

Original Research Article

Patterns of oral habits in patients with oral cancer and oral potentially malignant disorders: a cross-sectional study

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ABSTRACT

Background: While evaluating the various etiologic factors, most of the studies had attributed the development of oral cancer (OC) and oral potentially malignant disorders (OPMDs) to oral habits like smoking, drinking alcohol, chewing of smokeless tobacco, both qualitatively and quantitatively. The aim of this study was to investigate the patterns of oral habits in patients with OC and OPMDs.

Methods: This is a hospital-based cross-sectional study. The patients attending the outpatient department of this tertiary care hospital were selected after thorough clinical screening with a view to detect the presence OPMDs and oral squamous cell carcinoma (OSCC). After obtaining written informed consent, all the details including habit history were recorded in a specially prepared clinical record sheet through active interrogation and proper clinical examination. This data was tabulated in the excel sheet to facilitate further statistical analysis.

Results: While analyzing the oral habits among male subjects, significant number (65.5%) had tobacco-chewing habit, 52.2% had tobacco smoking habit while 35.4% had the habit of alcohol consumption. On the other hand, 66% of 53 female subjects had only tobacco chewing habit. There was an increasing trend of Gutkha use among both sexes. The tobacco chewing habits were more prevalent in the third, fourth and fifth decades of life among the study population. Frequency of habit-associated OC or OPMDs was also statistically significant.

Conclusions: The study proves a definite association between smokeless tobacco habit and OC and OPMDs and necessitates appropriate interventions.

Keywords: Leukoplakia, Oral cancer, Oral habits, Oral submucous fibrosis, Smokeless tobacco

INTRODUCTION

Oral cancer (OC) is a major oral health problem in the Indian sub-continent where it ranks among the top three types of cancers.¹ Most of these OCs develop from pre-existing OPMDs, previously known as pre-malignant lesions and conditions. Multiple disease processes fall under OPMDs of which oral leukoplakia (OLKP), erythroplakia, oral sub-mucous fibrosis (OSMF), oral lichen planus (OLP) are important.^{2,3} The use of tobacco

in its various forms, including smokeless tobacco, is regarded as the main cause of such lesions, particularly when associated with the use of excess alcohol.

The World Health Organization predicts that tobacco deaths in India may exceed 1.5 million annually by 2020.⁴

Tobacco usage is influenced by various factors such as individual attitude, workload, stress, availability, advertising campaigns etc.

In India, the practice of tobacco consumption varies from one state to another and even within different parts of a state. Therefore, it is important to collect information about the prevalence of tobacco habit among the local population. This helps to assess the epidemiological and behavioral patterns among the habitual users. Also, this information would help to devise and implement relevant tobacco intervention strategies, as oral health care providers often come across patients with tobacco habits, when compared to the general practitioners.

Cross-sectional studies help in estimating the prevalence of a disease in the population and identifying high-risk populations. The association between OPMDs and OSCC with various epidemiological and habit parameters along with relative prevalence had been studied in various other parts of India; but very few studies had been conducted in the state of West Bengal, particularly in this part of the district of North 24 Pgs. Hence, the present study records the clinico-epidemiological profile of the patients with OPMDs and OSCC visiting this tertiary care hospital with an aim to evaluate the risk factors including the oral habits in respect to occurrence of the disease processes.

METHODS

It was a hospital based cross-sectional study. The study was conducted in the Department of Oral and Maxillofacial Pathology of a tertiary care centre for a duration of two years from February 2021 to January 2023.

All the patients attending the out-patient department were screened clinically with a view to detect the presence OPMDs and OSCC on the basis of clinical guidelines laid down by Neville et al.⁵ Out of total number of 33,085 patients screened, one hundred and 66 (166) patients, either having OPMDs or OSCC, were selected for the study. Informed consents were taken from the study subjects for participation. Due precautions and sterilization protocols were followed during the clinical examination of the patients to prevent any such contamination. The following inclusion and exclusion criteria were laid down.

Inclusion criteria

Patients above 12 years of age and patients having clinical signs of OPMDs or OSCC were included in study.

