Research Article,

Correlation between Sociodemograpic Charecteristics and Clinicopathological Presentation of Oral Squamous Cell Carcinoma: A Crossectional Study from a Tertiary Care Cancer Centre, Odisha.

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Abstract:

Background: Oral squamous cell carcinoma (OSCC) is significantly higher in India as about 70% of the cases are reported in the advanced stages leaving five-year survival rates around 20% only. Primary prevention and early diagnosis were found to be novel approaches to avert cancer cases and related deaths. In India, organized prevention and early detection efforts are still lacking.
Aim and objectives: To investigate the correlation between sociodemographic characteristics and clinicopathological presentation of oral squamous cell carcinoma.
Materials and methods: Single hospital-based crossectional retrospective study was carried out at the Department of Head and Neck Oncology, Acharya Harihar Post Graduate Institute of Cancer, Cuttack for a period of three years from October 2018 to September 2021.
Results: A total of 418 cases of histopathologically confirmed OSCC were reported during this study period. There were 314 (75.11%) male and 104 (24.88%) female patients. The mean (± SD) age of the patients was 52.29 ± 13.37 years with ranging from 21 to 89 years. When checked for the association between tumor stage (early stage I/II and late-stage III and IV) and sociodemographic characteristics,we found middle age male,rural residency,low soccioeconomic status,illiteracy, chewing gutkha 7-10 numbers per day more than 10 years, were significantly associated with the late-stage tumors. Similarly, tumor at left buccal mucosa and border of tongue, moderately and poorly differentiated tumor, underlying Type 2 diabetes, diagnosis more than 10 months after the onset of symptoms were significantly associated with late stage presentation.
Conclusion: There is an important need to initiate public awareness programs in our region to control and prevent oral cancer by screening for early diagnosis and supporting a tobacco-free environment.

Introduction:

Oral cancer is a major global public health problem. It is the sixth most common type of cancer with a mortality rate of ~50%. [1] Around 77,000 new cases and 52,000 deaths are reported annually, which is approximately one-fourth of global incidences. In the Indian subcontinent, where it ranks among the top three types of cancer in the country, which accounts for over thirty percent of all cancers reported in the country and quickly becoming a global health priority.[2][3]
As compared to the west, the concern of oral cancer is significantly higher in India as about 70% of the cases are reported in the advanced stages leaving five-year survival rates around 20% only.[4] Prevention against major risk factors

(such as any form of tobacco use, alcohol use, high risk human papillomavirus infection, poor nutrition, and chronic trauma) and early detection through screening and relatively inexpensive treatment averts cancer cases and related deaths. In India, organized prevention and early detection efforts are still lacking.[5]

In the regional context, the estimation of socio-demographic characteristics, elucidation of major risk factors and their association with clinicopathological factors and disease outcome is of utmost importance for planning further region-specific health care strategies.

The high burden of oral cancer in Odisha with a paucity of literature in this regard prompted us to investigate, is there any association between sociodemographic characteristics and clinicopathological presentation of OSCC in our geographical region?

Materials and methods:

This single hospital-based crossectional retrospective study was carried out on patients who were diagnosed and treated for OSCC at the Department of Head and Neck Oncology, Acharya Harihar Post Graduate Institute of Cancer, Cuttack over a period of three years from October 2018 to September 2021.

Inclusion Criteria:

➢ Patients of any age with histopathological diagnosis of OSCC.

Exclusion criteria:

➢ Cases for which data were incomplete or not available in the clinical records.
➢ Patients with malignancies of the salivary glands, nasopharynx and hypopharynx and metastatic tumors were excluded from the study.
➢ In cases with no precise information about the primary location.

Socio-demographic details such as gender, age, family history of cancer, chewing & smoking habits details, marital status, educational level, occupation, socio-economic status were obtained and tabulated according to the previous study protocol.[6] In addition, details about clinical presentation and underlying disease history were also collected.

Clinicopathological data (tumor type, grade, anatomical site, tumor size, and TNM staging were retrieved from hospital records. The staging was done according to AJCC 8th Edition criteria and grouped as Early stage (I, II) and Late-stage (III, IV). All the data were collected according to the regulations of the protection of data privacy.

Statistics:

Continuous data were summarized as the mean ± standard deviation (SD), and percentage and proportions were calculated for categorical data. Categorical groups were compared by Chi-square test (χ2), taking the significance level to be 5% (P < 0.05).

