



SPECTRUM OF HAEMATOLOGICAL MALIGNANCIES AT TERTIARY CARE CENTER: A THREE-YEAR STUDY

Medical Science

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ABSTRACT

Background: Leukemias are the common hematological disorders in all the age groups ranging from pediatric to adults. For diagnosis of leukemias, peripheral smear examination along with bone marrow examination with complete clinical history is commonly done. However, for confirmation and deciding the line of management, ancillary techniques such as flow cytometry, FISH, immunophenotyping, etc. are essential. The study was conducted with a view to study the spectrum of hematological malignancies at our tertiary care center. **Material & Methods:** This is a two-year prospective and one-year retrospective study conducted in the Department of Pathology, Government Medical College and Hospital, Aurangabad from Sept-2019 to Sept-2022. A detailed clinical history, physical examination and laboratory examination of all the cases were done.

Results: Out of 100 cases, maximum cases were of Acute myeloid leukemia (46%), followed by Chronic myeloid leukemia (31%), Acute lymphoblastic leukemia (11%), Acute promyelocytic leukemia (6%), Chronic lymphocytic leukemia (3%), and Multiple myeloma (3%).

Conclusion: In our study, Acute myeloid leukemia was the most common subtype of leukemia in all the age groups. Detailed hematological analysis and peripheral blood smear examination with bone marrow aspirate examination coupled with ancillary techniques is very important for the diagnosis of hematological malignancies.

KEYWORDS

Haematological malignancy, Leukemia, AML.

INTRODUCTION

We live in an increasingly interconnected, global community with a fast-growing population. On one hand, we see rapid advances in healthcare as a result of global cooperation, while on the other hand disparities in healthcare are becoming apparent¹. Blood disorders are very common among different age groups. They usually range from anemias to advanced haematological malignancies². Haematological malignancies have historically been at the vanguard amongst cancers in the use of genetic analyses for diagnosis, classification, prognostication, and therapeutic decision-making. Genetic characterization is vital in the clinical evaluation of every form of hematologic malignancy and has continuously evolved with an increased genomic evaluation of cancer and improvements in molecular diagnostic technologies³. Haematological malignancies make up a fifth of the most commonly occurring cancers and the second leading cause of cancer mortality⁴.

The study was conducted to diagnose haematological malignancies based on peripheral smear examination, bone marrow aspirate examination, and ancillary techniques.

AIM AND OBJECTIVES

1. To study the pattern of haematological malignancies presenting to our hospital with respect to clinical, haematological and morphological characteristics.
2. To calculate male: female ratio.
3. To calculate the male: female ratio with respect to a particular malignancy.
4. To find out the commonest malignancy among all the haematological malignancies presenting to our hospital.

MATERIAL AND METHODS

The present study was a two-year prospective and one-year retrospective study conducted at Department of Pathology, Government medical college and Hospital, Aurangabad during the period from September 2019 to September 2022. A total of 100 cases were diagnosed as having haematological malignancy. Only those cases were included in the study whose bone marrow aspiration samples along with peripheral blood samples were sent to the department of Pathology. Detailed history, important clinical findings and relevant investigations were noted as per the case proforma. The peripheral blood smears and bone marrow aspiration smears were stained with Leishman stain and wherever applicable cytochemistry was done.

RESULTS

Table 1.1: Distribution Of Leukaemia Cases Reported (n=100)

Type of Leukaemia	No of cases	Percentage (%)
AML	46	46
APML	6	6
B-ALL	5	5
CLL	3	3
CML	31	31
MM	3	3
T-ALL	6	6
Total	100	100

Out of total 100 cases encountered Acute myeloid leukaemia was the most common accounting for 46% followed by chronic myeloid Leukaemia accounting 31%, followed by Acute Promyelocytic Leukaemia and T lymphoblastic Leukaemia and Multiple myeloma being least common.

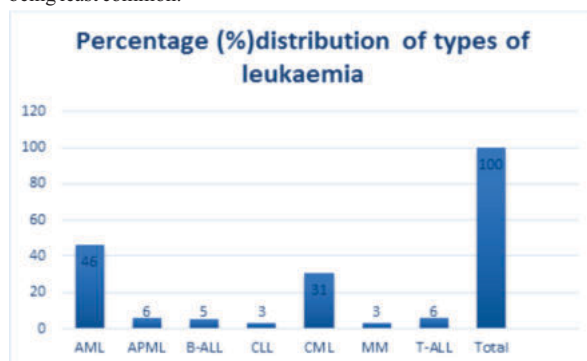


Table 1.2. Frequency And Age Range Distribution Of Cases Of Leukaemia

Malignancy	<10	11-20	21-30	31-40	41-50	51-60	61>	TOTAL
AML	16	12	8	5	1		4	46
APML		2	3	1				6
B ALL	2	1	2					5
CLL				1			2	3
CML	1	4	4	6	5	5	6	31
MM				1	1		1	3
T ALL	4	2						6
TOTAL	23	21	17	14	7	5	13	100

In the present study, it is observed that most of the cases were seen in the age group of 0-10 years with 16% cases of AML in the said group,

APML showed all the cases in the young population. All the cases of B ALL and T ALL were seen in the pediatric population. On the contrary, all cases of CLL and MM were seen in older adults. The age group affected by AML and CML varied from 7 months to 73 years. The higher number of cases were of adult population in case of CML.

