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Original Article

Pattern of Salivary Gland Tumours among Patients Attending Otorhinolaryngology and Maxillofacial Services at Tertiary Hospital in Tanzania, A Cross-Sectional Study

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ABSTRACT

The proportion of neoplasms of the salivary gland in the study population accounted for 10% of all head & neck and 3% of all neoplasms in the body. There is a scarcity of information regarding salivary gland tumours in Tanzania; therefore, this study addresses important issues in prevalence, histological, demographic characteristics, co-morbidities and treatment of salivary gland tumours. This study aimed to determine the pattern of salivary gland tumours among patients attending Otorhinolaryngology and Maxillofacial services at a tertiary hospital. This was a cross-sectional study done on patients diagnosed with salivary gland tumours. A total of 276 patients were recruited. Pre-tested coded questionnaires were used to collect data which were later analysed using SPSS statistical computer software version 20.0. Of the studied 276 participants, 156 (56.5%) were males, and 120 (43.5%) were females. Their age group ranged between 0 to 90 years with a mean age of 49.47 years, SD ±15.7. Most of them, 69 (28.6 %) aged above 60 years, and 31 (26.1 %) were in the age group of 40-49 and 60+ years. Mostly affected were males, 64 (55.1%) and 52 (44.8%) were females, P=0.76. The most commonly affected site was the parotid gland (75%), and the least affected sites were submandibular and sublingual (7.5%). Among 116 patients, malignant and benign types accounted for 76 (66%) and 40 (34%), respectively. Both benign and malignant salivary gland tumours (SGT) had male preponderance. Pleomorphic adenoma was high in males (28.1%) compared to females (25.0%); mucoepidermoid carcinoma was commonly found, accounting for 23.4% in males and 28.9% in females. More males were commonly affected, particularly the 40-49 age group, although the differences were statistically insignificant (p-value= 0.07). In conclusion, the majority of salivary gland tumours were malignant type and mucoepidermoid carcinoma being the most common histological type, while pleomorphic adenoma was the most frequently encountered benign type, and both had male preponderance, mostly seen at the age of 40 years and above. The majority of patients with malignant tumours presented late to the hospital; therefore, there is a need for advocacy for early health-seeking behaviour to the

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community and early detection of the disease by health personnel in the primary health centres.

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INTRODUCTION

The salivary glands are exocrine glands with ducts that produce saliva. Salivary glands are divided into major and minor categories. The Parotid, submandibular, and sublingual glands are major salivary glands[1]. The upper aerodigestive submucosa (palate, lip, pharynx, nasopharynx, larynx, parapharyngeal space) contains the minor salivary glands, which are dispersed throughout [1-3]. The tumours of the salivary glands represent a rare heterogeneous group of neoplasms with complex clinicopathological characteristics [4, 5]. However, they are important in head and neck pathology since their diagnosis and management are difficult and have unpredictable clinical courses. Several studies showed differences in the prevalence of these tumours, which range from 3-10% of all head and neck tumours, with an estimated annual incidence throughout the world ranging from 0.05 to 2 new cases per 100,000 population [6]. Within the salivary glands can arise different types of tumours. Studies revealed that histopathologically, these neoplasms are more complex and diverse as compared to any other body site [7]. The World Health Organization (WHO) in 1972 proposed the first histological classification of SGTs [8]. Multiple studies have been performed to describe the epidemiology of benign and malignant salivary gland tumours [5-7,10,11] Advances in the understanding of the causes and characteristics of these tumours, together with their wide morphological diversity, made World Health Organization (WHO) publish the fourth and last edition of this classification in 2017[13]. Different parts of the world differ in incidence, prevalence, age, gender, sites, and prognosis [7, 10].

There are broadly three categories of salivary gland neoplasms, which include; benign neoplasms, tumour-like conditions, and malignant neoplasms [6, 11].

