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Bone tumours in Cameroon: incidence, demography and histopathology

Accepted: 30 April 2003 / Published online: 26 August 2003
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Abstract A multicentre analysis was carried out on bone tumours in Cameroon during a 10-year period. Registers and patient records of five pathology laboratories were consulted, and all patients with a histological report of a bone tumour were included in the study. A total of 268 bone tumours were studied and the average incidence was 27 tumours a year, or two per one million inhabitants. Of these tumours 48% were benign, 45% were primary bone cancers and only 6% were metastatic disease. Among the primary malignant bone tumours, osteosarcoma was the most frequent (39%), followed by non-Hodgkin's primary bone lymphoma, fibrosarcoma, chondrosarcoma, and Ewing's sarcoma. Primary site of the metastatic bone tumours was prostatic adenocarcinoma, breast cancer, hepatocarcinoma and thyroid cancer. In Cameroon many bone tumours are not diagnosed due to lack of medical facilities and little awareness among our medical staff. It is likely that the real incidence is at least ten times higher than that shown in our report.

Résumé Une analyse des tumeurs osseuses a été faite au Cameroun pendant une période de 10 années. Les regis-

tres et les dossiers des malade de cinq laboratoires d'anatomie pathologique ont été examinés. Tous les malades avec des compte-rendus histologiques de tumeur osseuse ont été inclus dans l'étude. Un total de 268 tumeurs a été étudié et la fréquence moyenne était 27 tumeurs par année ou deux cas par million d'habitants. 48% de ces tumeurs étaient bénignes, 45% étaient des cancers primitifs de l'os et seulement 6% étaient des métastases. Avec 39% de toutes les tumeurs malignes primitives, l'ostéosarcome était le plus fréquent, suivis par le lymphome non-Hodgkinien, le fibrosarcome, le chondrosarcome, et la tumeur d'Ewing. Le site initial des tumeurs osseuses secondaires était l'adénocarcinome prostatique, le cancer du sein, l'hépatocarcinome et le cancer thyroïde. À cause de la faible médicalisation du Cameroun et de la connaissance limité de ces maladies, beaucoup de tumeurs de l'os ne sont pas diagnostiquées. La vraie fréquence devrait être considérée comme au moins dix fois plus élevée.

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Introduction

The diagnosis of a bone tumour may be difficult [16], and despite the development of sampling procedures as well as of pathological techniques, we agree with some authors, such as Peabody and Simon [14] and Fasanelli et al. [5] that this diagnosis should be made solely histopathologically. For Hansmann et al. [7], age, gender and skeletal site are important factors when making a diagnosis. Many of these relevant demographic, clinical and epidemiological characteristics have been reported, especially by Dahlin et al. [2] from the Mayo clinic in the USA, and by Parkin et al. [13]. The importance of geographical variations in the incidence of bone tumour [16], and of racial difference [15] means that these factors are very relevant when considering a possible diagnosis. To the best of our knowledge, such reports do not exist for the large majority of sub-Saharan African countries, and this was the reason that we made our study. We decided to carry out a multicentre analysis of bone tu-

mours of the motor system recorded during a 10-year period in Cameroon, a sub-Saharan country with 15 million inhabitants, paying special attention to incidence, demography and histopathology.

Materials and method

This study was undertaken in all five pathology laboratories in the country. These are located in the University Hospital Centre (UHC), the Central Hospital of Yaounde (CHY), the Centre Pasteur of Yaounde (CPY), the General Hospital of Yaounde (GHY) and the General Hospital of Douala (GHD). We analysed the pathology registers and the records of patients with bone tumours over the 10-year period from January 1992 to December 2002. The "gold standard" used was the definite diagnosis of bone tumour made by a consultant pathologist.

Apart from this pathological report, special attention was given to the location of the lesion, the method of taking the specimen and the laboratory techniques. This clinical data was recorded, together with individual demographic data, and all the information was then analysed using standard statistical methods.

Results

Incidence and demography

During the 10-year period of the study, 348 bone specimens were received in the laboratories. All of these were surgical biopsies, either excisional or intralesional, and they were all stained with haematoxylin-eosin. The report included a macroscopic description as well as the consultant pathologist's opinion. Nine were considered to be normal, 61 were said to be inflammatory, and ten had insufficient information and were excluded. Two hundred and sixty-eight were diagnosed as bone tumours and form the basis of our study.

The annual incidence was 20–30 tumours (average 27) and contained 8–14 benign tumours, 9–15 primary malignant tumours and 1–2 metastases. The youngest patient was 20 months old and the oldest 89 years. Patients were divided into three age groups: children and teenagers (11–19 years), young adults (30–39 years) and the elderly (60–89 years).

Location and nature of tumours

Of the tumours 129 were benign, 122 were primary malignant and 17 were metastatic. The majority of tumours were located either in the tibia (35%), the femur (19%) or the spine (16%). The pelvic ring, the scapular ring and the humerus each contained 6%, while the forearm, the hand and the foot shared less than 2%.

