

# The Prevalence of Salivary Gland Mucoepidermoid Carcinoma in Iran: An 11 years' retrospective study

## Original Article

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## **Abstract**

### **Introduction:**

Mucoepidermoid carcinoma (MEC) is one of the most common salivary gland malignancies. The prevalence of salivary gland tumors varies in different geographic areas. In this report, we evaluated the prevalence of MEC in Iran and compared it with that previously reported in other countries.

### **Materials and methods:**

The files of oral pathology, Shahid Beheshti University of Medical Sciences, Amiralam and Taleghani hospitals, served as the source of the material from 2001 to 2011 for this study. Information, including patient's age, gender, tumor location, clinical symptoms and histopathologic grade was recorded. Mann-Whitney test was used for statistical analysis.

### **Results:**

Mucoepidermoid carcinoma accounted for 24.1% of salivary gland malignancies during the 11-year period. Most cases were diagnosed in the third to fifth decades of life and the male to female ratio was 1:0.3. The parotid gland was the most common location (49.5%). Tumor grading was available for 92 neoplasms and of them, 39.13% was graded low, 32.6% was intermediate and 28.26% was high grade. Swelling, pain and ulceration existed in 68.6%, 30.4% and 4.8% of patients, respectively. Forty-four point forty-five per cent of cases that demonstrated pain were high grade, 29.6% were intermediate, and 25.9% were low grade ( $p = 0.03$ ). High grade tumors were more common in males ( $p = 0.06$ ).

### **Conclusion:**

The mean age, site of involvement, sex of patient, and microscopic grading of salivary gland MEC in the Iranian population were found to be similar to those of most other countries.

**Key words:** •*Mucoepidermoid Carcinoma*  
• *Salivary Glands* • *Neoplasms*

## Introduction

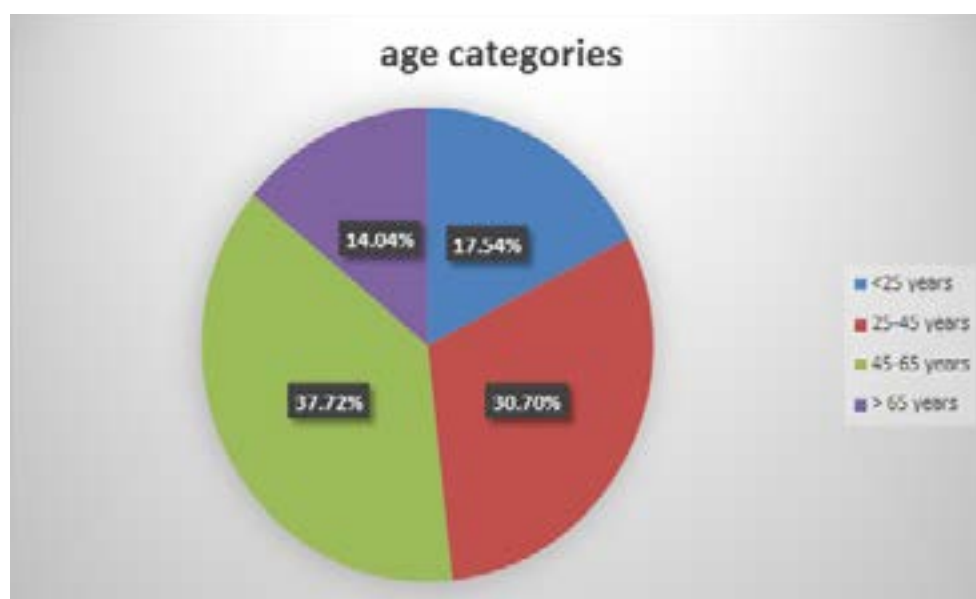
Salivary gland tumors make up 1%-4% of all human neoplasms and constitute an important part in the field of oral and maxillofacial pathology.<sup>(1,2)</sup> Regardless of their low incidence, they are of concern due to their differences in microscopic patterns and clinical mannerisms.<sup>(3-6)</sup> MEC and adenoid cystic carcinoma are the most common salivary gland malignancies.<sup>(1)</sup> Histopathologic examination of MEC shows that a tumor consist of nests and islands of epidermoid, mucous, and intermediate cells with cystic spaces of various sizes in a fibrous stroma.<sup>(7)</sup> The treatment of choice is wide surgical excision and radiotherapy appears to be a beneficial auxiliary aid in cases represented with close surgical margins and high grade tumors.<sup>(7)</sup> The pathogenesis of MECs is unclear, while radiation exposure may be one of the risk factors.<sup>(8)</sup> Also, the most common pediatric malignant salivary gland tumor is MEC.<sup>(9)</sup> Conventionally, MECs have been categorized into three microscopic grades: grade I, II, and III, based on the amount of cyst formation, degree of cytologic atypia and relative number of mucous, epidermoid, and intermediate cells.<sup>(8)</sup> Epidemiologic studies may be helpful since they supply valuable details about the lesions, incidence, microscopic aspects and demographic characteristics in different countries.<sup>(10)</sup> Therefore, the purpose of this study was to illustrate the prevalence of MEC in the Iranian population.

