Pattern of Bone Tumours Seen In A Regional Orthopaedic Hospital In Nigeria

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ABSTRACT

Background: Primary bone tumour is a challenge to Orthopaedic surgeons working in developing countries due to late presentation as a result of ignorance and poverty. This is further compounded by limited number of specialist personnel, diagnostic and therapeutic centres. Consequently, they are associated with high rate of morbidity and mortality, which can be reduced with early presentation.

Materials and methods: This is a retrospective review of all histologically proven primary bone tumours seen at National Orthopaedic hospital Enugu,South east Nigeria, over a 6 year period.

Results: Sixty eight (68) cases met the study criteria and were reviewed. Male:Female ratio was 1.35:1, with a mean age of 22.8years and peak frequency in the 11-20years age range. A total of 28(41.1%) were benign, 21(30.9%) were malignant while 19(27.9%) were tumour-like conditions. The commonest benign tumour was osteochondroma, accounting for 44.7% of non-malignant lesions, while fibrous dysplasia was the commonest tumour-like condition(23.4%). Primary malignant bone tumours accounted for 30.9% of all pathologies, with osteosarcoma(17) accounting for 80.1% of all malignant lesions. The commonest region affected is the leg i.e proximal tibia. Duration of symptoms before presentation ranged from 1month to 12years, with the commonest presenting complaint being a painless lump.

Conclusion: Primary bone tumours is commonest in young males, usually benign and affecting the Tibia. Associated late presentation results in increased morbidity and mortality. Hence, efforts need to be geared towards public enlightenment in developing countries, to ensure early presentation, thereby reducing morbidity and mortality.

INTRODUCTION

As a connective tissue, bone consists of many cell types including osteoblasts, osteoclasts, reticular cells, supporting tissues like fibrous tissues, vessels and nerves and hematopoietic cells, all of which are incorporated into the matured bone. Any of these could proliferate into a tumour. There are basically two varieties of bone tumours- primary and secondary bone tumours. The primary tumours are further divided into benign and malignant tumours. In addition, the supporting structures could proliferate to produce tumour-like lesions. As a result of this heterogenous nature, it is important to diagnose, stage and treat these tumours promptly.

The actual aetiology of bone tumours is not known, with many arising from somatic mutation[1] denovo. Other factors implicated include irradiation[2], bone infarcts[3], foreign bodies[4] and pre-existing bone lesions like trauma[5]. Benign tumours occur more commonly than primary malignancies, which are associated with high rate of morbidity and mortality especially with late presentation and inadequate management. Males are more affected than females, with 2nd and 3rd decades of life being the peak age incidence.[6-9] In America, about 3000 new cases of bone tumours are seen annually.[10] Primary bone tumour is a challenge to Orthopaedic surgeons working in developing

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countries, due to late presentation as a result of ignorance and poverty. The problem is further compounded by limited number of personnel, diagnostic and therapeutic centres. The precise incidence of bone tumours is not known in Nigeria, as majority of the diagnosed cases are not documented in the Nations cancer registry. Moreover many patients die without orthodox medical care and appropriate diagnosis. There are some studies in many parts of the country that has brought to the fore these problems[6-9].This report is presenting our experience in a regional orthopaedic Hospital in Nigeria.

MATERIALS AND METHODS

The case notes of all patients who presented with histologically proven bone tumours at the National Orthopaedic Hospital Enugu from January - December 2001- 2006 were analysed. They were reviewed for age, gender, histological type of tumour, anatomical site of occurrence, duration of symptoms and clinical findings. All secondary bone tumours, tumours of marrow origin which were referred to Hematologists and all case files with incomplete results were excluded from the study.

RESULTS

Sixty eight (68) case notes of histologically proven primary bone tumours and tumour-like conditions were reviewed within the 6 years under review (2001-2006). A total of 28(41.1%) were benign, 21(30.9%) were malignant while 19(27.9%) were tumour-like conditions. Males were generally more affected in 39(57.3%) and a male to female ratio of 1.35:1. Of the benign tumours, 15(53.6%) occurred in males and 13(46.4%) occurred in females, 12(57.1%) of the malignant tumours occurred in males and 9(42.9%) in females while 12(63.2%) of the tumour-like conditions occured in males and 7(36.8%) in females.

