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Clinicopathological features of oral squamous cell carcinoma in patients referred to Amir al-Momenin and Velayat Hospitals in Rasht, Iran, from 2020 to 2023

Maryam Zohari [1], Ali Akbar Samadani [2,3], Saghi Azad Afshari [4], Nazanin Bashardoust [5], Parisa Rahimirad [4], Paridokht Karimian [6]*

[1] Department of Periodontics, School of Dentistry, Guilan University of Medical Sciences, Rasht, Iran

[2] Medical Biotechnology Research Center, School of Paramedicine, Guilan University of Medical Sciences, Rasht, Iran

[3] Guilan Road Trauma Research Center, Trauma Institute, Guilan University of Medical Sciences, Rasht, Iran

[4] School of Dentistry, Guilan University of Medical Sciences, Rasht, Iran

[5] Departments of Oral and Maxillofacial Pathology, School of Dentistry, Guilan University of Medical Sciences

[6] Department of Pathology, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran

Abstract

Introduction: Oral squamous cell carcinoma (OSCC) is the most prevalent malignancy of the oral cavity, representing approximately 90% of all oral cancers. This study was conducted to evaluate the frequency and clinicopathological characteristics of OSCC among patients referred to Amir al-Momenin and Velayat Hospitals in Rasht, Iran, from 2020 to 2023.

Materials and methods: In this descriptive-analytical cross-sectional study, 54 medical records were selected through a census-based approach. Data collection involved extracting demographic and pathological information from surgical pathology reports, which were then analyzed using SPSS version 26. Descriptive statistics and Fisher's exact test were employed to assess the data, with a significance level of $p<0.05$.

Results: The mean age of patients was 61 years, with a higher prevalence in males (59.26%) compared to females (40.74%). The tongue was the most frequent site of involvement, accounting for 53.70% of cases, followed by the lip (20.37%), pharyngeal regions (18.52%), and intraoral areas (7.41%). Regarding histological differentiation, 35.19% of cases were well-differentiated, while a significant portion of records (33.33%) lacked specific grading. Furthermore, surgical margin status was unrecorded in 51.85% of cases, though 31.48% were confirmed as tumor-free.

Conclusions: Given the significant proportion of unrecorded pathological data in our sample, this study highlights the need for more consistent and standardized documentation in future pathological reports to better support clinical decision-making.

Keywords: Oral squamous cell carcinoma, Clinicopathological characteristics, Tongue neoplasm, Epidemiology

Corresponding Author: Paridokht Karimiyan

✉ Email: paridokhtkarimian@yahoo.com

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Introduction

The oral cavity is composed of diverse anatomical subregions, including the hard and soft palate, lips, and tongue, each possessing distinct clinical and functional characteristics (1). Broader clinical aspects and diagnostic frameworks for these sites have been well-documented in recent literature (7, 10). Among the malignancies affecting these sites, Oral Squamous Cell Carcinoma (OSCC) is the most prevalent (2). Current epidemiological data indicates that approximately 405,000 new cases of OSCC are predicted annually worldwide (3, 4). In Iran, the clinico-epidemiological profile—including gender distribution—largely mirrors these international trends (5).

Demographically, OSCC shows a higher predilection for men, with most cases diagnosed after the fifth decade of life (6). While environmental carcinogens such as tobacco and alcohol are primary drivers (9), the pathogenesis involves a complex interplay of genetic alterations (8). Advanced molecular mechanisms and endothelial signaling pathways are increasingly recognized as contributors to cancer cell survival (11). Beyond common clinical presentations such as non-healing ulcers (1), clinicians must account for the synchronicity of primary tumors, occurring in approximately 1.5% of cases (6). Effective evaluation of these neck masses remains a cornerstone of early diagnostic protocols (14). The posterolateral border of the tongue remains the most frequently involved site, accounting for nearly 50% of diagnoses (1).

From a pathological perspective, features such as cellular differentiation (15), depth of invasion (17), and Perineural Invasion (PNI) are critical (12). PNI, characterized by tumor cell infiltration into the perineurial space, is strongly associated with poor disease-specific survival (13). Despite advancements, the risk of recurrence remains a challenge (15). Further molecular and immunohistochemical analysis continues to refine our understanding of these diagnostic challenges (16). Since localized data from northern Iran is limited, this study aims to evaluate OSCC patients in Rasht from 2020 to 2023.

