Demographic Pattern of Chronic Lymphocytic Leukemia in a Tertiary Hospital in Calabar, South-South Nigeria

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Abstract

Background: Chronic lymphocytic leukemia (CLL) is a heterogeneous group of monoclonal forms of lymphoproliferative disorder, which is usually common among older adults. There is an increasing trend in the number of patients presenting with the disease. Aim: This study aims to determine the epidemiology pattern of CLL in Cross River state. Methodology: A retrospective study with 10-years data (2010–2019) obtained from the register of the Department of Haematology and Blood Transfusion, University of Calabar Teaching Hospital, Calabar. The data collected include the date of presentation, the age, gender, location of residence, and occupations of the patients. Results: A total of 47 cases were seen during the 10-year period, with a male: female ratio of 1:1. The mean age at presentation was 59 years. The majority of the patients were in their fifth and sixth decades of life. Most patients (44.68%) practice farming as their profession. Conclusion: The study has reawaken our consciousness on the increasing trend on the epidemiological burden of CLL in our environment and will help to enhance further investigation into the relationship between the rising trend and available possible risk factors in our environment.

Keywords: Calabar, chronic lymphocytic leukemia, demography

Résumé

Contexte: La leucémie lymphoïde chronique (LLC) est un groupe hétérogène de formes monoclonales de trouble lymphoprolifératif, qui est généralement fréquent chez les personnes âgées. Il y a une tendance croissante dans le nombre de patients présentant la maladie. Objectif: cette étude vise à déterminer le schéma épidémiologique de la LLC dans l’État de Cross River. Méthodologie: une étude rétrospective avec des données sur 10 ans (2010–2019) obtenu auprès du registre du Département d’hématologie et de transfusion sanguine, Hôpital universitaire de Calabar, Calabar. Le les données recueillies comprennent la date de présentation, l’âge, le sexe, le lieu de résidence et les occupations des patients. Résultats: Un total de 47 cas ont été observés au cours de la période de 10 ans, avec un rapport hommes: femmes de 1: 1. L’âge moyen à la présentation était de 59 ans. La majorité des les patients étaient dans leurs cinquième et sixième décennies de vie. La plupart des patients (44, 68%) pratiquent l’agriculture comme leur profession. Conclusion: l’étude a réveillé notre conscience de la tendance croissante à la charge épidémiologique de la LLC dans notre environnement et contribuera à une enquête plus approfondie sur la relation entre la tendance à la hausse et les facteurs de risque possibles disponibles dans notre environnement.

Mots-clés: Calabar, leucémie lymphoïde chronique, démographie

INTRODUCTION

Chronic lymphocytic leukemia (CLL) is a heterogeneous group of monoclonal forms of lymphoproliferative disorder,
which is common in the Western world.\cite{1} It is characterized by the accumulation in the blood, bone marrow, and lymphoid organ of mature incompetent lymphocytes. The international workshop on CLL 2018 guideline for the diagnosis of CLL requires the presence of monoclonal $\beta$-lymphocytic count of $5 \times 10^9/L$ or more with a characteristic phenotype of $\beta$-cells with the presence of CD5, CD19, and CD23, weak expression of CD20 and CD79b with either kappa or lambda immunoglobulin light chains.\cite{2}

CLL is a disease of the elderly with incidence highest among Caucasians, intermediate among Africans/African American, and low among Asian/Pacific.\cite{3} There have been several divergent reports on the epidemiology of CLL with an increasing trend in Denmark and the USA and stable in Sweden.\cite{3-5} CLL accounts for 17%–20% of all hematological malignancies (HM) in Nigeria.\cite{6} CLL was said to make up 18.2% of all lymphoid malignancies.\cite{7} A similar study by Akaba et al.\cite{8} also reported that CLL makes up 26.09% of all HM in a study on the epidemiological pattern of adult HM in Calabar, South-South Nigeria. There is also a report of male preponderance worldwide,\cite{9} this is in keeping with a study by Madu et al.\cite{10} but varies with the finding of Salawu et al.\cite{11} which reported the female preponderance. Furthermore, a similar study by Korubo et al.\cite{12} and Akaba et al.\cite{8} also reported the female predominance. This shows that there is inconsistency in the available data on the epidemiology of CLL in our environment. The aim of this study is to determine the epidemiology pattern of CLL in Cross River state.

**Methodology**

A retrospective study of CLL seen at the University of Calabar Teaching Hospital (UCTH). The study population consists of all patients diagnosed and managed for CLL from 2010 to August 2019, a 10-year period. The data were obtained from the register of the Department of Haematology and Blood Transfusion, UCTH. The diagnoses of CLL were made by medical consultants based on clinical and laboratory investigations of the patients. The investigations include peripheral blood film and bone marrow examinations, histopathological assessment, immunohistology, and immunohistochemistry.

The data collected include the date of presentation, the age, gender, location of residence, and occupations of the patients. The data were computed into the Microsoft Excel 2016 spreadsheet and analyzed with the IBM SPSS Version 22 (Chicago, Illinois). The results were presented using simple descriptive statistics.