Most of the SGTs (70%) arise from the parotid gland. The submandibular gland and the minor salivary glands account for 8% and 22%, respectively[11]. Eighty percent (80%) of neoplasms of parotid glands are non-malignant, while more than 50% of tumours of the submandibular gland and 60-80% of minor SGTs are malignant [12]. Pleomorphic adenomas (benign mixed tumours) are common tumours of salivary glands and are most often located in the tail of the parotid gland. The most commonly involved minor salivary

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glands are the hard palate, followed by the upper lip. These tumours are termed pleomorphic due to the reason that they are composed of epithelial and connective tissues in varying degrees. Grossly they appear as round, smooth masses with a thin, delicate, incomplete capsule. Pleomorphic adenomas account for 85% of all salivary gland neoplasms, and they are the most common benign tumours in salivary glands [12].

Albrecht first recognised Warthin tumour (i.e., papillarycystadenomalymphomatosum) in 1910 [3], and in 1929 it was described by Warthin. The tumour normally appears as a smooth, soft, parotid mass. When located in the parotid gland, it is usually well-encapsulated and contains multiple cysts. No malignant transformation has been observed to date. Normally all patients with Warthin tumour survive, and usually, it can recur in about 5% of patients. Mostly the Warthin tumour is bilateral, which accounts for 10% of cases and is commonly found in the major salivary glands [13, 14]. On the contrary, Intraductal papilloma (IDP) is a small and smooth mass that commonly affects the submucosal layer. In most cases, IDP of the minor salivary gland is uncommon [14].

The oncocytic tumour was first described by Duplay in 1875. Salivary glands' oncocytomas are very rare. These tumours very uncommonly occur in the minor salivary glands. Females are more commonly affected by this type of neoplasm than males, whereby the female-to-male ratio is 2:1. Old age is a common risk factor, and most of the patients are 50 years and above and commonly affects the superficial lobe of the parotid gland. These tumours present as small, firm, spherical and slow-growing masses[14]. Parotid glands' bilateral oncocytomas have been described, and the recurrence rate is high in situations of incomplete excision [14.]

In children, hemangiomas are the most frequently encountered SGTs, and they usually arise from the parotid gland. They have been found to involve the submandibular gland but very rarely. They are vascular tumours that are often distinguished from vascular malformations by their natural history as they present early in life; commonly, they have a rapid growth phase in children aged between one to six months, and they slowly regress between one to twelve years. Typically, patients present with a painless, unilateral, compressible mass. Macroscopically they appear as dark red, lobulated, unencapsulated masses [14]. In paediatrics, most commonly, lymphangiomas (cystic hygroma) arise in the head and neck. Its occurrence is explained by the lymphatic sequestration of primitive embryonic lymph ducts that grow and canalise irregularly. These tumours are spongy, multiloculated masses with a surface which appears yellowish or bluish and are formed by endothelial-lined spaces. It has been noted that more than 50% of these tumours manifest at birth, while 80% manifest at around two years of age. Clinically these tumours are painless masses that may involve parotid glands, submandibular glands, or both, and their diagnosis relies more on clinical findings [14].

Lipomas are another variant of tumours that are relatively not common in major salivary glands. These tumours are derived from fat cells. Their clinical appearance is soft, freely mobile, painful masses, and they are common above 50 years of age, with M: F ratio of 10:1. They are slow-growing tumours and surgery is the mainstay treatment modality [14].

Tumour-like lesions of salivary glands may easily be mistaken for malignant tumours, and they include necrotising sialo metaplasia. These lesions are commonly found on the hard palate as a single, one-sided, painless, or sometimes painful lesion. They are commonly non-malignant and heal spontaneously. They are usually encountered above 40 years of age and are more common in males than in females by 2-3 times. To date, the cause is unclear, however, studies showed a reparative process in response to ischemic necrosis of salivary tissue. A tissue biopsy can help in confirming the diagnosis and ruling out malignancy [14]

Lymphoepithelial hyperplasia (Mikulicz disease, sicca complex, chronic punctate sialadenitis) usually manifests as a diffuse enlargement of the

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whole parotid gland. The tumour may appear as an isolated mass. Lymphoepithelial hyperplasia commonly affects females as compared to males, and it is more prevalent above forty years of age. Bilateral disease is possible. The tumour commonly grows slowly, and it can present with periauricular pain[14.]

