

## RESEARCH ARTICLE

# Clinicopathological Correlation Study of Oral Squamous Cell Carcinoma in a Local Indian Population

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### Abstract

**Background:** Oral squamous cell carcinoma (OSCC), the most common malignancy of the oral cavity, shows geographical variation with respect to the age, sex, site and habits of the population. The histopathologic grade of the tumor is closely related to its tissue of origin. This study was conducted to establish the prevalence of OSCC in relation to patient sex, age, habits and sites of lesions. **Materials and Methods:** A total of 130 cases of histopathologically diagnosed OSCC were selected for the study, out of which 66, 38 and 26 were well (WD), moderately (MD) and poorly differentiated (PD), respectively. Sections were stained with haematoxylin and eosin and graded according to a modified Borders's system. Then statistically analyzed different grades of OSCC for correlations with other variables. **Results:** In our study the majority cases of OSCC were found in the 5th to 7th decades of life, males accounting for 53%. The most common site was the buccal mucosa and most cases had habit of tobacco use either in the form of chewing or smoking or both. When the different grades of OSCC were compared with different sites a statistically significant value was observed ( $P=0.029$ ). **Conclusions:** The incidence of high grade PD is very much less in female patients but in males such lesions were common. In our location population the buccal mucosa is the most common site due to the tobacco habits of the patients and majority cases of the buccal mucosa are WD whereas in tongue, floor of the mouth and palate PD are common.

**Key words:** Oral squamous cell carcinoma - clinicopathological study - histopathological grading

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### Introduction

Oral squamous cell carcinoma (OSCC) is the most common oral malignancy, representing up to 80-90% of all malignant neoplasms of the oral cavity (Fabio et al., 2013). OSCC shows geographical variation with respect to the age, sex, site and habits of the population (Ayesha et al., 2013) so the incidence of oral cancers parallels the longevity, multiplicity, and intensity of carcinogenic exposure. It is generally considered that OSCC is most common in men in the 6th to 8th decades of life and is rare in patients younger than 40 years (Swetha and Amsavardani, 2012). Smoking, betel quid, and tobacco chewing habits are the factors which cause high incidence in vast population of south East Asia (Abdul et al., 2015). Most of the cases of OSCC are preceded by the presence of clinically identifiable premalignant changes of the oral mucosa. These lesions often present as either white or red patches, known as leukoplakia and erythroplakia (Brad and Terry, 2002).

Early squamous cell carcinoma (SCC) often present as a white or red patches or mixed red and white lesion (Erythroleukoplakia). Superficial ulceration may develop with time. As the lesion grows, it may become an

exophytic mass with a fungating or papillary surface. Many early lesions are asymptomatic; however, more advanced carcinoma will often be painful. SCC can affect all areas of the oral cavity but most common reported sites are the tongue, floor of the mouth and lower lip. (Aree et al., 2009; Doshi et al., 2011)

Oral squamous cell carcinoma is a malignant neoplasm arising from the mucosal epithelium of the oral cavity (Ankur et al., 2010). The histopathologic grade of the tumor is related somewhat to its biologic behavior. In other words, a tumor that is mature enough to closely resemble its tissue of origin seems to grow at a slightly slower pace and to metastasize later in its course. Such a tumor is low-grade, grade I or well-differentiated squamous cell carcinoma. In contrast, a tumor with much cellular and nuclear pleomorphism and with little or no keratin production may be so immature that it becomes difficult to identify the tissue of origin. Such a tumor often enlarges rapidly, metastasizes early in its course, and is termed high-grade, grade III/IV, poorly differentiated or anaplastic. A tumor with a microscopic appearance somewhere between these two extremes is labeled a "moderately differentiated" carcinoma (Brad et al., 2008; Doshi et al., 2011; Rajendran et al., 2012).

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This study was conducted in our location to find out the prevalence of OSCC in relation with patients sex, age and sites of the lesion. Of course in our location the most common habit of the patient is tobacco related, either chewing or smocking. The main purpose of this study is to correlate all these common clinical parameters like gender and age of the patient, sites of the oral lesion and kind tobacco habit like chewing or smocking or both with different grades of OSCC like well, moderate and poor.

