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ABSTRACT

Objective: **To determine the pattern of occurrence of salivary gland tumours in Tanzania over a period of twenty years.**
Design: **Cross-sectional retrospective study.**
Setting: **Two referral centres; Muhimbili National Hospital (MNH) and Kilimanjaro Christian Medical Centre (KCMC).**
Methods: **Medical records of patients who presented with tumours of the salivary glands in the two major referral centres over a period of twenty years from 1982 to 2001 were reviewed. Data regarding demographic, clinical and histologic information was analysed.**
Results: **Salivary gland tumours constituted 6.3% of all oral-facial tumours and tumour like lesions. Among the salivary gland tumours, 54% were benign and 46% malignant, which occurred in 80 males and 53 females. Peak age was between 20 and 49 years, with a male-female ratio of 1.5:1 ($p < 0.05$). Pleomorphic adenoma was the commonest occurring tumour (44.4%) followed by adenoid cystic carcinoma (24.8%), mucoepidermoid carcinoma (9.8%) and adenocarcinoma (6.5%). Among the benign tumours, pleomorphic adenoma dominated (83.9%), followed by adenoma (9.9%). Among malignant tumours adenoid cystic carcinoma occurred in 54.3% followed by mucoepidemoid carcinoma (22.9%) and adenocarcinoma (11.4%). The parotid gland was the commonest site of occurrence followed by the palate. At initial stages the only complaint from the patients was essentially a slowly growing painless swelling. Treatment modality was mainly surgical in both benign and malignant tumours, however, for malignant tumours radiotherapy alone or in combination with surgery was sometimes employed.**
Conclusion: **On average salivary gland tumours occurred at a relatively younger age compared to that reported in Western countries. Contrary to reports from Europe and America, adenoid cystic carcinoma was the most frequently occurring malignant salivary gland tumour. Late presentation was seen as a problem that needs to be addressed in order to maximise the effectiveness of treatment.**

INTRODUCTION

Tumours of the salivary glands form one of the most heterogeneous groups of oncological pathology(1). They constitute a substantial proportion of all tumours of the oro-facial region(2-5). Head and neck tumours represent approximately 5% of human neoplasms, and out of these, salivary gland neoplasms constitute 10%(4,6). The 1972 World Health Organisation (WHO) classification of salivary gland tumours was revised in 1992 and re-categorised several of the salivary gland tumours(7,8). However, the heterogeneous nature of salivary gland tumours still makes it difficult to classify them accurately.

Between 74% and 80% of major salivary gland tumours are benign, pleomorphic adenoma being the commonest, and the most frequently affected gland is the parotid(4,9-12). Majority of malignant salivary gland tumours are also found in the parotid gland with reported relative frequencies of between 28.1% and 57.5%, followed by palatal salivary glands which represents between 17.7% and 22.6%(13,14). In a study done in Kenya salivary gland tumours formed 20.2% of all tumours and tumour-like lesions of the oro-facial region(2). Arotiba found 32.1% of salivary gland tumours located in the parotid gland, 24.9% in the palate and 19.4% in the sub-mandibular gland(15). In two different studies of intra-oral minor salivary gland tumours in Brazil between 62% and 65% were benign and 34% to 38% malignant (16,17). The palate has been found to be the most common site of minor salivary gland tumours followed by the buccal mucosa and upper lip (16-18). Multiple salivary gland tumours rarely occur (19).

The majority of patients with benign salivary gland tumours are aged between 40 and 59 years(17,20,21). However, malignant salivary gland tumours most often tend to occur in patients above 50 years of age with males more frequently affected than females (2,21-23). There have been reports suggesting a difference in the pattern of occurrence of these tumours in Africans compared to

Americans and Europeans(24). The mean age of patients with salivary gland tumours from Africa has been reported to be lower compared to that reported in Europe and America(25). Similarly, regarding malignant salivary gland tumours, while European and American reports show the mucoepidermoid carcinoma to occur with the highest relative frequency, African and Asian studies have reported adenoid cystic carcinoma to be commonest(2,16-20,26-28). Little information exists on the possible aetiology of salivary gland tumours.

