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Original Research Article

STUDY OF EOSINOPHILIA IN HEMATOLOGICAL MALIGNANCY

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Abstract

Background: Eosinophilia, an elevated eosinophil count in the blood, has been associated with various types of cancers, including hematological malignancies. Eosinophils are thought to influence tumor biology through mechanisms such as promoting angiogenesis and connective tissue formation. This study aims to evaluate the clinical significance and profile of eosinophilia in patients with hematological malignancies. **Materials and Methods:** This prospective study examined a cohort of 800 patients, identifying 32 individuals with eosinophilia (≥0.5×10⁹/L) in conjunction with a diagnosis of hematological malignancy. Patients of both sexes, aged between 18 and 72 years, were included. Data collected included demographics, eosinophil counts, and types of malignancies. The Charlson Comorbidity Index was used to adjust for co-morbid conditions. Statistical analyses were conducted to compare eosinophil counts across different malignancies and assess associations with clinical outcomes. **Results:** Eosinophilia was found in 4% of the overall patient cohort. Among the 32 patients with hematological malignancies and eosinophilia, the mean age was 44.28 years, with a male predominance (81.25%). Chronic myeloid leukemia (CML) was the most common malignancy, accounting for 25% of cases. Acute lymphoblastic leukemia (ALL), chronic lymphocytic leukemia (CLL), and Hodgkin lymphoma (HL) each constituted 9.38% of cases. Eosinophil counts were significantly associated with disease type, with higher counts linked to myeloproliferative disorders such as CML and polycythemia vera. In contrast, lower eosinophil counts were more frequently observed in acute leukemias and myelodysplastic syndromes. The differences in eosinophil distribution across malignancies were statistically significant ($p < 0.001$). **Conclusion:** The study highlights the association between eosinophilia and specific hematological malignancies, emphasizing its potential role as a marker for disease type and progression. Elevated eosinophil counts are more commonly associated with myeloproliferative neoplasms, while lower counts may indicate acute leukemia and myelodysplastic syndrome. These findings underscore the importance of considering eosinophilia in the diagnostic evaluation of patients with suspected hematological malignancies and may aid in guiding referrals for specialized hematology care.

INTRODUCTION

Eosinophilia, characterized by an elevated eosinophil count in the peripheral blood, is a condition that can arise from both benign and malignant disorders. It plays a critical role in the body's immune response, particularly in defending against helminth-parasitic infections.[1] Eosinophilia is defined by peripheral blood eosinophil counts exceeding 500 cells per microliter (µL), with a normal upper limit ranging from 350 to 500 cells per cubic millimeter (mm^3).[1] The severity of eosinophilia is categorized as mild (500–1500/mm^3), moderate (1500–5000/mm^3), and severe (>5000/mm^3).[2]

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Eosinophilia can be classified into reactive and clonal types. Reactive eosinophilia involves the proliferation of polyclonal, mature eosinophils, often driven by various inflammatory conditions and infections.[3] Clonal eosinophilia, on the other hand, results from a primary malignant clone, with precursor cells detectable in the peripheral blood or bone marrow.[4] In cases of clonal eosinophilia, comprehensive diagnostic evaluations, including peripheral blood smear analysis, bone marrow sampling, cytogenetics, and immunohistochemistry, are essential to identify underlying WHO-defined myeloid disorders such as systemic mastocytosis, chronic myelogenous leukemia, acute myeloid leukemia, myelodysplastic syndrome, or myelodysplastic/myeloproliferative neoplasm overlap entities.[5]

Anecdotal reports have highlighted a relatively rare association between myelodysplastic syndromes (MDS) and bone marrow eosinophilia and/or basophilia.[5] Eosinophilia is also observed in various types of human cancers, both within the tumor microenvironment and in the peripheral blood. It may complicate lymphoproliferative disorders, notably in Hodgkin lymphoma and certain peripheral T-cell lymphomas, such as Sezary syndrome, adult T-cell leukemia/lymphoma, and angioimmunoblastic T-cell lymphoma. Occasionally, marked eosinophilia is present in acute B-cell lymphoblastic leukemia.[5]

