



## PREVALENCE OF ORAL POTENTIALLY MALIGNANT DISORDERS IN PATIENTS ATTENDING PRIVATE DENTAL INSTITUTION IN CHENNAI – A RETROSPECTIVE STUDY

<b>Pravda C</b>	Professor and head OMDR sathyabama Dental College and Hospital Chennai.
<b>Satavisha Mohapatra</b>	CRRRI ,sathyabama Dental College and Hospital Chennai.
<b>Samul James Raja</b>	CRRRI, sathyabama Dental College and Hospital Chennai.
<b>Saakshi Gulati</b>	Reader, sathyabama Dental College and Hospital Chennai.
<b>Nandhini</b>	Senior Lecturer, sathyabama Dental College and Hospital Chennai.
<b>Ganesan Priyanka M</b>	Tutor, sathyabama Dental College and Hospital Chennai.

**ABSTRACT** **Background** The Aim of this retrospective study is to identify the spectrum of potentially malignant disorders in high-risk patients and knowing its relation with the type of habit **Method** The study was based on one year data collected during 2019 of all patients with habit and Oral Potentially Malignant lesions. **Results** The study population consisted of 770 subjects. The age group of the study population was between 17 years and 88 years, with the mean age being  $37.70 \pm 14.22$  years. The study population consisted of 90.91% (700) male subjects and 9.09% (70) female subjects. Smoking habit was seen in 45.19% (348) subjects, smokeless tobacco use was seen in 26.49% (204) subjects and alcohol consumption was seen in 8.5% (66) subjects. Only 1.56% (12) of the subjects had all three habits. In this study we see that Leukoplakia is the most prevalent PMD with 23.08% (36) followed by Tobacco Pouch Keratosis with 19.23% (30), Smoker's palate with 16.03% (25) and OSMF with 13.46% (21) of the study population. **Conclusion** Leukoplakia has been found to be the most prevalent OPMD in the present study. We also saw that patients who had all three habits of smoking, smokeless tobacco, and alcohol consumption had more prevalence of Leukoplakia as compared to OSMF and tobacco pouch keratosis. We recommend a more detailed study to be performed on patients who have all three habits.

**KEYWORDS :** Oral potentially malignant disorder, Leukoplakia, oral submucous fibrosis, tobacco pouch keratosis.

### INTRODUCTION

Oral Squamous Cell Carcinoma (OSCC), the commonest form of oral cancer is attributed to the frequent use of tobacco and its products. Globally, oral cancer is the sixth most common type of cancer with India contributing to almost one-third of the total burden and the second country having the highest number of oral cancer cases<sup>1</sup>. The risk of developing Oral squamous cell carcinoma is higher in Oral Potentially Malignant Disorders (OPMD) as compared to other Oral lesions. The term Oral Potentially Malignant Disorder (OPMD) was recommended in a workshop of the WHO Collaborating Centre for Oral Cancer/Precancer (WHOCC) to involve what was previously referred to as "Precancer" or "Premalignant lesions and conditions"<sup>3</sup>. Oral potentially malignant disorders (OPMDs) include oral Leukoplakia and erythroplakia, proliferative verrucous Leukoplakia, oral submucous fibrosis, and oral lichen planus/lichenoid lesions<sup>4</sup>. The global prevalence of OPMD has been reported at 1–5%<sup>2</sup>. About 14–46% of tobacco-induced oral cancer are likely to be preceded by precancers. The spectrum of oral malignancy varies with geographical distribution, type of habit, ethnicity of a person<sup>5</sup>. Generally, a male predilection is noticed in these conditions<sup>6</sup>. OPMD is associated with smokeless tobacco use, smoking tobacco, and alcohol use<sup>7</sup>. The role of Human Papilloma Virus (HPV) is controversial in the causation of OPMD<sup>8</sup>. OPMD has no distinct progression of the disease and it is difficult to predict which lesion goes in for malignant transformation. The highest risk of malignant transformation is reported in Erythroplakia, erythroleukoplakia, proliferative verrucous Leukoplakia, and Oral Submucous Fibrosis. Common PMD like Oral leukoplakia is reported to have a malignant transformation rate of 0.13 to 34.0%<sup>9</sup> while Oral lichen planus has a range from 0 to 3.5%<sup>10</sup>. Although most of the cases are asymptomatic at the time of detection, a regular follow up is mandatory. Any changes like ulceration or increased redness may indicate malignant transformation.