Salivary gland tumours are basically treated by surgery. Due to their behaviour, malignant salivary gland tumours pose a big challenge in treatment. Local invasion increases the possibility of leaving behind islands of the tumour during surgery and hence leading to recurrences.

No study, so far, has been carried out on the occurrence of salivary gland tumours in Tanzania. Therefore, the aim of the present study was to analyse the pattern of occurrence of salivary gland tumours in Tanzania and to compare the findings with those available from elsewhere.

MATERIALS AND METHODS

Medical records of patients with salivary gland tumours from the two main referral centres, Muhimbili National Hospital (MNH) and the Kilimanjaro Christian Medical Centre (KCMC) for twenty years, from January 1982 to December 2001, were scrutinised. The data used in this study was obtained from the patient's files and histopathology reports. Information on demographic, clinical and histological information i.e. age, sex, presenting symptoms, duration, site and histologic type of tumour, were obtained from the patient's files and histopathology reports. Only patients with tumours that were histologicaly proven to be salivary gland neoplasms were included in this study. In categorisation of these tumours efforts were made to closely adhere to the revised WHO (1992) classification of salivary gland tumours(7).

RESULTS

There were a total of 2435 tumours and tumour-like lesions of the oro-facial region, out of which 153 (6.3%) were of salivary gland origin. Among the salivary gland tumours reviewed, there were 54% benign and 46% malignant tumours which occurred in 80 males and 53 females, affecting almost all age groups. The peak age of occurrence was between 20 and 49 years with a mean of 42.4 years. The tumours were rarely found below twenty years of age and only one patient was below the age of 10 years. The male to female ratio was l.5:1 ($p< 0.05$).

Pleomorphic adenoma was the most commonly occurring tumour (44.4%) followed by adenoid cystic carcinoma (24.8%) (Table 1). Among the benign tumours pleomorphic adenoma occurred in 83.9% of the patients followed by adenoma at 9.9% (Table 3). Among malignant tumours adenoid cystic carcinoma dominated (54.3%) followed by mucoepidermoid carcinoma at 22.9% (Table 4). The parotid gland was the commonest site of occurrence for both benign and malignant salivary gland tumours (34.6% and 30.4% respectively), followed by the palate (23.5% and 24.6% for benign and malignant respectively). The commonest presenting clinical feature was that of a slowly growing painless swelling. Pain and ulceration was reported in few of the patients, especially those with malignant lesions.

A small number of tumours (0.74%), although diagnosed as salivary gland neoplasms, were not specified.

Table 1

Relative frequency of salivary gland tumours

Tumour	Relative Frequency	
	No.	%
Pleomorphic adenoma	68	44.4
Adenocystic carcinoma	38	24.8
Mucoepidermoid carcinoma	15	9.8
Adenocarcinoma	10	6.5
Adenoma	8	5.2
Acinic cell carcinoma	5	3.3
Monomorphic adenoma	3	2.0
Adenolymphoma	2	1.3
Carcinoma parotid gland	2	1.3
Mucoepitheloid Carcinoma	1	0.7
Unspecified	1	0.7
Total	153	100

Table 2

Distribution of salivary gland tumours by age and sex

Tumour	Age and Sex														
	0-9		10-19		20-29		30-39		40-49		50-59		60		UK
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	UK
Pleomorp. adenoma	0	0	3	3	3	10	10	5	8	2	6	2	6	1	9
Adenoid cystic carcinoma	0	0	0	0	2	2	3	1	5	1	4	2	7	6	5
Mucoepidermoid carcinoma	0	0	0	0	2	0	0	1	2	1	2	0	1	3	3
Adeno carcinoma	0	0	0	0	0	0	2	1	1	0	2	0	0	2	2
Adenoma	0	1	1	1	2	0	1	0	0	1	0	0	0	1	0
Acinic Parotid Gland carcinoma	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0
Mucoepith. carcinoma	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Adenolymph	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0

