

To Study the Significance of Fungus in Nasal Polyposis



Medical Science

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ABSTRACT

In the last couple of years the medical professionals considered rhinosinusitis as an unique entity commonly associated with nasal polyps. In this study we evaluated the significance of fungus in nasal polyposis and also incidence, etio-pathological factors, presenting sign and symptoms, histopathological features and the appropriate management for Nasal Polyposis. Past studies on pathogenesis include hypersensitivity and T-cell mediated reactions as well as a humoral immune response. Treatment is largely surgical, with a strong role for oral corticosteroids and an emerging role for IT. Antifungal, both systemic and topical, currently have a limited role in treatment, although this area needs further study.

INTRODUCTION

Nasal polyps and rhinosinusitis are usually seen together and basically the inflammation in the mucosal area of nose. They are characterized by the clinical symptoms like blockage or congestion, discharge in anterior or posterior nasal drip, facial pain (pressure) and reduction (or loss) of smell. Fungal rhinosinusitis refers to a broad group of conditions caused by fungal infection paranasal sinuses. In the original Mayo study, Ponikay et al. showed that fungal growth was found in washing from the sinuses in 96% of patients with chronic sinusitis. It was believed by some people that it is a result of extensive use of antibiotics causing overgrowth of fungi. Others believed that it is the result of extensive exposure to mold and fungi in the environment, both due to water leaks from roofs plumbing as well as more efficient home with less air exchange.

This study was designed to perform the epidemiological study of patients having nasal polypi, chronic rhinosinusitis, chronic rhinitis & presence of fungi in sinuses & their significance. To determine the incidence of associated chronic rhinosinusitis. To study the histopathological features of case of nasal polypi and co-relation between the histopathological findings and the aetiological factors. Also the study the treatment modality of fungal sinus disease.

MATERIAL AND METHODS

The present study was carried out on 50 patients of nasal polypi and rhinosinusitis attending ENT OPD or admitted in ENT-Ward of M.B.S. Hospital, Govt. Medical College, Kota, Rajasthan from Nov.2014 to Oct 2015.

Key points of the observations done

A detailed clinical history with special reference to all symptomatology was taken. A thorough clinical examination including anterior and posterior rhinoscopy, ear and throat examination was carried out. Diagnostic criteria were based on a detailed history and clinical examination.

Criteria for selection of cases:

Patients suffering from the chronic rhinorrhea, nasal blockage and / or headache, who clinically and / or radiologically show the presence of nasal polyposis.

The patients were subjected to laboratory investigations namely Routine blood examination including T.E.C, Radiological examination including X-ray PNS (waters view), x-ray nasopharynx (lat view) and CT scan PNS (axial as well

as coronal view), to differentiate between ethmoidal and choanal polypi and to see the extent of involvement of sinuses.

Computed tomography demonstrating the heterogeneous signal intensity that is characteristic of allergic fungal rhinosinusitis.

Patients were subjected to surgeries either by endoscopic or by radical surgery through sublabial canine fossa approach. Details of all clinical findings and relevant investigation and their management will be recorded in the annexure proforma.

Patients were also divided into three grades based upon the Lidholdts staging system described for nasal polyposis. According to this, based on anatomical landmarks (middle and inferior turbinates) nasal polyps can be divided into three grades with increasing severity.

Grade 1 Small polyps extending just beyond the free edge of middle turbinate

Grade2 Medium size polyps reaching between the upper and lower edges of the inferior turbinate

Grade3 Large polyps reaching below the lower edge of inferior turbinate

PRE-OPERATIVE SAMPLING

The following pre operative examination was done to establish and confirm the fungal etiology

The surgical specimen obtained were divided into two portion and then sent for the below mention test:

1. Histopathology: For histopathological examination the nasal polypi along with caseous debris was sent in 10% formalin.

2. Microbiological study: The surgical specimen was sent in normal saline for identifying the fungus. KOH mounts were prepared for identification of fungal hyphae and charcot-leyden crystals.