In this regard the present study was aimed at identifying the spectrum of Oral Potentially Malignant Disorders in high-risk patients and determining its relation primarily with the type of habit.

### METHODS

The study was conducted in the department of oral medicine and radiology in Sathyabama Dental College and Hospital, Chennai. Data was collected from the existing records of 2019. habit history covered

betel quid chewing, tobacco chewing, smoking and use of alcoholic beverages were obtained. For all habits, type, quantity, duration, were obtained. Type of smoking was specified as cigarettes, beedis or cigars. Betel quid chewing was categorized as with or without tobacco, quid comprising betel leaf, areca nut and lime only or betel leaf and areca nut or areca nut alone. Alcohol consumption was also obtained. A total of 770 patients information was obtained all subjects in the study were above the age of 15 years at the time of their history taking. The diagnostic criteria were based on the recommendations of WHO for the detection of Leukoplakia, erythroplakia, OSF, lichen planus and other oral mucosal abnormalities.

### Statistical Methods

Descriptive analysis was carried out by mean and standard deviation for quantitative variables, and by frequency and proportion for categorical variables. Non-normally distributed quantitative variables were summarized by median and interquartile range (IQR). Data was also represented using appropriate diagrams like bar chart, pie chart. Categorical outcomes were compared between study groups using Chi square test /Fisher's Exact test (If the overall sample size was < 20 or if the expected number in any one of the cells is < 5, Fisher's exact test was used.). P value < 0.05 was considered statistically significant. Data was analysed by using SPSS software, V.22. (1) 1. SPSS I. IBM SPSS Statistics Version 22 Statistical Software: Core System Users' Guide. SPSS Inc. 2014.

### RESULTS

The study population consisted of 770 subjects. The age group of the study population was between 17 years and 88 years with the mean age being  $37.70 \pm 14.22$  years (Table 1). The study population consisted of 90.91% (700) male subjects and 9.09% (70) female subjects. of the 700 subjects 696 of them had habit history in males and 67 females (table 2). 7 of the subjects had no habit history but had developed PMDs. The study shows a male prevalence in habit history. When considering the occupation of the subjects 80.0% (616) of the study population was employed. 8.05% (62) of them were students and 7.14% (55) of them were unemployed (table 3). Habit history revealed that smoking habit was seen in 45.19% (348) subjects, smokeless tobacco was seen in 26.49% (204) subjects, alcohol was seen in 8.5% (66) subjects. 1.56% (12) of the subjects had all three habits. 0.9% (7) of the study population did not have any habits (Table 4). In table 5 we see that the

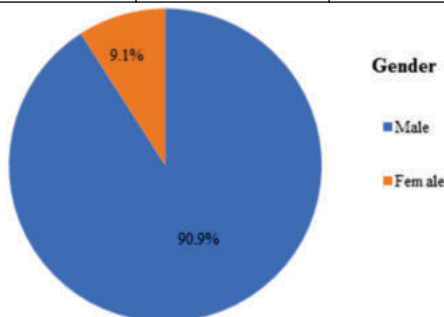
duration of use of the products to be a minimum of 0.50 years to a maximum of 62 years, with the mean being  $9.67 \pm 9.53$  years. In this study we see that Leukoplakia is the most prevalent PMD with 23.08% (36) followed by Tobacco Pouch Keratosis with 19.23% (30), Smoker's palate with 16.03% (25) and OSMF with 13.46% (21) of the study population (table 6). In our study we saw that 9.52% (2) of subjects who consumed alcohol and smokeless tobacco had Tobacco Pouch Keratosis. And the percentage of subjects who consumed all three and had tobacco pouch keratosis was 8.33% (1) (table 7). In our study we saw Leukoplakia in 6.37% (13) of patients who had smokeless tobacco habit while 12 (3.45%) subjects who had smoking history also developed Leukoplakia (table 8). When considering OSMF in the present study we see it more prevalent in smokeless tobacco users [9.31% (19)] (table 9).