Benign tumours were found in nearly every bone, while primary malignancies were mainly located in the tibia, the femur or the spine (78%). Metastatic bone tumours occurred most commonly in the spine (60%), occasionally in the femur and pelvic ring, once each in the humerus and the scapula, but never distal to either the knee or the elbow (Table 1).

Histopathology of benign tumours

Fifteen pathological types of benign bone tumours were found in our series. The most frequent of these were 26 osteochondromas (20%), 20 fibrous dysplasias (15%), 17 giant cell tumours (13%) and 13 chondromas (10%). Childhood tumours (occurring in patients under the age of 19 years, accounted for 17.5% of all benign tumours, of which 11 were non-ossifying fibromas (8%), six unicameral bone cysts (5%), four chondromyxoid fibromas (3%) and two aneurysmal bone cysts (1.5%). We also found chondroblastomas (3%), osteoblastomas (3%), neurofibromas (3%) and intraosseous lipomas (3%). The remainder consisted of benign histocytotofibroma (3%), Gorham's disease (1.5%) and osteoid osteoma (7%).

Histopathology of malignant tumours

Among the 122 specimens there were ten histopathological varieties of malignant bone tumour, and 94% of these fell into five diagnostic groups. There were 48 osteosarcomas, usually in young adults (average age 22 years), 33 malignant non-Hodgkin's bone lymphomas (mean age 37 years), 18 fibrosarcomas (mean age 35 years), nine chondrosarcomas (mean age 35 years) and seven Ewing's sar-

Table 1 The sites and nature of 268 bone tumours in a multicentre study in Cameroon

Site	Benign tumours		Primary malignant tumours		Secondary malignant tumours		Overall	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Tibia	46	17.0	47	17.5	–	–	93	35
Femur	23	8.5	24	9.0	3	1.0	50	19
Spine	10	3.5	24	9.0	10	3.5	44	16
Pelvic ring	10	3.5	5	2.0	2	0.5	17	6.0
Scapular ring	9	3.0	8	3.0	1	0.25	18	6.5
Humerus	9	3.0	6	2.0	1	0.25	16	6.0
Forearm	6	2.0	4	1.5	–	–	10	4.0
Fibula	5	2.0	1	0.25	–	–	6	2.0
Wrist and hand	2	0.5	2	0.5	–	–	4	1.5
Foot and ankle	9	3.0	1	0.25	–	–	10	4.0
Total	129	48.0	122	45.5	17	6.5	268	100

comas in young patients (mean age 16 years). Five other types of tumour (malignant haemangiopericytoma, solitary plasmocytoma, haemangioendothelioma, malignant histocytofibromas and multiple myeloma) were rare, forming only 6% of all the malignant tumours. Six types of metastatic bone tumours were recorded, and these comprised six prostate cancer (35%), four breast cancer, three primary liver cancer, two thyroid cancer, one squamous cell carcinoma of the skin and one lung cancer.

Discussion

The incidence of two bone tumours per million inhabitants per year (20–30 per year) in Cameroon is far lower than the 120 tumours per million inhabitants reported in the United States [9]. This confirms the suggestion of Mbakop (also from Cameroon) that, due to the lack of appropriate medical facilities, only about one in ten bone tumours are diagnosed histologically [12]. Accordingly, we believe that we should be seeing about 300 tumours each year, giving an incidence of about 20 new tumours per one million inhabitants. Thus, currently it is difficult to arrive at accurate statistics in Cameroon for the incidence of any one type of bone tumour.

However, our three “age groups” are similar to those of Kasser [9] in the USA, although the dimensions of his groups vary slightly from ours. In our study, the first peak in children and teenagers may be due to the high proportion of benign bone cysts, as also cited by Faure et al. [6]. The second peak may be due to the high incidence of primary malignant bone tumours in young adults [10], while the elderly group have more metastatic tumours [18]. As far as the actual histology is concerned, we found 42% of benign tumour and 52% of malignant tumours, which is different from the 24% and 77% published by Dahlin and Unni [2]. This may be due to the large proportion of young people in our country, where 56% are children or teenagers, and only 4% are elderly [8]. Benign tumours occurred mainly in the young, and this is similar to other reports [6]. On the other hand, primary malignant non-Hodgkin’s lymphoma of bone, which is normally considered to be rare [11, 17], ranked second in this series with 33 cases (27%), the first being osteosarcoma with 48 cases (39%). It is interesting that Abena Obama in 1991 [1] and Mbakop et al. in 1996 [12] from Cameroon, and Essoh et al. in 1987 [4] from the Ivory Coast, reported non-Hodgkin’s lymphoma as the most frequent bone tumour in children. In view of the relative youth of our population, it is possible that the same factors relating to the occurrence of these tumours in the soft tissues may also be responsible for their incidence in bone. However, osteosarcoma, fibrosarcoma and chondrosarcoma are of the same types and occur in the same frequency as reported elsewhere [10, 15].

While we had seven cases of Ewing’s sarcoma (6%), which was placed sixth in frequency, Eggli et al. [3] reported this tumour to be rare in Africans and Asians. The low proportion of metastatic bone tumours in our series may relate to the relatively short life expectancy in Cameroon, although their incidence is the same as that in the literature [18] apart from lung cancer, which comes at the bottom of our list.

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