## Materials and Methods

The files of oral and maxillofacial pathology, ShahidBeheshtiUniversity of Medical Sciences, Amiralam and Taleghani hospitals, served as the source of the material during an 11-year period from 2001 to 2011 for this retrospective, descriptive cross-sectional study. Clinical information including patient's age, gender, tumor location, clinical symptoms and histopathologic grade was recorded. Age groups were calculated as follows: <25 years, 25-45 years, 46-65 years and >65 years. Samples with unclear pathologic report or without demographic information were excluded. For statistical analysis, Mann-Whitney test was used in SPSS software 18 and statistical significance was  $p < 0.05$ .

## Results

Among 65,281 biopsies 1,376 were salivary gland tumors, of which 472 were malignant. Mucoepidermoid carcinoma accounted for 114 cases (8.3% of total salivary gland tumors and 24.1% of salivary gland malignancies) during the 11-year period. Most cases are diagnosed in the third to fifth decade of life with a mean age of 45.28 years (min age = 2, and max age = 89). About 17.54% of tumors occurred in children and young adults (< 25 years) (Chart 1). Fifty-eight cases (50.9%) occurred in men and 56 cases (49.1%) in women. The parotid gland was the most common location (49.5%), followed by the palate (12.6%) (Table 1).



**Figure1.** Frequency of mucoepidermoid carcinoma on the basis of site of tumor.

**table 1.** Frequency of mucoepidermoid carcinoma on the basis of site of tumor.

location	frequency	percent
parotid gland	55	49.5
palate	14	12.6
submandibular gland	4	3.6
floor of mouth	1	0.9
maxillary sinus	5	4.5
lower lip	3	2.7
buccal mucosa	4	3.6
tongue	3	2.7
maxilla	3	2.7
mandible	10	9
other sites	9	8.1
unknown	3	2.7
Total	114	100

Intraosseous tumors comprised 11.7% of the cases and the mandible was the predominant site for the lesion. Ninety-two tumors were excisional biopsies and the microscopic grades were recorded. Among them, 39.13% were low grade, 32.6% were intermediate and 28.26% were high grade tumors. Among all the cases, 105 cases (92%) were recorded in order to identify their clinical manifestations. Swelling, pain and ulceration existed in 68.6%, 30.4% and 4.8% of patients, respectively. Forty-four point forty-five per cent of cases that demonstrated pain were

high grade, 29.6% were intermediate, and 25.9% were low grade ( $p = 0.03$ ). Low grade tumors were more common in females and high grade tumors were more common in males ( $p = 0.06$ ) (Table 2). Also, there was a higher prevalence of high grade tumors in those aged older than 46 years (57.69%) ( $p = 0.16$ ). On the other hand, low grade tumors were more prevalent (44.8%) in those who were 25 years or younger, although this was not statistically significant ( $PV = 0.16$ ) (Table 3). Another factor that was assessed was the relationship between the histological grading and the location of the tumors. The parotid gland served as a site for 28.3% of low grade tumors, 32.1% intermediate grade, and 28.3% high grade tumors. Low grade tumors accounted for 25% of all tumors of the submandibular gland, intermediate grade tumors accounted for another 25%, and 50% were high grade tumors. In minor salivary glands, 40% of tumors were low, 34.28% were intermediate and 22.85% were high grade ( $p$  value = 0.51).