TABLE 1: SEX DISTRIBUTION AND HISTOLOGICAL TYPES

HISTOLOGICAL TYPE	MALE	FEMALE	TOTAL
BENIGN			
OSTEOCHONDROMA	10	11	21
OSTEOCLASTOMA	3	1	4
OSTEOMA	2	-	2
CHONDROMA	-	1	1
TOTAL	15	13	28
MALIGNANT			
OSTEOSARCOMA	9	8	17
CHONDROSARCOMA	2	1	3
LARGE CELL LYMPHOMA	1	-	1
TOTAL	12	9	21
TUMOR LIKE LESIONS			
FIBROUS DYSPLASIA	6	5	11
OSSIFYING FIBROMA	1	1	2
NON-OSSIFYING FIBROMA	1	1	2
SIMPLE BONE CYST	3	-	3
HARMATOMA	1	-	1
TOTAL	12	7	19
GRAND TOTAL	39	29	68

The age range was from 1 to 74 years with mean of 22.8yrs. Majority of the tumours 41(60%) occurred in patients aged 20years and below with peak frequency in the 11-20 years age range.

TABLE 2: AGE DISTRIBUTION ACCORDING TO HISTOLOGICAL TYPES

TYPE	1-10YS	11-20	21-30	31-40	41-50	51-60	61-70	71-80	UNSPECIFIED
OSTEOCHONDROMA	1	14	4	1		1			1
OSTEOMA					1		1		
CHONDROMA		1							
OSTEOCLASTOMA		1	1	2					
OSTEOSARCOMA	5	8	1	3					
CHONDROSARCOMA		2	1						
LARGE CELL LYMPHOMA								1	
FIBROUS DYSPLASIA	1	3	3	2			2		
OSSIFYING FIBROMA	1				1				
NON-OSSIFYING FIBROMA		1			1				
BONE CYST		3							
HARMATOMA			1						
TOTAL	8	33	11	8	3	1	3	1	1

Among the benign bone tumours and tumour-like conditions, osteochondroma was by far the most common accounting for 21(44.7%), followed by fibrous dysplasia 11(23.4%). Majority of these tumors occurred in the 2nd and 3rd decades of life. Osteosarcoma was the commonest malignant bone tumour accounting for 17(80.1%) of the malignant tumours. More than 80% 0f these tumours occurred in the 1st and 2nd decades of life.

The distal femur and proximal tibia accounted for majority of site of distribution of both the malignant and benign tumours. Sixteen (34%) of the benign and tumour-like conditions developed in the tibia and five(10.6%) occurred in the femur. Nine (19.1%) were seen on the face. There were 3 simple bone cyst, one occurred on the face while the rest occurred over the proximal left tibia. One case of chondromyxoid fibroma was diagnosed on the face while a harmatoma was excised from the lower lumbar vertebra which presented with low back pain. Of the malignant tumors 10(47.6%) occurred in the proximal tibia. Three cases of chondrosarcoma were diagnosed with 2 of them occurring in the iliac bone, the other in the left tibia.

TABLE 3: ANATOMICAL DISTRIBUTION ACCORDING TO HISTOLOGICAL TYPES

TYPE	FACE	CLAVICLE	HUMERUS	RADIUS/ULNA	PELVIS	VERTEBRA	FEMUR	TIBIA/FIBULA	METATARSAL
OSTEOCHONDROMA	1	1	3	2	1		1	11	1
CHONDROMA								1	
OSTEOMA				1				1	
OSTEOCLASTOMA								4	
OSTEOSARCOMA	1		4				3	9	
CHONDROSARCOMA					2			1	
LARGE CELL LYMPHOMA			1						
FIBROUS DYSPLASIA	7						4		
NON-OSSIFYING FIBROMA	2								
OSSIFYING FIBROMA	2								
SIMPLE BONE CYST	1						2		
HARMATOMA						1			
TOTAL	14	1	8	3	3	1	10	27	1

The duration of symptoms before presentation ranged from 1 month to 12 years. One patient presented within two hours of sustaining a pathological fracture of left mid femur without initial symptoms. Majority of the malignant tumours presented earlier than benign tumours, usually before 4 years of onset of symptoms but typically within the first year of symptoms. The commonest presenting complaints include-swelling in 42 patients, which were commoner with the benign and tumour-like conditions; pain and swelling was observed in 20 patients, while only pain occurred in 5 patients. There were associated loss of function and deformity in 6 and 2 patients respectively. 7 patients presented with pathological fractures while 3 patients each presented with proptosis, lymph node enlargement and neurological impairment.

