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Pattern of Bone Tumour Presentation at Teaching Hospitals in Port Harcourt, Nigeria

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Abstract

Background: Primary malignant bone tumour is the third leading cause of death among young people, after leukaemia and central nervous system tumours. It has been documented to have global incidence with two peaks at 10-20 years, and 40-80 years, highest prevalence in South America and a 1.5 times male preponderance. There are global variations in the incidence of bone tumours. The aim of this study was to describe the bone tumours Teaching Hospitals in Port Harcourt in the last ten years, from January 2010 to January 2020, with reference to age, sex, and type of tumours.

Materials and Methods: A retrospective cross-sectional descriptive study was done among patients seen and diagnosed with bone tumors using hospital registers, and data was formed into tables.

Results: Bone tumors were more prevalent among the age range 10 and 59 years. One hundred and forty-three patients with bone tumors were admitted into the wards of both teaching hospitals. There were 31 (21.7%) cases of osteosarcoma, 25 (17.5%) patients with giant cell tumor of bone, and 25 (17.5%) cases of osteoma. There were 17 (11.9%) metastatic bone tumours in the ward admission records. Eighty-one patients were operated, and there were 26 cases of osteosarcoma (32.1% of operated cases), 15 osteomas (18.5% of operated cases), and 13 giant cell bone tumours (16% of operated cases).

Conclusion: The bone tumours prevalent in our practice were osteosarcoma, osteochondroma, giant cell bone tumours, osteoma, chondroma, chondrosarcoma, and metastatic bone tumors, out of which osteosarcoma was the most common.

Keywords: ***Bone tumours; Pattern; Teaching hospitals; Port Harcourt; Nigeria***

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1. Introduction

The 2020 World Health Organization classification of soft tissue and bone tumours has taken advantage of the impact of recent molecular methods and novel immunohistochemical markers in refining existing classification and development of new entities [1]. However, it can be remembered that tumours affecting bone are often described as primary - when they originate from the bone, or secondary - when it reaches the bone as metastasis arising from other organs. Tumours of the prostate, breast, kidney, lung, etc. have been known to have predilection for bone, and hence give rise to secondary bone tumors [2,3]. There are global variations in the incidence of bone tumors, including childhood bone tumors [4]. Primary malignant bone tumors have been documented to have global incidence with two peaks at 10-20 years, and 40-80 years, highest prevalence in South America and a 1.5 times male preponderance [5]. Primary malignant bone tumor is the third leading cause of death among young people, after leukemia and central nervous system tumors [6,7]. In North of Jordan, multiple myeloma followed by osteochondroma & chondrosarcoma were the prevalent primary bone tumors [8]. In Zagreb Croatia, osteosarcoma was noted to be the most common primary malignant bone tumor [9]. Another report from Yogyakarta Indonesia also emphasized the high prevalence of osteosarcoma [10], and similar report in India [10].

Osteosarcoma has also been documented as the most common primary malignant bone tumor in reports emanating from some African countries like Tanzania [10], Lome Togo [11], Addis Ababa Ethiopia [12], and South Africa [13]. An account of 170 Nigerians who had primary malignant bone tumors over 17 year-period was presented in an Ibadan some 40 years ago [14]. In this study, males were more than twice as involved as females with osteosarcoma being the most common tumor. Similar prevalence was reported in other independent studies in Lagos with peak prevalence of osteosarcoma being in the second and third decades [15-17]. A report from a regional center in South-Eastern Nigeria also had osteosarcoma as the most common primary malignant bone tumor, and the tibia as the most common site [18]. Similar findings were noted in Nnewi South-Eastern Nigeria where the distal femur was the commonest site [19]. Although Burkitt's lymphoma was reported as being the most common malignancy among children in Zaria Nigeria [20], rising prevalence of primary malignant bone tumors was noted in children below 9years in another study in Ibadan South-Western Nigeria [21]. In Port Harcourt Nigeria, a 2002 study reported pathological bone lesions occurring in 13 out of 21 radiologic investigations in patients who had prostate cancers [22].

Cancer registry is a pool from which information on cancers can be accessed. Such information on bone tumors is needed for teaching, patient care, research, and policy formulations. This research is therefore an effort in this regard to attempt to document the age, sex, and pattern of bone tumors seen in our practice in Port Harcourt in the last ten years. The aim of this study was to describe the bone tumours in Port Harcourt, as seen at the Rivers State University Teaching Hospital and the University of Port Harcourt Teaching Hospital in the last ten years, from January 2010 to January 2020.

