FREQUENCY OF VARIOUS TYPES OF LEUKAEMIAS DIAGNOSED AT PAF HOSPITAL MIANWALI

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ABSTRACT

Objective: To determine the frequencies of various types of leukaemias in a secondary care hospital.
Study Design: Descriptive
Place and Duration of Study: PAF Hospital Mianwali, from Jan 2009 to Dec 2012.
Material and Methods: Record of all the cases of acute lymphoblastic leukaemia (ALL), acute myeloid leukaemia (AML), chronic lymphocytic leukaemia (CLL) and chronic myeloid leukaemia (CML) diagnosed during the period of study was retrieved from the laboratory and total number of leukaemia cases were counted. The ages and the genders of the patients were noted. Median age at diagnosis for each type of leukaemia was worked out. Frequency of each leukaemia type was noted and relative frequency was calculated as percentage.
Results: Out of a total of 67 patients, AML was diagnosed in 22 (32.8%), CML in 16 (23.8%), ALL in 15 (22.4%) and CLL in 14 (20.9%) cases. Median age at diagnosis for ALL, AML, CLL and CML was 5, 41, 70 and 40 years respectively while male to female ratio was 2.7, 1.4, 1.3 and 1.5 respectively.
Conclusion: AML was the commonest leukaemia type, followed by CML, ALL and CLL. In children, ALL was found to be four times more common than AML.

Keywords: Acute lymphoblastic leukaemia, Acute myeloid leukaemia, Chronic lymphocytic leukaemia, Chronic myeloid leukaemia.

INTRODUCTION

Leukaemia is a heterogeneous group of malignancies, broadly divided into acute and chronic leukaemias with further sub-classification into lymphoid and myeloid varieties. World Health Organization (WHO) has classified leukaemias and lymphomas into various entities on the basis of clinico-morphological features immunophenotyping, cytogenetics and molecular biology[1]. Initial diagnosis of a leukaemia, however, is still done on the basis of morphology, while cytochemistry helps in differentiating acute lymphoblastic from acute myeloid leukaemia.

Acute lymphoblastic (ALL), acute myeloid (AML), chronic lymphocytic (CLL) and chronic myeloid leukaemia (CML), are the four most commonly diagnosed leukaemias. For a pathologist working in a peripheral hospital with limited diagnostic facilities, classification of leukaemias into these four major categories is still useful in making a working diagnosis and for referring the patient to an oncology centre.

We carried out a study to see the frequencies of ALL, AML, CLL and CML, diagnosed in our hospital. Study also aimed at calculating frequencies of ALL and AML in paediatric age group separately, in order to compare them with each other and with the frequencies of ALL and AML in adults, respectively.

MATERIAL AND METHODS

This was a descriptive study carried out at Pakistan Air Force hospital Mianwali from Jan 2009 to Jan 2012. Record of all the cases of four major forms of leukaemia viz. ALL, AML, CLL and CML diagnosed during period of study was retrieved from the hospital's laboratory and total number of leukaemia cases was counted. The study did not include other haematological disorders such as hairy cell leukaemia, myelodysplastic syndrome, lymphomas, multiple myeloma, and non-leukaemic myeloproliferative disorders.

The ages and the genders of the patients were noted. Median age at diagnosis of each

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type of leukaemia was worked out. Frequency of each entity of leukaemia was calculated. Relative frequency of each type was computed in terms of percentage.

In case of acute leukaemia, the patients were also divided into the age groups of children (less than 15 years) and adults (15 years and above). Number of patients of paediatric and adult ALL and AML and their relative frequencies, in terms of percentages, were calculated.

RESULTS

During the four year period, a total of 67 patients were diagnosed with different types of leukaemia. These included 41 males and 26 females. There were 37 patients of acute leukaemia while the chronic leukaemias accounted for the rest of 30 cases. AML was the commonest leukaemia followed by CML, ALL and CLL. Frequency and percentage of each type of leukaemia, male to female ratio and median age at diagnosis are summarized in table-1.

In the category of childhood leukaemia a total of 15 cases were seen. All were suffering from acute leukaemia. Relative frequencies of acute leukaemias in paediatric and adult population are given in table-2.

Table-1: Showing frequencies, male to female ratio and median ages of patients of various types of leukaemia (n=67).

	Sex	No of cases	Frequency and percentage	Male: Female	Median age (Years)
ALL	M	11	15 (22.4%)	2.7	5
	F	4			
AML	M	13	22 (32.8%)	1.4	41
	F	9			
CLL	M	8	14 (20.9%)	1.3	70
	F	6			
CML	M	9	16 (23.8%)	1.5	40
	F	7			
Total	M	41	67 (100%)	1.6	-
	F	26			

ALL: Acute lymphoblastic leukaemia, AML: Acute myeloid leukaemia, CLL: Chronic myeloid leukaemia, CML: Chronic myeloid leukaemia.

