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Research Article

Age and Sex Distribution of Leukemia in Patients Seen at a Tertiary Hospital in Ghana

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Abstract

Background

The leukemias are malignant proliferations of blood cells and occur worldwide. Observation of patient trends pointed to clusters of leukemia in particular age groups in Ghana. This prompted a closer study looking at age and sex distribution, which is reported in this study.

Methods

A retrospective review of bone marrow reports from 1st January 2003 to 30th April 2005 at the Korle- Bu Teaching Hospital (KBTH), Accra, Ghana were made. All new cases with diagnosis of leukemia made by the hematologist were included. Marrows done to assess remission status were excluded. Name, sex, age and diagnosis were recorded. The data was analyzed by tallying into year of diagnosis, age group and sex.

Results

Over the 28 month period (1st January 2003 to 30th April 2005), there were a total of 220 cases in the following order of frequency; Acute Lymphoblastic Leukemia (ALL) 74, Chronic myeloid leukemia (CML) 55, Chronic lymphoid leukemia (CLL) 51, and Acute Myeloid leukemia (AML) 40. The chances of developing acute leukemia were more than 3 times higher in those aged 34 and below as compared to older subjects. ALL showed a cluster below 20 years, whilst AML was uniformly spread. There was a preponderance of females in CLL, CML and AML, which did not achieve statistical significance (p=0.57, 0.10, 0.92 respectively). ALL was significantly commoner in males (p=0.03). There was no case of CLL below the age of 35 years.

Conclusion

The age and sex distribution of acute and chronic leukemia in Ghana, has its peculiarity peaks and it would be important to examine why, looking not only at the biology of the disease but also socioeconomic factors and changes.

Keywords: Leukemia; Sex; Age; Bone marrow; Ghana

Introduction

The leukemias are malignant proliferations of blood cells and occur worldwide. Although various aetiological agents have been implicated in its development, in any individual case the cause is in most cases unknown. Aetiological agents include ionizing radiation which has been implicated in all except CLL; non-ionizing radiation as in electromagnetic fields, benzene exposure, herbicides, pesticides, fertilizers, diesel fuel and exhaust, infectious agents associated with live stock, Epstein-Barr (E-B) virus, human T-lymphotrophic virus type I (HTLV-I) and human immunodeficiency virus (HIV). Others are alkylating agents, immune suppression, cigarette smoking, and familial predisposition, which is highest in CLL.

Methods

KBTH is the main tertiary referral centre for southern Ghana. It is the largest hospital in Ghana and only hospital with a hematology unit. A retrospective review of bone marrow records examined from 2003 to 2005 April was done. All new cases with diagnosis of leukemia made by the hematologist were included. Marrows done to assess remission status were excluded. Details on age and sex were complete and thus examined. The data was analyzed by tallying into age group and sex.

The statistical significance was calculated using the chi-square with the vassarstrts statistical package.

Results

76 cases in 2003 (40 acute),100 in 2004 (50 acute) and up to 31st April 2005, 44 cases with 24 acute. Figures 1 – 6 were constructed with the total of 220 new cases of leukemia seen during that 28 month period.

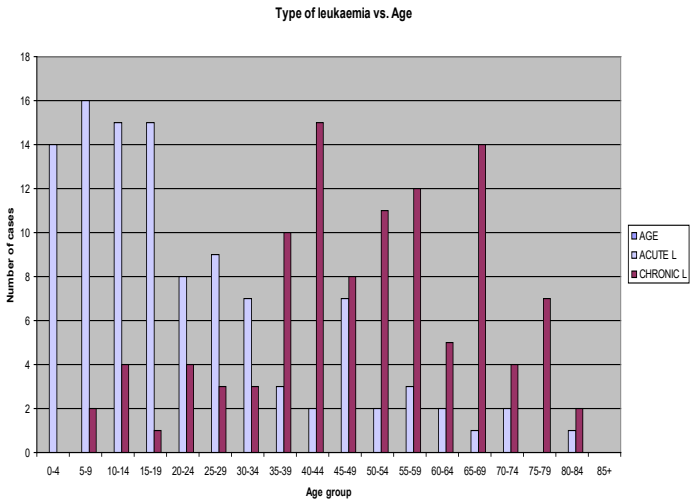

Figure 1. Type of leukemia versus age group.

Of the total of 220 cases seen from 1st January 2003 to 30th April 2005, the four different types of leukemia were diagnosed in the following order of frequency; Acute Lymphoblastic Leukemia (ALL) 74, Chronic myeloid leukemia (CML) 55, Chronic lymphoid leukemia (CLL) 51, and Acute Myeloid leukemia (AML) 40.

