

# Malignant Tumors of Tongue in Iranian Population

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Received 2015 October 20; Revised 2016 January 04; Accepted 2016 August 10.

## Abstract

**Background:** The incidence of oral cancers varies from one country to another, which can be clarified by the difference in the distribution of the risk factors and the possible etiologies. Tongue is a main segment of oral cavity and malignant lesions of this region accounts for nearly 30% of all oral cancers.

**Objectives:** In the present study, we evaluated the pattern of tongue cancer in Iranian population and compared these findings with those previously reported in the other countries.

**Methods:** In this multicenter, retrospective cross-sectional study recorded cases of the malignant tongue tumors in the cancer research center (CRC) of Shahid Beheshti University of Medical Sciences were extracted. The patient records and their microscopic reports were retrieved from the archives and age, sex and microscopic types were evaluated. It is to be noted that the CRC has been serving as a cancer registry center for major hospitals all over the country since the year of 2003. Thus, the obtained statistics are highly reliable.

**Results:** During the years 2003 to 2008, a total number of 952 new cases of the tongue cancer were recorded in the CRC. Most cases are diagnosed in the sixth and seventh decades of life. 450 cases (47.2%) occurred in men and 489 cases (51.36%) in women. Four different types of malignant lesions (epithelial, salivary gland, hematopoietic and mesenchymal) were diagnosed. Epithelial tumors were the most prevalent malignancies (93%) of which squamous cell carcinoma (SCC) made up 87.39% of all lesions. Salivary gland tumors had the second place with 3.15% of the total lesions.

**Conclusions:** In Iranian population, squamous cell carcinoma is the most prevalent malignancy of tongue and it is notable that the ratio of female to male population was equal. These lesions were prevalent in the sixth and seventh decades of life. Thus screening examination of tongue by dentist especially in elderly patients is necessary for early detection of cancerous lesions.

**Keywords:** Malignant Tongue Tumor, Cancer in Iran, Prevalence, Carcinoma, Squamous Cell

## 1. Background

According to traditional Chinese medicine, tongue is the main window into the body (1, 2). A number of authors explain that tongue lesions represent an important part of oral mucosal lesions, with incidence varying among epidemiologic research from different parts of the world (1). Several studies have been working on the prevalence of tongue lesions (1-4) but cancers are of particular importance and prevalence of oral malignancies reveals vast geographic difference (5). Oral clinicians are the pioneer for the early discovery of oral cancers. Curriculums of cancer control are structured on the principles that the early detection of the lesion lead to better treatment, increased survival rate, and mortality reduction (6).

## 2. Objectives

Therefore, the purpose of this study was to illustrate the prevalence of malignant tumors of the tongue in Iranian population and compare these findings with those previously reported in the other countries.

## 3. Methods

This multicenter, retrospective, cross-sectional study was carried out to assess the recorded cases of tongue malignancies in the cancer research center (CRC) of Shahid Beheshti University of Medical Sciences. Patients' records and the associated pathology reports were retrieved from the archives. Then age and sex of the patients and its microscopic type were assessed and classified in tables. CRC

has been collecting the needed information about patients with cancer from all major hospitals in Iran since 2003. One of the primary objectives of this center is to record the changes in pattern of malignancies in Iran. Such information is classified and recorded according to the guidelines of the cancer office of center for disease control (CDC). These standards include monitoring of information coverage and complete details, controlling the accuracy of information, and elimination of repeated cases. Also, collected data dating back to 2008 and onward were in the process of electronic storage and the CRC did not provide us with such information. Data were statistically analyzed using descriptive statistics.

#### 4. Results

During the years 2003 to 2008, a total number of 952 new cases of the tongue cancer were recorded in the CRC. In the current study, tongue cancers accounted for 21.33% of oral malignancies and 2.22% of head and neck cancers. The tongue cancers were the most common in the fourth to eighth decades of life and most cases are diagnosed in the sixth and seventh decades (Table 1). 450 cases (47.2%) were men and 489 cases (51.36%) were women. Four different types of malignant lesions (epithelial, salivary gland, hematopoietic and mesenchymal) were diagnosed. Epithelial tumors were the most prevalent malignancies (93%) of which squamous cell carcinoma (SCC) made up 87.39% of all lesions (Table 2). Salivary gland tumors had the second place with 3.15% of the total lesions. Among salivary gland malignancies, adenoid cystic carcinoma (AdCC) and mucoepidermoid carcinoma (MEC) were the most common. Hematopoietic group constituted 2% of the lesions. Non-Hodgkin lymphoma especially "Diffuse large B cell lymphoma" (DLBL) was most prevalent in hematopoietic group. Mesenchymal malignancies made up 0.4% of the cancers and rhabdomyosarcoma was the most common form. 13.02% of all cancers and 13.3% of SCCs occurred below 40 years and 32.11% was detected in women.

