

Analysis of 46 cases of malignant jaw tumours in Calabar, Nigeria

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ABSTRACT

Background: The occurrence and distribution of malignant jaw tumours differs across the globe because of differences in geographical, cultural, racial, and socioeconomic factors. The aim of this study was to determine the types and pattern of malignant jaw tumours in Calabar, located in South-South Nigeria. **Materials and Methods:** The histopathologic results, as well as demographic and clinical information of all consecutive patients diagnosed of having a malignant jaw tumour at the Oral and Maxillofacial Unit of University of Calabar Teaching Hospital, Calabar, Nigeria from January 2000 to December 2013 was retrospectively collected and analyzed. **Results:** A total of 46 (25.1%) out of the 180 cases of jaw neoplasms seen over the 14 year period were malignant. There was a slight male predominance with a ratio of 1.7:1 and the age ranged from 4 to 70 years, mean (standard deviation) 34.6 (4.56) years. The most common malignant lesion was squamous cell carcinoma (SCC) ($n = 20$; 43.5%), followed by Burkitt lymphoma ($n = 8$; 17.4%). The gender distributions of the lesions were significant, with more SCC seen in females in a ratio of 1.5:1 in relation to males. Osteosarcoma ($n = 6$; 13%) and rhabdomyosarcoma ($n = 4$; 8.7%) were observed only in males and females, respectively. About half of the lesions occurred in the mandible (47.8%). The age distribution of lesions was significant ($P < 0.001$), with SCC frequently seen in the sixth and seventh decades while Burkitt's lymphoma and rhabdomyosarcoma were seen around the first decade. Clinical presentations ranged from swelling ($n = 31$), pain ($n = 26$), loosed teeth ($n = 15$), toothache ($n = 11$) to missing teeth ($n = 9$) among others and occurring either singly or in two or more combinations. The duration of symptoms on presentation ranged from 1 to 46 months, mean 21.7 (13.12) months and this was not different for male or female ($P > 0.05$). **Conclusion:** Oral cancer awareness campaign and advocacy is necessary to steer the awareness of the population on the need for regular dental visits, early recognition, and the dangers associated with late presentation of orofacial malignancy.

Key words: Jaw, malignant, tumours

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INTRODUCTION

The occurrence and distribution of malignant jaw tumours differ across the globe because of differences in geographical, cultural, racial, and socioeconomic factors.¹ Other factors that have been implicated in the distribution of malignant neoplasms of the head and neck region include behavioral, habits, and genetic makeup, as well as the age of the patient.^{1,2} Previous studies have reported squamous cell carcinoma (SCC) as the most prevalent malignant

orofacial tumour among the Caucasians accounting for well over 70% of all orofacial malignancies.^{3,4} In South-East Asia, SCC constitutes about 80–90% of all orofacial malignancies and this high prevalence has been linked to the habitual consumption of betel quid and other forms of smokeless tobacco among the population.^{5,6} In Nigeria and other parts of Africa, the prevalence of SCC is much lower with reported values varying from 43% in a study carried out in Ibadan,⁷ 46.2% from Kano,¹ 64% from Ghana,⁸ to 73% observed by Chidzonga and Mahomva in Zimbabwe.⁹ Other reported jaw malignant lesions include sarcomas, lymphomas, malignant odontogenic tumours, and salivary gland neoplasms.^{1,8} While SCC has been implicated as the most common malignant jaw tumours in adults, Burkitt's lymphoma and rhabdomyosarcoma are commonly reported among children and adolescents.^{1,7,10}

In Nigeria, majority of the studies were conducted in the South-Western and Northern regions,^{1,7,10,11} with very few

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information from the South-South region, which largely form the Niger-delta.¹² The aim of this study was to determine the types and pattern of malignant jaw tumours in Calabar, located in South-South Nigeria.

MATERIALS AND METHODS

The histopathologic results, as well as demographic and clinical information of all consecutive patients diagnosed of having a malignant jaw tumour at the Oral and Maxillofacial Unit of University of Calabar Teaching Hospital, Calabar, Nigeria from January 2000 to December 2013 were retrospectively obtained and analyzed using SPSS Version 13, Chicago, IL, USA. The results were presented as frequencies and percentages, mean, standard deviations (SD), and cross tabulations. Inferential statistics were done using Chi-square and Student's *t*-tests as appropriate. Statistical significant was set at $P < 0.05$.

