

Changing pattern of haematological malignancies in Ilorin, Nigeria: A 10 year retrospective review of 181 cases

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Abstract

The global burden of cancer has been reported to be on the increase and haematological malignancies (HM) are not exceptions to this observed trend. The aim of this study was to carry out a retrospective analysis of all cases of HM seen at the University of Ilorin Teaching Hospital, Ilorin and document the current pattern of HM and compare with previous reports from Nigeria and elsewhere. Materials used for the study were obtained from the Records Department, patient's case folders and laboratory reports forms, histopathology report forms and records from the Cancer Registry of the University of Ilorin Teaching Hospital. A total of 181 cases of HM were diagnosed and managed within the study period constituting 8.1% of all cancer cases and 0.2% of all hospital admissions. The ages of patients with HM ranged from 7 months to 80 years. There were 116 (64.1%) males and 65 (35.9%) females. The various HM recorded in the study were: ALL 17(9.4%), AML 23(12.7%), CLL 33(18.2%), CML 46(25.4%), NHL 33(18.2%), HL 7(3.9%), BL 2(1.1%) and MM 20(11.0%). CML was the commonest HM observed in this study. NHL was the commonest lymphoma encountered constituting 82.5% of all the lymphoma cases. This study demonstrated that haematological malignancies are common in this environment. Availability of improved diagnostic facilities, improved blood transfusion services, early presentation and better referral system from other health facilities to our centre may have contributed to the improved mean survival of patients with HM observed in this study.

Keywords: Pattern, Haematological, Malignancies, Ilorin, Retrospective

Introduction

Haematological malignancies (HM) are heterogeneous group of primary neoplasms which affect the blood, bone marrow and lymphatic system. They are usually clonal in origin and may be induced by genetic damage or mutation in somatic cells, which can result from environmental agents such as chemicals, ionizing radiation and viral agents¹.

HM comprises three major groups namely leukaemias, lymphomas and plasma cell neoplasms, which are quite often associated with chromosomal abnormalities^{2,3}. The four main types leukaemias are acute myeloid leukaemia (AML), acute lymphoblastic leukemia (ALL), chronic myeloid leukemia (CML) and chronic lymphocytic leukemia (CLL). The lymphomas are of three forms –

non-Hodgkin's lymphoma (NHL) and Hodgkin's lymphoma (HL) and Burkitt's lymphoma (BL). The Plasma cell neoplasm consists of multiple myeloma (MM), Monoclonal gammopathy of undetermined significance (MGUS) and plasma cell leukemia (PCL).

HM had been reported to constitute approximately 6.5% of all cancer incidence worldwide². The incidence of HM have been reported to vary with geographical region, ethnicity/race, age, sex etc. thereby suggesting that different aetiological factors may be involved in the development of the malignancies^{2,4}.

The pattern of clinical presentation of these malignancies is variable and depends largely on the nature of the disease and the extent of tissue or organ involvement. Despite the differences between the various types as regards the epidemiology of the disease, age and sex incidence, a changing pattern in the clinical presentation and distribution has been reported in various parts of the world over the years^{2,4,5,6,7}.

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In the United States of America, haematological malignancies were reported to be the second most common cause of cancer deaths, and accounted for approximately 6-8% of cancer incidence in both sexes, the incidence of acute leukemias being about 34 per million populations^{8,9}. In Europe, the number of newly diagnosed patients with HM was estimated at about 230,000 patients annually which represented about 8% of all the new cancer patients diagnosed in 2005¹⁰. The European data also reported that HM constituted about 7% of all the cancer-related deaths in 2005^{4,10}. In Ibadan, South Western Nigeria, the incidence for acute lymphoblastic leukemia and acute myeloblastic leukemia had been reported to be 3.7 per 10⁶ per year and 1.9 per 10⁶ per year respectively^{5,11}. In their study on the epidemiology of haematological malignancies in Benin, Nigeria, Nwannadi IA et al¹² reported that HM constituted 17.4% of all malignancies seen. Also, a previous study from Ilorin, Nigeria reported that HM constituted 18.05% of all cancer cases seen within the study period¹³. In Korea, Park HJ et al¹⁴ found a much lower prevalence of 4.5% for haematological malignancies in their study. While many researchers had observed an increase in the incidence of HM in their studies^{2,4,12,13,15}, others have actually reported a downward trend in the incidence of haematological malignancies^{14,16}. The aim of the present study therefore, was to determine and document the pattern of various haematological malignancies which were diagnosed and managed at the Haematology department of the University of Ilorin Teaching Hospital, Ilorin, Nigeria over a ten year period, and compare with previous report from our centre and other studies within and outside Nigeria.

