# Histological Pattern of Oral Squamous Cell Carcinoma with Respect to Age, gender and Site in Pakistan

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**Abstract**

**Objective:** To assess histological pattern of "oral squamous cell carcinoma (OSCC)" with respect to age, gender and site in Pakistan.

**Material and Methods:** This study was Observational descriptive study. "CMH Medical College, Lahore" from 1st July to 30th December 2023. A total of 150 patients with suspicious chronic oral ulcer were included in the study. Age, gender, gross appearance and site of ulcer were documented. Biopsy was obtained from the ulcer to make diagnosis of OSCC and determine its histological type. Data was analyzed using SPSS 22:00.

**Results:** Mean age of patients with OSCC was 53.07 ± 16.98 years. There were 103 (68.67%) male patients while 47 (31.33%) patients were females. Mean duration of ulcer was 9.56 ± 2.18 weeks. 106 (70.67%) had ulcerative lesion, 29 (19.33%) had exophytic lesion and 15 (10.00%) had verrucous lesion. Most common histological type of OSCC found was "spindle cell carcinoma" in 76 (50.67%) patients. There was no statistical difference in distribution of histological pattern of OSCC by age group (p = 0.413), gender (p = 0.932) and site of lesion (p = 0.386).

**Conclusion:** Most common histological type of OSCC was "spindle cell carcinoma" with buccal mucosa being most common site.

**Keywords:** Histological type of neoplasm, Oral ulcer, Squamous cell carcinoma.

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## Introduction

Oral squamous cell carcinoma (OSCC)" is one the most prevalent type of oral malignancy that has been reported to have an approximated annual incidence of more than 350 thousand new cases during the year 2018.[1] In Pakistan, this incidence, when standardized by age, has been reported to be among the highest in the world at an approximate of 27.03 per 100,000 population followed by China, Iraq and lowest one is in Kuwait where it was estimated at 0.51 per 100,000 population.[2]

There are several factors that have the tendency to increase the propensity to develop "oral squamous cell carcinoma (OSCC)" that include use of smoking materials (like cigarettes, bidi, huqqa and cigars), consuming alcohol in any form and habit of chewing certain substances (like tobacco, areca nut, betel leaf and slaked lime).[3] In addition, genetic predisposition is another important risk factor for developing "oral squamous cell carcinoma (OSCC)"[3,4] When it comes to pathogenesis of "oral squamous cell carcinoma (OSCC)", it is a multi-step progressive process in which certain carcinogenic mutations and genetic alterations result in dysplasia that progresses into development of precancerous pathological lesions followed by onset of "carcinoma-in-situ" and ultimately the cancer which may or may not metastasize.[5] There are several sites where the lesions of "oral squamous cell carcinoma (OSCC)" may appear as a non-healing ulcer including tongue (the most common site), lips,

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gums, floor of mouth, hard palate, "retromolar trigone" and buccal mucosa.[6] In terms of age, previously it was thought that patients belonging to older age group have much higher chances to develop this common malignancy of the oral cavity but over the years newer research have demonstrated different results showing that even amongst the younger population, there is a rising trend in the prevalence of "oral squamous cell carcinoma (OSCC)".[7]

One of the most important aspect of managing the patients with malignancy is to have an intricate knowledge of all the aspects of the said malignancy including its overall prevalence in the community, its various subtypes, its possible locations and its distribution across various age groups and the genders which is achieved through developing a comprehensive cancer registry which in Pakistan is unfortunately lacking[8], particularly in case of "oral squamous cell carcinoma (OSCC)". Therefore, it was essential to conduct a study in this regard to help contributing towards development of such registry for which this study was conducted with the aim of determining the frequency of various histological patterns of "oral squamous cell carcinoma (OSCC)" and its distribution among various age groups, gender and site at which lesion is located among the population of Pakistan.

## Materials and Methods

This observational descriptive study was conducted at "CMH Medical College, Lahore" from 1st July to 30th December 2023 after obtaining approval from the ethical review board of "CMH Medical College, Lahore" (ERB#:09/ERD/CMH/LMC Dated 28-02-2024). Sample size was calculated using WHO sample size calculator for two means using following formula[9]:

For calculation following parameters were used; confidence interval of 95%, absolute precision 8% and anticipated frequency of "OSCC" in chronic oral ulcers of 38/79 (48.1%).[10]

$$n = \frac{z^2_{1-\alpha/s} P(1-P)}{d^2}$$

This gave a sample size of 150. Adult patients who had the age more than eighteen years, males and females with suspicious looking chronic oral ulcer which on biopsy came out to be "oral squamous cell carcinoma (OSCC)" were included in this study. Patients with any other type of malignancy, previous history of treatment for "oral squamous cell carcinoma (OSCC)" and those undergoing chemotherapy or radiotherapy were excluded from the study.