**Table 1: Descriptive analysis of age in study population (N=770)**

Parameter	Mean ± SD	Median	Minimum	Maximum
Age	37.70 ± 14.22	35.00	17.00	88.00

**Table 2: Descriptive analysis of gender in the study population (N=770)**

Gender	Frequency	Percentages
Male	700	90.91%
Female	70	9.09%



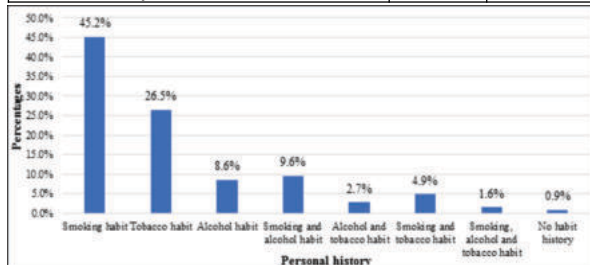
**Figure:** Pie chart of gender in the study population (N=770)

**Table 3: Descriptive analysis of occupation in the study population (N=770)**

Occupation	Frequency	Percentages
Employee	616	80.00%
Homemaker and house maid	37	4.81%
Student	62	8.05%
Unemployed	55	7.14%

**Table 4: Descriptive analysis of personal history in the study population (N=770)**

Personal history	Frequency	Percentages
Smoking habit	348	45.19%
Smokeless Tobacco habit	204	26.49%
Alcohol habit	66	8.57%
Smoking and alcohol habit	74	9.61%
Alcohol and Smokeless tobacco habit	21	2.73%
Smoking and Smokeless tobacco habit	38	4.94%
Smoking, alcohol and Smokeless tobacco habit	12	1.56%
No habit history	7	0.91%



**Figure:** Bar chart of personal history in the study population (N=770)

**Table 5: Descriptive analysis of duration (in years) in study population (N=734)**

Parameter	Mean ± SD	Median	Minimum	Maximum
Duration (in years)	9.67 ± 9.53	6.00	0.50	62.00

**Table 6: Descriptive analysis of final diagnosis in the study population (N=156)**

Final diagnosis	Frequency	Percentages
Leukoplakia	31	19.87%
Tobacco Pouch Keratosis	29	18.59%
Smoker's palate	25	16.03%
Oral Submucous Fibrosis	21	13.46%
Lichen Planus	2	1.28%
Smokeless tobacco-induced keratosis	1	0.64%

**Table 7: Comparison of personal history between Tobacco Pouch Keratosis (N=770)**

Personal history	Tobacco Pouch Keratosis	
	Yes	No
Smokeless Tobacco Habit (N=204)	21 (10.29%)	183 (89.71%)
Smoking Habit (N=348)	2 (0.57%)	346 (99.43%)
Smoking And Alcohol Habit (N=74)	0 (0%)	74 (100%)
Alcohol Habit (N=66)	0 (0%)	66 (100%)
Smoking And Smokeless Tobacco Habit (N=38)	2 (5.26%)	36 (94.74%)
Alcohol And Smokeless Tobacco Habit (N=21)	2 (9.52%)	19 (90.48%)
Smoking, Alcohol And Smokeless Tobacco Habit (N=12)	1 (8.33%)	11 (91.67%)
No Habit History (N=7)	0 (0%)	7 (100%)

\*No statistical test was applied- due to 0 subjects in the cells

**Table 8: Comparison of personal history between Leukoplakia (N=770)**

Personal history	Leukoplakia	
	Yes	No
Smoking Habit (N=348)	12 (3.45%)	336 (96.55%)
Smokeless Tobacco Habit (N=204)	13 (6.37%)	191 (93.63%)
Smoking And Alcohol Habit (N=74)	0 (0%)	74 (100%)
Alcohol Habit (N=66)	1 (1.52%)	65 (98.48%)
Smoking And Smokeless Tobacco Habit (N=38)	3 (7.89%)	35 (92.11%)
Alcohol And Smokeless Tobacco Habit (N=21)	0 (0%)	21 (100%)
Smoking, Alcohol And Smokeless Tobacco Habit (N=12)	2 (16.67%)	10 (83.33%)
No Habit History (N=7)	0 (0%)	7 (100%)

