

Salivary Gland Neoplasms In Zaria, Nigeria: A 20-Year Retrospective Analysis

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ABSTRACT

Background: Salivary gland neoplasms are rare and can pose complex diagnostic questions and management challenges to the Histopathologist and Surgeon respectively.

Materials and Methods: The study was carried out in the Pathology Department of the Ahmadu Bello University Teaching Hospital (ABUTH) Zaria, Nigeria. Universal sampling was employed, in which from the departmental records (Reception Registers, Bench Books, Request forms, etc), all cases registered as salivary gland tumors over the period: 1st January, 1989 to 31st December 2008 (20 years) were consecutively selected specifically with respect to patients' age, sex, and site of biopsy. The corresponding Hematoxylin and Eosin (H & E) stained slides were retrieved from the departmental archives and reviewed using diagnostic criteria laid down by WHO Classification of Tumors of the Head and Neck.

Data obtained was entered into and analyzed using the Statistical Package for the Social Sciences (SPSS, 20) and presented using frequencies and percentages.

Results: Salivary gland neoplasms constituted 2.1% of all neoplastic lesions seen in the study period. The male-to-female ratio was equal. Peak age range was 31-40 years. Malignant tumours accounted for 50.7% (n = 131) and benign tumours 49.2% (n = 127). Pleomorphic adenoma had the highest frequency of 43.4% and adenoid cystic carcinoma was the second commonest (25.9%).

Conclusion: Salivary gland neoplasms are rare with males being more likely to have malignant salivary gland tumors as compared to females.

Key Words: salivary glands, morphology, rare.

INTRODUCTION

The salivary glands are located in the head and neck region. They are grouped into major and minor glands depending on whether they empty their secretions via ducts or onto the mucosal surface.¹

Salivary gland neoplasms represent 2% to 6.5% of all neoplasms occurring in the head and neck region.² While, head and neck cancers rank as the fifth most common malignancy in men, and eighth in women.³

These neoplasms as a group are complex and diverse and thus pose considerable diagnostic and

management challenges to the pathologist and surgeon.^{4,7}

The global annual incidence of all salivary gland neoplasms ranges from 0.4 to 13.5 cases per 100,000 population with variable loco-regional incidence rates.^{8,9,10}

This study is a retrospective histopathological review of salivary gland neoplasms over a twenty-year period (1989 – 2008) in the Department of Pathology Ahmadu Bello University Teaching Hospital, Zaria (ABUTH) which is located in Northern Nigeria. The hospital sub-serves Zaria city, the rest of Kaduna state and neighboring

states of Sokoto, Zamfara, Jigawa, Kano, Katsina, Bauchi and Niger states.

MATERIALS AND METHOD

The study was carried out in the Pathology Department of the Ahmadu Bello University Teaching Hospital (ABUTH) Zaria. This institution is amongst the Tertiary Health Care Hospitals in the Northern Nigeria, subserving, amongst others, the following states: Kaduna, Kano, Katsina, Kebbi, Sokoto, Zamfara, Bauchi and Niger States. The Department offers a range of Pathology Services (in addition to Teaching and Research) which include Histopathology (of Surgical biopsy and Research specimens), Cytopathology, Immunohistochemistry and Autopsy. It has a vibrant Residency Training Program with full accreditation to run training for Fellowship with the National Postgraduate Medical College of Nigeria and West Africa College of Physicians.

Ethical Clearance was obtained from the Ethics Committee of ABUTH.

Universal sampling was employed, in which from the departmental records (Reception Registers, Bench Books, Request forms, etc) all cases registered as salivary gland tumours over the period: 1st January, 1989 to 31st December 2008 (20 years) were consecutively selected specifically with respect to patients' age, sex, and site of biopsy. The corresponding Hematoxylin and Eosin (H & E) stained slides were retrieved from the departmental archives and reviewed using diagnostic criteria laid down by WHO Classification of Tumours of the Head and Neck.⁸ Data obtained was entered into and analyzed using the Statistical Package for the Social Sciences (SPSS, 20) and presented as frequencies and percentages (e.g.: Frequency Distribution of Salivary gland Neoplasms by Sex).