The presence of eosinophilia in malignancy could offer insights into tumor biology, potentially influencing tumor-host interactions through mechanisms like angiogenesis and connective tissue formation.[6] Eosinophils and their granule proteins may be involved in diverse inflammatory and fibrotic processes, with studies suggesting their role in stimulating DNA synthesis in human fibroblasts.[7]

Blood eosinophilia occurs in response to soluble factors such as interleukin-5 (IL-5), granulocyte-macrophage colony-stimulating factor (GM-CSF), and interleukin-3 (IL-3). IL-5 is particularly crucial for eosinophil differentiation, proliferation, trafficking, and survival.[8,9,10,11,12] Reactive eosinophilia is typically driven by elevated levels of IL-5, IL-4, and IL-3, often associated with hyperimmunoglobulin E (hyper-IgE) syndromes.[13] In Western countries, allergic conditions are the most common cause of reactive eosinophilia, with IL-5 increases mediated by T-helper 2 cells.[13] So, this study aimed to evaluate the clinical significance and profile of eosinophilia in hematological malignancies, providing insights into its role and implications in various disease states.

MATERIALS AND METHODS

Study Setting and Design

The study was conducted in the Department of Medicine, Hematology, at Vardhman Mahavir Medical College and Safdarjung Hospital over the period from 2015 to 2017. This study was designed as a single-center observational prospective study, aimed at evaluating the clinical significance and profile of eosinophilia in patients with hematological malignancies.

Study participants and Sample Size

The sample size was calculated using the formula $4pq/L^2$, where p represents prevalence, q is, and L denotes the level of error considered. With a prevalence estimate (p) of 2% and a study power of 80%, the sample size was determined to be 32. So, a total of 32 patients who met the inclusion and exclusion criteria were enrolled in the study. Participants were included if they were above 18 years of age, had absolute eosinophil counts greater than 500/mm³, and were confirmed to have hematologic malignancy. Exclusion criteria included patients with secondary causes of eosinophilia, such as parasitic or viral infections, drug-induced eosinophilia, allergic diseases, chemical-induced eosinophilia, and eosinophilia due to hypoadrenalism.

Data Collection

Approval from the institutional ethical committee and written informed consent from all enrolled subjects were obtained before starting the study. Patients were evaluated through a detailed history, including symptoms such as fever, abdominal pain, skin rashes, and malaise, along with a clinical examination. Data were collected from 32 patients admitted to the ward and through outpatient department (OPD) settings, focusing on variables like gender, underlying malignancy, and presence and duration of fever. Absolute eosinophil count was assessed for all patients.

Laboratory Investigation

Blood samples were collected from each patient to estimate the complete blood count (CBC) during each follow-up visit. The follow-up schedule varied based on the type of malignancy associated with each patient. The laboratory investigations included a complete hemogram with differential counts, absolute eosinophil counts, liver function tests (LFT), kidney function tests (KFT), serum lactate dehydrogenase (LDH), C-reactive protein, serum albumin, and imaging studies like chest X-ray (PA view). Cultures of blood, urine, stool, and sputum were conducted, as well as other cultures based on the suspected focus of infection. Additional investigations, such as bone marrow aspiration and biopsy, cytogenetic analysis (karyotype), and immunophenotyping, were performed if required.

Statistical Analysis

The data obtained from case record forms were entered into an MS Excel file and analyzed using SPSS IBM software version 22. Categorical variables were presented as numbers and percentages, while continuous variables were presented as mean ± standard deviation (SD) and median. Statistical tests applied included the chi-square test and Fisher's exact test for qualitative

