ORIGINAL ARTICLE

Human Immunodeficiency Virus in patients with lymphoma in Jos North-Central Nigeria

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Abstract

Background: Individuals with human immunodeficiency virus (HIV) infection have increased risk of developing malignancies including lymphoma despite adequate antiretroviral therapy. The study was conducted with the aim of determining the proportion of adults with HIV-associated lymphoma in Jos, Nigeria.

Methods: Consecutive consenting adults diagnosed with lymphoma attending the Haematology clinics of Jos and Bingham University Teaching Hospitals in Jos between February, 2016 and December, 2017had their blood samples screened and confirmed for HIV after completing a questionnaire.

Results: Sixty (60) patients which comprised of 37 (61.7%) males and 23 (38.3%) females with lymphoma aged between 18 and 75 years participated. Nine (15.0%) of them were positive for HIV, which comprised of 8 (13.3%) Non-Hodgkins lymphoma (NHL) and 1 (1.7%) Hodgkins lymphoma (p = 0.074).

Conclusion: The study has demonstrated a high prevalence of HIV infection in patients with lymphoma in Jos.

Key words: Lymphoma, Human Immunodeficiency Virus, Jos.

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Introduction

The Human Immunodeficiency Virus (HIV) is a lentivirus (a subgroup of retrovirus) that causes the acquired immune deficiency syndrome (AIDS), a condition in humans in which progressive failure of the immune system allows life-threatening opportunistic infections and cancers to thrive[1]. Since the emergence of AIDS in 1981, an association between HIV infection and the development of specific cancers has been recognized. This group of cancers includes the three AIDS-defining malignancies: high-grade B-cell non-Hodgkin's lymphoma (NHL), Kaposi's sarcoma (KS) and invasive cervical cancer [2,3]. The incidence of lymphomas have been on the increase, with primary central nervous system lymphoma (PCNSL) and Burkitt's lymphoma (BL) reported to have increased 1000 fold, Hodgkin's lymphoma increased up to eight fold and NHL increased 60-200 fold[4,5].

The prevalence of AIDS-related lymphomas reported from a tertiary health facility in South West Nigeria was 4.3% in 2010[6]. While in some European countries the prevalence increased from 3.6% to 5.4% between 1994 and 2000, thereafter showing a declining pattern[7]. Although most of the early descriptions of the emerging immunodeficiency syndrome were reported in patients living in the United States, most of the burden of HIV disease now affects resource-limited nations, with approximately two-thirds of HIV-positive individuals living in sub-Saharan Africa and only 8% in Western nations [8]. The discovery and widespread use of highly active antiretroviral therapy(HAART) in resource-rich countries has both decreased the incidence of HIV-related lymphoma and improved its prognosis[8].

While the availability of HAART has improved in resource-poor nations, similar changes in the incidence and outcome of HIV-related lymphomas have not yet been noted[8].

There is paucity of reports to the best of our knowledge on the prevalence of HIV-related lymphoma in Jos, a Centre with one of the largest facilities for HIV care in Nigeria. This study therefore aimed at describing the proportion of patients with HIV-associated lymphoma with the view of adding to database that may improve management strategies for better outcomes.

Patients and Methods

Ethical consideration

The study was approved by the Ethics committees of the Jos University Teaching Hospital and the Bingham University Teaching Hospital (BUTH) Jos. Written

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informed consent was obtained from all participants prior to procedure and confidentiality maintained by removing personal identifiers. The result of investigations were discussed appropriately and advice on possible treatment offered.

This study was a descriptive, cross-sectional prospective study in patients with lymphoma attending Haematology outpatient clinics of Jos University and Bingham University Teaching Hospitals in Jos, North-Central Nigeria. Jos University Teaching Hospital is one of the two teaching hospitals in the city of Jos, the Plateau State Capital in North-Central zone of the country. It is a 600 bed tertiary hospital, while Bingham University Teaching Hospital is a 150 bed tertiary hospital. They serve as referral centres for the State as well as the neighbouring States of Bauchi, Nassarawa, Benue, Gombe, Adamawa, Taraba and Kaduna State.

Consenting consecutive patients with lymphoma attending the Haematology clinics of Jos University and Bingham University Teaching Hospitals between February, 2016 and December, 2017 were studied. Non consenting patients with lymphoma and other malignancies were excluded. Participants had their blood samples collected after filling a structured questionnaire and screened for human immuno-deficiency virus (HIV) antigen and antibody by ELISA method using fourth generation kits (GENSCREEEN™ Bio-Rad, Marnes-la-Coquette, France), and confirmed by Western Blot analysis kits (GENSCREEEN™ Bio-Rad, Marnes-la-Coquette, France).

The questionnaire addressed parameters such as age, sex, occupation, educational and marital status, also searched for medical history, such as fever, night sweats, cough and weight loss.

