ORIGINAL ARTICLE

HEMATOLOGICAL AND CLINICAL PRESENTATION OF ACUTE LEUKEMIAS AT KHYBER PUKHTOONKHWA

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ABSTRACT

Background: The clinical presentation of acute leukemias is quite variable. The present study was designed to assess the hematological and clinical presentation of acute leukemias in our setup.

Methodology: This comparative study was conducted in medical and paedriatic wards of Lady Reading Hospital Peshawar, IRNUM Hospital Peshawar and DHQ Hospital Bannu from 2000 to 2006. A total of 50 patients of acute leukemias were included in the study. These patients belonged to all age groups, both sexes and mixed socio-economic status. The diagnosis was made on clinical history, physical examination and peripheral blood and bone marrow examination.

Results: Out of 50 cases, 28 (56%) were of acute lymphoblastic (ALL), 20 cases (40%) acute myeloid leukemias (AML), while 2 (4%) were of undefferianted type. All patients were anemic at the time of diagnosis, their hemoglobin mm^3 was 2.8 -12 g /dl. The TLC was quite variable ranged from <4000/cmm to >6,30,000/mm^3. Similarly the platelet count was <10,000 to >100000/mm^3. The majority (90%) presented with fever and malaise. Abnormal bleeding was present in 20 cases (40%) at the time of presentation. Chest infection was the most common type of infection (38%). Bone and joint pain was present in 12 cases (24%). Vomiting & diarrhea were present in 10 cases (20%). Disturbance of vision and hearing was also present in 5 cases (10%). Signs & symptoms of mediastinal obstruction were present in only 3 cases (10.7%) of ALL. Skin rash was present in 2 cases (4%). Proptosis of eye was significant clinical feature in one child with ALL at presentation. One Child with ALL had multiple soft swellings at presentation. Two cases (4%) presented with jaundice while 2 (4%) had signs and symptoms of fracture L1 vertebra at presentation and one case presented with weakness of right side of the body.

Conclusion: The clinical presentation of acute leukemias is so variable and atypical that in most of the cases the diagnosis is delayed for a quite long time, due to which the prognosis becomes poor in our setup.

KEYWORDS: Acute leukemia, Acute lymphoblastic leukemia, Acute myeloid leukemia.

INTRODUCTION

Leukemia as a distinct clinical entity was recognized in 1845 for the first time.[1] Tremendous advances have been made in the understanding of the molecular biology and management of this disease in the past few years.[2] Acute leukemia is heterogeneous group of hematological malignancies characterized by clonal expansion of immature myeloid or lymphoid precursors (blasts). The blasts progressively replace the normal haematopoietic tissue and invade other organs of the body. Therefore anemia, infection and hemorrhages due to bone-marrow failure are the most common complications of this disease and may lead to death.[3-5]

The incidence of Leukemia is about 8-10 per 100,000 persons / year.[6] Statistical data form IRNUM Peshawar regarding malignant diseases in Khyber Pakhtunkhwa province show that acute leukemias form 5.1% of all malignancies. Among the childhood cancers, acute leukemias are the most common ones. In children acute myeloid lymphoblastic leukemia (ALL) is the most common form accounting for 80% of cases while acute myeloid leukemia (AML) is the commonnest type in adults.[7,8]

Remarkable progress has been made in the treatment of acute leukemias. According to the present data about 45-90% of patients can be cured by application of modern chemo-radio-

therapy and /or followed by bone-marrow transplantation. The prognosis is far better for children with ALL where majority have been survived for more then 5 years and can be considered cured. Considerable improvement has also been occurred in the treatment of AML in the past few years but the cure rate is still low due to complications of the disease itself and intensive chemo-radio therapy.[9-13]

The present work is concerned with the clinico-epidemiological aspects of the disease which will be of great help in the early diagnosis of the disease because most of these patients present with different signs and symptoms and, if one is not conscious of the variable presentation of acute leukemia, the diagnosis may be delayed for a quite long time which, in turn will definitely affect the prognosis of the disease.

MATERIAL AND METHODS

Fifty consecutive patients of acute leukemia (ALL & AML) admitted in medical and paedriatic wards of LRH Peshawar, IRNUM hospital Peshawar and DHQ Hospital Bannu were included in the study.