The world health organisation has classified malignant salivary gland tumours into benign epithelial tumours, malignant epithelial tumours, haematolymphoid tumours, soft tissue tumours, and secondary tumours (i.e., metastasis from a distant location)[14]

Aetiology and Associated Risk Factors

As it is in most neoplasms, the causes of SGTs are not clearly stated. The two theories which predominate are the bicellular stem cell and the multicellular theories.

Bicellular stem cell theory states that tumours arise from 1 of 2 undifferentiated stem cells: the excretory duct reserve cell or the intercalated duct reserve cell. Squamous cell and mucoepidermoid carcinomas arise from the excretory stem cells, while pleomorphic adenomas arise from intercalated stem cells, which is also similar to adenocarcinomas, oncocytomas, acinic cell carcinomas and adenoid cystic carcinomas. According to the multicellular theory, within the salivary gland unit, there is a specific differentiated cell of origin which can give rise to various tumour types. The bicellular stem cell theory is the more probable aetiology of salivary gland tumours. This theory explains more tumours with mixed discrete types of cells, like Warthin tumours and pleomorphic adenomas [15, 18].

The salivary gland unit is what describes the histological characteristic of salivary gland tumours. According to the multicellular theory of SGTs, pleomorphic adenomas arise from two types of cells named the intercalated duct cells and the myoepithelial cells, while oncolytic tumours arise from the striated duct cells. The theory also tells that acinic cell tumours probably originate from the acinar cells while the mucoepidermoid and squamous cell tumours arise from the excretory duct cells [15, 16,18].

Clinical Presentation

The clinical characteristics of a salivary gland neoplasm depend upon its specific site of origin and the extent of involvement of adjacent organs. Major salivary gland neoplasms may present with a parotid, submandibular, or sublingual gland mass, which is painless. The presence of a parotid mass together with features indicative of seventh cranial nerve paralysis, pain, ulceration, fixation to surrounding tissues and lymph node involvement commonly signify a malignant tumour [17-20].

Neoplasms arising from minor salivary glands within the oropharynx may present with a submucosal mass which is painless or an ulcer in the palate, lips, or buccal mucosa, with an appearance similar to sialometaplasia (squamous metaplasia of salivary glands) or squamous cell carcinoma. Advanced minor salivary gland tumours can present with nasal obstruction, congestion, vision changes, or trismus when present in the paranasal sinus. Advanced nasopharynx SGTs can invade the skull base, intracranial extension, or cranial nerve involvement [20].

The minor SGTs have a diverse presentation depending on the site of origin and size of the tumour. They can present as painless masses on the palate or oral cavity. Salivary gland neoplasms in the larynx can present with voice hoarseness, difficulty in swallowing or upper airway obstruction, which depends on the size of the tumour. Tumours from the nasal cavity or paranasal sinus can present with nasal obstruction or features of sinus infection. Bulging of the pharyngeal wall can result in difficulty in swallowing and muffed voice which is a characteristic of tumours of parapharyngeal space [20].

A thorough general head and neck examination is important in diagnosing these tumours. This should include ascertaining the size, mobility, involvement of nearby structures and tenderness.

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Important to note is bimanual palpation of the lateral pharyngeal wall, submandibular and sublingual areas. Skin and mucosal sites, which drain to the parotid and submandibular lymphatic, should also be assessed as the malignancies from these sites can metastasise to the salivary glands. Cervical lymph nodes should be palpated as the metastatic disease from primary salivary glands can involve the cervical lymph nodes. Cranial nerves, especially CN VII should be assessed carefully as neurological involvement may present with weakness or paralysis. Nerve infiltration can also present with seventh cranial nerve palsy, which is a feature of malignancy [20].

