Original Article

Primary bone tumours and tumour-like lesions in children in Zaria, Nigeria

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ABSTRACT

Background: Studies on bone neoplasms are generally scanty globally and more so in children. Primary bone tumours and tumour-like lesions in children have not been reported from Zaria. **Objective:** To determine the relative frequencies, sex and age distributions, and anatomical sites of occurrence of primary bone tumours and tumour-like lesions in children in Zaria. **Materials and Methods:** A retrospective review of histopathology reports of 40 children with bone tumours and tumour-like lesions in 11 years of age. **Results:** Benign tumours accounted for 12 (30%) of the 40 tumours reviewed (osteoma 2.5%, osterochondroma 22.5%, fibroma 5%); while malignant tumours occurred in 19 (47.5%) (osteosarcoma 5%, Burkitt's lymphoma 37.5%, diffuse lympholastic lymphoma 5%). Tumour-like lesions accounted for 9 (22.5%), all fibrous dysplasia. Out of 40 tumours, 23 (57.5%) occurred in males and 17 (422.5%) in females. The majority of tumours, 45% occurred in the age group of 10–15 years, followed by 15 (37.5) occurring in the 5–9 years age range. The most common malignany was Burkitt's lymphoma 15 (37.5%). Maxilla was the most common site for malignant (30%) and benign tumours (12.5%). **Conclusion:** This study has shown that, primary bone tumours are relatively uncommon in children in our setting.

Key words: Children, primary bone tumours, tumour-like lesions

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INTRODUCTION

Bone cancer is not a common cancer compared to many other types of cancers.[1] There are relatively few reports on paediatric primary bone tumours in the literature,[2,3] especially on types, sex, and site distribution. Primary bone tumours in children are said to be rare.[4] Only a few countries in Africa have reliable statistics on bone cancer.[1] The diagnosis of bone tumours in children may pose a challenge because symptoms are often nonspecific and resemble other nonneoplastic conditions. The clinician and the pathologist handling bone specimen must have high index of suspicion as to the nature of bone lesion in children. The purpose of this study is to address types, sex, and sites of occurrence of neoplastic bone lesions seen at the Ahmadu Bello University Teaching Hospital (ABUTH), Zaria, Northern Nigeria, in the period of study.

MATERIALS AND METHODS

A retrospective study was done at the pathology department of ABUTH, Zaria, covering the period between January 1994 and December 2004. The histological reports and slides of children below 15 years of age, having tissue biopsies, have been retrieved together with their request forms. These materials contain relevant information including age, sex, histological type of tumour, and anatomical site of occurrence. A total of 19,130 histological specimens were received in the department during the period under review; bone specimens were 342 (1.8%). A total of 127 neoplasms were observed from all age groups; 40 (31.5%) of these neoplasms were primary bone tumours from children between the age range of 0–15 years. A total of 363 cancers were noted from all sites in this age group, while 20 (5.5%) were primary malignant bone lesions from children.

Bone tumours of odontogenic origin, metastatic, and infectious lesions have been excluded from this study.

Classification is based on the current World Health Organization (WHO)[5] histological classification of bone tumours. The data is analysed manually using frequency distribution and percentages.

RESULTS

The types, sex, age distribution, and sites of bone lesions encountered with their relative frequencies are summarised in Tables 1 and 2.

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Table 1: Showing histological types, age range and sex distribution of primary bone tumours and tumour like lesions in children

Age range years	0 – 4		5 – 9		10 – 15		Sub-total		Total (%)
Histological type	M	F	M	F	M	F	M%	F%	
Benign tumours									
Osteoma					1		1 (2.5)	0 (0)	1 (2.5)
Osteochondroma		2		3	2	2	2 (5.0)	7 (17.5)	9 (22.5)
Fibroma				1		1	0 (0)	2 (5.0)	2 (5.0)
Malignant tumours									
Osteosarcoma				1	1		1(2.5)	1(2.5)	2(5.0)
Burkitt's lymphoma			11		3	1	14(35.0)	1(2.5)	15(37.5)
Diffuse						2	0 (0)	2(5.0)	2(5.0)
Lymphoblastoma									
Tumour-like									
Fibrous dysplasia					4	5	4 (10)	5(12.5)	9((22.5)
Total (%)	0 (0.0)	2(5.0)	11(27.5)	5 (12.5)	11(27.5)	11(27.5)	22(55.0)	18(45.0)	40(100)

Table 2: Anatomical sites of primary bone tumours and tumour-like lesions in children

	Fib. Dys	Lymp lymp	B. Lymph	Os. Sarc	Fibroma	Os.cho	Osteoma	Total (%)
Mandible	2		3		1			6 (15.0)
Maxilla	5	1	12	2		1		21 (55.0)
Orbit	1							1 (2.5)
Skull	1						1	2 (5.0)
Humerus					1	1		2 (5.0)
Pelvic bone		1						1 (2.5)
Scapular						1		1 (2.5)
Femur						3		3 (7.5)
Tibia						3		3 (7.5)
Total	9	2	15	2	2	9	1	40 (100)

Fib. Dys = Fibrous Dysplasia; Lymb. Lymp = Lymphoblastic lymphoma; B. Lymp = Burkitt's lymphoma; Os. Sarc = Osteosarcoma; Os. Chon. = Osteochondroma

In this study, benign tumours were 12 (30%) [osteoma 2.5%, osteochondroma 22.5%, fibroma 5%], whereas malignant tumours accounted for 19 (47.5%) [osteosarcoma 5.0%, Burkitt's lymphoma 37.5%, diffuse lympholastic lymphoma 5.0%]. Tumours-like lesions accounted for 9 (22.5%), all fibrous dysplasia [Table 1].

