Original Article

Salivary Gland Diseases: Analysis of Patients Attended at Dow Lab Karachi

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ABSTRACT

Objective: The aim of this study is to describe demographic characteristic of 103 cases of major and minor salivary glands diagnosed at DDRRL (Dow lab Diagnostic reference and research laboratory) OJHA campus, DUHS Karachi.

Study Design: Observational Study.

Place and Duration of Study: This study was conducted at Dow University of Health Sciences Ojha Campus, Karachi from January 2009 to April 2011.

Materials and Methods: Salivary gland diseases are uncommon and include diseases which affect both major and minor salivary gland. They consist of a group of heterogeneous lesions with complex clinicopathological characteristics and distinct biologic behavior. Epidemiological data of these diseases in the various parts of the world can be helpful for a better understanding of its biology and clinical characteristics.

Clinical and histopathological data of all patients with salivary gland diseases are retrospectively analyzed and described.

Results: In this study, 103 cases of salivary gland diseases be analyzed, out of all cases 31 were infections, 50 were benign neoplasms, and 22 were malignant neoplasms. Majority of the cases occurred in parotid gland followed by submandibular and minor salivary glands. Infections are common between the ages between 10-35 years and peak incidence in 30 years. Benign tumors are common between 20-25 years and 40-50 years and with a peak incidence in 40 years. Tumor affected more commonly the adult patients with peak incidence between 35-65 years and peak incidence in 50 years with slight predominance in females. Pleomorphic adenoma is the most frequent finding followed by sialadenitis and squamous cell carcinoma.

Conclusion: Patients with salivary gland diseases are mainly adults with marginally more female patients. Most commonly found infections are sialadenitis involving sub mandibular gland in majority of cases. Benign tumors are more frequent then malignant ones. Pleomorphic adenoma is the commonest benign tumor and squamous cell carcinoma is the commonest malignant neoplasm. Both benign and malignant tumors involve parotid gland commonly.

Key words: Salivary Gland Disease, Sialadenitis, Submandibular Gland, Pleomorphic adenoma, Sqaumous Cell Corcinoma.

INTRODUCTION

A variety of systemic diseases, as well as a number of pathological conditions affects human salivary glands as their primary target. [1] The non-neoplastic salivary gland diseases[2]
represent a diverse group of disorders which affect both the major and minor
salivary glands. [2]

Salivary gland tumors are relatively uncommon. [3]Their clinical importance, however, far outweighs their relatively low frequency,

The mean age of patients with salivary gland tumors is 45 years, peaking in the sixth and seventh decades of life.[4]Benign salivary gland tumors occur more frequently in females, while malignant tumors are slightly more frequent in males.[4] The parotid gland is the most frequent site – about 70% of cases[4] About 80% of parotid tumors are benign, the most common being the pleomorphic adenoma (60% of parotid tumors), followed by Warthin's tumor (10% of parotid tumors). [4] The most common salivary gland malignancy is the squamous cell carcinoma which involves mostly the parotid gland, followed by the minor, submandibular and sublingual salivary glands.[4] The cystic adenoid carcinoma and mucoepidermoid carcinoma are the second most frequent malignancies in this area.

The main symptom in patients with parotid neoplasms is a lump in the parotid area. Other symptoms such as pain, facial palsy and skin ulcers may manifest in malignant cases. [4]

Worldwide epidemiological series show geographic variation in the relative incidence of salivary gland tumors, with discrepancies among clinicopathological aspects. [6]Salivary gland tumors are complex neoplasms, due to their broad histological spectrum resulting from multiple tumor cell differentiation.[6]

The purpose of this study was to find out all salivary gland diseases including infectious lesions, benign lesions and cancerous proliferation.And to describe the demographic characteristics of 103 cases over a period

of 2 years and compare these data with other epidemiological studies.

MATERIALS AND METHODS

Data is being collected from the Files of the Dow University of Health Sciences Ojha Campus for a 3 year period (January 2009- april2011). All salivary gland disease including infections, benign neoplasms and malignant neoplasms in both sexes, in all age groups are selected in the study.

This is a retrospective study, in which different clinicopathological variables are analyzed including age, gender, location, histological type and lesion type.

All cases are classified according to criteria suggested by 1991 world health organization histological classification. [7]All salivary gland diseases including infections, benign tumors and malignant neoplasms in both sex and in all age groups are selected.