Table 3

Distribution of benign salivary gland tumours by site

Tumour	Site							
	Parotid	S/man dib.	Palate	Lip	Other intraoral	Unknown	Total	%
Pleomor Aden.	26	5	17	4	10	6	68	84.0
Adenoma	1	3	1	1	1	1	8	9.7
Monomor Aden.	0	0	0	2	0	1	3	3.7
Adenolymphoma	1	0	1	0	0	0	2	2.5
Total	28	8	19	7	11	8	81	100

Table 4

Distribution of malignant salivary gland tumours by site

Tumour	Site							
	Parotid	S/man dib.	Palate	Lip	Other intraoral	Unknown	Total	%
Adenoidcystic carcinoma	14	3	9	2	2	8	38	54.3
Mucoepidermoid carcinoma	4	2	5	1	2	2	16	22.9
Adeno carcinoma	1	0	2	0	3	2	8	11.4
Acin cell carcinoma	1	1	1	0	2	0	5	7.1
Mucoepith carcinoma	0	0	0	0	0	1	1	1.4
Ca parotid	2	0	0	0	0	0	2	2.9
Total	22	6	17	3	9	13	70	100

DISCUSSION

Majority of the patients who needed histopathology services during the period under study were referred to one of the two medical centres covered in this study. Only few other hospitals especially those run by religious organisations send their specimens abroad. However, in such cases, the patients would ultimately be referred for management at the MNH, which is the only centre in the whole country with specialised oral and maxillofacial surgery services. Therefore, the data from these two centres are, to a large extent, representative of the entire Tanzanian population. One of the drawbacks was the absence of some of the patient's files which, meant that the only information that could be obtained for these cases was that on the histopathology reports.

Salivary gland tumours occurred with a relative frequency of 6.3% out of all other tumours and tumour-like lesions in the oro-facial region, which is in agreement with several other studies (4,6). However, this is in contrast to findings from Kenya where they were seen to occur with a higher relative frequency (2).

There were significantly more males than females with salivary gland tumours with a male female ratio of 1.5:1. This is in agreement with some reports (18,25) but also, is in disagreement with others who have found either an equal distribution or a higher female-male ratio (4,13, 17,20). Similarly, the mean age of occurrence of salivary gland tumours as seen in this study (42.4 years) was comparatively lower than reported from elsewhere (4,10,14,19). These findings suggest a possible wide variation in the presentation of salivary gland tumours in different populations. Apparently, in the present medical record keeping policy in Tanzania the tribes of individuals are not shown on the treatment file. This precluded the possibility of accurately extracting information regarding any tribal predilection. Often patients register under addresses of the relatives they stay with while temporarily in the city for treatment. Therefore, the use of such addresses to allocate patients to different tribes they belong to could lead to a false impression that the majority of the patients originated from the two regions where the referral centres are located.

Pleomorphic adenoma was the commonest encountered salivary gland tumour, comprising 44.4% of the total, followed by the adenoid cystic carcinoma (24.8%) and mucoepidermoid carcinoma (9.8%) (Table 1). Other authors have reported a higher relative frequency of pleomorphic adenoma (60-80%) and found the mucoepidermoid carcinoma to be the most frequently occurring malignant tumour of the salivary glands (16,19). Our findings are in keeping with several other African and Asian studies in which the adenoid cystic carcinoma was second in frequency to pleomorphic adenoma albeit at different percentages (2,12,18,25,27).

The distribution of salivary gland tumours by site as seen in this study (Table 2) is in keeping with that reported in other studies (13,14). Pleomorphic adenoma constituted the majority of the tumours at all sites. Altogether, 39.3% of the tumours were found in the major salivary glands with a majority in the parotid. Studies from other parts in the African continent have shown that pleomorphic adenoma account for 40-63% of all parotid gland tumours (3,25-27,30-32). Our results differ with several other studies that reported that about 90% of the tumours were located in the major salivary glands (6,33,34).

