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Original Article

# The Prospective Study on Acute Leukemia in Tertiary Care Teaching Hospital in Rajsamand

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## ABSTRACT

***Background:*** *Acute leukemia are characterized by clonal expansion of immature myeloid or lymphoid precursors (blasts). The blasts cells are known to replace the normal hematopoietic tissues and to invade other organs of the body as well. Anemia, hemorrhage and infections occurring due to bone marrow failure are the top three complications of acute leukemia.*
***Methods:*** *This study was carried out in the Department of Pathology, Ananta Institute of Medical Sciences and Research Centre, Rajsamand*
***Results:*** *In The present study, 32 cases of different patterns of acute leukemia were reported. According to hematological parameters, 25 cases (78.1%), 2 cases (6.25%), 3 cases (28.1%) and 2 cases (6.25%) were reported as acute leukemia, AML, ALL and bi-lineage leukemia respectively.*
***Conclusions:*** *The present study showed that AML is more prevalent than ALL. It is observed that ALL is more common in children. The incidence of AML is higher in adults in comparison to children and decreases towards older age.*

***Keywords:*** *acute leukemia's, heterogeneous, hematological ,ALL, ALM*

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## INTRODUCTION

It is a known fact that acute leukemias are heterogeneous group of hematological malignancies. Acute leukemias are characterized by clonal expansion of immature myeloid or lymphoid precursors (blasts). The blasts cells are known to replace the normal hematopoietic tissues and to invade other organs of the body as well. Anemia, hemorrhage and infections occurring due to bone marrow failure are the top three complications of acute leukemia[1-3] and may even be fatal. Acute leukemias are among the most common childhood cancers. The percentage of blasts should be more than 20% in the marrow or peripheral blood for diagnosing as per WHO classification.[4]

Acute leukemias are classified morphologically, in two types acute myeloid leukemia (AML) and acute lymphoblastic leukemia (ALL). AML is the most common type of leukemias in adults while ALL, accounting for 80% of the total cases, is the most common type in children.[5,6] ALL is further subclassified in three subtypes L1-L3 while AML in eight subtypes M0-M7.[7] some cytoplasmic and surface proteins known as cluster differentiation (CD) antigens are expressed by every blood cell. A unique set of CD antigens is expressed at every level of differentiation. The identification and quantification of cellular antigens through fluorochrome labeled monoclonal 7 antibodies are known as immunophenotyping.[8]

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**Source of Support:** Nil, **Conflict of Interest:** None

## METHODS

**Study population:-** A total of 32 cases of acute leukemia's were reported in the Haematology section.

**Study Area:-** This study was carried out in the Department of Pathology, Ananta Institute of Medical Sciences and Research Centre, Rajsamand.

**Data Collection:-** The complete haemograms were determined according to standard laboratory procedures. Slides were prepared with peripheral blood and in selected cases bone marrow aspirates which were stained by 'Leishman stain' and 'Giemsa stain' to find out the blast cells morphology in peripheral blood and bone marrow. Diagnosis of acute leukemia was made in cases where blast percentage was ≥20% (WHO guideline) and then Flow cytometric immunophenotyping was performed to distinguish between AML & ALL.

**Data analysis:-**Data were analyzed by using Microsoft excel.

## RESULTS

In The present study, 32 cases of different patterns of acute leukemia were reported. According to hematological parameters, 25 cases (78.1%), 2 cases (6.25%), 3 cases (28.1%) and 2 cases (6.25%) were reported as acute leukemia, AML, ALL and bi-lineage leukemia respectively. The lowest blast percentage was 18.7% and highest was 31.25%. The hematological diagnosis (by means of complete blood count (CBC) / peripheral blood smear (PBS) / bone marrow aspirates (BMA)) and the number of cases that fall in different ranges of haemoglobin (Hb) level, total leucocyte count (TLC), platelet count (Plt.) and blast percentage are detailed in chart 3-7.

