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DESCRIPTIVE EPIDEMIOLOGY OF SALIVARY GLAND TUMORS IN GENERAL HOSPITALS OF LAHORE, PAKISTAN

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Abstract

Background: Salivary gland tumors are relatively rare when compared with other oral neoplasms and morphologically diverse group of lesions. This study aimed to determine the demographic findings and distribution of salivary gland neoplasms. A relatively large group of patients was selected from different general hospitals of Lahore, Pakistan. Materials and Methods: A retrospective cross-sectional study was performed to diagnose the prevalence of both benign and malignant tumors. Primary epithelial SGT (n=76) cases are included in 5 years from 2013-2017. The data was collected from previously designed questionnaires. Result: The general features of the relevant salivary gland tumors were analyzed in the first section. Out of (n=74) cases, (n=47) were males and (n=29) were females. The mean age at the time of diagnosis was about 41 years. Overall, these tumors were seen more frequently in males than in females. The more common site is Parotid glands. The most frequent tumor is pleomorphic adenoma and most prevalent malignant tumor is adenoid cystic carcinoma.

Keywords: *Benign tumors, Malignant tumors, Neoplasm, Parotid glands, Salivary gland tumors, Submandibular glands*

INTRODUCTION

Salivary gland tumors are heterogeneous group of neoplasms, relatively uncommon, comprising 3-6% of all head and neck tumors (1). The incidence of most benign salivary glands tumors ranges from 0.4 to 13.5 cases per 100,000 Population (2). Salivary gland tissues are present in the upper aero digestive tract (3). The parotid, submandibular, and sublingual glands are the major salivary glands. Minor glands are present in many sites, such as the tonsils, gingiva, cheek, lips, tongue, oropharynx, Para nasal sinuses, and Para pharyngeal space as upper aero digestive tract. They may arise at any age but more predilections towards 5th -7th decades having predominance with females (4). Major salivary gland tumors are more common than minor one's accounting 90% occurring in parotid, 10% in submandibular while sublingual gland tumors are very rare(5,6). Benign and malignant ratio is mostly about 1:2 in 2010 in Brazilian population but earlier years included in study shows less ratio between these two, having benign more and malignant less (7). North and Latin American countries have reported benign as dominant tumors (8). The site, patient age, and sex distributions of different types of salivary gland tumors vary with race and geographic location. The

incidence of these tumors is different in between geographic areas and ethnic groups (9-11). In Pakistani literature, there are too little reports on salivary gland tumors. Therefore, this paper presents epidemiological data, relative frequency, age and sex predilection, and site of salivary gland tumors from general hospitals of Lahore, Pakistan. Moreover, this work presents an inventory of the contemporaneous state with regards of SGTs as well.

MATERIALS AND METHODS

STUDY AREA

The present study was conducted during January 2013 to April 2017, in general hospitals of Lahore, Pakistan.

STUDY DESIGN AND SAMPLING METHOD

A retrospective chart review of all patients treated or underwent operations in the Maxillofacial Surgery departments of general hospitals in Lahore between January 2013 to April 2017 was conducted. The institutional review boards waived the need of patients consent all personal information of patients remained confidential. Information including age, gender, residence of patients, anatomical location of the tumors and histological pattern was collected from the patients' hospital record. Patients meeting any of the following criteria were excluded from the study: lymphomas, tumor like lesions (cysts, chronic inflammations, metaplasia, and Masson's tumor), secondary tumors, tumors from lacrimal gland and metastasized tumors. Random sampling technique was used to include patients in the study. Only those patients were included in the study that was found to be potential cases of salivary gland on diagnostic test used in the study.

DIAGNOSIS

Hematoxylin and eosinophil-stained slides were retrieved and re-examined. Hematoxylin and Eosin stains are used in many areas of the histology laboratory, including frozen sections, fine needle aspirates, and paraffin fixed embedded tissues. To better understand what makes a well-stained slide, it is important to understand the components of the stain. Hematoxylin is used to illustrate nuclear detail in cells and is a reasonably simple dye to make. Oxidation of the hematoxylin produces hematein, which is the actual dye used in an H&E stain. Addition of the mordant improves the ability of the hematein to attach to the anionic (negatively charged) components of the tissues. Immunohistochemistry was done wherever needed. Tumors from lacrimal glands were excluded.

STATISTICAL ANALYSIS

The data was collected on a predesigned questionnaire. Data was entered into excel spread sheet. The data was analyzed through SPSS version 20.0. Chi square test was used to measure the potential association between different categorical variables studied at a significance level of 95% confidence interval. Data analysis included the age, gender, site of tumor and histologic pattern.