Material and Methods

This is a retrospective study of all cases of haematological malignancies that were referred to, diagnosed and managed at the Haematology Department of the University of Ilorin Teaching Hospital, Ilorin, from 1st January, 2006 to 31st December 2015 inclusive.

The University of Ilorin Teaching Hospital (U.I.T.H.) is a 650 bedded tertiary health facility which serves the population of Ilorin metropolis and the surrounding towns and villages. It also serves as a referral centre for primary and secondary healthcare facilities in the neighbouring states of Nigeria (Oyo, Osun, Ekiti, Ondo and Niger). Ilorin, the capital city of Kwara state,

Nigeria, is located on the latitude 8.5⁰ North and longitude 4.55⁰ East with a total population of 908,490 and an annual growth rate of 2.3%¹⁷.

The materials used were data obtained from patients' case folders, bone marrow report forms, histopathology report forms where available and the Histopathology department records. The case folders of all the patients included in the study were retrieved from the Records Department of the Hospital. Also, records from the Cancer Registry of the Morbid Anatomy Department were examined for the lymphoma cases that were diagnosed by histopathologists but not managed by the haematologists. Additional data regarding total hospital admissions/discharges, clinic attendance and the total number of all cancer cases recorded for the period under review were also obtained from the Records department. The cases were characterized with respect to age, sex, morphological or histological type of malignancy, extent of disease, survival outcome. In the cases of haematological malignancies other than lymphomas, diagnosis was made in most cases, from clinical features, full blood counts, peripheral blood and bone marrow aspiration film examination, bone marrow biopsy; and special staining techniques were used where indicated. Final diagnoses were arrived at by consensus among the Consultants and Senior Residents in the Department. Diagnosis of lymphomas cases was based mainly on the histological reports from the histopathologists which were correlated with findings on bone marrow aspirate and biopsy.

Other investigations which guided us in diagnosis or management of the patients included – X-rays, serum sodium, potassium, urea, creatinine, calcium and phosphate; liver function tests; serum protein electrophoresis, serum total proteins and albumin, serum IgG and IgM estimation, urinary Bence-Jones Protein; and urinalysis where indicated. Cases which had incomplete documentation or missing histopathology /bone marrow report forms were excluded from the final analysis.

All the peripheral blood and bone marrow films of the patients were prepared using standard haematological methods described by Dacie and Lewis¹⁸.

The data generated from the above sources were entered into the Statistical Package for Social

Sciences (SPSS) software version 21 and analyzed. The results obtained were presented in form of frequency tables.

Results

A total of 2,249 cancer cases were recorded between 1st January 2006 and 31st December 2015 at the University of Ilorin Teaching Hospital (U.I.T.H), Ilorin out of which 181 were cases of haematological malignancies. The haematological malignancies represented 8.1% of all cancer cases seen, and 0.2% of all hospital admissions during the period under review. The total number of hospital admission for this period was 123,492 approximately.

Table I: Showing the frequency, Mean age at diagnosis and the Mean survival of the various haematological malignancies at U.I.T.H., Ilorin.

Type of haematological malignancy	Frequency n (%)	Mean Age At Diagnosis (years)	Mean Survival (months)
Acute lymphoblastic leukemia(ALL)	17(9.4)	13.8	7.2
Acute myeloid leukemia (AML)	23(12.7)	34.5	5.4
Chronic lymphocytic leukemia (CLL)	33(18.2)	56.7	55.1
Chronic myeloid leukemia (CML)	46(25.4)	38.7	56.8
Non-Hodgkin's lymphoma (NHL)	33(18.2)	49.5	24.2
Hodgkin's lymphoma (HL)	7(3.9)	55.0	47.6
Burkitt's lymphoma(BL)	2(1.1)	11.0	3.4
Multiple myeloma (MM)	20(11.0)	58.8	56.2
Total	81(100)		

The patients with haematological malignancies were aged between 7 months to 80 years. The mean age of patients at diagnosis for the various malignancies recorded is shown in Table I. There were 116 (64.1%) males and 65 (35.9%) females giving a male: female ratio of 1.8:1.

The sex distribution for the various haematological

malignancies is shown in Table II.