DISCUSSION

The frequencies and pattern of histologically proven primary bone tumours was highlighted by this retrospective study at National Orthopaedic Hospital Enugu, a referral centre for Trauma and Orthopaedics in Enugu, Nigeria. This study found male preponderance which has been reported by other studies both within and outside Nigeria.[6-9, 12, 19] The male to female ratio of 1.35:1 seen in our study is similar to the finding of Edinghton and Maclean[11] in Ibadan, Odetayo[6] at National Orthopaedic Hospital Lagos(NOHL), Nigeria and Rasahid et al[12] in China and slightly less than what was found in Zaria, Nigeria by Mohammed et al[7] and Obalum et al[8] at Lagos University Teaching Hospital (LUTH),Nigeria. Our finding of peak age of occurrence of these tumours 11-20 years also agrees with the study in LUTH[8]. Majority (60%) of the tumours occurred in those 20 years or less, which was slightly higher than 48% found in LUTH[8] and 45% reported in Ibadan by Omololu et al[9] among same age group.

The preponderance of benign over malignant tumors had been highlighted by numerous studies.[6-9, 20] The most common benign tumour was osteochondroma (44.7%) while Osteosarcoma was the most common malignant (80.1%) which is consistent with results of several studies.[6-9, 21] Of the osteochondroma, 66% fell within the 11-20 years age range similar to reports by Mohammed et al[7] where it occurred most in late adolescence. The male to female ratio in our study was 1:1.1 which is different from the reported ratio of 3:1 by Mohammed et al[7]. The most common site of occurrence in our study was proximal tibia and fibula followed by other long bones, similar to reports by Odetayo[6] in Lagos and Kikum[13] and different from the site of occurrence by Mohammed et al[7], where they found the face commonly affected.

Giant cell tumor (Osteoclastoma) made up 4(5.9%) of the total bone tumours with a male to female ratio of 3:1 which is different from that found in Zaria by Mohammed et al[7] and

also another study by Lawrence et al[17] where they found female preponderance. However there is no variation in the age patient at presentation, as seventy-five percent of these occurred in 20-50 age range. This is similar to the observation that these tumours rarely occurred in those less than 20 and above 55 years age range[6,7].

The prevalence of Osteosarcoma as the most common primary bone tumour has been reported by several studies and corroborated by this study. The ratio of male to female is 1.1:1 with peak age range incidence in the second decade of life is in agreement with other studies[6,7].

Majority of these tumours occurred around the knees with 9 on the proximal tibia and fibula and 3 on distal femur. The proximal humerus followed next in 4 patients. These findings were equally reported by Odetayo[6] in Lagos and Klien et al[14] but different from the reports of Mohammed et al[7], where they had more female preponderance, peak age incidence in 3rd decade and the face as the commonest site affected. Ayala et al[18] also found high female to male ratio but the commoner site was still the long bones. The common occurrence of chondrosarcoma in the pelvic bone and its higher prevalence in the male, has equally been reported by other studies[6-9]. In a large series, Kissane et al[15] found a male to female ratio of 1.5:1; highest age frequency of 10 - 15 years which is similar to our findings of male to female ratio of 2:1 and age majority in 11-20 age range. However the long bones were more affected in their series. In the Bernes et al[16] series, the pelvis, femur, ribs and shoulder girdle were more affected. In Zaria, Mohammed et al[7] found the face to be more affected and 3rd decade the commonest age range.

Most of the tumour-like lesions were fibrous dysplasia 11(57.3%) with a slight male preponderance. Majority of the patients (63.6%) were less than 30 years old. Mohammed et al[7] observed similar parameters in Zaria with a variation in the sex distribution where in their study, there is slight female preponderance.

The duration and presentation of these patients reported in this study was similar to findings by Odetayo in National Orthopaedic Hospital Lagos, though all the patients in this study presented within 12 years of onset of symptoms. He equally reported that swelling was the commonest complaint in his own series, however some of the patients in his series presented up to 24 years from onset of symptoms. We also observed that all the malignant tumours presented with pain and may account for their relative earlier presentation in all within 4 years, with majority (75%) presenting within 1 year as against benign tumours in which most of the patients presented after 1 year of onset of symptoms.

From our study, 7 patients had pathological fracture, 5 of whom had fibrous dysplasia and 1 of them presenting within 2 hours of sustaining the fracture following a fall, without initial symptoms. The other 2 had Osteosarcoma. 3 patients had features of chest metastases with respiratory distress and cannon ball lesions on X-rays while 2 had neurological impairment of foot drop due to the site of the tumor in proximal fibula and paraplegia in a patient with intra-spinal extension of a harmatoma involving a vertebra.

CONCLUSION

Primary bone tumours are commoner in males, with a peak age group of 11 – 20 years, usually not malignant but usually presents late. Early recognition and prompt treatment is necessary to reduce morbidity from primary bone tumours. Public enlightenment campaigns on the need to present early to the appropriate hospital, even when a lump is painless, will help in establishing diagnosis and instituting treatment promptly, before the on-set of complications.

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