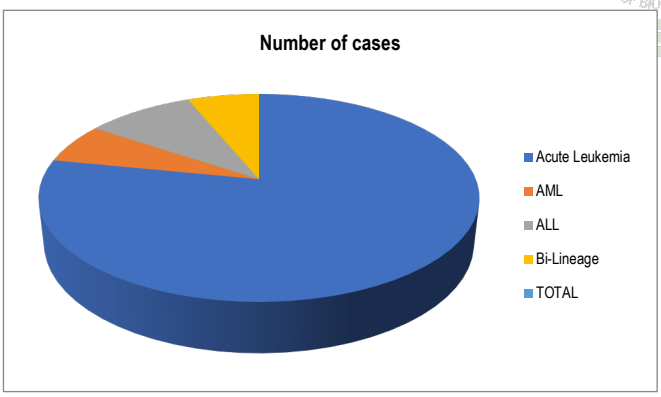


Chart 1: Distribution of hematological diagnosis

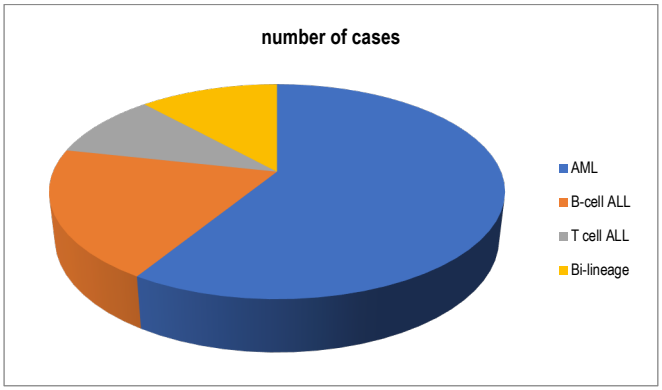


Chart 2: Distribution of Immunophenotypical diagnosis

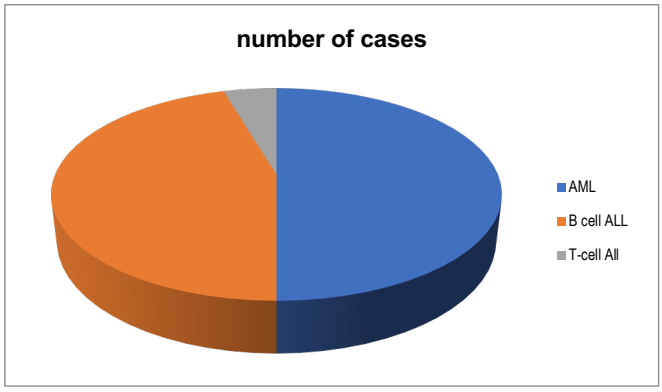


Chart 3: Distribution of Immunophenotypical diagnosis

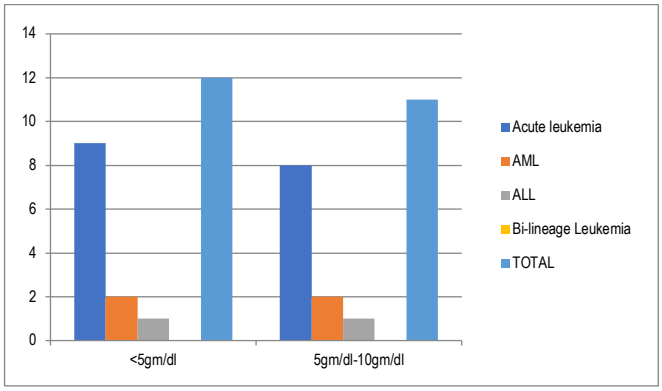


Chart 4: Hemoglobin findings of all cases presenting as acute form of leukemia

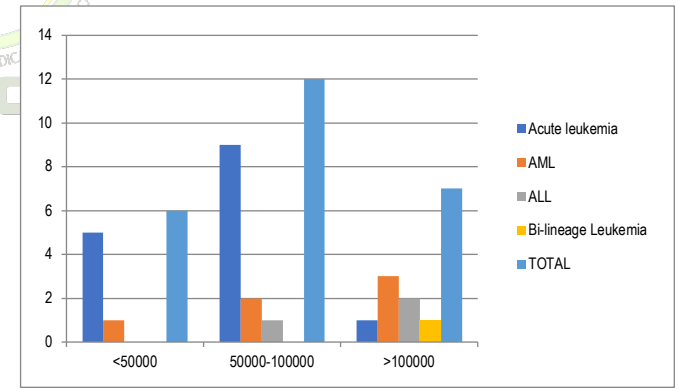


Chart 5: Total leucocyte count findings of all cases presenting as acute form of leukemia

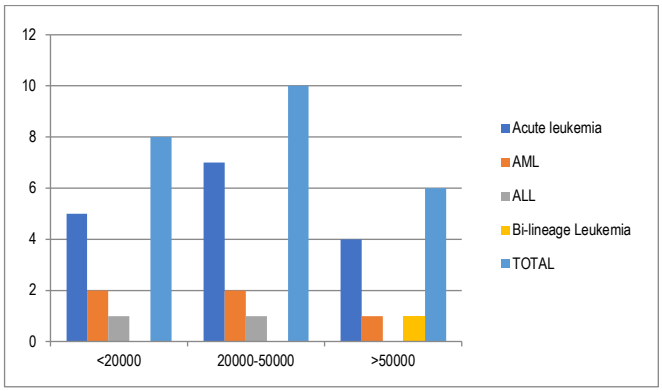


Chart 6: Platelets count findings of all cases presenting as acute form of leukemia