Cases of missing tissue blocks (whose slides could not be found) were excluded.

RESULTS

A total of 44,698 surgical specimens were received and processed in the Department of Pathology

ABUTH, Zaria during the period 1st January 1989 to 31st December 2008. Neoplastic lesions accounted for 12,337 (27.6%) and of these, benign were 3,683 (8.2%) while malignant were 8,654

(19.4%). Two hundred and fifty eight (258) salivary gland neoplastic lesions were analyzed. They represented 0.6% of the total specimens and 2.1% of neoplastic lesions seen in the study period. The overall male: female ratio was approximately 1: 1. (Table 1)

Table 1: Frequency Distribution of Salivary gland Neoplasms by Sex

SEX	Frequency	%
Male	131	50.8
Female	127	49.2
Total	258	100.0

Table 2: Frequency Distribution of Salivary gland Neoplasms by Age

AGE (Years)	Frequency	%
1-10	4	1.6
11-20	25	9.7
21-30	58	22.4
31-40	65	25.2
41-50	53	20.5
51-60	36	14.0
61-70	8	3.1
71 +	4	1.6
Unspecified	5	1.9
Total	258	100.0

The age range for all the neoplasms was 2.5 - 91years with a mean age of 50.7years and peak age distribution in the 3rd - 5th decades. (Table 2)

There were one hundred and twenty seven (127) benign tumors of which 121 were epithelial in origin and comprised 46.9% while malignant tumors were one 131, representing 50.7% and all were epithelial in origin. (Table 3)

Epithelial Salivary gland Neoplasms

The benign epithelial neoplasms comprised mainly pleomorphic adenoma 112 cases (43.4%), basal cell adenoma-8 cases (3.1%) and one cystadenoma (0.4%). (Table 3)

The highest frequency of these epithelial tumors 37 (14.3%) occurred in the third decade of life. (Table 4)

Adenoid cystic carcinoma accounted for 67(25.9%) and muco-epidermoid carcinoma 47 (18.2%) cases. The least common tumors were a case each of acinic cell carcinoma (affecting the parotid gland of a 17 year old female) and sialoblastoma (affecting the parotid gland of a 3 year old female). These represented 0.4% each. (Table 3, 5 and 7)

Sex Distribution of Salivary gland Neoplasms

A total of 131 (50.8%) salivary gland neoplasms occurred in males and 127 (49.2%) in females. Of these, 30.2% (78 cases) and 20.5% (53 cases) represented malignant variants in males and females respectively. The commonest malignant

epithelial neoplasm in both sexes was adenoid cystic carcinoma with a frequency of 37 (14.3%) in males and 30 (11.6%) in females, while mucoepidermoid carcinoma was the second commonest in both sexes. (Tables 1 and 5)

Pleomorphic adenoma was the commonest benign lesion in both sexes with a female predominance (25.6%). (Table 5)

Site Distribution of Salivary Gland Neoplasms

One hundred and thirty nine cases (53.9%) occurred in the parotid gland and 63 cases (24.4%) occurred in the minor salivary glands. Other sites were the submandibular gland with 37 tumors (14.3%) and the neck region with 12 cases (4.7%). (Table 6)

Pleomorphic adenoma and mucoepidermoid carcinoma were the commonest tumors in the parotid gland. (Table 7)

Table 3: Frequency Distribution of Salivary gland Neoplasms by Types

TUMOUR TYPE	Frequency	%
Benign		
Epithelial Origin		
Pleomorphic adenoma	112	43.4
Basal cell adenoma	8	3.1
Cystadenoma	1	0.4
<i>Sub-total</i>	121	46.9
Soft Tissue Origin		
Lipoma	3	1.2
Fibromyxoma	2	0.8
Fibrohistiocytoma	1	0.4
<i>Sub-total</i>	6	2.4
Malignant		
Epithelial Origin		
Acinic cell carcinoma	1	0.4
Mucoepidermoid carcinoma	47	18.2
Adenoid cystic carcinoma	67	25.9
Polymorphous low-grade adenocarcinoma	5	1.9
Clear cell carcinoma NOS*	1	0.4
Basal cell adenocarcinoma	2	0.8
Cystadenocarcinoma	2	0.8
Adenocarcinoma, NOS*	5	1.9
Sialoblastoma	1	0.4
<i>Sub-total</i>	131	50.7
Grand Total	258	100.0