Results:

A total of 418 cases of histopathologically confirmed OSCC were reported during this study period. There were 314 (75.11%) male and 104 (24.88%) female patients.The mean (± SD) age of the patients was 52.29 ± 13.37 years with ranging from 21 to 89 years. The maximum numbers of patients 278 (66.5%) were in the age group of 41-60 years. The difference in mean age between males and females was statistically significant (P = 0.116). The age and sex-wise distribution of oral squamous cell carcinoma are shown in [**Table 1**].

The data regarding habit history showed about 320 (76.55%) of patients had tobacco consumption habits either chewing or smoking form among which the most common habits were tobacco chewing 305 (95.31%). A total of 98 (23.44%) did not have any habits.The mean age of patients with habit of chewin was lower (46 years) than the mean age of patients without habit of chewing(51years).Amongst the types of chewable substances, only gutka was found to be significantly associated with the buccal cavity. The median duration of the habit in these cases was 8 years at an average frequency of 7 to 10 times per day. The socio-demographic characteristics of OSCC cases are shown in [**Table 2**].

Table: 1Age and sex wise distribution of oral squamous cell carcinoma cases.

Age Group (in year)	Male (%)	Female (%)	Total (%)
<40	54(17.19)	17(16.34)	71(16.98)
41-60	204(64.96)	74(71.15)	278(66.50)
>61	56(17.83)	13(12.5)	69(16.50)
Total	314(75.11)	104(24.88)	418(100%)

Table 2: the socciodemographic charecteristics of oral squamous cell carcinoma cases.

Sociodemographic charecteristics of OSCC cases	Frequency (N)	Percentage (%)
Type of occupation		
Labour	82	19.61
Businessman	110	26.31
Office work	78	18.66
Student	120	28.7
Unemployed	28	6.69
Soccio economic status		
Above property line	120	28.7
Below property line	298	71.29
Residence		
Urban	120	28.7
Rural	298	71.29
Marital status		
Married	374	89.47
Unmarried	38	90.90
Education		
Illitrate	135	32.29
Under matric	90	21.53
Intermediate	106	25.35
Graduate	87	20.81
Addiction to tobacco		
Yes	320	76.55
No	98	23.44
Tobacco Consumption Duration (median)years	8	
Types of Tobacco		
Chewing	305	95.31
Smoking	205	0.64

The most common sites of OSCC, in both male and female patients, were found to be buccal mucosa 214 (51.19 %). The occurrence of OSCC at different sites, in males and females, did not have any statistical significance. Almost all patients were presented with ulceroproliferative growth. Out of total cases,136 (32.53 %) patients were reported to have type 2 Diabetes Mellitus as underlying comorbidity. Most of the cases were moderately differentiated OSCC 224(53.58 %), followed by poorly differentiated OSCC 158(37.79 %). The median duration between the onset of symptoms to final diagnosis was 3 months with range between 15 days to 7 months. The majority of patients, i.e.361 (86.36 %) were presented in late stage (Stage II &III). The clinicopathological presentation of oral squamous cell carcinoma cases are shown in [**Table 3**].

Table 3. The Clinicopathological presentation of oral squamous cell carcinoma cases

Clinicopathological presentation of OSCC cases	Frequency (N)	Percentage (%)
Tumor Site		
Buccal mucosa	214	57.65
Tongue	68	16.26
Palate	6	1.43
Floor of mouth	4	0.95
Retromolar trigone	7	1.67
Gingivo buccal sulcus	93	22.24
Alvelous	51	12.2
Gum	3	0.71
Lip	5	1.19
Tumor Grade		
Grade 1	36	8.61
Grade 2	224	53.58
Grade 3	158	37.79
Perineural invasion(PNI) (+)	68	16.26
lymphovascular space invasion(LVSI) (+)	32	7.65
TNM Stage		
I	8	1.91
II	69	16.5
III	204	0.48
IV	157	0.37

Table 4. Corelation between sociodemographic charecteristics, clinicopathological presentation and disease stage of OSCC cases.

Sociodemographic charecteristics and clinicopathological presentation of OSCC cases.	Early Stage (I & II) (n=77,%)	Late Stage (III & IV) (n=341,%)	P value
Sex			
Male	26 (33.76)	288 (84.45)	.00001
Female	51(66.23)	53 (15.54)	
Age			
<40	25 (32.46)	46 (13.48)	
41-60	45 (58.44)	233 (68.32)	.000168
>61	7 (9)	62 (18.18)	
Residency			
Rural	29 (37.66)	179 (54.49)	.018732
Urban	48 (62.33)	162 (47.5)	
Education			
Literate	61 (79.22)	212 (70.38)	.00001
Illitrate	16 (20.77)	129 (21.7)	
Chewing Tobacco			
Yes	26 (33.76)	294 (86.21)	.00001
No	51 (66.23)	47 (13.78)	
Tobacco consumption			.151198
<5 years	7	13	