As part of the investigation workup, the investigation which is commonly used is fine needle aspiration cytology (FNAC). Many studies revealed FNAC sensitivity of 85% and specificity of 99% [15, 17]. However, other studies revealed less specificity and sensitivity[19]. This investigation helps in the preparation of surgery in case of malignancy concerning the type of surgery, possible complications, neck dissection, and postoperative radiotherapy [19].

Staging is done according to the Seventh Edition of the American Joint Committee on Cancer (AJCC) Cancer Staging Manual and the International Union for Cancer Control (UICC) Tumour, Nodes, Metastases (TNM) system, where the primary tumour (T) is staged according to size, extra parenchymal extension, and direct invasion. Regional lymph node involvement (N) staging depends on the size and site of the metastatic lymph nodes. M1 means there is distant metastasis. A combination of these three factors derives overall cancer staging [21].

Surgery is the mainstay of treatment for salivary gland tumours. Superficial parotidectomy with facial nerve dissection and preservation is the standard diagnostic procedure for tumours of the parotid gland. In cases of benign or small malignant tumours limited to the superficial lobe, this procedure can be therapeutic[19]. Tumours of the salivary glands form one of the most heterogeneous groups of oncological pathology. They constitute a substantial proportion of all tumours of the oro-facial region. Salivary gland neoplasms constitute 10% of all head and neck tumours.

Salivary gland tumours are among the diseases seen in the ORL and Maxillofacial departments. Salivary gland tumours in the parotid or submandibular glands usually present as an enlarging painless mass and hence raise little concern to seek medical attention. This may be associated with neurological symptoms such as facial nerve paralysis or pain if the tumour is malignant.

Patients with salivary gland tumours present late in the hospitals due to their painless presentation, and therefore treatment becomes challenging, and most of them end up with complications like facial nerve paralysis or malignant transformation of benign tumours. This is a problem that needs to be addressed for the good outcome of the treatment. Very little documented information about SGTs is available in our setting. Insufficient knowledge of the disease by the health personnel in the primary health care centres is another challenge which leads to delayed referral to higher centres that can manage the disease making most patients present in the late stage of the disease.

SGTs constitute a significant cause of morbidity in most African countries. Prognosis correlates most strongly with the clinical stage, emphasising the importance of early diagnosis. Optimal initial surgery minimises the risk of local recurrence; hence the risk of distant metastases is reduced with early diagnosis and intervention.

This study aimed to establish the prevalence of salivary gland tumours in our setting, in which little is known. The only study which was done in Tanzania was conducted in the Maxillofacial department. The knowledge on salivary gland tumours will be disseminated to health workers, and the findings of this study provided baseline data for the occurrence of salivary gland tumours among the Tanzanian population. The information obtained from this study will help in early diagnosis and referring patients to higher centres for further management. However, the

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information has also to be used to educate society on early seeking of treatment so as to reduce the deleterious effects of the tumours on society and the nation at large.

METHODS

This study was carried out at the ORL and Maxillofacial departments at a tertiary hospital in Tanzania which serves as a referral and teaching hospital.

Study Design

The study adopted a Hospital-based descriptive cross-sectional study.

Study Population

The study population included 276, both outpatients and inpatients with ORL and Maxillofacial problem(s).

Data Collection Technique

This was done by the principal investigator and the specialists working at ORL/Maxillofacial departments. Two hundred seventy-six patients who attended ORL and maxillofacial departments were screened for salivary gland tumours, and those who gave consent were recruited. Among the study participants, 116 had features suggestive of SGTs. The study period was six months.

Demographic characteristics, such as age, sex, address, phone number, symptoms, and duration, were obtained from the patient through history taking, and relevant physical examination of the head and neck was performed to determine the site and the results recorded in the questionnaire and clinical examination forms. Patients with clinical features which did not suggest salivary gland tumours were treated accordingly while those with clinical features suggesting salivary gland tumours underwent further investigations to confirm the disease and staging. Fine Needle Aspiration Cytology (FNAC) was done on all patients with SGTs and the results were received within two weeks. Tissue biopsy was taken from patients with the clinical diagnosis of salivary gland tumour who have ulcerative lesions and those the cytology results have been not confirmative and recommended tissue biopsy to obtain the histopathologic type of tumour. The tissue biopsy was taken by the principal investigator in collaboration with the specialists from both ORL and Maxillofacial clinics and wards. Histopathology reports were followed up and recorded in a questionnaire according to patients' identifications.

