

East African Medical Journal Vol. 96 No. 3 March 2019

A PROFILE OF LEUKAEMIAS IN ADULTS MANAGED AT THE UNIVERSITY OF CALABAR TEACHING HOSPITAL IN NIGERIA

Kingsley Akaba, Department of Haematology and Blood Transfusion, University of Calabar Teaching Hospital, Calabar, Nigeria, Patrick Osho, Department of Haematology, University of Medical Sciences, Ondo, Ondo State, Nigeria, Olukayode Oshatuyi, Department of Biochemistry, Ebonyi State University, Abakaliki, Edakabasi Akaba, Department of Pathology, University of Calabar Teaching Hospital, Calabar, Nigeria, Victor Eduve, Department of Ophthalmology, University of Calabar Teaching Hospital, Calabar, Nigeria.

Correspondent author: Kingsley Akaba, Department of Haematology and Blood Transfusion, University of Calabar Teaching Hospital, Calabar, Nigeria. Email: akaba_kingsley@yahoo.com

A PROFILE OF LEUKAEMIAS IN ADULTS MANAGED AT THE UNIVERSITY OF CALABAR TEACHING HOSPITAL IN NIGERIA

K. Akaba, P. Osho, O. Oshatuyi, E. Akaba and V. Eduve

ABSTRACT

Background: Types and proportions of leukaemias in adults tend to vary from one institution to another. These are due to a variety of factors that may be examined after establishing and describing the status of leukaemias in a particular setting. The results inform planning for management and impacts on outcomes of intervention.

Objective: To determine the types and trend of adult leukaemia managed at the University of Calabar Teaching Hospital.

Design: This was a cross sectional retrospective study of the adult leukaemias seen at the Department of Haematology and Blood Transfusion, University of Calabar Teaching Hospital, Calabar (UCTH).

Setting: The Haematology Department of the University of Calabar Teaching Hospital (UCTH) Nigeria.

Population: All adults managed for haematological malignancies at the UCTH during the study period of ten-year from August 2009 to December 2018.

Materials and Methods: Data were retrieved from the archives in the hospital including cancer registry, and departmental records. Information that met the study entry criteria was collected using a proforma questionnaire. The following were required for each case: dates of presentation, diagnosis, age, gender, and type of leukaemia. Data was also being further reviewed by the haematologist who had to corroborate with medical records and patients' case-notes. The data were then pooled, screened, collated and entered in a Microsoft Excel 2016 spreadsheet and analysed with IBM SPSS Version 22. Chi-square test was used to determine relationships between the variables. The results were presented using descriptive statistics (frequencies and percentages), and graphical charts.

Results: A total of 138 haematological malignancies was seen over a period of ten years. Of which 70 were adult leukaemia, constituting the 50.72% of the total haematological malignancies. Male to female ratio was 1:1. Overall age characteristics; age ranges from 19 to 82 years, mode was 54 years, and median age was 53 years. Male age characteristics range 19 to 78, mean 48.72 ± 12.75 , Female age characteristics range 26 to 82, mean 54.25 ± 10.50 . Trend results for each type of leukaemia, in males, in females. The CLL was the most prevalent leukaemia variant with 26.09%, followed by CML 19.57%. The ALL and AML had a prevalence of 2.90% and 2.17% respectively. However, when leukaemia was categorised into types; females revealed CLL and CML 52.78 % and 59.26% of the leukaemias respectively. A peak was observed between 2014 and 2017. The mean age of the patients with leukaemia over the study period was 49.49 ± 16.95 (standard deviation) years. Gender distribution of all types, 4 males had ALL with no female, 17 males and 19 females had CLL, 3 males had AML with no female, 11 males and 16 females had CML.

Conclusion: this study showed that leukaemias in adults in University of Calabar Calabar Teaching Hospital, Cross River State have variable patterns of age and sex. Type of leukaemia also showed similar variations. This study recommends further studies to understand causes of the variations in the profile of leukaemias.

