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A Clinicopathologic Study of Salivary Gland Neoplasms in a South- South Nigerian Population

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ABSTRACT

Objective: To determine the prevalence, age, gender, orofacial sites and histopathologic types of neoplastic salivary gland tumours (SGTs) in a South-South Nigerian population.

Methods: This was a 26-year retrospective review of patients' records, histopathology reports and slides of diagnosed cases of neoplastic salivary gland tumours in the Department of Oral Pathology/Medicine and Department of Morbid Anatomy, University of Benin Teaching Hospital, Benin City Nigeria.

Results: A total of 179 (1.6%) cases of neoplastic salivary gland tumours among the 11,050 diagnosed neoplasms, and 12.1% of 1480 orofacial tumours. The peak occurrence was observed in the year 2005. The peak age group was third decade of life (n=41, 22.9%). There were 116 (64.8%) female and male 63 (35.2%) giving a ratio of 1.8:1. The major salivary glands (n=110, 61.4%) were mostly affected, with the parotid gland accounting for 69 (38.5%) cases and the palatal glands (n=59, 33.0%) was the most commonly affected minor salivary gland. There was a reversal of the ratio of benign to malignant tumours from 1.2:1 to 1:1.1 in the latter half of the study period (2003-2015). Pleomorphic adenoma (n=80, 44.7%) and adenocystic carcinoma (n=26, 14.5%) were the most benign and malignant SGT respectively in this study.

Conclusion: A low prevalence of SGTs was observed among all neoplasms, while a relatively higher prevalence of SGTs was observed among orofacial tumours in this study. The surge in the prevalence of malignant SGT observed in this study supports the need for early assessment of persistent parotid or palatal swellings to ensure early diagnosis and treatment of malignant SGTs.

Keywords: Benign, malignant, prevalence, salivary gland tumour,

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INTRODUCTION

Salivary gland tumours (SGT) are a morphologically diverse group of neoplasms, which may present considerable challenges for the Pathologists and Surgeons regarding diagnosis and treatment.[1-5] They are relatively rare and account for less than 2% of all human neoplasms and 2.8 to 10.5% of head and neck tumours.[1,6-10] The reported global incidence ranges from 0.4 – 13.5 per 100,000 individuals annually.[11] An estimated 700 deaths (0.4 per 100,000 for males and 0.2 per 100,000 for females) related to SGTs occur annually.[12]

Previous studies showed significant variation in the distribution in terms of age, sex, site, and histomorphologic pattern.[3,5-10] SGTs are generally more prevalent in the third and fourth decades of life, with the benign lesions showing predilection for the third decade of life and the malignant lesions, the sixth decade of life.[13] Overall, the mean age of patients with benign tumours is significantly lower than those with malignant tumours.[14,15] SGTs tend to be commoner in females in most studies,[5,16,17] however few studies have also reported a male predilection.[14,18] The parotid gland is reported to be the most common site of SGTs, followed by the submandibular and the minor salivary gland.[5] SGTs of the minor glands are less common.[5,11] The sublingual gland is consistently reported to be the least affected site.[5,16,18] Whereas majority of researchers have reported a higher prevalence of benign SGTs compared to the malignant SGTs,[3,18] fewer studies have reported malignant lesions as the more common type.[18] There is variation in the relative frequencies of benign and malignant SGTs in different sites. The majority of tumours of the parotid gland are reported as benign (80%), while the majority of the tumours in the smaller major salivary glands especially the sublingual glands, are malignant.[5,11] A useful rule of thumb is the 25/50/75 rule, that is, as the size of the gland decreases, the incidence of malignancy of a tumour in the gland increases in approximately these proportions.[12] Minor salivary gland tumours are said to account for about 5.0 to

69.5% of all salivary gland tumours.[8,14-16,19-21] Of the minor salivary glands, the palate has been consistently reported to be the most common site of occurrence of SGT followed by the buccal mucosa and the lip.[15,22]

Pleomorphic adenoma is generally agreed to be the most common benign SGT, with a predilection for the parotid gland.[5,17,18,23,24] Several authors have reported a female predilection for pleomorphic adenoma.[8,25-27] However, Odukoya[24] (Lagos, Nigeria) reported pleomorphic adenoma to be slightly commoner in males and Silas et al.[8] (Jos, Nigeria) also reported a male predilection. There are conflicting reports as regards the most common malignant SGT. Some researchers have reported adenoid cystic carcinoma to be the most common malignant SGT,[5,14,18] whereas other studies have reported mucoepidermoid carcinoma as the most common.[3,17,28]

Although several studies[3,5-10,14,15,18,29,30] have reported on SGTs in Nigerians, none of these studies indicated if their findings were based on collaboration between the Oral Pathology Department (with predominant samples of intraoral / minor saliva gland lesions) and Morbid Anatomy Department (with predominant samples of extraoral / major salivary gland lesions). This colloboration has been recommended in a recent study to help ascertain the actual prevalence of neoplastic SGT in Nigerians.[30] Consequently, the objective of this study was to determine the prevalence, age, gender, orofacial sites and histopathological types of neoplastic salivary gland tumours seen in Oral Pathology and Morbid Anatomy Units in a tertiary health facility in a South-South Nigerian population.