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data. Odds ratios for the severity of absolute eosinophil count (AEC) with various outcomes were calculated. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The study population comprised 32 individuals with various hematological malignancies. The age distribution showed that the largest group was aged 51-60 years (34.38%), followed by those ≤30 years (31.25%). The gender distribution was predominantly male (81.25%) compared to female (18.75%). Regarding malignancy types, Chronic Myeloid Leukemia (CML) was the most prevalent (25.00%), with Acute Lymphoblastic Leukemia (ALL) and Chronic Lymphocytic Leukemia (CLL) both at 9.38%, and other malignancies each accounting for 3.13% to 9.38% of cases. Fever was present in 65.63% of patients, while lymphadenopathy and organomegaly were observed in 56.25% of the patients each. Most patients (71.88%) had normal C-Reactive Protein levels, whereas 28.13% had increased levels. The Charlson's Comorbidity Index revealed that 46.88% had a score of 2, followed by 40.63% with a score of 3, indicating a significant presence of comorbid conditions among the participants. [Table 1]

The study examined the Absolute Eosinophil Count (AEC) at the first and second visits. At the first visit, 56.25% of patients had mild AEC, 25.00% had moderate AEC, and 18.75% had severe AEC. By the second visit, the proportion of patients with mild AEC increased to 62.50%, while those with moderate AEC decreased to 18.75%, and the percentage with severe AEC remained the same at 18.75%. The change in AEC distribution between the first and second visits was not statistically significant, with a P value of 0.822. [Table 2]

The Table 3, summarizes the Absolute Eosinophil Count (AEC) at the first visit across various conditions, highlighting differences in severity and associations with specific conditions. In B-ALL/Eo, 58.06% had mild AEC, while 25.81% had moderate AEC, and 16.13% had severe AEC, with severe cases showing a higher odds ratio of 10.091 (P = 0.175). For NHL, 56.67% had mild AEC, 23.33% had moderate, and 20.00% had severe AEC, with a moderate AEC odds ratio of 2.429 (P = 0.55). AML and ATLL showed 54.84% with mild AEC, and similar trends were observed in Polycythemia Vera and Mastocytosis. In CML, a severe AEC was associated with an odds ratio of 5.0 (P = 0.119). Conditions such as CLL, AITL, MF, ALL, and HL had varying odds ratios for moderate and severe AEC levels, with none achieving statistical significance. Overall, severe AEC was notably associated with higher odds in B-ALL/Eo and CML, though statistical significance was not reached. [Table 3]

The Table 4, displays the Absolute Eosinophil Count (AEC) at the second visit for various conditions, highlighting the distribution of mild, moderate, and severe AEC levels and their associated odds ratios and p-values. In B-ALL/Eo, 64.52% had mild AEC, 19.35% had moderate AEC, and 16.13% had severe AEC, with severe AEC showing an odds ratio of 11.182 (P = 0.156). For NHL, 60.00% had mild AEC, and both moderate and severe AEC had an odds ratio of 0.569 (P = 0.727). AML, ATLL, Polycythemia Vera, Mastocytosis, Multiple Myeloma, and PTCL showed a similar pattern with 61.29% mild AEC and identical odds ratios of 1 for moderate and severe AEC. In CML, severe AEC was associated with an odds ratio of 5.667 (P = 0.092), while ALL had the highest odds ratio for moderate AEC at 22.778 (P = 0.056), approaching statistical significance. Overall, while some conditions showed high odds ratios for moderate and severe AEC levels, none reached statistical significance. [Table 4]

Among the malignancies, MDS had the highest frequency of eosinophil counts ≤0.16×109/L at 23.08%, followed by ALL at 21.15%. CML had the highest frequency of elevated eosinophil counts ≥0.5×109/L at 25.00%. Both ALL and CLL had a significant representation in the elevated eosinophil count group, with 9.38% each. Other malignancies like AITL, HL, and NHL showed lower frequencies in both categories. Notably, B-ALL/Eo, Mastocytosis, MF, Polycythemia Vera, and PTCL had no cases in the lower eosinophil count category but had representation in the elevated eosinophil count group, each accounting for 3.13%. [Table 5]

Table 1: Baseline Characteristics of the study participants (N=32)

Variables	Number	%
Age (years)		
≤30	10	31.25%
31-40	4	12.50%
41-50	3	9.38%
51-60	11	34.38%
>60	4	12.50%
Gender		
Female	6	18.75%
Male	26	81.25%
Types of Malignancy		
AITL	2	6.25%
ALL	3	9.38%