**table 2.** Histopathological grading distribution according to sex.

Grade of tumor	Male	Female	total
High grade	18	8	26
Intermediate grade	15	15	30
Low grade	14	22	36
Total	47	45	92

**Table3.** Histopathological grading distribution according to age.

Grade of histology	Age (year)				Total
	< 25	25 - 45	46 - 65	> 65	
High grade	5 (5.4%)	6 (6.5%)	9 (9.8%)	6 (6.5%)	26 (28.3%)
Intermediate grade	4 (4.3%)	13 (14.1%)	13 (14.1%)	0 (0%)	30 (32.6%)
Low grade	7 (7.6%)	10 (10.9%)	14 (15.2%)	5 (5.4%)	36 (39.1%)
Total	16 (17.4%)	29 (31.5%)	36 (39.1%)	11 (12.0%)	92 (100.0%)

## Discussion

In this study, MECs accounted for 8.3% of all the salivary gland tumors. These findings were consistent with other studies, with an incidence of 8.03%<sup>(4)</sup>, 7.9%<sup>(11)</sup> and 13.55%<sup>(12)</sup>. Most cases are diagnosed in the third to fifth decade of life with a mean age of 45.28 years, which is similar to other studies.<sup>(13-15)</sup> In our study, 50.9% of cases occurred in men and 49.1% in women. This is in accordance with previous

reports.<sup>(14,16,17)</sup> The parotid gland was the most common location followed by minor salivary glands. This is in agreement with other research.<sup>(4,12,18,19)</sup> Intraosseous MECs comprised 11.7% of the cases and the mandible was the predominant site in our study. Intraosseous MEC of the jaws are rare, comprising 2%-3% of all MECs in the literature.<sup>(7)</sup> This tumor may arise from ectopic salivary gland tissue or may have originated from the transformation of mucous cells found in odontogenic cysts and maxillary sinus or

submucosal salivary glands that have intraosseous extensions.<sup>(7)</sup> One of the parameters that was assessed in this study was the presence of clinical manifestations in the patients.

Unfortunately, very few articles have taken this into account, and the articles that have assessed the presence of clinical manifestations have only explained it superficially.<sup>(13,16,20,21)</sup> In this study, clinical manifestations were seen in 92% of the cases upon the diagnosis of their lesion. In the studies that were done by Plambeck<sup>(20)</sup> and Auclair<sup>(13)</sup>, this percentage varied; 46% and 39%, respectively. The prevalence of pain in the patients differed according to the grading of their tumors. Swelling was seen in 68.6% of the patients in this study, which complied with that of Jakobsson's study<sup>(21)</sup> in which a high percentage of patients exhibited this particular clinical manifestation, especially those who were suffering from parotid gland tumors. In this study, the parotid gland served as a site for 28.3% low grade tumors, 32.1% intermediate grade and 28.3% high grade tumors.

In comparison with the study that was carried out by Goode<sup>(16)</sup> these percentages varied: 79.1%, 6.1% and 14.8%, accordingly. However, in comparison to the study of Healey<sup>(22)</sup>, low grade tumors accounted for 33.3% of all tumors, 45.2% were intermediate grade, and 21.5% were high grade tumors. Most of the MECs of the minor salivary gland in our study were low grade, which is in agreement with the study by Auclair et al.<sup>(13)</sup>

In our study, the high grade MECs were more common in patients who were aged older than 46 years (although this was not statistically significant). Also, Erovic et al.<sup>(23)</sup> showed that overall and disease-free survival were considerably worsened with age greater than 60 years. MEC was the most prevalent salivary gland carcinoma in children and adolescents in other studies<sup>(9,24,25)</sup> Also, in our research, 17.54% of tumors occurred in children and young adults. The prevalence of MEC was also notably seen in the submandibular salivary gland. Low grade tumors accounted for 25% of all tumors, intermediate grade tumors accounted for another 25%, and 50% of all the tumors located in the submandibular gland were high grade tumors. In comparison to the study done by Goode<sup>(16)</sup>, the numbers varied as such: 74.1%, 19.4% and

6.5%, respectively. Finally, when these numbers were compared to the study done by Healey<sup>(22)</sup>, the percentages were 40%, 20%, and 40%, respectively.

Upon comparing this study with those of the previously mentioned authors, it can clearly be seen that the current study is very similar to that of Healey<sup>(22)</sup> and different from that of Goode<sup>(16)</sup> This difference can be attributed to the fact that different pathologists have a different amount of experience in diagnosing and determining the grading of the tumors.

On a final note, all of the percentages in the findings point to the fact that submandibular gland tumors exhibit higher grading than the tumors of the parotid gland. In turn, this impacts both the prognosis and treatment plan of the patient.

## Conclusion

MEC accounted for 8.3% of total salivary gland neoplasm and 24.1% of salivary gland malignancies. The parotid gland was the most common site, followed by the minor salivary gland. The common clinical manifestation was swelling. Most of the MECs were low grade. High grade MECs are associated with pain and are more common in older males. Therefore, the mean age, site of involvement, sex of patient, and microscopic grading of salivary gland MEC in the Iranian population were found to be similar to those of most other countries.

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## Conflict of Interest

The authors declare no conflicts of interest.



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