Table 1.3: Gender Distribution Among Types Of Leukaemia

Type of Leukaemia	Male		Female		Total
	No of cases	Percentage (%)	No of cases	Percentage (%)	
AML	25	54.34	21	45.65	46
APML	3	50	3	50	6
B ALL	1	20	4	80	5
CLL	1	33.33	2	66.66	3
CML	20	64.51	11	35.48	31
MM	2	66.66	1	33.33	3
T ALL	4	66.66	2	33.33	6
Total	56		44		100

In our study, maximum cases in males were of Acute myeloid Leukaemia being 54.34%, similarly CML also showed a male preponderance with 64.51%.

However, CLL and B-ALL showed a female preponderance with 66.66% of cases. APML showed the equal number of cases in males and females. MM and T ALL showed a slight male preponderance with 66.66% cases in both.

Table 1.4: M:F Ratio Among Types Of Leukaemia

Malignancies	M:F Ratio
Acute Myeloid Leukaemia(AML)	1.19:1
Acute promyelocytic Leukaemia(APML)	1:1
B-Lymphoblastic Leukaemia(B-ALL)	0.25:1
Chronic lymphoid Leukaemia (CLL)	0.5:1
Chronic Myeloid Leukaemia(CML)	1.81:1
Multiple myeloma (MM)	2:1
T-Lymphoblastic Leukaemia(T-ALL)	2:1

In the present study, the male preponderance is seen in AML, MM, CML, T ALL with male: female ratio of 1.19:1, 2:1, 1.81:1 and 2:1 respectively. However, B-ALL and CLL showed a slight female preponderance with male: female ratio of 0.25:1 and 0.25:1

Table 1.5 Clinical Features Of Leukaemia Cases

Clinical features	Frequency	Percentage
Fever	70	70
Weakness	42	42
Abdominal pain	13	13
Bleeding tendency	6	6
Splenomegaly	38	38
Hepatomegaly	43	43
Lymphadenopathy	11	11

It was observed in the present study that the most common presenting feature was fever (70%) followed by generalized weakness (42%). Other complaints included skin ecchymoses, bone pain, breathlessness, giddiness and abdominal fullness.

Patients Diagnosed with Multiple myeloma gave history of multiple bone pains (100%). Abdominal pain, fullness and breathlessness were the main symptom presented by patients of CML. Splenomegaly (38%) and hepatomegaly (43%) were the predominant features in most of the patients.

DISCUSSION

Haematological disorders are the major global health problem which is affecting both developed and developing nations. Peripheral smear and bone marrow aspiration are the obligatory tools for the assessment of bone marrow cellularity, fibrosis, metastatic deposits and architectural patterns^{8,9}.

The mean age observed in the present study is 28.8 years, in accordance with the mean age observed by the study by Singh et al⁹. Studies done by others observed a mean age of somewhat older age group. The possible reason must be the differences in the epidemiological patterns of leukaemia in different regions.

In our study, the male: female ratio observed is 1.27:1 which is similar

to studies done by Anjum et al², Ishwar et al⁹ and Gajender et al⁵.

Overall there were 54 males and 46 females. In our study, most of the cases were observed in the age group of 0-10 years being 23% which is similar to the study done by Gajender et al⁵. Next common age group is 11-20 years which is again similar to the study done by Gajender et al⁵.

The most common clinical feature observed in our study is fever and pallor which is similar to that observed in the studies done by Singh et al⁹, Jain et al¹² and Naghmi et al¹³. Weakness is also observed in most of the patients which is in accordance with the studies done by Singh et al⁹, Jain et al¹² and Naghmi et al¹³. Splenomegaly and hepatomegaly are observed in 38% and 43% patients which is also a finding in studies done by Singh et al⁹ and Naghmi et al¹³. Lymphadenopathy is less commonly observed being seen only in 11% of patients.

In our study, the total number of all malignancies at all sites seen during the study period were 3981 and 100 haematological malignancies were studied on bone marrow aspiration which accounted for 2.51% compared to malignancies at other sites. The studies done by Errahhali et al⁶ and Kingsley et al⁴ showed a slightly higher percentage of HM due to the variations in the epidemiology of HM. The variability of risk factors from one locality to another and health seeking behaviour contribute to the prevalence rate of the community. Availability and accessibility to cancer preventive and control measures may too contribute to the relatively lower rate reported in the present study.

