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Prevalence of Salivary Gland Tumors in Patients Referred-Pathology Departments of Kermanshah Hospitals, Iran, 2007-2012

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Abstract: The aim of the study was-determine the frequency and type of benign and malignant salivary gland tumors of patients referred-pathology departments of hospitals located in Kermanshah, Iran between 2007 and 2012.In this descriptive cross-sectional study, all medical records available in the pathology departments of Taleghani, Imam Khomeini, Imam Reza, Farabi and Bisotoon hospitals were reviewed. The records of patients with salivary gland tumors were extracted. The required data were extracted and entered into a checklist. The checklist included information such as age, gender and characteristics of the tumor such as its histopathologic type and location. The data were analyzed by SPSS (ver. 15.0) using the Chi-squared test and student's t-test. A total of 6,338 records were reviewed, of which 1.07% had salivary gland tumors. About 62% of the tumors were seen in men. Mean ages of patients with benign and malignant tumors were respectively 44 and 57 years. The most common location of the tumors was parotid gland (55.9%). About 62% of the tumors were benign and 38% was malignant. About 75% of the tumors were located in major salivary glands and 25% were located in minor salivary glands. Salivary gland tumors were more common in men in their fifth or sixth decades of life. Benign tumors were more common than malignant tumors and the most common location was the parotid gland.

Key words: Prevalence, salivary gland tumor, pleomorphic adenoma, parotid tumor, malignant

INTRODUCTION

Salivary gland tumors constitute a major part of oral and mandibular pathologic conditions. Although these tumors are relatively uncommon, they are not rare. The annual incidence of salivary gland tumors is 1-6.5 cases per 100,000 persons. It is estimated that salivary gland tumors comprise 2-5% of all head and neck tumors (Neville *et al*., 2009).

Salivary gland tumors have different types and their anatomic locations are varied. Salivary glands are categorized as major or minor glands. Developing tumors in minor glands is less frequent than in major glands (i.e., parotid, submandibular and sublingual) but percentage of malignant tumors is high. Although some minor and major salivary gland tumors originate from similar cells, they have various biologic behaviors based on their anatomic locations (Gnepp *et al*., 2009).

Evaluation, diagnosis and treatment of minor and major salivary gland tumors need specific work-up. Firstly, the inflammatory, neoplastic, or non-neoplastic behavior of each lesion should be considered. Differential diagnosis is made based on the history, physical examination and the anatomic location of the lesion. Generally speaking, salivary gland tumors are painless with slow growth. The presence of ulcer on the face can show malignant nature of the lesion but there are malignant tumors which do not cause ulcers. An issue regarding the diagnosis of suspicious lesions in minor salivary glands is performing incisional or excisional biopsy which is different based on the anatomic location of the tumor. Geographical and racial factors can also play role in occurrence of different salivary gland tumors (Nanci, 2008; Regezi *et al*., 2008). The objective of the study was-assess salivary gland tumors in a 5 year period using the medical records of patients admitted, the departments of pathology at Kermanshah hospitals in Iran.

MATERIALS AND METHODS

In this descriptive cross-sectional study, the medical records available at pathology deperments of Taleghani, Imam Khomeini, Imam Reza, Farabi and Bisotoon hospitals

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were reviewed. Those records with the diagnosis of salivary gland tumor were extracted. All records were included in the study. Inclusion criteria were all medical records with the diagnosis of salivary gland tumor. Those records with samples taken by needle and aspiration method without biopsy were excluded. Also, the records with defective information of the patients and tumor or those with "see description" note were excluded. The records of 2007 and 2012 were reviewed. Those records with benign salivary gland tumors were separated. Only records were included with final diagnosis of a salivary gland tumor in the oral cavity. The records which described the tumor as "unknown" were excluded. The required data were extracted and entered into a checklist. The data included age, gender, the type of the tumor and its location.

The information inside the records was kept confidential. The protocol of the study was verified by the Ethics Committee of our medical university. Descriptive indices including frequency, percentage, mean and its Standard Deviation (SD) were used-express the data.-assess relationship between categorical variables, the Chi-squared test was used and for continuous variables, t-test was used. The analyses were done by SPSS software (ver. 15.0). Significance level was set at 0.05.

