

Spectrum of Clinical Presentations of Acute Leukemia in Tertiary Care Hospital of Jharkhand

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ABSTRACT

Objective: The clinical presentation of leukemia can vary widely in symptoms and signs, with different frequency in AML and ALL, whose prompt diagnosis and treatment are important for better survival. In current study we aimed to study spectrum of clinical presentations, age and sex factors, laboratory findings duration of symptoms in AML & ALL in pediatric patients of Rajendra Institute of Medical College, Ranchi.

Methodology: A retrospective documentary analysis of various clinical presentations of acute leukemias in childhood was conducted.

Results: Out of 2480 patients admitted during the study duration of 6 months, 26 patients were diagnosed as acute leukemia on the basis of 102 bone marrow studies with male to female ratio of 1.17:1. 30.8% cases were AML, 50% of cases were ALL while 19.2% cases of acute leukemia were unspecified.

Conclusion: The common symptoms in acute leukemia were weakness, fever, anorexia, pallor, localized swelling, weight loss, cough, arthralgia and pain abdomen. The commonest

were weakness, fever, anorexia and pallor. Anemia, lymphadenopathy and organomegaly was more common in ALL as compared with AML.

Keywords: Acute Leukemia, ALL, AML, Clinical Presentations, Pediatric Age.

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INTRODUCTION

The leukemias are the most common malignant neoplasms in childhood, accounting for approximately 31% of all malignancies that occur in children younger than 15 years of age. Acute lymphoblastic leukemia (ALL) accounts for approximately 77% of cases of childhood leukemia, acute myelogenous leukemia (AML) for approximately 11%, chronic myelogenous leukemia (CML) for 2-3%, and juvenile myelomonocytic leukemia (JMML) for 1-2%. The clinical features, laboratory findings, and responses to therapy vary depending on the type of leukemia.¹

The clinical presentation of leukemia can vary as per type. The initial presentation of acute leukemias are anorexia, fatigue, malaise and low-grade fever. Bone or joint pain, particularly in the lower extremities, may be present. As the disease progresses, signs and symptoms of bone marrow failure become more obvious with the occurrence of pallor, fatigue, exercise intolerance, bruising, or epistaxis. Organ infiltration can cause lymphadenopathy, hepatosplenomegaly, testicular enlargement,

or central nervous system (CNS) involvement. The varied clinical presentation of childhood leukemia makes the diagnosis difficult. The prompt diagnosis is necessary as early treatment can lead to early remission cure rate.

Currently, there is limited data regarding the prevalence of different types of acute leukemias in different parts of India and virtually no data at all from a state like Jharkhand. At present, there are no cancer registry programs in Jharkhand which can keep a track and notify regarding the prevalence and incidence of various types of cancers including leukemia in childhood. In a state like Jharkhand, the leukemia in pediatric age group is a serious health issue due to abundance of environmental risk factors.

This study may help to identify common and signs and symptoms of acute leukemia making early chemotherapy treatment possible, delay to which can lead to significant mortality which is 100 % without treatment.

Hence, the objective of this study is to observe and document various pediatric cases of acute leukemia with their different clinical presentations. We also tried to compare various clinical presentations in our series with observations of other authors reporting from various parts of country and abroad.

METHODS

A retrospective documentary analysis of admitted patients was conducted in Department of Pediatrics, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand.

A total of 102 bone marrow aspiration reports were reviewed which were performed during a duration of 6 months from October, 2017 to March, 2018. Out of these, 26 patients out of 2480 total admitted were diagnosed as suffering from different types of acute leukemias. The inclusion criterion was pediatric patients of both sexes and age group 0 to 18 years who were newly diagnosed as acute leukemia by bone marrow examination irrespective of age, gender, socio-economic status, ethnicity and geographical location. The exclusion criteria were all patients with diagnosis other than leukemia (e.g. anemia, idiopathic thrombocytopenic purpura, non-Hodgkin's lymphoma, marrow infiltration with lymphoma cells etc.). The data regarding age, gender, address, referring unit, presenting complaints, duration of illness, findings of clinical examination, peripheral blood smear findings and diagnosis on bone marrow examination.

RESULTS

Out of 2480 patients admitted during the study duration, 26 patients were diagnosed as suffering from different forms of acute leukemia on the basis of 102 bone marrow studies. 14 cases were

boys and 12 cases were girls (male: female ratio 1.17:1). The ages of 3.85% of patients were 0-11 months, 34.6% were between 1-5 years, 46.1% were between 6-12 years and 15.4% were between 13-18 years old. 30.8% cases were AML, 50% of cases were ALL while 19.2% cases of acute leukemia were unspecified. (Table 1)

Maximum cases from Palamu 15.4%, Ranchi 15.4%, Ramgarh 16.6% and the rest from Latehar, Giridih, Bokaro, Koderma, Lohardaga, Jamtara, Dumka, Hazaribagh, Gumla districts of Jharkhand and Sudargarh, Orissa. (Table 2)

