CLINICOPATHOLOGICAL ASPECTS OF MALIGNANT SALIVARY GLAND NEOPLASMS – A STUDY OF 150 CASES AT AFIP, RAWALPINDI (PAKISTAN)

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ABSTRACT

Objective: To study the clinicopathological aspects of malignant salivary gland tumors, diagnosed at AFIP, Rawalpindi (Pakistan).

Study Design: Descriptive study

Place and Duration of Study: Armed Forces Institute of Pathology, Rawalpindi from Jan 2005-Dec 2009.

Patients and Methods: The study included all the cases diagnosed as malignant salivary gland tumors in the last five years. Records of all the tumors of head and neck region that presented during this period were analyzed and out of these clinicopathological features of malignant salivary gland tumors were studied. The data analysis included the age, gender, site of tumor and histopathological pattern.

Results: A total of 18685 malignant tumors presented in the last five years. Out of these, malignant tumors of head and neck were 2165. Total malignant salivary gland tumors were found out to be 150 with an overall frequency of 0.8% and frequency in head and neck malignancies was found out to be 6.9%. The age ranged from 6-80 years (mean 48.02 + 1.23). Of these 150 cases, 58.7% were males and 41.3 were females with a male to female ratio of 1.4:1. The most common tumor seen was mucoepidermoid carcinoma (49.3%) followed by adenoid cystic carcinoma (31.3%). A total of 48.7% of the tumors originated in minor salivary glands. Parotid gland was the second most commonly involved site (40.7%).

Conclusion: Malignant salivary gland neoplasms are a common malignancy of head and neck region and their frequency is slightly more in our population. Almost half of the tumors originated in minor salivary glands and mucoepidermoid carcinoma was the most common type of malignancy.

Key Words: Malignant, Mucoepidermoid Carcinoma, Salivary gland malignancy,

INTRODUCTION

Salivary gland tumors account for almost 5-6% of the head and neck malignancies and commonly appear in the sixth decade of life.[1] Benign neoplasms show female predilection but malignant tumors are distributed equally between the sexes.[2] The 5 year survival rate is reported to be almost 57-62.3% and is strongly associated with the grade of the tumor.[3] The salivary glands are divided into 2 groups: the major and the minor salivary glands. The major salivary glands consist of parotid gland, submandibular gland, and the sublingual gland. The minor salivary glands comprise 600-1000 small glands distributed throughout the upper aerodigestive tract.[4]

Mucoepidermoid carcinoma is the most common salivary gland malignancy followed by adenoid cystic carcinoma.[5] Malignant salivary gland tumors are characterized by rapid growth or a sudden growth spurt. They are firm, nodular, and can be fixed to adjacent tissues, often with a poorly defined periphery. Pain and neural involvement are common and adenoid cystic carcinoma is especially notorious for it. Surgery, followed by radiation therapy, is the treatment of choice for resectable disease.[3,6]

To The objective of the study was to analyze the clinicopathological aspects including frequency, age, gender distribution, site of origin and histopathological pattern of malignant salivary gland tumors, diagnosed at AFIP, Rawalpindi (Pakistan).

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MATERIAL AND METHODS

Records of all the malignant tumors which presented to the Armed Forces Institute of Pathology (AFIP), Rawalpindi Pakistan, from Jan 2005- Dec 2009 were analyzed retrospectively. The institute receives biopsy material from Armed forces, public and private sector hospitals in Northern Pakistan. Out of these records the tumors of the head and neck area were retrieved and then the record of malignant salivary gland tumors from this data was extracted. Fresh hematoxilin and eosin stained slides were prepared and histopathological pattern was reconfirmed on these freshly prepared specimens. The age, gender of the patient and anatomic location of tumor was noted. The tumors were classified according to 1991 WHO classification of salivary gland tumors.

Data was analyzed using SPSS version 17. Descriptive statistics were used to describe the variables, i,e mean, standard deviation (SD) for quantitative variables while frequency and percentages for qualitative variables.