\*No statistical test was applied- due to 0 subjects in the cells

**Table 9: Comparison of personal history between oral submucous fibrosis (N=770)**

Personal history	Oral Submucous Fibrosis	
	Yes	No
Alcohol And Smokeless Tobacco Habit (N=21)	1 (4.76%)	20 (95.24%)
Alcohol Habit (N=66)	0 (0%)	66 (100%)
No Habit History (N=7)	0 (0%)	7 (100%)
Smoking And Alcohol Habit (N=74)	0 (0%)	74 (100%)
Smoking And Smokeless Tobacco Habit (N=38)	0 (0%)	38 (100%)
Smoking Habit (N=348)	1 (0.29%)	347 (99.71%)
Smoking, Alcohol And Smokeless Tobacco Habit (N=12)	0 (0%)	12 (100%)
Smokeless Tobacco Habit (N=204)	19 (9.31%)	185 (90.69%)

\*No statistical test was applied- due to 0 subjects in the cells

**DISCUSSION**

OPMD are lesions of concern as even in defined conditions like Leukoplakia, squamous cell carcinoma can occur anywhere in the oral cavity as a result of field cancerization<sup>14</sup>. This makes it important for early diagnosis of these lesions and constant monitoring of the changes while educating the patient about the condition. These methods when followed can achieve early treatment with good prognosis and reduce the risk of developing advanced-stage malignancy.

In the present study we see that the age group of the individuals is between 17 years and 88 years. This indicates that the lesions of OPMD can be seen in a wide age group of individuals with a mean of  $37.70 \pm 14.22$ . Most of the patients with premalignant lesions

(Leukoplakia, oral submucous fibrosis, tobacco pouch keratosis) were seen in the third decade, which shows similarities to the studies of Hanumakonda et al<sup>6</sup> whereas, Misra V et al<sup>12</sup> in their study found the fourth decade as the commonest age of occurrence of OPMDs. This reduction in age of patients diagnosed with OPMDs could be attributed to the decrease in the age of patients taking smoked or smokeless tobacco products in the recent years, potentially due to increasingly stressful lifestyles and peer pressure.

In the present study, we see a male preponderance with 90% of the study population being male and 9.09% being female. Almost all studies are consistent with our findings except that of Pindborg et al<sup>13</sup> who had a female preponderance in their study with male to female ratio as 3:8.

In our study, we see that 80% of them were employed and 8.05% were students which is an alarming number that makes this population prone to OPMD and at risk of squamous cell carcinoma affecting the youth population which can be a burden on the country's development.

In the present study we see that the most common habit is Tobacco smoking at 45.19%, followed by smokeless tobacco at 26.49% This is in coordination with studies of Lin Li<sup>15</sup>. It was observed that 9.61% of the study population had both smoking and alcohol habit and 1.56% had all three habits. Further it we also noted that 19.87% of cases were of Leukoplakia, 13.46% were OSMF cases, and 18.59% of the cases had developed Tobacco Pouch Keratosis which are the most commonly observed OPMDs associated with Tobacco and nicotine-related habits. Chowdhary et al<sup>11</sup> in their study conducted in a Tertiary Care Centre in Jharkhand had found OSMF to be the most prevalent lesion encountered in the oral cavity, followed by oral Leukoplakia. Hence, a geographical variation in the prevalence and distribution of OPMDs is noted.

2005 WHO defines Leukoplakia as 'A white plaque of questionable risk having excluded (other) known diseases or disorders that carry no increased risk for cancer'<sup>14</sup> it is a clinical diagnosis and has no histopathological connection. In our study we see a predilection for leukoplakia cases over OSMF, lichenplanus and Tobacco pouch keratosis. We also observed that the cases are more prevalent in smokeless tobacco users as compared to smoked tobacco users. All lesions showed a male predilection over females. This is in agreement with the studies of Hanumakonda et al<sup>6</sup> and Lin li et al<sup>15</sup>. In our study we see leukoplakia to be more prevalent. On comparing the results we found that OPMDs were more prevalent in patients who had all three habits, while the minimum cases were seen in patients who had only alcohol habit.

## CONCLUSION

Leukoplakia is seen to be the most prevalent OPMD followed by OSMF and Tobacco Pouch Keratosis in patients with habits. Both tobacco habits and development of OPMDs showed a male preponderance, as compared to females. A strong correlation was observed between tobacco-related habits and the risk of developing OPMDs. However, we recommend a more detailed study to be done on patients who have all three habits.

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