Exclusion criteria

Mentally retarded patients and individuals not willing to give consent to participate in the study were excluded from the study.

After obtaining written informed consent, all the details were recorded in a specially prepared clinical record sheet through active interrogation and proper clinical

examination. The demographic details and habit history of patients including all forms of tobacco consumption and alcohol along with quantity and duration and clinical presentations were recorded, after prior calibration. This data were tabulated in the excel sheet to facilitate further statistical analysis.

The data was entered using MS excel 2016 and was analyzed using IBM SPSS statistics (Version 25). The continuous variables were presented in terms of mean and SD, while the categorical variables were presented in terms of frequency and percentages. Inferential statistics for the correlation of the variables were done using One way ANOVA statistics. The Odds' ratio was calculated to see the risk of development of the disease. The p value was kept at 0.05.

RESULTS

In the present study, screening of the patients was performed in the out-patient department (OPD) of GNIDSR, Kolkata, during the period from January, 2021 to May, 2022. The sample population frame included 33,085 participants, among which 166 study subjects matched the eligibility criteria and were recruited for the study. The prevalence of the cases was calculated to be 0.5%.

Distribution of the study subjects according to different pathophysiological conditions

After careful clinical examination of 166 study subjects, 40 (24.1%) patients were provisionally diagnosed with leukoplakia, 6 (3.6%) with erythroplakia, 44 (26.5%) of them with OSMF, 28 (16.9%) with OLP and 48 (28.9%) with OC, which was found to be statistically significant.

Distribution of study subjects according to age

While analyzing the age distribution, all the study subjects were divided into SIX age groups. Group I: 20 to 29 years, group II: >29 to 39 years, group III: >39 to 49 years, group IV: >49 to 59 years, group V: >59 to 69 years and group VI: >69 years. A considerable number of patients (28.3%) were in the age group III (>39 to 49 years); followed by 22.3% in the age group II; 18.1% in each group IV and V; 9% in age group I while, 4.2% of them were in age group VI.

Distribution of study subjects according to gender

While analyzing the gender distribution among the study subjects, significant number of them were males (68.1%) while 31.9% were females.

Gender-wise prevalence of the alcohol habit

Out of 113 number of male subjects, 35.4% had the habit of alcohol consumption, whereas none of 53 female subjects had any alcohol habit.

Gender-wise prevalence of tobacco chewing habits

A considerable number of male subjects (65.5%) had tobacco-chewing habit, whereas 66% of females had this habit too.

Gender-wise prevalence of type of chewing tobacco product

Out of various tobacco products or its combination, it was noted that significant male subjects had habits of chewing gutkha (33.6%), khaini (26.5%), pan supari jarda (10.6%), only pan (11.5%) and supari (13.3%) when compared to females. On other hand, female subjects had predominant habits of pan supari jarda (41.5%) followed by gutkha (15.1%), gurakhu (7.5%) and gul (5.7%).

Gender-wise prevalence of tobacco smoking habit

Out of 113 number of male subjects, 52.2 % had habit of tobacco smoking, whereas none of the 53 female subjects had smoking habit.

Age-wise prevalence of alcohol habits

Out of 166 study subjects, habit of alcohol consumption was most prevalent in the age group of >29 to 39 years (35.1%), followed by age group >39 to 49 years (31.9%), 20 to 29 years (26.7%) and >49 to 59 years (16.7%).

Age-wise prevalence of tobacco chewing habits

Out of 166 study subjects, the habit of tobacco chewing was most prevalent in the age group of 20 to 29 years (80%), followed by >39 to 49 years (74.5%), >29 to 39 years (67.6%), >59 to 69 years (60%), >49 to 59 years (50%) and lastly >69 years (57.1%).

Among various types of tobacco chewing products, Gutkha chewing is most prevalent in age group of 20-29 years (60%) followed by >29-39 years (45.9%). Pan-supari-jarda is most prevalent in age group of >69 years (42.9%), whereas khaini use is most prevalent in age group of >39-49 years (31.9%). Gul and Dokta are used by age group of >69 years (14.3%) and >59-69 years (6.7%) respectively.