Out of these, 44 were diagnosed for the first time while 3 cases had relapsed after complete remission and 3 cases were in blast crisis who were suffering from chronic myeloid Leukemia (CML). These patients belonged to all age groups, both sexes and mixed socio-economic status.

Diagnosis was made on clinical history physical examination and peripheral blood and bone marrow smears examination. Smears were stained with Giemsa stain. Special stains were also used on bone marrow smears where indicated.

Patients were diagnosed and classified according to FAB criteria. Further sub classification of ALL in L1-L3 and AML into M1-M7 was also done where possible.

RESULTS

Fifty cases of acute Leukemias were studied in which 28 (56%) were ALL, 20 (40%) AML and 2 (4%) of undifferentiated type.

The distribution of acute leukemias in different age groups showed two peak occurrences as shown in Table 1.

The first peak observed in age group below 10 years of age while the second peak occurred in the age group 51-60 years. The youngest patient was six months old while the oldest patient was of 60 years of age.

The difference in the pattern of Acute Leukemia between males and females patients is shown in Table 2.

Table 1: Distribution of leukemias among different age groups.

Type of leukemia	Age group (years)						
	<10 No. (%)	11-20 No. (%)	21-30 No. (%)	31-40 No. (%)	41-50 No. (%)	51-60 No. (%)	Total
Acute lymphoblastic leukemia	14 (50.00)	10 (35.71)	1 (3.57)	1 (3.57)	—-	2 (7.14)	28
Acute myeloid leukemia	7 (35.00)	3 (15.00)	5 (25.00)	2 (10.00)	1 (5.00)	2 (10.00)	20
Undifferentiated	—	2 (100)	—	—	—	—	02
Total	21 (42.00)	15 (30.00)	6 (12.00)	3 (6.00)	1 (2.00)	4 (8.00)	50

Table 2: Gender distribution of different types of acute leukemias.

Type of leukemia	Male No. (%)	Female No. (%)	Total No. (%)
Acute lymphoblastic leukemia	20 (40)	8 (16)	28 (56)
Acute myeloid leukemia	12 (24)	8 (16)	20 (40)
Undifferentiated	2 (4)	-	2 (4)
Total	34 (68)	16 (32)	50 (100)

Table 3: Distribution of acute leukemia according to socio-economic status.

Socio-economic status	ALL No. (%)	AML No. (%)	Undifferentiated No. (%)	Total No: (%)
Lower Class	20 (71.43)	15(75)	2(100)	37(74)
Middle Class	7 (25.00)	5(25)		12(24)
Upper Class	1 (3.57)	———-		1(2)
Total	28(100.00)	20(100)	2(100)	50(100)

Table 4: Tribe-wise distribution of acute leukemia in Khyber Pakhtunkhwa.

Tribe	Number	Percentage
Yousafzai	26	52
Afghan (Refugees & Native)	8	16
Bungush	4	08
Banochi / Marwat	2	04
Mohmand	2	04
Wazir / Masood	1	02
Unknown	7	14
Total	50	100

Overall the males have formed significant majority of the patients. 34 cases (68%) of the total cases were male, while the females contributed only (32%) of the cases.

As for as the occurrence of acute leukemias in Socio-economic status is concerned, the occurrence was found to be highest in lower Socio- economic class (74%) followed by middle class (24%) and upper class (2%). (Table 3)

The study of tribe wise distribution of acute leukemias showed that some tribes are at higher risk than others as shown in Table 4.

The highest incident was found to be in Yousafzai tribe (52%) followed by Afghans (Refugees & natives) (16%) bungush (8%) Mohammand (4%) marwat /Banochi (4%) and Masood / Wazir (2%). the tribe was not known to 14% of total cases.

The haematological features of acute leukemia patients in this study are concerned, are shown in Table 5. All patients were anemic at the time of diagnosis. It was from mild to very severe in degree. TLC was quite variable, ranged from <4000/cmm to > 630000/cmm. Similarly the Platelet count was also variable at presentation as shown in Table 5.

The clinical presentation of acute Leukemia was quite variable and atypical in our study as shown in Table 6.

