



ORIGINAL RESEARCH PAPER

ENT

INCIDENCE AND PRESENTATION OF FUNGAL SINUSITIS IN PATIENTS DIAGNOSED WITH SINONASAL POLYPOSIS

KEY WORDS: Fungal Sinusitis, Sinonasal polyposis, Allergic fungal sinusitis

Dr. S.P. Rao

Dr. R.K. Kalpana

Dr. S. Vaishali

ABSTRACT

This study calculated the incidence of fungal sinusitis in sinonasal polyposis in more than 15 year old patients of either sex by clinical, microbiological and histopathological methods. Endoscopic study of nasal polyps was also done. Out of 60 cases, 19 were diagnosed as allergic fungal sinusitis, 2 as fungal ball, 34 as ethmoidal polyps, 2 each as inverted papilloma and carcinoma maxillary sinus and 1 as angiofibroma. Incidence of fungal sinusitis in sinonasal polyposis was 63%. Most of the polyps were grade 2. We conclude that the incidence of fungal sinusitis in sinonasal polyps is on the rise in this era of antibiotics and diagnostic facilities. So there is need to improve the awareness of the society in this field for the early diagnosis and better care of the patients.

Introduction

Nasal polyposis, which is regarded as a chronic inflammation is in strict sense not a nasal but a sinonasal disease. Etiology in large majority of cases is unknown and the pathogenesis poorly understood. The reported prevalence of nasal polyposis seems to vary between 0.2 and 4.3 percent of the population. Many theories and hypothesis concerning its pathogenesis have been proposed. But fungal infection in nasal polyposis is still a challenge for otolaryngologist.

The relationship between nasal polyposis and chronic rhinosinusitis is much debated but in its broadest sense nasal polyposis should probably be regarded as one form of chronic inflammation in the nose and sinuses, i.e. part of the spectrum of chronic rhinosinusitis.

Incidence of fungal rhinosinusitis has been increasing due to technical advances in mycology, serology, histopathology, and radiology, fungal overgrowth as a result of alteration in the normal bacterial flora by the increasing use of broad spectrum antibiotics and topical nasal preparations. Increasing frequency of invasive mycotic infections is due to growing number of immunosuppressed individuals like patients of diabetes mellitus, defective immune response following radiation or chemotherapy and acquired immunodeficiencies in those taking immunosuppressive drugs after organ transplantation and long term users of steroids.

Despite the availability of medical and surgical treatments, the recurrence rate is extremely high, and patients require years of follow-up. We have made an attempt to evaluate the incidence of fungal sinusitis in sinonasal polyposis and to study the nasal polyps of fungal origin.

Aims and Objectives

1. To study the incidence of fungal infection in nasal polyposis.
2. To know the clinical profile of nasal polyps of fungal origin.
3. To correlate clinical versus microbiological and histopathological characteristics of nasal polyps of fungal origin
4. And to evaluate the nasal polyps endoscopically.

Material and Methods

60 patients with nasal polyps were taken. Samples were collected by complete enumeration method. The prospective non randomized cohort study was conducted in the department of ENT, MGM Medical College, Kamothe, Navi Mumbai. Study period was conducted for a period of 2 years from August 2008 to July 2010.

Patients included in the study were cases 1. Clinically diagnosed as having unilateral or bilateral nasal polyp(s). 2. Patients with recurrent nasal polyps. Patients excluded were those with age less than 15 years. Patient underwent a detailed clinical evaluation

which include History, Anterior and Posterior rhinoscopic findings. Radiological examination included C.T. scan [N.C.C.T.] P.N.S. Axial, coronal and sagittal sections and C.T. scan [with contrast] in cases of recurrences. Appropriate blood investigations were done. Diagnostic nasal endoscopy was done for all patients and endoscopic staging of nasal polyposis with scores were noted. No polyps - Restricted to middle meatus 1, Below middle turbinate 2, Massive polyposis 3, Nasal swab for wet mount and fungal culture and staining - KOH mount. For culture - sabouraud's dextrose agar was used as culture media. For staining - L.P.C.B [lacto phenol cotton blue] stain, Gram stain. Debris was looked for Charcot Leyden crystals. For demonstration of fungal elements in tissue sections, Hematoxylin and Eosin stain, PAS [Paraaminosalicylic acid] stain. Debris were looked for allergic fungal mucin. Due to financial constraints, immunological (serological) evaluation of the patients could not be done. All the patients with unilateral or bilateral nasal polyps appearing for the first time were given medical management with topical steroids for 2-3 months. Resistant cases were subjected to Functional Endoscopic Sinus Surgery. Debris and discharge, was collected and sent to microbiology and histopathology. On 2nd post operative day, nasal packs removed along with the crusts and secretions. On 7th day, check endoscopy done to clear early adhesions and crusts. Then check endoscopy done at regular interval of one month for six months and then once a year.

Observation and Results

1. Incidence of fungal sinusitis in sinonasal polyps

NEW CASE - newly diagnosed case of nasal polyp with fungal sinusitis within the duration of study.