#### 5. Discussion

In the current study, tongue cancers accounted for 21.33% of oral malignancies. Several studies established that tongue was the most common site of occurrence in oral cavity cancers with incidence rate of 50% (7), 43% (8), 23% (5), and 20% (6,9). In contrast some studies introduced other sites such as gingival as the most common location in this regard (10, 11). This represents that geographic regions can potentially influence the area of involvement

within oral cavity. For example in South and South-East of Asia the most common site in oral cavity for cancer development is buccal mucosa followed by tongue carcinoma but in Western Countries the tongue is a more common location (12).

The susceptibility of tongue for malignancies was described in previous reports (5, 13, 14). Saliva would combine with carcinogen agents and collected at the bottom of the mouth and persistently wash these regions. In addition, lateral border and ventral part of the tongue have thin and nonkeratinized mucosa with less protection (5). Tongue has rich lymphatic network and highly muscularized structure which makes it poorly supplied to save itself from invasion and metastasis (13, 14). In our research SCC was the most common malignant tumor of tongue. This is in agreement with most of the previously published reports (1, 5, 7-10, 15). In our study the most cases are diagnosed in the sixth and seventh decades of life similar to other studies (1, 16). Many studies showed oral cancers have tendency to affect elderly patients (5-10). In accordance with previous reports (5, 7, 17), in our series 13.02% of all cancers and 13.3% of SCCs occurred below 40 years. Razmpa et al. (16) found that only 6.9% of the patients were younger than 40 years. Other studies reported 29.2% (9), 27.1% (18), 25.8% (19), 34.3% (20) and 45% (21) of the cases were under 40 years of age. Tongue seems to be the most common location in young patients with head and neck SCC without a history of tobacco use, or association with HPV (22). Further studies in this age group were required to assess the risk factors and characteristics of tongue cancer (16). Biopsy of suspicious oral lesions was necessary to exclude malignancy in young patients (7). The prevalence of tongue cancers including SCC was almost equal between men and women in our study with a mild tendency to women. This is in compliance with other studies on SCC of tongue (16, 23-25). In contrast, a male to female ratio 1.75 (21), 2 (26) and 2.5 (27) was reported.

Moreover, it was described that the prevalence of oral carcinoma considerably elevated among females rather than males; especially in developing countries (11, 28). But previous reports demonstrated that malignancies of the oral cavity predominantly occurred in men (6, 7, 10). There are many risk factors for oral SCC such as alcohol and tobacco, geographic variation, genetic predisposition, diets, immune status, oncogenic viruses, radiation, Poor oral hygiene, and environmental factors (5, 29-31). Diets rich in fresh fruits and vegetables, micronutrients and vitamins A, C, E may have protective role against oral cancer (32). Risk of oral malignancies is greater for non-vegetarians probably due to increased exposure to polycyclic aromatic hydrocarbons that are present in high concentrations in meat products (31). Obesity and a diet rich in fat were as-

**Table 1.** Age Distribution of Patients With Tongue Cancer

	Age, Y									
	0 - 9	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69	70 - 79	80	Unknown
Epithelial tumors	0	6	34	69	93	175	194	209	101	22
Salivary gland tumors	0	0	4	4	5	2	7	7	2	0
Hematopoietic tumors	0	0	1	3	3	2	9	2	2	2
Mesenchymal tumors	1	1	0	1	0	1	0	0	0	0