OBSERVATIONS

The present study was conducted in the department of E.N.T, G.M.C. Medical College & associated group of hospital, Kota. 50 cases of nasal polyps were taken at random

from OPD and male and female E.N.T. wards from Nov-14 to Oct15. Observations were analysed as under:-

Types of polyps

- Age distribution of patient of nasal polyp
- Sex distribution of cases
- Etiological factors of nasal polyp
- Initial symptoms noticed by patients of nasal polyp
- Association of asthma with nasal polyp
- Signs observed in case of nasal polyp
- Percentage of eosinophils(DLC) in case of nasal polyp
- Total eosinophil count in case of nasal polyp
- Radiological finding in case of nasal polyp
- Surgical treatment in case of nasal polyp
- Histopathological finding of nasal polyp
- Histopathological study of fungal hyphae with nasal polyp
- Microbiological study of fungal hyphae with nasal polyp
- Recurrence in case of nasal polyp

S. NO.	AGE GROUP	ETHMOIDAL POLYP	ANTRO-CHO-ANAL POLYP	TOTAL NO.OF CASES	% OF CASES
1	0-10	0	0	0	0
2	11to20	2	8	10	20
3	21-30	8	9	17	34
4	31-40	10	3	13	26
5	41-50	6	1	7	14
6	51-60	3	0	3	6
7	61 & ABOVE	0	0	0	0
	TOTAL	29	21	50	100

ETIOLOGICAL FACTORS	ETHMOIDAL POLYP	ANTRO-CHO-ANAL POLYP	TOTAL NO.OF POLYP	% OF CAS-ES
ALLERGY	22	6	28	56%
RECURRENT INFECTION	7	15	22	44%

S. NO	SYMPTOMS	POSITIVE CASES	% OF CASES
1	NASAL OBSTRUCTION	50	100
2	RHINORRHEA/ SNEEZING	50	100
3	CHANGE OF SMELL	32	64
4	HEADACHE	18	36
5	POST NASAL DRIP	15	30

S.NO	SIGN	POSITIVE CASES	% OF CASES
1	POLYPS	50	100
2	D.N.S	15	30

3	HYPERTROPHY OR CONGESTED MUCOSA	30	60
4	EARACHE/EAR DISCHARGE	3	6

S.NO	SPECIES	NO. OF CASES	%
1	ASPERGILLOUS FUMIGATOUS	2	4%
2	ASPERGILLOUS FLAVUS	9	18%
3	BIPOLARIS	2	4%
4	NO GROWTH	37	74%

	POSITIVE FOR FUNGES	NEGATIVE FOR FUNGES
HISTOPATHOLOGICAL	13	37
KOH STAIN	13	37
TOTAL	13	37
%	26	74

DISCUSSION

Polyps are common clinical condition posing problems in Otorhinolaryngology. Time to time various types of treatment have been devised but none provides permanent safeguard against recurrence specially in case of ethmoid polyps. The present study is an attempt for better diagnosis, appropriate treatment and prevention of recurrence of nasal polyp and rhinosinusitis by studying keenly the clinical, histopathological and microbiological aspects of nasal polyp as contributing factors for its etiopathogenesis.

This study showed that Out of total 50 cases 29 were diagnosed as ethmoidal polyps while 21 were diagnosed as antrochoanal polyps. In the study of 50 cases of nasal polyp Ethmoidal polyps were more common than Antrochoanal polyps. The youngest patient was 12 years old and oldest was 60 years of age.

In this study, maximum numbers of cases were found between the 2nd to 5th decades of life. This is comparable to the study of Hardy (1957) and Sirola (1966), in their study maximum number of patients were between 10-40 years and 10-50 years of age respectively.

In the study of Lund V.J. (1983), Drake Lee (1984), Marque Dowell, Ahmes Pahor (1972) the lower limit was similar to the present study but the upper limit was little higher i.e. 13-70 yrs., 13-79 yrs., 11-81 yrs., and 14-78 yrs respectively. In study by Anjali Das Gupta et.al (1997) age range was 8-76 years.