2. Materials & Methods

A retrospective cross-sectional descriptive study was carried out at the surgical out-patient clinics, the surgical operating theatre, and the surgical wards of the Surgery Departments of the Rivers State University Teaching Hospital and the University of Port Harcourt Teaching Hospital, using hospital registers to input data into a study proforma. The records of all patients seen and diagnosed with bone tumors (primary and secondary) at the study sites were used for the study. Data obtained was formed into tables and analyzed for the study.

3. Results

TABLE 1 shows the age and sex data of patients that presented with bone tumors in the clinics, theatre and the wards. Bone tumors were more prevalent among the age range 10 and 59 years. There were more females seen over the ten-year period with bone tumours than males, as seen in the records of the clinics (M=31; F=40), wards (M=57; F=86), and theatres (M=33; F=48).

TABLE 1. **Age and sex data of bone tumours.**

S/No.	Age Range	Clinics			Wards			Theatres		
		M	F	***Total***	M	F	***Total***	M	F	***Total***
1	≤ 9	-	1	***1***	7	6	***13***	4	3	***7***
2	10 - 19	6	7	***13***	12	13	***25***	8	5	***13***
3	20 - 29	5	8	***13***	6	19	***25***	7	6	***13***
4	30 - 39	7	5	***12***	11	15	***26***	5	11	***16***
5	40 - 49	8	6	***14***	10	15	***25***	5	6	***11***
6	50 - 59	3	8	***11***	5	6	***11***	2	8	***10***
7	60 - 69	2	5	***6***	4	8	***12***	2	6	***8***
8	70 - 79	-	-	***1***	2	4	***6***	-	3	***3***
9	≥ 80	-	-	-	-	-	-	-	-	-
Total		31	40	***71***	57	86	***143***	33	48	***81***

TABLE 2 shows the bone tumors seen in the clinics within the study period. Out of a total of 71 bone tumors seen in the clinics within the 10-year study period, there were 18 osteochondroma (25.4% of clinic cases), 11 giant cell tumour of bone (15.5% of clinic cases), and 10 cases of osteoma (14.1% of clinic cases).

TABLE 2. **Clinic data of the types and numbers of bone tumours.**

S/No.	Type of case	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
1	Osteochondroma	2	2	-	2	1	3	2	1	2	3	18
2	Giant Cell Bone Tumour	-	1	1	1	2	1	2	-	1	2	11
3	Osteoma	1	3	-	1	1	-	2	-	-	2	10

4	Chondrosarcoma	2	-	-	1	1	1	1	2	-	-	8
5	Chondroma	2	2	-	-	-	-	-	-	-	-	4
6	Metastatic Bone Tumour	1	1	2	-	-	-	1	1	-	1	7
7	Unspecified Tumours	2	1	3	1	-	1	-	3	-	3	13
Total		10	10	6	6	5	5	8	7	3	11	71

TABLE 3 shows the types and numbers of bone tumours operated at the teaching hospitals within the period of study. Eighty-one patients were operated, and there were 26 cases of osteosarcoma (32.1% of operated cases), 15 osteomas (18.5% of operated cases), and 13 giant cell bone tumours (16% of operated cases).

TABLE 3. **Theatre data on bone tumours.**

S/No.	**Type of Case**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Total**
1	Osteochondroma	-	1	-	-	1	-	1	1	-	1	5
2	Giant Cell Bone Tumour	2	4	1	-	2	-	2	-	1	1	13
3	Osteoma	4	2	2	1	1	-	-	3	1	1	15
4	Osteosarcoma	-	5	6	4	2	2	-	2	3	2	26
5	Chondrosarcoma	-	1	-	2	-	-	1	-	1	2	7
6	Chondroma	2	1	-	1	-	1	-	-	2	-	7
7	Metastatic Bone Tumour	-	2	-	-	2	-	2	-	2	-	8
Total		8	16	9	8	8	3	6	6	10	7	81

TABLE 4 shows data obtained from the wards on bone tumours in Port Harcourt. One hundred and forty-three patients with bone tumors were admitted into the wards of both teaching hospitals within the ten-year period of the study. There were 31 (21.7%) cases of osteosarcoma, 25 (17.5%) patients with giant cell tumor of bone, and 25 (17.5%) cases of osteoma. There were 17 (11.9%) metastatic bone tumours in the ward admission records.

