

The Prevalence Study of different Types of Leukemias in Population of Bhavnagar District.



Medical Science

KEYWORDS : Leukemia,types and frequency, Bhavnagar.

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ABSTRACT

OBJECTIVE:The aim of this study was to analyze the trends in the incidence rates of four main types of Leukemias in the population of Bhavnagar district.Previous studies have shown important geographic variation and trend patterns of different types of leukemia.Epidemiological study can play a vital role in understanding the occurrence and outcome of the disease.

METHODS:Study of 165 cases was done, data of these cases have been collected from Department of pathology, Government medical college, Bhavnagar.The data was analyzed in relation to patient's age, sex and type of leukemia.

RESULTS:In present study it was observed that acute leukemia is more prevalent than chronic leukemia, male to female ratio is 1.8:1, among acute leukemia ALL is common and among chronic leukemia CML is common.

CONCLUSIONS:Leukemias are more prevalent in males and acute leukemias exceeds in frequency than chronic leukemias.

INTRODUCTION

Leukemia, which was considered a rare disease before is now a days increasing in incidence and currently it is not a rare disease. It is characterized by widespread, rapid and disorderly proliferation of leukocytes and their precursor and by the presence of immature leukocytes in blood often in very large numbers unexceptionally at some time during the course of the disease (Forkner, 1938). Epidemiology has played a vital role in learning about the causes of cancer in the past few decades. This further puts the challenge to take these findings into the population and use them to detect different types of cancers earlier or ideally to prevent them altogether. [1]

Acute leukemias are hematologic malignancies with increased numbers of myeloid or lymphoid blasts. The term “acute,” historically referring to a rapid onset and promptly fatal outcome, now indicates the relatively undifferentiated nature of the leukemic cells.[2]

The overall annual incidence of these disorders in the general population is about 4 per 100,000, with approximately 70% of them being acute myeloid leukemia (AML). AML accounts for about 15% of childhood leukemias and for approximately 80% to 90% of acute leukemias in adults, with the median age at diagnosis being about 70 years. Acute lymphoblastic leukemia (ALL) is primarily a childhood disease, with the peak incidence between the ages of 2 to 3 years. It diminishes in frequency until it reaches a nadir from about the ages of 25 to 50,after which it increases to achieve a second, but minor, peak at ages older than 80. [2]

The most common of the CMPDs (chronic myeloproliferative diseases), chronic myelogenous leukemia (CML), accounts for about 20% to 35% of all adult leukemias. It typically occurs at ages 40 to 60, with about 20% to 40% of patients asymptomatic, the diagnosis having been suggested by hepatosplenomegaly on physical examination or abnormal results—leukocytosis, anemia, or thrombocytosis—on routine hematologic testing.[2]

The fundamental step in caring for the patients is to estimate the current burden of blood cancer in India and to understand how the occurrence and outcome of the disease varies across the whole country. In this context, this study aims to describe the prevalence and risk of Leukemia in the population of Bhavnagar district.[1]. Due to the lack of any nationwide leukemia screening program, the majority of the population of India is still unaware of this blood disorder. Lack of awareness also plays a role in underlying late presentation and noncompliance with screening guidelines[1]

MATERIALS AND METHODS

The study was performed on 165 patients diagnosed to have leukemia.The medical records are collected from Hematology section, Department of pathology, Government Medical College, Bhavnagar. Care was taken to see that records of patients are not repeated in case they visited the hospital for more than one time for follow up purpose.The data was collected in relation to patients age, type of leukemia and gender of the patients. In laboratory, patient’s blood is received and peripheral blood smears are made from it,then smear is stained with Leishman’s stain and examined under microscope for the detection of leukemic cells and their relative percentages.According to the percentage of blast cells and premature cells in smear leukemia is diagnosed either as acute or chronic form.

Along with peripheral smear examination all the cases of leukemia are confirmed by bone marrow examination.

Special stains are done in order to determine the myeloid or lymphoid series.Special stains include MPO(Myeloperoxidase Stain), PAS (Periodic Acid Schiff Stain) and Sudan Black.

RESULTS

The data obtained during the present study are presented in Table 1, Table 2 and Table 3. Out of 165 patients 107 are males and 58 are females. The data have been divided according to the age group and according to the sex. There is also a table showing analysis of data showing frequency of different types of leukemias in relation to age groups and sex.The male to female ratio is 1.8:1.