Cases are excluded when the patients files are not located or when information is lacking in the file.Statistical analysis is carried out using SPSS version 16. Descriptive and cross tabs are used to analyze the variables. And then Meta analysis is done among different studies. For associations chi-square test is used. Level of significance was set at 5 %($p<0.05$).

RESULTS

The study sample consists of 103 cases with necessary information for analysis. There are 31 infections (30.1%), 50 benign tumors (48.5%), and 22 were malignant tumors (21.4%). Mean age is 37.99 and there are marginally more females in the sample. Parotid gland in involve in majority of cases.

Infections are common between the ages of 10-35 years and also at the age of 50 years with peak incidence in 30 years. Infections are more common in submandibular glands including 23(74.19%) cases, affecting male patients most commonly. The most frequent infections are sialadenitis, about 18 (58.06%) cases, occurring mostly in submandibular gland 15 cases (83.34%) followed by parotid gland 3 cases (16.64%). Male to female ratio is 1.2:1. Then it is Followed by tuberculosis 6 (19.35%) cases, occurring in sub mandibular gland only and affect female patients in majority of cases. We also find single case each of ranula at age 35 years in a female patient, extravasation Mucocele in a boy of 10 years, reactive lymph adenitis all in minor salivary glands and three cystic lesions in parotid, submandibular and minor salivary glands. Sub lingual gland is not involved in any infection of salivary gland.

In this study we found 50 cases (48.5%) of benign neoplasms. Patient age varies from 20 to 25 years and 40-50 years and peak incidence in 40 years of age for benign neoplasms and it increases significantly in the transition from benign to malignant. Male to female ratio is 0.8:1. Most frequent benign tumors are the pleomorphic adenoma 40 cases (80%), followed by warthin's tumor 4 cases (8%). We also found 2 cases of lipoma and hemangiona and one case each of chondroidsyringoma and lymphangioma. Majority cases are found in the parotid gland 34 cases (68%) followed by submandibular gland 11cases (22%) and minor salivary glands 5 cases (10%). Peak incidence is in the second and fourth decade. Sub lingual gland is not involved in any benign neoplasm.

Table No.1: Distribution of salivary gland diseases according to site, gender and age in 103 cases

	Parotid salivary	Sub-mandibular salivary gland	Minor salivary gland	Gender		Age range	Percent
				Male	Female		
Tumor type							
Infections	4	23	4	17	14	10-52 years.	30.1%
Benign tumors	34	11	5	22	28	15-70 years	48.5%
malignant	17	1	4	9	13	20-70 years	21.4%
Histological type							
sialadenitis	3	15	-	12	6	10-52 years	58.06%
tuberculosis	-	6	-	1	5	10-50 years	19.35%
Pleomorphic adenoma	29	9	2	15	25	15-65 years	80%
Warthin's tumor	3	1	-	3	1	47-70 years	8%
Adenoid cystic carcinoma	4	-	3	4	3	36-70 years	31.8%
Mucoepidermoid carcinoma	7	-	-	1	6	20-56 years	31.8%
Squamous cell carcinoma	6	-	1	3	4	35-65 years	31.8%

We found 22 cases of malignant neoplasms in the salivary gland diseases. Male to female ratio is 0.7:1. They are more common between 35-65 years of age and peak incidence in 50 years.Among them the most common malignant tumors include squamous cell carcinoma, mucoepidermoid carcinoma and adenoid cystic carcinoma all with equal frequency of 7 cases (31.8%) each. We also found one case of invasive salivary gland carcinoma. Commonly involved gland is parotid having 17 cases (77.27%), followed by minor salivary gland 4 cases (18.18%) and only one case is found in submandibular salivary gland. Sub lingual salivary gland in not involved in any salivary gland malignancy.

Table No.2: Comparisons of Representative Percentages of Epithelial Salivary Gland tumors of worldwide series.