* Not Otherwise Specified

Table 5: Frequency Distribution of Salivary gland Neoplasms by Sex

TUMOUR TYPE	Frequency		Total (%)
	Male	Female	
Benign			
Epithelial Origin			
Pleomorphic adenoma	46	66	112 (43.4)
Basal cell adenoma	3	5	8 (3.1)
Cystadenoma	0	1	1 (0.4)
<i>Sub-total</i>	<i>49</i>	<i>72</i>	<i>121 (46.9)</i>
Soft Tissue Origin			
Lipoma	2	1	3 (1.2)
Fibromyxoma	1	1	2 (0.8)
Fibrohistiocytoma	1	0	1 (0.4)
<i>Sub-total</i>	<i>4</i>	<i>2</i>	<i>6 (2.4)</i>
Malignant			
Epithelial Origin			
Acinic cell carcinoma	0	1	1 (0.4)
Mucoepidermoid carcinoma	30	17	47 (18.2)
Adenoid cystic carcinoma	37	30	67 (25.9)
PLGA*	2	3	5 (1.9)
Clear cell carcinoma	1	0	1 (0.4)
Basal cell adenocarcinoma	2	0	2 (0.8)
Cystadenocarcinoma	2	0	2 (0.8)
Adenocarcinoma, NOS**	4	1	5 (1.9)
Sialoblastoma	0	1	1 (1.9)
<i>Sub-total</i>	<i>78</i>	<i>53</i>	<i>131 (50.7)</i>
Grand Total	131	127	258(100.0)

* Polymorphous Low Grade Adenocarcinoma

** Not Otherwise Specified

Table 6: Frequency Distribution of Salivary gland Neoplasms by Site

SITE OF TUMOUR	Frequency	%
Parotid gland	139	53.9
Submandibular gland	37	14.3
Minor salivary glands	63	24.4
Neck	12	4.7
Unspecified	7	2.7
Total	258	100.0

Table 7: Frequency Distribution of Salivary gland Neoplasm Types by Site

Tumour type	Site					Total	(%)
	Parotid gland	Submandibular gland	Minor salivary gland	Nec k	Unspecified		
Benign							
Epithelial Origin							
Pleomorphic adenoma	64	20	19	9	0	112	(43.4)
Basal cell Adenoma	5	1	1	0	1	8	(3.1)
Cystadenoma	1	0	0	0	0	1	(0.4)
<i>Sub-total</i>	<i>70</i>	<i>21</i>	<i>20</i>	<i>9</i>	<i>1</i>	<i>121</i>	<i>(46.9)</i>

Soft Tissue Origin							
Lipoma	0	1	0	0	2	3	(1.2)
Fibromyxoma	1	0	0	0	1	2	(0.8)
Fibrohistiocytoma	1	0	0	0	0	1	(0.4)
<i>Sub-total</i>	2	1	0	0	3	6	(2.4)
Malignant Epithelial Origin							
Acinic cell Carcinoma	1	0	0	0	0	1	(0.4)
Mucoepidermoid carcinoma	32	3	11	1	0	47	(18.2)
Adenoid cystic carcinoma	25	10	31	1	0	67	(25.9)
PLGA*	0	1	1	1	2	5	(1.9)
Clear cell carcinoma NOS**	0	0	0	0	1	1	(0.4)
Basal cell adenocarcinoma	2	0	0	0	0	2	(0.8)
Cystadenocarcinoma	2	0	0	0	0	2	(0.8)
Adenocarcinoma, NOS**	4	1	0	0	0	5	(1.9)
Sialoblastoma	1	0	0	0	0	1	(0.4)
<i>Sub-total</i>	67	15	43	3	3	131	(50.7)
Total	139	37	63	12	7	258	(100.0)