RESULTS

During the five years period from January 2013 to April 2017, (n=75) cases of salivary gland tumors were diagnosed at pathology reference labs of general hospitals Lahore. Depending upon histopathological reports and out of (n=75) cases, (n=31, 41%) were benign and (n=45, 59%) were malignant. That is contrary to many studies because most of studies respond it as higher benign to malignant ratio but in this present study (9). Table I shows the sex and age distribution according to different age groups.

Table II shows relative frequency of different subtypes of salivary gland tumors accounting total (n=31) cases, such as adenoid cystic carcinoma accounting for (n=25) cases, mucoepidermoid carcinoma (n=17) and malignant acinic cell carcinoma (n=3) cases. These are contributing respectively 41%, 32.8%, 22.3% and 4% as shown in table II.

Table I. Age of patients and gender of patient cross tabulation

Age of patients	Gender of Patient		Total
	Male	Female	
15-25 years	11	5	16
26-35 years	7	3	10
36-45 years	11	8	19
46-55 years	5	3	8
56-65 years	10	5	15
66-75 years	2	5	7
76-85 years	1	0	1
Total	**47**	**29**	**76**

Table II. Relative frequency of different Subtypes of SGTS

Tumor description	Number
Pleomorphic Adenoma	31
Adenoid Cystic Carcinoma	25
Mucoepidermoid Carcinoma	17
Malignant Acini Cell Carcinoma	3
Total	**76**

Table III shows the involvement of glands. Majority of the tumors are invading major salivary glands than minor ones. Among major glands parotid has more attach rate than others with next gland is sub-mandibular.

Table III. Frequency of Glands involved

Major Glands			Minor Glands		
Group	Frequency	Percentage %	Group	Frequency	Percentage %
Parotid Gland	27	35.5%	Palate	10	13.2%
Sub-Mandibular Gland	15	19.7%	Maxilla	3	3.9%
Sub-Lingual Gland	10	13.2%	Tongue	4	5.3%
Total	**52**	**68%**	Buccal Region	5	6.6%
			Nasal Region	1	1.3%
			Alveolar Ridge	1	1.3%
			Total	**24**	**25%**

Table IV shows annual distribution according to registration from January 2013 –April 2017.

Table IV. Annual distribution of salivary gland tumors cases

Year of Occurrence					
2013	2014	2015	2016	up to April 2017	Total
17	20	18	14	7	76

DISCUSSION

Tumors of salivary gland are uncommon, however, their multifaceted clinical presentation, varies morphological configuration and relatively unpredictable prognosis continue to an attract much of the medical interest (12). The current study shows that malignant salivary gland tumors are more common as compared to benign tumors, that different from previous studies (13). Because environmental and heredity factors have a characteristic role in geographical distribution of cancers usually the age distribution was 15-85 years. In the present study tumors of salivary glands were more prevalent in males than females, as higher male: female has been reported, but this finding is in contrast with the overall female predominance as reported in many Western literatures (11). In this series, benign tumors on an average presents a decade earlier than malignant are more prevalent, in accordance with published literatures (14). All the tumors in this study are epithelial and parotid gland is most involved gland contributing 35.5% among all major and minor glands, similar to the published literature (15). In this study pleomorphic adenoma was the most frequent neoplasm 40% with peak prevalence in 2nd and 3rd decades of life. It is only one type of benign tumor occur in our study. Among malignant tumors Adenoid cystic carcinoma is more common accounting 32.8% in our study that is in contrary with other studies in contrast to Agha Khan University SGTs data.

This type invade all age groups but most of these tumors seen in 36-45 years of age. This is followed by mucoepidermoid carcinoma 22.3% that is most commonly occur in parotid gland but in earlier studies it mostly involves minor salivary glands (16), and the next tumor is malignant acinic cell carcinoma counting for 4.0%. The prevalence recorded in this study represents only in cases received by general hospitals in Lahore coming from all over the Punjab. However, these figures give an idea of their frequency of their occurrence.

CONCLUSION

The present study found higher frequency of Adenoid Cystic Carcinoma among the malignant tumors and pleomorphic adenoma in benign tumors with male predominance. There are hardly any epidemiological studies of significant proportion regarding salivary gland tumors in general hospitals of Lahore Pakistan. The demographic of this population is different which may lead to variation in age, gender, type, and tumor distribution.

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