Research Paper Medical Science

Clinicomorphological Profile in Acute Leukemias: Experience From A Tertiary Care Centre in Jammu.

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ABSTRACT

Acute Leukemias are a heterogenous group of neoplasms arising from the malignant transformation of white blood cells or their precursors. Hospitalised patients diagnosed with acute leukemia were examined to study their clinical profile. A total of 100 patients diagnosed as acute leukemia (FAB classification) on bone marrow aspiration over a period of two and a half years were evaluated. ALL(52%) was more common than AML(48%) and males(66%) were affected more than females(34%). Pallor(89%) was the most common clinical presentation followed by generalized weakness(81%), fever(78%) and bony tenderness(60%) amongst others.

KEYWORDS Acute Lymphoid leukemia(ALL), Acute Myeloid leukemia(AML), Bone marrow aspiration , Leukemia

INTRODUCTION

Leukemia is the eleventh most common cancer worldwide with about 257,000 new cases each year [1]. Acute leukemias can be classified according to the type of the predominant leukemic cell population as revealed by morphological examination of blood and bone marrow into Acute Lymphoid Leukemia (ALL) and Acute Myeloid Leukemia (AML) [2]. ALL is the commonest form of acute leukemia in the childhood. AML is the commonest form of acute leukemia in the adults. It is also the predominant form of acute leukemia before 1 year of age[3]. In the western countries, the overall incidence of ALL is 1.4 per 100,000 population and AML is 3.4 per 100,000 population. In India, the incidence of ALL is 35% and AML is 15% of all hematological malignancies[4]. The clinical features of acute leukemias are mostly same as that of other hematological malignanies. These include fatigue and weakness as the most common symptoms. Bruising, fever, and weight loss are also frequent. Pallor is the most frequently observed sign along with bony tenderness, lymphadenopathy and hepatospleenomegaly[5,6]. The present study was conducted for detailed analysis of clinical profile in acute leukemia for effective management at a tertiary care center.

MATERIAL AND METHODS:

The present study was carried out over a period of two and a half years (1st june 2006 to 31st October 2008). During this period, all those patients attending the OPD and casualty of Govt. Medical College & Associated Hospitals, Jammu as well as those referred from district hospitals and other health care centers of our state with a history of short duration of clinical features like pallor, fatigue, bleeding in the form of bruising, petechiae or ecchymotic spots, persistent fever, bone or joint pains with or without organomegaly and/or lymphadenopathy, were taken up for the study and examined, after obtaining their written consent. A detailed clinical history regarding nature and duration of illness, loss of weight, significant family history and drug history, if any, was taken. This was followed by detailed general physical and systemic examination. Out of all the patients, during this period, a total number of 100 cases were diagnosed as acute leukemia on bone marrow examination with presence of more than 30% blasts in bone marrow (FAB classification) (Fig. 1,2,3,4). The clinical presentation in acute leukemia subtypes (AML and ALL) was studied.

RESULTS:

A total of 100 new cases of acute leukemia were diagnosed, out of which 52 were of ALL and 48 were of AML. The clinical profile of these patients was analysed by calculating the specific percentages out of the collected data.

The total number of hospital admissions during the period of study was 163,006. The incidence of acute leukemia came out to be 0.6 per 1000 hospital admissions(C.I 0.5-0.7 per 1000) In our study, ALL was seen in 52% of cases while AML was seen in 48% of cases. Amongst ALL, L1 was the commonest subtype followed by L2 and L3 respectively. Amongst AML cases, M2 was the most common subtype followed by M1, M4, M3 and M5 respectively (Table 1).

Out of 100 patients, children (0-15 years) constituted 53% of cases whereas adults (>15 years) comprised 47% of cases. Amongst the children, ALL was more common as compared to AML. Amongst the adults, AML was more common in comparison to ALL. A patient was diagnosed as congenital leukemia at 1 month of age(Table 2).

The study revealed that acute leukemia was more common in males (66%) as compared to females (34%), male to female ratio being 1.94:1. In ALL, male to female ratio was 2.05:1 and in AML, male to female was 1.82:1(Table 3).

Table no.4 depicts the prominent clinical presentation of the 100 patients with acute leukemia, who were the subjects of current study. Generalized weakness (81%) and fever (78%) were the most common presenting symptoms followed by bone pains (54%), weight loss (51%), bleeding manifestations (46%) and headache and vertigo (28%) respectively. Pallor (89%) was the most frequently observed sign along with bony tenderness (60%), lymphadenopathy (58%) and hepatospleenomegaly (52%). In ALL, the most common presenting clinical symptom was fever followed by generalized weakness, bone pains, bleeding manifestations, weight loss and headache. Pallor was the most common clinical sign in ALL followed by lymphadenopathy, bony tenderness and organomegaly. In AML, the commonest clinical symptom was generalized weakness followed by fever, weight loss, bleeding manifestations, bone pains and headache. Pallor was the commonest clinical sign in AML also, followed by bony tenderness, organomegaly and lymphadenopathy.