RESULTS

A total of 18685 malignant tumors were diagnosed at AFIP, Rawalpindi during the study period. Out of these, malignant tumors involving the head and neck were found out to be 2165. Malignant tumors of salivary gland were 150 out of these. Overall frequency of salivary glands malignancies was found out to be 0.8%, while among head and neck tumors it was 6.9%.

The age ranged from 6-80years (mean 48.02± 1.23). Age statistics were analyzed for each tumor and the results showed that mean age for Mucoepidermoid carcinoma was 41.5±2.61 years, Adenoid cystic carcinoma showed a mean age of presentation to be 51.4+1.84years. Similarly the mean ages for other tumors were analysed (Table 1).

Out of 150 cases of malignant salivary gland tumors, 88 (58.7 %) were males and 62 (41.3 %) were females with a male to female ratio of 1.4:1.

Regarding site of malignancy, it was observed that 48.7% of the tumors originated in minor salivary glands. Parotid gland was the second most commonly involved site (40.7%) followed by submandibular (7.3%) and sublingual gland (3.3%). (Figure)

The most common histological tumor type seen was mucoepidermoid carcinoma (49.3%) and the second most common tumor was adenoid cystic carcinoma (31.3%). Other malignant salivary gland tumors included polymorphous low grade adenocarcinoma (5.3%), Acinic cell carcinoma (4.7%), epithelial myoepithelial carcinoma (3.3%), carcinoma ex pleomorphic adenoma (2.7%), salivary duct carcinoma (1.3%), myoepithelial carcinoma (1.3%) and oncocytic carcinoma (0.7%) (Table 2).

DISCUSSION

Tumors of salivary gland constitute an important aspect of head and neck pathology

Table-1: Age statistics for the malignant salivary gland tumors (n = 150)

Tumor	Minimum age (years)	Maximum age (years)	Range	MEAN + STD MEAN ERROR
Mucoepidermoid Carcinoma	06	67	61	41.5 + 2.61
Adenoid Cystic Carcinoma	20	80	60	51.4 + 1.84
Polymorphous Low Grade AdenoCarcinoma	40	56	16	50.0 + 2.04
Acinic Cell Carcinoma	38	70	32	50.1 + 4.44
Epithelial Myoepithelial Carcinoma	55	70	15	66.6 + 2.92
Carcinoma Ex Pleomorphic Adenoma	60	70	10	65.6 + 2.06
Myoepithelial Carcinoma	65	65	0	65.0 + 0.00
Salivary Duct Carcinoma	64	75	11	69.5 + 5.50
Oncocytic Carcinoma	60	60	0	60.0 + 0.00

Table-2: Histological pattern & frequency of malignant salivary gland tumors (n = 150)

Histopathological Pattern	Frequency	%
Mucoepidermoid carcinoma	74	49.3%
Adenoid cystic carcinoma	47	31.3%
Polymorphous low grade adenocarcinoma	8	5.3%
Acinic cell carcinoma	7	4.7%
Epithelial myoepithelial carcinoma	5	3.3%
Carcinoma ex pleomorphic adenoma	4	2.7%
Salivary duct carcinoma	2	1.3%
Myoepithelial carcinoma	2	1.3%
Oncocytic carcinoma	1	0.7%

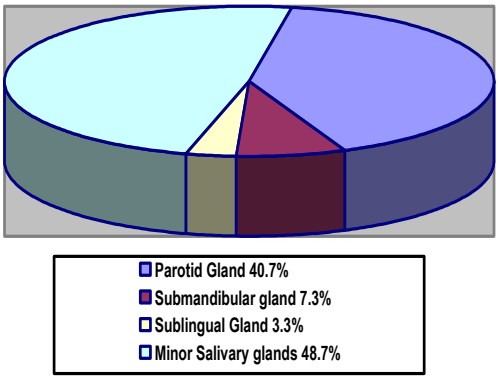

Figure: Anatomical sites and frequency of malignant tumors (n = 150)

comprising nearly 6% of the head and neck malignancies.[1] Estimated annual incidence of salivary gland malignancies in the United States is 2.2 to 2.5 cases per 100,000 population.[3,4] The salivary glands are the site of origin of a wide variety of neoplasms with a complex and diverse histopathology and these can present in any age group and show no specific predilection for any gender.[2,7]

