Advanced International Journal of Multidisciplinary Research
E-ISSN: 2584-0487
editor@aijmr.com
Volume 4, Issue 3, May-June 2026
CrossRef DOI: 10.62127/aijmr.2026.v04i03.1304

Spectrum and Prospective Analysis of Patients with Eosinophilia in a Tertiary Care Hospital

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Abstract:
Background: Eosinophilia is a commonly encountered hematological abnormality associated with a wide range of clinical conditions, including allergic disorders, infections, and systemic diseases. Its evaluation often provides important diagnostic clues. **Aim:** To analyze the clinical spectrum, severity, and etiological distribution of eosinophilia in patients presenting to a tertiary care center. **Materials and Methods:** This prospective observational study was conducted at Government Medical College and Hospital, Sawai Madhopur, Rajasthan, India, from February 2025 to January 2026. A total of 280 patients with absolute eosinophil count (AEC) >500 cells/µL were included. Clinical details, laboratory findings, and underlying diagnoses were recorded and analyzed. Cases were categorized into mild, moderate, and severe eosinophilia. **Results:** Out of 280 cases, 162 (57.9%) were males and 118 (42.1%) were females. The majority of patients (n=162, 57.8%) belonged to the 11–50 years age group. Mild eosinophilia was observed in 198 cases (70.7%), moderate in 76 cases (27.1%), and severe in 6 cases (2.1%). Chronic kidney disease (28.6%) was the most common associated condition, followed by incidental detection (15%), fever (11.4%), and anemia (10.7%). **Conclusion:** Eosinophilia is frequently encountered in clinical practice, with a predominance of mild cases. While often associated with benign conditions, it may also indicate underlying systemic disease, necessitating appropriate clinical evaluation.

Keywords: Eosinophilia, Absolute eosinophil count, Tertiary care hospital, Clinicopathological study.

INTRODUCTION

Eosinophils are granulocytic leukocytes involved in host defense mechanisms, particularly in parasitic infections, allergic reactions, and inflammatory processes. Their development in the bone marrow is regulated primarily by interleukin-5, which also facilitates their release into circulation and migration into tissues.

Under normal conditions, eosinophils constitute a small fraction of circulating leukocytes. An increase in their number beyond 500 cells/µL is termed eosinophilia and can be categorized as mild (500–1500 cells/µL), moderate (1500–5000 cells/µL), or severe (>5000 cells/µL). Persistent or marked eosinophilia may indicate significant underlying pathology.

Eosinophilia can be broadly classified into primary (clonal) and secondary (reactive) types. Reactive eosinophilia is more common and may be associated with infections, allergic disorders, autoimmune diseases, malignancies, and chronic systemic illnesses.

Given the wide etiological spectrum, evaluation of eosinophilia requires careful clinical and laboratory correlation. This study aims to assess the pattern and causes of eosinophilia in patients attending a tertiary care hospital in Rajasthan.

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MATERIALS AND METHODS

This prospective observational study was conducted in the Department of Pathology at Government Medical College and Hospital, Sawai Madhopur, Rajasthan, over a period of one year from February 2025 to January 2026.

Inclusion Criteria:

- Patients of all age groups with AEC >500 cells/µL

Exclusion Criteria:

- Patients with incomplete clinical data
- Known hematological malignancies (primary eosinophilic disorders)

Data Collection:

Detailed demographic information, clinical presentation, and laboratory findings were obtained. Absolute eosinophil counts were recorded using automated hematology analyzers. Relevant clinical diagnoses were noted from patient records.

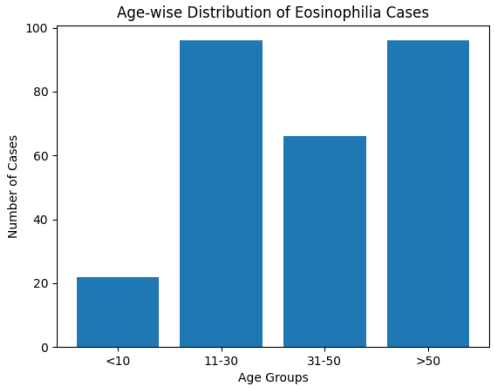
Classification:

Eosinophilia was categorized as:

- Mild: 500–1500 cells/µL
- Moderate: 1500–5000 cells/µL
- Severe: >5000 cells/µL

RESULTS

Table 1: Age and Sex Distribution



Age Group	Total Cases	Male	Female
<10 years	22	12	10
11–30 years	96	56	40
31–50 years	66	40	26
>50 years	96	54	42
Total	**280**	**162**	**118**

There was a **male predominance** with 162 males (57.9%) and 118 females (42.1%). The **highest number of cases (57.8%)** was observed in the age group of **11–50 years**, indicating that eosinophilia is more frequently encountered in the young and middle-aged population. The least number of cases were seen in children below 10 years.