RESULTS

A total of 46 patients out 183 patients with neoplasms of the jaws seen over the period of study were histopathologically diagnosed with malignant jaw tumours, giving a prevalence of 25.1%. Overall, male accounted for 29 (63%) and female constituted 17 (37%) giving a gender ratio of 1.7:1. The ages ranged from 4 to 70 years, mean (SD) 34.6 (4.56) years. About half of the patients were students ($n = 26$; 56.5%), followed by housewife ($n = 8$; 17.4%), farmers ($n = 6$; 13%), artisan ($n = 4$; 8.7%), and trader ($n = 2$; 4.3%).

The most common malignant lesion was SCC ($n = 20$; 43.5%), followed by Burkitt lymphoma ($n = 8$; 17.4%), estrogenic sarcoma ($n = 6$; 13.0%), rhabdomyosarcoma ($n = 4$; 8.7%), adenoid cystic carcinoma ($n = 3$; 6.5%), mucoepidermoid carcinoma ($n = 2$; 4.3%), and nonHodgkin lymphoma ($n = 1$; 2.2%) in that order [Table 1]. The gender distributions of the lesions were significant, with more SCC seen in females in a ratio of 1.5:1 in relation to males. Osteosarcoma ($n = 6$; 13%) and rhabdomyosarcoma ($n = 4$; 8.7%) were observed only in males [Table 1].

Anatomically, 20 (47.8%) of the lesions occurred in the mandible, 19 (41.3%) cases were observed in the maxilla,

5 (10.9%) occurred in the floor of mouth [Table 2]. The mandible was the most common site of occurrence for SCC ($n = 9$; 19.6%) followed by the maxilla ($n = 6$; 13%), and floor of the mouth ($n = 5$; 10.9%). No case of SCC was observed in the lips and tongue [Table 2].

There was a significant distribution of the different malignant tumours with age ($P < 0.001$). While SCC occurred frequently in the sixth and seventh decades, childhood malignant tumours such as Burkitt's lymphoma and rhabdomyosarcoma were seen in patients in the 1-10 years age group [Table 3]. Clinical presentations ranged from swelling ($n = 31$), pain ($n = 26$), loose teeth ($n = 15$), toothache ($n = 11$) to missing teeth ($n = 9$) among others and occurring either singly or in two or more combinations [Table 4]. There were a total 138 different clinical presentations in the 46 patients seen, giving an average of 3 clinical signs, and symptoms per patient. The duration of symptoms on presentation ranged from 1 to 46 months, mean 21.7 (13.12) months and this was not different for male or female ($P > 0.05$).

DISCUSSION

The present study analyzed the relative frequency of different malignant tumours, which involved the oral and maxillofacial region in patients of both gender and cutting across all age groups. The observed male predominance of 1.7:1 supports earlier report from similar studies in

Table 1: Gender distribution of malignant jaw tumours in 46 patients

Histopathologic diagnosis	Female	Male	Total (%)
Squamous cell carcinoma	8	12	20 (43.5)
Burkitt's lymphoma	3	5	8 (17.4)
Osteosarcoma	0	6	6 (13.0)
Rhabdomyosarcoma	4	0	4 (8.7)
Adenoid cystic carcinoma	1	2	3 (6.5)
Mucoepidermoid carcinoma	1	1	2 (4.3)
Chondrosarcoma	1	0	1 (2.2)
NonHodgkin lymphoma	0	1	1 (2.2)
Liposarcoma	0	1	1 (2.2)
Total	18	28	46 (100)

$\chi^2 = 12.77$; $P = 0.047$

Table 2: Site distribution of malignant lesions

Malignant tumours	Floor of mouth	Mandible	Maxilla	Parotid	Total
Squamous cell carcinoma	5	9	6	0	20
Burkitt's lymphoma	0	3	5	0	8
Osteosarcoma	0	4	2	0	6
Rhabdomyosarcoma	0	2	2	0	4
Adenoid cystic carcinoma	0	0	2	1	3
Mucoepidermoid carcinoma	0	1	0	1	2
Chondrosarcoma	0	1	0	0	1
NonHodgkin lymphoma	0	0	1	0	1
Liposarcoma	0	0	1	0	1
Total	5	20	19	2	46

Table 3: Age group distribution of malignant jaw tumours (n = 46)

Diagnosis	1-10	11-20	21-30	31-40	41-50	51-60	61-70	Total
Squamous cell carcinoma	0	0	0	0	0	16	4	20
Burkitt's lymphoma	8	0	0	0	0	0	0	8
Osteosarcoma	0	1	4	1	0	0	0	6
Rhabdomyosarcoma	4	0	0	0	0	0	0	4
Adenoid cystic carcinoma	0	0	0	0	1	2	0	3
Mucoepidermoid carcinoma	0	0	0	0	0	2	0	2
Chondrosarcoma	0	0	0	1	0	0	0	1
NonHodgkin lymphoma	0	0	1	0	0	0	0	1
Liposarcoma	0	0	0	1	0	0	0	1
Total	12	1	5	3	1	20	4	46

