ACR Original Article

Morphological pattern of paediatric tumours in Warri, Southern Nigeria

IgbeAP[1],Nwanchokor FN[2],Forae GD[3]

[1]Department of Pathology, Ambrose Alli University,Ekpoma
[1]Department of Pathology, Igbinedion University, Okada
[2]Department of Pathology, School of Medicine, University of Benin

Abstract

Background*: Tumours are emerging as an important cause of mortality in the paediatric age group. However, childhood tumour patterns in Warri, Nigeria are not known. This study aims at documenting the morphological patterns of these tumours as seen at Central Hospital Warri.*
Materials and Methods: The study was 7-year retrospective analysis of all histologically diagnosed tumours in children age 0 – 16 years seen at the Department of pathology, Central Hospital Warri, Nigeria.
Results*: Seventy-five tumours comprising of 60 benign and 15 malignant tumours were diagnosed histologically during the study period. The ratio of benign to malignant tumours was 4:1. The Male to Female ratio for benign tumours was 1:4.5 while the male to female ratio for malignant tumours was 4:1. The mean age for benign and malignant tumour was 13 years (3.6SD) and 11 years (4.8SD) respectively. Breast tumours accounted for (48.3%) of all benign childhood tumours. Lymphomas and osteosarcoma constitute 26.6% and 20% of all malignant childhood tumours respectively.*
Conclusion*: Benign tumours are more common in the paediatric age group. The most common benign tumours are breast tumours with fibroadenoma constituting the vast majority while lymphoma is the most common paediatric malignant tumour.*

Key-words: Paediatric Tumours, Lymphoma, Fibro-adenoma

Introduction

Tumours are relatively rare in the children and those encountered in the paediatric age group particularly the cancers are unique in many respect.[1] Tumours account for a significant percentage of morbidity and mortality in children. Quinn et al observed that cancer develops in approximately 1 in 600 children aged between 1 and 15 years making it the second most common cause of death in this age group.[2] Among Caucasians, cancer is the leading cause of childhood mortality.[3,4] kang et al in Ibadan, Nigeria, in 1992 reported that malignancies are the fourth leading cause of childhood mortality.[5] It will be appreciated from these studies that neoplasms are among the leading causes of childhood mortality.

Corresponding Author Alex P Igbe,
Histopathology Department
Irrua Specialist Teaching Hospital, Irrua.
Email: apijami@yahoo.com

The authors are not aware that any work has been done previously in Warri, Southern Nigeria on the patterns of these neoplasms. A study of these tumours which imparts greatly on childhood and the general population at large is therefore of great interest. The present study is being carried out to determine the relative frequency and the histopathological patterns of childhood tumours as seen at Central Hospital Warri, Nigeria. The study also aims at determining the age and sex distribution patterns of these tumours. It is hoped that findings from this study will contribute to the pool of knowledge and enhance the practice of paediatric pathology in the West African sub-region. It will also help clinicians to be aware of the common tumour to expect in this age group in this environment where only few hospitals patronize histopathological facilities.

Materials and Methods

The study was a 7-year retrospective analysis of all histologically diagnosed neoplastic lesions in children aged 0 – 16 years in the Histopathology Department of Central Hospital Warri, Southern Nigeria from January 2005 to December 2011. The hospital is the only Centre in Warri metropolis and its environs offering histopathology services. Therefore, it is a major referral Centre for histopathology services from government and privately owned hospitals in Delta state, Southern Nigeria. Records of cases were obtained from the histopathology surgical day books of the Department. All specimens were Formalin Fixed Paraffin Embedded (FFPE) and were sectioned and stained with haematoxylin and eosin. Special stains such as phosphotungstic acid haematoxylin (PTAH) and reticulin were employed for further characterization of tumour where necessary. All the slides were reviewed using standard compound light microscope. The age, sex and histopathological variants were presented in frequency distribution tables with mean standard deviation (SD) and analyzedusing the Statistical Packaging for Social Sciences (SPSS) version 17 Statistical Package (SPSS) incorporated. Chicago, Illinois USA.

