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Original Research Article

The prevalence and demographic pattern of childhood malignancies amongst patients in Imo State University Teaching Hospital, Nigeria 2007 – 2014

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Background: Childhood cancers represent an important global public health problem. With effective immunization control of childhood infections in the developing world, non- infectious diseases such as malignancies have become increasingly important causes of childhood morbidity and mortality.
Objective: To determine the prevalence and demographic pattern of childhood malignancies amongst patients in Imo State University Teaching Hospital, Nigeria 2007 - 2014.
Methods: It was a descriptive cross sectional retrospective study using a pro forma as means of data abstraction. This study assessed the prevalence and demographic pattern of childhood malignancies among patients attending Imo State University Teaching Hospital Nigeria 2007 – 2014.
Results: A total number of 14,993 children were seen at the hospital between 2007- 2014; of these, 64 were diagnosed with malignancies, giving a prevalence rate of 0.43%. Most of the cases of malignancies were seen in children 0- 4 years of age (37.5%). Malignancies were more in males than females (F:M ratio of 1:1.6). Diagnosis of malignancy were by both laboratory and clinical methods. Amongst the children, Burkitt's Lymphoma was the most common malignancy accounting for 40.6% of all malignancies. On the other hand Hepatoblastoma was the least diagnosed (1.6%).
Conclusion and recommendations: This study shows a higher prevalence of childhood malignancy in children 0- 4 years of age, in males, rural dwellers and the commonest malignancy was burkitt's lymphoma. Efforts should be made by caregivers to identify the disease in time for early treatment because most of these malignancies, especially Brukitt's Lymphoma respond well to aggressive chemotherapy when started early.

Key words: childhood, malignancies, neoplasm, Burkitts lymphoma, Imo, Nigeria.

INTRODUCTION

Children make up one- third of the population especially in the developing countries [William w. 20th edition]. With effective immunization control of devastating childhood infections in the developing world, non- infectious diseases such as malignancies have become increasingly important causes of childhood morbidity and mortality. Each year approximately 150 in 1 million children worldwide are diagnosed with cancer. For children between the ages of 1-14 years, cancer is the fourth (4th) leading cause of death after unintentional injuries, homicides and suicide (William w. 20th edition).

In Nigeria and many developing countries, due to various constraints in community based research, hospital records of morbidity and mortality are still the basis of many published health statistics. Despite their limitations, these sets of data are significant pointers to childhood malignant disease pattern in the community. The prevalence and spread of these malignancies have been found to be related

to the level of education, environmental sanitation and socio-economic condition of the parents of these children (Abdulkareem, 2009 and Pisani, 2006). It has been observed that Acute myeloid leukemia, Acute lymphoblastic leukemia, Lymphomas and Lymphoproliferative disorders (especially Hodgkin and Burkitt's lymphomas); Nephroblastoma, Neuroblastoma and Retinoblastomas are the most commonly occurring childhood malignancies. Despite the growing developments in the biomedical and medical sciences and technologies, the prevalence and pattern of childhood cancers is on the increase. (William w. 20th edition, Harsh Mohan; 6th edition, www.roswellpark.org, 2015), www.texaschildren.org/aboutus/news, 2015; Badoe et al. (2009); http://www.cancer, 2016 and Abdulkareem, 2009). Childhood cancers globally accounts for about 4.4%-12.5% of the cancer load of all age groups in developing countries and 0.5%-2% in industrial countries (William w. 20th edition)

An estimated 175,300 new cases occurred among children aged 0-14 years in 2008. It is difficult to measure the incidence of childhood cancer accurately in developing countries, where cases are often unreported due to the greater frequency of deaths from infectious diseases and malnutrition. However, the great majority of children (80%) with cancer live in developing countries (Pisani (2006). Leukemia is the most common form of cancer among children in most parts of the world, except in Africa, where Kaposi Sarcoma and Burkitt's lymphoma are predominant. Worldwide, about 96,400 children died from cancer in 2008 (Pisani, 2006).

Mortality rates are lowest in developed countries despite higher incidence rates. This reflects better diagnosis and access to higher quality treatment (Pisani, 2006 and Eden, 2004).

