



Role of Nasal Smear for Eosinophils in Patients of Allergic Rhinitis

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Introduction

Allergic rhinitis is a common problem worldwide with significant impact on the quality of life.⁽¹⁾ With increasing pollution and changing environment, allergies are prevalent among all the age group.⁽²⁾ Ig E mediated inflammatory reaction of nasal mucosa with symptoms like, sneezing, nasal discharge and nasal obstruction seen in allergic rhinitis.⁽³⁾ To confirm the allergic rhinitis, we perform various tests such as skin prick tests (SPT) or radio allegro sorbent test (RAST), enzyme-linked immune sorbent assay (ELISA) tests.⁽¹⁾⁽⁴⁾ However, in developing countries like Nepal SPT, RAST and ELISA are expensive and unavailable.

Nasal smear eosinophilia(NSE) and absolute eosinophil count (AEC) in blood are readily available and cheaper tests.⁽⁵⁾Nasal smear eosinophilia is less invasive test

and can be used as screening test.^(3,6,7)Though NSE is sensitive in allergic rhinitis and it is non-specific.⁽⁶⁾ This study is done to emphasize the importance of the nasal smear eosinophilia in the under-resource settings.

Methods

Allergic rhinitis patients diagnosed in otolaryngology outpatient department (ENT-OPD) of KIST medical college and teaching hospital (KISTMCTH) from June 2019 till March 2021 using census method were included in this study. Descriptive (cross-sectional) study was done in 44 patients, whose data was collected using a Performa. Data was collected after approval of Institutional Review Committee of KISTMCTH and consent of the patients. The patient included were aged more than 10 years and clinically diagnosed as allergic rhinitis. Patients with evident causes of nasal symptoms like deviated nasal septum

Abstract

Introduction: Our environment in changing rapidly which has led to the increase in cases of allergies. Allergies can manifest on different parts of our body. Among all the sites allergic rhinitis is one of the common presentations in all the age groups. In this study we are trying to see the feasibility of the nasal smear for eosinophils in allergic rhinitis patients. To evaluate the nasal smear for eosinophils in the patients with allergic rhinitis and compare it with the blood eosinophil level.

Methods: Descriptive (Cross sectional) study of the patient with allergic rhinitis presenting in the department of ENT in KIST medical college and teaching hospital.

Results: Allergic rhinitis was commonly seen in 29 years of age with female predominance. Out of 44 allergic rhinitis patients, 13 of them had significant eosinophilia in nasal smears. Most of the patient with nasal allergies showed that they had mild eosinophilia in the nasal smear whereas there was no evident eosinophilia in the blood. The nasal smear eosinophilia and blood eosinophilia were correlating in the severe allergic cases. In most of the patients with nasal allergy there was no significant family history.

Conclusion: Nasal smear for eosinophils can be a readily available, less invasive and less expensive test in the allergic rhinitis patients.

Keywords: *Absolute eosinophilia; Allergic rhinitis; Nasal eosinophilic smear*

or any other anatomic variants in nose and those who have taken any antihistamines, mast cell stabilizers, nasal corticosteroids or antileukotrienes for at least 1 week prior were excluded in this study. Following anterior rhinoscopy, a smear was collected from the posterior part of the lower or middle turbinate, with cotton swab⁽⁶⁾ Then the swab was spread out thinly on a glass slide. Slide was air dried and stained with Wright stain. The stained slide was microscopically evaluated by investigating pathologist.

The blood from forearm was collected in the EDTA tube and then processed in the Sysmax coulter (5parts). Peripheral blood smear was prepared by technician, which was evaluated by the pathologist for AEC. Statistical analysis was done using SPSS and excel.

Results

Forty-four patients were included in the study with age ranging from 14 to 64 years (mean age = 28.93 years). Female to male ratio is 2.6, with 32 females and 12 males. Eight of the patients had history of some form of allergy within the family.

Thirty-three of the patients were symptomatic with most common symptom being sneezing, followed by nasal stuffiness and nasal discharge.

Out of 44 patients, 25 cases had significant eosinophilia on nasal smear, while, 23 patients (9.24%) showed increased level of eosinophils in blood samples.

Eight patients had positive family history of allergies rest of the 36 patients did not have any form of allergies in the family.

The nasal eosinophilia was divided into four groups according to the percentage of eosinophils present in their nasal smear slides. (Figure 1)

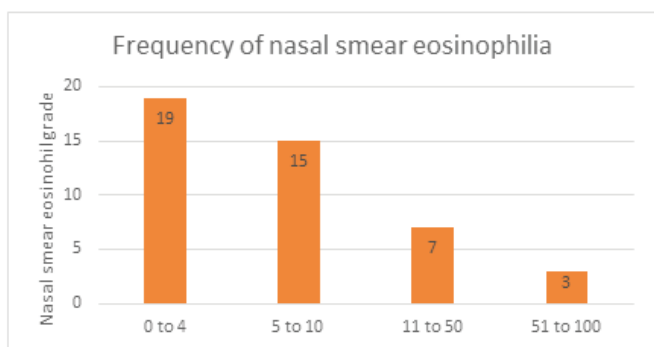


Figure 1. ????