Data Handling and Analysis

Collected data was confidentially handled both physically and electronically by the principal researcher. The data were entered, cleaned, and the "IBM SPSS Statistics for Windows version 20 (IBM Corp., Armonk, NY, USA)" was used to analyse.

RESULTS

This study constituted 276 study population of which 156 (56.5%) were males and 120 (43.5%) were females. The age range was between 0 to 90 years with a mean age of 49.47 years, SD ±15.7. Most of them were aged above 60 years which constituted 69 (28.6 %) (*Table 1*).

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Table 1: Demographic distribution of study participants

Variable		Salivary gland tumours		
		yes	no	Total
Age group	<=19	9(7.8)	3(1.9)	12(4.3)
	20-29	12(10.3)	10(6.2)	22(8.0)
	30-39	11(9.5)	25(15.6)	36(13.0)
	40-49	31(26.7)	29(18.1)	60(21.7)
	50-59	22(19.0)	45(28.1)	67(24.3)
	60+	31(26.7)	48(30.0)	79(28.6)
Gender	Male	64(55.2)	92(57.5)	156(56.5)
	Female	52(44.8)	68(42.5)	120(43.5)
	Total	116(100)	160(100)	276(100)

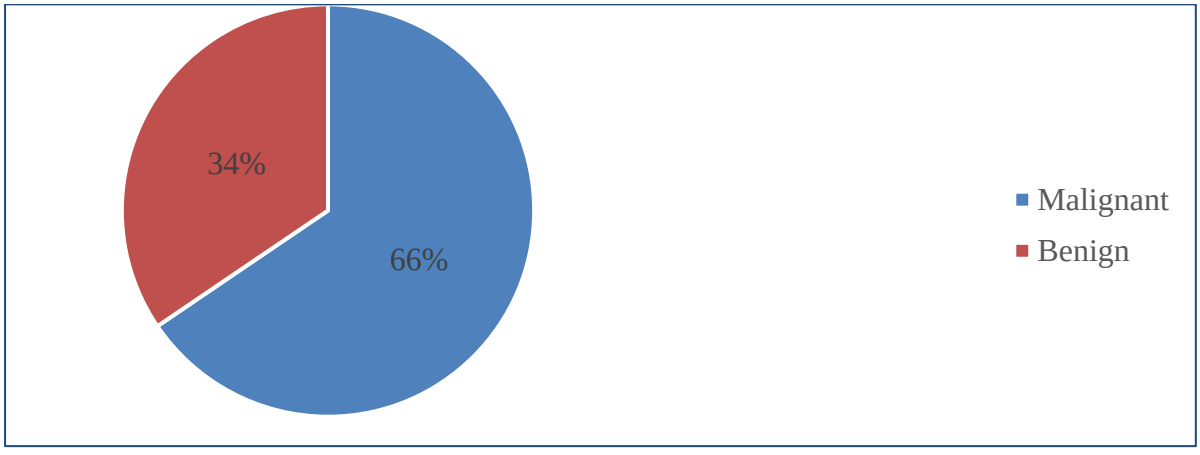
The majority of tumours (26.7%) were in the age group 40-49 and 60+ years, and the least common affected age was less than 19 years (7.8%) with a P-value of 0.02 which is statistically significant. Males were more affected, 64 (55.1%), as compared to females, 52 (44.8%), P=0.76 (*Table 2*).

