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Research Paper

Mortality Rate Amongst Patients with Haematological Malignancies at a University Teaching Hospital in Southern Nigeria.

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Abstract
Background*: Haematological malignancies are a common, heterogeneous and complex group of diseases that are often associated with poor outcomes despite intensive treatment. There are many studies on the pattern, types and incidence of haematological malignancies, but there are few documented works on mortality due to haematological malignancies. There is currently no study in Africa or Nigerian on mortality due to these malignancies.*
Methodology*: The study was a cross sectional study carried out at Delta State University Teaching Hospital, Oghara. Participants were recruited consecutively as the events occurred. Data obtained were analyzed using Statistical Package for the Social Sciences (SPSS) version 23.*
Results*: A total of 123 cases of haematological malignancies were diagnosed during the period of the study which comprised 63 (51.2%) males and 60 (48..8%)females. The patients were aged between 18 and 84years with a mean age of 51.7 years. Sixty-six (53.7%) patients with haematological malignancies, died during the 24 months of the study. Mortality was highest among patients within the age range of 60-69 years, and was least in patients less than 20 years of age. More deaths were recorded in females than in males. (53% vs 47%). Mortality rate was highest in the leukaemias representing 54.5% of cases, followed by the lymphomas 16.6% and myeloma 15.2%.*
Conclusion*: The mortality rate in our center, a resource-poor facility was quite high. However,this was similar to mortality rate in some developed centers.*
Key words*: **Haematological malignancies, mortality rate, University Teaching Hospital, Nigeria***

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I. Introduction

Haematological malignancies (HM) are clonal haemopoietic disorders characterized by the accumulation of malignant haemopoietic cells in various tissues of the body[1]. They arise as a result of varied genetic damages to several key biochemical pathways in cellular differentiation, proliferation and maturation. These events result in the unregulated proliferation of abnormal cells that are immortal[1]. These abnormal cells usually cause symptoms because of bone marrow suppression and infiltration of various tissues of the body. They are classified into myeloid and lymphoid malignancies. The myeloid malignancies include Acute Myeloid

Leukaemia (AML), Chronic Myeloid Leukaemia (CML), the myeloproliferative neoplasms (Polycythemia Rubra Vera, [PRV], Essential Thrombocythaemia [ET] and Primary Myelofibrosis [PMF]), Myelodysplastic Syndrome (MDS) and the Myelodysplastic/Myeloproliferative Neoplasms (MDS/MPN) while lymphoid malignancies include Acute Lymphoblastic Leukaemia (ALL), Chronic Lymphoid Leukaemias (CLL), Plasma Cell Dyscrasias (PLD), Hodgkin Lymphoma and Non – Hodgkin Lymphomas [2].

Haematological malignancies are among the most common cancers. A recent study by Dirisu and colleagues[3] recorded a prevalence rate of 17.1% at the study center. Haematological malignancies are a heterogeneous group of diseases with some being acutely aggressive and rapidly fatal if untreated while others follow a chronic and indolent course lasting years. Patients with haematological malignancies often have unpredictable course of illness, varying from long-lasting disease to death within a few days of diagnosis.They often require intensive therapies such as high-dose chemotherapy, haemopoietic stem cell transplantation (HSCT), and chimeric antigen receptor T-cell therapy. These are all associated with significant risk of morbidity and mortality. In addition, patients often need a high level of supportive care, with red cell and platelet transfusions, antimicrobial treatments, growth factor regimens and immunosuppressive therapy.[4,5] Treatment limitations, especially in resource poor centers, declining performance status, presence of comorbidities, disease status (relapse, refractory, or persistent disease), persistent viral, bacterialand fungal infections are associated with the risk of death in patients with haematological malignancies.[6]

Literature search revealed an overwhelming paucity of research on the mortality rate amongst patients with haematological malignancies. A study by Akinde OR and colleagues [7] on cancer mortality pattern in Lagos University Teaching Hospital, Lagos, Nigeria revealed an overall mortality rate of 9%, second only to breast cancer.This is similar to findings from studies done by Ndukwe C [8]in the southeast region of Nigeria and Christopher OC [9]in the Niger Delta region of Nigeria. Ndukwe reported a mortality rate of 10.3%, with haematological malignancies ranking the third highest cause of cancer deaths while Christopher OC reported a rate of 9.2% and ranking fourth most common cause of cancer deaths. In the United States of America about 9.5% of all cancer deaths are caused by haematological malignancies[10].

The aim of the study was to highlight mortality rate amongst patients with haematological malignancies at the Delta State University Teaching Hospital, Oghara Delta State.

The objective of the study was to determine the mortality rate in patients with haematological malignancies, the factors responsible and make recommendations on how it can be addressed in order to reduce loss of lives.

II. Methodology

Study area

The study was a cross sectional study carried out at Delta State University Teaching Hospital, Oghara, a tertiary health institution located in Ethiope-West local government area of Delta State, South – South Nigeria. It is a state government owned teaching hospital with over 300 bed capacity.

