

Histological analysis of Nasal Polyps in A Tertiary Hospital

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Abstract

Background: Nasal polyposis is a very common condition seen in adults and encompasses a wide variety of lesions that have a common presentation. The role of mast cells in pathogenesis of allergic polyps has been under scrutiny for a long time.

Aims: The aim of this study was to do a clinicopathological correlation of nasal polyps and also to compare the mast cell population in allergic and non allergic inflammatory polyps.

Materials And Methods: This study was carried out over a period of one year by collecting clinical data and reviewing the slides using H&E stain and special stains.

Results: Out of 100 cases studied, 76% of them were non neoplastic and 24% were neoplastic. Among the non neoplastic conditions, non allergic polyps accounted for 71% and allergic polyps accounted for 29% of cases. Among the neoplastic lesions, 83% were benign and 17% were malignant. Nasal obstruction (80%) was the most common symptom followed by rhinorrhoea. In the stroma, eosinophils were more common in allergic polyps while mononuclear cells were common in non allergic polyps. In the epithelium, 0-5 mast cells per 10 hpf were seen in 84% of inflammatory polyps and in majority of cases mast cells in the stroma were seen in the range of 11-20 cells per 10 hpf. There was no significant difference in the increase in mast cells between allergic and non allergic polyps.

Conclusion: All nasal polyps though have the same presentation they may be of variable etiology that can be ascertained only by histopathological examination and mast cell staining do not help to identify the etiology of inflammatory polyps.

Keywords: Nasal polyp, mast cells, toluidine blue

I. Introduction

Nasal polyp is a polypoidal projection in the nasal cavity. The causes of nasal polyp is so varied that it can be considered as a symptom rather than a disease. In many patients the most innocuous polyp can be found to have a different diagnosis on histopathological examination. The size of the nasal polyp varies widely and the symptoms depend on the size. The inflammatory polyps are the commonest of all nasal polyps and they frequently arise from middle meatus and clefts of the ethmoid sinus.

Nasal polyposis has been reported in about 1-4% of the general population and is higher in certain populations such as 36% of patients with aspirin intolerance, 20% of patients with cystic fibrosis, 7% of patients with asthma and 2% of those with chronic rhinosinusitis¹.

The etiology of nasal polyps has not been ascertained but the two common theories are allergy and inflammation. Non inflammatory polyps may be due to a variety of benign and malignant tumours. In inflammatory polyps the role of mast cells has been under scrutiny for many years as degranulation of mast cells is an important source of histamine. But their distribution and association with allergic polyps has not yet been proven conclusively. This study was undertaken to study the histopathology and classify the lesions of nasal cavity and to study the relative distribution of mast cells in inflammatory polyp.

II. Materials And Methods

The present study was undertaken over a period of 12 months from August 2012 to July 2013. A total number of 100 cases diagnosed clinically as nasal polyp were analysed. Attention was paid to record the clinical history and examination findings like age, sex, presenting symptoms and signs of each patient in the proforma. The specimens were processed and sections were stained with conventional Haematoxylin and Eosin stain and systematically examined. Toluidine blue staining was carried on sections which were diagnosed as non neoplastic on H&E. Mast cells in these polyps were counted in the epithelium and stroma.

III. Results

Out of the 100 cases 76 were non neoplastic and 24 neoplastic. Among the non neoplastic 22 were allergic polyps and 52 were inflammatory polyps. The neoplastic polyps included 10 angiofibroma, 3

haemangioma, 2 schwannoma 4 inverted papilloma, 1 respiratory epithelial adenomatoid hamartoma and 4 malignant lesions. The distribution of various lesions is shown in table (Image 1).

The age of the patients varied from 5 to 70 years. The polyps were more common in the age between 20yrs to 50 yrs (68%).

Among the 50 patients 27 were male and 23 female. Angiofibroma was commonly seen in males while allergic polyp and inflammatory polyp were almost equally seen in males and females.

In the group studied the most common symptom was nasal obstruction present in 80 cases followed by rhinorrhoea in 48 cases. Further correlation of symptoms with allergic and non allergic polyps showed the results as in Table (Image 2). There was no significant association between nasal obstruction and rhinorrhoea with allergic / non allergic polyps, but sneezing was found to be significantly associated with allergic polyps.

