

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

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**Aim:** The present study aimed to evaluate the prevalence and symptoms in patients with eosinophilia.

**Methods:** The study was done in Department of Pathology, Sri Krishna Medical college, Muzaffarpur, Bihar, India for one year. Study protocol was approved by Institutional Human Ethics Committee. 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.

**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 were in age between 1-10 and 2 patients in 81-90 years. Male (n=60) were more compared to females (n=40) in this study. A total of 18 symptoms observed in the study population. Fever was the most common (n=25) symptom compared to others. 20 patients showed cough and 18 had breathlessness. 12 had chest pain and 15 had rash. Least number of patients showed hemoptysis, hydrocele, headache, bleeding per rectum. 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

The typical percentage of blood eosinophils in healthy individuals is 0- 6%. [1] Absolute eosinophil count can be determined by multiplying total white blood cell count by the percentage of eosinophils. Peripheral Blood Eosinophilia can be caused by parasitic infections, allergy, drug reactions, Leukemia and non-hematological cancers. Eosinophilia is considered when absolute eosinophil count exceeds 500/ $\mu$ L in peripheral blood. Eosinophilia can be categorized as mild

(absolute eosinophil count ranges from 500/ $\mu$ L to 1,500/ $\mu$ L), moderate (absolute eosinophil count ranges from 1,500/ $\mu$ L to 5,000/ $\mu$ L), or severe (absolute eosinophil count >5,000/ $\mu$ L). [2]

The urgency for the evaluation of eosinophilia depends on the presence and the degree of tissue and/or organ involvement. There are many reports of acutely ill patients with extremely high eosinophil count or outpatients with signs of organ involvement. [3-6] However,

eosinophilia might be discovered as an incidental finding based on complete blood count in an otherwise healthy individual. Because eosinophilia in such situation is rarely reported, collective features of incidental eosinophilia have not been clearly delineated.

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. [7-9] 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. [10,11] 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. [12]

The present study aimed to evaluate the prevalence and symptoms in patients with eosinophilia.

## Methods

The study was done in Department of Pathology, Sri Krishna Medical college, Muzaffarpur, Bihar, India for one year. Study protocol was approved by Institutional Human Ethics Committee. 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 analysed.

### Inclusion criteria

- Both gender
- Eosinophil count more than 500/microlitre
- No other hematological disorders

### Exclusion criteria

- Critically ill
- Recent infection
- Any recent major surgery

**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: Distribution of patients based on the age and gender**

Age groups in 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	10	10
81-90	2	2
<b>Gender</b>		
Male	60	60
Female	40	40

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 were in age between 1-10 and 2 patients in 81-90 years. Male (n=60) were more compared to females (n=40) in this study.

**Table 2: Distribution of patients based on the symptoms**

Symptoms	Number
Fever	25
Cough	20
Breathlessness	18
Chest pain	12
Itching	15
Rash	15
Diarrhea	10
Running nose	10
Edema	8
Vomiting	4
Abdominal pain	3
Tiredness	6
Menorrhagia	5
Loss of appetite	3
Hemoptysis	2
Hydrocele	1
Headache	1
Bleeding per rectum	1

A total of 18 symptoms observed in the study population. Fever was the most common (n=25) symptom compared to others. 20 patients showed cough and 18 had breathlessness. 12 had chest pain and 15 had rash. Least number of patients showed hemoptysis, hydrocele, headache, bleeding per rectum.

**Table 3: Distribution of patients based on the eosinophil count**

Type	N
Mild	60
Moderate	30
Severe	10

60 patients in mild, 30 in moderate and 10 in severe eosinophilia categories were observed in this study.

### Discussion

The study aimed at elaborating the prevalence and symptoms associated with peripheral blood eosinophilia in a total of 100 patients and 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. studies 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. [12,13]

In the study by Anshu M et al [14], evaluated that etiology of eosinophilia was undiagnosed in 70% of the patients. 18% of the cases of peripheral blood eosinophilia were attributed to asthma in our study. According to George L, eosinophilic inflammation has a clear role in asthma exacerbations and its inhibition by anti-IL5 improves lung function, symptoms and health status related to the intensity of eosinophilic inflammation and possibly with greater effects upon lung function following IL-5R $\alpha$  blockade rather than IL-5 neutralization. [15] 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. [16]