**Materials and Methods**

Formalin fixed, paraffin embedded blocks of oral squamous cell carcinoma (OSCC) were obtained from the archives of Department of Oral Pathology and Microbiology, K.V.G Dental College & Hospital, Sullia, Karnataka, India. The reported cases of oral squamous cell carcinoma were analyzed retrospectively from the institutions. A total of 130 cases of histopathologically diagnosed as OSCC were selected for the study. The study group comprised of: *i*). 66 cases of well differentiated squamous cell carcinoma.(WDSCC); *ii*). 38 cases of moderately differentiated squamous cell carcinoma. (MDSCC); *iii*). 26 cases of poorly differentiated squamous cell carcinoma (PDSCC).

The paraffin block sections were inspected to confirm the adequate size of the tissue with most representing area. The section was stained with Haematoxylin and Eosin and graded according to Modified Borders’s system as well, moderate and poorly differentiated squamous cell carcinoma respectively (Brad et al., 2009). All the slides were methodically evaluated by a single blinded observer in order to eliminate inter-observers bias. The clinical details of all the cases like patient’s age, sex, site of the lesion and habits and its duration were systematically tabulated. All the statistical analysis was carried out by using the SPSS version 20 software. Clinicopathological correlative study of different grades of oral squamous cell carcinoma with patient’s age, sex, site of the lesion and habits and its duration by Chi-Square analysis except habit with smocking alone was analyzed by Fishers exact test.

**Results**

The present study comprised of total 130 cases, out of which 66(50.8%) cases of WDSCC, 38 (29.2%) cases of MDSCC and 26 (20.0%) cases of PDSCC. Among these cases 69 (53%) patients are male and 61 (46.9%) patients are female (Table-1). Among the male patient, 29(42%) well differentiated, 22 (31.9%) moderately differentiated and 18 (26.1%) cases were poorly differentiated SCC. And Among the female patient 37 (60.7%) well differentiated, 16 (26.2%) moderately differentiated and 8 (13.1%) cases were poorly differentiated SCC. Chi-square analysis of the gender distribution when comparing with different grades of OSCC was found to be statistically non-significant (P=0.071).

Among the total 130 cases, 7 (5.4%) patients in the age group <40 years, 25 (19.2%) patients in the age group of 40-49 years, 38 (29.2%) patients in the age group of 50-59 years, majority 47 (36.2%) patients in the age group

of 60-69 years and 13 (10%) patients in the age group of 70 years and above. Comparison with different grades of OSCC as shown in Table-2. Chi-square analysis of the age-wise distribution when comparing with different grades of OSCC was found to be statistically non-significant (P=0.302).

Out of 130 cases of OSCC, 69 (53.1%) cases were found in buccal mucosa, 4 (3.1%) cases were found in floor of the mouth,18 (13.8%) cases were found in labial mucosa, 16 (12.3%) cases were found in palate, and 23 (17.7%) cases were found in tongue. Comparison with different grades of OSCC as shown in Table-3. Chi-square analysis of the site-wise distribution when comparing with different grades of OSCC was found to be statistically significant (P=0.029).

Among the total 130 cases, 81 (62.3%) patients were having the habit of tobacco chewing alone and majority 50 (61.7%) cases were WDSCC, 22 (27.7%) and 9 (11.1%) cases were diagnosed as moderate and

**Table 1. Gender-wise Distribution of Patients**

OSCC		Gender		TOTAL
		Male	Female	
WD	Count	29	37	66
	%	42.00%	60.70%	50.80%
MD	Count	22	16	38
	%	31.90%	26.20%	29.20%
PD	Count	18	8	26
	%	26.10%	13.10%	20.00%
Total	Count	69	61	130
	%	53%	46.90%	100.00%

**Table 2. Age-wise Distribution of Patients**

AGE GROUP	WD	MD	PD	TOTAL
<40	Count	5	1	1
	%	7.60%	2.60%	3.80%
40-49	Count	17	5	3
	%	25.80%	13.20%	11.50%
50-59	Count	18	12	8
	%	27.30%	31.60%	30.80%
60-69	Count	20	18	9
	%	30.30%	47.40%	34.60%
≥70	Count	6	2	5
	%	9.10%	5.30%	19.20%
Total	Count	66	38	26
	%	100.00%	100.00%	100.00%