INTRODUCTION

Leukaemias are a group of haematological malignancies of clonal origin arising from bone marrow and subsequently involves the peripheral circulation and other parts of the body. Leukaemia causes effects by infiltration and changes in metabolism among others [1]. Using WHO classification of leukaemia 2016 updated version; leukaemia is classified into the myeloid and lymphoid with their variants or subtypes. This classification is based on morphology, clinical feature, Immunophenotyping, cytogenetics and molecular studies. However, in poorly resourced countries, leukaemia is still classified based on morphology of the leukaemia cells as per French American-British classification. Generally, the acute form which constitute 28.9% are common in

children while among adult and elderly the chronic form constitutes 71.1% [2]

Leukaemia account for 2.5% of all cancers and 3.2% of all cancer deaths [3]. However, in resource poor countries leukaemia is said to pose a great challenge as the disease predominantly affecting those less than 60 years olds [4]. This age group majorly makes up the active workforce and also somewhat affecting the economy. Africa particularly has 70% of the workforce below 50 years. Furthermore, it is the fifth most common cause of cancer death in males and sixth most common in women in the United States in a five years' study between 2007 and 2011 [5]. However, there is paucity of data on profile of leukaemias in adults. In Ethiopia, Shamebo reported a prevalence of 2.3% of all hospital admission of adult leukaemia with male preponderance of ratio 2.3:1 [6]. Another study conducted in Saudi Arabia between

1981 -1988 by Khan and his colleagues reported low prevalence of 0.13% [7]. In addition, a study conducted in Northcentral Nigeria by Egesie *et al* showed a prevalence of 64.5% [8] while a similar study conducted in South-South Nigeria between 1999 and 2008 by Nwannadi *et al* revealed a prevalence of 51.1% [9]. Due to this variation in data, this study aims to determine the proportion of adult leukaemia managed at the University of Calabar Teaching Hospital in terms of age and sex.

MATERIALS & METHODS

Study design: The study was a retrospective study of the Leukaemias seen at the University of Calabar Teaching Hospital, Calabar (UCTH) from August 2009 to December 2018.

Study area: The hospital is a 600-bed tertiary health institution that renders specialist care to its host and neighbouring communities.

Subject: Those studied consisted of patients diagnosed to have leukaemia and treated at the Department of Haematology, University of Calabar Teaching Hospital. The Haematology department patient care service is clinical staff, consultants, resident doctors, trained nurses and laboratory scientific officers. The diagnoses were made by the haematologists on bone marrow and peripheral blood. In addition, further studies performed on the specimen were cytochemistry and immunophenotyping while cytogenetic and karyotyping studies majorly BCR/ABL-Philadelphia were sorted

for externally at Obafemi Awolowo University Teaching Hospital, Ife, Osun State.

Selection criteria: Those whose information were retrieved from the cancer registry, hospital records and patients' personal folder were included in the study while those with omission and discrepancy from any part of the archives were excluded from the study. Also, those with confirmed diagnoses of leukaemia types: acute myeloid leukaemia (AML), acute lymphoid leukaemia (ALL), chronic myeloid leukaemia (CML), and chronic lymphoid leukaemia (CLL) were included, and those with diagnostic dilemmas and inconclusive diagnosis were excluded.

The data and results collated were analysed using Microsoft Excel 2016 and IBM SPSS Version 21. The data were analysed using simple inferential statistics (frequencies and percentages), Chi-square test was used to determine associations between categorical variables, and graphical charts were used to present our findings.

Ethical approval: Written ethical approval was obtained from the ethics committee of the University of Calabar Teaching Hospital.

RESULT

Total haematological malignancies over the ten years was 138 of which leukaemia were 70, this represent 50.72% of the total haematological malignancies. The CLL was the most prevalent leukaemia variant with a prevalence of 26.09%, CML 19.57%. The ALL and AML were 2.90% and 2.17% respectively.