Cancer is emerging as the common cause of childhood death in Asia, Central and Middle East, where fewer children are now dying from preventable diseases. In Nigeria about 3.3% of childhood mortality are attributed to Neoplasm (Ochicha. 2012). Data from most parts of the country show that the five most common childhood cancers are: Non Hodgkin lymphoma (majority of which is Burkitt's lymphoma), Retinoblastoma, leukemia, Sarcoma and Nephroblastoma (Eden, 2004).

Earlier studies from Ibadan have also reported remarkable percentage of brain tumours and leukemia (Eden, 2004).

Burkitt's lymphoma (BL) which is strongly associated with malaria, Epstein Barr virus and malnutrition has higher frequency in the Southern forest area compared to the Northern Savannah. The recent decrease noted in the incidence of Burkitt's lymphoma has been attributed to improved living conditions and better malaria control. Retinoblastoma and Nephroblastoma are common in children below five years of age. Lymphoma and Sarcomas occur in older children. Late presentation and poor survivals are marked features of childhood cancers (Eden, 2004).

METHODS

Study area: The study was conducted in Imo State University Teaching Hospital , in Orlu Local Government Area of Imo State in South Eastern Nigeria

Study population: All children 0-14years who attended paediatrics clinic within the time frame. Sample population were all those that were diagnosed with malignancy (January 2007 – January 2014) in Imo State University Teaching Hospital, Orlu, Imo State.

Study design: A descriptive cross sectional retrospective study

Sampling technique: All the children who were seen at the paediatric clinic within the time frame were the study population, from whom all those diagnosed with malignancy were studied.

Data collection: Data was collected from the case files of all paediatric patients managed for childhood malignancy within the period of study.

Data analysis: Data was analyzed using computer software, SPSS 15.0 for windows (Inc., Chicago, USA, 2001).

Ethical consideration: Approval was obtained from the ethical committee of Imo State University Teaching Hospital, Orlu.

RESULTS

A total number of 14,993 children (male= 8242; female= 6751) were seen at the hospital between 2007- 2014; of these, 64 were diagnosed with malignancies, giving a prevalence rate of 0.43%. The socio-demographic parameters of respondents (Table 1) showed that most cases of malignancies were seen in children 0- 4 years of age 24 (37.5%) followed by children of 5- 9 years of age 23(36.0%). >10years had the least cases of malignancy 17(26.5%). On the bases of gender, malignancies were more in males than females (ratio female to males 1:1.6). Most of the parents were of low socioeconomic class 23(60.5%). The affected children were all rural dwellers.

Diagnosis was made by both clinical 29(45.3%) and laboratory 16(25%) methods. Types of malignancies amongst the children (Table 2) shows Burkitt's Lymphoma with the highest frequency at 26(40.6%) and Hepatoblastoma presented with the lowest frequency at 1(1.6%).

Gender, in relation to types of malignancies Burkett's Lymphoma was 15(38.5%) males to 11(44%)females, Neuroblastoma and Hepatoblastoma, males only 1(2.6%). Burkett's Lymphoma was the most common malignancy among the children 26 (40.6%). Hepatoblastoma was the least at 1(1.6%). Out of the total 64 children diagnosed with malignancies, a total of 12 deaths were recorded (18.8%) of which Burkitts Lymphoma had the highest mortality 7(58.3%).

The yearly distribution of malignancies (Table 3) shows that 2012 recorded the highest number of malignancies of 12(18.8%) and 2007 recorded the least with 5(7.8%).

