PATTERN AND OUTCOME OF CHILDHOOD SOLID TUMOURS AT USMANU DANFODIYO UNIVERSITY TEACHING HOSPITAL, SOKOTO

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Abstract

Background: Childhood solid tumours are important non- infectious causes of morbidity and mortality in children worldwide, particularly in resource poor countries. The condition has been neglected in our environment, due perhaps to ignorance of the nature of the illness by caregivers, poverty and inadequate care provider commitment.

Objectives: To determine the prevalence, pattern and outcome of childhood solid tumours as seen in Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto.

Methods: It was a 5- year retrospective descriptive study from August 2011 to July 2016. Cases were children aged below 15 years admitted with malignant solid tumours. Relevant information from their case folders were extracted into a proforma sheet and data was analyzed using SPSS version 20.

Results: Forty- two (0.5% or 5 per 1000) of the 9,184 admissions had histological diagnosis of solid tumours. Males were 23(54.8%) and females were 19(45.2%), with M: F ratio 1.2:1. Mean age at presentation was 5.2 ± 3.3 years. Majority 23(54.8%) were of low socioeconomic class. Commonest clinical presentations were swellings 34(81.0%), fever 13(31.0%), weight loss 8(19.0%) and pain 3(7.1%). Commonly diagnosed tumours were Retinoblastoma 13(31.0%), Rhabdomyosarcoma 10(23.8%), Burkitt's lymphoma 10(23.8%) and Nephroblastoma 6(14.2%). Twenty nine (69.1%) of the 42 patients were discharged, 5 (11.9%) left against medical advice and 8 (19.0%) died. Of the 29 that were discharged, 18 (62.1.0%) were lost to follow up.

Conclusions: Retinoblastoma is the commonest childhood solid tumour seen in this study. Facilities should be made available for prompt diagnosis and effective treatment of such tumours. The high occurrence of patients being lost to follow up could be minimized by counseling and reduction in the costs of care.

Keywords: Pattern, Outcome, Childhood, Solid Tumours, Sokoto

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INTRODUCTION

Childhood solid tumours are important non-infectious causes of morbidity and mortality in children worldwide, particularly in resource constraint countries.¹ They are said to account for about 30% of all cancers among the Paediatrics age group in the developed nations, where enormous strides have been made in the management of cancers with increasing cure rate.¹⁻³ In the developing countries, they are emerging as major childhood killers, partly due to lack of specialized facilities, personnel and high cost of treatment.⁴ Treatment of children with cancer begins with an absolute requirement for the correct diagnosis.⁵ Prompt and accurate diagnosis provides appropriate multidisciplinary and usually multimodal therapy, with the best chance of cure of patients with primary disease.⁵

In resource constraints countries, a good number of children are never diagnosed at all, or diagnosed very late, with limited treatment options.⁶ About

60% or more of children with cancers are said to succumb to illness in developing countries.⁷ The economic, physical, and psychosocial impact of solid tumours during childhood remains substantial, worse so in our setting where millions of persons live in poverty.⁸⁻¹⁰ The condition has been neglected in our environment, due perhaps to ignorance of the nature of the illness by caregivers; inadequate care provider commitment and poverty.⁹ Furthermore, variation in specific tumour types have been recognized in different population and has been attributed to environmental and genetic factors.¹¹

There is need for an updated record of childhood solid tumours in UDUTH Sokoto because, the study conducted in the centre was almost two decades ago.¹² The centre also lacks an organized Paediatrics oncology team dedicated to the care of children diagnosed with cancers. This study was therefore, conducted to determine the prevalence, pattern and outcome of childhood solid tumours in UDUTH Sokoto, with the hope that information

generated from the study will be enlightening and will improve the care and outcome of children diagnosed with solid tumours.

MATERIALS AND METHODS

It was a 5- year retrospective study of childhood malignant solid tumours, spanning from August 2011 to July 2016. It was conducted at the Department of Paediatrics, UDUTH, Sokoto, a tertiary institution located in Sokoto the capital of Sokoto State, Nigeria. Cases were children aged below 15 years admitted with histologically confirmed diagnosis of malignant solid tumours. Relevant information from their case folders were extracted into a proforma sheet. Information recorded included demographic characteristics such as name, age, gender, address, ethnicity, educational status and occupation of parents. The social status was determined using Oyedeki classification.¹³

Presenting complaints, duration of illness, physical findings, diagnosis and outcome were also recorded. Ethical approval for the study was sought and obtained from the Health Research and Ethics Committee of UDUTH, Sokoto. The data obtained were treated with utmost confidentiality. Data was analyzed using SPSS version 20. The prevalence rate of childhood malignant solid tumours was presented as percentage while the age distribution of the cases was analyzed and expressed as mean and standard deviation. Frequency distribution tables and pie charts were used to illustrate results. Ap-value of ≤ 0.05 was taken as significant.

RESULTS

Of the 9,184 admissions into the Emergency Paediatrics Unit and the Paediatrics wards of UDUTH during the study period, 42 (0.5%) had histological diagnosis of malignant solid tumours. Their ages ranged from 2 months to 14 years and the mean age at presentation was 5.2 ± 3.3 years. The prevalence of childhood solid tumours increases with age until age of 11 years when they were rarely seen. Males were 23(54.8%) and females were 19(45.2%), with M: F ratio of 1.2:1. There was no significant difference between the age group and

gender, ($p < 0.5$). (Table I).