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. [17] The present study also showed similar results. Exfoliative dermatitis was implicated to be the cause of eosinophilia in 15% 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 [16] had attributed eosinophilia to skin diseases in 2.1% of the patients and Kobisade et al. [12], in 3% of cases. The study results showed fever is the most common symptom compared to others. Eosinophil is a multifunctional leukocyte that contributes to various inflammatory processes, including parasitic helminth, bacterial and viral infections, pathogenesis of tumor immunity, allergic disease, and drug-induced reaction. [5,18,19]

### 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.

### References

1. Tefferi A. Blood eosinophilia: a new paradigm in disease classification, diagnosis, and treatment. In Mayo Clinic Proceedings 2005 Jan 1 (Vol. 80, No. 1, pp. 75-83). Elsevier.
2. Helbig G. Advances in the diagnosis and treatment of eosinophilia. *Curr Opin Hematol* 2014; 21:3-7.
3. Mejia R, Nutman TB. Evaluation and differential diagnosis of marked persistent eosinophilia. In *Seminars in hematology*. WB Saunders. 2012 Apr 1; 49(2):149-159.
4. Dulohery MM, Patel RR, Schneider F, Ryu JH. Lung involvement in hypereosinophilic syndromes. *Respiratory medicine*. 2011 Jan 1; 105(1):114-21.
5. Schleich FN, Chevremont A, Paulus V, Henket M, Manise M, Seidel L, Louis R. Importance of concomitant local and systemic eosinophilia in uncontrolled asthma. *European Respiratory Journal*. 2014 Jul 1; 44(1): 97-108.
6. Anna K, Peter FW. Eosinophilia. *Prim Care* 2016; 43(4):607-17.
7. Ogbogu PU, Bochner BS, Butterfield JH. Hypereosinophilic syndrome: a multicenter, retrospective analysis of clinical characteristics and response to therapy. *JACI* 2009; 124(6):1319-25.
8. Stevens WW, Ocampo CJ, Berdnikovs S. Cytokines in chronic rhinosinusitis role in eosinophilia and aspirin exacerbated respiratory disease. *Am J Respir. Crit. Care Med* 2015; 192(6): 682-94.
9. Akuthota P, Weller PF. Eosinophilic pneumonias. *Clin. Microbiol. Rev* 2012; 25(4):649-60.
10. Nutman TB. Evaluation and differential diagnosis of marked persistent eosinophilia. *Immuno Allergy Clin North Am* 2007; 27(3):529-49.

11. Elise MO, Thomas BN. Eosinophilia in infectious diseases. *Immunol Allergy Clin North Am* 2015;35(3):493-22.
12. Kobi Sade, Alex M, Yoram L et al., Eosinophilia: A study of 100 hospitalized patients. *European Journal of Internal Medicine* 2007;18(3):196-201.
13. Brigden M, Graydon C. Eosinophilia detected by automated blood cell counting in ambulatory North American outpatients: incidence and clinical significance. *Archives of pathology & laboratory medicine*. 1997 Sep 1;121(9):963.
14. Anshu M, Anurag R, Atul G et al., Study of clinical profile and spontaneous course of Eosinophilia. *JK Science* 2005;7(4):199-201.
15. George L, Brightling CE. Eosinophilic airway inflammation: role in asthma and chronic obstructive pulmonary disease. *Therapeutic advances in chronic disease*. 2016 Jan;7(1):34-51.
16. Lombardi C, Passalacqua G. Eosinophilia and diseases: clinical revision of 1862 cases. *Arch Intern Med* 2003;163(11):1371-3.
17. Bousquet J, Chanaz P, Lacoste JY et al. Eosinophilic inflammation in asthma. *N Engl. J Med* 1990; 323(15):1033-9.
18. Thi NV, Pozio E, Van De N, Praet N, Pezzotti P, Gabriël S, Claes M, Thuy NT, Dorny P. Anti-Trichinella IgG in ethnic minorities living in Trichinella-endemic areas in northwest Vietnam: study of the predictive value of selected clinical signs and symptoms for the diagnosis of trichinellosis. *Acta Tropica*. 2014 Nov 1; 139:93-8.
19. Obaid S. R. Diagnosis of Bacteria Atypical Pneumonia Causative Agents by Using Indirect Immune Fluorescent Assay. *Journal of Medical Research and Health Sciences*. 2022; 5(7): 2059–2063.