Childhood Bone and Soft Tissue Tumours: A review of 43 Treated at two University Teaching Hospitals in Rwanda (CHUB and CHUK) in RWANDA

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Back ground: Cancer represents one of the major causes of death in the world estimated at 1 out of 10 deaths. Globally, 160,000 children are diagnosed to have cancer each year. In the developing countries, one child out of two with cancer will die because of this disease mostly because they present with advanced disease or due to limited resources for proper management[1,2]. This study was aimed at determining the prevalence, the histological types and the management outcome of childhood bone and soft tissue tumours in Rwanda Methods: A retrospective descriptive study of 43 histologically confirmed cases of bone and soft tissue tumours in children was done in the Surgery Departments of University Teaching Hospitals (CHUB and CHUK). The period of study was 6 years from January 2001 to December 2006. Only children aged 16 years or below were included in the study. Data was obtained from patient's clinical files, pathology register and theatre registers. Information obtained was recorded using a special questionnaire; Data obtained was analyzed using Epidata 2.1b, SPSS 11.5 computer programs. Statistic test Pearson Chi-carré (P) was considered significant if P value was less than or equal to 0.05. Results: During 6 years period, 43 children aged 2 to 16 years were seen having bone and soft tissue tumours. Males accounted for 28 (65.1%) of the cases. The 10 to 16 year age group was predominantly affected, accounting for 72% (n=31) of all cases.. Pain and swelling were the main clinical signs in 100%of cases. Tumours were benign in 17 (40%) and malignant in 26 (60%) of cases. History of local trauma and pain was associated with malignant bone tumours (P=0.003 and P=0.000), respectively (n=23). Delay time between the onset of symptoms and consultation to hospitals was associated with death for malignant tumours (P=0.049). The bones were affected in 76.7% (n=33), being malignant in 23 (69.7%)of them. The hospital mortality rate was 18% for malignant tumours. Pulmonary and bone spread of the disease were observed in all fatal cases. Conclusion: Limitation of diagnostic and therapeutic means and lack of an oncology department that would provide chemotherapy and radiotherapy) in our University teaching hospitals (CHUB and CHUK) made the management of malignant tumours and the follow up after discharge inadequate, unsuitable and difficult.

Introduction

Although, Cancer is rare in children aged less than 15 years[1], it represents a main concern for parents, families, and health professionals to care for children affected with cancer. The problems confronting Paediatric oncology in Africa are many. They are linked to:

- Lack of common strategy and policies concerning detection, prevention, and treatment of cancer patients
- Insufficient specialized human resources,
- Absence of referral cancer centers,
- Unavailability of antimitotic drugs and radiotherapy,
- Lack of financial resources
- Patients consulting at late stage of cancer.

These lead to low survival and cure rates: The patients' survival at 5 years is ≤ 50% in developing world whereas cure rates in developed countries represent 75-80 %[1]. In Rwanda there is no possibility of effective,

efficient management of cancer after diagnosis is confirmed for lack of an established oncology Department. A review of literature shows that no specific study on cancer in children has bee reported from Rwanda. It was with such background that a study was undertaken on childhood cancers in Butare University Teaching Hospital.

Methods

A retrospective descriptive study of 43 histologically confirmed cases of bone and soft tissue tumours in children was done in the Surgery Departments of University Teaching Hospitals (CHUB and CHUK). The period of study was 6 years from January 2001 to December 2006. Only children aged 16 years or below were included in the study. Data was obtained from patient's clinical files, pathology register and theatre registers. Information obtained was recorded using a special questionnaire; Data obtained was analyzed using Epidata 2.1b, SPSS 11.5 computer programs. Statistic test Pearson Chi-carré (P) was considered significant if P value was less than or equal to 0.05.

Results

During the 6 years under review, bone and soft tissue tumours accounted for 2% in CHUB and 1.8% in CHUK of paediatric surgery admissions. A total of 43 children we admitted to the two University teaching hospitals at Butare (CHUB) and Kigali (CHUK). The majority of 58.1% (n=25) were admitted in CHUB (Table 1). Table 2 shows the age distribution. The 10 to 16 age group years contributed 31 (72%) of all cases. Males were 28. The male to female sex ratio was 1.9: 1. Twenty four patients came from Southern province in which CHUB is located. The time interval between the onset of symptoms and consultation to the university teaching hospitals ranged between 2 and 36 months.