**Table 3. Site-wise Distribution of Cases**

Site of the Lesion	WD	MD	PD	Total
Buccal mucosa	Count	43	19	7
	%	65.20%	50.00%	26.90%
Floor of the mouth	Count	0	1	3
	%	0.00%	2.60%	11.50%
Labial mucosa	Count	8	6	4
	%	12.10%	15.80%	15.40%
Palate	Count	6	5	5
	%	9.10%	13.20%	19.20%
Tongue	Count	9	7	7
	%	13.60%	18.40%	26.90%
Total	Count	66	38	26
	%	100.00%	100.00%	100.00%

**Table 4. Distribution of Cases According to Habit and its Duration**

DURATION		TOTAL	WD	MD	PD
Tobacco chewing alone					
<10	Count	19	11	7	1
	%	23.50%	13.60%	8.60%	1.20%
10-20	Count	31	19	9	3
	%	38.3	23.50%	11.10%	3.70%
21-30	Count	22	15	2	5
	%	27.2	18.50%	2.50%	6.20%
>30	Count	9	5	4	0
	%	11.1	6.20%	4.90%	0%
Total	Count	81	50	22	9
	%	62.30%	61.70%	27.70%	11.10%
Tobacco smoking alone					
<10	Count	0	0	0	0
	%	0%	0%	0%	0%
10- 20	Count	3	0	3	0
	%	27.30%	0%	27.30%	0%
21-30	Count	8	0	3	5
	%	72.70%	0%	27.30%	45.50%
>30	Count	0	0	0	0
	%	0%	0%	0%	0%
Total	Count	11	0	6	5
	%	8.50%	0%	54.50%	45.50%
Both tobacco chewing and smoking					
<10	Count	2	1	1	0
	%	5.70%	2.60%	2.60%	0%
10-20	Count	18	8	5	5
	%	47.40%	21.10%	13.20%	13.20%
21-30	Count	13	5	5	3
	%	34.20%	13.20%	13.20%	7.90%
>30	Count	5	2	0	3
	%	13.20%	5.70%	0%	7.90%
Total	Count	38	16	11	11
	%	29.20%	42.10%	28.90%	28.90%

poorly differentiated SCC respectively (Table-4). Chi-square analysis of the habit of tobacco chewing alone with its duration wise distribution when comparing with different grades of OSCC was found to be statistically non-significant (P=0.18). 11 (8.5%) patients were having the habit of tobacco smoking alone and 6 (54.5%) and 5 (45.5%) cases were diagnosed as moderate and poorly differentiated SCC respectively (Table-4). Fishers exact test analysis for the habit of tobacco smoking alone with its duration wise distribution when comparing with different grades of OSCC was found to be statistically non-significant (P=0.078).

38 (29.2%) patients were having the habit of both tobacco chewing and smoking. 16 (42.1%) cases were well differentiated and 11 (28.9%) cases each were diagnosed as moderate and poorly differentiated SCC (Table-4). Chi-square analysis of the habit of both tobacco chewing and smoking with its duration wise distribution when comparing with different grades of OSCC was found to be statistically non-significant (P=0.586).

## Discussion

Oral squamous cell carcinoma is the most frequent malignancy in the mouth, accounting to 95% of all oral malignant lesions. The most important risk factors for

OSCC are use of tobacco or betel quid and the regular drinking of alcoholic beverages. The most affected sites are the tongue, lower lip and floor of the mouth. The typical demographic profile of OSCC is one of a man in the fifth to eighth decades of life, who is a tobacco chewer and/or a smoker (Doshi et al., 2011). Among the 130 cases of our study majority cases were male patients (53%) compare to female (about 46%), so female patients were also almost equally affected and majority cases were WDSCC (60.7%). And the incidence of high grade PDSCC was very less in female patient (13.1%) but in male patients incidence of high grade PDSCC were doubled compare to female patients (26.1%). Out of 130 cases of our study 85(65.4%) patients were found between the age of 50 and 70 years. So according to the previous studies here also the majority cases were found in 5th to 7th decades of life.