The most common stromal feature was stromal edema followed by predominant mononuclear cells. On studying the predominant cell type in the stroma of inflammatory polyps the findings were as in Image 4 . There is a positive statistical association between predominant eosinophils and allergic polyps while mononuclear cells were more significantly associated with non allergic polyps at 95% ($P < 0.05$)

The study on mast cells in epithelium showed that they were mostly less than 5 per 10 High power field. There was no statistical association between the type of polyp and distribution of mast cells in the epithelium at 95% [$P > 0.05$].

Out of the 76 cases stained with toluidine blue, in the stroma, 11-20 mast cells per 10 hpf were seen in 34.2%, 21-30 in 18.4%. On correlating with type of polyp , the mast cells were increased in all non neoplastic polyps and there was no significant difference in the increase in mast cells between allergic and non allergic polyps (Image 6).

IV. Discussion

In the present study out of 100 cases studied, 76% were non-neoplastic and 24% neoplastic cases which correlates with the study by Lathi et al² who found 72% non-neoplastic and 28% neoplastic. In a study by Zafar et al³ in Uttar Pradesh there was an incidence of 40% neoplastic polyps. Shulba⁴ conducted a study in 100 patients and found 91 non neoplastic and 9 neoplastic lesions.

Inflammatory polyps were classified as non-allergic and allergic polyps depending upon the predominance of eosinophils. The present study had 72% non allergic polyps and 28% allergic polyps which correlates with the study by Shulbha et al who found 77% allergic and 23% non allergic. In a study conducted by Mysorekar V et al⁵, out of 110 cases, 72 cases were non-allergic polyps and 18 cases were allergic polyps. The remaining 20 cases were diagnosed as chronic hypertrophic rhinitis.

In the 100 cases studied, 24 neoplastic lesions were found out of which 20 were benign and 4 malignant. Kale et al⁶ studied 344 cases and observed 16 neoplastic lesions presenting as nasal polyps, out of which 9 were benign and 7 malignant. In the study by Shulba et al, out of the 9 neoplastic polyps, 7 were benign and 2 were malignant.

In the present study, the age range was from 14 to 75 years, 54 being males and 46 females. In the study of 110 cases conducted by Mysorekar V et al., 66 cases were males, and 44 cases were females. Triglia JM and Nicollas R⁷, in a study of 46 children, isolated polyps were seen occurring in 24 girls and 22 boys. Their age range was from 4 to 18 years.

In the present study, similar to the study by Shulbha et al mononuclear cells were the predominant inflammatory cell in 61% of cases. The allergic polyps showed predominant eosinophils while non allergic polyps had predominant mononuclear cells. Shulbha et al showed that 64% of the nasal polyps had predominant mononuclear cells. In the study by Couto et al⁸ the predominant cell type was eosinophils in 73% of their polyps.

The present study showed that the presence of mast cells in polyps were significant but mast cells were equally increased in allergic and non allergic polyps. This correlates well with other studies such as by Mysorekar V et a who showed that mast cells were found to be equally increased in allergic and non allergic polyps and a few more authors such as Ruhno et al⁹ and Otsuka et al¹⁰ who have also have shown that mast cells are equally elevated in non allergic and allergic cases (Image 7)

Though mast cells are not significantly associated with allergic polyps their role in the pathogenesis of inflammatory polyps is well documented by Zhang et al¹¹ who showed that mast cells migration was influenced by the overexpression of chemokines (CCL5, CCL11, CX3CL1, interleukin-8). The pathogenesis of nasal polyps was also studied by Vento et al¹² in 2000. The authors concluded that although expression of VPF/VEGF was not increased in the epithelium of the nasal polyps, VPF/VEGF secreted from mast cells may take part in nasal polyp formation.⁴⁸

V. Conclusion

Nasal polyps are a relatively common condition with patient presenting due to nasal obstruction. Though inflammatory polyps are the most common polyps some of the polyps on histological examination turn out to be benign and malignant lesions quite unexpectedly and hence alter the further management of the patient. Sometime mucor mycosis diagnosed in polyps can significantly change the prognosis of the patients if identified by histology. Hence as documented by Diamantopoulos et al¹³ all nasal polyps need histological correlation for better management of the patient.

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