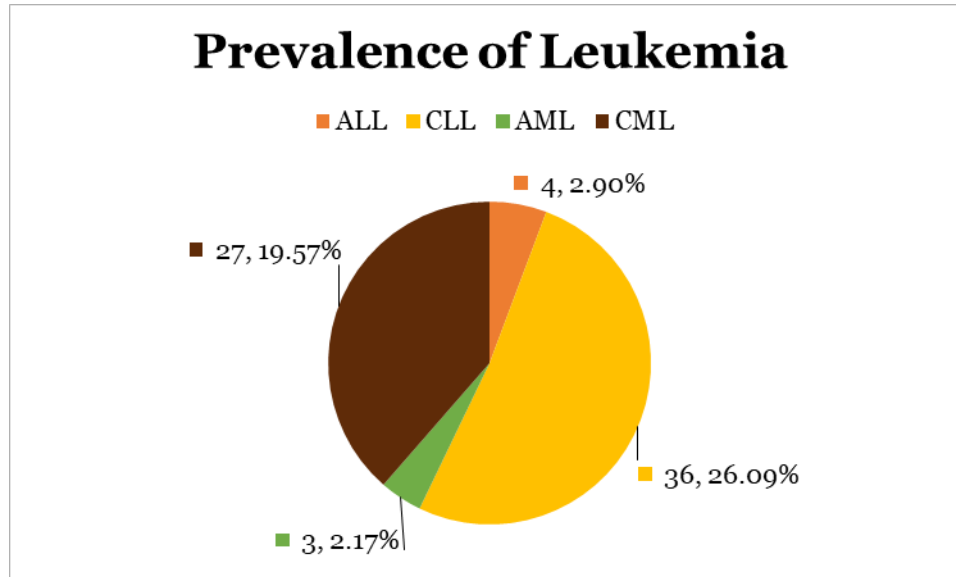


Figure 1 shows the proportion of leukaemia seen and managed in UCTH, Calabar

Table 1
Showing adult leukaemia in UCTH

TYPE OF LEUKEMIA	FREQUENCY	PERCENTAGE (%)
Acute Lymphoblastic Leukemia (ALL)	4	5.71
Chronic Lymphocytic Leukemia (CLL)	36	51.43
Acute Myeloid Leukemia (AML)	3	4.29
Chronic Myeloid Leukemia (CML)**	27	38.57

** all 27 were BCR/ABL positive

Gender distribution of patients with leukaemia is presented in figure 2. The yearly presentation of adult leukaemia is presented in table 2.

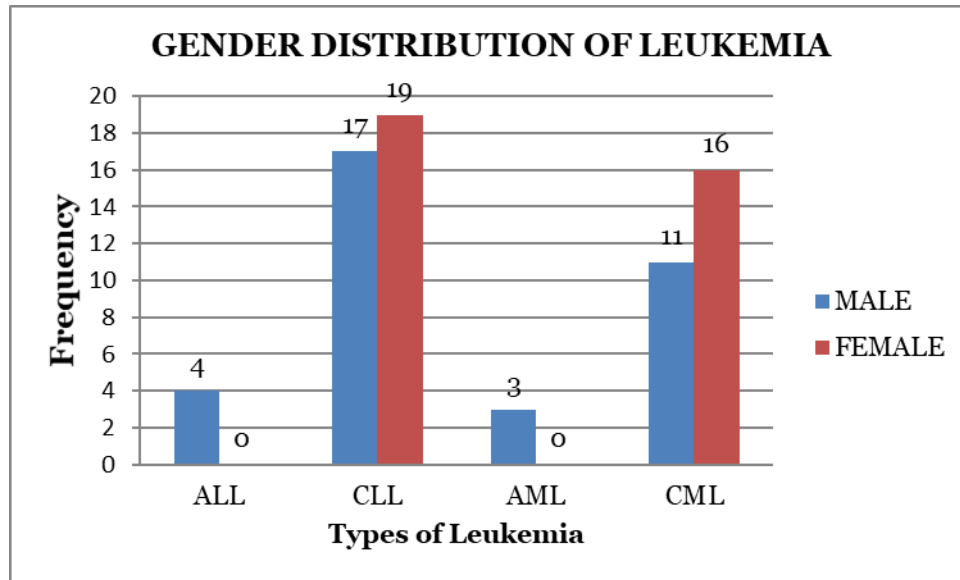


Figure 2: Showing the gender distribution of studied patients.

Table 2

Showing the association between gender and leukaemia in UCTH

Types of Leukemia	Male (%)	Female (%)	X ²	P - value
Acute Lymphoblastic Leukemia	4 (11.11)	0 (0.00)	2.56	0.657
Chronic Lymphocytic Leukemia	17 (47.22)	19 (54.29)		
Acute Myeloid Leukemia	3 (8.33)	0 (0.00)		
Chronic Myeloid Leukemia	11 (30.56)	16 (45.71)		

No statistically significant association was observed between gender distribution and the types of adult leukaemia seen at UCTH. Chi-square = 2.56, p = 0.657.

Table three shows the age distribution, frequency and percentage of adult leukaemia. The mean age was 49.49 16.95 (SD) years, the median age was 53 years.