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AML	1	3.13%
AML-M4	1	3.13%
ATLL	1	3.13%
B-ALL/Eo	1	3.13%
CLL	3	9.38%
CML	8	25.00%
HL	3	9.38%
Mastocytosis	1	3.13%
MDS	2	6.25%
MF	1	3.13%
Multiple Myeloma	1	3.13%
NHL	2	6.25%
Polycythemia Vera	1	3.13%
PTCL	1	3.13%
Fever		
Absent	11	34.38%
Present	21	65.63%
Lymphadenopathy		
Absent	14	43.75%
Present	18	56.25%
Organomegaly		
Absent	14	43.75%
Present	18	56.25%
C-Reactive Protein		
Increased	9	28.13%
Normal	23	71.88%
Charlson's Comorbidity Index		
1	2	6.25%
2	15	46.88%
3	13	40.63%
4	1	3.13%
6	1	3.13%

Table 2: Absolute Eosinophil Count at various visits among study participants

Absolute Eosinophil Count	1st Visit	2nd Visit	P value
	Frequency (%)		
Mild	18 (56.25%)	20 (62.50%)	0.822
Moderate	8 (25.00%)	6 (18.75%)	
Severe	6 (18.75%)	6 (18.75%)	

Table 3: Absolute Eosinophil Count at 1st visit for various conditions among study participants

Condition	AEC at 1st Visit	No	Yes	Odds Ratio	P Value
		Frequency (%)			
B-ALL/Eo	**Mild**	18 (58.06%)	0 (0.00%)	-	-
	Moderate	8 (25.81%)	0 (0.00%)	2.176	0.703
	Severe	5 (16.13%)	1 (100.00%)	10.091	0.175
NHL	**Mild**	17 (56.67%)	1 (50.00%)	-	-
	Moderate	7 (23.33%)	1 (50.00%)	2.429	0.55
	Severe	6 (20.00%)	0 (0.00%)	0.897	0.95
AML	**Mild**	17 (54.84%)	1 (100.00%)	-	-
	Moderate	8 (25.81%)	0 (0.00%)	0.686	0.823
	Severe	6 (19.35%)	0 (0.00%)	0.897	0.95
ATLL	**Mild**	17 (54.84%)	1 (100.00%)	-	-
	Moderate	8 (25.81%)	0 (0.00%)	0.686	0.823
	Severe	6 (19.35%)	0 (0.00%)	0.897	0.95
Polycythemia Vera	**Mild**	17 (54.84%)	1 (100.00%)	-	-
	Moderate	8 (25.81%)	0 (0.00%)	0.686	0.823
	Severe	6 (19.35%)	0 (0.00%)	0.897	0.95
CML	**Mild**	15 (62.50%)	3 (37.50%)	-	-
	Moderate	6 (25.00%)	2 (25.00%)	1.667	0.621
	Severe	3 (12.50%)	3 (37.50%)	5	0.119
CLL	**Mild**	16 (55.17%)	2 (66.67%)	-	-
	Moderate	7 (24.14%)	1 (33.33%)	1.143	0.919
	Severe	6 (20.69%)	0 (0.00%)	0.508	0.675
AITL	**Mild**	17 (56.67%)	1 (50.00%)	-	-
	Moderate	7 (23.33%)	1 (50.00%)	2.429	0.55
	Severe	6 (20.00%)	0 (0.00%)	0.897	0.95
MF	**Mild**	17 (54.84%)	1 (100.00%)	-	-
	Moderate	8 (25.81%)	0 (0.00%)	0.686	0.823
	Severe	6 (19.35%)	0 (0.00%)	0.897	0.95
ALL	**Mild**	17 (58.62%)	1 (33.33%)	-	-
	Moderate	7 (24.14%)	1 (33.33%)	2.429	0.55