TABLE 4. **Ward Data on bone tumours in Port Harcourt.**

S/No.	Type of Case	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
1	Osteochondroma	1	3	1	2	2	2	2	1	2	3	19
2	Giant Cell Tumour of Bone	2	5	2	1	4	1	3	2	2	3	25
3	Osteoma	5	5	2	2	2	-	2	3	1	3	25
4	Osteosarcoma	1	5	6	4	4	3	-	3	3	3	31
5	Chondrosarcoma	2	1	-	3	1	1	2	2	1	2	15
6	Chondroma	4	3	-	1	-	1	-	-	2	-	11
7	Metastatic Bone Tumour	1	4	1	3	2	-	3	-	2	1	17
Total		16	26	12	16	15	8	12	11	13	14	143

4. Discussion

Mixed age group involving teenagers, young adults, and the middle aged were observed to be more involved with different types of bone tumors. There were more females with bone tumours than males. This finding is different from an earlier report outside our shores [5]. A likely explanation for this could be that in our study, both benign and malignant bone tumours were considered, while in the considered report primary malignant bone tumours were described [5]. Our finding is also different from other studies in Lagos Nigeria where male preponderance were documented [17,19]. However, it shares some similarity with the findings from a regional hospital in Lagos, where a slight female preponderance was reported [20]. The two peaks global incidence of 10-20 years and 40-80 years for primary malignant bone tumours quoted in previous studies, were not demonstrated in this study [5]. However, the age of occurrence of bone tumours seen in this study are within the reported range from other studies [5]. Osteochondroma, osteoma, chondroma, giant cell bone tumours, chondrosarcoma, osteosarcoma, and metastatic bone tumours were the bone tumours seen in our practice. Although there were more cases of osteochondroma (25.4% of clinic cases) seen in the clinics than any other bone tumours, osteosarcoma dominated the records of admitted and operated bone tumour cases (comprising a fifth of all cases) encountered, followed by giant cell tumor of bone and osteoma.

Eighty-one patients were operated for bone tumours in ten years, while 58 patients with bone tumours were seen in the clinics within the study period, and one hundred and forty-three cases were admitted to the wards. There were more bone tumour cases operated and admitted to the wards, than they were seen in the clinics. The likely explanation for this discrepancy could be that the remaining patient could have presented as emergencies, operated ad admitted to the wards, or data may have been missing. Additionally, out of the 81 bone tumour patients operated, osteosarcoma was the commonest, followed by osteoma. Our study differs from the experience in North of Jordan where multiple myeloma was the most prevalent primary bone tumour [8]. However, ours is similar to global figures [9-11], reports from Africa [12-15], and the findings of studies from other parts of Nigeria [17-21].

Almost a fifth of the admitted patients had metastatic bone tumours. These are secondary bone tumours whose source could be from the prostate, breast, kidney, lung, etc. [2,3]. This figure is more than the figure of less than 5% quoted for metastatic bone tumour in a study in Addis Ababa, Ethiopia [14], and 5.2% in a Lagos study [17].

5. Conclusion

The bone tumours prevalent in our practice were osteosarcoma, osteochondroma, giant cell bone tumours, osteoma, chondroma, chondrosarcoma, and metastatic bone tumours. More women than men were seen with bone tumours, the most common of which was osteosarcoma.

6. Study Limitations

This study describes the demographics of bone tumors in general, without indicating the age and sex prevalence for individual benign and malignant tumors. Also, the source of data for this retrospective study was from the registers of the clinics, theatres and ward, and so subject to the demerits of secondary data such as incompleteness (from omissions and loss of registers) of data, etc. Such demerit explains the discrepancy in the total number of 143 bone tumors recorded in the ward, with far less number was seen in the clinics or operating theatre. We have therefore reported this as found. Patients with bone tumors seen and treated in private health facilities were not captured in this study.

7. Recommendations

There is need for the establishment of a central cancer registry in Rivers State, where the details of individual tumors will be documented for research, planning and policy decisions. Also, further study is required to explore the demographic profile of individual bone tumors in our environment.

8. Acknowledgement

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9. Ethical Considerations

The approval of the Research Ethics Committee of the Rivers State University Teaching Hospital and the University of Port Harcourt Teaching Hospital were sought and obtained in writing, and confidentiality of information was maintained in the process of data collection. This study involves only contact with medical records with no contact with the individual patients.

10. Funding

The cost of the study was borne by the researchers.

11. Conflict of Interest

None declared.

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