In our study 69 (53.1%) cases were the lesions found in buccal mucosa, this is because the patients in these region having the habit of tobacco chewing frequently with keeping tobacco quid against the buccal mucosa at vestibule. The next frequent site after buccal mucosa was tongue i.e.23 (17.7%) cases in our study unlike the tongue was the most frequent site in most of the previous studies (Doshi et al., 2011; Liviu and Johan, 2012). All the cases of our study had the habit of tobacco use either in the form of chewing or smoking or both. The statistical analysis of these correlative study between the different grades of OSCC and patients gender and age found to be non significant. Even the patients habits and its duration also non significant statistically. When the different grades of OSCC compared with different sites of the lesion of our study have shown statistically significant value (P=0.029). Among the lesions from the buccal mucosa, majority cases were diagnosed as WDSCC and compare to the other sites like tongue, floor of the mouth and palate the majority cases were diagnosed as PDSCC.

Farnaz et al, (2011) studied the clinical and histopathological analysis of OSCC of young patients in Mashhad, Iran, from 158 cases of OSCC, 21 patients were younger than 40 years. The most common site of involvement was the tongue. Characteristics of OSCC in young patients are different from older age group. Major risk factors like smoking, alcohol consumption and HPV were not etiologic factors for OSCC in young patients. Janaina et al. (2014) studied clinical and histopathological evidence of OSCC in young patients, they believed, there were differences in the factors associated with pathogenesis, biological behavior and prognosis in young patients, since most studies showed more rapid and aggressive tumor progression in this age group.14

Patients with OSCC had a mean age of 50.36±1.98 years with equal prevalence in both genders. It was observed that SCC was most commonly arising from tongue (23.1%) followed by lip mucosa (20.5%) and buccal mucosa (12.8%) and most of the cases were MDSCC (51.3%). They also found a very strong association between the site and grade of tumor like in our study, almost all the tumours on sublingual mucosa especially those arising from floor of the mouth were poorly differentiated (Sharma et al., 2010; Ayesha et al., 2013; Md. Aktar et al., 2014) studied

clinicopathologically on OSCC and found similar result like our study. Majority of the patients were at 6th decade where female outnumbered the male with male female ratio is 5:4, and about the site of the lesion maximum patients had the lesion in buccal mucosa.

The Clinicopathological characteristics of oral squamous cell carcinoma in Northern Norway, the majority of the patients presented with well or moderately differentiated tumours, most frequently located in the tongue, floor of mouth and alveolar mucosa. The patients with the habit of Smoking and alcohol were diagnosed between the fifth and seventh decades of life. There were fewer smokers and drinkers among the young individuals, who frequently presented tumours in the tongue. Tumours arising in the floor of mouth were by far more frequent in male patients with a high consume of both tobacco and alcohol and has been explained by the accumulation of carcinogens in the mucus in the floor of the mouth (Koch et al., 1999; Barnes et al., 2005; Oddveig et al., 2014). In our study also majority cases of the floor of the mouth were diagnosed as PDSCC.

Abdul et al. (2015) were correlated histopathological patterns of OSCC with age & site. 30% cases were observed in age group of 41-50 years and 45 % of cases were found on buccal mucosa. They found statistical significant value between these two correlations. But in our study, correlation between the site and histopathological types were found significant but not with age of the patient.

In demographic view prognosis of OSCC was found to be poor for females, patients above 40 years of age, Southeast Asian origin, with tobacco and alcohol consumption, people with diet of mostly non-vegetarian. Patients with the presence of or history of any systemic illness would have poor prognosis. Patients with tumor at floor of mouth, soft palate and posterior tongue and histologically, patients with poor grade tumor (PDSCC) would have poor survival rate (Kiran and Nidhi, 2013).

In conclusion, OSCC most commonly found in 5th to 7th decades of life, female patients were almost equally affected like male and incidence of high grade PDSCC was very less in female patient but in male patients incidence of PDSCC were doubled compare to female patients. In this region tobacco chewing is most common habit and frequently keeping tobacco quid at the vestibule against buccal mucosa, so the buccal mucosa is the most common site. Majority cases of the buccal mucosa are WDSCC whereas in tongue, floor of the mouth and palate PDSCC are common.