Among the symptoms, most common were weakness, fever, anorexia, pallor, localized swelling in neck or other areas, weight loss, cough, arthralgia and pain abdomen. Other observed symptoms were abdominal distension, low back pain, rash, generalized swelling, headache, vomiting, ear ache, hearing loss, epistaxis, jaundice, malena and red urine. (Table 3)

Among the signs, most common were anemia (73.1%), lymphadenopathy (50%), hepatomegaly (50%) and splenomegaly (38.5%). Other uncommon signs were rashes, edema and anasarca present in 3.85% cases. Anemia, lymphadenopathy and organomegaly were more common in ALL than AML while rashes and edema were more common in AML than ALL. In one male case of ALL, anasarca was present. (Table 4)

The duration of symptoms was less than 28 days in 38.5% cases, one to two months in 11.5% cases, two to three months in 30.8% cases and three to six months in 19.2%. (Table 5)

In peripheral blood picture, anemia was present in 92% of cases, thrombocytopenia in 84%, leucocytosis in 38%, leucopenia in 30%, pancytopenia in 15% and blasts were present in 81% of slides. (Table 6)

Table 1: Age and Gender wise Distribution of Acute Leukemias

AGE	AML		ALL		UNSPECIFIED		TOTAL
	Male	Female	Male	Female	Male	Female	
0-11 months	1(3.85%)	0%	0%	0%	0%	0%	1(3.85%)
1-5 years	0%	0%	5(19.2%)	3(11.5%)	1(3.85%)	0%	9(34.6%)
6-12 years	3(11.5%)	2(7.7%)	2(7.7%)	2(7.7%)	1(3.85%)	2(7.7%)	12(46.1%)
13-18years	1(3.85%)	1(3.85%)	0%	1(3.85%)	0%	1(3.85%)	4(15.4%)
TOTAL	5(19.2%)	3(11.5%)	7(26.9%)	6(23%)	2(7.7%)	3(11.5%)	26(100%)

Table 2: Geographical Distribution of Cases of Leukemia

ADDRESS	
PALAMU, JHARKHAND	4(15.4%)
RANCHI, JHARKHAND	4(15.4%)
RAMGARH, JHARKHAND	3 (16.6%)
LATEHAR, JHARKHAND	2 (11.1%)
GIRIDIH, JHARKHAND	2 (11.1%)
BOKARO, JHARKHAND	2 (11.1%)
KODERMA, JHARKHAND	2 (11.1%)
LOHARDAGA, JHARKHAND	2 (11.1%)
JAMTARA, JHARKHAND	1 (5.6%)
DUMKA, JHARKHAND	1 (5.6%)
HAZARIBAGH, JHARKHAND	1 (5.6%)
GUMLA, JHARKHAND	1 (5.6%),
SUNDARGARH, ORISSA	1 (5.6%)

Table 3: Symptoms of Patients

SYMPTOMS	AML	ALL	UNSPECIFIED	TOTAL
WEAKNESS	6(23%)	11(42.3%)	6(23%)	23(88.5%)
FEVER	5(19.2%)	10(38.5%)	6(23%)	21(80.8%)
ANOREXIA	5(19.2%)	8(30.8%)	5(19.2%)	18(69.2%)
PALLOR	5(19.2%)	7(26.9%)	4(15.4)	16(61.5%)
LOCALIZED SWELLING	2(7.7%)	7(26.9%)	1(3.85%)	10(38.5%)
WEIGHT LOSS	3(11.5%)	5(19.2%)	2(7.7%)	10(38.5%)
COUGH	3(11.5%)	3(11.5%)	0	6(23%)
ARTHRALGIA	0	0	4(15.4%)	4(15.4%)
PAIN ABDOMEN	1(3.85%)	1(3.85%)	1(3.85%)	3(11.5%)
ABDOMINAL DISTENSION	0	2(7.7%)	0	2(7.7%)
LOW BACK PAIN	0	2(7.7%)	0	2(7.7%)
RASH	2(7.7%)	0	0	2(7.7%)
GENERALIZED SWELLING	1(3.85%)	1(3.85%)	0	2(7.7%)
HEADACHE	1(3.85%)	0	1(3.85%)	2(7.7%)
VOMITING	1(3.85%)	1(3.85%)	0	2(7.7%)
EARACHE	0	0	1(3.85%)	1(3.85%)
HEARING LOSS	1(3.85%)	0	0	1(3.85%)
EPISTAXIS	1(3.85%)	0	0	1(3.85%)
JAUNDICE	1(3.85%)	0	0	1(3.85%)
MALENA	0	1(3.85%)	0	1(3.85%)
RED URINE	0	1(3.85%)	0	1(3.85%)

Table 4: Signs in Patients

SIGNS	AML	ALL	UNSPECIFIED	TOTAL
ANEMIA	6(23%)	10(38.5%)	3(11.5%)	19(73.1%)
LYMPHADENOPATHY	2(7.7%)	10(38.5%)	1(3.85%)	13(50%)
HEPATOMEGALY	3(11.5%)	8(30.8%)	2(7.7%)	13(50%)
SPLENOMEGALY	3(11.5%)	6(23%)	1(3.85%)	10(38.5%)
RASH	1(3.85%)	0	0	1(3.85%)
EDEMA	1(3.85%)	0	0	1(3.85%)
ANASARCA	0	1(3.85%)	0	1(3.85%)

