

A Hospital Based Observational Assessment of the Prevalence and Symptoms in Patients with Eosinophilia using Peripheral Smear Method

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Abstract

Aim: The present study was designed to evaluate the prevalence and symptoms in eosinophilia using peripheral smear method.

Methods: The study was done in Department of Pathology, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India. It was done from February 2019 to January 2020. Study protocol was approved by Institutional Human Ethics Committee. The study included total of 100 patients based on the inclusion and exclusion criteria.

Results: The study included 100 patients. 25 patients were in the age group of 41-50 years. 22 patients were between 51-60 years. 3 patients in each had age between 1-10 and 81-90 years. Male (n=58) were more compared to females (n=42) in this study. Fever was the most common (n=25) symptom compared to others. 15 patients showed cough and 10 had breathlessness. 8 had chest pain and 8 had skin lesions. Least number of patients showed hemoptysis, hydrocele, headache, bleeding per rectum and history of snake bite. 60 patients in mild, 30 in moderate and 10 in severe eosinophilia categories were observed in this study.

Conclusion: The study showed middle age with male sex is more prone to eosinophilia. Fever and cough are the most common symptoms.

Keywords: Blood, Eosinophilia, Age, Gender, Fever, Cough

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Introduction

Eosinophilia represents an increased number of eosinophils in the tissues and/or blood. Although enumeration of tissue eosinophil numbers would require examination of biopsied tissues, blood eosinophil numbers are more readily and routinely measured. Hence, eosinophilia is often recognized based on an elevation of eosinophils in the blood. Absolute eosinophil counts exceeding 450 to 550 cells/ μ L, depending on laboratory

standards, are reported as elevated. This is done by multiplying the total white cell count by the percentage of eosinophils. Eosinophils are bone marrow-derived cells of the granulocyte lineage. They have an approximate half-life of 8 to 18 hours in the bloodstream, and mostly reside in tissues¹ where they can persist for at least several weeks. [1]

Mild eosinophilia is present often in patients with allergic disease (<1500 cells/ μ L will be used for the definition of mild, whereas hypereosinophilic syndromes, defined elsewhere in the article, are generally considered with sustained eosinophilia > 1500 cells/ μ L²). Allergic rhinitis and asthma often produce a mild eosinophilia. Atopic dermatitis may produce a more significant eosinophilia if affecting a large part of the body and if associated with significant atopy. Eosinophilic esophagitis as well as other eosinophilic gastrointestinal diseases can cause a mild peripheral eosinophilia. Chronic sinusitis, especially of the polypoid variety seen in aspirin-exacerbated respiratory disease, produces a more robust eosinophilic response that can be in the mild to moderate range. [2] Often these patients start with nasal allergies and asthma, but then develop abnormal arachidonic acid metabolizing cascades and hence have a more dramatic presentation both of their disease entity and of the eosinophilia. [3,4] Allergic bronchopulmonary aspergillosis, related both to a fungus (*Aspergillus*) and to sensitization in an allergic/asthmatic host, can also produce varied and sometimes significant degrees of eosinophilia and also elevated total immunoglobulin (Ig)E. [5]

Mild or moderate increase in the blood eosinophil count detected from the differential leukocyte count may be met with during routine health screening as an isolated laboratory abnormality without an apparent association with the disease or as an epiphenomenon during a diagnostic work up for an illness. [6-8] However in the modern literature, a little work has been done in the field of blood eosinophilia. In patients with eosinophilia, it is prudent to have a thorough investigation performed to diagnose and rule out underlying systemic disease. [9,10] The diagnostic work up of patients with eosinophilia remains controversial as there are no definite symptoms and no

definite cause can be diagnosed in most cases. [11]

The typical percentage of blood eosinophils in healthy individuals is less than 5%. Absolute eosinophil count can be determined by multiplying total white blood cell count by the percentage of eosinophils. Eosinophilia is considered when absolute eosinophil count exceeds 500/ μ L in peripheral blood. Eosinophilia can be categorized as mild (absolute eosinophil count ranges from 500/ μ L to 1,500/ μ L), moderate (absolute eosinophil count ranges from 1,500/ μ L to 5,000/ μ L), or severe (absolute eosinophil count >5,000/ μ L)². Peripheral blood eosinophilia can be caused by parasitic infections, allergy, drug reactions, leukemia, and non-hematologic cancers. [12]

The urgency for the evaluation of eosinophilia depends on the presence and the degree of tissue and/or organ involvement. The hospital health screening program also contains many other useful tests such as stool parasite exam, blood chemistry, urinalysis, ultrasound of upper abdomen, chest X-ray, and chest computed tomography (CT). It can provide information regarding the prevalence of eosinophilia in healthy population. It is also helpful in defining the cause of eosinophilia. Changes in prevalence of eosinophilia over time in healthy population have rarely been reported.