Table1. Hospital Incidence of Bone and Soft Tissue Tumours at CHUB and CHUK.

Years	Incidences per Year				Total	
	CHUB		CHUK		Number	%
	Number	Total No	Number	Total No	n = 2125	
2001	5	178	3	163	8	3.3
2002	2	156	3	128	5	1.7
2003	5	182	1	158	6	1.7
2004	5	191	2	132	7	2.1
2005	5	233	4	205	9	2.0
2006	3	202	5	197	8	2.0
Total	**25 (2%)**	**1142**	**18 (1.8%)**	**983**	**43**	**2%**

Table2: Age group distribution

Age in Years	Number	%
<5	3	7,0
5-10	9	21,0
10-16	31	72,0
Total	**43**	**100**

Table3: Patients clinical signs

Clinical Feature	Number	%
Swelling	43	100
Pain	29	67.4
Local injury	6	14
Bad general condition	3	7.0
Fever	1	2.3
Pathological fracture	1	2.3
Dyspnea)	1	2.3
Skin ulceration	1	2.3
Lymph nodes	1	2.3
Swelling	43	100.0

Table 4. Distribution of Affected Long Bones

Bone	Number of Times	%
Femur	12	43
Tibia	11	39
Humerus	2	7
Ulna	2	7
Radius	1	4
Total	**28**	**100**

Table 5. Distribution of Malignant Tumours

Histological type	Frequency	%
Malignant histiocytofibroma	**2**	**7.7**
Chondrosarcoma	**6**	**23**
Fibro sarcoma	**1**	**3.8**
Osteosarcoma	**14**	**54**
Rhabdomyosarcoma	**2**	**7.7**
Ewing' s Sarcoma	**1**	**3.8**
Total	**26**	**100**

Table 6. Distribution of benign tumours

Histological type	Frequency	%
Chondroma	2	11.8
Osteochondroma	6	35.2
Soft tissue fibroma	3	17.7
Lipoma	4	23.5
Osteoma	2	11.8
Total	**17**	**100**

A significant number (30.2%) consulted between 6 to 12 months. The average delay was 12 months. Clinical signs were mostly swelling in 100% (n=43) and pain in 67.4% (n=29). History of local trauma was elicited from 6 patients having malignant bone tumours (26%) with P=0.003. Bone tumours were 33 (76.7%) and soft tissue tumours were 10 (23). The long bones were affected in 28 (65.1%) of the children with the lower

limbs bones (Femur and tibia) being more involved than the upper limb (Table 4). Soft tissue tumours were mostly located on the shoulder (n=3), buttocks, arm and thigh (n = 2 each) and forearm (1 case). All patients had tumour biopsy. The bone X-rays were done in 34 (79%), chest X-ray in 26 (69.7%) and ultrasonography in 9 (20.9%).

Table7. Distribution of Bone Tumours

Histological type	Benign	Malignant	%
Malignant histiocytofibroma		2	6.1
Chondroma	2		6.1
Osteochondroma	6		18.2
Chondrosarcoma		6	18.2
Osteoma	2		6.1
Osteosarcoma		14	42.3
Ewing'sarcoma		1	3.0
Total	**10 (30.3%)**	**23 (69.7%)**	**100.0**

Of the 32 patients whose HIV status was known, only 2 (4.6%) were positive. Five (19.2%) of the 6 patients who had chest x-rays already had pulmonary metastases on their admission. Table 5 shows the type of malignant tumours diagnosed in 26 cases. Of these, osteosarcomas were 14 (54%). Osteochondromas were the commonest benign tumours (Table 6)'

In our study, most of bone tumours were malignant 69.7% (n=23).Osteosarcoma was the most frequent bone tumour diagnosed in 42.3% (Table 7). Among malignant bone tumours, femur was the most affected bone in 50% (n=10), followed by tibia in 40% (n=8) and humerus in 10% (n=10). There was a significant relation between pain and bone malignant tumours. All patients having bone malignant tumours had pain (P=0.000). Among patients having bone and soft tissue tumours (Table 8), the age group from 10 to16 years was the most affected 72% (n=31). Osteosarcoma was the most common tumour in this age group accounting for 12 (38.7%) of cases.

Twenty (46.5%) of the patients had surgical treatment that included tumour excision for benign tumours; limb amputation in 13 (30.2%) or disarticulation in 7 (16.3%) of the patients with malignant tumours (Table 9). Three patients (7%) in bad general conditions with metastatic malignant tumours had a palliative treatment (analgesics, oxygen). None of the patients received chemotherapy or radiotherapy.