In our study, AML was the most common malignancy accounting for 46% cases which is in accordance with the studies conducted by Nabneet et al⁷ and Humayun et al¹⁰. Next to AML, the second most common Leukaemia found in the present study is CML accounting for 31% which is in concordance with the studies conducted by Gajender et al⁵ and Nabneet et al⁷.

Similarly, CLL and MM accounted for 3% of cases respectively which is in concordance with the studies conducted by Gajender et al⁵, Humayun et al¹⁰, Nabneet et al⁷ and Nasim et al¹¹. Accordingly, MM cases are in concordance with the studies conducted by Nabneet et al⁷.

CONCLUSION

Any age group can develop haematological malignancies, though men are more frequently affected. Children and adolescents frequently develop haematological malignancies from precursor T and B cells. With the combination of morphological findings and flow cytometry, we can accurately diagnose the lineage of Leukaemia which aids in the treatment of patients. Present study was conducted at a tertiary care centre where the bulk of patients come from periphery and rural areas. Late presentation to health care centre was observed due to ignorance of preliminary symptoms such as fever, weakness, abdominal pain, lack of awareness, negligence and preference for age old traditional remedies for treatment. It is the need of hour to create awareness among people about early approach to hospital and periodic blood check-ups. There is a need to educate people about the alarming symptoms, greater vigilance in the diagnosis, and an interdisciplinary approach is needed for the effective management of the haematological malignancies.

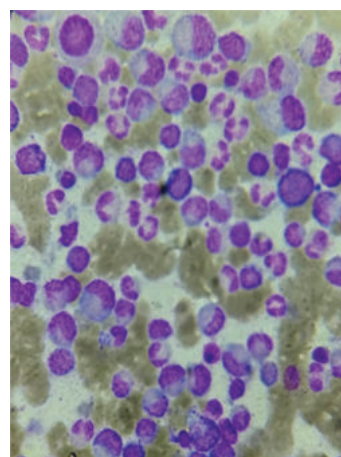


Figure 1. BM Showing 100x View With Left Shifted Leucocytosis With Increased Myelocytes

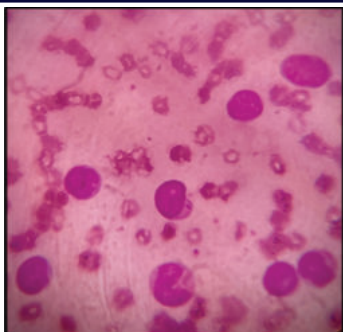


Figure 2. PS Showing 100x View Of Auer Rods In The Blasts In A Patient Of AML

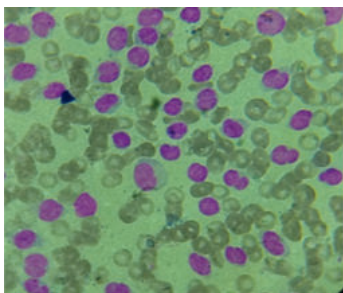


Figure 3. PS Showing 100x View Of Increased Atypical Lymphoid Cells And Lymphoblasts

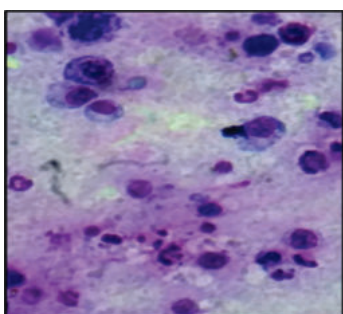


Figure 4. BM Showing 100x View Of Increased Plasma Cells In A Patient Of MM

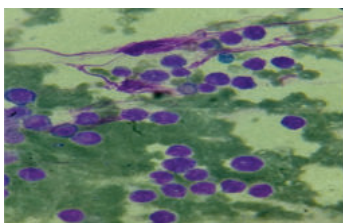


Figure 5. Bm Showing 100x View With Lymphocytosis In A Patient Of CLL

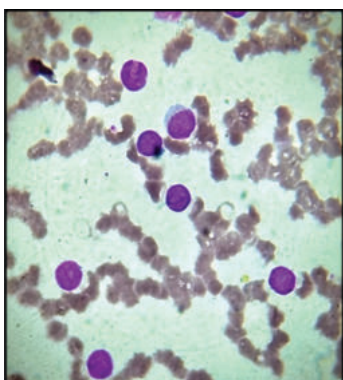


Figure 6. BM Showing 100x View Of Increased Atypical Lymphoid Cells And Lymphoblasts

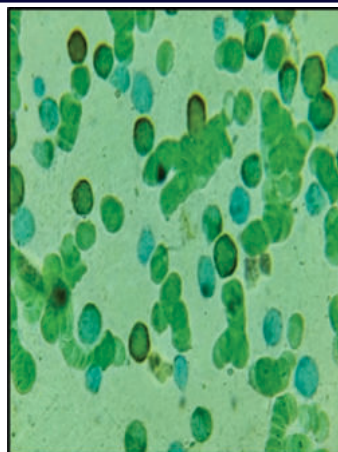


Figure 7. MPO Positive Blasts

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