OLD CASE - previously diagnosed case of nasal polyp with fungal sinusitis before starting the study

Total no. of new cases/ new and old cases
21/21+12=63%

Categorization of patients and nasal polyps:

Diagnosis	No. of patients
Allergic fungal sinusitis	19
Fungal ball	2
Ethmoidal polyps	34
Carcinoma maxillary sinus	2
Inverted papilloma	2
Angiofibroma	1

Histopathological and microbiological features of all nasal polyps :

	Allergic fungal rhinosinusitis	Fungal ball	Ethmoidal polyps	Others [Inverted papilloma, carcinoma]

Allergic mucin	+	-	-	-
Luminal fungal hyphae	+	+	-	-
Inflammatory cells	+	+	+	-
Multinucleate giant cell granuloma enclosing fungal hyphae	-	-	-	-
Angioinvasion by fungi	-	-	-	-

Discussion

Nasal polyps, which are one of the commonly encountered entities for an otorhinolaryngologist, are still under debate in reference to its etiology and pathogenesis. In our present study performed in a selected cohort of 60 patients with nasal polyps, all the patients resistant to medical treatment were subjected to functional endoscopic sinus surgery and debris & tissues were sent for microbiological and histopathological examination. Immunological evaluation could not be done due to financial constraints. The total number of patients affected by fungal sinusitis came out to be 21, out of which 19 patients were diagnosed as allergic fungal sinusitis and 2 patients as of fungal ball. Ethmoidal polyps were diagnosed in 34 patients, carcinoma maxillary sinus and inverted papilloma in 2 patients each and Angiofibroma in 1 patient. Vennewald et al¹ in 1999 described that microscopic fungal colonization of the nose and paranasal sinuses may be a common finding in both normal and

diseased states. Disease manifestations depend upon the immune status of the individual. Chakrabarti, Das and Panda² in 2008 described the controversies surrounding the categorization of fungal sinusitis and divided it into two types i.e. invasive and non invasive fungal sinusitis. Klossek³ in 1997 suggested the involvement of single sinus in most cases of fungal ball. In 10% of the cases, it is associated with nasal polyps. Hyphae can be seen in the fungal ball but culture is positive only in 23-50% of cases. Manning and colleagues⁴ in 1989 described allergic fungal rhinosinusitis as a nasal correlate of allergic bronchopulmonary aspergillosis. Dhiwakar et al⁵ in 2003

studied 20 cases of allergic fungal rhinosinusitis with an age group of 15-40 years and found the mean age to be 24.9 years which is 32 years in our study with an age group ranging from 15-80 years. Manning and Holman et al⁶ in 1998 found the incidence of fungal infection to be more in males with the ratio of 1.6:1 which is comparable to our study where the ratio is 1.7:1. The high level of IgE in polyp tissue, even in the absence of other markers of atopy (such as skin prick testing), may indicate local production. It remains possible therefore, that local allergic mechanisms could play a role in the pathogenesis of polyps. Cody et al⁷ in 1994 found raised eosinophil counts in 65% of patients. In our study, eosinophils were raised in all patients of allergic fungal rhinosinusitis. Schubert and Goetz⁹ in 1998 found the incidence of polyposis to be 100% in allergic fungal sinusitis. Nasal polyposis is a non specific indicator of chronic nasal inflammation, and patients undergoing functional endoscopic sinus surgery for polypoid rhinosinusitis are expected to be afflicted with allergic fungal rhinosinusitis in 5-10% of such cases. Morpeth¹¹ in 1996 proved the variable yield of fungal cultures [64% -100%] which renders allergic fungal rhinosinusitis in the presence of a negative fungal culture possible. Histological appearance of allergic mucin remains the most reliable indicator of allergic fungal rhinosinusitis. In our study, fungal hyphae as well as allergic fungal mucin were seen in all patients of allergic fungal sinusitis. In the study of Cody et al⁸, the incidences of orbital symptoms were 17% and 20% in some series. In our study, orbital symptoms were not present in any of the patients. Dhiwakar et al⁵, in 2003 found nasal polyposis, increased IgE and C.T. scan finding of hyperattenuation in all patients of allergic fungal rhinosinusitis which is comparable to our study but we could not do IgE evaluation due to financial constraints. Most of the patients with nasal polyps were of endoscopic grade 2 preoperatively and recurrence was found in

6% of the patients after 1 year of follow up. Recurrences can be because of the non compliance of the patients. Marple¹² in 1998 excluded fungal culture for the diagnosis of allergic fungal sinusitis because a negative culture may be caused by laboratory inexperience and a positive culture may represent a saprophytic growth of fungi. In our study, 58% of the cases of fungal sinusitis did not show any growth of the fungus. 38% were found to be positive for *Aspergillus fumigatus*. 4% were positive for other species of *Aspergillus* and *Dematiaceous* fungi. Klossek JM¹³ in 2008 found that some cases of chronic invasive fungal sinusitis on nasal endoscopy reveals nasal congestion or polypoid mucosa and sometimes soft tissue mass covered by normal or ulcerated mucosa. In our study, no patients with nasal polyps were diagnosed as invasive fungal sinusitis so the association of nasal polyps with invasive fungal sinusitis could not be determined.

The present study done in 60 patients, has shown the incidence of fungal sinusitis to be 63%. A larger prospective clinical study of a longer duration is underway at our institution, as an extension of the present study, to establish the long term follow up of our patients to know the recurrences and to study more about fungal sinusitis.

Conclusions

Incidence of fungal rhinosinusitis is on the rise in this era of antibiotics and diagnostic facilities. Nasal polyps are associated with fungal sinusitis. In our study, the incidence of fungal sinusitis in patients with sinonasal polyposis is 63%. All our patients were immunocompetent. So, the association of invasive fungal sinusitis with sinonasal polyposis could not be assessed. Invasive fungal sinusitis parallel the explosive increase in the immunocompromised patient population, and are characterized by diagnostic difficulties and extreme mortality. Current strategies need considerable improvement, yet ongoing collaborative efforts will have a positive impact on our understanding of the fungus-host interaction and ultimately our ability to offer better care to our patients.

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