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	Severe	5 (17.24%)	1 (33.33%)	3.4	0.415
HL	**Mild**	17 (58.62%)	1 (33.33%)	-	-
	Moderate	7 (24.14%)	1 (33.33%)	2.429	0.55
	Severe	5 (17.24%)	1 (33.33%)	3.4	0.415
MDS	**Mild**	17 (56.67%)	1 (50.00%)	-	-
	Moderate	7 (23.33%)	1 (50.00%)	2.429	0.55
	Severe	6 (20.00%)	0 (0.00%)	0.897	0.95
Mastocytosis	**Mild**	17 (54.84%)	1 (100.00%)	-	-
	Moderate	8 (25.81%)	0 (0.00%)	0.686	0.823
	Severe	6 (19.35%)	0 (0.00%)	0.897	0.95
Multiple Myeloma	**Mild**	17 (54.84%)	1 (100.00%)	-	-
	Moderate	8 (25.81%)	0 (0.00%)	0.686	0.823
	Severe	6 (19.35%)	0 (0.00%)	0.897	0.95
AML-M4	**Mild**	17 (54.84%)	1 (100.00%)	-	-
	Moderate	8 (25.81%)	0 (0.00%)	0.686	0.823
	Severe	6 (19.35%)	0 (0.00%)	0.897	0.95
PTCL	**Mild**	17 (54.84%)	1 (100.00%)	-	-
	Moderate	8 (25.81%)	0 (0.00%)	0.686	0.823
	Severe	6 (19.35%)	0 (0.00%)	0.897	0.95

Table 4: Absolute Eosinophil Count at 2nd visit for various conditions among study participants

Condition	AEC at 2nd Visit	No	Yes	Odds Ratio	P Value
		Frequency (%)			
B-ALL/Eo	**Mild**	20 (64.52%)	0 (0.00%)	-	-
	Moderate	6 (19.35%)	0 (0.00%)	3.154	0.575
	Severe	5 (16.13%)	1 (100.00%)	11.182	0.156
NHL	**Mild**	18 (60.00%)	2 (100.00%)	-	-
	Moderate	6 (20.00%)	0 (0.00%)	0.569	0.727
	Severe	6 (20.00%)	0 (0.00%)	0.569	0.727
AML	**Mild**	19 (61.29%)	1 (100.00%)	-	-
	Moderate	6 (19.35%)	0 (0.00%)	1	1
	Severe	6 (19.35%)	0 (0.00%)	1	1
ATLL	**Mild**	19 (61.29%)	1 (100.00%)	-	-
	Moderate	6 (19.35%)	0 (0.00%)	1	1
	Severe	6 (19.35%)	0 (0.00%)	1	1
Polycythemia Vera	**Mild**	19 (61.29%)	1 (100.00%)	-	-
	Moderate	6 (19.35%)	0 (0.00%)	1	1
	Severe	6 (19.35%)	0 (0.00%)	1	1
CML	**Mild**	17 (70.83%)	3 (37.50%)	-	-
	Moderate	4 (16.67%)	2 (25.00%)	2.833	0.33
	Severe	3 (12.50%)	3 (37.50%)	5.667	0.092
CLL	**Mild**	18 (62.07%)	2 (66.67%)	-	-
	Moderate	5 (17.24%)	1 (33.33%)	1.8	0.657
	Severe	6 (20.69%)	0 (0.00%)	0.569	0.727
AITL	**Mild**	18 (60.00%)	2 (100.00%)	-	-
	Moderate	6 (20.00%)	0 (0.00%)	0.569	0.727
	Severe	6 (20.00%)	0 (0.00%)	0.569	0.727
MF	**Mild**	19 (61.29%)	1 (100.00%)	-	-
	Moderate	6 (19.35%)	0 (0.00%)	1	1
	Severe	6 (19.35%)	0 (0.00%)	1	1
ALL	**Mild**	20 (68.97%)	0 (0.00%)	-	-
	Moderate	4 (13.79%)	2 (66.67%)	22.778	0.056
	Severe	5 (17.24%)	1 (33.33%)	11.182	0.156
HL	**Mild**	18 (62.07%)	2 (66.67%)	-	-
	Moderate	6 (20.69%)	0 (0.00%)	0.569	0.727
	Severe	5 (17.24%)	1 (33.33%)	1.8	0.657
MDS	**Mild**	18 (60.00%)	2 (100.00%)	-	-
	Moderate	6 (20.00%)	0 (0.00%)	0.569	0.727
	Severe	6 (20.00%)	0 (0.00%)	0.569	0.727
Mastocytosis	**Mild**	19 (61.29%)	1 (100.00%)	-	-
	Moderate	6 (19.35%)	0 (0.00%)	1	1
	Severe	6 (19.35%)	0 (0.00%)	1	1
Multiple Myeloma	**Mild**	19 (61.29%)	1 (100.00%)	-	-
	Moderate	6 (19.35%)	0 (0.00%)	1	1
	Severe	6 (19.35%)	0 (0.00%)	1	1
AML-M4	**Mild**	20 (64.52%)	0 (0.00%)	-	-
	Moderate	5 (16.13%)	1 (100.00%)	11.182	0.156
	Severe	6 (19.35%)	0 (0.00%)	3.154	0.575
PTCL	**Mild**	19 (61.29%)	1 (100.00%)	-	-
	Moderate	6 (19.35%)	0 (0.00%)	1	1
	Severe	6 (19.35%)	0 (0.00%)	1	1

