to meet these patients, it is essential for them to be familiar with AFS presentations and complications.

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