Table 2: Severity of Eosinophilia

Category	AEC (cells/µL)	Cases
Mild	500–1500	198
Moderate	1500–5000	76
Severe	>5000	6

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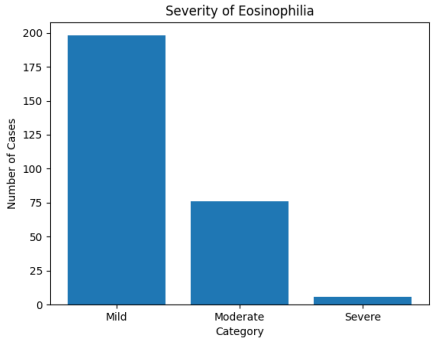

The majority of patients had **mild eosinophilia (70.7%)**, followed by **moderate eosinophilia (27.1%)**. Only a small fraction (**2.1%**) demonstrated **severe eosinophilia**, suggesting that extreme elevations are relatively uncommon in routine clinical practice.

Table 3: Distribution by Diagnosis (Etiological distribution)

Diagnosis	<10 years	11–30 years	31–50 years	>50 years	Total
CKD	4	10	28	38	80
Ischemic heart disease	0	6	5	7	18
Urticaria	1	2	1	2	6
Fever	3	14	8	7	32
Anemia	2	12	8	8	30
COPD	0	6	6	6	18
UTI	1	3	2	2	8
Incidental	0	18	14	10	42
Psoriasis	0	2	4	2	8
Cirrhosis	0	1	3	4	8
Acid peptic disease	0	4	4	2	10
Arthritis	0	2	3	3	8
Hemophilia	0	1	0	0	1
RHD	0	1	0	0	1

Among the various associated conditions, **chronic kidney disease (CKD)** was the most common, accounting for **28.6% of cases**. This was followed by:

- **Incidental findings (15%)**
- **Fever (11.4%)**
- **Anemia (10.7%)**

Other conditions such as COPD, ischemic heart disease, and dermatological disorders contributed smaller proportions.

Age-wise distribution revealed that:

- CKD cases were more common in patients **above 30 years**
- Infectious conditions like fever were more frequent in **younger age groups**
- Incidental eosinophilia was commonly detected during **routine investigation**

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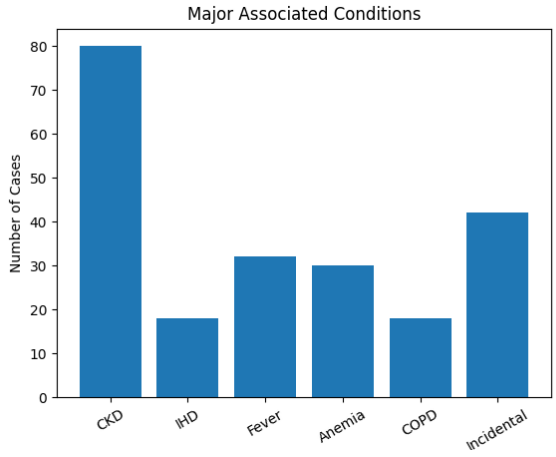
Table 4: Gender-wise Distribution



Diagnosis	Male	Female	Total
CKD	52	28	80
IHD	10	8	18
Urticaria	2	4	6
Fever	20	12	32
Anemia	14	16	30
COPD	10	8	18
UTI	4	4	8
Incidental	24	18	42
Others	26	20	46

DISCUSSION

The present study evaluated 280 cases of eosinophilia and demonstrated a slight male predominance, consistent with several previous reports. The highest frequency was observed in the 11–50 years age group, indicating that eosinophilia is more commonly encountered in the economically productive population.

Mild eosinophilia constituted the majority of cases, reflecting the predominantly reactive nature of eosinophilia. Moderate and severe forms were less frequent, but their presence warrants further clinical evaluation.

Chronic kidney disease emerged as the most common associated condition in this study. Although eosinophilia is not classically emphasized in CKD, its presence may be related to chronic inflammation, drug exposure, or associated comorbidities. Incidental detection was also notable, highlighting the importance of routine hematological screening.

Infective and inflammatory conditions such as fever, anemia, and COPD also showed significant association. The role of eosinophils in inflammatory pathways and immune responses may explain their elevation in such conditions

CONCLUSION

Eosinophilia is a frequently encountered hematological finding with diverse etiologies. Most cases are mild and reactive in nature; however, careful evaluation is essential to identify underlying causes. Early recognition and appropriate investigation can help in timely management and prevention of complications.

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