Table 3

Showing ten-year proportions of leukaemia in UCTH

Types of Leukaemia	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Acute Lymphoblastic Leukaemia	0	1	0	1	0	0	0	0	2	0
Chronic Lymphocytic Leukaemia	2	4	3	2	3	6	5	3	5	4
Acute Myeloid Leukaemia	0	0	1	0	0	1	0	0	0	1
Chronic Myeloid Leukaemia	2	2	0	0	4	3	3	6	4	2
Total	4	7	4	3	7	10	8	9	11	7

Table 4

Showing age distribution, frequency and percentage of leukaemia patients

AGE RANGE	FREQUENCY	PERCENTAGE	STATISTICS
19	2	2.86	$\bar{X} = 49.49 \pm 16.95$ (SD) years
20-29	7	10.00	
30-39	9	12.86	
40-49	13	18.57	Median Age = 53.00 years
50-59	17	24.29	
60-69	11	15.71	
70-79	9	12.86	
≥80	2	2.86	

Table 5

Showing the association between the types of leukaemia and age distribution

HAEMATOLOGICAL MALIGNANCIES	≤19	20-29	30-39	40-49	50-59	60-69	70-79	≥80	X ²	P-Value
Acute Lymphoblastic Leukaemia	2	1	0	1	0	0	0	0	23.18	0.022
Chronic Lymphocytic Leukaemia	0	0	0	7	11	8	8	2		
Acute Myeloid Leukaemia	0	1	1	1	0	0	0	0		
Chronic Myeloid Leukaemia	0	5	8	4	6	3	1	0		
Total	2	7	9	13	17	11	9	2		

Statistically significant association was observed between the age distribution and the types of adult leukaemia. Chi-square = 23.18, $p = 0.022$

Figure 3 shows the trend on adult leukaemia seen and managed at the University of Calabar in the 10 year period

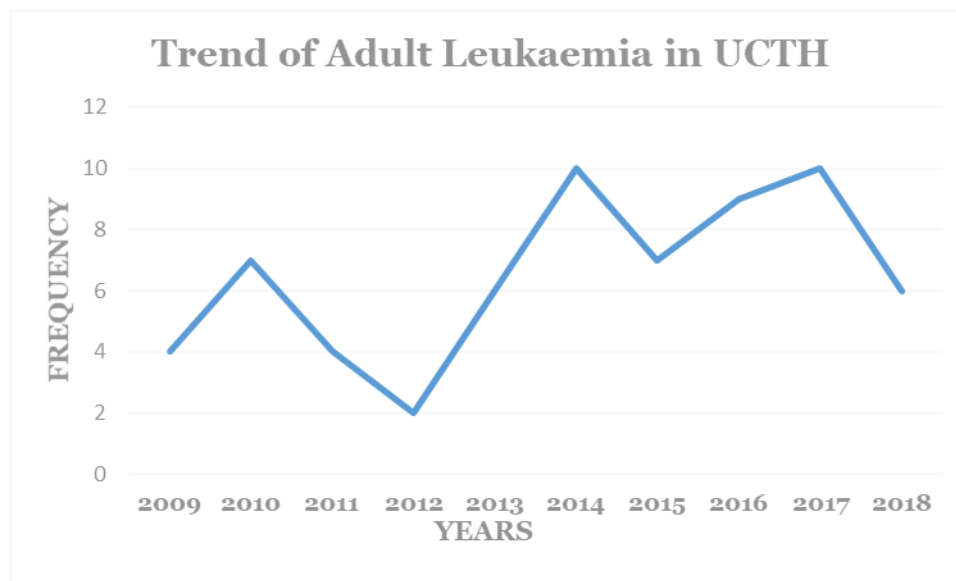


Figure 3: showing the trend of adult leukaemia

DISCUSSION

The results of this study shows inconsistency with the available data of leukaemias in relation to age, sex and types in our institution. Leukaemia in adults constitutes 5.3% of all malignancies recorded during the period of review. This is similar to the study reported in the United Kingdom and United State of America respectively [10, 11]. Although, this study is at variance with similar study conducted in the North Central of Nigeria, where a higher prevalence of 64.5% was reported [8]. There are further studies that reveals a lower prevalence in Zimbabwe [12]. This variation in prevalence of adult leukaemias might be attributed to the variability of pick up by the institution medical teams, risk factors from one locality to another, health-seeking behaviour, social infrastructure for easy access to health facility, competences of doctors and laboratory to make the diagnosis and provide management. Also, orientation and education status of the population not attributing this disease condition to Spiritism. All these factors might contribute to the low prevalence recorded in our study.

