ORIGINAL ARTICLE

Pattern of Haematological Malignancies in A Tertiary Hospital in Yola, Nigeria: A Three Year Retrospective Review

Jasini **JAMES**[1]
Ochaka J **EGESIE**[2]
Obadiah D **DAMULAK**[2]
Ezra D **JATAU**[2]
Ayuba **ZAKARI**[2]
Chinedu N **OKEKE**[3]
Aminu MC **DAHIRU**[4]
Nasiru **RAHEEM**[4]
Anita JD **SAYI**[5]

[1]*Department of Haematology and Blood Transfusion Federal Medical Centre, Yola*
[2]*Department of Haematology and Blood Transfusion Jos University Teaching Hospital, Jos*
[3]*Department of Haematology and Blood Transfusion Bingham University Teaching Hospital, Jos*
[4]*Department of Histopathology Federal Medical Centre, Yola*
[5]*Department of Nursing Services Federal Medical Centre, Yola*

Author for Correspondence:
Dr Jasini **JAMES**
Department of Haematology and Blood Transfusion Federal Medical Centre Yola Adamawa State, NIGERIA

Phone: +234 806 622 9505
E-mail: jasinijames31@gmail.com

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ABSTRACT

Background: Haematological malignancies (HMs) are primary neoplasms of the blood and blood forming organs, such as the bone marrow and lymphoid tissues. There is paucity of information on the pattern of HMs in the North-East part of Nigeria.

Objective: To determine the current pattern of various HMs encountered in Yola, and compare with previous reports from other parts of Nigeria and worldwide.

Methodology: A retrospective review of all cases of HMs that were referred to, diagnosed and managed at the Haematology and Blood Transfusion Department of Federal Medical Centre, Yola from 1st January, 2018 to 31st December, 2020 was carried out.

Results: A total of 90 cases of HMs were attended to within the period under review comprising 53 (58.9%) males and 37 (41.1%) females; aged between 3 and 82 years with median age of 38 years. There were 53 (58.9%) cases of leukaemia, 31 (34.4%) of lymphoma and 6 (6.7%) of multiple myeloma. The commonest leukaemia was chronic myeloid leukaemia (CML) constituting 23.3% of all cases, followed by acute myeloid leukaemia (AML) and acute lymphoblastic leukaemia (ALL) accounting for 14.4% and 12.2% of all cases, respectively. Among lymphoma cases, non-Hodgkin's lymphoma (NHL) was more frequently occurring accounting for 27.8% of all cases.

Conclusion: This study has revealed the pattern of HMs in our setting and could serve as a database for future health policy planning and implementation as well as further epidemiologic studies in HMs. It is concluded that leukaemia was the commonest haematological malignancy.

Keywords: *Haematological malignancies, Leukaemia, Lymphoma, Yola*

INTRODUCTION

Haematological malignancies (HMs) are primary neoplasms of the blood and blood forming organs, such as the bone marrow and lymphoid tissues.[1] The disorders usually involve the myeloid and/or lymphoid progenitor cells. They are usually clonal in origin and are frequently associated with chromosomal abnormalities.[1] The disease spectrum ranges from the pre-leukaemia (myelodysplasia), leukaemia, lymphoma to multiple myeloma. The aetiology of these malignancies is largely unknown; however, they are believed to be induced by genetic damage or mutation in somatic cells, which can result from environmental agents such as chemicals, ionizing radiation and infectious agents.[2] The clinical presentation of these malignancies varies and depends largely on the biological nature of the disease and extent of spread.[2]

In leukaemic syndromes, the disease is often disseminated with infiltration by neoplastic cells of the blood, bone marrow, lymph nodes and other tissues. Lymphomas, another variant of haematopoietic cancers, are solid tumours with primary involvement of lymphnodes, and less often extra nodal structures.[2] It has a worldwide distribution but more common in the developed countries as compared to the developing countries, and can occur at all ages and in both sexes.[3]