Age-wise prevalence of tobacco smoking habits

Out of 166 study subjects, habit of tobacco smoking was most prevalent in age group of >29-39 years (48.6%), followed by >49-59 years (33.3%) and >59-69 years (33.3%) each. Prevalence 31.9% in age group of >39-49 years, whereas it was 26.7% in 20-29 years age group.

Prevalence of cancer and OPMDs based on duration of habits

OSCC showed increased prevalence in case of oral habits with duration >30 years (45.5%) followed by >20 to 30

years (29%), >10 to 20 years (17.2%), 1 to 10 years (12.5%), as well as among no tobacco users also (29.8%). Leukoplakia too followed similar tendency with more prevalence among persons with oral habit for >20 to 30 years (38.7%), >10 to 20 years (24.1%) and without oral habit (26.3%). It was interesting to note that OSMF was found prevalent with oral habits for 1 to 10 years duration (68.8%) followed by >10 to 20 years (55.2%), >30 years (24.2%) and >20 to 30 years (22.6%). OLP was prevalent with no oral habits (38.6%).

Association between oral cancer and OPMDs with the oral habits

Association between oral cancer with the oral habits

The odds of developing OSCC from smoking are 0.837. Similarly, the odds of developing OSCC from smokeless tobacco are 1.357. However, the odds of developing OSCC from alcohol consumption are 1.114. Thus, smokeless tobacco and alcohol use are important attributes towards development of OSCC (Table 1).

Association between leukoplakia with the oral habits

The odds of developing leukoplakia (OLKP) from smoking are 4.510. Similarly, the odds of developing OLKP from smokeless tobacco are 0.833. However, the odds of developing OLKP from alcohol consumption are 2.424. Thus, smoking and alcohol use are important risk factors towards development of OLKP (Table 2).

Association between erythroplakia with the oral habits

The odds of developing erythroplakia (OE) from smoking are 0.904. Similarly, the odds of developing OE from smokeless tobacco are 2.692. However, the odds of developing OE from alcohol consumption are 0.621. Thus, smokeless tobacco and smoking to some extent are important attributes towards development of OE (Table 3).

Association between OSMF with the oral habits

The odds of developing OSMF from smoking are 0.483. On the other hand, the odds of developing OSMF from smokeless tobacco are 20.847. However, the odds of developing OSMF from alcohol consumption are 1.031. Thus, smokeless tobacco to a great extent and alcohol use are important attributes towards development of OSMF (Table 4).

Association between OLP with the oral habits

The odds of developing OLP from smoking are 0.437. Similarly, the odds of developing OLP from smokeless tobacco are 0.093. However, the odds of developing OLP from alcohol consumption are 0.094. Thus, habits are not significant risk factor towards development of OLP (Table 5).

Table 1: Association between oral cancer with the oral habits.

Variables		Smoking		Odd's ratio	Smokeless tobacco		Odd's ratio	Alcohol		Odd's ratio
		Present	Absent		Present	Absent		Present	Absent	
OSCC	Present	14	29	0.837	26	17	1.357	11	32	1.114
	Absent	45	78		83	40		29	94	
Odd's ratio		1.142	0.956		1.116	0.823		1.029	0.924	

Table 2: Association between leukoplakia with the oral habits.

Variables		Smoking		Odd's ratio	Smokeless tobacco		Odd's ratio	Alcohol		Odd's ratio
		Present	Absent		Present	Absent		Present	Absent	
Leukoplakia	Present	25	15	4.510	25	15	0.833	15	25	2.424
	Absent	34	92		84	42		25	101	
Odd's ratio		1.492	0.432		1.250	0.922		1.283	0.529	

Table 3: Association between erythroplakia with the oral habits.

Variables		Smoking		Odd's ratio	Smokeless tobacco		Odd's ratio	Alcohol		Odd's ratio
		Present	Absent		Present	Absent		Present	Absent	
Erythroplakia	Present	2	4	0.904	5	1	2.692	1	5	0.621
	Absent	57	103		104	56		39	121	
Odd's ratio		1.103	0.996		0.382	1.030		1.587	0.985	

Table 4: Association between OSMF with the oral habits.