In the blood sample of 44 patients with allergic rhinitis, 31 patients (71%) had normal eosinophil level, 12 patients (27%) had mild eosinophilia and one patient (2%) had severe eosinophilia. (Figure 2)

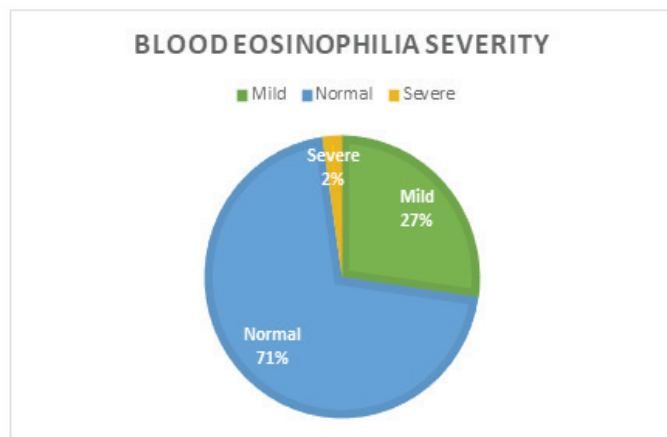


Figure 2. ????

Among the 15 patients with mild nasal smear eosinophilia, blood sample of 11 of them revealed normal eosinophil level and only four of them had mild blood eosinophilia. Similarly, among the patients with severe NSE, two of them had mild eosinophilia and one had severe eosinophilia in blood samples. (Table 1)

Table 1. ????

| Nasal Smear Eosinophils grading | Eosinophilia severity in blood | | | | Total |
|---------------------------------|--------------------------------|----|---|---|-------|
| | A | B | C | D | |
| 0-4% | 16 | 3 | 0 | 0 | 19 |
| 5-10% | 11 | 4 | 0 | 0 | 15 |
| 11-50% | 4 | 3 | 0 | 0 | 7 |
| 51-100% | 0 | 2 | 0 | 1 | 3 |
| Total | 31 | 12 | 0 | 1 | 44 |

A= Normal, B= Mild (500-1500/cumm), C= Moderate (1500-5000/cumm), D= Severe (>5000/cumm)

Discussion

Allergic rhinitis is frequently presenting disease among varied age group in the ENT department. Tests like skin hypersensitivity test, Radio allegro sorbent test, (RAST), enzyme-linked immunosorbent assay (ELISA), Ig E assay can be done for the confirmation of the allergies. However, these tests are not feasible and readily available in all parts of Nepal.

| Gender | Current study | Sood et al | Rudrapa et al |
|--------|---------------|------------|---------------|
| Male | 28% | 45% | 50% |
| Female | 72% | 55% | 50% |

With this study we are trying to see the feasibility of the nasal smear for eosinophils, as NSE is less invasive and easily available.⁽⁸⁾

As we all are aware that the allergic conditions run in the family. However, there are conditions where the allergies are aggravated by the environmental factors. In this study we wanted to see the relevance of allergies in family, which concluded that in majority of allergic rhinitis cases they did not have family history of any form of allergy.

Nasal allergies are the local condition affecting the mucosa of nose and sinuses. We have innate immunity within ourselves battling with these allergies, which leads to increase of allergy elevating factors, such as eosinophils and mast cells, locally than in the blood. So, keeping this point in mind we tried to compare the eosinophils level in the nasal smears and the blood.

In this study we have taken cut off value for NSE as 5%, and then we have classified NSE as mild (5-10%), moderate (11-50%) and severe (51-100%).⁽⁷⁾ eosinophil level, especially in the cases with mild eosinophilia. In the severe eosinophilia both the nasal and blood eosinophils levels were increased and were correlating. Studies done by Sood et al, Patel et al and Mierzejewska et al has similar findings to that of our study.^(1,7,9) From this study we can see that the local allergies leads to increase in allergy alleviating factors locally than in blood.

This test is less invasive and can be performed in the out-patient department easily. However, we need expertise to perform this test. If the test is not done properly, it will lead to smearing of only mucoid material on the slide and giving inconclusive findings.

Conclusion

Nepal is a developing country with limited health facilities outside the major cities, where nasal smear for eosinophils can be done with limited resources. As nasal smear for eosinophils can be effective, economical, readily available and less invasive test in the hands of expertise, in developing country like ours.

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