Haematological malignacies are estimated to account for 6.5% of all cancers globally, with non-Hodgkin's lymphoma accounting for 2.7% while leukaemia, multiple myeloma and Hodgkins lymphoma accounts for 2.5%, 1.0% and 0.8% of all cancers respectively.[4,5] Haematological malignancies is the fifth most commonly occurring cancers and second leading cause of cancer deaths worldwide.[6] In United States of America, it was reported that between 2007 and 2011, leukaemia was the fifth and sixth most common cause of cancer deaths in men and women, respectively.[7]

In Sub-Saharan Africa, HMs is the third and sixth most common malignancy in males and females respectively.[8] Studies conducted in Nigeria from North-Central and South-South regions reported prevalence rates of 19.8% and 17.4% respectively with male preponderance.[9,10]

There is paucity of information on the pattern of HMs in the North-eastern part of Nigeria. Thus, the aim of this study is to determine the current pattern of various HMs encountered in Yola, and compare with previous reports from other parts of Nigeria and worldwide.

METHODOLOGY

The study was approved by the Ethics Committee of the Federal Medical Centre, Yola. This was a retrospective study of all cases of HMs that were referred to, diagnosed and managed at the Haematology and Blood Transfusion Department of Federal Medical Centre, Yola from 1st January, 2018 to 31st December, 2020. Data were obtained from clinical records retrieved from the Records Department of the Hospital, bone marrow report registers, histopathology report forms, Haematology day-care and clinic attendance register and records from the Cancer Registry of the Histopathology Department for the lymphoma cases that were diagnosed but not managed in the Haematology Department.

In the cases of HMs other than lymphomas, diagnoses were made by consensus among the Consultants based on clinical features, full blood counts and bone marrow aspiration cytology. The criteria used for the diagnoses include; blast cell count of greater/equal to 20% of bone marrow and/or peripheral blood non-erythroid cells, leucocytosis in excess of 100 x 10^9/L with predominance of differentiating granulocytes and hypercellular bone marrow

with myeloid hyperplasia.[1] Others include, lymphocytic leucocytosis in excess of 100 x 10^9/L with blood film showing sheets of mature-looking small size lymphocytes and lymphocytic infiltration of bone marrow aspirate (>40%). Bone marrow plasma cells of greater 10% and presence of one or more of myeloma defining events (Bone lesion, anaemia, elevated calcium and renal impairement) were also used as criteria for diagnosis and other ancillary investigations such as erythrocyte sedimentation rate, serum protein electrophoresis, CT scan and Philadelphia chromosome detection etc.[1]

Diagnosis of lymphoma was based on the histological reports from the pathologist. The information obtained included demographic data and type of malignancy. Patients with inconclusive diagnoses were excluded from the study. Total number of HMs was expressed as percentage of all cancer cases recorded during the period under review (90/1286 x 100 =6.9% ≈ 7.0%).

Statistical Analysis

The data were computed into Microsoft Excel 2016 spreadsheet and analysed using Statistical Package for Social Science (SPSS) version 23.0 software. The results were summarized using simple descriptive statistics (frequencies and percentages), and presented as tables.

RESULTS

A total of 90 haematological malignancies (representing 7.0% of all cancer cases) were seen during the study period. Fifty-three (58.9%) were males and 37 (41.1%) were females with a ratio of 1.4:1. The age range included in the study was from 3 years to 82 years with a median age of 38 years. The most common age group was 18 to 44 years (46.7%), followed by 45 to 64 years (28.9%), and 5 to 17 years (13.3%) (Table 1).

There were 53 (58.9%) cases of leukaemia, 31 (34.4%) cases of lymphoma and 6 (6.7%) cases of multiple myeloma. The most frequently occurring leukaemia was chronic myeloid leukaemia (CML) constituting 23.3% of all cases, followed by acute myeloid leukaemia (AML) and acute lymphoblastic leukaemia (ALL) accounting for 14.4% and 12.2% cases respectively. Chronic Myeloid Leukaemia and AML were found more in adults and children respectively, while chronic lymphocytic leukaemia (CLL) occurred more in the middle age and elderly. Among lymphoma cases, non-Hodgkin's lymphoma (NHL) was the commonest making up 27.8% of all cases and occurring more in adults and middle age. Burkitt's lymphoma was the least frequently seen, only a case was recorded. Multiple myeloma (MM) occurred more in the middle age and elderly (Table 2).

