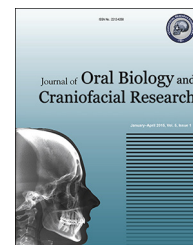


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## Original Article

# Clinico-epidemiological study of oral squamous cell carcinoma: A tertiary care centre study in North India



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## ABSTRACT

**Introduction:** Oral squamous cell carcinoma (OSCC) ranks 12th most common cancer in the world.

**Objective:** The aim of this study was to retrospectively evaluate the OSCC.

**Methods:** A retrospective study of 611 OSCC patients from January 2010 to December 2013 was carried out in Department of Surgical Oncology, King George's Medical University, Lucknow, India. Details of patient's sex, age, tobacco habit and site of cancer were noted. Data were analyzed by Student's t test and chi-square ( $\chi^2$ ) test.

**Results:** The prevalence of OSCC was significantly ( $p < 0.001$ ) higher in males (75.9%) than females (24.1%). The mean age of female patients was higher than males ( $p < 0.001$ ). In both the genders, the buccal mucosa and gingivobuccal sulcus were found to be the most affected sites. Moreover, the smokeless form of tobacco was found to be significantly associated with OSCC, especially in females.

**Conclusion:** The study concluded that OSCC is more common in men as compared to women, probably due to habit of tobacco consumption. Smokeless tobacco use is an important risk factor, especially in females.

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## 1. Introduction

Oral squamous cell carcinoma (OSCC) is the most common form of carcinoma of oral cavity and ranks as the 12th most

common cancer in the world.<sup>1</sup> Oral cancer is one of the major health problems in India and Indian subcontinent countries. Tobacco is the main etiological factor for oral carcinoma. Tobacco is used in various forms in these countries including betel quid, tobacco with lime, bidi, hookah, etc. Human

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papilloma virus<sup>2,3</sup> and dietary deficiencies<sup>4</sup> and poor oral hygiene<sup>5</sup> are minor etiological factors of oral carcinoma. People of lower socio-economic strata of society are more commonly affected by oral cancer because of higher prevalence of life style risk factors.<sup>6</sup>

The aim of this study was to identify the clinical and epidemiological features of OSCC. This study is in continuation with my previous study.<sup>7</sup>

## 2. Methods

A retrospective study of 611 OSCC patients from January 2010 to December 2013 was carried out in Department of Surgical Oncology, King George's Medical University, Lucknow, India. The cases of buccal mucosa, alveolus, anterior two-third of tongue, gingivobuccal sulcus, hard and soft palate, floor of mouth and retromolar trigone were included in the present study. Details of patients' sex, age, tobacco habit and oral cancer subsites were analyzed. Cases were classified according to the TNM classification of the Union for International Cancer Control (7th edition) staging of carcinoma of oral cavity.<sup>8</sup>

## 3. Statistical analysis

Continuous data were summarized as mean  $\pm$  SD while discrete (categorical) in numbers (*n*) and percentage (%). Continuous groups were compared by independent Student's *t* test. Categorical groups were compared by chi-square ( $\chi^2$ ) test. A two-tailed ( $\alpha = 2$ ) *p* value less than 0.05 ( $p < 0.05$ ) was considered statistically significant. Analyses were performed on SPSS software (Windows version 16.0).

## 4. Results

A total of 611 OSCC patients were included in this study. The age of patients ranged from 20 to 85 years with mean ( $\pm$ SD) 48.35  $\pm$  13.07 years. Among patients, 464 were males (75.9%)

**Table 1 – Prevalence of OSCC according to gender.**

Cases	No. of cases (n = 611) (%)
Male	464 (75.9)
Female	147 (24.1)

and 147 were females (24.1%) (Table 1). The age of male and female patients ranged from 20 to 80 years and 25 to 85 years, respectively with mean ( $\pm$ SD) 46.95  $\pm$  13.05 years and 52.77  $\pm$  12.14 years, respectively. The mean age of females was significantly higher than males ( $t = 4.79$ ,  $p < 0.001$ ).

In males, the OSCC was most prevalent in 40–49 years (25.2%) while in females, it was in 50–59 years (26.5%) (Table 2). Further, the frequency (%) of OSCC differed significantly between age and gender ( $\chi^2 = 22.09$ ,  $p = 0.001$ ).

The frequency of OSCC according to tobacco habits and gender is summarized in Table 3. In males, the frequency of OSCC was highest in patients with history of smokeless tobacco consumption (45.0%) followed by person with history of smoking and smokeless tobacco users (41.8%) together accounting for 86.8% prevalence. Conversely, in females, the frequency of OSCC was highest in smokeless tobacco users accounting for 72.8% prevalence. Thus, in OSCC patients, the prevalence of OSCC differed significantly according to habits and genders ( $\chi^2 = 90.09$ ,  $p < 0.001$ ).

Similarly, the frequency of OSCC according to site and gender is summarized in Table 4. In both males and females, the OSCC was most prevalent in buccal mucosa and gingivobuccal sulcus accounting for 49.8% and 40.1% prevalence, respectively. The prevalence of OSCC did not differ between different sites between the sexes in our patients ( $\chi^2 = 8.34$ ,  $p = 0.139$ ), i.e. found to be statistically the same.