Table 5: Duration of Symptoms

DURATION OF SYMPTOMS	AML	ALL	UNSPECIFIED	TOTAL
0-28 days	1 (3.85%)	8(30.8%)	1(3.85%)	10(38.5%)
1- <2months	1(3.85%)	0%	2(7.7%)	3(11.5%)
2-<3months	4(15.4%)	3(11.5%)	1(3.85%)	8(30.8%)
3-6months	2(7.7%)	2(7.7%)	1(3.85%)	5(19.2%)

Table 6: Peripheral Blood Examination Findings

HEMATOLOGICAL ABNORMALITIES	
ANEMIA	92%
THROMBOCYTOPENIA	84%
LEUCOCYTOSIS	38%
LEUCOPENIA	30%
PANCYTOPENIA	15%
BLASTS IN PERIPHERY	81%

DISCUSSION

In current study, out of 26 cases diagnosed with acute leukemia, 30.8% cases were suffering from AML, 50% of cases were of ALL while differentiation was not clear in 19.2% cases. The ALL to AML ratio was 1.17. Acute leukemia was found to be more common in males as compared to females; [ALL vs AML (26.9% vs 23%) and (19.2% vs 11.5%)] respectively. Maximum cases of AML were found in age group of 6-12 years while maximum ALL cases were found in age group of 1-5 years with similar results in both sexes.

As per American Cancer Society, 3 out of 4 childhood leukemia is ALL, ALL is more common in males while AML occurs equally among boys and girls. Also, ALL is more common in early childhood peaking between 2-4 years of age while cases of AML are more spread out across the childhood years (last revised February, 2016).² As per Chandrhas et al, it was observed that ALL cases were found more in the younger age group, 0-20 years. Acute Lymphocytic Leukemia (ALL) was the most frequent type in children (15.2%). Thirty-three cases of leukemia were diagnosed at Rajendra Medical College, Ranchi, Jharkhand in a study duration of one year (2009-2010).³ As per Lisa Lyngsie et al, ALL has incidence peak in children who are 2-5 years old with preponderance to male sex while AML is more common in girls with no age specific increased frequencies.⁴

As per Saumitra Biswas et al, acute lymphoblastic leukemia (ALL) and acute myeloid leukemia (AML) comprised 54 (72%) and 14 (18%) respectively, 49 were males, 26 were females (M: F = 1.9:1), ALL cases had an age range of 1.8-14 Years, AML patients had an age range of 2-14 years.⁶

Current study showed that areas of Jharkhand with maximum number of cases were Palamu, Ranchi, Latehar, Bokaro, Ramgarh, Giridih and Koderma. No previous studies were available to compare with present study.

In current study, the common symptoms in acute leukemia were weakness, fever, anorexia, pallor, localized swelling, weight loss, cough, arthralgia and pain abdomen. The commonest were weakness, fever, anorexia and pallor. Symptoms like weakness, fever, anorexia, localized swelling, abdominal distension, low back pain, malena and red urine were more common in ALL. Symptoms more common in AML were pallor, cough, pain abdomen, generalized swelling, rash, headache, vomiting, hearing loss, epistaxis and jaundice (Table 3). In current study, most common signs were anemia, lymphadenopathy, hepatomegaly and splenomegaly, with more frequency in ALL as compared with AML. Signs more common in AML were rashes and edema. Anasarca was present notably in one case of ALL with severe pallor (Table 4).

As per Rachel T Clarke et al, the most common infiltrative symptoms were hepatomegaly (64%) and splenomegaly (61%). Bruising, the most common haemorrhagic symptom, occurred in 52% of children. Fever (53%) was the most common infective symptom, and the most prominent musculoskeletal features were limb pain (43%) and bone pain (26%). Systemic features such as pallor (54%) and fatigue (46%) were also common. Finally, the most common gastrointestinal feature, anorexia/weight loss (29%), was present in almost a third of children.⁵ As per Saumitra Biswas et al, among the different symptoms, fever (85.33%) was commonest followed by pallor (64%). Hepatomegaly (72%),

splenomegaly (60%), Gum bleeding (63.3%), bleeding from skin (52%) and lymphadenopathy (50.67%) were the frequent signs at the time of presentation. Uncommon symptoms and signs were: abdominal pain was noted in 7(9.33%) cases, abdominal protrusion due to organomegaly in three cases and ascites in one case of ALL. Joint pain (9.33%) of leukemia. One case each had hematuria (AML) and hematemesis (ALL).⁶

In current study, most of the ALL (30.8%) cases have a duration of symptoms less than 28 days while in most of the AML cases duration was 2-3 months.

CONCLUSION

Childhood leukemias are more common in males as compared with girls. The commonest symptoms were weakness, fever, anorexia and pallor. Anemia, lymphadenopathy and organomegaly were more common in ALL. The knowledge of both common and uncommon diagnosis and better management as it will increase survival rate of these children.

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