Analysis of Data

The data collected was analyzed using Epi info version 7.1.3.0 (CDC Atlanta Georgia, USA). Mean and standard deviation (SD) determined were used to describe continuous data. Chi-square was used to test association between two qualitative variables such HIV status and lymphoma diagnosis. $P < 0.05$was considered statistically significant. The results were presented in table and figure.

Results

A total of sixty participants comprising of 37 (61.7%) males and 23 (38.3%) females (M: F= 1.6 :1) were studied. Their ages ranged between 18 and 75 years (mean ± SD = 45.4 ± 16.0 years). Most (60.0%) of the participants were aged between 31 and 60 years. Twenty (33.3%) of which were males and sixteen (26.7%) females. Civil servants and farmers constituted most (51.7%) of the participants. Forty one (68.3%) of the participants attained secondary and tertiary levels of education. Majority (71.7%) of the participants were married (Table 1).

Table 1: Socio-demographic characteristics, Lymphoma types and HIV status of patients with lymphoma attending Haematology outpatient Clinic of Jos University and Bingham University Teaching Hospitals, Jos-Nigeria between Feb., 2016 and Dec., 2017.

Characteristics	Sex		
	Male	Female	Total
	n (%)	n (%)	
Age (years)			
≤20	6 (10.0)	1 (1.7)	7 (11.7)
21-30	4 (6.7)	2 (3.3)	6 (10.0)
31-40	3 (5.0)	6 (10.0)	9 (15.0)
41-50	9 (15.0)	7 (11.7)	16 (26.7)
51-60	8 (13.3)	3 (5.0)	11 (18.3)
61-70	5 (8.3)	2 (3.3)	7 (11.7)
71-80	2 (3.3)	2 (3.3)	4 (6.6)
	37 (61.7)	23 (38.3)	60 (100)
Occupation			
Artisan	6 (10.0)	1 (1.7)	7 (11.7)
Business	2 (3.3)	1 (1.7)	3 (5.0)
Civil servants	10 (16.7)	7 (11.7)	17 (28.3)
Clergy	3 (5.0)	0 (0.0)	3 (5.0)
Farmer	9 (15.0)	5 (8.3)	14 (23.3)
House wife	0 (0.0)	7 (11.7)	7 (11.7)
Student	7 (11.7)	2 (3.3)	9 (15.0)
	37 (61.7)	23 (38.3)	60 (100)
Educational levels			
Primary school	5 (8.3)	5 (8.3)	10 (16.7)
Secondary school	13 (21.7)	6 (10.0)	19 (31.7)
Tertiary school	14 (23.3)	8 (13.3)	22 (36.6)
No formal education	5 (8.3)	4 (6.7)	9 (15.0)
	37 (61.7)	23 (38.3)	60 (100)
Marital status			
Married	27 (45.0)	16 (26.7)	43 (71.7)
Single	10 (16.7)	2 (3.3)	12 (20.0)
Separated	0 (0.0)	0 (0.0)	0 (0.0)
Divorced	0 (0.0)	2 (3.3)	2 (3.3)
Widowed	0 (0.0)	3 (5.0)	3 (5.0)
	37 (61.7)	23 (38.3)	60 (100)

Parameter	HIV status			
	Positive	Negative	Indeterminate	
	n (%)	n (%)	n (%)	
Lymphoma types				
NHL	8 (13.3)	42 (70.0)	0 (0.0)	50 (83.3)
HL	1 (1.7)	8 (13.3)	1 (1.7)	10 (16.7)
	9 (15.0)	50 (83.3)	1 (1.7)	60 (100)

Out of the sixty patients with lymphoma screened for HIV, 11 (18.3%) were positive. Western blot confirmed only 9 out of the 11 participants who were positive by ELISA screening test. This accounted for 15.0% of the participants that comprised of 3 (5.0%) males and 6 (10.0%) females respectively. Of the remaining two participants, one was negative for HIV and the other was indeterminate (Figure 1).Eight (13.3%) out of 9 HIV positive participants had NHL (Table 1).