Table II: Prevalence and sex distribution of haematological malignancies in U.I.T.H, Ilorin

Type of haematological malignancy	Male n (%)	Female n (%)	Total n (%)
Acute lymphoblastic leukemia(ALL)	12 (6.6)	5 (2.8)	17(9.4)
Acute myeloid leukemia (AML)	14 (7.7)	9 (5.0)	23(12.7)
Chronic lymphocytic leukemia (CLL)	21 (11.6)	12 (6.6)	33(18.2)
Chronic myeloid leukemia (CML)	28 (15.5)	18 (9.9)	46(25.4)
Non-Hodgkin's lymphoma (NHL)	23 (12.7)	10 (5.5)	33(18.2)
Hodgkin's lymphoma (HL)	5 (2.8)	2 (1.1)	7(3.9)
Burkitt's lymphoma (BL)	1 (0.6)	1 (0.6)	2(1.1)
Multiple myeloma (MM)	12 (6.6)	8 (4.4)	20(11.0)
Total	116(64.1)	65(35.9)	181 (100)

The distribution of the various haematological malignancies recorded were: ALL 17(9.4%),AML 23(12.7%), CLL 33(18.2%), CML 46(25.4%), NHL 33(18.2%), Hodgkin's lymphoma 7(3.9%), Burkitt's lymphoma 2(1.1%) and Multiple myeloma 20 (11.0%) (Table I). CML was the commonest HM (25.4%) observed in this study, closely followed by CLL and NHL (18.2% each). Multiple myeloma was found in 20 (11.0%) patients. Non-Hodgkin's lymphoma was the commonest lymphomas encountered constituting 82.5% of all the lymphoma cases. Only 2 cases of Burkitt's lymphoma were recorded in the study (Table I).

The haematological malignances in this study constituted four major groups – acute leukemias (AML, ALL), chronic leukemias (CML, CLL), Malignant lymphomas (NHL,HL, BL) and Plasma cell neoplasm (MM) (Table III).

Acute lymphoblastic leukaemia occurred more in late childhood (mean age 13.8 years), acute myeloid leukaemia and chronic myeloid leukaemia (CML) occurred more in young and middle age adults while chronic lymphocytic leukaemia, Non-Hodgkin's

lymphoma and Multiple myeloma were found in older patients. Burkitt's lymphoma was found only in children. The mean age at diagnosis and the mean survival time for the various haematological malignancies are shown in Table I.

Table III: Prevalence of the different groups of haematological malignancies seen in U.I.T.H, Ilorin

Type of haematological malignancy	Frequency	Percentage
Acute Leukemias (AML, ALL)	40	22.1
Chronic leukemias (CML, CLL)	79	43.7
Malignant lymphomas (NHL, HL, BL)	42	23.2
Plasma cell neoplasm (MM)	20	11.0
Total	181	100

There was a male preponderance for the all haematological malignancies recorded except for Burkitt's lymphoma where equal distribution of male and female was noticed.

Table 4: Showing the frequency and distribution of haematological malignancies seen and managed by the haematologists in U.I.T.H, Ilorin.

Type of haematological malignancy	No. seen in UITH, Ilorin n (%)	No. managed by Haematologists n (%)
Acute lymphoblastic leukemia (ALL)	17 (9.4)	15 (8.3)
Acute myeloid leukemia (AML)	23 (12.7)	20 (11.0)
Chronic lymphocytic leukemia (CLL)	33 (18.2)	33 (18.2)
Chronic myeloid leukemia (CML)	46 (25.4)	46 (25.4)
Non-Hodgkin's lymphoma (NHL)	33 (18.2)	30 (16.6)
Hodgkin's lymphoma (HL)	7 (3.9)	7 (3.9)
Burkitt's lymphoma (BL)	2 (1.1)	1 (0.6)
Multiple myeloma (MM)	20 (11.0)	20 (11.0)
Total	181(100)	172(95)

Out of the 181 cases of haematological malignancies recorded, 141 (77.9%) of cases were diagnosed by the haematologists and co-managed with the clinical units which admitted the patients. All the lymphoma cases (NHL, HL and BL) had histological diagnosis from the

histopathology department but only 38 out of 40 cases were jointly managed by the haematology unit and the admitting clinical departments (Table IV).

Discussion

Haematological malignancies are heterogenous group of primary neoplasms affecting the haemopoietic system whose descriptive epidemiology as well as identification of aetiological factors has been slowed down over the years by many changes in diagnostic criteria and disease classification^{3,10}.

In the present study, a total of 181 cases of HM were recorded at the University of Ilorin Teaching Hospital, Ilorin, during the period under review constituting 8.1% of all cancer cases and 0.2% of all hospital admissions. In Benin, Nigeria, HM was reported to form 17.4% of cancer cases¹² and in a previous report from Ilorin, prevalence rate of 18.05% was recorded¹³. The observed prevalence rate of 8.1% in HM patients in the present study was much lower when compared with above studies, but was found to be higher than the 4.5% which was found in a study from Korea¹⁴ and previously from a study in Ibadan, Nigeria⁵. In the USA and Europe, lower incidence of HM was also reported^{8,9,10}. Although, there had been isolated reports from different centres in Nigeria, the true incidence of HM in our environment is largely unknown because there is presently no available population based cancer registry nor a national cancer registry in the country.