Results

A total of 947 tumours were diagnosed in the Histopathology Department Central Hospital Warri Delta State during the 7-year period under review. Out of these, 75 cases constituting 7.9%, were neoplasms occurring in the paediatric age group. Sixty of the 75 cases accounting for 80% were benign tumours while 15 cases (20%) were malignant tumours. The ratio of benign tumours to malignant tumours was 4:1. The Male to Female ratio for benign tumours was 1:4.5 while the Male to Female ratio for malignant tumours was 4:1. The mean ages for benign and malignant tumours were 13years ± 3.6 SD and 11 years ± 4.8 SD respectively.

Table 1 shows the age and sex distribution of the malignant tumours. The lymphoma encountered included I Burkitt and 3 Hodgkin's type while the carcinoma was a metastatic squamous cell carcinoma to the cervical lymph node.

Table 1: Age and Sex Distribution of Benign Tumours

Tumour	Number by age Group (years)			Number by sex		Total
Type	0-5	6-11	12-16	Male	Female	
Breast Tumour	-	3	26	-	29 (48.3%)	29 (48.3%)
Connective Tissue Tumour	4	5	9	7 11.7%)	11 (18.3%)	18 (30%)
Teratomas	1	-	4	-	5(8.3%)	5(8.3%)
Epithelial Tumour	-	2	2	2(3.3%)	2(3.3%)	4(6.7%)
Peripheral nerve sheath tumour	-	1	2	2(3.3%)	1(1.7%)	3(5.0%)
Bone tumours	-	1	-	-	1(1.7%)	1(1.7%)
TOTAL	5	12	43	11 (18.3%)	49 (81.7%)	60 (100%)

Table 2: Age and Sex Distribution of Malignant Tumours

Histological Type	Number by age Group (years)			Number by sex		Total (%)
	0-5	6-11	12-16	Male	Female	
Lymphoma	-	2	2	4 (26.6%)	-	4 (26.6%)
Osteosarcoma	-	-	3	2 (13.3%)	1 (6.7%)	3 (20.0%)
Rhabdomyosarcoma	-	-	2	2 (13.3%)	-	2 (13.3%)
Nephroblastoma	1	-	1	2 (13.3%)	-	2 (13.3%)
Retinoblastoma	-	1	-	1(6.7%)	-	1(6.7%)
Neuroblastoma	-	1	-	-	1(6.7%)	1(6.7%)
Carcinoma	-	-	1	1(6.7%)	-	1(6.7%)
Yolk Sac tumour	-	-	1	-	1(6.7%)	1(6.7%)
TOTAL	1	4	10	12 (80.0%)	3 (20.0%)	15 (100%)

Table 2 shows the age and sex distribution of the benign tumours. The common tumours were breast tumours (48.3%), connective tissue tumours (30%), teratomas (8.3%), epithelial tumours (6.7%), peripheral nerve sheath tumours (5%) and bone tumours which accounted for 1.7% of all benign tumours. The breast tumours included 25 cases of fibroadenoma and 4 cases of tubular adenoma while the connective tissue tumours were 7 cases of hemangioma, 3 cases of fibromatosis, 2 cases each of lymphangioma, lipoma

and dermatofibroma and 1 case each of giant cell tumour and leiomyoma of the intestine. Encountered epithelial tumours were 2 cases of squamous cell papilloma, 1 case each of basal cell adenoma and oncocytic adenoma while peripheral nerve sheath tumours were 2 cases of schwannoma and I case of granular cell tumor. The only bone tumour seen was osteoblastoma. Table 3 shows the regional anatomical distribution of all tumours.