* Polymorphous Low Grade Adenocarcinoma

** Not Otherwise Specified

DISCUSSION

A total of 258 salivary gland neoplasms which occurred over a twenty year period were analyzed. The tumors represented 2.1% of neoplasms seen in the study period. Our figure is comparable to Ogunniyi et al's 296 tumors (21 years) and Arotiba et al's 237 tumors (14years) in South Western Nigeria, thus supporting the relative rarity of these tumors in our environment. However, Edda et al in Uganda had 268 cases within a ten year period.^{11,12,13}

The equal sex distribution of the tumors as observed in this study conforms to other studies that showed no statistically significant difference between the sexes, although, the World Health Organization (WHO) favors a slight female preponderance.^{8,13,14}

The youngest patient in our series was 2.5 years old and the oldest, 91 years old. This finding is in keeping with studies by Nitin et al in India and Ma'aaita et al in Jordan with an age range of 2years to 81years. Studies from Uganda and Sudan also reported an age range of 0.5 to 80 years and 11years to 90 years respectively while a study from Enugu South Eastern Nigeria, reports a 10year - 74 years range.^{3,12,15}

Our mean age of occurrence of these tumors was 50.7 years in contrast to the WHO and Armed Forces Institute of Pathology (AFIP) reported mean age of 46 years.⁸ It is also higher than the observed mean age of 48.8 years in Central Sudan, 41 years in South Eastern Nigeria, 38.1 years in Uganda and 30.4 years in North Eastern Nigeria.^{12,16,17}

The epithelial tumor types had the highest frequency of occurrence comparable to WHO and AFIP findings. The 49.3% benign lesions observed in this study is similar to other studies in Nigeria and Uganda though lower than the WHO and AFIP expected estimate of 54-79%. Likewise, our 50.8% malignant cases though comparable to studies in Africa, are higher than the WHO and AFIP's 21 - 46% estimate.^{2,8,12,16,17}

Pleomorphic adenoma was the commonest benign epithelial lesion accounting for 43.4%. Reports from Uganda (74.8%), Kenya (78%), Ethiopia (58.5%), other parts of Nigeria (Lagos, Ibadan and Maiduguri respectively representing 65.5%, 29.2% and 44.3%) and WHO/AFIP also favor pleomorphic adenoma.^{2,8,12,17-20}

The commonest malignant epithelial neoplasm was adenoid cystic carcinoma, with a frequency of 26.0% and the second commonest was mucoepidermoid carcinoma with a frequency of

18.2%. The WHO and AFIP reports and studies from Uganda (Edda et al), and Lagos (Ladeinde et al) support this finding. While other studies by Hill et al in Kenya and Abiose et al reported mucoepidermoid carcinoma as the commonest malignant epithelial tumour.^{8, 12, 17-20}

Lipoma was the commonest non-epithelial benign neoplasm representing 1.2% of all tumors seen. This is comparable to the AFIP's observed frequency range of 0.5-1.2% with a male preponderance. Two of our three cases occurred in males.²

The parotid gland was the commonest site involved by these tumors with a frequency of 53.9%. Several studies from various regions support this finding. For example, WHO's 64-80%, India- 66.8%, Jordan – 70.2%, Ethiopia – 43.2%, Uganda – 34% and Lagos 72.4%. The minor salivary glands accounted for 24.4% of cases and falls within the estimated range of 9-23%. However, Edda et al reported a higher frequency of 32.8% in the minor glands in Uganda and a similarly higher figure of 31.9% was observed in Ibadan.^{2, 3, 8, 10, 12, 13}

The sublingual glands were entirely spared in conformity with the reported rarity of involvement of this site.^{2, 8}

In conclusion, the study showed that salivary gland neoplasms are rare with males being more likely to have malignant salivary gland tumors than females; benign salivary tumors however occurred more among females. This is consistent with IARC's finding of a slightly increased female preponderance.⁸

A major drawback of our study is that it is based on hospital pathology records. A population-based cancer registry statistics is called for to ascertain the true incidence of salivary gland tumours in the country.

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