Table 1. Socio-demographic parameters of children and their parents

Age (years)	**Frequency**	**Percentage %**
0 – 4	24	37.5
5 – 9	23	36.0
>10	17	26.5
TOTAL	64	100

Gender distribution of children

Gender	**Frequency**	**Percentage %**
Male	40	62.5
Female	24	37.5
TOTAL	64	100

Age distribution of parents

Age	**Father**	**Mother**	**Frequency**	**Percentage%**
20- 30	-	7	7	10.9
31- 40	17	25	42	65.6
41- 50	13	1	14	21.9
51- 60	1	-	1	1.6
TOTAL	31	33	64	100

Social class of parents

Class Social	**Frequency**	**Percentage %**
I	-	
II	-	
III	15	39.5
IV	23	60.5
V	-	
TOTAL	38	100

Occupation of parents

Occupation	Frequency	Percentage %
Petty trader	29	38.2
Tailor	8	10.5
Farmer	4	5.3
House wife	3	4.0
Teacher	4	5.3
Business	9	11.8
Menial job	12	15.8
Driver/ cyclist	4	5.3
Civil servant	3	4.0

Education attainment of parents

Education	**Father**	**mother**	**Frequency**	**percentage**
Primary	8	4	12	20.3
Secondary	17	22	39	66.1
Tertiary	4	4	8	13.6
Total	29	30	59	100

Residence of children

Urban	**Rural**
0	64

DISCUSSION

Most cases of childhood malignancies were seen in children 0- 4years age group 24(37.5%).The most common malignancy in our study was Burkett's Lymphoma (26 patients). The high prevalence of Burkett's Lymphoma in rural areas could be as a result of poor environmental sanitation and endemicity of malaria in rural areas. It could also be as a result of the fact that the study area, the Teaching Hospital is located in a rural area. With regards to the Socioeconomic conditions of the children's parents: low educational levels and poor socio economic levels could play a role in the vulnerability of the children to malnutrition, infections and infestations leading to low immunity and increasing their chances of developing malignancies (Ojesina, 2002 and Samaila, 2009).

The findings in our study are in accord with those of Ochicha (2012); Abdulkareem (2009) and Ojesina(2002) who found that childhood malignancies affect males more and that Burkett's Lymphoma was the commonest malignancy; Onwasigwe et al. (2002) in Eastern Nigeria (Enugu) reported Burkett's Lymphoma as having the

Table 2. Types of Malignancies in relation to gender

Types	male		Female		Total	
	Freq	%	Freq	%	Freq	%
Burkitt's Lymphoma	15	38.5	11	44	26	40.6
Retinoblastoma	5	12.8	2	8	7	10.9
Nephroblastoma	4	10.3	3	12	7	10.9
AcuteLymphoblastic lymphoma	4	10.5	1	4	5	7.8
Rhabdomyosarcoma	4	10.3	5	20	9	14.1
Non-Hodgkin Lymphoma	3	7.7	2	8	5	7.8
Hodgkin Lymphoma	2	5.1	0	0	2	3.1
Neuroblastoma	1	2.6	1	4	2	3.1
Hepatoblastoma	1	2.6	0	0	1	1.6
Total	39	60.9	25	39.1	64	100

Table 3. Distribution of malignancies per the year

year	Frequency	percentage %
2007	5	7.8
2008	7	10.9
2009	6	9.4
2010	6	9.4
2011	9	14.1
2012	12	18.8
2013	8	12.5
2014	11	17.2
Total	64	100

highest prevalence among childhood malignancies followed by Sarcoma, Nephroblastoma, and the least prevalent Neuroblastoma; which tallies with the findings of this study.With regards to socioeconomic conditions, a study by Chineke et al. (2015);. reported a high prevalence of Burkitt's Lymphoma 65% among 40 paediatric cancer patients and was commoner among males and children from low socioeconomic class and this tallies with findings of this study.

Conclusion

This study has shown that the prevalence of childhood malignancies in Imo State University Teaching Hospital was 0.43%. The commonest malignancies were Burkett's Lymphoma, Rhabdomyosarcoma, Nephroblastoma and Neuroblastoma.

The malignancies were seen more in children within 0- 4 years age group, rural dwellers, males and children from low socioeconomic background.

Recommendation

More attention should be paid to the developing countries/ regions and rural areas as they are most hit with childhood malignancies. In this regard, health education on early presentation to hospital when a child gets sick, environmental sanitation and good nutrition carried out in localities using local languages. Malaria prevention efforts should be enhanced in rural areas.

Improved and well equipped primary health centers to help make early diagnosis and prompt treatment to limit disabilities.

Competing interests

Authors have declared that there are no competing interests.

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