MATERIALS AND METHODS

This was a descriptive retrospective study of patients' records, histopathology reports and slides of diagnosed cases of neoplastic salivary gland tumours in the Department of Oral Pathology/Medicine and Department of Morbid Anatomy, University of Benin Teaching Hospital, Benin City over a period of 26 years (January 1990 and October 2015). Ethical approval to perform this study was obtained from the Hospital Ethics and Research Committee (Protocol number: ADM/E 22/A/VOL. VII/1031).

Data collected were yearly occurrence, age, gender, orofacial site and histopathological types of the SGT based on World Health Organization (WHO) 2005 classification of salivary gland tumours.[11] The data was analysed using the IBM SPSS version 23 software (IBM Corp., 2015). The results were subjected to descriptive analysis and data presented by frequency tables, charts, graphs, and cross tabulations. The cross tabulations were assessed with the Chi-square statistics. The level of significance was set at 95% (p-value <0.05).

RESULTS

A total of 179 (1.6%) cases of neoplastic salivary gland tumours were found among the 11050 diagnosed neoplasms in Oral Pathology and Morbid Anatomy Units. These 179 cases represented 12.1% of the 1480 orofacial diagnosed tumours in Oral Pathology Unit. There was a surge in the presentation of these tumours between the year 2001 and 2015 with the peak occurrence observed in the year 2005 (Figure 1). The age of the patients ranged between 4 years and 83 years, with a mean of age 39.6+16.8 years. The peak age group was the third decade of life (n=41, 22.9%). Salivary gland tumours were more common in females (n=116, 64.8%) than males (n=63, 35.2%) with a female: male ratio of 1.8:1 (Table 1).

The SGTs were more in the major salivary glands (n=110, 61.4%) compared to the minor salivary glands (n=69, 38.6%). The parotid gland (n=69 (38.5%) was the most commonly affected major salivary gland and the palate (n=59, 33.0%) was the most commonly affected minor salivary gland. (Table 2).

The overall ratio of benign (n=98, 54.7%) to malignant (n=81, 45.3%) tumours was 1.2**:**1. There was a reversal of trend in the second half of the study period (between 2003 and 2015) with a ratio of benign (n=59, 33.0%) to malignant (n=66, 36.9%) tumours of 1**:**1.1 (Table 2, Figure 1).

There was statistically significant association between the histopathological type of salivary gland tumour (benign versus malignant) and the age of occurrence *(p*=0.002). The benign tumours occurred at a significantly lower age (the 3rd decade and mean age is 36.5$\pm$16.2 years) than the malignant tumours (5th decade and mean age of 44.5$\pm$16.4 years) (Table 3).

There was a female predilection for both the benign (61 females: 37 males = 1.6:1) and malignant (55 females: 26 males = 2.1:1) lesions. There was no statistically significant association of benign or malignant tumours with gender. (Fisher's exact, *p* = 0.264) (Table 4, Figure 2)

Table 1: Age and gender distribution of the benign and malignant salivary gland tumours

			Gender		
CLASSIFICATION			Male	Female	Total
Benign	Age (years)	0-9	0	4	4
		10-19	3	6	9
		20-29	11	20	31
		30-39	7	13	20
		40-49	2	9	11
		50-59	11	5	16
		60-69	3	4	7
	Total		37	61	98
Malignant	Age (years)	10-19	2	4	6
		20-29	3	7	10
		30-39	7	11	18
		40-49	8	14	22
		50-59	2	10	12
		60-69	3	6	9
		≥ 70	1	3	4
	Total		26	55	81
Total	Age (years)	0-9	0	4	4
		10-19	5	10	15
		20-29	14	27	41
		30-39	14	24	38
		40-49	10	23	33
		50-59	13	15	28
		60-69	6	10	16
		≥ 70	1	3	4
	Total		63	116	179

A comparison of the benign and malignant lesions in the major and minor salivary glands showed that there were more benign lesions (n=44, 24.6%) than the malignant lesions (n=24, 13.4%) in the parotid gland. The submandibular gland tumours had slightly more malignant (n=20, 11.2%) than benign lesions (n=19, 10.6%). All the cases (n=2, 1.1%) seen in the sublingual gland were malignant lesions. The minor salivary glands had slightly more benign (n=35, 19.6%) than malignant (n=34, 19.0%) lesions, with the palate (n=59, 33.0%) accounting for most of the minor salivary gland lesions (Table 2, Figures 3 and 4)

Pleomorphic salivary adenoma (n=80, 44.7%) was the predominant histological type of the neoplastic salivary gland tumour and the commonest benign lesion. This was followed distantly by Warthin's tumour (n=5, 2.8%), basal cell adenoma (n=4, 2.2%) and oncocytoma (n=4, 2.2%) (Table 2).

Pleomorphic salivary adenoma occurred mostly in the parotid region (n=31, 17.3%) [p=0.808]. There was a significant predilection for females (n=54, 30.2%) [p=0.036] and the 3rd decade of life (n=31, 17.3 %) [p=0.000] (Tables 2,3,4, Figure 5).

Warthin's tumour (n=5, 2.8%) was the 2nd most common benign lesion, with predilection for the parotid gland (n=3, 1.7%) [p=0.808]. There was significant association of the lesion with males (n=4, 2.2%) [*p*=0.036] and the 6th decade of life (n=3, 1.7%) [*p*=0.000] (Tables 2,3,4, Figure 6).