The present study was designed to evaluate the prevalence and symptoms in eosinophilia using peripheral smear method.

Materials and Methods

The study was done in Department of Pathology, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India. It was done from February 2019 to January 2020

Inclusion criteria

- Both gender.

- Eosinophil count more than 500/mm³.
- No other hematological disorders.

Exclusion criteria

- Critically ill.
- Recent infection.
- Any recent major surgery.

Procedure

The study included total of 100 patients based on the inclusion and exclusion criteria. All the patients were explained study protocol and informed consent was

obtained. The patient's blood was collected and used for peripheral smear examination. Demographic, clinical and pathological data was recorded and analyzed.

Statistical analysis: The data was expressed in number and percentage. Microsoft excel 2019 used for the calculation of percentage and drawing the graphs.

Results

Table 1: Demographic details

Age (Years)	N%
1-10	3 (3%)
11-20	7 (7%)
21-30	7 (7%)
31-40	12 (12%)
41-50	25 (25%)
51-60	22 (22%)
61-70	12 (12%)
71-80	9 (9%)
81-90	3 (3%)
Gender	
Male	58 (58%)
Females	42 (42%)

The study included 100 patients. 25 patients were in the age group of 41-50 years. 22 patients were between 51-60 years. 3 patients in each had age between 1-10 and 81-90 years. Male (n=58) were more compared to females (n=42) in this study.

Table 2: Distribution of patients based on the symptoms and on the eosinophil count

Symptoms	N
Fever	25
Cough	15
Breathlessness	10
Chest pain	8
Skin lesion	8
Feature of psychosis	5
Edema	5
Neurological symptoms	3
Body pain	3
Vomiting	3
Abdominal pain	3
Alcohol abuse	2
Tiredness	2
Menorrhagia	1
Loss of appetite	1

Preoperative check up	1
Hemoptysis	1
Hydrocele	1
Headache	1
Bleeding per rectum	1
History of snake bite	1
Types	
Mild	60
Moderate	30
Severe	10

Fever was the most common (n=25) symptom compared to others. 15 patients showed cough and 10 had breathlessness. 8 had chest pain and 8 had skin lesions. Least number of patients showed hemoptysis, hydrocele, headache, bleeding per rectum and history of snake bite. 60 patients in mild, 30 in moderate and 10 in severe eosinophilia categories were observed in this study.

Discussion

Eosinophilia is defined as an eosinophil count of more than 500 cells/ μ L in the peripheral blood and is related to parasite infection, hypersensitivity reaction to drugs, allergic illness, connective tissue diseases, malignancies, and idiopathic hypereosinophilic syndromes (HESs). [13-15]

A detailed history was taken, a complete examination including general and systemic examination carried out, and a series of investigations including complete peripheral smear examination was done. Eosinophilia was more prevalent in males in our study. Majority fell into the age group of 41-50 years. Patients presented with multiple nonspecific symptoms involving various organ systems. In 25 out of 100 patients (25%), eosinophilia could not be attributed to any specific etiology. This figure corresponds to the 34% of patients with undetermined etiology in Kobisade et al.'s study of 100 hospitalized patients with eosinophilia and 36% of patients with undetermined etiology in

Brigden and Graydon's study of 225 outpatient cases of eosinophilia. [16,17]

In the study by Anshumakkar et al, this corresponded to 70% of patients. 4.3% of the cases of peripheral blood eosinophilia were attributed to asthma in our study. [18] Asthma or other atopic diseases were the cause of eosinophilia in 13% of the cases according to previous study. In a recent study by Lombardi and Passalacqua on 1862 patients with eosinophilia, 80% of the cases were found to be associated with atopic diseases. [19] A study conducted by Bousquet J et al. on 43 patients with chronic asthma found that peripheral blood eosinophilia is associated with severity of asthma. [20] The present study also showed similar results. Exfoliative dermatitis was implicated to be the cause of eosinophilia in 5.2% of the patients in our study group. A number of dermatological conditions like exfoliative dermatitis, atopic dermatitis, eosinophilic cellulitis are associated with eosinophilia. Lombardi and Passalacqua [19] had attributed eosinophilia to skin diseases in 2.1% of the patients and Kobisade et al. [16], in 3% of cases. The study results showed fever is the most common symptom compared to others.

Conclusion

Eosinophilia is one of the commonest blood disorders. The study results concluded that eosinophilia is most common in middle aged males. The most common symptom among the patients was fever followed by cough and

breathlessness. Early detection and initiation of treatment can reduce the progression of disease.

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