ORIGINAL ARTICLE

Frequency of Allergic Fungal Rhinosinusitis in Patients of Sinonasal Polyposis

[1]MUHAMMAD RIAZ, [2]MIRZA MUHAMMAD SARWAR, [3]WAQAS JAVAID, [4]SALEHA SAFDAR, [5]MARYAM FATIMA, [6]SHAMA JAFFERY

[1,2]Associate Professor, [3]Assistant Professor, [4,5,6]PGR/MO, Department of ENT, Fatima Jinnah Medical University/ Sir Ganga Ram Hospital, Lahore.

***Corresponding author:** Dr Muhammad Riaz, Associate Professor ENT FJMU/SGHR, Lahore.*
Contact No. 0334 4005157, Email: muhammadriazmd@gmail.com

ABSTRACT

Background: Chronic Rhinosinusitis (CRS) is a prevalent disease in Pakistan and allergic fungal rhinosinusitis (AFRS) represents a significant proportion of it. It is an allergic response to fungal elements within the facial sinuses and in the nasal cavity. This study was carried out to determine the frequency of AFRS, in patients of CRS with ethmoidal polyps.

Patients and Methods: This cross-sectional study was carried out at ENT Department SGR Hospital, Lahore. The duration was one year (January 01 to Dec. 31, 2016). One hundred and twenty five cases were enrolled in this study. Laboratory investigations included eosinophilic count and total IgE levels. Orbital and Intracranial involvement was ruled out by CT scan. Endoscopically excised polyps and mucin collected from sinuses were sent to the pathologist for histopathology, microscopy and culture.

Results: The mean age of the patients was 30 years. There were 67 (53.6%) males and 58 (46.4%) females in the study. In 70 (56%) patient's microscopy was positive.

Conclusion: A significant proportion of patients of CRS with polyps also have AFRS.

Keywords: allergic, fungal rhinosinusitis, sinonasal polyposis.

INTRODUCTION

Chronic Rhinosinusitis (CRS) affects more than 14% of adults and children population. The overall incidence of Allergic Fungal Rhinosinusitis (AFRS) is more than 8% of the patients having CRS and undergoing sinonasal surgery.[1-3] AFRS is a noninvasive disease of sinuses and is an allergic response to fungi present inside the facial sinuses.[4] It was observed in a study in 1976 that this response had a similarity to the findings in allergic bronchopulmonary aspergillosis.[5,6] The finding of fungi in mucin is key to diagnose AFRS. This leads to the suspicion to categorize AFRS with Eosinophilic Fungal Rhinosinusitis (EFRS) and Eosinophilic Mucin Rhinusinusitis (EMRS) which are also characterized with mucin and eosinophilia.[7]

There are many varieties of Fungal Rhinosinusitis (FRS) and most commonly adopted system classifies the FRS into two sub groups which are invasive and noninvasive.[8] AFRS is one of the noninvasive FRS and is due to type-1 allergic response to fungi in atopic individuals.[9] Patients may have nasal blockade, headache, facial pain or facial deformity. Allergic rhinitis is often found in this group of patients and about half of the patients also develop asthma. The younger groups having advanced disease may present with proptosis, telecanthus and facial dysmorphia.

Medical as well as surgical management is necessary.[10,11] The removal of polyps and mucin by Functional Endoscopic Sinus Surgery(FESS). is treatment of choice for AFRS.[12,13] Proper follow-up and medical treatment after surgery is essential to control the disease so that the mucosa starts functioning normally.[14] AFRS may recur even after aggressive medical management and surgery. Extensive research remains the need of time in this area which willa be helpful to improve the treatment. Postoperative endoscopic suction and clearance and examination should be done regularly. CT scan 6 weeks after surgery is recommended and then as and when required. Subcutaneus immunotherapy can be tried but it is effective in only a few cases.[14,15] The aim of this study was to find out the frequency of AFRS in local population. Thus, knowing the total magnitude of this condition, early diagnosis and management would be possible.