Table 2: Age and sex distribution among patients with salivary gland tumours

Age	Male	Female	Total
<=19	6(9.4)	3(5.8)	9(7.8)
20-29	5(7.8)	7(13.5)	12(10.3)
30-39	5(7.8)	6(11.5)	11(9.5)
40-49	18(28.1)	13(25.0)	31(26.7)
50-59	11(17.2)	11(21.2)	22(19.0)
60+	19(29.7)	12(23.1)	31(26.7)
Total	64(100)	52(100)	116(100)

Among 116 patients with salivary gland tumours, malignant salivary accounted for 66% and benign 34% (*Figure 1*).

Figure 1: Distribution of salivary gland tumours



The parotid gland was most commonly affected by benign neoplasia, which accounted for 75% (*Figure 2*).

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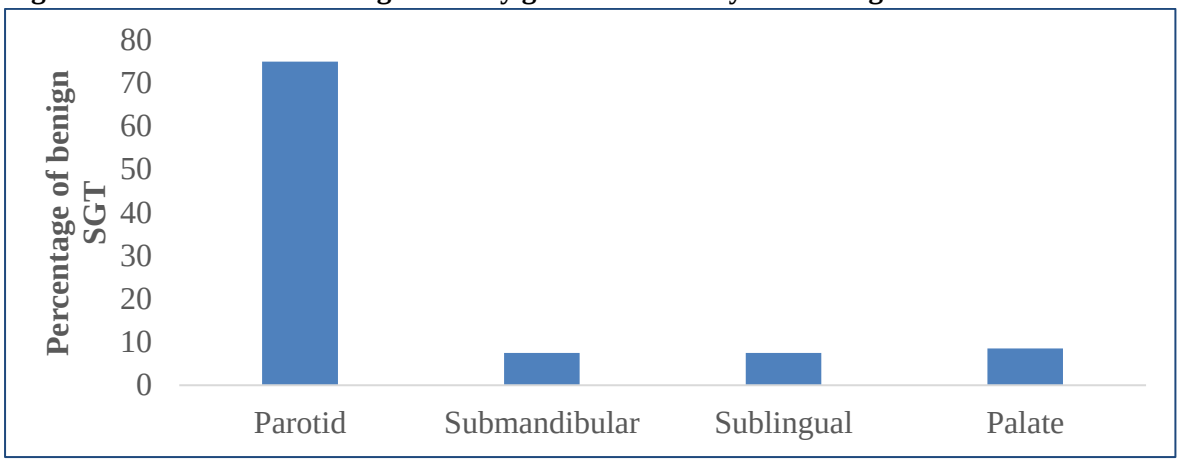
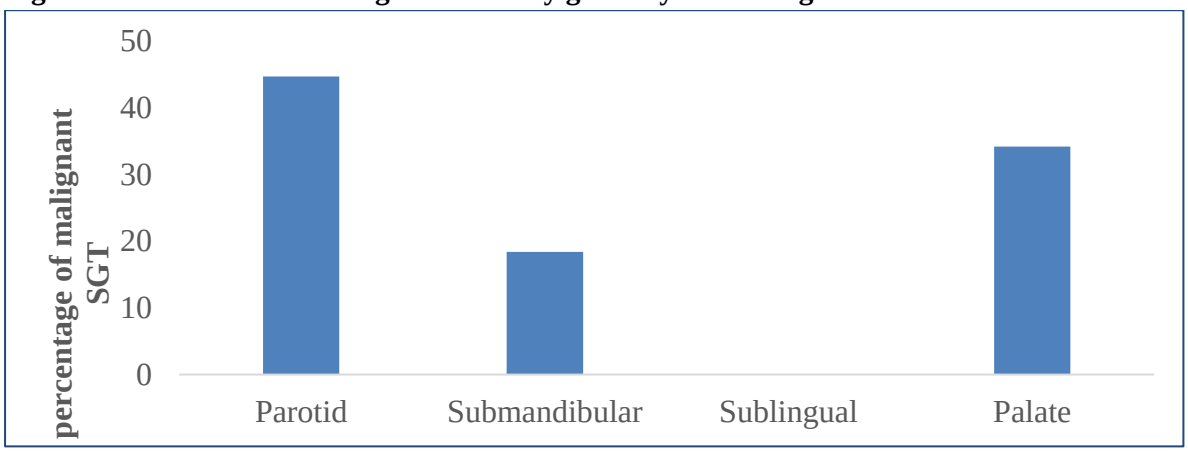
Figure 2: Distribution of Benign salivary gland tumours by site of origin



The commonly affected site by malignant SGT was the Parotid gland (44.7%) and the least affected was the submandibular 18.4% whereas the sublingual gland was not affected (*Figure 3*).