Oncocytoma was the third most common benign salivary gland tumour (n=4, 2.2%), with

predilection for males, the parotid gland and the 6th decade of life, (p= 0.000) (Tables 2,3,4). Basal cell adenoma accounted for 4 (2.2%), with a striking predilection for the parotid (n=3, 1.8%), equal gender distribution, and one case each seen between the fourth and the seventh decades of life (Tables 2,3,4). The rare benign salivary gland tumours seen were myoepithelioma (n=1, 0.6%), capillary hemangioma (n=3, 1.7%), lymphangioma (n=1, 0.6%) (Table 2).

Table 2: Site distribution of the histopathologic types of the salivary gland tumours

	Site					
	Major SG			Minor SG		
Tumour Histology	Parotid	Submandibular	Sublingual	Palate	Other MinorSG	Total
Benign						
Pleomorphic Adenoma	31	16	0	28	5	80
Warthin's Tumour	3	1	0	0	1	5
Oncocytoma	4	0	0	0	0	4
Basal Cell Adenoma	3	1	0	0	0	4
Myoepithelioma	0	0	0	1	0	1
Capillary haemangioma	3	0	0	0	0	3
Lymphangioma	0	1	0	0	0	1
Subtotal	44	19	0	29	6	98
Malignant						
Adenocystic Carcinoma	4	11	1	9	1	26
Mucoepidermoid Carcinoma	13	1	1	3	1	19
Acinic Cell Carcinoma	3	4	0	7	1	15
PLGA	0	2	0	8	0	10
Salivary Duct Carcinoma	1	0	0	0	0	1
Ca Ex PA	1	1	0	2	1	5
Epi-Myoepithelial carcinoma	1	1	0	0	0	2
Adenocarcinoma NOS	0	0	0	1	0	1
Carcinosarcoma	1	0	0	0	0	1
SCC	1	0	0	0	0	1
Subtotal	24	20	2	30	4	81
Total	69	39	2	59	10	179

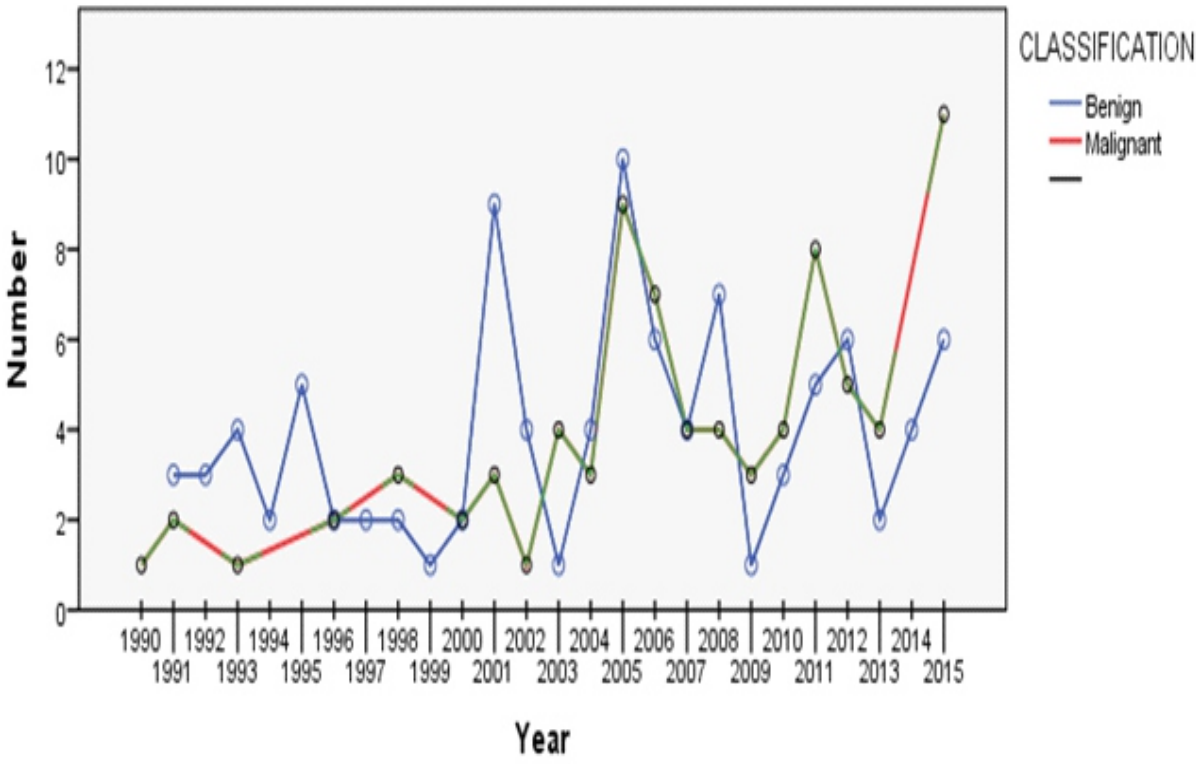

Figure 1: The yearly distribution of the salivary gland tumours

The malignant lesions were mostly adenocystic carcinoma (n=26, 14.5%), followed by mucoepidermoid carcinoma (n=19, 10.6%), acinic cell carcinoma (n=15, 8.3%), polymorphous low grade adenocarcinoma (n=10, 5.6%) and carcinoma ex-pleomorphic adenoma (n=5, 2.8%) (Table 2).