It is shown in Figure 1 and 2, that acute leukemia was more than 3 times commoner in those aged 34 and below as compared to older subjects, apart from a small peak at 45-49 years.

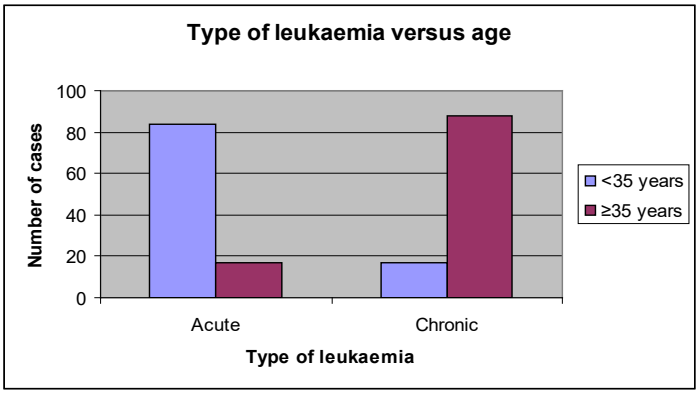

Figure 2. Type of leukaemia and age.

From Fig 3 ALL clustered below age 20. Beyond the age of 59 years, all ALLs were male. ALL was significantly commoner in males (p=0.03) with a male to female ratio of 1.53:1.

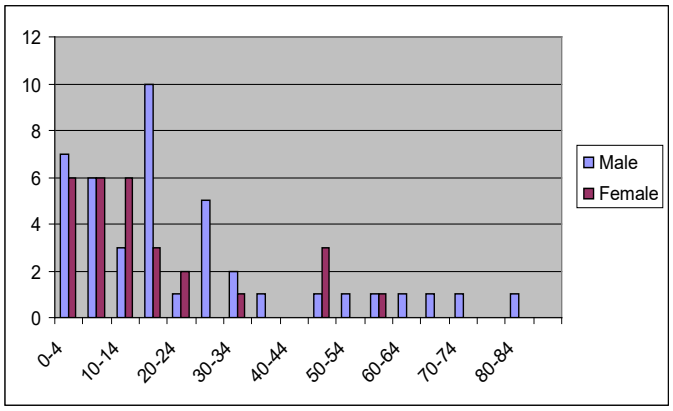

Figure 3. Age and Sex distribution in ALL.

AML (Fig 4) was more uniformly spread as compared to ALL, but there was a peak for females at 15-19 years and for males at 25-29 years. Beyond the age of 54 years, all AMLs were female. AML was commoner in females but the difference was not statistically significant (p=0.92). The male to female ratio was 0.97:1. In the case of CLL (Figure 5) there was no case below the age of 35. The peak for the disease and for males was at 65 – 69 but the peak for females was at 55-59. CLL was commoner in females, but not significantly so (p=0.50). CML showed a Gaussian distribution, peaking between 40-50 years (Figure 6). It was also commoner in females but not significantly so (p=0.10). The male to female ratio was 0.68:1.

It is noteworthy that in both the acute and chronic leukaemias, females peaked earlier than males.

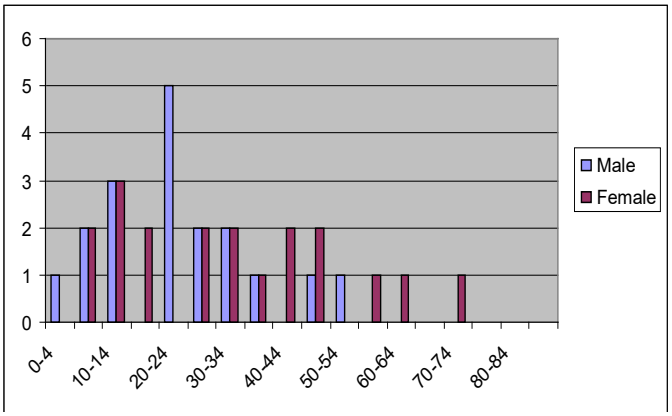

Figure 4. Acute Myeloid Leukemia. Age and sex distribution.

