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Clinical and Hematological Parameters in Patients with Acute Lymphoblastic Leukemia: A one year Study

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Abstract
Introduction: *Pediatric leukemia is the most common type of cancer in children. Around 95% cases of pediatric leukemia are acute, characterized by clonal expansion of immature hematopoietic precursor cells, which accounts for one third of all pediatric cancer patients. It is thus become important to recognize the disease on time to ensure good outcome and to prevent initial complications.*
Aim: *Study aim was to evaluate the clinical and hematological parameters in ALL patients.*
Material and Methods: *A one year study included 40 patients diagnosed as acute leukemia on peripheral smear in hematology section of Pathology department of MGM medical college Indore was done. Hematological parameters included leukocyte count , hemoglobin level , platelet count and percent of lymphoblasts in peripheral smear whereas the clinical parameters included fever, lymphadenopathy, hepatomegaly, splenomegaly etc .*
Results: *WBC ranged from less than10,000 – more than 500000/µL, Hgb between less than7 g/dl – more than 12.5 g/dl and Platelet from less than 20,000 – more than 01 lacs/µL. More than half of the children had all three lineages affected. In majority of patients fever, lymphadenopathy, hepatomegaly and splenomegaly was present with WBC > 20000/µL, Hgb < 120 g/L and Plt < 50000/µL.*
Conclusion: *Majority of patients has either clinical features or complete blood count values raising suspicion of ALL, but we point out to the patients with findings within the reference range. With the help of this research work we want to stress the importance of early recognition of signs and symptoms in children with ALL.*
Keywords: *acute lymphoblastic leukemia, clinical findings, hematological parameters.*

Introduction

Neoplasm as well known it occurs due to the deregulated proliferation of a single transformed cell. These neoplasm are either benign and malignant. The malignant neoplasm of the bone marrow are collectively known as leukemia which are further grouped as lymphoid, myeloid and histiocytic/ dendritic cell according to cell lineage. These myeloid and lymphoid neoplasm are further subgrouped as acute and chronic neoplasm.

Abnormal proliferation of lymphoid cell sometimes occurs within the lymphatic tissue or lymph nodes known as lymphoma. If the lymphoma affects the bone marrow and lymphoma cells are found in peripheral circulation, the leukemic phase of lymphoma is present.(1)

ALL is the most common cancer in children. Global incidence is about 3 per 100,000 population, in which 3 out of 4 cases occurring under 6 years age .(2) ALL accounts for 12% of all leukemia (but 80% in children).(3)

ALL is clonal malignant disease of immature precursors of lymphoid lineage, named lymphoblasts. Extensive growth of lymphoblasts suppresses the normal cell production in bone marrow causing various clinical findings such as pallor, fatigue, bleeding, fever, infection[4].

Detailed physical examination and blood count are in most cases sufficient for differential diagnosis in aim to rule out other medical conditions.

Fever is one of the most common symptoms in childhood and it is hard to distinguish it as a sign of leukemia[5].

Unilateral, generalized or persistently enlarged lymph nodes increase the attention to lymphoproliferative disorders, including ALL [4,6].

After the clinical findings CBC and peripheral smear (PS) are the first hematological investigation to be done.

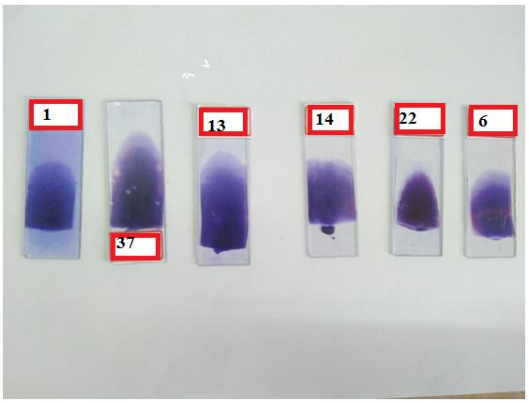
The severe thrombocytopenia can be prominent sign in pediatric patients with ALL, but is also diagnosed as isolated disorder.