Adenocystic carcinoma (n=26, 14.5%) was the most common malignant neoplastic salivary gland tumour, with predilection of the lesion for the submandibular gland (n=11, 6.2%). There was significant association of adenocystic carcinoma with females (n=18, 10.1%) [p=0.036] and the 4th decade of life (n=8, 4.5%) [p=0.000], as shown in Tables 2,3,4, Figure 7).

Mucoepidermoid carcinoma was the second most common malignant salivary gland tumour (n=19, 10.6%), with predilection for the parotid gland (n=13, 7.3%). There was significant association with the female gender (n=11, 5.8%) [p=0.036] (Tables 2, 3, 4, Figure 8).

Acinic cell carcinoma was the third most common malignant salivary gland tumour (n=15, 8.3%), with predilection for the palatal minor salivary glands (n=7, 3.9%). There was significant association of the lesion with females [p=0.036] and the 5th decade of life (n=6, 3.4%) [p=0.000] (Tables 2, 3,4).

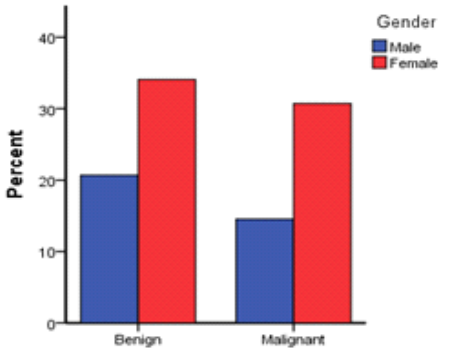

Figure 2: Gender distribution of the benign and malignant salivary gland tumour

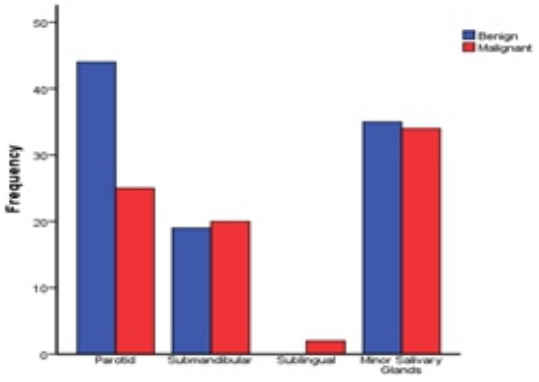

Figure 3: Comparison of the benign and malignant lesions in the major and minor glands

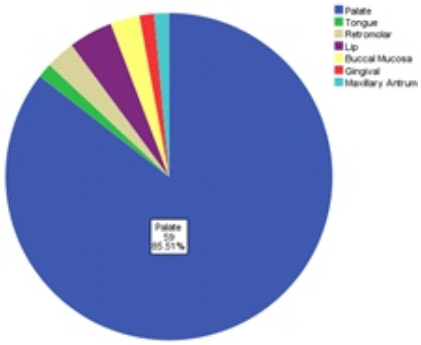

Figure 4: Site distribution of the minor salivary gland tumours

Polymorphous low grade adenocarcinoma was the fourth most common malignant lesion (n=10, 5.6%), with predilection for the palatal minor salivary glands (n=8, 4.5%). There was significant association of the lesion with females (n=7, 3.9%) [p=0.036], as seen in Tables 2, 3 and 4. Carcinoma ex-pleomorphic adenoma accounted for 5 (2.8%) cases, with predilection for the male gender (n= 3, 1.8%) and the fourth decade of life. The palate was the most common site accounting for 2(1.1%) cases (Tables 2,3,4). The rare malignant SGTs were epi-myoepithelial carcinoma (n=2, 1.1%), adenocarcinoma not otherwise specified (n=1, 0.6%), salivary duct carcinoma (n=1, 0.6%), and squamous cell carcinoma (n=1, 0.6%) (Tables 2,3,4).

Table 3: Distribution of the histopathologic types of salivary gland tumours among different age groups

	Age (years)							
Histology	0-9	10-19	20-29	30-39	40-49	50-59	60-69	≥70
Benign								
Pleomorphic Adenoma	0	7	31	18	10	8	6	0
Warthin's Tumour	1	1	0	0	0	3	0	0
Oncocytoma	0	0	0	0	0	4	0	0
Basal Cell Adenoma	0	0	0	1	1	1	1	0
Myoepithelioma	0	0	0	1	0	0	0	0
Capillary haemangioma	3	0	0	0	0	0	0	0
Lymphangioma	0	1	0	0	0	0	0	0
Subtotal(benign)	4	9	31	20	11	16	7	0
Malignant								
Adenocystic Carcinoma	0	0	4	8	7	5	1	1
Mucoepidermoid Carcinoma	0	3	3	3	4	1	4	1
Acinic Cell Carcinoma	0	2	1	3	6	2	1	0
PLGA	0	1	2	2	1	2	2	0
Ca Ex PA	0	0	0	2	1	1	1	0
Adenocarcinoma NOS	0	0	0	0	1	0	0	0
Salivary Duct Carcinoma	0	0	0	0	0	1	0	0
Carcinosarcoma	0	0	0	0	1	0	0	0
Epi-Myoepithelial carcinoma	0	0	0	0	1	0	0	1
SCC	0	0	0	0	0	0	0	1
Subtotal(Malignant)	0	6	10	18	22	12	9	4
Total	4	15	41	38	33	28	16	4