Pleomorphic adenoma is a tumour that grows slowly, and, except for increase in size, usually presents no symptoms. The absence of symptoms results in patients presenting late to the hospital especially when the tumours have attained a size that may lead to social pressure from family members or the community. To the contrary, adenoid cystic carcinoma often presents with pain and may produce some neurological symptoms. This tumour, which was the most commonly encountered malignancy of the salivary glands, has more often than occasionally an aggressive biologic behaviour (35). Its relative frequency as seen in this study is high compared to other studies (16,19). This can be explained by the fact that in Tanzania, patients tend to go to hospital only when they have incapacitating symptoms.

Adenocarcinoma constituted only 6% of all the tumours. All the three subtypes of adenocarcinoma, low grade adenocarcinoma, papillary cystadenocarcinoma and adenocarcinoma, (WHO 1992) were grouped together and reported just as adenocarcinoma(8). All of them were located in intraoral sites.

Adenoma constituted about 3.7% of all the tumours. Although the clinical relevance of the new sub typing of the adenomas is somewhat questionable it is believed that a more detailed histologic typing may lead to a better prediction of the prognosis. Acinic cell carcinoma, one of the fairly rare tumours constituted approximately 2.2% of all the salivary gland tumours. It was found only in the parotid glands in patients aged over 50 years. Occasionally this tumour, which is invariably invasive in growth, can be found in the sublingual salivary gland and in some of the minor glands(36).

Monomorphic adenoma constituted only 1.5% of all salivary gland tumours. This essentially benign tumour in most instances did not present any symptoms. Monomorphic adenoma differs from pleomorphic adenoma in its clinical and pathological features(37). There are three subclasses of monomorphic adenoma; adenolymphoma, oxyphilic and other types which includes the basal cell adenoma as one specific type(7). In as much as further detailed histological description was not given, we could not report whether the exceedingly rare monomorphic adenomas like Warthin's tumour and myoepithelioma were among those reported(16,38).

Only one case of carcinoma (0.74%) of the parotid gland was seen. This was an advanced tumour with ulceration and neurological symptoms that included facial nerve paralysis

Figure 1

A patient with carcinoma of the parotid gland who presented with ulceration and facial paralysis

It is not clear whether it was a primary tumour or a metastasis to the gland. In studies conducted elsewhere carcinomas of salivary glands constituted between 5 and 30% of all malignant tumours of salivary glands (23,38,39). The low frequency of carcinoma as seen in this study may be attributed to the fact that sometimes the clinicians did not specify the site of the biopsies. This might have led to some of the carcinomas being reported without indicating their origin, in which case, it remained oblivious whether they were or were not of salivary gland origin.

Age has been associated with the occurrence of salivary gland tumours(4). In this study there were few patients who admitted to the use of different forms of tobacco. However, separate analyses of major and minor salivary gland tumours and benign and malignant tumours did not reveal evidence of association of occurrence with the use of tobacco.

Surgery was basically the treatment offered for both benign and malignant lesions. In malignant cases surgery in combination with radiotherapy was sometimes applied and in patients presenting late with inoperable tumours, radiotherapy only was used for palliative purposes. Early diagnosis and expeditious surgery can reduce morbidity recurrences and indeed improve the treatment outcome.

We conclude that, the pattern of occurrence of salivary gland tumours did not differ much from those from other African studies as regards age of occurrence, location and relative frequency. However, it differed with findings from Western countries with relation to mean age of patients and the frequency of occurrence of the two malignant conditions; adenoid cystic carcinoma and mucoepidermoid carcinoma. We recommend a prospective study in order to get more accurate epidemiological figures on the incidence and presentation of salivary gland tumours in Tanzania.

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