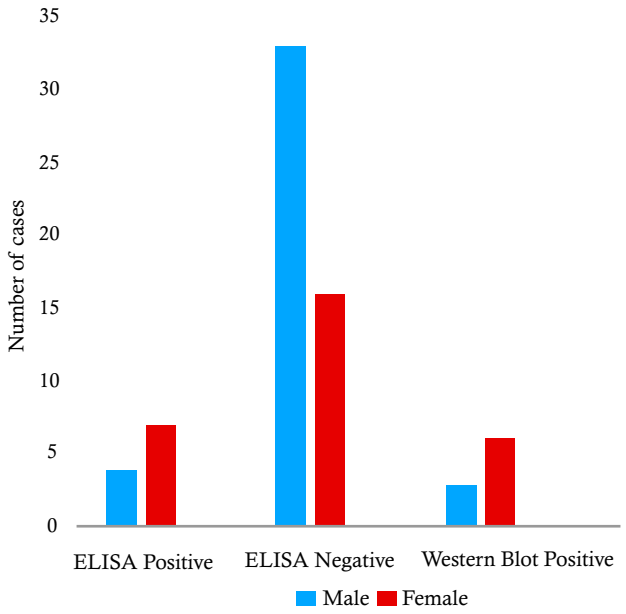

Figure 1: ELISA and Western Blot HIV status and sex of patients with lymphoma attending Haematology outpatient Clinic of Jos University and Bingham University Teaching Hospitals, Jos-Nigeria, between February, 2016 and December, 2017.

Discussion

HIV-infected individuals experience lymphoma rates 5-15 times higher than those without HIV, even in the modern era of potent antiretroviral therapy[9,10,11].

The participants were aged between 18 and 75 years, most of them 38 (63.3%) were in their 5th to 8th decades of life.This agrees with the findings of two similar studies which reported an increase in incidence of NHL with advancing age [12,13]. This means most of the participants were advanced in age, which is one of the risk factors for developing lymphoma especially NHL. A contributory factor of advancing age may be connected to persistent antigenic stimulation and waning immune competence[12,13].

The number of males was higher than that of females with a male: female ratio of 1.6:1. The higher prevalence of lymphoma in males compared to their female counterpart as observed in this study and many other studies[14,15] may be due to the influence of sex hormones on lymphoid malignancies with the female sex hormones having a protective influence[15]. Lee et al[15]reported that an increasing number of pregnancies and live births are associated with decreasing trend in the risk of developing DLBCL. They also reported a decreased risk of all NHL subtypes with the use of oral contraceptives pills. The shorter telomere length in males may have also contributed to the high prevalence in them[16,17].

Most of the participants were farmers and civil servants. Farmers are known to use pesticides and herbicides (by-products of petrochemical). Prolong exposure to these chemicals cause DNA damage and increase the risk of malignancies such as lymphoma[18]. Farmers working in the country side are at increased risk of infection with oncogenic viruses thereby increasing their risk of developing lymphoma[19]. This may explain why farmers constituted a significant proportion of the participants. Further studies are recommended to establish the specific agrochemical(s) associated with lymphoma in our own setting.

This study revealed a prevalence of 15.0% HIV infection among patients with lymphoma in Jos. The HIV prevalence in this study was higher than the reported National HIV prevalence of 1.4% in Adults [20]and 4.3% HIV prevalence in patients with lymphoma in South West Nigeria reported by Salawu et al[6]. The prevalence was also higher than the 6.0% reported from South West Nigeria by Ocheni et al[21].

Silas et al[22]and Inyama et al[23]working independently in Jos and Calabar reported nearly comparable prevalence of 20.0% and 18.2% respectively. These seemingly higher prevalence observed in this study, along with those of Silas and Inyama compared to that of Ocheni, Salawu and National HIV/AIDS may be due to smaller study population. Suffice to note that Ocheni's and Salawu's centres are large regional institutions, hence the likely reason for their large study population. The higher prevalence rate observed in Calabar and Jos, may be due to social predisposition of both centres as urban tourist centres[24] comparable to Banjul, Nairobi and Johannesburg[25].

The number of females who were HIV positive was higher than that of males in a ratio of 2:1. This may not be unconnected with the unique anatomy of the female urogenital system as well as their peculiar physiology increasing their susceptibility to HIV infection than their male counterparts [26].

The study found that NHL was the most frequent type of lymphoma giving a ratio of NHL: HL 5:1. In a recent study in a tertiary hospital in Jos, Nigeria, NHL was the more common occurring lymphoma and a significant difference was found in the occurrence of

NHL compared with HL[27]. Most of the patients with HIV-associated lymphoma in this study had NHL which is in agreement with previous studies[28,29]. This further buttressed the AIDS-defining status of NHL.

Conclusion

The study has demonstrated a high prevalence of HIV infection in patients with lymphoma in Jos. However, there is the need to carry out a larger population study at the national level to determine the prevalence of HIV in patients with lymphoma. A national policy for routine screening for HIV in patients with lymphoma and other haematological malignancies should be instituted in all health care facilities where these patients are treated. This is aimed at early detection and early institution of treatment in those infected. This will reduce the morbidity and mortality associated with HIV infection in lymphoma patients and improve overall outcomes.

Limitations of the Study

1. Molecular studies using polymerase chain reaction (PCR) to resolve the indeterminate Western Blot result
2. Small sample size
3. Control group

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Conflict of Interests

The authors hereby declare that they have no conflict of interest.

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