Variables		Smoking		Odd's ratio	Smokeless tobacco		Odd's ratio	Alcohol		Odd's ratio
		Present	Absent		Present	Absent		Present	Absent	
Oral submucous fibrosis	Present	12	37	0.483	47	2	20.84	12	37	1.031
	Absent	47	70		62	55		28	89	
Odd's ratio		1.700	0.821		11.517	0.081		0.979	1.001	

Table 5: Association between OLP with the oral habits.

Variables		Smoking		Odd's ratio	Smokeless tobacco		Odd's ratio	Alcohol		Odd's ratio
		Present	Absent		Present	Absent		Present	Absent	
OLP	Present	6	22	0.437	6	22	0.093	1	27	0.094
	Absent	53	85		103	35		39	99	
Odd's ratio		0.884	2.022		3.483	0.323		8.571	0.744	

*Statistically significant

DISCUSSION

The present study critically analyzed the prevalence of oral habits based on different demographic parameters. While analyzing the oral habits among 113 male subjects, significant number of them (65.5%) had tobacco-chewing habit, considerable number of 52.2% had habit of tobacco smoking while 35.4% had habit of alcohol consumption. On the other hand, 66% of 53 female subjects had only tobacco chewing habit. None of the female subjects had habit of smoking and alcohol consumption.

Singh et al had reported that OSCC was most prevalent in individuals having habit of smokeless tobacco consumption (45%) followed by persons having habit of both smokeless and smoking tobacco (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.⁶ Martinez et al

had found the distribution of risk factors among study population as 16% smokers, 10% Drinkers, 50% both smokers and drinkers and 24% none.⁷ Kaveri et al had reported 92.8% prevalence of smokeless tobacco habits among males and only 7.2% among females.⁸

Thus, it can be put forward that all three forms of oral habits i.e. tobacco chewing, smoking and alcohol drinking are prevalent among males; whereas smokeless tobacco is frequently used by females.

Gender wise difference also existed among type of smokeless tobacco products in the subjects in the present study. A significant number of male subjects had habits of Gutkha chewing (33.6%), Khaini (26.5%), Pan-supari-jarda (10.6%), Pan (11.5%) and supari only (13.3%). On the other hand, significant number of female subjects had habit of Pan-supari-jarda (41.5 %), Gutkha (15.1%), Gurakhu (7.5%) and Gul usage (5.7%).

Kaveri et al (2018) had reported prevalence of betel quid (58%) and Gutkha (32%) among males and betel quid (91%) and Gutkha (6%) among females.⁸

These findings are more or less similar to the findings of the present study on the nature of tobacco products and indicate an increasing trend of Gutkha use among both sexes.

PN Wahi had stated that oral cancer rate was found to go up with increasing consumption of alcoholic drinks.⁹ Martinez et al had reported 60% of his study population as drinkers. The age prevalence of alcohol habit is prevalent mainly in the middle age groups (29-49 years).⁷ In the present study too, it was most prevalent in the age group of >29 to 39 years (35.1%), followed by age group >39 to 49 years (31.9%).

Among the various types of tobacco chewing products, Gutkha chewing is most prevalent in the age group of 20 to 29 years (60%) followed by >29 to 39 years (45.9%). Pan-supari-jarda is most prevalent in the age group of >69 years (42.9%), whereas khaini use is most prevalent in the age group of >39 to 49 years (31.9%). Gul and Dokta are used by age group of >69 years (14.3%) and >59 to 69 years (6.7%) respectively, chiefly by women. Kaveri et al reported that prevalent age group of smokeless tobacco use was 40-49 years, with mean age being 45 years for males and 53 years for females.⁸

The prevalent age group in the present study seems to be a little lower than the earlier reports. This may be attributed to the more use of smokeless tobacco products by the younger population.