RESULTS

There were 6,338 medical records at the studied hospitals during the 5 year study period. There were 68 patients with salivary gland tumors. In other words, the prevalence of salivary gland tumors was 1.07%. Of 68 patients, 17 patients (25%) had minor salivary gland tumors and 51 cases (75%) had major salivary gland tumors. There were 42 men (62%) and 26 women (38%). The male-female ratio was 1.61-1.

The mean ages of patients with benign and malignant tumors were 44 and 57 years. The anatomic location of the tumors was parotid gland (55.9%), submandible (14.7%), palate (11.8%), lingual (8.8%), sublingual (4.4%) and mouth floor (4.4%) (Table 1).

As stated earlier, 61.8% of the patients had benign tumors of which 47.1% was pleomorphic adenoma and 14.7% was Warthin's tumor. About 38.3% of the sample had malignant tumor, of which 5.9% had carcinoma-ex-pleomorphic adenoma, 5.9% had adenoid cystic carcinoma and 26.5% had other forms of adenocarcinomas such as undifferentiated adenocarcinomas and acinic cell carcinoma. As the number of these malignant tumors was small, they were categorized as "other malignancies" (Table 2).

Table 1: Frequency of salivary gland tumors based on anatomic locations of the tumors

Location	Frequency	Percentage
Parotid	38	55.9
Submandible	10	14.7
Palate	8	11.8
Lingual	6	8.8
Sublingual	3	4.4
Mouth floor	3	4.4
Total	68	100

Table 2: Frequency of salivary gland tumors based on tumor type

Variable(type)	Frequency	Percentage
Benign		
Pleomorphic adenoma	32	47.1
Warthin's tumor	10	14.7
Malignant		
carcinoma-ex-ple morphic adenoma	4	5.9
Adenoid cystic carcinoma	4	5.9
Others	18	26.5
Total	68	100.0

Table 3: Comparison of patients based on gender in different tumor types

	Tumor type			
Gender	Benign	Malignant	Total	p-value
Male				
Frequency	23	19	42	
Percentage	54.8	45.2	61.8	
Female				
Frequency	19	7	9	
Percentage	73.1	26.9	38.2	
Total				
Frequency	42	26	28	0.131
Percentage	100	100	10	

*Chi-squared

Table 4: Comparison of patients according-the location of benign and malignant tumors

	Tumor type		
Location	Benign (%)	Malignant (%)	Total (%)
Palate, lingual, sublingual, mouth floor	8 (40)	12 (60)	20 (100)
Submandible and parotid	34 (70.8)	14 (29.2)	48 (100)
Total	42 (61.8)	26 (38.2)	68 (100)

Of 42 patients with benign tumors, 54.8% was male and 73.1% was female. Of 26 patients with malignant tumors, 45.2% was male and 26.9% was female. The Chi-squared test did not show a significant difference regarding gender distribution between benign and malignant tumors ($p = 0.131$). In other words, in both benign and malignant tumors, there were more men than women (Table 3).

Of 20 tumors in the palate, sublingual and mouth floor regions, eight tumors (40%) were benign. Of the tumors located in the submandibular and parotid gland, 34 tumors (70.8%) were benign (Table 4).

Mean ages of patients with benign and malignant tumors were 44 and 57 years. The t-test showed a significant difference regarding age between benign and malignant tumors ($p = 0.003$) (Table 5).

Table 5: Comparison of mean ages of the patients according-the type of the tumor

Tumor type	Frequency	Mean	SD	P value
Age				
Benign	42	44	17.177	0.003
Malignant	26	57	17.844	