Table I: Age and Gender Distribution of the Children with Solid Tumours

Age group (Years)	Male N (%)	Female N (%)	Total N (%)
0-2	5(21.7)	6(31.6)	11(26.2)
3-5	7(30.4)	5(26.3)	12 (28.6)
6-8	6(26.1)	6 (31.6)	12 (28.6)
9-11	4(17.4)	2 (10.5)	6 (14.3)
12-14	1(4.4)	0(0.0)	1(2.3)
Total	23(100)	19(100)	42(100)

$$\chi^2=1.872; df=4; p<0.5$$

Twenty-three (54.8%), 13(30.9%) and 6(14.3%) were of low, middle and upper socioeconomic classes respectively. The difference was statistically significant, $p < 0.001$ as shown in Table II below.

Table II: Socioeconomic class of children with solid tumour

Socioeconomic class	With tumour	Without tumour	Total
Low	23	1290	1313
Middle	13	2825	2838
High	6	5027	5033
Total	42	9142	9184

$$\chi^2=61.011; df=2; p<0.001$$

Commonest clinical presentations were swellings on body parts 34(81.0%), fever 13(31.0%), weight loss 8(19.0%) and pain 3(7.1%). Of the 42 cases, Retinoblastoma was the commonest malignant solid tumour accounting for 13(31.0%) cases, followed by Rhabdomyosarcoma 10(23.8%), Burkitt's lymphoma 10(23.8%) and Nephroblastoma 6(14.2%). Others were Neuroblastoma, Hepatoblastoma and Osteosarcoma accounting for 1(2.4%) cases, each. (Table III).

Table III: Types of Childhood Solid Tumours diagnosed

Diagnosis	Male (%)	Female (%)	Total (%)
Retinoblastoma	6 (14.3)	7 (16.7)	13 (31.0)
Rhabdomyosarcoma	7 (16.7)	3 (7.1)	10 (23.8)
Burkitt's Lymphoma	6 (14.3)	4 (9.5)	10 (23.8)
Nephroblastoma	3 (7.1)	3 (7.1)	6 (14.2)
Neuroblastoma	0 (0.0)	1 (2.4)	1 (2.4)
Hepatoblastoma	0 (0.0)	1 (2.4)	1 (2.4)
Osteosarcoma	1 (2.4)	0 (0.0)	1 (2.4)
Total	23(54.8)	19(45.2)	42(100)

Twenty nine (69.1%) of the 42 patients were discharged following various forms of treatment modalities (medical, surgical and supportive). Five (11.9%) of the patients left against medical advice and 8 (19.0%) mortalities were recorded. (Figure1).Of the 29 cases that were discharged, 18 (62.1.0%) were lost to follow up. (Figures 1 and 2)

DISCUSSION

The prevalence of childhood solid tumour in this series of 0.5% or 5 pre 1000 which is slightly low. There was also male preponderance which is similar to finding from Lagos.¹⁴ The prevalence of childhood solid tumours in this study was found to increase with age until age of 11 years when they

were rarely seen. It may perhaps imply that such children with solid tumours either die before or rarely survive after the age 11 years.

Retinoblastoma was the commonest tumour in this study. This compares favourably with the studies conducted in Lagos,¹⁴ Kano¹⁵ and Parkistan.¹⁶ Although Burkitt's lymphoma was also common in this study, a relative decline in its frequency compared to that of Retinoblastoma was observed. This finding is however, in contrast with other studies.¹⁷⁻¹⁹ The most favoured hypothesis in the aetiology of Burkitt's lymphoma is one in which the condition is linked to factors such as the high occurrence of Epstein Barr Virus infection and malaria endemicity.¹⁹⁻²¹ The decline in its frequency in this study could be attributed to significant progresses reported to have been made in the efforts at Malaria control in the study location and some other parts of Nigeria, that is, from hyperendemicity to mesoendemicity.^{21,22} The possibility of a changing trend in yet unidentified genetic factors implicated in the aforementioned solid tumours is also worth considering.

Rhabdomyosarcoma was as common as Burkitt's lymphoma in this study, further confirming that it is one of the commonest tumours in some locations in Northern Nigeria.^{23,24} Variations in geographic locations in the occurrence of solid malignancies is a well documented fact, mainly attributed to environmental factors such as differences in climate and levels of exposure to environmental toxins.²⁵ Additionally, ethnic variation in the occurrence of cancers has been linked to genetic predisposition in affected individuals.¹¹ The prevalence of Nephroblastoma in our study is comparable to those reported by Agboola *et al*²⁶ in South-western Nigeria and Haroun *et al*²⁷ in Sudan. Other uncommon tumours in this study are comparable to the findings of some studies conducted in Nigeria.^{28,29}

Majority (54.8%) of the patients were of low socioeconomic class, a finding comparable to reports from other studies.^{19,20,22,30} This might have contributed to the high mortality rate (19.0%) and high default rate (62.1%) following discharge.

Managing cancers any where in the world can be capital, manpower and time intensive, requiring series of investigations, procedures and treatment modalities. Where not adequately motivated, caregiver burn-out soon sets in further compounding the hope for cure, even in cancers with potentials for a favourable outcome. The high default rate in this study by implication means a further increase in the risk of mortality in diagnosed patients. This is because other non orthodox or suboptimal but cheap treatment options might be sought for. In the developed countries, government takes care of substantial amount of medical bills, in addition to efforts by voluntary organizations.³¹ The situation differs in resource constraints setting like ours, where families bear the bulk of medical expenses of their sick children with little or no support from the government.^{22,30}

CONCLUSIONS

Retinoblastoma is the commonest malignant solid tumour seen in this study and Rhabdomyosarcoma is as common as Burkitt's lymphoma in this study. Majority (54.8%) of the patients had parents who were of low socioeconomic status and most (62.1.0%) of the patients were lost to follow up. Prompt diagnosis of Retinoblastoma and other common solid tumours is required for effective treatment. An organized multi-disciplinary oncology team is required in the studied centre for optimum benefit of children with malignant solid tumours. Regular counseling and reduction in the costs of care could minimize the high occurrence of defaults to follow up.

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