TABLE-1. Distribution of patients according to Age and Sex.

AGE GROUP	MALE	FEMALE	PERCENTAGE
0-10 YEARS	16	08	14.54 %
11-20 YEARS	35	15	30.30 %
21-30 YEARS	15	08	13.94 %
31-40 YEARS	06	08	08.48 %
41-50 YEARS	08	06	08.48 %
51-60 YEARS	10	08	10.90 %
61-70 YEARS	16	04	12.12 %
71-80 YEARS	00	01	0.60 %
81-90 YEARS	00	00	00.00 %
91-100 YEARS	01	00	0.60 %
TOTAL	107 (64.85%)	58 (35.15%)	165 (100 %)

Table-1 shows age group and sex wise distribution of leukemia patients. It is evident from the table that the prevalence of leukemia is more in males as compared to females. Percentage of male patients is 64.85 % and that of female patients is 35.15 %. Among various age groups the prevalence of leukemia is highest (30.30%) in 11-20 years age group, overall it is seen that leukemias are more prevalent in younger age group.

TABLE 2. Distribution of patients according to Types of Leukemias.

TYPE OF LEUKEMIA	MALE	FEMALE	TOTAL	PERCENTAGE
AML	20	09	29	17.57 %
CML	30	20	50	30.30 %
ALL	25	10	35	21.21 %
CLL	12	05	17	10.30 %
ERYTHROLEUKEMIA	01	00	01	0.60 %
ACUTE LEUKEMIA (NO TYPING)	26	08	34	20.60 %
TOTAL	107	58	165	100 %

Table-2 shows sex wise distribution of different types of leukemias. It is evident from the table that acute leukemias are more common than chronic leukemias and among acute leukemias ALL (21.21 %) and among chronic leukemias CML (30.30 %) is more common. Overall all leukemias are more common in males.

TABLE 3. Distribution of patients of different types of leukemias in relation to age groups.

AGE GROUP	AML	CML	ALL	CLL	ACUTE LEUKEMIA WITH NO TYPING	ERYTHROLEUKEMIA	TOTAL	%
0-10	00	00	17	00	07	00	24	14.54 %
11-20	14	10	16	00	10	00	50	30.30 %
21-30	06	10	02	00	05	00	23	13.93 %
31-40	03	07	00	01	03	00	14	8.8 %
41-50	04	04	00	03	03	00	14	8.48 %
51-60	00	10	00	06	02	00	18	10.90 %
61-70	02	08	00	06	04	01	20	12.12 %
71-80	00	01	00	00	00	00	01	0.60 %
81-90	00	00	00	00	00	00	00	0.00 %
91-100	00	00	00	01	00	00	01	0.60 %
TOTAL	29	50	35	17	34	01	165	100 %
%	17.57	30.30	21.21	10.30	20.60	0.60	100	

Table-3 shows distribution of various types of leukemia in various age groups. It is evident from the table that acute leukemias are more commonly seen below 20 years of age (highest in percentage-30.30%) and chronic leukemias are more commonly seen in older age groups.

DISCUSSION

The largest contributors to mortality from childhood cancer in Britain are CNS tumors, reflecting the relatively poor survival in

this group, followed by Leukemia and Neuroblastomas. In contrast, in India, Leukemia continues to be the largest contributor to cancer-related mortality in children followed by Lymphoma and CNS tumors, which

have similar mortality rates[1]. Hematological malignancies are common in our country. Different studies have been conducted on various aspects of individual hematological malignancies in the past.

In present study acute leukemia was more prevalent than chronic leukemia. Among all subtypes of leukemia myeloid series leukemia are much more common than lymphoid series.

Among acute leukemias ALL has more prevalence than AML and among chronic type CML has more prevalence than CLL type of leukemia.

The incidence of leukemia varies with the age and gender. In our present study the prevalence of leukemia is more in males than in females. The reason of more prevalence of leukemia in males can be linked to the life style and habits like tobacco smoking other than genetic factors.

From the present study we can see that the prevalence of acute leukemia is more in younger age group, between age 0-20 years and among them ALL is more common in younger or paediatric age group. In contrast to acute leukemia chronic form of leukemia whether myeloid or lymphoid series is common in older age group and among them CML is more common.

The spectrum of cancer epidemiology seen in India is different than that seen in any developed country. It should be stressed that cancer registry data in the region are scanty, especially for the country like India with a large population, so that emphasis should be placed on better development of regional and national registries.