On discharge 30 (69.7%) of the patients had clinical improvement. There was a significant relation between the histological type of the tumour and death (P=0.042). Six patients all with malignancies died that is 14% of all cases or 23% of all malignancies. Four deaths had Osteosarcoma, one had Ewing's tumour and one had a chondrosarcoma. The presence of distance disease extension was the determinant factor to patient death (P=0.001). All the 6 deceased patients had pulmonary metastases, 3 of them had also bone extensions.

The length stay patients in hospital varied from 2 to 26 days. The average was 10 days for benign tumours and 16 days for malignant tumours. There was a significant relation between the long stay in hospital and the malignancy of the tumour

(P=0.031). Patients follow up was difficult. Only 11 patients (35.5%); 8 patients (25.8%) operated for benign tumours, 3 patients (9.7%) with malignant tumours, came back for review after discharge. Two patients had a referral for chemotherapy and radiotherapy abroad. The majority of patients were lost to follow up. It was therefore difficult to know if they were still alive or had died.

.Table 8. Age Group Distribution and Histological Types

Histological Types	Age Groups			Total
	2-5 Years	5-10 Years	10-16 Years	2-16 Years
Chondroma	0	0	2	2
Osteochondroma	0	1	5	6
Chondrosarcoma	0	0	6 (19.3%)	6
Fibroma	0	3	0	3
Fibrosarcoma	0	1	0	1
Malignant Histiocytofibroma	0	0	2	2
Lipoma	0	2	2	4
Osteoma	0	0	2	2
Osteosarcoma	0	2	12 (38.7%)	14
Rhabdomyosarcoma	2	0	0	2
Ewing'sarcoma	1	0	0	1
Total	**3 (7%)**	**9 (21%)**	**31 (72%)**	**43**

Table 9. Patient Treatment Distribution

Treatment	Frequency	%
Tumour excision	20	46.5
Amputation	13	30.2
Disarticulation	7	16.3
Palliative care	3	7
Chimiotherapy	0	0
Radiotherapy	0	0
Total	**43**	**100**

Discussion

According to the literature review the age group from 10 to 16 years s the most affected[3,4,5,6]. The males are predominantly affected by bone and soft tissue tumours[7,8,9,10]. There is no clear explanation for the sex differences. Most of our patients had a long delay prior to coming for consultation. This is in contrast to reports from the more developed countries like USA[11], Australia[7], Serbia[5] and Poland[9],where patients consult earlier. The long delay among our patients may be explained by the low socio-economical of the affected families. For lack of funds for hospital fee and transport, many of our patients commonly choose to first consult traditional healers.

The clinical features of malignant tumours in our study were similar to findings reported by Cleeman[11] in USA, Bacci[6] in Italy, Tanz[7] in Australia, and Brown[12] in Nigeria, on the bone predominant localisation of malignant tumours. The limited investigative capacities in our institutions characterized by lack of appropriate imaging facilities insufficient reagents for laboratory tests compounded by shortage of trained manpower are major contributory factors to delayed diagnosis and treatment. Our poor investigations are in contrast to what exists in other centres where CT scanner is used to guide biopsy and tom densitometry, bone scintigraphy and biochemical tests are performed[13,14,15,16,17]. The histological types found in our series and their predominance are similar to what other studies by Settakorn[18] in Thailand, Cleeman[11] in USA, Bacci[6] in Italy, Brown[12] in Nigeria, and Blakwell[19] in Australia reported.

Management of malignant tumours is poor and almost confined to surgical treatment whenever possible and palliative care for the advanced disease. Absence of an established oncology department in our two top referral centres is a major obstacle to proper management of our cancer patients. In other centres adjuvant chemotherapy and radiotherapy significantly affect the outcome of cancer treatment[12,11,7,6].

There an urgent need to improve the diagnostic facilities, to train more pathologists, oncologist and specialized personnel in palliative care. An Oncology Department should be established in Rwanda and a multidisciplinary approach to management of cancer patients (involving surgeons, oncologists, radiotherapists, palliative care specialists and nurses, counsellors and psychologists etc) should be promoted. Lastly, a National Cancer Registry should be set up.. All these measures will go a long way in improving the outcome of management of cancer patients in Rwanda.

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