5-10years **>10 years**	39 29	94 112	
(Onset of symptoms to diagnosis) **<5 months** **>5 months**	 47 30	 130 211	.000237
Grade 1	4(5.19)	32(8.79)	
Grade II	31(40.25)	193 (56.59)	.003326
Grade III	42(54.54)	116 (34)	
Anatomical Site			
Buccal Mucosa	39(50.64)	175(51.31)	
Tongue	8(10.38)	60(17.59)	
Palate	0	6(1.75)	
FOM	0	4(1.17)	.003326
RMT	2(2.59)	5(1.46)	
GBS	18(23.37)	75(21.99)	
Alvelous	4(5.19)	47(13.78)	
Gum	2(2.59)	1(0.29)	
Lip	4(5.19)	1(0.29)	

*The result is significant at $p < .05$.

When checked for the association between tumor stage (early stage I/II and late-stage III and IV) and sociodemographic characteristics,we found middle age male,rural residency,low soccioeconomic status,illiteracy, chewing gutkha 7-10 numbers per day more than 10 years, were significantly associated with the late-stage tumors. Similarly, tumor at left buccal mucosa and border of tongue, moderately and poorly differentiated tumor, underlying Type 2 diabetes, diagnosis more than 10 months after the onset of symptoms were significantly associated with late stage presentation **[Table 4.**

Disscussion:

Our data's gender distribution was comparable with the previous studies.[7,8,9] High proportion of cancer among males may be due to the high prevalence of tobacco consumption habits . Contrarily, in India, consumption of alcohol and tobacco is considered taboo amongst the female population. However, this custom is nowadays gradually fading away, as females cutting across age and socioeconomic lines are turning to these habits. In India, the peak-age frequency of occurrence (5th decade of life) is at least a decade earlier than that described in the western literature. [10] In developing countries, oral cancer may affect younger men and women more frequently than seen in the western world. The high prevalence of the addiction to tobacco chewing among young adult men and women may explain the stable trend in oral cancer incidence in this group. It could be due to easily being available at very affordable prices at the grocery stores and paan or betel quid kiosks. In this study, the site and size distribution was in agreement with other studies conducted in India, whereby the most frequent site of OSCC was buccal mucosa. [11] This might be due to the habitual practice of placing betel quid between teeth and buccal mucosa, as commonly observed in our population. This in turn led to constant irritation with chemical and physical insult. In our study 263 (62.91%) patients were presented after 8 months of the onset of symptoms. As in our area majority of patients were below the property line and have to earn their living by daily wages and the loss of working days means loss of wages and in addition patients comes from rural areas, illiteracy, possibly resorting to home remedies is the probable cause of late diagnosis as compared to western countries.[12] Although education plays an important role in the overall health of a country in terms of awareness toward the use of hazardous substances but in the South-Asian region, OSCC is highly associated with low socioeconomic status, where people are less aware of the consequences of carcinogenic compounds because of less education. The main reason is chewing

areca nut-related products particularly in low SES, where it is believed to increase work capacity, alertness, suppress hunger, and are a cheap source of entertainment [13]. In another study Odds of developing buccal mucosa tumors in chewers (of any type of substance) and gutka users were 2 and 4 times higher than non-chewers respectively. Middle age, chewing habits, and occupation were significantly associated with the late-stage presentation of OSCC. (p<0.05).[14] In this study, the association between tumor stage (early stage I/II and late-stage III and IV) and sociodemographic characteristics,we found middle age male,rural residency,low soccioeconomic status,illiteracy, chewing gutkha 7-10 per day more than 10 years, were significantly associated with the late-stage tumors. Similarly, tumor at left buccal mucosa and border of tongue, moderately differentiated, underlying Type 2 diabetes, diagnosis more than 10 months after onset of symptoms were significantly associated with late stage presentation In another study correlation between the two variables, i.e., site to habits, staging to the site involved, staging to the duration of the disease, staging to habits, and staging to the age of the patient, were found to be statistically nonsignificant (P>0.05).[7] We also found a positive correlation between clinicopathological presentation (tumor site, grade 3, perineural invasion (PNI) positive, and lymphovascular space invasion (LVSI) positive) and late-stage diagnosis.

Conclusion:

There is an important need to initiate public awareness programs in our region to control and prevent oral cancer by screening for early diagnosis and supporting a tobacco-free environment.

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