$\chi^2 - 143.42$; $df - 40$; $P - 0.001$

Table 4: Clinical presentations of malignant jaw tumours in 46 patients

Clinical presentations*	Frequency
Swellings	31
Pain	26
Loose teeth	15
Toothache	11
Missing teeth	9
Trismus	6
Bleeding per oral	5
Weight loss	11
Cervical lymphadenopathy	13
Epistaxis	3
Nasal discharge	2
Proptosis	2
Blurred vision	2
Visual loss	1
Intracranial metastasis	1
Total	138

*Each patient presented with one or more clinical features

the literature which also reported higher frequency of occurrence in males.^{1,7,8}

The finding that SCC was the most frequently observed malignant tumour in adults is in agreement with the results of previous studies in Nigeria.^{1,7,11} The sixth to seventh decades of occurrence of SCC while it differs from the results obtained by Adekeye *et al.*¹³ from Kaduna and Adebiyi *et al.* from Lagos¹⁴ Nigeria, the finding is in tandem with reports by other authors.¹⁵⁻¹⁷ The higher occurrence of squamous cell carcinoma in males, as in previous documented studies^{8,13,15} may be connected to the increased tendency of the male gender toward tobacco smoking and alcohol consumption, which have been reported as strong predisposing factors in development of oral cancer.¹⁵ The relative frequency of tumours at different sites varies widely in reports from different regions within the same country, as well as from different countries.^{1,8} In the present study, the mandible was the predominant sites which contrasts other Nigerian studies^{1,11,15} that reported a high prevalence of carcinoma of the tongue. The occurrence in the jaw bones is often thought to be

secondary to invasion from the adjoining gingival and floor of the mouth which are usually the primary sites of SCC in the oral cavity.¹⁸ The incidence of lip cancer is rare from this part of the world with value as low as 2.6-3.6% reported from previous Nigerian studies.^{7,11,19} That no single occurrence of SCC of the lip was recorded in this series strengthens the earlier observation that lip cancer is rare among the black population. The dark pigmented lip of the Negroes is believed to conferred some protection from the carcinogenic effect of actinic radiation.¹³

The other carcinomas recorded in this series were adenoid cystic carcinoma and mucoepidermoid carcinoma and these originated from the maxillary sinus and parotid gland. The single case of mucoepidermoid carcinoma observed in the lower jaw is likely to have involved the mandible secondarily or probably arise *de novo* in salivary gland tissues entrapped within the mandible during embryogenesis. Malignancies of the major gland were expectedly low in this series because different surgical subspecialties are involved in their management in our center. The study excluded salivary gland tumours that presented to other specialties such as ENT and General Surgery. In the present study adenoid, cystic carcinoma was slightly more than mucoepidermoid carcinoma which disagrees with reports that found the latter as the most common malignant salivary gland tumour.²⁰ Our results were similar to the those of Farhan *et al.*¹⁶ who also found a slightly higher occurrence for adenoid cystic carcinoma in a related study.

The other prominent malignant lesion in the adult population, as observed in this series, was osteosarcoma. This observed age of distribution which spread across the second to a fourth decade with peak at the third decade is consistent with previous reports. Osteosarcoma, with a strong predilection for male occurrence, was the most predominant lesions among the sarcomas and this support the report of Aregbesola *et al.*²¹ but contrast the result of a similar study from South Africa that observed Kaposi sarcoma as the most common.⁹ Other sarcomas observed in the present study were rhabdomyosarcoma, chondrosarcoma, and liposarcoma.

Burkitt's lymphoma and rhabdomyosarcoma were observed to peak within the first decade of life, which agreed with previous reports^{21,22} and thus reinforcing their classification under childhood malignancy. While the gender distribution of Burkitt's lymphoma is in support of published reports,^{21,23} the observed slight predilection for the maxilla contrasts with other reports that noted higher occurrence in the mandible.^{21,23} The results of this study support the previously reported female predominance for rhabdomyosarcoma.¹⁹

The main burden of management of malignant jaw tumours in sub-Saharan Africa is poverty and ignorance among the affected patients and this result in delayed presentation at treatment centres.²⁴ The almost 2 years mean duration of the presentation obtained in the present study supports this assertion. Delayed presentation may result in poor treatment outcome and is often accompanied with high morbidity and mortality.

Oral cancer awareness campaign and advocacy by all clinicians, governmental, and nongovernmental organizations and other stakeholders concerned with oral health care management is necessary to steer the awareness of the population on the need for regular dental visits, early recognition, and the dangers associated with late presentation of orofacial malignancy.

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