DISCUSSION

Salivary gland tumours are a group of heterogeneous lesions with varied clinico-demographic and histomorphologic patterns depending on the population studied.[7,31] There is a significant variation and overlap of histo-architecture within tumour types and between different tumour types.[1] They can sometimes pose a considerable challenge in their histopathologic diagnosis, even for the experienced pathologist.[1-5]

Neoplastic salivary gland lesions are relatively rare and account for less than 2% of all human neoplasms, [1, 6- 8] and 2 to 10.5% of head and neck tumours.[6,8-10] Similarly, a low (1.6%) prevalence of neoplastic salivary gland lesions was observed among all the neoplastic tumours in this study.[1,6-8] A relatively higher prevalence of SGTs (12.1%) was observed among orofacial tumours in this study than previously reported among head and neck tumours. [6,,8-10] A surge in the prevalence of SGTs

was observed between the year 2001 and 2015. These findings may be attributed to increased patients' awareness of where to seek treatment, improved diagnostic facilities, and increased number of well trained diagnosticians of orofacial diseases.

The mean age of the patients studied was 39.6 ±16.8 years, which is comparable to the mean age of 39 years reported by Nzegwu et al.[3] However, Lawal et al.[5] reported a lower mean age of 43.7±16.9 years in South-West Nigeria. Majority of the patients in this study were in the 3rd decade of life, which is lower than the 5th decade of life reported for salivary gland tumours by Lawal et al.[5] There was a female predilection accounting for 64.8% of the SGTs in this study, which was similar to reports from previous studies.[5,16,,32] However, a male predilection for salivary gland tumours has been reported in some studies.[1,3,8,14,18,23] In agreement with previous studies,[3,5,18,23] the parotid gland (38.5%) was the most common site of occurrence of SGTs in this study. This was followed by the palate (33.0%) and the submandibular gland (21.8%). Conversely, Ladeinde et al.[14] documented the minor salivary gland as the most common site for these lesions. The variation in orofacial site predilection for SGTs may be due to lack of collaborative study between Oral Pathology (with predominant intraoral samples and Morbid anatomy (with predominant extraoral samples) Units.

Table 4: Gender distribution of the histopathological types of salivary gland tumours

Tumour Histology	Gender		Total	p-value
	Male	Female		
Benign				0.036
Pleomorphic Adenoma	26	54	80	
Warthin's Tumour	4	1	5	
Basal Cell Adenoma	2	2	4	
Oncocytoma	4	0	4	
Myoepithelioma	1	0	1	
Capillary haemangioma	0	3	3	
Lymphangioma	0	1	1	
Sub-total (benign)	37	61	98	
Malignant				
Adenocystic Carcinoma	8	18	26	
Mucoepidermoid Carcinoma	8	11	19	
Acinic Cell Carcinoma	2	13	15	
PLGA	3	7	10	
Ca Ex PA	3	2	5	
Adenocarcinoma NOS	0	1	1	
Salivary Duct Carcinoma	0	1	1	
Epi-Myoepithelial carcinoma	0	2	2	
SCC	1	0	1	
Carcinosarcoma	1	0	1	
Sub-total (malignant)	26	55	81	
Total	63	116	179	

Key: PLGA= Polymorphous low grade adenocarcinoma SCC= Squamous cell carcinoma
CEPA= Carcinoma ex-pleomorphic adenoma NOS= Not otherwise specified

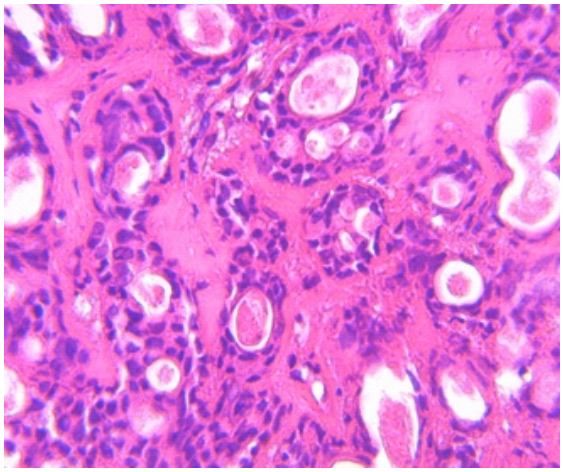

Figure 5: Pleomorphic adenoma with ductular epithelial pattern with eosinophilic coagulum in a fibrous and hyalinised stroma (H&E×400)

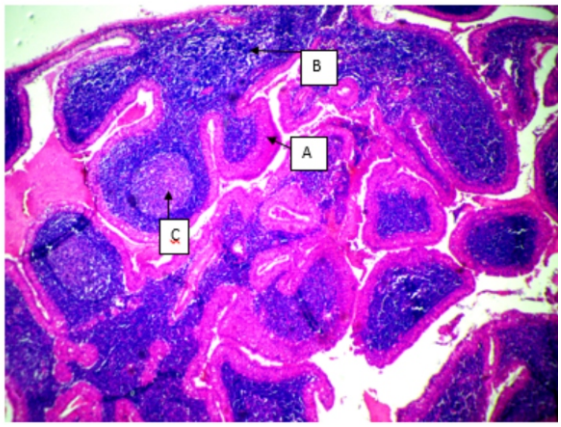

Figure 6: Warthin's tumour with papillary cystic structures (A) in a lymphoid stroma (B) with presence of germinal centre (C) (H&Ex40)

