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NASAL SMEAR FOR EOSINOPHILIA: A DIAGNOSTIC MARKER FOR ALLERGIC RHINITIS

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ABSTRACT

Background: Eosinophil play an important role in the pathophysiology of Allergic Rhinitis. Presence of tissue eosinophilia is a characteristic feature of allergic inflammation and is associated with release of Th2 cytokines with gives rise to various symptoms.

Objective: To establish the diagnostic importance of Eosinophil count in nasal smear for Allergic Rhinitis.

Methods: Patient were selected on basis of history & clinical examination. These patients were subjected to nasal smear for eosinophilia.

Results: The study showed strong correlation between nasal eosinophilia and Allergic rhinitis i.e. 88.57% of patients had significant nasal eosinophilia (>10% eosinophil of total leucocytes).

Conclusion: Nasal eosinophilia is a reliable indicator for diagnosis of Allergic rhinitis. It is a non-invasive and inexpensive OPD test. Thus it can be a valuable adjunct for history and clinical examination in the diagnosis of Allergic rhinitis.

INTRODUCTION

Allergic Rhinitis is the commonest immunologic disease and is the commonest disease experienced by humans. The management of Allergic Rhinitis constitutes a large proportion of day to day practice of Otolaryngologists as well as general practitioners.

Allergic Rhinitis occurs in atopic individuals who are exposed to aeroallergens. Although frequently trivialized by patients & doctors, it remains a common cause of morbidity, social embarrassment and impaired performance at workplace.

As per the classification of allergic reactions by Gell& Coomb, allergic reactions commonly associated with rhinitis is type I reaction. The allergen specific Immunoglobulin E (Ig E) binds to nasal mast cells and interact with the inhalant antigens.

A type I allergic reaction produces symptoms within minutes, with a late phase recurrence of symptoms 4 – 6 hours later, mediated by various inflammatory cells that migrate under the influence of chemical factors called cytokines.

Allergic rhinitis is a common condition, though not life threatening but causes significant morbidity in terms of quality of life, further it may also affect the clinical course of other diseases such as Sinusitis, Otitis Media & Asthma.

It has been estimated that up to 50% of patients evaluated in Otolaryngology clinics have some component of inhalant allergy in their presenting complaints. Allergic rhinitis is a heterogeneous disorder, despite its high prevalence it often remains undiagnosed.

A careful medical history & a careful physical examination are the basis in diagnosis of allergic rhinitis but complementary objective tests might be needed.

OBJECTIVE

- To study the presence of eosinophils in nasal smear of patients with Allergic Rhinitis.
- To establish the diagnostic importance of eosinophils in nasal smear of patients with Allergic Rhinitis

MATERIALS AND METHODS

The study was conducted on 35 patients of allegic rhinitis attending OPD of Dept. of E.N.T. and Head & Neck Surgery of KLE's Dr.PrabhakarKore Hospital & MRC, Belgaum.

A control group of 35 non-allergic, healthy individuals were selected for comparison.

Inclusion criteria:

- Patients between 15 to 45 years of age.
- Patients presenting with two or more complaints running nose, nasal congestion, nasal pruritis and sneezing for more than four consecutive weeks.

Exclusion criteria:

- Patients with signs of super-imposed nasal infection.
- Patients on anti-allergic treatment

METHODOLOGY

- Patients fulfilling the criteria were taken for the study.
- Nasal swab was taken by scraping the mucous membrane of the inferior turbinate using a sterile cotton applicator and smear was made on a glass slide
- The slide was air dried and fixed with absolute alcohol.

- The slide was stained with 1 ml Wright-Giemsa stain for 10 min, then rinsed with distilled water and air dried.
- The slide was then stained with 2 ml hematoxylin and eosin for 5 min, then rinsed with distilled water and air dried.
- The slide was then studied under High power magnification of light microscope and Eosinophil per hundred leucocytes was calculated.
- A slide with >10% of eosinophil of total leucocyte was considered to be positive.

RESULTS

The study group consisted of 21 males and 14 females between the ages of 15 years to 45 years with a mean age of 31.14 years.

The control group consisted of 29 males and 6 females between the ages of 15 years to 45 years with a mean age of 29.63 years.

Table No. 1: Age Distribution

Age groups in years	No. of Patients in study group	No. of Individuals in controls
15 - 25	3	5
25 -35	14	19
35 - 45	18	11

Table No. 2: Eosinophil count

%age of Eosinophil	Interpretation	No. of Cases in Study group	No. of Cases in Controls
<5%	-	2	13
6-10%	+	2	20
11-50%	++	23	2
>50%	+++	8	0

Among the study group 31 of the 35 patients (88.57%) had significant nasal eosinophilia i.e. their nasal smear showed more than 10% eosinophil of the total leucocytes.

Among the control group only 2 of the 35 individuals (5.71%) had significant nasal eosinophilia, whereas 33 of the 35 individuals (94.29%) had an eosinophil count less than 10% of the total leucocyte count in the nasal smear.

The study showed strong correlation between nasal eosinophilia and Allergic rhinitis i.e. 88.57% of patients is the study group had significant nasal eosinophilia (>10% eosinophil of total leucocytes) while only 5.71% of individuals in the control group had significant nasal eosinophilia. Thus we obtained a z-score of 6.94 and p-value of 0 ($p<0.05$) which is statistically significant.

DISCUSSION

The correlation between Allergic Rhinitis and nasal eosinophilia was first emphasized by Eyermann in 1927. He reported a series of 92 cases with 72% showing eosinophils in the nasal secretions.

Bryan et al in 1974 concluded that increased number of eosinophil are found in nasal mucosa in active allergic nasal disease. In contrast, the normal nasal cytology usually demonstrates no eosinophil.

Bhandari et al in 1972 found nasal smear for eosinophil to be positive in 81.6% of cases.

Miller et al in 1982 found positive nasal smears for eosinophil in 45% of cases and in 5% of controls. While, Urmil et al in 1984 reported eosinophilia in about 90% of cases.

In a study conducted by Sood in 2005, positive nasal smear for eosinophilia was found in about 80% of cases and only in 5% of controls.

In the present study, a positive nasal smear for eosinophil was found in 88.57% of cases who were selected on the basis of symptoms and thorough clinical examinations. Patients with super-imposed nasal infection and those who were on anti-histaminics were excluded from the study.

Malmberg and Holopainen in 1979 reported a few false positive and false negative cases in their study. They state that presence of an infection may cause a small number of eosinophil to appear in nasal secretions of non-allergic persons. And also, it may cause a temporary disappearance of eosinophil from secretions of persons with allergic rhinitis. The other reason they stated in their study for few false positive cases may be failure to test specific allergen to which patient is sensitive or it being a case of Non- allergic rhinitis with eosinophilia syndrome (NARES).

In this study, a strong correlation has been found between nasal eosinophilia and Allergic rhinitis. The test being a non-invasive and inexpensive OPD test can be used as a diagnostic marker for Allergic rhinitis.

CONCLUSION

It can be concluded that Nasal eosinophilia is a reliable indicator for diagnosis of Allergic rhinitis. It is a non-invasive and inexpensive OPD test. Thus it can be a valuable adjunct for history and clinical examination in the diagnosis of Allergic rhinitis.

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