Materials and methods

Study Design and Population:

This descriptive-analytical cross-sectional study was conducted on patients diagnosed with Oral Squamous Cell Carcinoma (OSCC) at Amir al-Momenin and Velayat Hospitals in Rasht, Iran, between 2020 and 2023. The initial study population consisted of all patients with a confirmed diagnosis of OSCC during the specified period. Of the total 112 identified medical records, 58 files were excluded due to incomplete clinical or pathological data. Consequently, 54 eligible files were included in the final analysis. The sampling was performed using a non-random, convenience sampling method based on the availability of records.

Data Collection and Analysis:

Data were extracted using a structured two-part checklist. The first part encompassed demographic information (age and gender), while the second part focused on pathological parameters, including the affected tissue site, tumor differentiation grade, presence of lymphatic vessel invasion (LVI), perineural invasion (PNI), and surgical margin status. The collected data were initially managed in Microsoft Excel 2016 and subsequently analyzed using SPSS software (version 26).

Ethical Considerations:

This retrospective cross-sectional study was conducted using existing pathology reports and medical records. Patient confidentiality was strictly maintained throughout the study. All personal identifiers were removed before data collection, and each patient was assigned a unique study code. The study protocol was approved by the Ethics Committee of Guilan University of Medical Sciences (Approval Code: 452.403).

Results

A total of 54 patients diagnosed with OSCC were included in this descriptive-analytical cross-sectional study conducted from 2020 to 2023 at two referral hospitals in Rasht, Iran. The patients' age ranged from 28 to 94 years, with a mean ± SD of 61.15 ± 15.59 years.

Demographic and pathological characteristics, including gender, tissue type, differentiation grade, lymphovascular invasion (LVI), perineural invasion (PNI), and surgical margin status, were analyzed using frequency and percentage distribution. To evaluate the association between gender/age groups and tumor site, Fisher's exact test was applied, with a p-value < 0.05 considered statistically significant. All analyses were performed using SPSS software (version 26). The results are detailed in Tables 1 through 8.

Table 1. Presents the frequency and percentage distribution of gender among patients diagnosed with oral squamous cell carcinoma (OSCC).

Sex	Frequency	Percentage
Female	22	40.74
Male	32	59.26

Table 2. Frequency and percentage distribution of tissue type in patients with OSCC.

Type of tissue	Frequency	Percentage
	4	7.41
	29	53.7
	11	20.37
	10	18.52

Table 3. Frequency and percentage distribution of differentiation grade in patients with OSCC.

Differentiation grade	Frequency	Percentage
Not registered	18	33.33
Low	5	9.26
Medium	12	22.22
High	19	35.19

Table 4. Frequency and percentage distribution of lymphovascular invasion (LVI) status in patients with OSCC.

Lymphatic invasion	Frequency	Percentage frequency
Not registered	32	59.26
Not observed	15	27.78
Observed	7	12.96

Table 5. Frequency and percentage distribution of perineural invasion (PNI) status in patients with OSCC.

Invasion of surrounding nervous tissue	Frequency	Percentage of frequency
Not registered	32	59.26
Observed	12	22.22
Not observed	10	18.52

Table 6. Frequency and percentage distribution of surgical margin status in patients with OSCC.

Involvement of the margins of the sampled tissue	Frequency	Percentage
Not registered	28	51.85
Near to tumor	1	1.85
Tumor-free	17	31.48
Tumor-free/ Involved in tumor	2	3.70
Extended to the tongue muscle	2	3.70
Involved in tumor	3	5.56
Surgical margin	1	1.85

Table 7. Shows the relationship between gender and tissue type using the Fisher exact test. According to the results of this table, it can be concluded that there is a statistically significant relationship between these two variables (p=0.037).