Figure 3: Distribution of malignant Salivary gland by site of origin



The most commonly encountered benign tumour was pleomorphic adenoma which was more prevalent in males (28.1%) compared to females (25.0%), and mucoepidermoid carcinoma was the most common malignant tumour (23.4%) in males and (28.9%) in females. The frequency was high in the 40-49 age group (p= 0.07) see *Table 3*.

Table 3: Histopathological types of salivary gland tumours

Histology	Gender		Age group			
	Male	Female	0-20	21-40	41-60	61+
Benign tumours						
Chronic Sialolithiasis	1(1.6	3(5.7)	0	1(1.6)	2(4.0)	1(3.5)
Myoepithelioma	2(3.1)	0	0	2(4.1)	0	0
Pleomorphic adenoma	18(28.1)	13(25.0)	5(55.6)	11	13(26.0)	2(6.9)
Warthin's tumour	1(1.6)	2(3.9)	0	0	1(2.0)	2(6.9)
Malignant tumours						
Adenocarcinoma	7(10.9)	3(5.8)	0	2(7.1)	7(14.0)	1(3.5)
Adenoidcystic carcinoma	11(17.2)	6(11.5)	3(3.3)	3(10.7)	7(14.0)	4(13.8)
Carcinoma x pleomorphic adenoma	1(1.6)	4(7.7)	0	0	3(6.0)	2(6.9)
Mocoeidermoid carcinoma	15(23.4)	15(28.9)	1(11.1)	4(14.3)	12(24.0)	13(44.8)
Squamous cell carcinoma	6(9.4)	2(3.8)	0	1(3.6)	4(8.0)	3(10.3)
Others	2(3.2)	4(7.6)	0	4(14.3)	1(2.0)	1(3.5)

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DISCUSSION

Among the 276 studied population, 156 (56.5%) were males, and 120 (43.5%) were females. The study population age ranged from 0 to 90 years with a mean age of 49.47 years, SD ±15.7. Mostly affecting the age group above 60 years which accounted for 26.7 %.

The majority of tumours (26.7%) were detected in the age group between 40-49 years and (19%) in the 50-59 years (P value 0.02), which is statistically significant. The percentage of SGT was high in age 60+ (29.7%) in males and (26.7 %) in females, followed by 40-49 (28.1%) in males and 26.7 % in females. The least common affected age was < 19 years in females. The average age for males and females was 49.48 ± 15.4 and 47.43 ± 15.3 years, respectively. Benign tumours were diagnosed at an average age of 49.47 ± 19.2 years, and malignant tumours at an average age of 49.2 ± 15.9 years The age of appearance of malignant and benign tumours were statistically different (p=0.03).

Among the studied population who were diagnosed to have SGTs, 76 (65.5%) had a malignant type, and 13(44.8%) were in the age group 60 years and above. The majority, 13 (26.0%) of those with benign type, were between 41-60 years of age. Male preponderance was noted in both types of tumours.

Males were commonly affected, whereby 64 (55.1%) of SGTs occurred in males, and 52 (44.8%) occurred in females, P=0.76. WHO and other reports [5,8,26] are in agreement that females are more affected than males, although other studies, including this study, reported increasing prevalence in males[7-11].

Mostly affected areas were major salivary glands as compared to minor glands, commonly affecting the parotid gland (59.7%), followed by palatine glands (15.5%). The majority of studies on SGTs report similar results [5, 7, 8, 11, 12, 15, 22-30].