PATIENTS AND METHODS

This cross-sectional study was carried out at ENT Department Sir Ganga Ram Hospital, Lahore from 01-01-2016 to 31-12-2016. One hundred twenty five cases between the ages of 13 to 70 years from both genders undergoing surgery for nasal polyps were included through non-probability consecutive sampling. All consecutive patients fulfilling the inclusion criteria were included in the study. Patients with diabetes mellitus, positive history of organ transplantation, HIV/AIDS, those on steroids or other immunosuppressive drugs were excluded. Demographic details and symptoms as well as aspirin sensitivity, asthma and previous sinus surgery was noted. Specific laboratory investigations comprised eosinophilic count and total IgE levels. All patients underwent CT scan to exclude orbital and intracranial involvement. Functional Endoscopic Sinus Surgery (FESS) was done and endoscopically excised polyps and mucin collected from sinuses were sent to the pathologist for histopathology, microscopy and culture. The culture material was sent to pathology laboratory in normal saline in culture tubes. Prednisolone 1mg/kg body weight was given orally to patients having ethmoidal polyps, for one week before and for two weeks after surgery. The patients were followed up for six months after surgery. First visit was one month after surgery, second visit after three months and third visit six months after surgery. On each visit, the patient's nasal examination was done endoscopically to see any recurrence of polyps. Calculations of 125 cases were done with a confidence level of 95% and a margin of error of 5% expecting allergic fungal rhinosinusitis as 8.6% of all patients with chronic rhinosinusitis who undergo sinus surgery. All the information collected was entered in SPSS version 16 and analyzed. Mean and standard deviations were calculated for numerical data like age, duration and size of polyp. AFRS microscopy results and culture test were presented as frequency and percentage. Data was stratified for the age and gender. Chi square was applied and significant p-value was taken as less than 0.05.

RESULTS

The age of the patients was between 13 and 70 years with a mean age of 30±10 years. Tables 1 and 2 show the results of microscopy and culture in both genders. There were 67 (53.6%) males and 58 (46.4%) females. In 70 (56%) patients culture test was positive and 55 (44%) had culture test negative. There was remarkable association among allergic fungal rhinosinositis and culture test and microscopy in both genders and the age groups (13-40 years and 41-70 years), p-values<0.005. Significant IgE levels (more than 200 IU/ml) were found in 52% of the patients and peripheral eosinophilia in 48% of patients studied. The most common fungal infection was Aspergillosis, which was reported sensitive to itraconazole on culture and sensitivity test. But as the allergic fungal polyposis responds very well to corticosteroids, prednisolone 1mg/kg body weight was given to all patients for one month in a tapering regime. The nasal polyps were removed by endoscopic sinus surgery. One patient had CSF leakage and another had orbital cellulitis postoperatively. Both were managed. In this study of 125 patients with polyposis 70 (56%) had AFRS.

Table 1: Fungal rhinosinusitis and microscopy stratified for gender

Gender	Microscopy	Allergic Fungal Rhinosinositis		p-value
		Yes	No	
Male	Positive	43	0	<0.005
	Negative	0	24	
Female	Positive	27	0	<0.005
	Negative	0	31	

Table 2: Fungal rhinosinusitis and culture test stratified for gender

Gender	Culture test	Allergic Fungal Rhinosinositis		p-value
		Yes	No	
Male	Positive	43	0	<0.005
	Negative	0	24	
Female	Positive	27	0	<0.005
	Negative	0	31	

DISCUSSION

Clinically, fungal rinosinusitis (FRS) can present as acute and chronic forms. In the acute form FRS is rare and occurs mainly in the form of non-invasive disease almost in 90% of cases. Granville and colleagues reported more than 70% AFRS as noninvasive disease in Houstin.[16] Taxy reported non-invasive disease in over 80% of FRS patients in the Chicago area.[17] Overall it is concluded that non-invasive FRS type is predominate in the United States population. In another study from India, Das and associates have reported 56% AFRS.[18] The divergent Geographical distribution may be due to difference in climates and environmental factors, as well as different ways of fungal exposure.

The age of the patient at the time of presentation is also a variable element. Study performed by Irshad-ul-Haq et al.[19] showed that mean age of the patients was 31.56 ± 6.18 years ranging from 10 - 50 years. The mean age of the patients reported by Irshad-ul-Haq et al.[19] was higher than by Mian MY, et al.[20] which was 24 years. In study by Zakirullah, et al.[21] large number of patients were young with a mean age of 20 years at the time of presentation and 83% were in 2nd and 3rd decade of life which is also comparable to that study by Irshad-ul-Haq et al study i.e. approximately 72.7% patients were in 2nd and 3rd decade of life. In our present study the age of the patients at presentation was between 13 and 70 years with a mean age of 30±10 years which is comparable to the results of study by Irshad-ul-Haq et al but it differs from the study by Zakirullah, et al.[21] which showed mean age of 20 years at presentation. Perhaps different criteria for selection of patients could be responsible for this difference.

Regarding the gender distribution, Mian MY, et al, reported male preponderance with ratio of 3:1 and our present study has also shown a male dominance where 53.6% patients were male and 46.4% were females.

Morpeth et al.[22] in their review on AFRS literature noted elevated total IgE in44% of patients and peripheral eosinophilia in 40% which is comparable with our immunological study results i.e. elevated total IgE level in 52% of patients and peripheral eosinophilia in 48%. While the surgical treatment of AFRS is by endoscopic sinus surgery almost everywhere, the medical management varies in different setups depending upon the choice of medicines and their routes of administration, the corticosteroids being the mainstay of medical treatment.

