

INVESTIGATION ON THE PREVALENCE OF LEUKAEMIA AT A TERTIARY CARE HOSPITAL, LAHORE

NIGHAT NASIM, KALIMUDDIN MALIK, NAUMAN A. MALIK
SHAISTA MOBEEN, SAUD AWAN AND NAGHMANA MAZHAR
Department of Pathology, PGMI / Lahore General Hospital, Lahore

ABSTRACT

Introduction: Cancer in all forms is causing about 12% deaths throughout the world. After recent advances and improvement in treatment and prevention in cardiovascular diseases, tumour is an important cause of morbidity and mortality.¹ The incidence of leukaemia across the world is 1 per 100,000 annually. It contributes to 25% of childhood cancers.² The study was designed to investigate the Prevalence of Leukemia subtypes at Lahore General Hospital / The Graduate Medical Institute, Lahore and was carried out in the Bone Marrow Clinic. The study was cross – sectional prospective. The period of the study was two year from 01 June, 2010 to 30 June, 2012.

Methodology: Complete blood counts, bone marrow aspiration and trephine biopsies were performed according to standard methods.

Results: In a total of 45 cases of leukaemia, acute leukemia was more prevalent than chronic leukaemia. The ratio of acute and chronic leukaemias was 4:1. Male to female ratio was 1.3: 1. Most of the patients (42%) were below the age of 15 years. ALL (49%) was more common than AML (31%). Among chronic leukaemias, CML (16%) was more common than CLL (2%) and CMML (2%). The study of acute leukaemia subtypes revealed that ALL – L₂ was more common (77%) than L₁ (24%). In AML subtypes, M₃ (57%) was most prevalent while M₂ (14%) and M₄ (14%) and M₁ (7%) and M₆ (7%) were less prevalent of leukaemia subtypes.

Conclusion: Acute leukaemias were more prevalent than chronic leukaemias. Leukaemias of all types were slightly more prevalent in male patients. ALL was more common than AML and was found to be a childhood malignancy. In leukaemia subtypes, ALL – L₂ and AML-M₃ were most common and in chronic leukaemias CML was most common.

Key Words: Leukemia, ALL, AML, CML, CLL.

INTRODUCTION

Cancer in all forms is causing about 12% deaths throughout the world. After recent advances and improvement in treatment and prevention in cardiovascular diseases, tumours are an important cause of morbidity and mortality.¹ The incidence of leukaemia across the world is 1 per 100,000 annually. It contributes to 25% of childhood cancers.²

The term leukaemia refers to white blood cell malignancies and a rare case arising from red blood cell precursors in erythroleukaemia.³ Leukaemia are of two types; acute and chronic. Acute leukaemias are; acute lymphoblastic leukaemia (ALL) and acute myeloid leukaemia (AML). AML and ALL are further categorised into subtypes based on French, American, British (FAB) classification⁴ AML is further divided into 7 subtypes and ALL into 3 subtypes by the FAB classification.⁵

Chronic leukaemias are; chronic myeloid leukaemia (CML) and chronic lymphocytic leukaemia (CLL). However, other variants of chronic myeloid leukaemias also exist e.g. chronic myelomonocytic

leukaemia (CMML).⁶

Acute leukaemias are malignant disorders which are rapidly fatal if left untreated but they are curable with appropriate treatment. A sudden uncontrolled growth of immature haemopoietic cells replacing the normal marrow function is a hallmark of acute leukaemias.⁷ Acute myeloid leukaemia is primarily a cancer of adults and acute lymphoblastic leukaemia is more prevalent in children under 15 years of age. The chronic leukaemias are distinguished from acute leukaemia by their slower progression. CML is a clonal disorder of a pluripotential stem cells. The male to female ratio is 1.4:1 and common age of presentation is between 40 – 60 years. CLL is the most common tumour among chronic lymphoid leukaemias with a peak incidence of 60 – 80 years of age.⁸

This study was conducted to investigate the prevalence of different types of leukaemia at Lahore General Hospital, a tertiary care center catering for a large population of Lahore and nearby areas including Kasur, Hasilpur and Dipalpur. Therefore this representation was collected from a part of Lahore and

its nearby towns.

The analysis was based on the prevalence of different types of leukaemia. Gender distribution and age of the patients were studied as well.

MATERIALS AND METHODS

The present study was carried out in the Pathology Department of Post Graduate Medical Institute, Lahore / Lahore General Hospital over a period of 2 years starting from 01.06.2010 till 30.06.2012. A total of 45 patients were diagnosed to have leukaemia. All indoor patients and a few outdoor patients from LGH or INMOL Hospital were included in the study. Patients on cancer chemotherapy and radiotherapy were excluded.

Detailed relevant history was taken and clinical examination was carried out. All the haematological parameters were recorded. Blood counts were performed on automated haematology analyser. Bone marrow examination included bone marrow aspiration and trephine biopsy.

The peripheral blood smears and bone marrow smears were stained with May – Grunwald Geimsa and Sudan Black B. Trephine biopsies were stained with haematoxylin and eosin. Findings of bone marrow aspiration and trephine biopsies were interpreted in the light of history, clinical examination and peripheral blood findings. FAB classification of acute leukaemia was applied for sub-typing.