The parotid gland was the most commonly affected site by benign SGT n=28 (41.9%), followed by the palatal and the submandibular glands. Among the 40 benign tumours, 33 (62.8%) were pleomorphic adenomas.

Among the 76 malignant tumours (n=64) were located in the parotid gland, and n=34 (59.7%) were malignant. Generally, the parotid gland was the most commonly affected (59.7%) by both benign and malignant tumours, followed by the palate (15.5%) and the submandibular glands (12.0%), respectively. The results are similar to the ones reported by Cho et al.[11]. Their study found that the parotid gland was the most commonly affected in 83.3% of the cases, while the submandibular gland was found in 17.7% of the cases. This lesion affected mostly the parotid, submandibular and minor palatal salivary glands, respectively; this finding was similar to other studies [6- 9,13,15,24].

Minor SGTs, which were located in the palate, accounted for 15.5%. Among these, eighteen were malignant, while four were benign. This finding shows that malignant neoplasms are more common than benign neoplasms in the minor salivary glands of the palate, although the difference is statistically not significant. These findings are similar to those reported in other studies [5, 6, 8, 12].

According to the histological types, the most prevalent neoplasm of SGT was the pleomorphic adenoma (62.8%), followed by mucoepidermoid carcinoma and then adenoid cystic carcinoma. Pleomorphic adenomas were found mostly in females; this finding was statistically significant (p= 0.007). Similar results have been reported by other authors [7, 8]. Only one case of Warthin tumour was found in a male patient, which is similarly reported in other studies [7-9]. Concerning mucoepidermoid carcinoma, the present series have shown a male predilection.

The second commonest tumour encountered was mucoepidermoid carcinoma which was also the most frequent malignant neoplasm, followed by adenoid cystic carcinoma and adenocarcinoma. Similar results were reported in the previous series [6, 7,10,13]. In this study, a high prevalence was seen in mucoepidermoid carcinoma, n= 30

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(39.5%), which affected all sites and mostly the parotid, followed by n=18 (23.7%) adenoid cystic carcinoma, which mostly affected the submandibular gland, n=8 (10.5%) were squamous cell carcinoma and n=4 (5.3%) were Carcinoma X pleomorphic adenoma.

Adenoid cystic carcinoma was the most prevalent SGT in males compared to females, which is contrary to several studies that show a predilection for females. Studies conducted in various parts of Africa reported the predominance of adenoid cystic carcinoma[7, 10, 29,31-38]. However, studies conducted in Iran, Brazil, Jordan, the USA[11,12,14], the United Kingdom, and Italy reported different findings whereby mucoepidermoid carcinoma was more prevalent than adenoid cystic carcinoma. A similar distribution between these two types of SGTs has been reported [6,24.] Therefore, these findings denote geographic variation in the prevalence of malignant SGTs. Other observed, benign SGT histological variants were, Warthin tumour, chronic sialolithiasis, and Myoepithelioma, and for malignant SGT SCC, Acinic cell carcinoma, Nodular KS, Myoepithelial carcinoma, Carcinoma (NOS) were observed in one or two cases.

CONCLUSION

Salivary gland tumours are rare neoplasms that arise in the major or minor salivary glands but have proven to be a public health problem that commonly affects people above forty years of age. The disorder is more prevalent among males than females with the parotid gland being commonest affected. This study revealed benign tumours to be more common than malignant tumours, whereby pleomorphic adenoma and mucoepidermoid carcinoma were the most common benign and malignant tumours encountered in this study, respectively. All minor salivary gland tumours were malignant; therefore, special attention must be taken in a situation where these glands are affected.

Recommendation

Health education to the community through social media and outreach services on symptoms of the disease and the importance of early health-seeking behaviour for early detection of the disease and proper management to avoid the deleterious effects of the disease to the patient, community, and nation at large. Health education to the health personnel in the primary health centres on early diagnosis of SGT and prompt referring patients to higher centres for further management, including early interventions.

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