We studied 150 cases of salivary gland malignancies which presented to our department in the last five years (2005-2009). In our set up, we found out that overall frequency of salivary gland malignancies in all the cancers of general body was 0.8% which is slightly higher than the reported incidence in United States and Sweden (0.3%).[6,8] Similarly we found that the frequency of salivary gland malignancies in the head and neck cancers was 6.9% which is again slightly more as compared to what is reported in literature (2-6%).[7,8,9,10] We had almost 30 new cases of malignant salivary gland tumors appearing every year.

Age of onset of these malignancies was evaluated. In our study the age ranged from 6-80 years with a mean age of 48.02 (+ 1.23) years. When these statistics were compared with the literature, it was seen that age in our patients was comparable to local studies from Karachi [11] and Lahore [12] (mean ages 44 and 45 years respectively) but was slightly less than what is reported in a study from Israel (55.2years)[9] and was higher than an African study (38.1years)[2]. When statistics regarding age for individual tumors was analyzed, it was seen that mean age of onset for mucoepidermoid carcinoma was 41.5 + 2.61 years. When this was compared with a study from Brazil[14], it was found to be in accordance with our results (mean age 44 years). Similarly for adenoid cystic carcinoma, mean age in our series was 51.4 + 1.84 years and when compared with the results from a study conducted in United Kingdom[15] it was seen that age in our set up was slightly less than reported in their series (56 years).

In our study salivary gland malignancies depicted a male predominance (male to female ratio was 1.4:1) which is also reported in a local study from Karachi[11], Israel[9] and China[18] but by and large it is contrary to what is reported in literature from other countries where it is said that benign salivary gland tumors are more common in females while malignant tumors of salivary glands show almost equal distribution for both sexes.[2,12,13,16,17,19]

Regarding anatomical site, almost half of the tumors originated in the minor salivary glands (48.7%). Parotid gland was the second most common location for salivary gland malignancies in our study (40.7%) followed by 7.3% of tumors occurred in the submandibular gland (7.3%) while sublingual gland was affected in only a meager 3.3% cases. This fact was compared with local studies[11,12,13] and it was seen that they reported parotid gland to be the most common location in their population

and the minor salivary glands to be the next most common anatomical site but this was reverse in our scenario.

On analysis of histopathological pattern of salivary gland malignancies that presented to our department during the last five years, it became evident that Mucoepidermoid carcinoma (MEC) was the most common malignancy with a frequency of 49.3%. Out of these, 36.4% were high grade, 14.8% intermediate grade and 48.6% were low grade Mucoepidermoid carcinomas. The second most commonly occurring salivary gland malignancy in our series was adenoid cystic carcinoma with a frequency of 31.3%. Almost all the adenoid cystic carcinomas were of cribriform pattern on the histopathology with just 02 cases being the tubular variety. After adenoid cystic carcinoma, the next was polymorphous low grade adenocarcinoma (5.3%) followed by acinic cell carcinoma (4.7%), epithelial myoepithelial carcinoma (3.3%), carcinoma ex pleomorphic adenoma (2.7%), salivary duct carcinoma (1.3%), myoepithelial carcinoma (1.3%) and oncocytic carcinoma (0.7%) respectively. These statistics, when compared with other studies revealed that our results are in accordance with local studies[11,12,13] and studies from United Kingdom[7,19] and Brazil[16] where mucoepidermoid carcinoma is the most common malignancy reported. However a study from Africa[2] revealed that adenoid cystic carcinoma was the most common malignancy in their set up while a study from Israel[9] reported that adenocarcinoma was the most common malignancy. Similarly in a Chinese study, mucoepidermoid carcinoma and adenoid cystic carcinoma with equal prevalence has also been reported.[18]

CONCLUSION

Malignant salivary gland neoplasms are a common malignancy of head and neck region and their frequency is slightly more in our population as compared to that in other parts of the world. Almost half of the malignant salivary gland neoplasms occur in minor salivary glands and mucoepidermoid carcinoma followed by adenoid cystic are the most common type of malignancies observed in our population.