Tumor Type	Present Study	Study By Brazil2009	Ito et al.[10] Brazil 2005	Vargas et al. [9] Brazil 2002	Li et al.[14] China 2008	Ansari et al.[3] Iran 2007
benign	48.5	78.3	67.5	80	59.8	68.4
malignant	21.4	21.7	32.5	20	40.2	31.6
Gender.						
Male	46.6	39	41.5	40	47.3	41
Female	53.4	61	58.5	60	52.7	59
Age	4	4	5	4	4	5
location						
Parotid	53.4	68.5	67.7	71	61.4	63
Sub mandibular gland	34	15.5	9.5	24	10.8	23
Minor salivary gland	12.6	14.5	22.8	5	26.4	14
Histological type.						
Pleomorphic adenoma	80	67.8	54.2	67.7	51.3	65.4
Warthin's tumor	8	6.3	8.5	10.5	4.4	0
Adenoid cystic carcinoma	31.8	6.5	7.9	4	7.3	2.3
Mucoepidermoid carcinoma	31.8	4.8	13.5	10.4	7.6	11.5

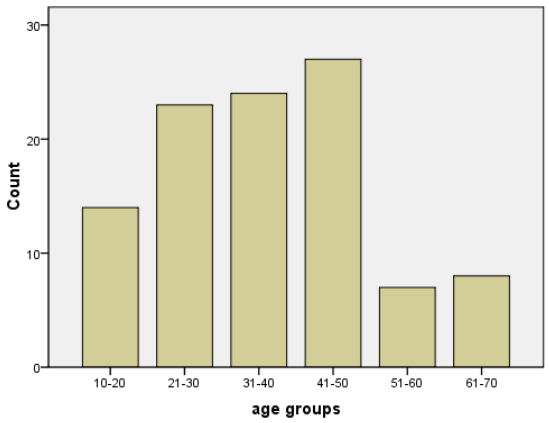

Figure No.1: Distribution of salivary gland diseases into different age groups.

are infections, 50(48.5%) are benign tumors and 22(21.4%)

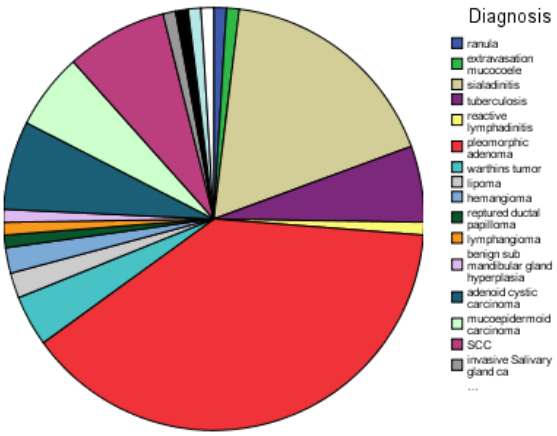

Figure No.2: Different Salivary Gland Diseases.

DISCUSSION

Salivary glands tumors are specific in the oral and maxillofacial region, and account for about 5% of all the tumors in this region.(8) In our present review of 103 cases of salivary gland diseases, 31(30.1%) cases are malignant tumors. Ratio of benign to malignant is 1.43:1 in this study, similar results also found in another study conducted in china by Li et al to be 1.49:1. The ratios from previous similar studies in other continent ranged from 1.18:1 in Africa to 5.62:1 in

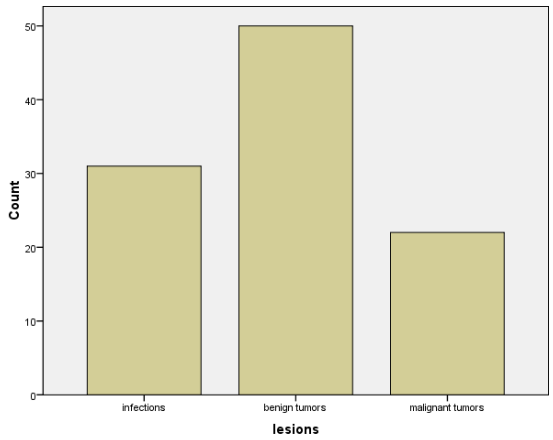

Figure No.3: Distribution of Salivary Gland Diseases into infection, benign and malignant lesions.

Europe. [8] In one study conducted by Wang et al, in 2007 there were more malignant tumors compared to benign.