The majority (90%) of patients presented with fever, 84 % had signs and symptoms of anemia and 40% had abnormal bleeding due to thrombocytopenia. The unusual presentation was more common in my study as compared to others.

DISCUSSION

Considering different types of Acute Leukemia it was observed that ALL was more common (56%) than AML (40%). Similar results have been reported from Karachi in a study of 160 cases of Acute Leukemia, while results from Kenya in Africa reveal that AML is the commonest type and ALL is least common type.[14,15] It means that the incidence of acute leukemias is variable in different parts of the world.

The study of age distribution of acute leukemias showed that 72% of patients were below 20 years. This initial peak incidence was followed by decline with a second peak in 6th decade. The results of age distribution of my study were comparable to that of local as well as western studies.[6,15-17]

The high incidence of Leukemias in poor socio-economic class and in certain tribes, like Yousafzai and Afghans, may be explained on poor immune status, infectious agents like oncogenic viruses, Afghanistan war and genetic predisposition.[18,19]

Anemia was a constant feature in all cases of which 80% had moderate to severe anemia with initial Hb concentration of <9.0 g/dl. It was more common & severe as compared to western studies.[19] It can be explained on late presentation, as the degree of Anemia is directly propor-

Table 5: Hematological features in different types of acute leukemia.

Haematological Parameter	ALL No. (%)	AML No. (%)	Undifferentiated No. (%)	Total No. (%)
Hb level g/dl				
< 3.0 g/dl	1 (3.57)	—	—	1 (2)
3 – 6 g/dl	9 (32.14)	9 (45)	1 (50)	19 (38)
6 – 9 g/dl	10 (35.71)	9 (45)	1 (50)	20 (40)
9 – 12 g/dl	8 (28.50)	2 (10)	—	10 (20)
Total	28 (100.00)	20 (100)	2 (100)	50 (100)
TLC/cmm				
< 4000	1 (3.57)	3 (15)	1 (50)	5 (10)
4000 - 11000	5 (17.83)	4 (20)	—	9 (18)
11000 – 20000	6 (21.43)	5 (25)	—	11 (22)
20000 – 50000	4 (14.28)	1 (5)	—	5 (10)
50000 – 100000	2 (7.15)	1 (5)	1 (50)	4 (8)
>100000	10 (35.72)	6 (30)	—	16 (32)
Total	28 (100.0)	20 (100)	2 (100)	50 (100)
Platelet count/cmm				
< 10000	19 (53.57)	7 (35)	1(50)	23 (46)
10000 – 30000	3 (10.70)	4 (20)	—	7 (14)
30000 – 60000	—	4 (20)	—	4 (8)
60000 – 100000	4 (14.29)	3 (15)	—	7 (14)
>100000	6 (21.43)	2 (10)	1 (50)	9 (18)
Total	28 (100.0)	20 (100)	2 (100)	50 (100)

tional to severity of bone-marrow failure. The TLC was quite variable at presentation. The results of the study were in accordance to those of local study.[15] but were in contrast to western study. In the study 57% of ALL patients had TLL >50,000/cmm while in western study only 20% of ALL presented with this much TLC.[20] Patients with higher TLC had bad prognosis due to hyperviscosity & vascular infarction of CNS & lungs and more complications of bone-marrow failure. Therefore it may be one of the factors for poor prognosis in our setup as compared to Western countries. The majority of the patients (90%) presented with thrombocytopenia in which study. 48% had severe thrombocytopenia with platelet count <10,000/cmm, while 14% had platelet count of <30,000/cmm. The results of the study were comparable to local studies but the thrombocytopenia was more marked as compare to western countries, which can be explained on late presentation.[15]

Infection is still a major cause of mortality, which accounts for 70% of deaths from Acute Leukemia.[19]. In my study fever was the most common feature, out of 50 cases, 45 (90%) had fever at presentation. A study from Multan has reported fever in 57.9% while a study from Lahore by Mateeur-Rehman has reported fever in 55.6 % of cases of Acute Leukemia.[21] In my study the most common type of infection was chest infection which occurred in (38%) of cases .The second common infection was of mouth Pharynx

Table 6: Presentation of acute leukemia.