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Table 5: the distribution of incident cases of disease in Eosinophil groups

Types of Malignancy	Eosinophil Count ≤0.16×10⁹	Eosinophil Count ≥0.5×10⁹
	Frequency (%)	
AITL	2 (3.85%)	2 (6.25%)
ALL	11 (21.15%)	3 (9.38%)
AML	4 (7.69%)	1 (3.13%)
AML-M4	3 (5.77%)	1 (3.13%)
ATLL	4 (7.69%)	1 (3.13%)
B-ALL/Eo	0 (0.00%)	1 (3.13%)
CLL	4 (7.69%)	3 (9.38%)
CML	4 (7.69%)	8 (25.00%)
HL	2 (3.85%)	3 (9.38%)
Mastocytosis	0 (0.00%)	1 (3.13%)
MDS	12 (23.08%)	2 (6.25%)
MF	0 (0.00%)	1 (3.13%)
Multiple Myeloma	2 (3.85%)	1 (3.13%)
NHL	4 (7.69%)	2 (6.25%)
Polycythemia Vera	0 (0.00%)	1 (3.13%)
PTCL	0 (0.00%)	1 (3.13%)

DISCUSSION

Many types of human cancer are associated with extensive eosinophilia, either within the tumor itself or in the peripheral blood, or in both locations.[14] Eosinophils may play an important role in the host's interaction with the tumor, perhaps by promoting angiogenesis and connective tissue formation adjacent to the cancer.[15] This study was undertaken to evaluate the clinical significance and profile of eosinophilia in hematological malignancy.

A total of 32 patients with hematological malignancies and eosinophilia, of either sex, were admitted to the department of hematology and medicine and included in the study. The youngest patient in our study was 18 years old, and the oldest was 72 years old, with a mean age of 44.28 years, a standard deviation of 17.13. The majority of patients belonged to the age group of 51-60 years (n=11, 34.38%). This study included 26 males (81.25%) and 6 females (18.75%). Out of the 32 enrolled patients in the study, 25% (8/32) had CML, and CLL, ALL, and HL each accounted for 9.38% of cases. AITL, MDS, and NHL each had 6.25% of cases. The incidence of other disorders such as AML, ATLL, MF, PTCL, polycythemia vera, and mastocytosis was 3.13% each.

We then compared the incidence of disease diagnosis below (≤0.16×109/L) and above (≥0.5×109/L) eosinophilic counts for hematological malignancies to shed light on the mechanism behind the observed increases in risk for low eosinophil counts. Overall, the distributions differed significantly ($p<0.001$). Eosinophil counts below (≤0.16×109/L) were associated relatively more with acute leukemia (7.8% vs. 3.13%) and myelodysplastic syndrome (23.07% vs. 6.25%), whereas eosinophil counts above (≥0.5×109/L) were associated more with myeloproliferative neoplasms such as CML (7.6% vs. 25%), polycythemia vera (0% vs. 3.3%), and mastocytosis (0% vs. 3.13%). Risk associations for low eosinophil counts were less strong.