CONCLUSION

In this study 56% of patients of fungal rhino-sinusitis (FRS) with polyps also had AFRS. Therefore, it is suggested that possibility of allergic fungal rhino-sinusitis should also be considered while managing patients of nasal polyps and tests for screening and diagnosing AFRS like culture, microscopy, IgE levels and peripheral eosinophilia should also be done in all cases of FRS with polyps.

REFERENCES

1. Suresh S, Arumugam D, Zacharias G, Palaninathan S, Vishwanathan R, Venkatraman V. Prevalence and clinical profile of fungal rhinosinusitis. Allergy Rhinol 2016;7(2): e115.
2. Collins MM, Nair SB, Wormald P-J. Prevalence of noninvasive fungal sinusitis in South Australia. Am J Rhinol 2003;17(3):127-32.
3. Irshad-ul-Haq M, Farooq M, Qadri SH. Prevalence of allergic fungal sinusitis among patients with nasal polyps. JSZMC 2014; 5(4): 690-2.
4. Kumar N, Berry V. Allergic fungal sinusitis. JK Sci 2008;10(1):2-8.
5. Panjabi C, Shah A. Allergic Aspergillus sinusitis and its association with allergic bronchopulmonary aspergillosis. Asia Pacific Allergy 2011;1(3):130-7.
6. Cardoso ICE, de Mattos Oliveira F, Bittencourt C, Irion L, Severo LC. Aspergillosis of the nose and paranasal sinuses: a review of 54 cases. Rev Patol Trop 2015;44(1):13-9.
7. Uri N, Ronen O, Marshak T, Parpara O, Nashashibi M, Gruber M. Allergic fungal sinusitis and eosinophilic mucin rhinosinusitis: diagnostic criteria. J Laryngol Otol 2013;127(09):867-71
8. Rupa V, Thomas M. Different types of fungal sinusitis occurring concurrently: implications for therapy. Eur Arch Otorhinolaryngol 2013;270(2):603-8.
9. Dutre T, Al Dousary S, Zhang N, Bachert C. Allergic fungal rhinosinusitis (AFRS)-more than a fungal disease? Clin Transl Allergy 2013; 3(Suppl 2): P15.

10. Marple BF. Allergic fungal rhinosinusitis: current theories and management strategies. Laryngoscope 2001;111(6):1006-19.
11. Fokkens WJ, Lund VJ, Mullol J, Bachert C, Alobid I, Baroody F, et al. EPOS 2012: European position paper on rhinosinusitis and nasal polyps 2012. A summary for otorhinolaryngologists. Rhinology. 2012;50(1): 1-12.
12. Gan EC, Thamboo A, Rudmik L, Hwang PH, Ferguson BJ, Javer AR, editors. Medical management of allergic fungal rhinosinusitis following endoscopic sinus surgery: an evidence-based review and recommendations. International forum of allergy & rhinology; 2014: Wiley Online Library.
13. Loftus PA, Wise SK. Allergic fungal rhinosinusitis: the latest in diagnosis and management. Rhinosinusitis with Nasal Polyposis. 79: Karger Publishers; 2016. p. 13-20.
14. Greenhaw B, Arnold J, Wright L. Fungal immunotherapy in patients with allergic fungal sinusitis. Ann Allergy Asthma Immunol. 2011;107(5):432-6.
15. Schubert MS. Medical treatment of allergic fungal sinusitis. Ann Allergy Asthma Immunol 2000;85(2):90-8.
16. Granville L, Chirala M, Cernoch P, Ostrowski M, Truong LD. Fungal sinusitis: histologic spectrum and correlation with culture. Human Pathol 2004;35(4):474-8
17. Taxy JB. Paranasal fungal sinusitis: contributions of histopathology to diagnosis: a report of 60 cases and literature review. Am J Surg Pathol 2006;30(6):713-20.
18. Das A, Bal A, Chakrabarti A, Panda N, Joshi K. Spectrum of fungal rhinosinusitis; histopathologist's perspective. Histopathology 2009;54(7):854-9.
19. Irshad-ul-Haq M, Farooq M, Qadri SH. Prevalence of allergic fungal sinusitis among patients with nasal polyps. JSZMC 2014;5(4):690-2.
20. Mian M, Kamal S, Senthilkumaran G, Abdullah A, Pirani M. Allergic fungal rhinosinusitis: current status. Pak J Otolaryngol 2002;18(3):36-40.
21. Zakirullah NG, Sattar SF. Presentation and diagnosis of allergic fungal sinusitis. J Ayub Med Coll Abbottabad 2010;22(1):53-7.
22. Morpeth JF, Bent JP, Kuhn FA, Rupp NT, Dolen WK. Fungal sinusitis: an update. Ann Allergy Asthma Immunol 1996;76(2):128-40.