Material and Methods

This study was conducted in Department of Pathology, Mahatma Gandhi Memorial Medical College and M.Y. Hospital, Indore, Madhya Pradesh, India. Permission was obtained from the departmental scientific committee and the institutional ethical committee at the beginning of the study. The study duration was June 2017 to July 2018. Sample size for the study was 40 cases.

All the clinical findings including fever, hepatomegaly, spleenomegaly, lymphadenopathy etc were noted down.

The routine hematological parameters and CBC of all the suspected cases was done with the help of cell counter maschine. After that peripheral examination was done to find out the blast percentage.



Each one of the case then categorizes according to clinical, hematological and blast percentage.

Results

Table: Age Wise Distribution of cases

Age Groups	No. of Cases	Percentage
0 – 15 Years	21	52.5%
15 – 35 Years	09	22.5%
35 – 50 Years	08	20.0%
More Than 50 Years	02	5.0%
Total Cases	40	100%

Table: Distribution of cases as per Clinical Symptoms

Sign And Symptoms	Number of Cases	Percentage
Fever	17	42.5%
Hepatomegaly	20	50%
splenomegaly	24	60%
Paleness	07	17.5%
Bleeding (e.g., petechiae or purpura)	10	25%
Lymphadenopathy	22	55%
Bone pain	03	7.5%
Abdominal pain	04	10%
Weight loss	02	5%

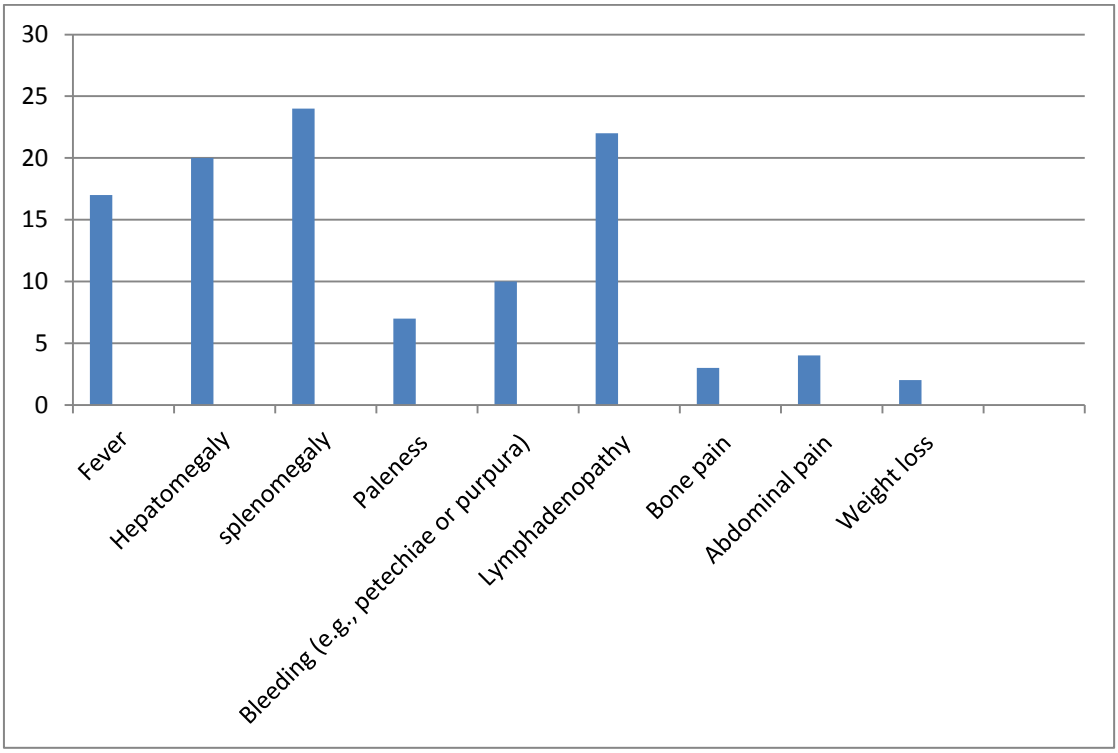


Figure: Bar Graph Showing Distribution of cases as per Clinical Symptoms

Table Showing Sex Wise Distribution

Sex	Number Of Cases	Percentage
Male	24	60%
Female	16	40%
Total	40	100%

Table: Distribution of Cases According to the Level of Hemoglobin

Level Of Hemoglobin	Number Of Cases	Percentage
< 7 Grams	18	45%
7 To 12.5 Grams	16	40%
>12.5 Grams	06	15%
Total	40	100%