Table-2: Showing distribution and comparison of the frequencies of ALL and AML in paediatric patients and adult patients (n=37).

	ALL	AML	TOTAL
Paediatric patients (less than 15 years of age)	12 (80%)	3 (20%)	15 (100%)
Adult patients (aged 15 years and above)	3 (13.6%)	19 (86.4%)	22 (100%)

ALL: Acute lymphoblastic leukaemia, AML: Acute myeloid leukaemia.

DISCUSSION

An estimated 350,000 people are diagnosed with leukaemia each year[2]. Around 8300 people in UK and 3200 people in Australia were diagnosed with leukaemia during 2010 and 2011 respectively, while nearly 50,000 people are expected to be diagnosed with leukaemia in USA during 2013[2-4]. Leukaemia is the 12th and 13th most common malignancy in UK and worldwide respectively[2,5]. It accounts for 2.5% and 3% of all the malignancies in UK and USA respectively[2,6]. In Pakistan, some studies have shown leukaemia to be among the commonest malignancies[7].

Leukaemia is the commonest childhood malignancy, accounting for 33% of paediatric cancers and ALL is responsible for 75% to 80% of paediatric leukaemias[8-10]. In adults, ALL accounts for around 20% all acute leukaemia cases. Peak age at diagnosis in the west is 2-5 years, median age 14 years and its incidence is 1.3-1.5 times higher in males than in females[4].

Our study showed ALL to be 2.7 times higher in males than in females and the median age at diagnosis of 5 years. Out of a total of 15 children with acute leukaemia, 12 (80%) had ALL, figures similar to those seen the west[9].

AML has an age adjusted incidence of 3.7/100,000 per annum in US with a peak in seventh decade[4]. It is responsible for up to 80% of acute leukaemias in adults with slight male preponderance. AML was overall the commonest leukaemia in our study. It is the second most common type of leukaemia in the United States while in Pakistan studies have also shown AML to be the commonest leukaemia[4,11,12].

In children, AML accounts for up to 20 % of acute leukaemias, mostly occurring in neonates[10,13]. In our study too, only 20% cases of acute leukaemia in children had AML, while in adults, it was diagnosed in 86.3% cases of acute leukaemia. Over all male to female ratio of 1.3 was also similar to the figures reported in western countries[4]. The median age at diagnosis in our case series was 41 years which was much less than 63 and 65 years seen in the United States and UK respectively[4,14]. Other local studies have also shown even a lower median or mean age at diagnosis for AML falling in 3rd and 4th decades[12,15-17]. As these studies are from oncology treatment centres, where younger patients are more likely to register, therefore there is a possibility of a selection bias. Secondly, because of socioeconomic reasons, especially in rural areas, the elderly patients are liable to suffer neglect and remain undiagnosed and untreated, hence may remain underrepresented in local studies.

CLL is the commonest adult leukaemia in the west, with an annual incidence rate of 4.3/100,000, and relative frequency of 25% among all leukaemia types[4,18]. In our study it was the least common of the four major forms of leukaemia, seen in 20.1% of leukaemia cases. This difference could be because of smaller size of the sample of our case series, as well as due to longer life span and better diagnostic health care facilities in the West. It has a peak incidence between 60-80 years with a median age at diagnosis of 70 years and prevalence twice in males as compared to females[18]. We saw the same median age at diagnosis but male preponderance was less pronounced.

CML accounts for approximately 15% of all cases of leukaemias and has an annual incidence rate of 1.6/100,000 in the US[4,19]. In our study CML was the second most common leukaemia among the four major types, with a relative frequency of 23.8%. The disease occurs 1.5 times more often in men than in women in the West and an identical male predominance was seen in our study. CML is rare below the age of 20 years but occurs with increasing frequency with each subsequent decade of life. The median age at diagnosis is 64 years in the US[4]. Our study showed the median age at diagnosis of 40 years. This has endorsed the findings of earlier local studies about the median age of CML being at least a decade less than the one reported in the West[11,12,20,21]. Selection bias, environmental factors or genetic factors may be responsible for this difference in median age but exact cause is not known.

CONCLUSION

Study revealed AML to be the commonest leukaemia type, followed by CML, ALL and CLL. Median ages, at which AML and CML were diagnosed, were lower than the corresponding ages reported in the West. In children ALL was found to be four times more common than AML.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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