Lymphadenopathy was more commonly seen in cases of ALL as compared to AML. 4 cases of ALL presented with lymphadenopathy more than 2 cm in diameter. Majority of the patients had non-significant lymph nodes measuring <1 cm in diameter. 12 cases of ALL had lymph nodes in the range of 1-1.5 cm and 6 cases had lymph nodes in the range of 1.5-2 cm. In AML, majority of cases had lymph nodes measuring less than 1 cm in diameter. Only 2 patients had massive lymphadenopathy more than 2 cm in diameter. Bleeding manifestations were seen almost equally in both ALL and AML. In ALL, most of the patients presented with small petechiae(12) all over the body, while 7 patients presented with ecchymotic spots and 5 with a history of bleeding gums. Amongst AML, ecchymotic spots were the most common manifestation seen in 8 patients. DIC was seen in 2 cases of AML.

DISCUSSION:

Acute leukemias occupy a prominent position among the hematological malignancies all over the world. These are the most frequent types of cancer in the children, the frequency and clinical patterns of which vary depending on the areas of world where they are studied [7]. In our study, ALL was more common of the two acute leukemias with ALL constituting 52% and AML 48% of the total cases. ALL-L1 was the commonest type seen in 35% 0f patients followed by AML-M2 (24%), AML-M1 (15%), ALL-L2 (14%), AML-M4 (5%), AML-M3 (3%), ALL-L3 (3%) and AML-M5 (1%). In our study, ALL was more common of the two acute leukemias. This observation was comparable to that of Magotra M et al (6), Fadoo Z et al (8), Rao VSK et al (9), and Rego MF et al (11) who reported ALL in more cases as compared to AML.

In the present study, ALL was more common than AML in children (0-15 years). 41 children were diagnosed as ALL whereas only only 12 children were having AML. This was comparable to studies conducted by Harrison CJ (10), Meighen SS (12) and Hasanbegovic E (13). Amongst the adults (>15 years), AML was more common in comparison to ALL. This was also found in studies conducted by Dick FR et al (14), Paul B et al (15) and Ghalaut PS et al (4).

This study reveals that in both ALL and AML, males had preponderance over females. Overall, there were 66% males and 34% females with male to female ratio being 1.94:1 as seen in studies conducted by Rao VSK et al (9), Shome DK et al (3), Idris M et al (5), Jmili NB et al (7), Harani MS et al (16) and Hasanbegovic E (13).

The symptomatology of patients suffering from acute leukaemia is variable but, by analyzing the cases a common spectrum of presentation was noted. Generalized weakness and fever were the most common presenting symptoms followed by bone pains, weight loss and bleeding manifestations respectively. In ALL, the most common presenting clinical symptom was fever followed by generalized weakness, bone pains, bleeding manifestations, weight loss and headache. In AML, the commonest clinical symptom was generalized weakness followed by fever, weight loss, bleeding manifestations, bone pains and headache. Bleeding manifestations were seen in the form of petechiae, ecchymotic spots and bleeding from gums. This was comparable with the studies of Boggs DR et al (17), Pratap V et al (18), Eden T (19), Shome DK et al (3) and Idris M et al (5). Hasanbegovic E (13) found high temperature, fatigue and paleness as the most dominant clinical signs. They concluded that most frequent signs at the beginning of the illness are general symptoms like fatigue, unclear febrile state and accentuated bone pains. These signs united with complete blood picture finding should be enough reason for suspicion under possible leukemia.

Pallor was the most frequently observed sign along with bony tenderness, lymphadenopathy and hepatospleenomegaly. Lymphadenopathy was more common in ALL as compared to AML. Majority of the patients of acute leukemia had non-significant lymphadenopathy of less than 1 cm. Only 6 cases, mostly of ALL(4), showed significant lymphadenopathy of more than 2 cm. Boggs DR et al (17) reported sternal tenderness, hepatospleenomegaly and lymphadenopathy as the most dominant physical findings. Rao VSK (9) observed hepatomegaly, spleenomegaly, bleeding manifestations and lymphadenopathy as the chief clinical findings. Magotra ML et al (6) reported hepatomegaly and spleenomegaly as the main clinical manifestations followed by lymphadenopathy, bony tenderness and swelling. Paul B et al (15) observed chloromas in 11% cases of AML. Idris M et al (5) reported pallor in 100% cases of acute leukemias.

CONCLUSION:

In India, under the existing circumstances, population screening for the study of acute leukemia is extremely difficult due to lack of diagnostic and specialised services in periphery. Therefore, we have to depend largely on the hospital based data. Keeping in view the increased amount of morbidity and mortality associated with acute leukemia, early recognition of signs and symptoms of acute leukemia can ensure that the disease is diagnosed or at least suspected quite early in its course. This will also ensure timely referral of such patients from primary and secondary health care centers for detailed hematological analysis at a tertiary care center like our institution, where clinicians and hematopathologists can play a vital role in its effective management.