When tobacco smoking was considered, the most prevalent age group was >29 to 39 years (48.6%), followed by equal distribution between >49 to 59 years (33.3%) and >59 to 69 years (33.3%). Wahi also found maximum number of cases in ≥ 30 years age group.⁹

Duration of habits also have significant impact on the development of OSCC and OPMDs. In the present study, OSCC showed increased prevalence in case of oral habits with duration >30 years (45.5%) followed by >20 to 30 years (29%), >10 to 20 years (17.2%), 1 to 10 years (12.5%), as well as among no tobacco users also (29.8%). Leukoplakia too followed similar tendency with more prevalence among persons with oral habit for >20 to 30 years (38.7%), >10 to 20 years (24.1%) and without oral habit (26.3%). OSMF was found prevalent with oral habits for 1 to 10 years duration (68.8%) followed by >10 to 20 years (55.2%), >30 years (24.2%) and >20 to 30 years (22.6%). OLP was prevalent with no oral habits (38.6%).

Kaveri et al reported that leukoplakia and OSCC developed with longer duration of habit, i.e. 21 years. OSMF was prevalent with shorter duration of habit in their study i.e. 1-10 years.⁸ Sujatha et al and Aruna et al

were of opinion that significant correlation existed between frequency and duration of habit on the development of OMLs. Due to the changing patterns in the prevalence of habit and OMLs among the younger population, they are at risk of developing malignancy at the third and fourth decades of life.^{10,11}

While analyzing the association between OSCC and OPMDs with risk factors like oral habits, it was found that smokeless tobacco and alcohol use were important attributes towards development of OSCC. Tandon et al stated that, India was a high-risk region for oral and oropharyngeal cancer due to a high prevalence of tobacco use, particularly chewing (in both sexes), smoking, and alcohol drinking in the male population.¹²

While in case of leukoplakia, present study recorded smoking and alcohol use are important risk factors towards development of lesions. According to review by Abidullah et al, Tobacco in various forms was found to be the chief etiologic factor for OLKP. Apart from tobacco, alcohol consumption was found as a common habit in patients with Leukoplakia.¹³

Erythroplakia, on the other hand, has been associated with smokeless tobacco and smoking. A series of publications based on a large case control study in Kerala, India, shed more light on some of the factors involved in the etiology of OE. One of these studies evaluated the risk of OE in relation to chewing tobacco, smoking, alcohol drinking, body mass index (BMI), and vegetable, fruit, and vitamin/iron intake.¹⁴

In case of OSMF, smokeless tobacco to a great extent and alcohol use are important attributes towards its development. In the literature, the pathogenesis of OSMF is multifactorial and enigmatic. The etiological factors implicated are excessive chilly consumption, areca nut chewing, vitamin B complex and iron deficiency, autoimmunity, genetic and environmental factors.¹⁵ The findings of Babu et al among OSF patients in Hyderabad, showed a strong association between gutkha chewing and OSMF and pointed that gutkha consumption led to OSMF.¹⁶

While analyzing the association of OLP with oral habits, no significant risk factor was established in the present study. In the literature, speculation about the etiology covered a wide range of possibilities including trauma, specific bacteria, syphilis, parasites, viruses, mycotics, allergies, toxicity, neurogenic, hereditary and psychosomatic disorders.¹⁷

The main limitation of this study is the possibility of information bias, mainly under-reporting of oral habits by female participants owing to associated social taboo. Moreover, it appears that further in-depth studies with a greater number of samples are required for proper association of oral habit factors to the development of lesions.

CONCLUSION

Tobacco habits are very common in this part of the state. OSMF showed an increasing trend among women, which may be attributed to the prevailing tobacco chewing habits specially among the housewives. There was an increasing trend of Gutkha use among both sexes. The smokeless tobacco was found to be more or less common etiological factor for development of OSCC and most of the OPMDs. Due to changing patterns in the prevalence of oral habits and mucosal lesions, younger population are at risk of developing malignancy at the third and fourth decades of life, which may pose a significant threat to the health and economy of the nation. Thus, it is necessary to conduct further surveys on psycho-social aspects of tobacco habits to understand its changing pattern and to devise effective control and prevention strategies.

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