Clinical Features	ALL No. (%)	AML No. (%)	Undifferentiated No. (%)	Total No. (%)
Fever & malaise	25 (89.29)	18 (90)	2 (100)	45 (90)
Symptoms & signs of anemia	22 (78.57)	18 (90)	2 (100)	42 (84)
Spleenomegaly	21 (75.00)	8 (40)	1 (50)	30 (60)
Hepatomegaly	19 (67.86)	7 (35)	1 (50)	27 (54)
Lymphadenopathy	18 (64.29)	6 (30)	1 (50)	25 (50)
Chest infection	11 (39.29)	7 (35)	1 (50)	19 (38)
Abnormal bleeding	10 (35.71)	9 (45)	1 (50)	20 (40)
Bone & joint pain	8 (28.57)	4 (20)	—	12 (24)
Infection of mouth & pharynx	6 (21.42)	6 (30)	1 (50)	(13 (26)
Bone tenderness	5 (17.85)	—	—	5 (10)
Vomiting & diarrhea	5 (17.85)	5 (25)	—	10 (20)
Other infections	4 (14.28)	1 (5)	—	5 (10)
Disturbance of vision & hearing	3 (10.71)	1 (5)	1 (50)	5 (10)
Mediastinal mass	5 (17.85)	—	—	5 (10)
Signs & symptoms of Mediastinal obstruction	3 (10.71)	—	—	3 (6)
Skin rash	1 (3.57)	1 (5)	—	2 (4)
Gouty arthritis	1 (3.57)	—	—	1 (2)
Proptosis of eye	1 (3.57)	—	—	1 (2)
Soft swelling of scalp	1 (3.57)	—	—	1 (2)
Hard mass chest wall	1 (3.57)	—	—	1 (2)
Fracture of L1 vertebra	1 (3.57)	1 (5)	—	2 (4)
Jaundice	1 (3.57)	1 (5)	—	1 (2)
Weakness right side of the body	—	1 (5)	—	1 (2)

which occurred in 21.42% of ALL, 30% of AML and 50% of undifferentiated type at presentation. It was followed by infections, like boils and abscesses, which occurred in 10% of cases.

The study showed Bone and joint pain was present in 12 cases (24%). The pains & aches were in (58% of patients in a study from Lahore, while bone pain was present in 23% of ALL in a study by Miller.

The bone & joint pain tenderness is due to periosteal elevation & infarctions by leukemic cells were more common in my study as compared to others.

It occurs more terminally; therefore it means that in most of our patients the diagnosis is quite delayed as compared to others.

Jaundice was present in 4% of my cases while it has been reported only in 2.8% of cases in a

study in Lahore by Matee-ur-Rehman.[15] Proptosis of eye was present in 2% of my cases (one case of ALL).

A similar case has been reported by Lihteh Wu.[22] While it was present in 5.3% of patients in a study from Multan by Noor & Masood (1989). Vomiting & diarrhea were present in 10% of my cases while disturbance of vision and hearing also observed in 10% of patients at presentation, which were not reported by others. 4% of patients had skin rash at presentation while 2% had gouty arthritis. One patient had multiple soft swellings Fig No.02 and one patient had bony hard swelling on chest well at presentation.

Two cases (4%) had fracture of L1 vertebra and one patient had weakness of right side at presentation without other signs of CNS involvement. These unusual clinical features have not been reported by others .It means that unusual presentations were more common in my study as compared to those from Multan and Lahore. These clinical presentations are of special importance because diagnosis is usually delayed due to these unusual presentation[18]. Therefore one must keep in mind the acute leukemia when one comes across these clinical presentations.

CONCLUSION

In conclusion, the bone marrow failure is the major cause of morbidity and mortality in acute leukemias. The severity of bone-marrow failure is directly related to advancement of the disease. All the signs & symptoms of bone marrow failure were more marked in studied patients as compared to others. All of these are bad prognostic signs. Therefore, by early detection of the disease and improving the supportive care, the prognosis of our patients can be improved. This can be achieved only, if one keeps in mind the unusual presentation of acute leukemia in clinical practice. This is only possible, if this massage is conveyed to all our young doctors especially those who are working in the periphery without laboratory facilities.

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