Likewise, the frequency of OSCC according to stage and gender is summarized in Table 5. The highest frequency of both male and female OSCC patients presented with stage IV disease followed by Stage III, together accounting for 91.8% prevalence in both the sexes. Moreover, the prevalence of OSCC also did not differ significantly with reference to stage between the sexes in OSCC patients ( $\chi^2 = 0.60$ ,  $p = 0.879$ ), i.e. also found to be statistically the same.

**Table 2 – Prevalence of OSCC according to age and gender.**

Age (years)	Male (n = 464) (%)	Female (n = 147) (%)	$\chi^2$ value (df = 5)	<i>p</i> value
<30	33 (7.1)	3 (2.1)	22.09	0.001
30–39	107 (23.1)	18 (12.2)		
40–49	117 (25.2)	33 (22.4)		
50–59	102 (22.0)	39 (26.5)		
60–69	77 (16.6)	36 (24.5)		
≥70	28 (6.0)	18 (12.2)		

**Table 3 – Prevalence of OSCC according to tobacco habit and gender.**

Tobacco habit	Male (n = 464) (%)	Female (n = 147) (%)	$\chi^2$ value (df = 3)	<i>p</i> value
No tobacco	16 (3.4)	24 (16.3)	90.09	<0.001
Smokeless	209 (45.0)	107 (72.8)		
Smoking	45 (9.7)	6 (4.1)		
Smoking and smokeless	194 (41.8)	10 (6.8)		

**Table 4 – Prevalence of OSCC according to site and gender.**

Site	Male (n = 464) (%)	Female (n = 147) (%)	$\chi^2$ value (df = 5)	p value
Alveolus	118 (25.4)	47 (32.0)	8.34	0.139
<sup>a</sup> BM & GBS	231 (49.8)	59 (40.1)		
Tongue	101 (21.8)	34 (23.1)		
Floor of mouth	3 (0.6)	4 (2.7)		
Palate	8 (1.7)	2 (1.4)		
Retromolar trigone	3 (0.6)	1 (0.7)		

<sup>a</sup> Buccal mucosa and gingivobuccal sulcus.

**Table 5 – Prevalence of OSCC according to stage and gender.**

Stages	Male (n = 464) (%)	Female (n = 147) (%)	$\chi^2$ value (df = 3)	p value
Stage I	18 (3.9)	5 (3.4)	0.60	0.897
Stage II	20 (4.3)	7 (4.8)		
Stage III	147 (31.7)	51 (34.7)		
Stage IV	279 (60.1)	84 (57.1)		

## 5. Discussion

Around 300,000 patients are annually estimated to have oral cancer worldwide.<sup>9</sup> India has world's highest number (nearly 20%) of oral cancers with an estimated 1% of the population having oral premalignant lesions.<sup>10</sup> In the present study, male cases of OSCC outnumbered female OSCC cases. Male to female ratio was 3:1 which is consistent with other North Indian studies on oral carcinoma.<sup>11</sup> Socio-cultural norms and values favour easy availability of tobacco products to males. Advent of ready to use tobacco products and aggressive marketing attracts not only youths but also children.

Oral cancer is known to be disease of middle age and in the present study, most of the males and female cases were in 4th and 5th decade of life at the time of diagnosis of carcinoma. The age incidence of OSCC is consistent with other studies conducted in North India.<sup>12,13</sup> A youngest male patient was 20 years old while oldest was 80 years of age. In case of female patients, youngest was 25 years old while oldest was 85 years of age.

Tobacco contains many carcinogens which makes oral cavity more vulnerable to cancer. Amount of tobacco consumption is directly proportional to early occurrence of carcinoma. Buccal mucosa and gingivobuccal sulcus were the most affected sites both in males (49%) and females (40%) followed by alveolus which was 25% and 31% respectively. These finding are consistent with other studies.<sup>11,13,14</sup> Placement of tobacco quid in the gingivobuccal sulcus region has been attributed to the development of carcinoma. Tongue and floor of mouth carcinoma are more common in western countries due to consumption of alcohol and smoking.

In western countries, smoking is the major mode of tobacco consumption while in India and Indian subcontinent countries smokeless forms, including pan masala, khaini, gutkha, etc., are major modes of tobacco consumption. Sixteen percent male patients and 3.4% female patients never consumed tobacco.

Better treatment outcomes are shown if carcinoma is diagnosed in early stage of development. For tongue cancer, 5-year survival in the United States is 71% for stage I disease and 37% for late-stage disease.<sup>15</sup> In India, late diagnosis of

carcinoma is one of the major factors which worsens the disease prognosis. In the present study, majority of patients were at advanced stage of disease, while comparatively less number of patients were diagnosed in early stage of cancer development. Studies conducted in other parts of India also found diagnosis of carcinoma at advanced stages.<sup>16,17</sup>

## 6. Conclusion

Commonest age of presentation of OSCC was 5th decade of life in our study. Buccal mucosa and gingivobuccal sulcus were the most affected sites due to use of smokeless tobacco, which is a common practice in India. Smokeless form of tobacco consumption was the major form of tobacco consumption in our study. Smokeless tobacco use was found to be an important risk factor, especially in female as found in our study.

## Conflicts of interest

The authors have none to declare.

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