**Table 2.** Histopathologic Type and Gender Distribution Among Patients With Tongue Cancer

	Total Number	Female	Male
Squamous cell carcinoma	836	435	401
Verrucous carcinoma	25	11	14
Undifferentiated carcinoma	19	13	6
Total epithelial tumors	893	459	421
Adenoid cystic carcinoma	18	9	8
Mucoepidermoid carcinoma	8	9	0
Polymorphous low grade adenocarcinoma	1	1	0
Lympho epithelial carcinoma	1	1	0
Mucin-producing Adeno carcinoma	1	0	1
Epithelial-myo epithelial carcinoma	1	1	0
Total salivary gland tumors	30	21	9
Neurofibrosarcoma	1	1	0
Giant cell sarcoma	1	0	1
Embryonal rhabdosarcoma	2	1	1
Total mesenchymal tumors	4	2	2
Lymphoma	25	7	18
Total hematopoietic tumors	25	7	18

sociated with oral malignancies (32). Also, Bosetti et al. (33) indicate that diabetes may increase the risk of cancers of the oral cavity. Moreover, in iron deficiency, epithelial cells of the oral mucosa turn over more rapidly and produce an atrophic or immature mucosa and consequently may cause malignancy (34). The majority of the Iranian population are Muslims and their religion prohibits them from alcohol consumption. But unfortunately traditional water pipe (hookah) is smoked in many cafes and restaurants due to this wrong insight that hookah smoking is less harmful than cigarette smoking especially among young women. Another problem in Iran, (Afghanistan and Pakistan) is smokeless tobacco use named nass (snus) whose consumers are unaware of the harm and it is cheap and easily available. Nass is used by placing it under the lip for extended periods of time. Smokeless tobacco is very strongly correlated with cancers of the cheek and gums (35). This

may decrease the frequency of tongue cancer ratio in Iran.

In our study epithelial cancers constituted 93% of all malignant tumors and most of them were SCC (87.39% of all tumors). This is in agreement with most of the previously published reports (1, 5, 7-10). Razmpa et al. (16) found that 63.2% of tongue cancers were SCC and 36.8% were other types but they did not describe other types of malignancies. In our series salivary gland carcinomas comprised 3.15% of the total lesions followed by non-Hodgkin lymphoma and sarcomas. Anis et al. (7) found 13.6% of malignancies had salivary gland origin that MEC (5.4%) was the most common followed by AdCC (2.7%). Similar to our findings Chidzonga et al. (9) found that salivary gland malignancies comprised 4.9% of the all lesions that AdCC with 3.3% and MEC with 0.9%. The low percentage of cancers of glandular origin in our series is related to evaluation of tongue malignancies and the common site for sali-

vary gland tumor in oral cavity was palate. Dias et al. (8) found that only 3% of tumors were non-epithelial that 1.3% of them were non-hodgkin lymphoma. Moreover in another study, the prevalence of lymphoma was 2.7% of the oral cancers (7) that was similar to our findings. In our series DLBL was the most common form; whereas, in other studies, burkit lymphoma was common (9, 10). In addition, Arotiba et al. (36) mentioned that the proportion of orofacial SCC in Nigerians is quite low (42.8%) because of a high ratio of salivary gland carcinoma and Burkitt's lymphoma.

As seen in most of the studies, sarcomas were less common than carcinomas (5, 7, 37). In our research sarcomas were diagnosed in young age groups. This is in agreement with other studies (5, 36).

In conclusion, In Iranian population SCC is the most prevalent malignancy of tongue and female to male ratio was equal. These lesions were prevalent in the sixth and seventh of life but it may be seen below 40 years old. The dentists have a special role in detection and initial management of oral cavity lesions. Screening examination of tongue by dental practitioner, especially in elderly patients is necessary for early detection of cancerous lesions.

## Acknowledgments

None declared.

## Footnotes

**Authors' Contribution:** Study concept and design: Saede Atarbashi Moghadam and Mohammad Esmaeil Akbari; analysis and interpretation of data: Saede Atarbashi Moghadam and Zahra Bastani; drafting of the manuscript: Saede Atarbashi Moghadam and Fazele Atarbashi Moghadam; critical revision of the manuscript for important intellectual content: Saede Atarbashi Moghadam and Fazele Atarbashi Moghadam; statistical analysis: Saede Atarbashi Moghadam.

**Conflict of Interests:** None declared.

**Financial Disclosure:** None declared.

**Funding/Support:** None declared.

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