RESULTS

The present study revealed that 80% of patients had acute leukaemia while 20% had chronic leukaemia (Table 1). Of acute leukaemia, 49% patients had acute lymphoblastic leukaemia (ALL) and 31% had acute myeloid leukemia. Of chronic leukaemia, 16% patients had chronic myeloid leukaemia (CML), 2% had chronic lymphocytic leukaemia and 2% had chronic myelomonocytic leukaemia (CMML) (Table 2).

Table 1: Percentage of leukaemias.

Type of Leukaemia	Total No. of Cases	Percentage
Acute leukaemia	36	80
Chronic leukaemia	19	20

The leukemias overall revealed a male preponderance with a percentage of 58% males and 42% females. Gender distribution revealed; in AML 57% males and 43% females and in ALL; 59% males and 41% females. In CML, there were 7 patients in total; 43% males and 57% female patients. One male patient was diagnosed to have juvenile CML. In CLL and CMML, there was single male patient in each group (Table 3). Investigation of age revealed that ALL was more prevalent in children and AML in

adults (Table 4). AML sub-typing revealed M₃ as the most common (57%), followed by M₂ (14%) and M₄ (14%) and leastcommon M₁ (7%) and M₆ (7%). ALL sub-typing showed L₂ as the most common (72%), followed by L₁ (24%), (Table 5).

Table 2: Prevalence of different types of leukemias.

Type of Leukemia	Total Cases	Percentage
ALL	22	49
AML	14	31
CML	07	16
CLL	01	2
CMML	01	2
Total	45	100

Table 3: Gender distribution in leukemia sub-types.

	Male	Female	Total
AML	8	6	14
ALL	13	9	22
CML	3	4	07
CLL	1	-	01
CMML	1	-	01
Total	26	19	45
	58%	42%	100

Table 3: Gender distribution in leukemia sub-types.

	Male	Female	Total
AML	8	6	14
ALL	13	9	22
CML	3	4	07
CLL	1	-	01
CMML	1	-	01
Total	26	19	45
	58%	42%	100

DISCUSSION

The present study revealed that acute leukaemias are more prevalent than chronic leukaemias. The results

are consistent with other studies; Humayun et al (2005)¹ showed 90% of acute type. In leukaemia subtypes, ALL was the most prevalent in children (< 15 years). This finding is consistent with other studies (Ali et al 1999⁹ and Yasmin et al 2009).¹⁰

Acute myeloid leukemia was more prevalent in adults, a finding consistent with other studies (Ali et al 1999).¹⁰ There was a slight male preponderance in the study. The male to female ratio in the study was 1.3:1. The same frequency of gender distribution has been reported in different international and local studies, e.g. 1.5:1¹¹ and 1.2:1¹² and 1.7: 1.¹³ AML subtyping revealed AML-M₃ as the most common type and consistent with other studies (Zaki et al 2002)¹⁴ while the study by

Table 4: Age wise distribution of leukaemia cases.

Type of Leukaemia	Adult	Child	Adult Percentage	Child Percentage	Total Percentage
ALL	9	13	41	59	100
AML	9	5	64	36	100
CML	6	1	86	14	100
CLL	1				100
CMML	1				100
Total	26	19			

Table 5: Prevalence of subtypes of acute leukemia.

	AML								ALL			
	M ₁	M ₂	M ₃	M ₄	M ₅	M ₆	M ₇	Total	L ₁	L ₂	L ₃	Total
	1	2	8	2	-	1	-	14	5	17	-	22
Percentage	7.2	14.3	57	14.3	-	7.2	-	100	24.5	77.5	-	100

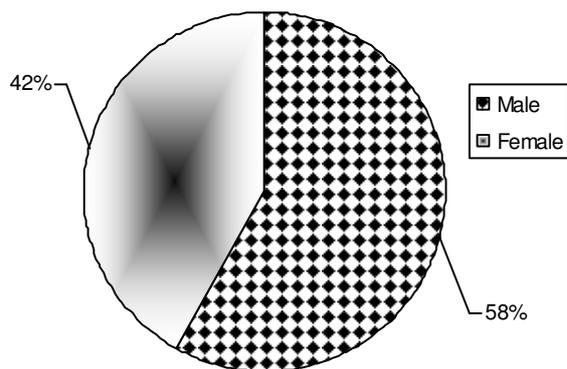


Figure 1: Gender distribution in Leukaemia.

Humayun et al¹ shows M₁ as the most common type and the study by Fauzia et al (2008)¹⁵ shows M₂ as the most common type. In ALL, L₂ was the most common subtype in this study while the study by Humayun et al¹ showed L₁ as the most common subtype of ALL. No case was reported as ALL – L₃ designating it to be the rarest of all ALL subtypes as found earlier. In CML, only one patient was diagnosed with juvenile CML.

It is **concluded** that acute leukaemias are more prevalent than chronic leukaemias. ALL is a more common childhood malignancy. In leukaemia subtypes, AML – M₃ and ALL – L₂ were the most prevalent and in chronic leukaemias, CML was most common in adult age.

Table 6: Prevalence of subtypes of chronic leukaemia.

	CML			CLL	CMML
	Juvenile	Adult	Total		
	1	6	7	1	1
Percentage	14	86	100	100	100

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