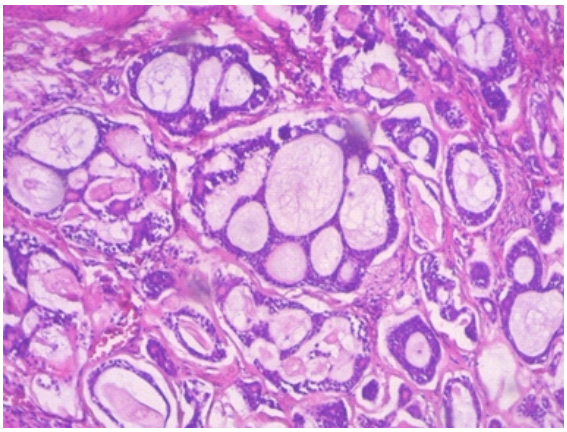

Figure 7: Adenocystic carcinoma with lobules of basaloid epithelial cells disposed in a cribriform pattern, within a fibrous stroma. H&E×100

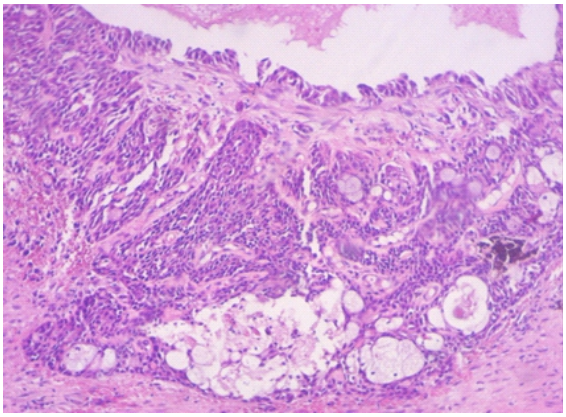

Figure 8: Mucoepidermoid carcinoma (low grade) with a cystic space surrounded by sheet of epidermoid cells and islands of mucous cells, H&E×100

There were more benign tumours (54.7%) than malignant tumours (45.3%), with a ratio of benign to malignant tumours of 1.2:1. The predominance of benign lesions over the malignant salivary gland tumours observed in this study is similar to reports from Nigerian, other African, and American studies.[7,8,32,33] However, Ladeinde et al.[14] and Lawal et al.[5] reported a higher occurrence of malignant SGTs than the benign. The reversal of the ratio of benign to malignant lesions observed in the latter half of the study period supports a surge in malignant lesions, which agree with recent the Nigerian reports by Ladeinde et al,[14] and Lawal et al.[5] Further study is recommended to identify the possible environmental factors that may have predisposed these individuals to the development of malignant SGTs in our environment. Also, this surge in malignant lesions support the need for early assessment of any persistent salivary gland swelling for an early diagnosis and treatment of these tumours.

Comparable to previous studies,[8-10] the benign tumours were found significantly more in younger patients (3rd decade of life, mean age = 36.5±16.2 years) compared to the malignant tumours (5th decade of life, mean age of 44.5±16.4 years) in this study. There was female predilection for both the benign (1.6:1) and malignant (2.1:1) lesions. However, a male predilection was reported for the malignant lesions by Lawal et al.[5] There was a predilection of the benign tumours for the parotid gland (24.6%) and a predilection of the malignant tumours for the palatal minor salivary gland (16.2%) and the sublingual gland. These findings are consistent with previous reports.[15-19] This study suggests that the age and orofacial sites are useful clinical indicators to suspect either benign or malignant SGTs.

Pleomorphic adenoma was the most common SGT

(44.7%) and the most common benign SGT (81.6%) in this study. Warthin's tumour, basal cell adenoma, oncocytoma, myoepithelioma, capillary hemangioma and lymphangioma were rare benign tumours. The prevalence of the benign SGTs observed in this study is consistent with findings in previous studies in Nigeria,[7,8] Africa,[32] America[33] and Europe.[34] There was a significant association of pleomorphic adenoma with the females and the third decade of life, with a mean age of 35.3±14.4 years. In contrast, a slight male preponderance was reported by Odukoya.[24] However, previous studies agreed that parotid gland was the predominant site of occurrence for pleomorphic adenoma.[5,7,8,12,14,32]

Warthin's tumour otherwise known as papillary cystadenoma lymphomatosum, is reported to be the second most common benign salivary gland tumour in the Western literature.[11] The lesion is strongly associated with smoking, the male gender, the parotid gland, and the Caucasian race.[11,33-36] Its rarity in the black race has also been documented.[5,7,37] This study showed a predilection of Warthin's tumour for males, the parotid gland and older adults (6th decade of life). Also, this study observed that oncocytoma (2.2%) and basal cell adenoma (2.2%) were found predominantly in the parotid gland, with predilection of oncocytoma for males and older age group (6th decade of life). Basal cell adenoma had no gender or age predilection. There was a relatively higher prevalence of the rare benign salivary gland tumours in this study compared to previous studies.[3,5-8]