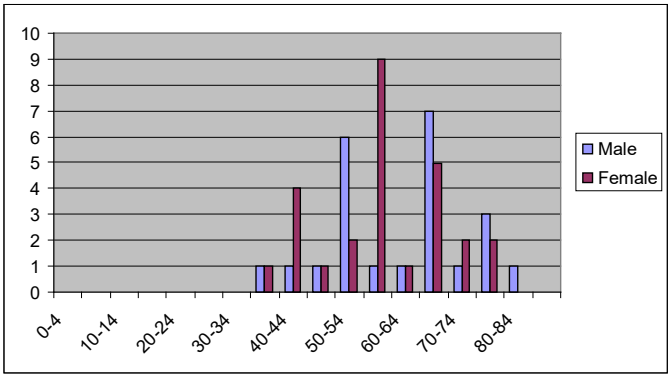

Figure 5. Chronic Lymphocytic Leukemia. Age and sex distribution.

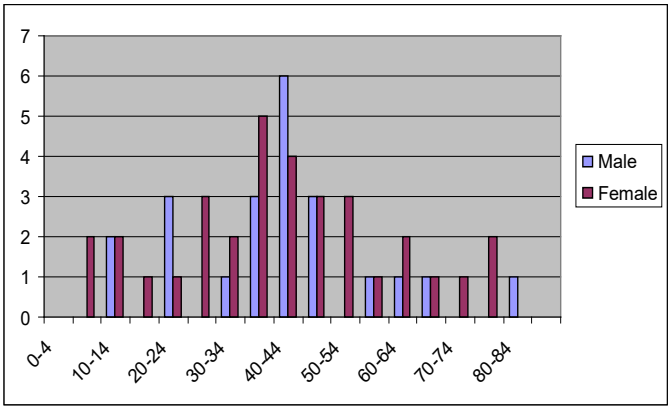

Figure 6. Chronic Myeloid Leukemia. Age and sex distribution.

Discussion

The age and sex distribution reported in this study is similar to those reported by Cancer Research UK [1]. The general trend of the cases in the various age groups is similar to a report made in 1979 and published in 2012 [2]. In this study, the peaks noted for the acute and chronic leukemias between males and females though, were different. The female preponderance in all leukemia cases except ALL is different from previous studies [3-5], and this should be explored further in another study. The sex of an individual is said to be one of the greatest known risks for contracting lymphomas and leukemias [6]. Another study with a larger sample size would be needed for further comment. It has been reported that during socioeconomic transition ALL peaks at 1-4 years [7], this is what was seen in the current study. Whether this truly reflects socioeconomic change can only be answered in a repeated study over decades. The peak for AML in this study is from age 20 to 24 years, this is not so in other studies [8] and in that particular study by Gunnar et al the peak for AML was in the seventh decade. It is possible this is more a reflection of the different population structures but a more comprehensive study as mentioned, is recommended to answer these questions.

Conclusion

The age and sex distribution of acute and chronic leukemia in Ghana, has its peculiarity peaks and it would be important to examine why, looking not only at the biology of the disease but also socioeconomic factors and changes.

Acknowledgement

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Conflict of Interest

None declared

References

1. Cancer Research UK. Leukaemia Statistics. CancerStats. 2007.

2. E Tanner, Swiss Reinsurance Company, ML Hefti Springer Science & Business Media. Annals of Life Insurance Medicine 6: Proceedings of the 13th International Congress of Life Assurance Medicine Madrid 1979. 6 2012, 118.

3. Nakatsuka S, Aozasa K. Epidemiology and pathologic features of Hodgkin's lymphoma. Int J Hematol. 2006, 83(5): 391-397.

4. Oluboyede OA, Olaofe WA, Esan GJF. Non-Hodgkin's Lymphoma in Ibadan, Nigeria. J Natl Med Assoc. 1977, 69(7): 499–502.

5. Bodis S, Kraus MD, Pinkus G, Silver B, Kadin ME et al. Clinical presentation and outcome in lymphocyte-predominant Hodgkin's disease. J ClinOncol. 1997, 15(9): 3060-3066.

6. Cartwright RA, Gurney KA, Moorman AV. Sex ratios and the risks of hematological malignancies. Br J Haematol. 2002, 118(4): 1071-1077.

7. Hrušák O, Trka J, Zuna J, Poloučková A, Kalina T et al. Acute lymphoblastic leukemia incidence during socioeconomic transition: selective increase in children from 1 to 4 years. Leukaemia. 2002, 16(4): 720-725.

8. Gunnar Juliusson, Petar Antunovic, Åsa Derolf, Sören Lehmann, Lars Möllgård, Dick Stockelberg et al. Age and acute myeloid leukemia: real world data on decision to treat and outcomes from the Swedish Acute Leukemia Registry. Blood. 2009, 113(18): 4179-4187.