Patients were selected through "non-probability consecutive sampling" technique. A written consent which was signed by the study participants was made an essential pre-requisite. Baseline characteristics including age (in years), gender (male/female), duration of lesion (in weeks), gross appearance of lesion and site of lesion were documented. Patients were given explicit pre-procedural information regarding the possibility of the lesion to be cancerous. Biopsy specimen was obtained by research team under strict aseptic condition through incisional biopsy technique under local anesthetic. Biopsy sample was sent to consultant histopathologist with a minimum two year experience in oncological histopathology to make histological diagnosis of "oral squamous cell carcinoma (OSCC)". In all these patients, further histological assessment was performed to determine histological type of OSCC. Based on diagnosis, appropriate treatment plan was devised through consultant oncologist consultation having minimum of five years of experience. "Data was analyzed by using Statistical Package for Social Sciences (SPSS) 22.00. Quantitative data (age and duration of lesion) was represented using mean±standard deviation (SD). Qualitative data (gender, gross appearance of lesion, site of lesion and histological type of OSCC) was represented by using percentage and frequency. Histological pattern of OSCC identified was stratified by age group, gender and site of lesion and post-stratification, Chi-square test was used. A p-value of ≤0.05 was considered as statistically significant".

## Results

In this study, a total of 150 patients with histological diagnosis of "oral squamous cell carcinoma (OSCC)" were included. Mean age of study participants was 53.07 ± 16.98 years. 19 (12.66%) patients were aged 18-30 years, 48 (32.00%) were aged 31-50 years, 67 (44.67%) were aged 51-75 years and 16 (10.67%) were aged > 75 years. There were 103 (68.67%) male patients while 47 (31.33%) patients were females. Mean duration of ulcer was 9.56 ± 2.18 weeks. 106 (70.67%) had ulcerative lesion, 29 (19.33%) had exophytic lesion and 15 (10.00%) had verrucous lesion. Aforementioned data and site of lesion are summarized below in table I: Most common histological type of OSCC found in study

participants was "spindle cell carcinoma" occurring in 76 (50.67%) patients followed by "verrucous carcinoma" 34(22.67%), "basaloid cell carcinoma" 20(13.33%), "papillary cell carcinoma" 13 (8.67%) and "mucoepidermoid carcinoma" 7(4.67%), depicted below in figure 1: Distribution of histological pattern of OSCC by age group, gender and site of lesion is given below in table II:

**Table 1:** *Baseline characteristics of OSCC patients (n = 150)*

| Characteristic | n (%) |
|---|---|
| **Mean age** | 53.07 ± 16.98 years |
| **Age group** | |
| 18-30 years | 19 (12.66%) |
| 31-50 years | 48 (32.00%) |
| 51-75 years | 67 (44.67%) |
| > 75 years | 16 (10.67%) |
| **Gender** | |
| Male | 103 (68.67%) |
| Female | 47 (31.33%) |
| **Mean duration of lesion** | 9.56 ± 2.18 weeks |
| **Gross appearance of lesion** | |
| Ulcerative | 106 (70.67%) |
| Exophytic | 29 (19.33%) |
| Verrucous | 15 (10.00%) |
| **Site of lesion** | |
| Buccal mucosa | 77 (51.34%) |
| Lower gingiva | 26 (17.33%) |
| Tongue | 18 (12.00%) |
| Lips | 15 (10.00%) |
| Retromolar trigone | 9 (6.00%) |
| Hard palate | 5 (3.33%) |

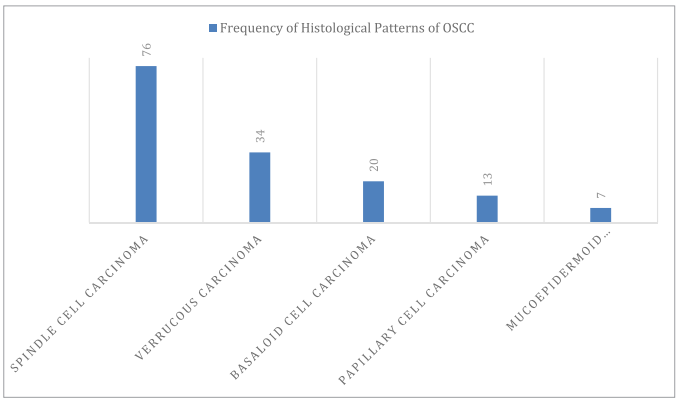


**Figure 1:** *Histological patterns of OSCC (n = 150)*

## Discussion

This study primarily focused on the histological pattern of "oral squamous cell carcinoma (OSCC)" across different age groups, genders and site at which clinically evident lesion of "oral squamous cell carcinoma (OSCC)". In Pakistan, to the best of knowledge, this is amongst the initial studies that are focusing on this stratification of histology of OSCC by age group, gender and site of lesion. In present study, highest proportion of patients who had OSCC were aged 51-75 years followed by those aged 31-50 years. This is coherent with the findings of recent studies that have shown that although OSCC incidence has classically been higher in elderly population but now its burden is increasing among the younger population of the community.[11,12] Male to female ratio among patients with OSCC in present study was approximately 2:1. This male predominance has been demon-