Adenocystic carcinoma (32.1%) was the overall second most common salivary gland tumour, and the most prevalent malignant salivary gland tumour seen in this study. This pattern of presentation have been reported in previous studies.[5,14,18,38] However, some studies in Nigeria, Brazil, Iran, Europe have documented mucoepidermoid carcinoma as the most common malignant salivary gland tumour.[3,16,17,28,29] There was predilection of the lesions for females and the 4th decade of life (mean age= 44.1±13.7 years). The submandibular gland (6.1%) closely followed by the palatal minor salivary glands (5.6%) were the most common sites. Similarly, a predilection of the lesion for the submandibular gland has been previously reported by Kolude et al.[29] In contrast, other studies have reported variable gender, sites and age predilection of the lesion.

Mucoepidermoid carcinoma (10.6%) was the second most common malignant salivary gland tumour with a predilection for the parotid gland and females, and a mean age of 41.4±19.9 years. These findings agree with previous studies,[5,12] although Kolude et al.[29] reported mucoepidermoid carcinoma as the most common malignant salivary gland tumour. Acinic cell carcinoma was the third most common malignant salivary gland tumour (8.3%), with predilection for the palatal minor salivary glands, females and the 5th decade of life. Similarly, previous study by Okoh et al.[30] reported a predilection of the lesion for females and the 5th decade of life, however there was parotid gland predilection for the lesions. The findings above suggest variation in the prevalence and site of acinic cell carcinoma.

Polymorphous low grade adenocarcinoma (PLGA) is reported to be the second most common malignant salivary gland tumour of the minor salivary glands, majorly the palatal minor salivary gland.[11] In this study, PLGA was the fourth most common malignant salivary gland tumour, with predilection for the palatal minor salivary glands (4.5%), comparable with previous report.[15] Carcinoma ex-pleomorphic adenoma (CEPA), epi-myoepithelial carcinoma, salivary duct carcinonma and carcinosarcoma were among the rare malignant lesions seen in this study. CEPA accounted for 2.8% of cases, with a predilection for the males, the fourth decade of life, and the palate. CEPA were found in slightly older patients compared to pleomorphic adenoma, which supports carcinomatous change in long standing cases of pleomorphic adenoma.[12,35]

CONCLUSION

In conclusion, a low (1.6%) prevalence of salivary gland tumours was observed among all neoplasms, while a relatively higher prevalence (12.1%) was observed among orofacial tumours in this study. This study suggests that age and orofacial sites are useful clinical indicators to suspect either benign or malignant salivary gland tumours. A surge in the prevalence of malignant salivary gland lesion was observed in the latter half of the study period, especially in the parotid and palatal sites, middle aged and female patients. This study recommends early histopathologic assessment of any persistent parotid and palatal swellings for early diagnosis and treatment of

REFERENCES

1. Gill MS, Muzaffar S, Soomro IN, Kayani N, Hussainy AS, Pervez S, Hasan SH. Morphological pattern of salivary gland tumours. J Pak Med Assoc 2001; 51(10):343-346.
2. Cavalcante RB, Lopes FF, Ferreira AS, Freitas RA, Souza LB. Immunohistochemical

