

Research Article

Prevalence and Correlation of Oral Potentially Malignant Disorder Among Tobacco and Arecanut Users in Gwalior District

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ABSTRACT:

Background- Oral cancer can arise from potentially malignant illnesses through a series of stages, including genetic, epigenetic, and metabolic changes. Some risk factors that increase the risk of developing oral cancer include using tobacco products, especially smokeless tobacco (SLT). The aim of this study was to find correlation & prevalence of oral potentially malignant disorder in tobacco and areca nut user's people residing in Gwalior district.

Materials & Methods- A cross-sectional study with a descriptive design was carried out on 3042 participants. The study participants were selected from screening camps and in a hospital environment using simple random sampling. A survey was conducted to gather information on sociodemographic traits, different risk factors for oral cancer, and the existence of the disease's symptoms. The research investigator thoroughly examined each participant's oral cavity in accordance with WHO criteria for the early detection of OPMD.

Results- the prevalence of OPMD was 4.27% among tobacco users. OSMF accounted for 1.58% of all cases. Tobacco users had a 3.241-fold increased incidence of OPMD (CI-0.041-0.303, p-0.01). The consumption of areca nut has increases the incidence of OPMD by 7.17 (CI: 0.747-6.503, p-0.001) times. Alcohol raises the risk of OPMD by 1.51 (CI- 0.002-0.128, p-0.05) times. Males had a 2.54 (1.10-2.42,p-0.01) times increased chance of getting OPMD. Age group 18-30 showed 1.84 (1.32-2.15, p-0.001) times higher chance of developing OPMD.

Conclusion- The research reaffirms that the usage of drugs including alcohol, tobacco, and areca nut is one of the modifiable risk factors for OPML.

KEYWORDS: OPMD, Tobacco, Oral cancer, Risk factors, areca nut, Smokeless

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INTRODUCTION:

Oral mucosal abnormalities that are linked to a statistically significant risk of developing oral cancer are referred to as OPMDs. OPMDs may be defined as "any oral mucosal abnormality that is associated with a statistically increased risk of developing oral cancer".^[1]

OPMDs are characterized by a variety of clinical features, including color variations (white, red, and mixed white-red), morphological modifications (plaque/plateau, smooth, grooved, wrinkled, granular, atrophic), and varying diameters affecting various oral cavity anatomical regions. Remarkably, not every oral

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lesion progresses to become mouth cancer and certain oral malignancies originate from non-dysplastic lesions.^[2,3] There are currently recognized OPMDs such as discoid lupus erythematosus, actinic cheilitis, leukoplakia, erythroplakia, oral lichen planus, oral submucous fibrosis, palatal lesions of reverse cigar smoking, and some inherited disorders like dyskeratosis congenita and Fanconi's anaemia that are linked to a high risk of malignant transformation.^[4] Oral cancer can arise from potentially malignant illnesses through a series of stages, including genetic, epigenetic, and metabolic changes.^[5]

According to epidemiological research, 4.47% of people worldwide may have OPMDs. Of them, the South Asian population has been reported to have the most cases. In Asian populations, the overall prevalence of OPMDs was 10.54%, while in North American groups, it was 0.11%. Non-homogeneous oral leukoplakia (0.16%) was the least common lesion, whereas oral submucous fibrosis (4.96%) was the most common. According to estimates from several research, the frequency of OPMDs varies among populations and is mostly related to lifestyle. Approximately 80% of cases of oral cancer are the result of OPMDs. 7.9% is the total malignant transformation (MT) rate for OPMDs.^[6,7,8] Oral potentially malignant disorders (PMDs) are quite high in Indian population. According to studies a prevalence rate of 13.2%–13.9% has been observed.^[9]

Some risk factors that increase the risk of developing oral cancer include using tobacco products, especially smokeless tobacco (SLT), chewing betel leaves, drinking too much alcohol, maintaining poor dental hygiene, eating a diet low in nutrients, and having ongoing viral infections, such as the human papillomavirus (HPV). The global prevalence varies widely, and risk factors related to behaviour, exposure to harsh environments, and lacks of understanding are indicative of this diversity.^[10] Especially in developing countries, tobacco use (in any form) is one of the main causes of cancer. In addition to tobacco, one of the main causes of mouth cancer is chewing paan, which is made of piper betel leaves combined with areca nut, lime, catechu, cinnamon, etc. The northeastern regions of India have the highest rate of cancer in the country.^[11]

While there is a paucity of epidemiologic studies that offer valuable insights into the incidence,

prevalence, and severity of oral disease in a particular population, there is a dearth of literature on the prevalence of oral potentially malignant disorders among tobacco and areca nut users in central India. Taking this into consideration, the aim of this study was to find correlation & prevalence of oral potentially malignant disorder in tobacco and areca nut user's people residing in Gwalior district, in order to create a trustworthy baseline data for the development of preventive oral health programmes.