In our study, we found more males being affected than females with HM. This observation was consistent with what had been reported by several other studies within and outside Nigeria^{3,4,5,7,12,13}. Also, in this study acute leukemias were found more in children and young adults while the chronic leukemias, Non Hodgkin's lymphoma, Hodgkin's lymphoma and multiple myeloma were observed more in middle age and elderly. The different mean ages at diagnosis recorded for the various HM in this study were in agreement with the pattern which had been reported in other studies^{5,13,14}.

Chronic leukemias (CML and CLL) were found to be the commonest HM encountered in this study constituting 43.7% of the HM. CML was recorded in 25.4% and CLL in 18.2% of cases. This finding is at variance with some previous studies where malignant lymphomas were found to constitute the largest proportion of the HM

^{12,13,14}. The changed pattern in the prevalence of chronic leukemias observed in this study compared with the previous studies was also observed in a study from Bangladesh which was attributed to increasing industrialization and urbanization ². Increasing presence of factories such as pharmaceuticals, metallurgical as well as increasing number of petrol fuel stations has been noticed within Ilorin metropolis in recent time. Exposure to gaseous emissions from factories and hydrocarbons from petrochemicals may be a likely cause of the observed increase in the prevalence of CML cases in our study.

The malignant lymphomas were next to the chronic leukemias in prevalence in our study. Malignant lymphomas consisting of NHL, HL and Burkitt's lymphoma were found in 42 (23.2%) of patients with HM. This finding was similar to the study of Hossain et al ² in Bangladesh which also reported lymphomas as the second commonest HM in their study.

Multiple myeloma was the only form of plasma cell neoplasm found in this study which constituted 11.0% of HM cases. Similar observation was reported by Nwannadi et al ¹² in Benin where MM was the only plasma cell disorder observed in 8.3% of their HM patients. The prevalence of HM recorded in our study is higher than 5.4% reported previously by Babatunde et al ¹³ in Ilorin and 8.3% by Nwannadi et al ¹² in Benin both in Nigeria.

The incidence of leukemias and lymphomas in various age groups had attracted considerable attention in literature. Previous studies showed that acute leukaemias exhibited two peaks of occurrence, at below 5 years and in the 15-20 years age group, CML had a peak incidence at 20-50 years while CLL had a peak incidence of 45-65 years ^{5,7,13,19}. In this study, the mean age of occurrence recorded for the various HM compared favourably with the pattern reported in previous studies ^{7,12,13,20}.

The mean survival for all the cases of HM in this study ranged between 5.4 months and 56.8 months. This observation was a great improvement over the mean survival times which were reported in an earlier study in this centre where the mean survival of patients with HM ranged between 0.5 months and 45 months ¹³. The acute leukaemias (ALL and AML) had the lowest survival times of 7.2 months and 5.4 months respectively in this study which was better than 0.5 months recorded for

each in the previous study ¹³. The treatment of acute leukemias is quite intensive and requires aggressive chemotherapy and adequate supportive care in terms of blood products transfusion. The factors which could have contributed to the observed improved survival in our patients with acute leukemias included increased awareness in the environment of available specialists care at the study centre, early presentation of patients in the hospital, less difficulty in getting the required chemotherapeutic drugs, and the improved blood transfusion services in the Haematology department with facilities to prepare blood products most especially platelet concentrates for patients' support. Also, improved mean survival of 56.8 months was observed in the CML patients in this study compared with 46 months in the earlier study ¹³. The improved survival observed in our CML patients may have been due to increased access to Imatinib mesylate (Glivec) by some of the patients at the Obafemi Awolowo University Teaching Hospital (OAUTH), Ile-Ife, Nigeria where the drug was being provided free of charge.

Out of the 181 cases of HM reviewed, 172 (95%) were managed by the haematologists in conjunction with the admitting clinical departments. This is an indication of increased collaboration and inter-disciplinary approach for the effective management of haematological malignancies in this centre; an improvement upon the 59.4% collaboration in the management of HM recorded in the earlier study ¹³.

Conclusion

This study has demonstrated that haematological malignancies are common in this environment, accounting for 8.1% of cancer cases seen at the study centre during the study period. An increasing trend in the incidence of HM was also observed which supported the claim by previous studies of an increase in the incidence of HM ^{8,10,12,15}. Availability of improved diagnostic facilities, improved blood transfusion services, early presentation and better referral system from other health facilities to our centre may be some of the reasons for the observed slightly higher mean survival of patients with HM in this study.

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