REFERENCES

1. Ali SS, Memon AS, Shaik NA, Soomro AG. Mucoepidermoid carcinoma of parotid presenting as unilocular cyst. J Ayub Med Coll Abbottabad 2008;20:141-2.
2. Vahuhala EA. Salivary gland tumors in Uganda: clinical pathological study. Afr Health Sci 2004;4:15-23.
3. Neville BW, Damm DD, Allen CM, Bouqout JE. Salivary gland pathology in Oral and Maxillofacial pathology. 3rd ed. Elsevier, St Louis. 453-506.
4. Barnes L, Eveson JW, Reichert P, Sidransky D. Salivary glands tumours in World Health Organization Classification of Head and Neck Tumors. Team Rush France. 209-82.
5. Nance MA, Seethala RR, Wang Y, Chiosea SI, Myers EN, Johnson JT, Lai SY. Treatment and survival outcomes based on histologic grading in patients with head and neck mucoepidermoid carcinoma. Cancer. 2008;113:2082-9.
6. Kessler A, Handler SD. Salivary gland neoplasms in children: a 10 year survey at the Children's Hospital of Philadelphia. Int J Pediatr Otorhinolaryngol 1994;29:195-202.
7. Strick MJ, Kelly C, Soames JV, Mc Lean NR. Malignant tumors of minor salivary glands- 20 year review. Br J Plast Surg 2004;57:624-31.
8. Ostman J, Anneroth G, Gustafsson H, Tavelin B. Malignant salivary gland tumors in Sweden 1960-1989- An epidemiological study. Oral Oncol 1997;33:169-76.
9. Nagler RM, Laufer D. Tumors of major and minor salivary glands: review of 25 years of experience. Anticancer Res 1997;17:701-7.
10. Thomas KM, Hutt MS, Borgstein J. Salivary gland tumors in Malavi. Cancer 1980;46:2328-34.
11. Gill MS, Muzaffar S, Soomro IN, Kayani N, Hussainy AS, Pervez S, et al. Morphologic pattern of salivary gland tumors. J Pak Med Assoc 2001;51:343-6.
12. Qureshi A, Rehman K, Husain S, Khawaja NS, Qureshi GR, Naveed IA. Salivary gland tumors- a three years experience at King Edward Medical College, Lahore. Ann King Edward Med Coll 2004;10:200-2.
13. Rahman B, Mamoon N, Jamal S, Zaib N, Luqman M, Mushtaq S, et al. Malignant tumors of the minor salivary glands in Northern Pakistan: a clinicopathological study. Hematol Oncol Stem Cell Ther 2008;1:90-3.
14. Pires FR, de Almeida OP, de Araujo VC, Kowalski LP. Prognostic factors in head and neck mucoepidermoid carcinoma. Arch Otolaryngol Head Neck Surg 2004;130:174-80.
15. Chummun S, McLean NR, Kelly CG, Dawes PJ, Meilke D, Fellows S, et al. Adenoid cystic carcinoma of the head and neck. Br J Plast Surg 2001;54:476-80.
16. da Cruz Perez DE, Pires FR, Alves FA, Almeida OP, Kowalski LP. Salivary gland tumors in children and adolescents: a clinicopathological and immunohistochemical study of fifty three cases. Int J Pediatr Otorhinolaryngol 2004;68:895-902.
17. Jaber MA. Intraoral minor salivary gland tumors: a review of 75 cases in a Libyan population. Int J Oral Maxillofac Surg 2006;35:150-4.
18. Tian Z, Li L, Wang L, Hu Y, Li J. Salivary gland neoplasms in oral and maxillofacial regions: a 23 year retrospective study of 6982 cases in an eastern Chinese population. Int J Oral Maxillofac Surg 2010;39:235-42.
19. Jones AV, Craig GT, Speight PM, Franklin CD. The range and demographics of salivary gland tumors diagnosed in a UK population. Oral Oncol 2008;44:407-17.