Study population

All patients with haematological malignancies who died, either in the hospital or at home after the diagnosis was made. These cases were recorded between October 2022 and September 2024.

Data collection

Information of all patients diagnosed with haematological malignancies were ab initio recorded in the departmental register and was regularly updated as patients passed on either in the hospital or outside the hospital. Regular communication was established between managing consultants and patients who were discharged by the consultant or those who discharged themselves against medical advice.

Data analysis

Data obtained were analysed using Statistical Package for the Social Sciences (SPSS) version 23. The results were summarised using descriptive statistics (frequencies and percentages) and presented as figures and tables.

III. Results

A total of 123 casesof haematological malignancies were diagnosed during the period of the study. They comprised sixty-three (51.2%) males and sixty (48.8%) females giving a ratio of 1:2.1. The patients were aged between eighteen (18) and eighty-four (84) years with a mean age of 51.7 years. Majority of the patients (66.7%) were married, while 18.7%and 14.6% were single and widowed respectively. Table 1.

Table 1. Age distribution, marital status and sex distribution of patients with haematological malignancies.

Age	
Mean ± SD	51.7 ± 17.5
Range	18.0 – 84.0

Age group	
<20	8 (6.5)
20 – 29	11 (8.9)
30 – 39	12 (9.8)
40 – 49	20 (16.3)
50 – 59	23 (18.7)
60 – 69	33 (26.8)
≥70	16 (13.0)
Sex	
Male	63 (51.2)
Female	60 (48.8)
Marital status	
Single	23 (18.7)
Married	82 (66.7)
Widowed	18 (14.6)

Theleukaemias constituted the largest proportion of HM diagnosed during the period of the study. (48.0%) with patients with Chronic Lymphocytic Leukaemia (CLL)constituting the highest number of cases (19.5%). These were followed by the lymphomas (17.9%) of which the Non-Hodgkin lymphomas represented the highest proportion (12.2%),and Multiple Myeloma (16.3%). The least common HM was the MPD/MDS (0.8%). Table 2

Table 2. Types and pattern of Haematological Malignancies (HM)

Pattern	
Leukaemia	
Acute	20 (16.3)
ALL	10 (8.1)
AML	10 (8.1)
Chronic	39 (31.7)
CML	15 (12.2)
CLL	24 (19.5)
MPN	10 (8.1)
IMF	2 (1.6)
PRV	1 (0.8)
ET	7 (5.7)
MPN/MDS	1 (0.8)
MDS	10 (8.1)
Lymphoma	22 (17.9)
NHL	15 (12.2)
HL	7 (5.7)
Myeloma	20 (16.3)
Outcome	
Died	66 (53.7)
Alive	57 (46.3)

During the period of study, sixty-six patientswith haematological malignancies, representing 53.7%, died during the 24 month, while fifty seven patients, representing 46.3% were still alive.Table 2. Mortality was highest among patients in the 60-69 age bracket.(21.2%), followed by the 50-59 age bracket (19.7%). Deaths amongst patients within the 40-49 and above 70 years age group ranked third (16.7%). Mortality was least in patients less than 20 years of age.(6.1%). Table 3.

More deaths were recorded in females than the males. (53% vs 47%). Table 3 also shows that mortality was highest among patients who were married. (63.6%)

Of the 24 cases of Chronic Lymphocytic Leukaemia diagnosed, 11, representing 16.7% died. This constituted the highest number of deaths among the individual malignancies. This was followed by patients who had Multiple Myeloma (15.2%), Chronic Myeloid leukaemia (13.6%) and the Non-Hodgkin lymphomas(13.6%). Of note is that there was no mortality among patients diagnosed with Essential Thrombocythemia (ET) and Polycythemia Rubra Vera (PRV) during the period of the study. Table 3

Table 3. Mortality in relation to socio-demographics and Haematological Malignancies.

	MORTALITY		Stats	p-value
	YES n = 66	NO n = 57		
Age				
Mean ± SD	51.5 ±17.9	51.9 ± 17.1	t-test = 0.116	0.908
Age group				
<20	4 (6.1)	4 (7.0)		
20 – 29	7 (10.6)	4 (7.0)		
30 – 39	6 (9.1)	6 (10.5)	2.344*	0.886
40 – 49	11 (16.7)	9 (15.8)		
50 – 59	13 (19.7)	10 (17.5)		
60 – 69	14 (21.2)	19 (33.3)		
≥70	11 (16.7)	5 (8.8)		
Sex				
Male	31 (47.0)	25 (43.9)	1.030	0.310
Female	35 (53.0)	32 (56.1)		
Marital status				
Single	14 (21.2)	9 (15.8)		
Married	42 (63.6)	40 (70.2)	0.703	0.704
Widow	10 (15.2)	8 (14.0)		
Pattern				
ALL	8 (12.1)	2 (3.5)		
AML	8 (12.1)	2 (3.5)		
CML	9 (13.6)	6 (10.6)		
CLL	11 (16.7)	13 (22.8)		
IMF	1 (1.5)	1 (1.8)	11.141*	0.266
PRV	0 (0.0)	1 (1.3)		
ET	0 (0.0)	7 (12.3)		
MPN/MDS	1 (1.5)	0 (0.0)		
MDS	6 (10.6)	4 (7.0)		
NHL	9 (13.6)	6 (10.5)		
HL	2 (3.0)	5 (8.8)		
Myeloma	10 (15.2)	10 (17.5)		
Chemotherapy	43 (65.2)	51 (89.5)	10.042	0.002