The median age of adult leukaemia patients in our centre was 53years which was similar to the finding by Omoti *et al.* in South-South region of Nigeria [13] but varies with the study by Egesie *et al.* in North-Central of Nigeria [8]. The variation could be attributed to the early exposure to western civilization which provides the opportunity for better healthcare and education. South-south is an oil-producing region (oil which is the wealth of the nation) with abundant crude oil; the greater economic opportunity in terms of access to health care facility and social amenities. Likewise, the low life expectancy of Nigerians may explain the lower mean age

value recorded in Jos [8]. Similarly, Shamebo *et al* reported a mean age of 29.6 years in Ethiopia [6]. This can be attributed to the difference in study design.

There was an equal sex distribution of adult leukaemias in our environment in the ratio of 1:1. This was similar to an earlier study conducted in Morocco [14]. There are variations among the different leukaemia with preponderance of chronic leukaemia in an adult population. This was similar to the study conducted in Poland [15]. However, when adult leukaemias were considered individually, females had higher prevalence amidst individuals with CLL and CML. Our finding is similar to studies conducted in France and the United Kingdom respectively [10, 11]. The female to male ratio was 1.2:1 and 1.3:1.

Adult leukaemia was observed to be highest in the age range 50-59 years (24.29%) followed by 40-49 years then 60-69years with the least seen at the extremity of age of the study population respectively. Further analysis revealed that between the 10-49 years had acute leukaemia which constitutes 10% while chronic leukaemia affects the age range of 10 to \geq 70years and make up 90% of all the leukaemias.

The annual pattern of distribution of adult leukaemias in the index study during the period of review showed that a peak was observed in the year 2014 and 2017. The variation in annual incidence may be attributed in part to the incessant industrial action in the hospital that limits patients' access to specialized care and thereby reducing the numbers of cases or missed cases. The decrease in the recent year can be attributed to the increase in the awareness, education and availability of haematologists and residents in haematology.

The CLL was said to be the most predominant adults constituting 26.09% with female preponderance. Female to male ratio was 1.1:1. CLL was observed in patients aged 40 years and above with majority (24.29%) seen in the 50-59 age range. The median age was 54.5 years. This was similar to the findings within Nigeria [16] but differs from the studies conducted in Asia [18], with a peak in 2014 that persist until now.

The CML was the next commonest adult in our setting constituting 19.57% of all adult with female preponderance and female to male ratio of 1.5:1. The median age was observed to be within the 30-39 years' age range. This finding was similar to a study conducted by Hoglund *et al* [19] but at variance with studies conducted by Vernon J Louw [20].

Commonest and predominant acute leukaemia ALL constitutes 2.90% of the total leukaemia with male preponderance and male to female ratio of 4:1. The peak age observed was within the 10-19 age range. This is somewhat similar to a finding reported in South-south Benin, by Omoti *et al* but reported a higher prevalence [13]. This can be attributed to the difference in study design. A similar finding was also reported by Elidrissi *et al* in Morocco, Northern Africa [14]. The incidence was said to peak in the year 2017 indicating an increasing trend and call for an awakening of our consciousness to this menace among adults.

The prevalence of AML was found to be 2.17% with a male preponderance. AML was observed in patients with age ranging from 20 to 49 years. The findings in this study were observed to be similar with a study conducted in Morocco, Northern Africa [14] but at variance with other studies reported within Nigeria where a lower prevalence was reported [8, 13]. This could be attributed to

occupational risks; Calabar, being an oil-producing region and study design, also study design.

CONCLUSION

The study has shown that adult leukaemia seen and managed at the University of Calabar Teaching Hospital have variable age distribution patterns with acute leukaemia commoner in adults less than 49years, male preponderance while chronic leukaemia had a bi-modal peak with female preponderance, CML found predominantly from 20years and above while CLL was commoner from 40years and above years. The implication of, its effect on the middle-aged and elderly can lead to a decline in this population and workforce, thereby threatening the growth of the economy in terms of productivity and experience from the elderly.

RECOMMENDATION

There is need for further research on the epidemiology, risk factor and treatment modality in the management on extended spectrum of adult leukaemia to enhance appropriate referral for proper diagnosis and prompt intervention. The rising trend of adult leukaemia requires the political will, in establishment of a robust and equipped health care system, with training and re-training of specialists to enhance quality of life in patients with this condition.