Table 3 shows the sex distribution for the various haematological malignancies. There were more males (58.9%) compared with females (41.1%). More male cases were recorded for each of the various malignancies except for CLL where slight female preponderance was noticed.

Table 1. Age and Sex distribution of patients with haematological malignancies

Age group (years)	Male n(%)	Female n(%)	Total (%)
<5 (under 5)	2 (2.2)	0	2 (2.2)
5-17 (children)	7 (7.8)	5 (5.6)	12 (13.3)
18-44 (adults)	25 (27.8)	17 (18.9)	42 (46.7)
45-64 (middle age)	16 (17.8)	10 (11.1)	26 (28.9)
≥65 (elderly)	3 (3.3)	5 (5.6)	8 (8.9)
Total	**53 (58.9)**	**37 (41.1)**	**90 (100.0)**

Table 2. Frequency and age distribution of haematological malignancies

Haematological malignancies	<5yrs (under 5)	5-17yrs (children)	18-44yrs (adults)	45-64yrs (middle age	≥65yrs (elderly)	Total (%)
NHL	0	3 (3.3)	10 (11.1)	10 (11.1)	2 (2.2)	25 (27.8)
CML	1 (1.1)	0	16 (17.8)	2 (2.2)	2 (2.2)	21 (23.3)
AML	1 (1.1)	6 (6.7)	4 (4.4)	2 (2.2)	0	13 (14.4)
ALL	0	1 (1.1)	10 (11.1)	0	0	11 (12.2)
CLL	0	0	0	4 (4.4)	4 (4.4)	8 (8.9)
MM	0	1 (1.1)	0	4 (4.4)	0	6 (6.7)
HL	0		0		0	5 (5.6)
BL	0	1 (1.1)	0	00	0	1 (1.1)
Total (%)	**2 (2.2)**	**12 (13.3)**	**42 (46.7)**	**26 (28.9)**	**8 (8.9)**	**90 (100.0)**

Key: NHL: Non-Hodgkin's lymphoma, CML: Chronic myeloid leukaemia, AML: Acute myeloid leukaemia, ALL: Acute lymphoblastic leukaemia, CLL: Chronic lymphocytic leukaemia, MM: Multiple myeloma, HL: Hodgkin's lymphoma, BL: Burkitt's lymphoma.

Table 3. Frequency and sex distribution of haematological malignancies

Haematological malignancies	Male n(%)	Female n(%)	Total %
NHL	15 (16.7)	10 (11.1)	25 (27.8)
CML	13 (14.4)	8 (8.9)	21 (23.3)
AML	7 (7.8)	6 (6.7)	13 (14.4)
ALL	6 (6.7)	5 (5.6)	11 (12.2)
CLL	3 (3.3)	5 (5.6)	8 (8.9)
MM	5 (5.6)	1 (1.1)	6 (6.7)
HL	3 (3.3)	2 (2.2)	5 (5.6)
BL	1 (1.1)	0	1 (1.1)
Total (%)	**53 (58.9)**	**37 (41.1)**	**90 (100.0**

Key: NHL: Non-Hodgkin's lymphoma, CML: Chronic myeloid leukaemia, AML: Acute myeloid leukaemia, ALL: Acute lymphoblastic leukaemia, CLL: Chronic lymphocytic leukaemia, MM: Multiple myeloma, HL: Hodgkin's lymphoma, BL: Burkitt's lymphoma.

DISCUSSION

In this study we described the pattern of HMs recorded over a 3-year review period. The figure obtained for HMs as percentage of all cancer cases recorded during the period under review is comparatively lower compared with the figures reported from previous studies.[11,12] This may be due to the small number of cases reviewed in our study. Other contributing factors may include variation of risk factors from one locality to another, poor health seeking behaviour and poor knowledge of the disease as well as misdiagnosis.