## References

Abdul HS, Taqi M, Ttazeen R (2015). Evaluating the correlation between histopathological patterns of oral squamous cell carcinoma, age & site. *Pakistan Oral Dental J*, **35**, 30-2.  
Angela CC (2009). Epithelial Pathology In Oral and Maxillofacial Pathology. 3<sup>rd</sup> ed . Ed Brad WN, Douglas DD, Carl MA, et al. Saunders, Elsevier Inc, Philadelphia, 418-19.  
Ankur B, Sonal S, Monali C (2010). Histopathological grading systems in oral squamous cell carcinoma: a review. *J Int Oral Health*, **2**, 1-10.  
Aree J, Somporn S, Malee T (2009). Oral squamous cell carcinoma; A clinicopathological study of 342 Thai cases.

*J Contemporary Dental Practice*, **10**, 1-9.  
Ayesha Z, Nagi AH, Nadia N (2013). A clinicopathological study of orofacial squamous cell carcinoma in local population. *Biomedica*, **29**, 147-50  
Barnes L, Eveson JW, Reichart P, Sidransky D (2005). Oral cavity and oropharynx in pathology and genetics of head and neck tumours. Ed Barnes LEJ, Reichart P, Sidransky D. WHO. Lyon: IARC Press. 163-68.  
Brad WN, Terry A (2002). Oral Cancer and Precancerous Lesions. *CA Cancer J Clin*, **52**, 195-15.  
Doshi NP, Shah SA, Patel KB, et al (2011). Histological grading of oral cancer: A comparison of different systems and their relation to lymph node metastasis. *National J Community Med*, **2**, 136-42.  
Fabio RP, Amanda BR, Jade Bittencourt CO, et al (2013). Oral squamous cell carcinoma: clinicopathological features from 346 cases from a single oral pathology service during an 8-year period. *J Appl Oral Sci*, **21**, 460-7.  
Farnaz F, Zohreh D, Atessa P, et al (2011). Clinical and histopathological analysis of oral Squamous cell carcinoma of young patients in Mashhad, Iran: A retrospective study and review of literatures. *Med Oral Patol Oral Cir Bucal*, **16**, 473-7.  
Janaina AM, Alessandro LC, Cassiano FWN, et al (2014). Clinical and histopathological evidence of oral squamous cell carcinoma in young patients: Systematized review. *J Bras Patol Med Lab*, **50**, 67-74.  
Kiran BJ, Nidhi G (2013). Clinicopathological prognostic implicators of oral squamous cell carcinoma: need to understand and revise. *North Am J Med Sci*, **5**, 671-9.  
Koch WM, Lango M, Sewell D, et al (1999). Head and neck cancer in nonsmokers: Adistinct clinical and molecular entity. *Laryngoscope*, **109**, 1544-51.  
Livi F, Johan L (2012). Oral squamous cell carcinoma: epidemiology, clinical presentation and treatment. *J Cancer Therapy*, **3**, 263-8.  
Mohd. AK, Mohd. Y, Mohd. YH, et al (2014). Clinicopathological Study of Oral carcinoma. *Bangladesh J Otorhinolaryngol*, **20**, 15-19.  
Oddveig GR, Inger-Heidi B, Lars Uhlin-Hansen, et al (2014). Clinicopathological characteristics of oral squamous cell carcinoma in Northern Norway: a retrospective study. *BMC Oral Health*, **14**, 1-9.  
Rajendran R (2012). Benign and malignant tumors of the oral cavity in shafer's textbook of oral pathology. 7<sup>th</sup> edition. Eds Rajendran R, Shivapathasundaram B. Reed Elsevier India, New Delhi, 109-13.  
Sharma P, Saxena S, Aggarwal P (2010). Trends in the epidemiology of oral squamous cell carcinoma in Western UP, IJDR, **21**, 316-9.  
Swetha A, Amsavardani ST (2012). Analysis of clinical and histopathological profiles of oral squamous cell carcinoma in young Indian adults: A retrospective study. *J Dental Sciences*, **7**, 224-30.