TABLE 1: TYPES OF ACUTE LEUKEMIA

Type of Acute Leukemia	Subtype	No. of patients	%age
Acute Lymphoblastic Leukaemia (A.L.L)	ALL-L1	35	35
	ALL-L2	14	14
	ALL-L3	3	3
Acute Myeloid Leukaemia (A.M.L)	AML-M1	15	15
	AML-M2	24	24
	AML-M3	3	3
	AML-M4	5	5
	AML-M5	1	1
	AML-M6	0	0
	AML-M7	0	0
Total		100	100

Table No.2: AGE WISE DISTRIBUTION (CHILDREN AND ADULTS)

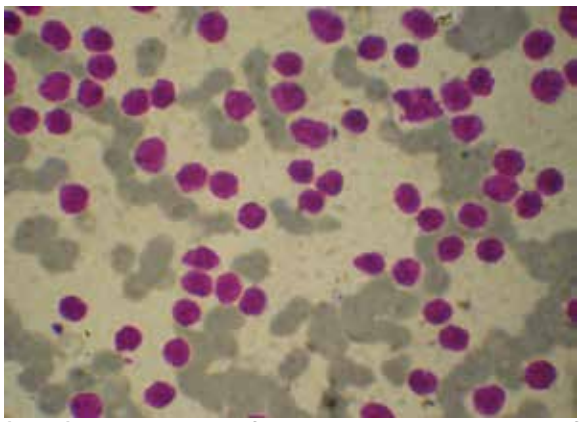
Age (years)	ALL No.	%age	AML No.	%age	Total No.	%age
Children(0-15)	41	41	12	12	53	53
Adults (>15)	11	11	36	36	47	47
Total	52	52	48	48	100	100

Table No.3: SEX WISE DISTRIBUTION

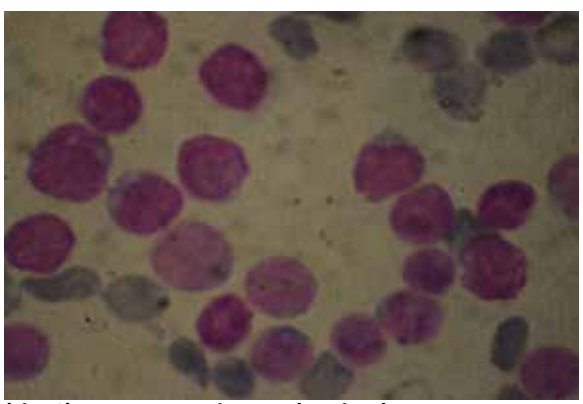
Sex	ALL No.	%age	AML No.	%age	Total No.	%age
Male	35	35	31	31	66	66
Female	17	17	17	17	34	34
Total	52	52	48	48	100	100

Table No.4: CLINICAL PRESENTATION (There is overlap of symptoms and signs)

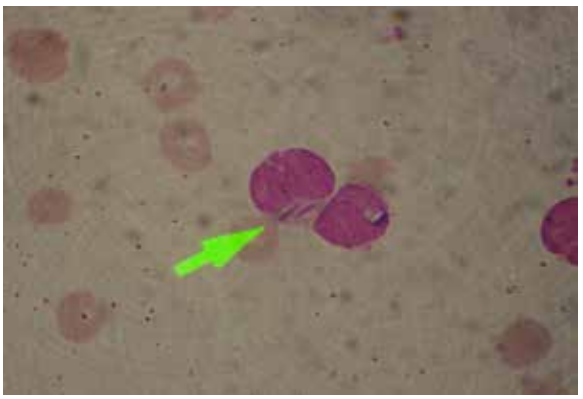
Clinical Presentation	ALL No.	%age	AML No.	%age	Total No.	%age
Pallor	47	47	42	42	89	89
Generalized weakness	35	35	46	46	81	81
Fever	45	45	33	33	78	78
Bone pains	33	33	21	21	54	54
Weight loss	21	21	30	30	51	51
Bleeding manifestations	24	24	22	22	46	46
Bony tenderness	34	34	26	26	60	60
Lymphadenopathy	40	40	18	18	58	58
Organomegaly	29	29	23	23	52	52
Headache	18	18	10	10	28	28



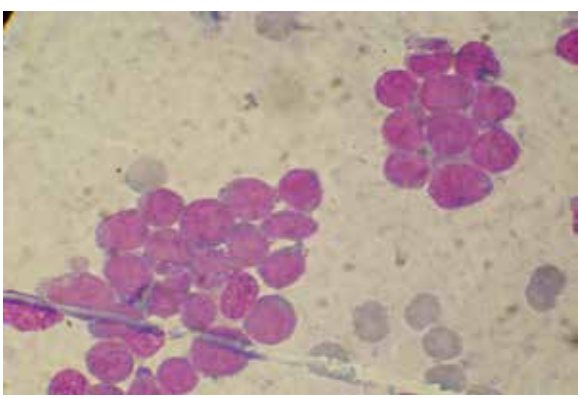
(Fig. 1)Peripheral blood film in ALL showing presence of lymphoblasts
Leishman stain(40x10)



(Fig. 2)Bone marrow in ALL showing homogenous population of lymphoblasts Giemsa(40x10)



(Fig. 3)Peripheral blood film in AML showing myeloblast containing double Auer rod. Leishman (40x10)



(Fig. 4)Bone marrow in AML showing sheets of myeloblasts. Giemsa(40x10)

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