Out of 40 cases of tumours, 23 (57.5%) occurred in males and 17 (42.5%) in females. The majority of the tumours 18 (45%), occurred in the age range of 10–15 years, followed by 15 (37.5%) occurring in the 5–9 years age range. The peak age of malignancy was 5–9 years, where Burkitt's lymphoma had 11 (27.5%) cases; while in the benign tumours, osteochondroma had 8 (20%), and fibrous dysplasia had 6 (15%) peak in the age range of 10–15 years, with equal male to female ratio. The lowest relative frequency of tumour occurrence was in the 0−4 years range, with six out of seven being malignant. The age range for the tumours was as follows: Burkitt's lymphoma, 1.5–14 years; osteochondroma, 4–15 years; fibrous dysplasia, 10–15 years; fibroma, two cases 5−15 years; osteogenic sarcoma, 9−13 years; lymphoblastic lymphoma, 11−14 years; and osteoma, 12 years.

While the median ages were: Burkitt's lymphoma, 15 years; osteochondroma, 7 years; fibrous dysplasia, 12 years; others constitute two cases only as above. Overall age range was 1.5–15 years, with median of 10 years.

The most common site for benign and malignant tumours was the maxilla, with 23% and 63% of the tumours, respectively [Table 2].

Maxilla was the most common site for overall tumour occurrence with 19 cases (47.5%), followed by mandible with 6 (15%), while skull had 3 (7.5%), femur 3 (7.5%), tibia 3 (7.5%), orbit 2 (5%), humerus 2 (5%), pelvic bone and scapular had 1 each (2.5%). Burkitt's lymphoma cases were 15 (37.5%), and all clustered on the jaw bones (maxilla and mandible), while osteochondroma had 7 (17.5%) cases occurring on tibia, femur, and humerus. Fibrous dysplasia had 7 (17.5%) cases occurring on the maxilla and mandibles.

DISCUSSION

In the present study, a significant proportion of neoplastic bone lesions was seen to occur in children constituting 31.5%. This finding is similar to reports by Omololu *et al.*,[4] in Ibadan and Mohammed *et al.*,[6] in Zaria, in their studies of bone tumours in all age groups.

In the present study malignant tumours were the predominant lesions (47.5%). This is similar to the findings of Omololu *et al*.[4] in Ibadan, in which 44% of malignant bone tumours occurred in children. Other studies[1] from the western world buttress the fact that the relative magnitude of bone cancer is considerably higher in children than in adults.

Burkitt's lymphoma was by far the most common malignant tumour in this review, accounting for 37.5%. All of them occurring in the classical site, jawbone. More of the Burkitt's lymphoma are found in the maxilla than in the mandible, this is in keeping with the literature of this exclusive tropical African disease.[7] All the Burkitt's lymphoma occurred below 10 years of age, which was also similar to the Ibadan[4] based study.

Osteosarcoma was seen in two patients, both males, and their anatomical sites being the skull and orbit, all around the head. It tends to occur in the metaphysis of femur more commonly, which was not the case here. Male predomination is usual, as it is described by a Swedish study.[8] The lack of femoral case here might be due to the low number of cases. The two cases occurred below 10 years of age. Osteogenic sarcoma is believed to be a disease of the young and adolescents.[9] This distribution is commonly accepted.[1–4,9]

Lymphoblastic lymphoma was also seen in two children (age range, 5–15 years). The cancer affects the pelvic bone and maxilla, respectively. For primary large cell lymphoma of the bone, this is not in keeping with other reports,[9–11] as it is said to be the most common in the age range of 30–60 years. Pelvic bone and the jaw are similar sites of occurrence with typical cases reported in the literature.[9]

Osteochondroma holds 22.5% of all the tumours, which makes it the most common benign tumour. The male to female ratio is 1:1. Six of these occur in the long bones of femur and tibia, six in the age range of 10–15 years. The high relative frequency of osteochondroma is similar to the study by Senac *et al*.,[3] where osteochondroma is the most common lesion, occurring in 22.3% of children. They also found the long bones of femur, tibia, and humerus to be the principal bones affected.

The other benign tumours are fibroma and osteoma having two and one cases, respectively. They both occur in patients within the age range of 10–15 years. The observed osteoma, classically occur on the skull, specifically in the frontal bone. The two fibroma cases occurred in the jaw and humerus, which is similar to some literature reports.[9] This is at variance with Senac *et al*.,[3] where the long bones of femur and tibia predominate.

Fibrous dysplasia, as the only tumour-like lesion seen in the study, accounts for 22.5% of the 40 primary bone lesions studied. Six occurred in the 10–15 year of age range with equal male to female ratio, while the other three cases are distributed two and one to 5–9 years and 0–4 years age ranges, respectively. Seven of the nine cases of fibrous dysplasia occurred on the jaw, while one each on the orbit and skull. This is at variance with Senac *et al*.,[3] where most of this appeared in the long bones followed by the facial bones.

For all combined bone tumours, there is a steady rise in relative frequency with increasing age, 0–4 years (17.5%), 5–9 years (37.5%), and 10–15 years (45%). This can be said to coincide with adolescent growth spurt.

In conclusion, this study has shown that primary bone tumours are relatively uncommon in children in our setting. Burkitt's lymphoma was the most common malignant tumour, while osteochondroma and fibrous dysplasia were the most common benign tumour and tumour-like lesions, respectively. Facial bones were the most affected.

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