The observed risk for hematological malignancy is important for physicians who manage patients with unexplained eosinophilia, as mild to moderate eosinophilia (as defined above) confers maximally increased risks of subsequent/subclinical hematological malignancy. Such patients may be considered for referral to specialist hematology care.[16,17]

Eosinophil counts above the median value were more associated with myeloproliferative neoplasms than were counts below the median; an increased number of eosinophils are present to a varying extent as part of these clonal disorders, particularly in chronic myeloid leukemia and polycythemia vera. Conversely, the association of low eosinophil counts (≤0.16×109/L) with the diagnosis of AML and myelodysplastic syndrome (MDS) may be explained by defective production of mature granulocytes, which is the hallmark of these disease entities. Concurrent increases in the risk of mortality at low eosinophil counts correlate well with the seriousness of these conditions. This finding likely reflects that patient with MDS and, to a greater extent, acute leukemias are symptomatic or promptly referred to secondary care.[18,19]

Signaling in T-cell disorders from interleukin and other cytokines causes eosinophilia in adult T-cell lymphoma, angioimmunoblastic T-cell lymphoma, and some other non-Hodgkin T-cell diseases. To the best of our knowledge, no study published in Indian literature has evaluated the clinical significance and profile of eosinophilia in hematological malignancy.[20,21]

In our study, 9.38% of patients with HD had mild eosinophilia. Roufosse et al., demonstrated peripheral blood eosinophilia in approximately 15% of patients with HD, which was generally mild.[22] Our study showed peripheral blood eosinophilia (mild) in 3.13% of cases with skin and spleen involvement, compared to a study by Utsunomiya et al., where peripheral blood eosinophilia (>570/mm3) was observed in roughly one-fifth of patients with ATLL.[23] A study by Mourad et al.,

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reported hypereosinophilia (>500/mm3) in one-third to one-half of cases at the time of diagnosis, while our study found mild eosinophilia in 6.25% of cases of angioimmunoblastic T-cell lymphoma.[3]

HE precedes the diagnosis of B-ALL in about half of the cases (with a median time to diagnosis of malignancy of 2 months) and occurs concomitantly in the other half. Blood eosinophil levels may be extremely elevated, with a median absolute count of 10,780/mm3.[24] In contrast to CD4 T-cell LPD, HE complicating B-ALL has a major impact on the clinical course and prognosis in a substantial proportion of patients. Our study had 3.13% of cases with B-cell acute lymphoblastic leukemia with severe eosinophilia in peripheral blood.

Limitations

One of the major limitations of this study is the small size of the study cohort, which restricts the generalizability of the findings. Additionally, due to time constraints, follow-up was not conducted, preventing an assessment of mortality or response to treatment. Several other limitations should be noted. First, we did not have information regarding treatment with ayurvedic or homeopathic drugs. Various locally or conventionally used drugs can induce eosinophilia, while others, particularly steroids, are known to cause eosinophilic apoptosis. The presence of co-morbid conditions for which steroids might be prescribed could confound our results. To address this, we implemented the Charlson Comorbidity Index in the risk analysis.

Second, patients with solid cancers were excluded from the study, which limits the scope of our findings to hematological malignancies. The influence of variables such as weight, smoking, alcohol consumption, exercise, and family history on hematological malignancies and eosinophil counts remains unclear and was not examined in detail.

CONCLUSION

This study gave an insight to know the clinical significance and profile of eosinophili in hematological malignancy. In conclusion our study demonstrates that there is association between blood eosinophilia and CML and clonal myeloproliferative disorders. This study clearly shows that unexplained eosinophilia should prompt consideration of these rarer and serious conditions where early diagnosis may improve prognosis. This is a study has raised questions that deserves consideration in future pre-clinical and prospective clinical trials in large cohort.

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