Present study shows male to female ratio 1.8:1, which is similar as shown in study by Harendra Modak et al[1], the distribution of various types of leukemias in population is similar, acute leukemias are more common than chronic leukemias. Present study and study by Harendra Modak et al show similar results.

The reference study[3], by Radha Rathee et al shows high male prevalence of leukemias which is similar to our present study and also there is a similar frequency distribution of types of leukemias in present study and study by Radha Rathee et al.

Figure-1 Morphology of cells in CML stained with Leishman's stain(100x), which shows leukocytosis with all stages of myeloid cells from blast cell to neutrophils.

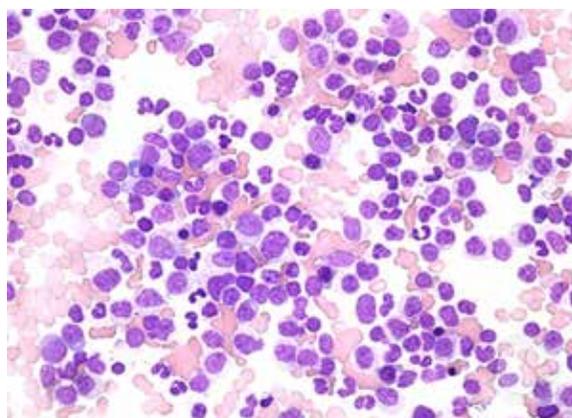


Figure-2 Morphology of cells in AML stained with Leishman's stain(100x), which shows very high total leukocyte count with majority of them being blast cells.

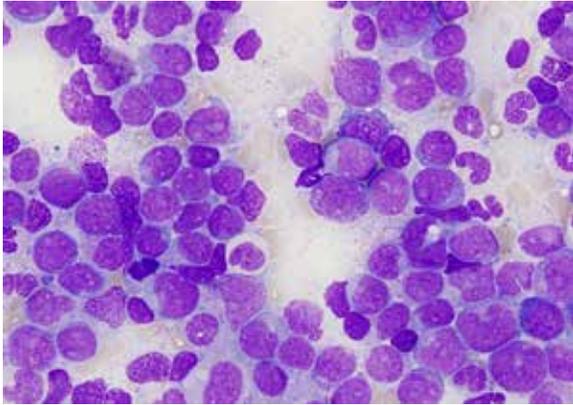


Figure-3 Morphology of cells in CLL stained with Leishman's stain(100x), which shows lymphocytosis with mainly mature lymphocytes.

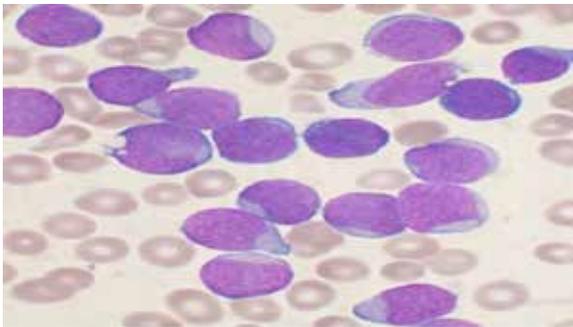
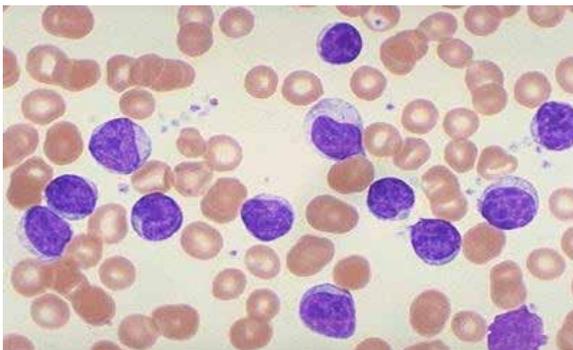


Figure-4 Morphology of cells in ALL stained with Leishman's stain(100x), which shows leukocytosis with majority of them being blast cells.



Conclusion:

Present study revealed that acute leukemia was more prevalent than chronic leukemia. The most common type of leukemia was CML followed by AML, ALL and CLL. Overall leukemia was more commonly seen in male patients. Age has significant effect on type of leukemia. ALL was more commonly observed in children whereas both CML and CLL were only observed in adults

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