**Table 2:** *Distribution of histological pattern of OSCC by age group, gender and site of lesion (n = 150)*

| | Histological type of OSCC [n(%)] | | | | | p-value |
|---|---|---|---|---|---|---|
| | Spindle cell | Verrucous cell | Basaloid cell | Papillay cell | Muco-epidermoid | |
| **Age group** | | | | | | |
| **18-30 years (n = 19)** | 9 (47.37%) | 5 (26.32%) | 1 (5.26%) | 4 (21.05%) | 0 (0.00%) | |
| **31-50 years (n = 48)** | 24 (50.00%) | 13 (27.08%) | 6 (12.50%) | 4 (8.33%) | 1 (2.08%) | 0.413 |
| **51-75 years (n = 67)** | 35 (52.24%) | 13 (19.40%) | 10 (14.92%) | 3 (4.48%) | 6 (8.95%) | |
| **> 75 years (n = 16)** | 8 (50.00%) | 3 (18.75%) | 3 (18.75%) | 2 (12.50%) | 0 (0.00%) | |
| **Gender** | | | | | | |
| **Male (n = 103)** | 53 (51.46%) | 22 (21.36%) | 13 (12.62%) | 10 (9.71%) | 5 (4.85%) | 0.932 |
| **Female (n = 47)** | 23 (48.94%) | 12 (25.53%) | 7 (14.89%) | 3 (6.38%) | 2 (4.25%) | |
| **Site of lesion** | | | | | | |
| **Buccal mucosa (n = 77)** | 41 (53.25%) | 20 (25.97%) | 11 (14.29%) | 1 (1.30%) | 4 (5.19%) | |
| **Lower gingiva (n = 26)** | 12 (46.15%) | 7 (26.92%) | 1 (3.85%) | 3 (11.54%) | 3 (11.54%) | |
| **Tongue (n = 18)** | 9 (50.00%) | 3 (16.67%) | 3 (16.67%) | 3 (16.66%) | 0 (0.00%) | 0.386 |
| **Lips (n = 15)** | 7 (46.67%) | 2 (13.33%) | 3 (20.00%) | 3 (20.00%) | 0 (0.00%) | |
| **Retromolar trigone (n = 9)** | 5 (55.56%) | 1 (11.11%) | 1 (11.11%) | 2 (22.22%) | 0 (0.00%) | |
| **Hard palate (n = 5)** | 2 (40.00%) | 1 (20.00%) | 1 (20.00%) | 1 (20.00%) | 0 (0.00%) | |

strated in multiple studies which may be due to higher proportion of males who consume hazardous agents, like tobacco, UV light and alcohol that increase the risk of developing "oral squamous cell carcinoma (OSCC)".[13,14,21,22]

In terms of gross appearance, ulcerative lesions were most common followed by exophytic and verrucous lesions. Similar trend was observed in a study conducted by Rafique et al.,[15] who found that ulcerative gross appearance was most commonly observed clinically in OSCC patients. In terms of site, most common OSCC lesion sites were buccal mucosa, lower gingiva and tongue. Multiple studies have reported these sites of the oral cavity to be commonly involved where "oral squamous cell carcinoma (OSCC)" develops.[16,17] Histological diagnosis and variant assessment was performed through histological analysis of tissue specimen obtained by incisional biopsy which is the gold standard for this purpose.[18] In terms of histological pattern of "oral squamous cell carcinoma (OSCC)", various histological variants of OSCC were identified including "spindle cell", "verrucous", "basaloid cell", "papillary cell" and "mucoepidermoid". These variants have been reported in previous studies that can exist in cases of "oral squamous cell carcinoma (OSCC)".[19,20] In terms of age group, it was found that there was no statistical difference between different age groups in terms of histological pattern of OSCC. Similar was the case in terms of gender and site of OSCC lesion. This was not coherent with the finding of a study that only focused on this distribution of histological pattern in different sites of lesion and reported that site of lesion significantly impacted the type of histological pattern of OSCC ($p = 0.047$). However, when it comes to assessment of histological pattern distribution across age group and gender, extensive pubmed and Cochrane database research failed to yield any studies from which a comparison could be performed.

Based on such paucity of data, it is strongly recommended that large scale studies should be conducted in this regard to effectively develop OSCC registry at national level and quantify the distribution of histological pattern of OSCC across age groups, gender and lesion site. Limited sample size and confinement of study sample to a single center were few limitations of the study.

## Conclusion

In conclusion, most common histological pattern of OSCC in present study was "spindle cell carcinoma". Buccal mucosa was the most common site of OSCC. There was no statistically significant difference in distribution of histological pattern of OSCC by age group, gender and site of lesion.

**Conflict of Interest:** *None*

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## Authors Contribution

**VSK, AACh , :** Conceptualization of Project
**VSK, AACh , HN ,IH, ZS:** Data Collection
**VSK, AACh , HN ,IH, ZS, FQ:** Literature Search
**VSK, AACh , HN ,IH, ZS, FQ:** Statistical Analysis: Drafting, Revision
**VSK, AACh , HN ,IH, ZS, FQ:** Writing of Manuscript