REFERENCE

1. Ramnik Sood. Leukaemias. In: Haematology for students and practitioners (4th ed), New Delhi, Jaypee Brothers. 2003; pp:207-235.
2. Okpala I.E., Okpala JU. Socioeconomic class distribution of the prognostic variants of lymphoproliferative cancer in Nigeria. *Afr J Med Med Sci* 1992; 21(1): 79-83.
3. Jemal A, Siegel R, Ward E, Hao Y, Xu J, Murray T, Thun MJ. Cancer statistics, 2008. *CA: A Cancer Journal for Clinicians*. 2008; 58:71-96.
4. Akaba K, Nwogoh B, Akpan I, Bassey O B, Effiong O, Petters E, Igwilo H, Onyeulor E and Ushie G. A. Epidemiological Pattern of Adult Haematological Malignancies in a Tertiary Hospital in Cross River State. *International Research Journal of Oncology*. 2019, 2(1): 1-9.
5. Cohen J, Pivodic L, Miccinesi G, Onwuteaka-Philipsen BD, Naylor WA, Wilson DM *et al*. International study of the place of death of people with cancer: A population-level comparison of 14 countries across 4 continents using death certificate data. *Br J Cancer* 2015; 113:1397-404.
6. Shambo M. leukaemia in adult Ethiopians. *Ethiop Med J*. 1990; 28:31-7.
7. Khan MQ, Shivarudrappa AS, ei Bialys, al Khawagi MZ, al Mojarreh M. Leukaemia cases in Central Hospital Riyadh, Saudi Arabia. *J Indian Med Assoc*. 1991; 89:38-42
8. Egesie OJ, Jatau E D, Damulak O D, Zakari A, Jasini J, Akinola O, Okeke C N, Akor EA, Adeyemi OA, Lar S L, Egesie UG. Prevalence and type of haematological malignancies among adults in a tertiary hospital in Jos-Nigeria: a sixteen-year retrospective analysis. *Highland Med. Research J*. 2017; 17(2): 1-7.
9. Nwannadi, Alao OO, Bazuaye GN, Nwagu M, Borke M. clinical and laboratory characteristic of patients with leukaemia in South-South Nigeria. *Inter J Oncol*. 2011;7.
10. Leclair SJ, Rodak BF. The new WHO nomenclature: lymphoid neoplasms. *Clin Lab Sci*. 2002;15(1):55-9.
11. Troussard X, Duchenet V, Cornet E, Mouchel D, Malet M, Collignon A. Haematological malignancies: incidence in Basse-Normandie, France, for 1997-2004. *Rev Epidemiol Sante Publique*. 2009;57(3):151-8
12. Chinembiri V, Mandisodza A, Maboreke T, Tinago W and Chokunonga E. The epidemiology of leukaemia in zimbabwe: A ten-year retrospective study. *Haematol Int J*. 2017; 1(1):1-7.
13. Omoti C E, Nwannadi A I, Obieche J C, Olu-Eddo N A. The epidemiological features of lymphoid malignancies in Benin City, Nigeria: a 15 years study. *The Pan African Medical Journal*. 2012;11:10. DOI:10.11604/pamj.2012.11.10.403
14. Mounia E E, Manal E E, Redouane B, Meryem O & Mohammed B. Distribution and features of haematological malignancies in Eastern Morocco: a retrospective multicenter study over 5 years *BMC Cancer* 2016; 16:159-169. DOI 10.1186/s12885-016-2205-5.
15. Kwiatkowski A. Trends in the incidence of leukaemia in Poland, 1963-90: an epidemiologic study. *Eur J Cancer Prev*. 1994;3(3):277-83.
16. Babatunde A, Amiwero C, Olatunji P, Durotoye I. Pattern of haematological malignancies in Ilorin, Nigeria: A ten-year review. *Internet J Haemat* 2008; 5:1-7
17. Tamura K, Sawada H, Izumi Y, Fukuda T, Utsunomiya A, Ikeda S, et al. Chronic lymphocytic leukaemia (CLL) is rare, but the proportion of T-CLL is high in Japan. *Eur J Haematol*. 2001;67(3):152-7.
18. Gogia A, Sharma A, Raina V, Kumar L, Vishnubhatla S, Gupta R, et al. Assessment of 285 cases of chronic lymphocytic leukaemia seen at single large tertiary center in Northern India. *Leuk Lymphoma*. 2012;53(10):1961-5.
19. Martin Höglund, Fredrik Sandin, Bengt Simonsson Epidemiology of chronic myeloid leukaemia: an update. *Annals of hematology* 2015; 94:241-247
20. Vernon J Louw. Chronic myeloid leukaemia in South Africa. *Journal of haematology* 2013; s75-s78