*t-test

DISCUSSION

In this study, the prevalence of salivary gland tumors in patients admitted-the pathology departments of Taleghani, Imam Khomeini, Imam Reza, Farabi and Bisotoon hospitals were reviewed. Here, the most common type was pleomorphic adenoma which is compatible with former studies (Jaber, 2006; Moshy *et al*., 2010; Dhanuthai *et al*., 2009; Buchner *et al*., 2007). In most studies, pleomorphic adenoma is the most common type of salivary gland tumor but in Adeyemi *et al*. (2010) study, adenoid cystic carcinoma was more prevalent than pleomorphic adenoma (Salehinezhad and Moosavi, 2006; Licitra *et al*., 2003). In the current study, male-female ratio was 1.6. In a former study, it was reported that 59% was female and 39% was male (De Oliveira *et al*., 2009). In Moshy study, also, females were more diagnosed with salivary gland tumors than males. Male-female ratio in benign tumors was 1.21-1 and in malignant tumors, it was 2.71-1. In other studies, male-female ratios were one (Subhashraj, 2008; Vuhahula *et al*., 2004; Khajavi *et al*., 2010). Mean age of the patients was 6 2.5 years. In Moshy *et al*. (2010) and Dhanuthai *et al*. (2009) studies, mean age of the patients was 47 years. In De Oliveira *et al*. (2009) study, mean age of patients was 48 years which is a little lower than mean age of the current studied patients. Here, mean age of patients with benign tumors (44 years) was significantly lower than mean age of patients with malignant tumors (57 years). In Adeyemi *et al*. (2010) study, similarly, mean age of patients with benign tumors was lower than malignant tumors. In Gbotolorun *et al*. (2008) study, patients with adenoid cystic carcinoma were older than those with pleomorphic adenoma. In Moshy *et al*. (2010) study, no significant difference existed between ages of patients with benign and malignant tumors (Ziapour *et al*., 2007). In the study, more than half of the salivary gland tumors (55.9%) were located in the parotid gland Submandibular gland (14.7%) and palate (11.8%) followed the parotid gland in terms of the anatomic location of salivary gland tumors. Sublingual gland and mouth floor were both in the next order (4.4%). In former studies, the parotid gland was reported as the most common location of salivary gland tumor (Yih *et al*., 2005; Bradley and McGurk, 2013; Ito *et al*., 2005; Ashkavandi *et al*., 2013). In Moshy *et al*. (2010) study and also in another report from Mexico, 51% of minor salivary gland tumors were in the palate which is in conformity with our study (Velazquez *et al*., 2012). In Subhashraj *et al*. (2008) about 59% and in Wang *et al*. (2012) study >68% of the tumors were located in the palate. In Jaber (2006) and Adeyemi *et al*. (2010) studies, the palate was the most common location of involvement. According this study, 61.8% of the tumors were benign and 38.2% was malignant. In Toida *et al*. (2005) study in Japan >67% of the salivary gland tumors were benign which is close-our results. In Yih *et al*. (2005) and Buchner *et al*. (2007) study, benign tumors were more prevalent than malignant tumors. However, in other studies, malignant tumors were more common than benign tumors (Salehinezhad and Moosavi, 2006; De Oliveira *et al*., 2009). In the study, pleomorphic adenoma constituted 76.19% of benign tumors and the remaining 23.81% were Warthin's tumor. In Wang *et al*. (2012) study, 81% of benign tumors were pleomorphic adenoma. In Yih *et al*. (2005) study, pleomorphic adenoma constituted 78% of benign tumors. They reported 4 cases of adenoid cystic carcinoma and one case with mucoepidermoid carcinoma in years between 1999 and 2010. In studies by Kruce *et al*. (2010) and Subhashraj *et al*. (2012), the most prevalent malignant tumors were (in order) adenoid cystic carcinoma and mucoepidermoid carcinoma. However, in other studies, the order of the mentioned malignant tumors was vice versa (Jones *et al*., 2008; Kayembe and Kalengayi, 2002; Eveson and Cawson, 1985). In Buchner *et al*. (2007) study, the most common malignant tumor was mucoepidermoid carcinoma and the next common tumor was low-grade polymorphous adenocarcinoma.

CONCLUSION

About 75% of the tumors were located in major salivary glands and 25% were located in minor salivary glands. Salivary gland tumors were more common in men in their fifth and sixth decades of life. Benign tumors were more common than malignant tumors and the most common location was the parotid gland. The most common benign tumor was pleomorphic adenoma. All these results are in conformity with previous studies. The only difference is regarding the most common malignant type which was carcinoma-ex-pleomorphic adenoma. In most former studies, adenoid cystic

carcinoma and mucoepidermoid carcinoma were reported as the most common malignant tumors.

LIMITATIONS

There was not enough information regarding size, gross appearance, grade and stage of the tumors in the medical records.

SUGGESTIONS

It is suggested to study five- and ten-year survival rate of patients with salivary gland tumor

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