Antrochoanal polyps were common in 11-40 yrs. Age group (95%) while Ethmoidal polyp in 21-60 yrs. Age group (93.1%). Sirola.R. (1966) also pointed out that the choanal polyps are common in teenagers as well as in adults and seem to be comparatively rare in persons over 40.

In the present study, there were 43 males and 7 females giving a male – female ratio of about 6:1. Males predominance can be explained on the basis that the family system in this country is male dependent. So the male members are more exposed to various pollution agents like dust pollution & other environmental factors. Secondly males

more commonly indulge in bad habits like smoking, Tobacco chewing, Alcohol etc. In study by Heck et al (1950) , Maloney J.R. (1977) , Lund V.J. (1983) and Marque Dowell , Ahmes L.C. Pahor (1992) and Anjali Das Gupta et al (1997) male female ratio was 2:1 , 2:1 , 2.3:1 , 2.5:1 , and 1.5:1 respectively.

The study revealed that there was a definite association of polypi with allergy and recurrent infection. 56% i.e. about half of the patient had a history of allergy and 44% had a history of recurrent infection. There finding are similar to Sirola (1966) who found 42% association of allergic factors with nasal polypi. Sinkey H.L. (1935) who found strong association of polypi with disease of accessory sinus and chronic necrotising ethmoidities.

In the study most of the patients presented with complaints of long standing rhinitis and / or sinusitis. Eggston (1947) and Lederer FL (1952) also stressed that long continued attacks of chronic sinusitis or rhinitis lead to periphlebitis and perilymphangitis thereby contributing to polyp formation.

Duke (1927) observed 24% cases of allergy in his study while Denvil stated 34% cases had either food or inhalant sensitivity.

Our findings revealed that Antrochoanal polyps are predominantly associated with recurrent infection(71.4%) while Antrochoanal polyps are also associated with allergy (28.57%) and while in 24% cases of ethmoidal polyps are associated with recurrent infection and Ethmoidal polyps are predominantly associated with allergy (75.86%).

Eosinophilia was observed in 34% of cases and total eosinophil count was raised in 24% of cases. It is comparable to Hardy (1957) who reported that about 19.3% cases had eosinophils more than 3%.

In about 22% cases there was a history of mild form of Asthma. The patients with polypi had a frequent history of progressive asthmatic changes. Moreover asthmatic changes were found mostly in patients with long standing complaints of about 2-4 yrs. This shows that these patients were neglecting their complaints for a long period proving the fact that long term nasal obstruction frequently leads to bronchospasm. This is comparable to study of Maloney (1976) and Drake Lee (1984) who reported 25% and 29% association of asthma and nasal and nasal polypi respectively.

Davison F.W. (1963) observed 42% and Lawson (1991) recorded 40% cases with history of asthma.

All the patients of the present study had nasal obstruction and Rhinorrhoea. In antrochoanal polyp most of the cases had unilateral nasal obstruction while in ethmoidal polyps, patients usually had bilateral obstruction. In smaller polyps , obstruction was observed more during cold and at the time of sleep.

The discharge in cases of rhinorrhoea was odourless and was not blood stained. A change in sense of smell was observed in 64% cases. This was because air was obstructed and could not reach the olfactory area of the nose and due to allergic changes in the nose. Other symptoms noted were headache in 36% and postnasal dip in 30% of cases. These findings are comparable with Lee (1984) and Robson et. al. (1990). They observed some degree of nasal obstruction in all their cases.

During examination of nasal cavity , polypi were seen in all cases and were mobile , did not bleed on touch and soft in consistency. 11 cases showed red surface. This was due to long standing infection and repeated trauma. These polypi were insensitive to probing. Hypertrophied turbinates or congested mucosa was found in about 60 % cases, post nasal dip in 30% due to associated infection. Deviated nasal septum was observed in 30% cases. Antrochoanal polypi were found towards narrower part of nasal cavity. This proves that Bernoullis theory is one of the etiological factors for occurrence

X-ray examination showed that none of the case had bony destruction which shows benign nature of disease but expansion of ethmoid sinuses was observed in 2 cases of ethmoidal polyps. Bilateral or unilateral maxillary sinus opacity or haziness as a sign of sinusitis was present in almost all cases. This is similar to observation of Lund V.J. (1983) who observed expansion in 22% of cases. Bilateral haziness of maxillary sinus was observed in 34% antrochoanal polyps. This is similar to 22.6% observed by Heck⁵⁵ (1950) et. al . and 23% by Hardy (1957).