In our study Salivary gland tumors more often affected women, with an overall male: female ratio of 1:1.7, and a male: female ratio of 1:1.6 for benign tumors and 1:1.7 for malignant tumors. Similarly, other previous studies describe a male: female ratio varying from 1:1.2 to1:3. [4, 5, 6, 8and13] However, some previous authors reported predominance for men with a male: female ratio of 1.4:1. [7] Women were predominantly affected in almost all histologic types except Warthin's tumors in which males are most commonly affected. [5] In our study also more males are affected then females by warthin's tumor three out of four cases occurred in males. Some studies have reported male predominance in benign tumors [7] and/or malignant tumors. [6]

In the present study, age distribution for the benign salivary gland tumors varied from 15-70 years-old, with common age of occurrences between 20-25 years and 40-50 years and a peak in 40 years of age. The common age of occurance for malignant tumors in this study is between 35-65 years, with a peak in 50 years, is significantly higher than for benign tumors (40 years). The peak incidence for benign tumors was in the second and fourth decade of life, while for malignant tumors, it was in the fourth and fifth decade, similar distribution for benign tumors is also found in previous studies [6, 8]. In other previous studies they found peak incidence of benign tumors in the 6th and 7th decade and malignant in the 7th, 8th and 9th decade. [5] One another previous study shows a peak incidence of malignant tumors in the seventh decade. [6, 8] As in our study also like all the previous studies mean age is higher for malignant then for benign and more females are affected by benign lesion then malignant. [4, 5, 6, 8]

Sialadenitis is most common infection and it mostly occurs in submandibular gland followed by parotid salivary gland. Males are affected more than females with a ratio of 2:1 and it has an age distribution from 10-50 years with peak incidence in the third decade and a mean age of 30 years. Most commonly sub mandibular gland is involved in all infections of salivary glands in our study.

The majority of salivary gland lesions in our study are located in the parotid gland (53.4%) followed by submandibular gland (34%) and minor salivary glands (12.6%). All previous large series of salivary gland tumors showed similar results though few other epidemiological studies showed a predominance of more than 60% for benign tumors [4-6, 8, 13]. Also in the previous studies parotid gland is followed by minor salivary gland and then submandibular salivary glands. [5,8]

Worldwide studies show geographic variation in the relative incidence of salivary glandtumors with differences in histological type. [6]

No case was identified in the sublingual gland in our study also, as mentioned in other studies. [3, 4, 5, 6, 12, and13] This confirms the rarity of salivary gland diseases at this site.

The second most common lesion site was the submandibular gland in our study, although some authors reported the minor salivary glands in second place after the parotid gland [5, 8]

Discrepancies in the frequency of salivary gland tumors in the submandibular gland and minor salivary glands is observed among other series varying from 9.5 to 24.3% and 3 to 31.4%, respectively [5].

Pleomorphic adenoma is the most common histological type in our study, corresponding to 68.4% of all salivary gland tumors and 86.7% of benign tumors. Predominance of pleomorphic adenoma was reported in other previous series also. [3, 4, 5, 6, 8, 12, 13]

Warthin's tumor is the second most common of benign salivary gland tumors involving 8% of cases with majority in parotid gland in our study as has also been observed in some Brazilian studies [6] while in another previous study they found it the third most common [5] tumor involving 6.4% of cases, with most of them located in the parotid gland (94.7%).

Malignant tumors represented 21.4% of all salivary gland tumors in our study. The most frequent in our study was squamous cell carcinoma, mucoepidermoid carcinoma and adenoid cystic carcinoma. Findings reported by some investigators shows adenoid cystic carcinoma to be the most common type [6], other studies reported mucoepidermoid carcinoma to be the most common malignant tumor[8, 5, 4].

Squamous cell carcinoma, Adenoid cystic carcinoma and Mucoepidermoid also show same distribution about 31 % in our study. All of these malignant tumors are located in parotid and minor salivary glands. Adenoid cystic carcinoma and squamous cell carcinoma are

found more in males while mucoepidermoid carcinoma is found more in females.

In our study, epidemiological data is compared with other worldwide series regarding the distribution of salivary gland tumors.

CONCLUSION

Women and the parotid gland are most affected in salivary gland diseases. Sialadenitis and pleomorphic adenoma are frequently involved lesion, followed by squamous cell carcinoma, adenoid cystic carcinoma and mucoepidermoid carcinoma. Infections are commonly found in sub mandibular salivary gland. Benign tumors are more common then malignant and they occur in younger age and females while malignant tumors involve elderly age and are more common in males.

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