Level of Hemoglobin shows majority of cases are anemic

Table: Distribution of cases According to WBC Count

WBC Count	Number of Cases	Percentage
<10,000	03	7%
10,000–49,000	15	38%
>50,000	22	55%
TOTAL	40	100%

Table: Distribution of Cases According to Platelet Count

Platelet Count	Number of Cases	Percentage
<20,000	17	42%
20,000-99000	19	48%
>1 LACS	04	10%
TOTAL	40	100%

Table: Distribution of Cases According to Blast Percentage

Blast Percent	Number of Cases	Percentage
<20%	02	05%
>20%	37	92.5%
OTHER	01	2.5%
TOTAL	40	100%

Discussion

Safoorah Khalid, et al showed in his study that the age of the patients ranged from 3 to 76 years with an average of 22±20 years, the paediatric patients were 18 (50%) of the cases with male to female ratio was 1:1.1. In our study maximum cases were under 20 year of age with male to female ratio of 1.5 which is nearly similar to this study.

Fareed Haddad et al in 2014 also found that around 63% of their patients were children (104

out of 165 patients) with age less than fourteen years old. 114 patients were male while 51 patients were female with male to female ratio 2.2: 1 whereas Precursor-B- acute lymphoblastic leukemia represents eighty percent (132 patients) of cases which was almost similar to our study**.**

Milica đorić et al in 2015 observed that WBC ranged from 1000 - 1050000/µL, Hgb between 40 - 156 g/L and Plt from 0 - 542000/µL. All the three lineages were affected, whereas the CBC remain within reference range in two patients. Only seven children they have the clinical findings. Majority of patients were presented with fever, lymphadenopathy, hepatomegaly and splenomegaly and they are strongly correlated with WBC > 20000/µL, Hgb < 120 g/L and Plt < 50000/µL which was nearly similar to our study

Conclusion

With the help of above thesis work we have observed that ALL is a most frequent childhood hematological neoplasm with male predominance

On peripheral smear examination around 37 cases (92.5%) were categorized as acute leukemia.

When we look for age wise distribution of cases, maximum cases they fall under 20 year of age i.e. about 27 cases (67.5%) which shows that ALL is most common among early age groups.

In clinical correlation it was concluded that maximum cases they presented with lymphadenopathy, hepatosplenomegaly and fever.

When hemogram parameters were studied it was observed that 90% cases have thrombocytopenia and 55% cases have WBC count more than 50,000 per microliter. 45% cases are severely anaemic and 40% have moderate anemia.

References

1. Mckenzie/Williams clinical laboratory hematology third edition.
2. Grigoropoulos NF, Petter R, Van 't Veer MB, et al; Leukaemia update. Part 1: diagnosis and management. BMJ. 2013 Mar 28346:f1660. doi: 10.1136
3. Redaelli A, Laskin BL, Stephens JM, et al; A systematic literature review of the clinical and epidemiological burden of acute lymphoblastic leukaemia (ALL). Eur J Cancer Care (Engl). 2005 Mar14(1):53
4. Hastings, C. A., Torkildson, J. C. & Agrawal, A. K. Evaluation of the Child with a Suspected Malignancy. In: Hastings, C. A., Torkildson, J. C. & Agrawal, A. K. Handbook of Pediatric Hematology and Oncology: Children's Hospital & Research Center Oakland. John Wiley & Sons, Ltd; 2012; p.122-132.
5. Marshall, G. S. Prolonged and recurrent fevers in children.J Infect, 68 Suppl 1, 2014.;S83-93.
6. Locke, R., Comfort, R. & Kubba, H. When does an enlarged cervical lymph node in a child need excision? A systematic review. Int J Pediatr Otorhinolaryngol, 2014; 78, 393-401.