Table 3: Anatomical Distribution of Paediatric Tumours

Anatomic region	Number of cases
Chest	**33(44%)**
Abdomen	**10(13.3%)**
Upper limb	**10(13.3%)**
Head and neck	**9(12.0%)**
Lower limb	**5(6.7%)**
Unspecified	**8(10.7%)**
Total	**75(100.0%)**

Discussion

This study shows that benign childhood tumours out-numbered the malignant tumours in a ratio of 4:1 in favour of the benign tumours. This report is in agreement with previous observations of paucity of malignant tumours as compared to benign tumours among Caucasian children.[6-9] On the contrary, a previous study by Igbe et al[10] in Benin City, Nigeria found malignancies to be slightly more common than benign tumours in a ratio of 1.1:1.0. This reason for this observation may be attributed to late presentation of children with benign tumours to hospitals as most Nigerians prefer the non-orthodox healing homes for treatment only to present late to hospitals when the condition has deteriorated.

In this study lymphoma was the most common malignancy just like in many other studies in Nigeria and other African countries.[11 – 17] Most of these studies reported Burkitt lymphoma as the most common lymphoma in children. However, a decline in the frequency of Burkitt's lymphoma has been observed by some previous workers [11- 13, 18] and in the present series, only 1 case was encountered. Indeed, the predominant lymphomas in this study were Hodgkin's lymphoma which accounted for 75% of the lymphomas.

Osteogenic sarcoma is the most common primary bone malignancy excluding haematopoietic malignancies [19-21]. This tumour occurs at any age with about 75% of cases occurring in people aged less than 20 years.[20] It is among the commonly diagnosed childhood malignancies in Ibadan,[11] Calabar,[16] Ife,[15] Lagos [13] and Kor Le Bu[17]. In this series, it is the most common malignancy after lymphoma accounting for 20% of malignant tumours.

Rhadbomyosarcoma and nephroblastoma each accounted for 13.3% of all malignant tumours in this study. The incidence of these tumours in children has been observed to be high by many other workers although there are variations in their relative frequencies. For instance, the relative frequency of 13.3% for rhabdomyosarcoma in this study compares well with 14.3% reported in Benin [18]and and 13.1% reported in Jos[14] whereas it differs from 7%, 6% and 0.7% reported in Calabar[16], Ife[15] and Ghana[13] respectively.

Epithelial tumours are not common in the paediatric age group. A rising incidence however has been reported by some works.[13, 18]Akhiwu et al[18] working in Benin City Nigeria found 9 cases representing 10.7% of the malignant tumours in a 10-year study. Only 1 carcinoma was found in this study. Yolk sac tumour is a reportedly rare tumour of germ cell origin most commonly encountered in children or young women.[22] We found I case in this study and it occurred in an 11-year-old girl.

In this study, benign tumours accounted for 80% of the tumours reviewed. The most common benign tumours were those derived from the breast which accounted for about 50% of all benign tumour the overwhelming majority being fibroadenoma. This fibroepithelialtumour derived from breast intralobular stroma, is the most common breast tumour in adolescent girls[23-26] and all the cases in this study occurred in the adolescent age group. The high incidence of breast tumours in this study is a reflection of the breast cancer awareness and breast self-examination rate in our environment.

Tumours of connective tissue origin were next to breast tumours in frequency in this study about 40% of which is constituted by hemangioma. Hemangioma, the most

common tumour during infacy,[7] was the most common tumour when Igbe et at[27] reviewed benign childhood tumours in Benin City, Nigeria. They make up about 7% of benign tumours during the childhood period[28] and in the present series, they make up 11.6% all benign tumours reviewed. Other soft tissue tumours encountered in this study are not uncommon in the paediatric age group except for leiomyoma, a smooth muscle tumour most commonly encountered in the genitourinary and gastrointestinal systems of adults.[29]Although rare in children, cases have been reported in this age group in different organs the including the skin[29] and the bronchus.[30] The present case occurred in the intestine.

Previous studies show that tumours generally are more common in the head and neck region. Although the reasons for this are not clear the high vascularity of this region has been suggested.[11] The chest, however, was the most commonly affected body region in this series and this is as a result of the high incidence of fibroadenoma which make up 41.6% of benign tumours and one third of all tumours.

Conclusion

This study has shown that benign tumours constituted the majority of paediatrictumours in Warri, with tumours of the breast and connective tissues being the predominant benign tumours. Malignant tumours are relatively few with lymphoma as the most commonly encountered histological type.

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