On histopathological examination the polyps although variable in size had the same general structure. Majority of cases had columnar epithelium, with or without cilia, with metaplastic changes and ulceration at some places. The stroma was usually oedematous. The cell population predominantly comprised of eosinophils, lymphocytes & plasma cells.

No dilated glands within the mucous membrane were found as is common in cases with cystic fibrosis.

Similar results were observed by Eggston & Wolff who stated that polyps are usually covered by columnar epithelium. Metaplastic changes may cause surface epithelium to become cuboidal or squamous. In some areas it may be ulcerated and replaced by acute inflammatory exudates. The stroma is usually fibrillar in character and may contain an abundance of migratory cells eg. Polymorphonuclear leucocytes, lymphocytes and plasma cells. An abundance of eosinophils signifies allergic factors. In their study, 67% were found to be inflammatory polyps.

In the present study out of 50 polyps histopathologically examined, 22% were inflammatory polyps, 22% were allergic inflammatory, 30% were only allergic and 26% showed fungal hyphae. Histopathological allergic features were found in 52% cases & inflammatory in 44% cases.

Out of 110 cases of nasal polyps studied by Anjali Das Gupta et. al. (1997) 67.3% were allergic while 32.7% were inflammatory polyps.

According to study of prevalence of fungal infection in nasal polyposis by E. Razmpa et al 2007 in department of Otolaryngology, School of Medicine, Medical Sciences/ University of Tehran, during 7 months, polyp samples from patients with nasal polyposis were collected. From the total amount of samples (50), both direct test with 10% KOH and culture with Sabouraud's dextrose agar were performed. In direct test, 42% of samples were positive for fungus. 34% of samples showed fungal colonization in culture, which include 30% *Aspergillus flavus* and 4% *Aspergillus fumigatus*.

However, none of invasive fungi were found in pathological lamella. Regarding to our results, it seems the high prevalence of fungal colonization in nasal polyposis may

explain etiological factors, reasons of growth, increasing in numbers, and frequent recurrence of nasal polyps to some extent.

SUMMARY AND CONCLUSION

This study was carried out on 50 case of nasal polypi attending ENT OPD or admitted in ENT ward in govt medical college and Hospital, kota from nov.14 to oct.15. An attempt has been made to evaluate the incidence, etio-pathological factors, presenting sign and symptoms, histopathological features and the best line of management. The following conclusions were drawn :-

- Ethmoidal polyps were found to be more common than Antro-choanal polyp in the study population.
- Highest incidence of polyp was between 10-50 years of age. Ethmoidal polyps were more commonly found in 21-60 years of age group as against Antro-choanal polyp in 11-40 years.
- Males were more commonly affected than females.
- Sign of either allergy or infection were present in almost all patients
- Allergy and infection were the main factors responsible for the disease. Etiology of ethmoidal polyp was commonly allergy and of Antro-choanal polyp, both allergy and infection.
- Main symptoms in these patients were nasal obstruction, nasal discharge, hyposmia, headache and post nasal drip.
- Asthma and chronic sinusitis were commonly associated with nasal polypi
- All the patients showed polypoid mass in their nasal cavity. Congested mucosa or hypertrophy of turbinates was commonly present.
- X-ray examination showed haziness in one or more paranasal sinuses without bony destruction
- All the case required some sort of surgical treatment to relieve the symptoms.
- Majority of polyps were inflammatory or allergic inflammatory polyps. Histopathologically the predominant cell type was either lymphocyte or eosinophil.
- Out of the total cases of polyposis sent for HPE / Microbiological study, role of fungi were found in 26% of cases.
- In this study, overall recurrence rate was low i.e. 8% of the total cases. All the cases are of ethmoidal polypi. No recurrence was seen with AC Polypi.

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