Sex Tissue type	Male(n=32)	Female(n=22)	p-value
Intraoral	3(%9.38)	1(%4.55)	P=0.037
Tongue	12(%37.50)	17(%77.27)	
Lip	9(%28.13)	2(%9.09)	
Pharyngeal	8(%25.00)	2(%9.09)	

Table 8. Shows the relationship between age groups (<40 and ≥40 years) and tissue type using Fisher's exact test. According to the results of this table, it can be concluded that there is no statistically significant relationship between these two variables (p=0.192).

Type of tissue	<40	≥40	p-value
Intraoral	1(%16.67)	3(%6.25)	P=0.192
Tongue	5(%83.33)	24(%50.00)	
Lip	0	11(%22.92)	
Pharyngeal	0	10(%20.83)	

Discussion

The increasing prevalence of Oral Squamous Cell Carcinoma (OSCC), combined with its poor prognosis and high mortality rates, underscores the urgent need for applied research that clarifies clinical characteristics and risk factors. While several census-based studies have explored this malignancy, regional variations in sample size and demographics necessitate localized investigations to fully understand how the disease manifests in different populations.

Our findings revealed a male predominance in the study cohort (59.26% male vs. 40.74% female), aligning with the observations of Emadian et al. (2019) (18). This gender disparity likely reflects historical differences in exposure to primary risk factors, such as tobacco and alcohol use. Patients ranged in age from 28 to 94 years (mean: 61.15 ± 15.59), mirroring the global trend reported by Jemal et al. (2017) (19), where the average age of onset was approximately 61 years. This age distribution suggests that OSCC is predominantly a disease of older adults, driven by the cumulative impact of long-term carcinogen exposure and age-related biological changes.

Regarding tumor site, the tongue emerged as the most frequently involved area (53.70%), followed by the lips (20.37%), pharyngeal regions (18.52%), and intraoral sites (7.41%). These patterns support the findings of Givony et al. (2020) (20), who also identified the tongue and lips as the most commonly affected sites. Furthermore, the histopathological diversity observed—ranging from variation in differentiation grades to instances of lymphatic (LVI) and perineural invasion (PNI)—underscores the aggressive potential of these tumors. As Chaturvedi et al. (2013) (21) noted, the presence of LVI and positive surgical margins are critical indicators of poor prognosis, a trend we observed in several of our cases.

Interestingly, a significant correlation emerged between gender and tumor site (P=0.037). While men demonstrated a higher frequency of lip and pharyngeal involvement, women were more frequently affected in the pharyngeal regions, a disparity that may be rooted in both biological differences and gender-specific lifestyle exposures, as previously suggested by Silverman (2001) (22). Conversely, we found no statistically significant association between patient age (at a 40-year threshold) and tumor site (P=0.192). This lack of correlation suggests that, within our study population, the anatomical distribution of the disease is less dependent on age and more likely influenced by independent factors, such as specific behavioral habits or genetic predisposition.

While these findings offer valuable insights into the local patterns of OSCC, this study does have limitations, notably its retrospective design and modest sample size, which may constrain the statistical power of certain sub-analyses. Nevertheless, these results contribute to the broader understanding of OSCC and highlight the need for further prospective research to decode the complex interplay between environmental risk factors and tumor biology.

Conclusion

The results of this study indicate that the incidence of Oral Squamous Cell Carcinoma (OSCC) is significantly higher in males than in females, with a mean patient age of 61 years. The tongue was identified as the most common site of involvement, and the tumors showed variable histopathological differentiation.

This study shows that the demographic and pathological characteristics of OSCC patients are influenced by various factors, including gender, while age has a less definitive impact on tumor tissue type. Our findings emphasize the importance of closely examining pathological features, such as lymphovascular invasion and surgical margin status, for predicting tumor behavior. These results can assist clinicians in planning more precise treatments and help researchers in designing future studies. Ultimately, this research underscores the need for more comprehensive investigations to improve our understanding of the factors affecting OSCC and to develop more effective prevention and treatment strategies.

Author contribution

MZ and AAS conceived and designed the study and also wrote and edited the article. **ASA, PR** and **PK** accompanied many other parts of the manuscript,

including data validity, writing, and scientific investigation. All authors read the manuscript comprehensively and confirmed the paper's final version.

Conflicts of interest

There are no conflicts of interest.

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