salivary gland malignancy.
expression of Vimentin, Calponin and HHF-35 in salivary gland tumours. Braz Dent J 2007; 18(3): 192-197.
3. Nzegwu MA, Ngozi NR, Ugochukwu AI, Amu C, Okolugbe N, Okoye LO, Mba AU, Uguru C. A Review of salivary gland neoplasms in Eastern Nigeria for a five-year period from January 1, 2000 to December 31st 2004. Advances Biores 2011; 2(1): 28- 32.
4. Gupta V, Ramani P, Chandrasekar T. A clinicopathological and immunohistochemical study of salivary gland tumours: A 5 year Indian experience. Int J Oral Maxillofac Pathol 2012; 3(1):15-22.
5. Lawal AO, Adisa AO, Kolude B, Adeyemi BF, Olajide MA. A Review of 413 salivary gland tumours in the head and neck region. J Clin Exp Dent 2013; 5(5): e218–e222.
6. Ezeonolue BE. Salivary gland neoplasms: a descriptive analysis of the pattern seen in Enugu. West Afr J Med 1999; 18: 179-183.
7. Ochicha O, Malami S, Mohammed A, Atanda A. A histopathologic study of salivary gland tumours in Kano, northern Nigeria. Indian J Pathol Microbiol 2009; 52(4):473-476.
8. Silas OA, Echejoh GO, Menasseh AN, Mandong BM, Otoh EC. Descriptive pattern of benign salivary gland tumours in Jos University Teaching Hospital (JUTH), Jos: A ten-year retrospective study. Ann Afr Med 2009; 8(3):199-202.
9. Abiose BO, Oyejide O, Oguniyi J . Salivary gland tumours in Ibadan, Nigeria: a study of 295 cases. Afr ed Sci J Med M 1990; 19(3):195-199.
10. Arotiba GT. Salivary gland neoplasms in Lagos. West Afr J Med 1996; 15(1):11-17.
11. Barnes L, Eveson JW, Reichart PA, Sidransky D, eds. World Health Organization classification of tumours: pathology and genetics of tumours of the head and neck. 2005. Lyon France. IARC Press.
12. Lee SC. Salivary gland neoplasms. http://emedicine.medscape.com/article/852373-overview. 2015. Accessed on June 28th, 2015.
13. Lima SS, Soares AF, de Amorim RFB, Freitas RA. Epidemiologic profile of salivary gland neoplasms: analysis of 245 cases. Rev Bras Otorrhinolaryngol 2005; 71(3):335-340.
14. Ladeinde AL, Adeyemo WL, Ojunlewe MO, Ajayi OF, Omitola OJ. Salivary gland tumours. A 15- year review at the Dental Centre Lagos University Teaching Hospital. Afr J Med Med Sci 2007; 36:299-304.
15. Adeyemi BF, Ogun GO, Akang EE. Retrospective analysis of intraoral salivary gland tumours in Ibadan, Nigeria. West Afr J Med 2010; 29 (2): 98 - 103.
16. Ito FA, Ito K, Vargas PA, De Almeida OP, Lopes MA. Salivary gland tumors in a Brazilian population: a retrospective study of 496 cases. Int J Oral Maxillofac Surg 2005; 34(5):533-536.
17. Ansari MH. Salivary gland tumors in an Iranian population: a retrospective study of 130 cases. J Oral Maxillofac Surg 2007; 65(11):2187-2194.
18. Otoh EC, Johnson NW, Olasoji H, Danfillo IS, Adeleke OA. Salivary gland neoplasms in Maiduguri, north-eastern Nigeria. Oral Dis 2005; 11(6):386-391.
19. Vargas PA, Gerhard R, Filho V, de Castro IV. Salivary gland tumors in a Brazilian population: A Retrospective study of 124 cases. Rev Hosp Clin Fac Med S Paulo 2002; 57(6): 271 - 276.
20. Loyola AM, de Araujo VC, de Sousa SOM, de Araujo NS. Minor salivary gland tumours. A retrospective study of 164 cases in a Brazilian population: Euro J Cancer 1995; 31(3):197-201.
21. Jude UO, Olu-Eddo AN. Salivary gland tumours, a twenty-year retrospective study. Afr J Med Health Sci 2014; 13(1):24-29.
22. Ajike SO, Adebayo AT, Adekeye EO. Minor salivary gland tumours in Kaduna, Nigeria. Nig J Surg Res 2003; 5(182): 100 - 105.
23. Adedeji TO, Tobhi JE, Olaosun AO, Oseni OG, Idowu JA, Olaitan PB. Delto-pectoral flaps for secondary defects following excision of recurrent parotid tumours: Case series. Int J Med Res Health Sci 2014; 3(1):197-201.
24. Odukoya O. Pleomorphic adenoma of the salivary glands in Lagos, Nigeria: clinicopathological analysis of 45 cases. Central Afr J Med 1990; 36(10):251-256.
25. Patankar SR, Meshram MA, Shewale V, Gokul S. Pleomorphic adenoma of parotid in a young

patient. J Case Reports 2013; 3(1):142-147.
26. Jain S, Hasan S, Vyas N, Shah N, Dalal S. Pleomorphic adenoma of the parotid gland: Report of a case with review of literature. Ethiopian J Health Sci 2015; (2):189-194.
27. Wu YC, Wang YP, Cheng SJ, Chen HM, Sun A, Chang JY. Clinicopathological study of 74 palatal pleomorphic adenomas. J Formosan Med Assoc 2016; 115(1):25-30.
28. Li LJ, Li Y, Wen YM, Liu H, Zhao HW. Clinical analysis of salivary gland tumor cases in West China in past 50 years. Oral Oncol 2008; 44(2):187-192.
29. Kolude B, Lawoyin JO, Akang EE. Salivary gland neoplasms: a 21year review of cases seen at University College Hospital, Ibadan. Afr J M ed M ed Sci 2000; 30(1-2):95-98.
30. Okoh DS, Orikpete EV, Omoregie, OF, Ojo MA. A study of the clinicopathologic patterns of Orofacial carcinomas in a Nigerian population. Afr J Oral Maxillofac Pathol Med 2015; 1(2): 10-17.
31. Rasheed FS, Majeed A. Immunohistochemical expression of actin and S100 in pleomorphic adenoma and mucoepidermoid carcinoma. J Bagh Coll Dentistry 2011; 23:51-55.
32. Vuhahula EA. Salivary gland tumours in Uganda: Clinical pathological study. Afr Health Sci 2004; 4(1): 15-23.
33. Pinkston GM, Cole P. Cigarette smoking and Warthin's tumour. Am J Epidemiol 1996; 144:183 - 187.
34. Speight PM, Barrett AW. Salivary gland tumours. Oral Dis 2002; 8: 229-240.
35. Cawson RA, Gleeson MJ, Eveson JW. The pathology and surgery of the salivary glands. Isis Medical Media. Oxford. 1997.
36. Ellis GL, Auclair PL. Tumours of the salivary gland 3rd ed. Armed forces institute of Pathology. Washington. 1996.
37. Thomas KM, Hutt MS, Borgstein J. Salivary gland tumors in Malawi. Cancer 1980; 46(10):2328-2334.
38. Chidzonga MM. Oral malignant neoplasia: a survey of 428 cases in two Zimbabwean hospitals. Oral Oncol 2006; 42(2):177-183.