- Adjusted chi square

IV. Discussion

This study was undertaken to determine the overall and individual mortality rates in patients with haematological malignancies at the Delta State University Teaching Hospital, Oghara, Delta State. A total of 123 cases of haematological malignancies were diagnosed during the duration of the study. Of these, 66 died representing amortalityrate of 53.7%.Unfortunately there were no similar contextual studies with which this outcome could be compared in other centers in Nigeria. However, the finding in this study is in tandem withother reports from international studies. Cuthbertson BH [11] and colleagues reported an hospital mortality rate of 55% amongst patients with haematological malignancies in a Scottish hospital. Studies byBird GT [12] and Hampshire PA [13] reported 6 month mortalities of 59.3% and 59.2% respectively in same patient population.High mortality rates in patients with hematological malignanciesisattributable to a number of factors including treatment limitations, especially in resource poor centerssuch as ours, declining performance status, presence of comorbidities, disease status, persistent viral, bacterial and fungal infections due to either the disease or treatment modalities [6].

This study revealed that mortality was highest in the middle aged and elderly patients, (40 to>70 years). This is in keeping with the fact that most haematological malignancies are diseases of middle aged and the elderlywith a median age atdiagnosis of65 years[3]. This is in contrast with studies done by Ndukwe CO [8] in South-East Nigeria and Lyimo EP [14] in Tanzania, where they reported deaths of more young adults younger than 31 years of age than in other age groups.

Chronic Lymphocytic Leukaemia (CLL), the most common of the leukaemias, constituted the highest number of mortalities (16.7%) in this study. This finding is similar to a2019 study done in Southern Nigeria which reported a mortality rate of 14.3%[15]. This could be due to the fact that the disease occurs mainly in the elderly where it is challenging to institute intensive chemotherapy as a result of poor performance status and prevalence of comorbidities.

Mortality rate in patients withthe lymphomas was 16.6%in our study. This is in contrast with reports from studies carried out by Madu *etal*[16] in SoutheasternNigeria and Afia [17] inSouth-South Nigeria who reported higher rates of 25% and 37.3% respectively [16,17]. The lower mortality rate in our study may reflect the environmental influence and novel treatment options available in the different areas.

With the introduction of novel targeted therapies in the management of multiple myeloma mortality rates have greatly reduced, especially in the elderly [18]. We found a mortality rate of 15.2%in our study. This is less than an early mortality rate of 21% reported by Kumar V *et al*in their study [19].

Chronic Myeloid Leukaemia mortality rate at our center was 13.6%. This is in contrast to a study carried out by Carlo Gambacorti and colleagues where they reported a mortality incidence rate of 4.8%. [20] Nearly all patients in our study opted for the cytoreductive drug, hydroxyurea, whereas all the patients in the Carlo Gambacorti study were on Imatinib mesylate, a targeted therapy that significantly improves survival and outcome in patients with chronic myeloid leukaemia.

Patients with acute leukaemias had the overall poorest survival among the patients with haematological malignancies. Mortality incidence rate was 24.2% overall (ALL-12.1%; AML -12.1%)with 80% mortality observed among patients with acute leukaemias. This is in tandem with a study done in Jos, Nigeria, [21] and Addis Ababa, Ethiopia where the mortality incidence rate was 23.5% [22].

In this study all patients with Essential Thrombocythemia and Polycythemia Rubra Vera were alive throughout the two year duration of the study. This is consistent with studies done by Passamonti et al[23]who reported that mortality compared with the general population was 1.6-fold higher in patients with polycythemia but was not increased in those with thrombocythemia. These findings reflect the very indolent nature of the proliferation associated with these malignancies.

Summarily, mortality rate was highest in the leukaemias (acute and chronic/ myeloid and lymphoid) representing 54.5% of cases.This was followed by the lymphomas (HL and NHL) 16.6% and myeloma 15.2%. MDS contributed a significant number of mortalities (10.6%). Mortality incidence rate was least seen in the myeloproliferative neoplasms/myelodysplastic syndrome patients with no deaths seen in patients with polycythemia vera and essential thrombocythemia during the period of the study.

V. Conclusion

Mortality rate in patients with haematological malignancies was quite high in our center, a resource poor tertiary health institution. However, similar mortality rates were recorded in resource developed centers. This reflects the complex nature of haematological malignancies highlighting the fact that treatment options alone do not determine the outcome of these heterogeneous group of malignancies.

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