**Result**

A total of forty-seven cases of chronic lymphocytic leukaemia was reported over a ten-years-period. The patients’ age ranges from 40-82 years with a mean age of 59 years. A 1:1 male to female ratio was observed [Figure 1]. Most of the patients were peasant farmers and are exposed to organophosphorus compounds that could predispose them to CLL. Figure 2 presents the annual pattern of distribution of CLL during the study period. A peak was observed in the years 2012, 2013 and 2018 and the least were seen in the years 2010 and 2017 respectively. The residential location of the patients is presented in table 3. Majority of the patients seen resides in Calabar, the capital city of Cross River State.

**Discussion**

In our study, CLL constitutes 4.2% of total cancer recorded during the period of review (total number of cancer patients seen during the period was 1119). This was similar to the findings

| Table 1: The age distribution of the patients |
|---------------------------------------------|
| Age range       | Frequency (%) |
|-----------------|---------------|
| 40-49           | 6 (12.77)     |
| 50-59           | 18 (38.30)    |
| 60-69           | 17 (36.17)    |
| 70-79           | 5 (10.64)     |
| 80 and above    | 1 (2.13)      |
| Total           | 47 (100.00)   |

| Table 2: The occupations of the patients |
|------------------------------------------|
| Occupation                  | Frequency (%) |
|------------------------------|---------------|
| Business                    | 5 (10.64)     |
| Clergy                      | 2 (4.26)      |
| Civil servants              | 3 (6.38)      |
| Driver                      | 1 (2.13)      |
| Farmer                      | 21 (44.68)    |
| Home maker                  | 1 (2.13)      |
| Lawyer                      | 1 (2.13)      |
| Lecturer                    | 1 (2.13)      |
| Petroleum engineer          | 1 (2.13)      |
| RTD                         | 7 (14.89)     |
| Teacher                     | 1 (2.13)      |
| Trader                      | 3 (6.38)      |
| Total                       | 47 (100.00)   |

RTD= Retired

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Figure 1: Showing the gender distribution of the patients
by Akaba et al. in a previous study on the epidemiological pattern of the adult HM in Calabar.\cite{10} Furthermore, a similar finding was reported in the USA and Denmark with an annual incidence of 2–6/100,000.\cite{8} The much higher prevalence reported in the developed countries could be attributed to the availability of facilities, lifestyle, urbanization, workforce to make the appropriate diagnosis, and also the degree of literacy. This study revealed that the age range of CLL was 40–82 years [Table 1] with a mean age of 59 years. This was similar to the findings by Salawu et al.\cite{11} in Southwest and Omoti et al.\cite{12} in the South-South zone of Nigeria, whereas the older age group has been predominantly documented in Europe and USA.\cite{13} This, however, implies that a younger age group is affected by CLL this can be attributed to the early exposure to organophosphorus compound and other predisposing risk factors for CLL due to poverty and illiteracy. Furthermore, another contributing factor is the decrease in life expectancy, and the fact that our environment is an oil-producing region.

Our study also showed male preponderance [Figure 1] which is similar to the finding by Madu et al. and other study outside Africa\cite{8} but varies with the finding of Salawu et al. and Omoti et al. in their various studies conducted in South-West and South-South Nigeria, respectively, which showed predominance of female.\cite{11,13} The female predominance could be attributed to the benign cause of the disease in them,\cite{13} and there is a higher overall survival in females.\cite{4} There is also a variation in a similar study that was conducted by Akaba et al.\cite{8} and Korubo et al.\cite{12} both in the South-South region of Nigeria. This variation in gender can be attributed to occupational exposure by male due to the problem of a diagnostic dilemma; this may imply that there may not be any actual difference in prevalence across the sexes.

In our study, the predominant occupation affected mostly were farmers, followed by retired civil servants, businessmen/women with lawyer, lecturer, and teachers are the least affected [Table 2]. This degree of variation in occupational exposure could be attributed to the standard of living and the predominant occupation in our environment which exposes most of our members to organophosphorus compounds, other contributing factors are the pollution effect, due to the uncontrolled activities of derivative of petroleum product.

The annual pattern of distribution of CLL during the period of review, a peak was observed in 2012, 2013, and 2018. With the least incidence in 2010 and the widest difference between the consecutive year was between the years 2012, 2013, 2018, and 2010 [Figure 2]. Incessant industrial actions by hospital workers may also contribute to the variation in the annual incidence.

In our study, the predominant local government area affected is Calabar followed by Obudu, Ikom, and Eko, whereas the least affected local government areas are Biase, Bekwara, and Obalinku [Table 3]. The predominance of Calabar can be attributed to proximity to the tertiary health facility (UCTH). That of Obudu can be attributed to the predominant occupation in the location being farming and exposure to organophosphorus compounds, which are high-risk factors for CLL. The same applies to Ikom and Eko while that of the other land grid array can be attributed to the difference in distance to the tertiary health facility and also, the attribution of illnesses to a spiritual cause, lack of infrastructures such as good road networks and illiteracy.

Conclusion
This study has reawaken our consciousness on the increasing trend on the epidemiological burden of CLL in our environment and will help to enhance further investigation into the relationship between the rising trend and available possible risk factors in our environment.

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Conflicts of interest
There are no conflicts of interest.

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