Haematological malinancies can occur at all ages, however in our study the patients were aged between 3 and 82 years with individual malignancies having varying peak age groups. A nearly comparable age range was reported by Shrestha *et al.*[13] in a study conducted in Nepal, but was at variance with a study conducted in Calabar by Kingsley *et al.*[14] as he considered only adults with HMs. Majority (75.6%) of the HMs were observed among adults and middle age group (Table 2). This may be explained by the *MULTIPLE HIT THEORY*, which suggests that the cumulative effect of genetic assault manifest over time.[15]

We observed from this study that more males were affected compared with females giving a ratio of 1.4:1. This finding agrees with the

general observation in scientific publication that HMs are commoner in males than females.[6] A favoured justification for this being that men are more likely than women to be exposed to potentially carcinogenic occupational and environmental agents.[6] However, there was slight female preponderance in the case of CLL. The explanation for this observation is not clear but may be connected to gender-specific differences in immune system regulation. Similar finding was reported by Salawu *et al*.[16] in Ile-Ife, South-West Nigeria and Egesie *et al*.[9] in Jos, North-Central Nigeria.

Leukaemias were found to be the most common HMs in this study. The high proportion of leukaemias noted in this study agrees with earlier observations from previous studies conducted in Yemen[17], Nepal[13] and Jos-Nigeria[9] but at variance with that conducted in Ilorin[11] which reported high occurrence of lymphomas.

Chronic leukaemia was more common than acute leukaemia in our study; this is in keeping with reports of previous published studies where they also found a similar pattern of preponderance of chronic leukaemia.[11,14] Based on morphological forms, myeloid was found to be more common than lymphoid leukaemias in our study as had been reported in other studies.[11,13] Among lymphomas, NHL was more common than HL. This is similar to what has been reported in previous studies.[9,18]

The prevalence of chronic leukaemia in our study was 32.2%. This is similar to the burden found in a study in Eastern Nepal[19] but higher than that reported in a study in North Central Nigeria.[11] CML accounted for 23.3% with a median age of 31 years and male preponderance. This is similar to the observation reported by Boma *et al*[20] but at variance with that reported by Hoglund *et a*l.[22] The median age for CLL was 55 years with slightly higher number of females compared to males; the male to female ratio is 1:1.7. This observed median age and female preponderance are in agreement with previous studies conducted in Nigeria[9,11,14] but contrary to what was observed in Asia and western countries.[22,23]

Acute leukaemia had a male preponderance and constituted about 27% of all cases in this study. This figure was comparatively higher than the prevalence found in a study in Nepal and other studies conducted in Nigeria.[11,13,14] This may be due to the small number of cases included in our study. The highest occurrence was seen in children and adults similar to what was observed by Xie *et al*[24] in the United States.

Lymphoma had the next frequency of occurrence to leukaemia in our study with a burden of 34.4%, a median age of 41 years and male preponderance. The proportion of cases of lymphoma was higher than that reported in a study conducted in India[25] but much lower than that reported in Ilorin North Central Nigeria.[11]

Multiple myeloma accounted for 6.7% of all cases seen with male preponderance and median age of 55 years. The proportion of myeloma cases was lower than what was reported in a study conducted by Elidrissi *et al*.[26] in Eastern Morroco. Few studies have reported equal sex predilection contrary to what we found in our study; more males were affected compared to females.[27,28]

The limitations of our study included what is inherent in retrospective studies in which missing information are common place. Additionally, investigations such as cytochemistry, immunophenotyping, cytogenetic and molecular genetic studies to adequately confirm and classify diagnoses were not possible due to lack of facility to perform these investigations in our centre. The patients could not access these services at

other referral centres due to financial constraints.

CONCLUSION

This study has revealed the pattern of HMs in our setting which appears similar to some other settings in Nigeria that showed that males were more affected and leukaemia the commonest haematological malignancy. This could also serve as a database for health policy planning and implementation as well as advanced epidemiologic studies in HMs in the future.

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