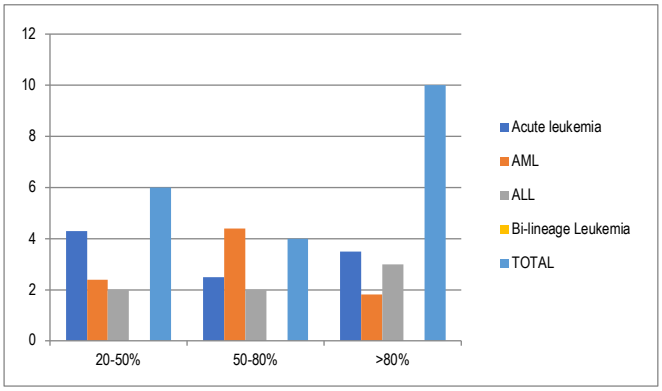


**Chart 7: Platelets count findings of all cases presenting as acute form of leukemia**

## DISCUSSION

In the present study, anaemia was diagnosed in all cases and 37.5% of the total cases presented with severe anaemia with less than 5.0 g/dl of haemoglobin concentration. TLC was found to be more than 50,000/ cu.mm in 25% of patients, while such high TLC was present in only forty to fifty percent of cases in western studies.[9] 18.75% of the patients presented with less than 50,000/cu.mm platelet counts while 25% of patients had severe thrombocytopenia with platelet count less than 20,000/cu.mm. The results of the present study were almost similar to the local studies but on comparison with western studies, the results are more manifested. These marked results can be attributed to the late presentation as the degree of anaemia; leucocytosis and thrombocytopenia are directly proportional to severity of bone-marrow failure.[10] Immunophenotypic observations of AML (HLA-DR, CD13, CD33, MPO) in the presented study were supported by other studies.[11-12] On the other hand, B-cell and T- cell ALL were diagnosed in immunophenotypically cases. These findings were supported by observations of Shanta V et al. and Magrath I et al.[13-14] The results of the present study of the aberrant expression of lymphoid antigens (CD22, CD79a) in AML were also similar to the findings of the Ghosh S et al studies. Considering the different types of acute leukemia it was observed that AML was more common than ALL . These results are closely resembled to results reported from Kenya in Africa.[15]

## CONCLUSION

The present study showed that AML is more prevalent than ALL. It is observed that ALL is more common in children. The incidence of AML is higher in adults in comparison to children and decreases towards older age.

In morphologically challenging cases, it is also concluded that immunophenotyping is an important diagnostic tool to differentiate between AML and ALL. It is possible to subtype as well as to establish the lineage of the leukemia from immunophenotyping. It is also essential to monitor the progress of patients after chemotherapy in detection of minimal residual disease.

## REFERENCES


1. Robins L, Kumar VD. Haematopoietic and lymphoid system. In: Basic Pathology.
2. 4th Ed. Philadelphia: Saunders; 1987: p. 351-406.
3. Childs c.c; and Stass SA. Introduction, Characterization & Diagnosis of acute leukemia. In the Acute Leukemia. (ed by) Stass SA. New York and Basel. Marcel Dekker Inc; 1987: p.1-26
4. Bonnet D, John ED. Human AML is organized as a hierarchy that originates from a primitive haematopioetic cell. Nature Medicine Vol. 3 July 1997. p.730-37.
5. Jaffe ES, Harris NL, Stein H, Vardiman JW, eds. World Health Organization Classification of Tumours. Pathology and Genetics of Tumours of Haematopoietic and Lymphoid Tissues. Lyon: IARC, 2001.
6. Luke KH. Paediatric oncology – current clinical practice. Medicine N. Am 1989;30:5569- 5579.
7. Neglia JP, Robison LL. Epidemiology of the childhood acute Leukemia: Prediartic Clinics No. Am 1988;35:676- 92.
8. Harris NL, Jaffe ES, Diebold J, Flandrin G, Muller-Hermelink HK, Vardiman J, et al. World Health Organization classification of neoplastic diseases of the hematopoietic and lymphoid tissues: Report of the clinical advisory committee meeting-Airlie house, Virginia, November 1997. J Clin Oncol 1999;17:3835-49.
9. Gupta A, Pal A, Nelson SS. Immunophenotyping in Acute Leukemia: A Clinical Study. International Journal of Scientific Study; August 2015, Vol 3, Issue 5, p.130
10. Poplack DC; and Reaman G: Acute Lymphoblastic Leukemia in childhood. Prediartic clinics N. Am 1988; 35: 903-32.
11. Noor NA, Masood M. Clinico-epidemiological study of Leukemia in Multan: Pak J Med Research 1989; 28: 232-43.
12. Khalidi HS, Medeiros LJ, Chang KL, Brynes RK, Slovak ML, Arber DA. □e immunophenotype of adult acute myeloid leukemia: High frequency of lymphoid antigen expression and comparison of immunophenotype, French-American-British classification, and karyotypic abnormalities. Am J Clin Pathol 1998;109:211-20.
13. Ghosh S, Shinde SC, Kumaran GS, Sapre RS, Dhond SR, Badrinath Y, et al. Haematologic and immunophenotypic profile of acute myeloid leukemia: An experience of Tata memorial hospital. Indian J Cancer 2003;40:71-6.
14. Shanta V, Maitreyan V, Sagar TG, Gajalakshmi CK, Rajalekshmy KR. Prognostic variables and survival in pediatric acute lymphoblastic leukemias: Cancer institute experience. Pediatr Hematol Oncol 1996;13:205-16.
15. Magrath I, Shanta V, Advani S, Adde M, Arya LS, Banavali S, et al. Treatment of acute lymphoblastic leukaemia in countries with limited resources; lessons from use of a single protocol in India over a twenty year period. Eur J Cancer 2005;41:1570-83.
16. Annual report. (1086-1987) Classification and diagnosis of leukemias.