MATERIALS & METHODS:

The present descriptive-cross sectional study was conducted in Gwalior district. The district has seven tehsils/taluk. For the collection of data we have organized screening camps at each taluk of Gwalior district and we also included the OPD patient of department of oral pathology & microbiology, MPCD & RC, Gwalior MP. Patients diagnosed with oral potentially malignant disorder and having habit of tobacco and areca nut were included in the study. This study has been approved by the Institutional Ethical Committee. Prior to assessment, informed consent from the study participants was taken.

Based on the findings of the pilot study and considering world case scenario we calculated 3042 sample size at 95% confidence interval. Simple random sampling was used for selection of study participants in a hospital setting and from screening camps. The standardized interviewer-based questionnaire was used to record information about the type of habit, duration, frequency, placement site, period of contact with the mucosa, and history of quitting the habit in addition to the patient's demographic details (Name, Age, Gender, Religion, Address, and Socioeconomic Background). A detailed clinical visual examination of the oral cavity especially the lesions involving buccal mucosa, hard & soft palate and tongue along with detailed relevant medical and lifestyle history was recorded. WHO criteria was followed for the diagnosis of each lesion.

Statistical analysis was done using Statistical Package of Social Science (SPSS Version 25; Chicago Inc., USA). Data comparison was done by applying specific statistical tests to find out the statistical significance of the comparisons. Chi square test was used to find significant association between smoking tobacco, chewing tobacco and a combination of both with oral potential malignant disorder. Logistic regression analysis was conducted to predict the occurrence of OPMD to various risk factors. Significance level was fixed at $p < 0.05$.

RESULTS:

There were 3042 participants in all in this study. The study had 34.1% female individuals and 65.9% male participants, with a mean age of 34.86 years. Based on age category, 43% of participants were between the ages of 18 and 30; 27% were between the ages of 31 and 40; 19% were between the ages of 41 and 50; and 11% were over the age of 50. Based on the socioeconomic position of the participants, the majority of them (26.2%) are from the upper lower class, followed by 24% from the lower middle class, 23% from the lower class, 17.9% from the upper middle class, and 8.9% from the upper class (Table 1).

The percentage of individuals who used tobacco was 30% out of 3042, whereas 60% did not use tobacco. A total of 19.0% of individuals reported using smokeless tobacco, 8% reported using smoking tobacco, and 3% reported using both smoking and smokeless tobacco. Based on age group, the majority of participants (13.0%) were tobacco users between the ages of 18 and 30, followed by 9.0% from the age group of 31 to 40. Additionally, 5.0% of participants were above 50, and 3% were from the age range of 41 to 50. Just 3% of the 30% of tobacco users were female, while the bulk of tobacco users (27%) were men. The

Table 1: Demographic distribution and personal habit of study participants (n=3042).

Study Variables		n (%)
Mean Age (Mean±SD)		34.86 ±10.80
Age Groups	18-30 years	1309 (43.0%)
	31-40 years	822(27.0%)
	41-50 years	577(19.0%)
	Above 50 years	334(11.0%)
Gender	Male	2006(65.9%)
	Female	1036(34.1%)
Socio economic status (Kuppuswami Scale)	Upper class	272 (8.9%)
	Upper middle class	544(17.9%)
	Lower middle class	729(24%)
	Upper lower class	797(26.2%)
	Lower class	700(23.0%)
Tobacco Use	Yes	913(30%)
	No	2129(70.0%)
Form of tobacco	Smokeless	579(19.0%)
	Smoking	242(8.0%)
	Both	92(3.0%)

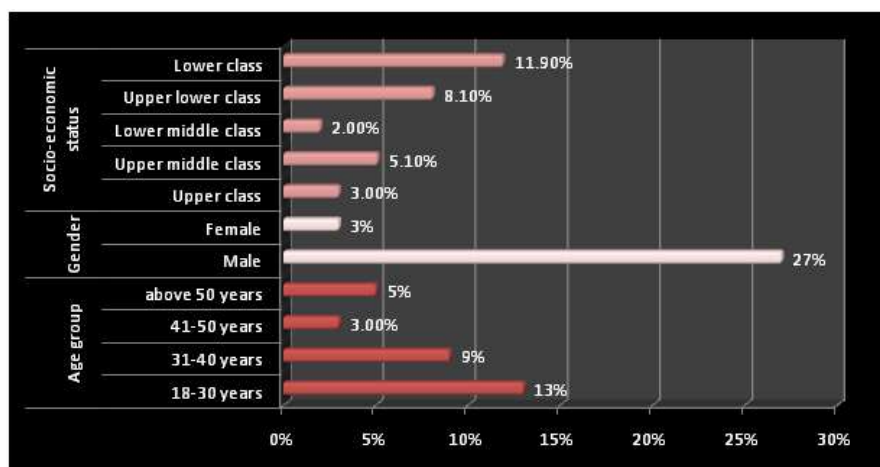


Figure 1: Distribution of tobacco users according to age, gender and socio-economic status

Table 2: Distribution of study participants according to presence of oral potentially malignant disorder (OPMD).

Variable	Tobacco users	Non tobacco users
	(n-913)	(n-2129)
Presence of lesion	Yes 39(4.27%)	0(0.0%)
	No 874(95.73%)	2129(100%)

Table 3: Distribution of OPMD according type of disorders.

Type of Oral potentially malignant disorders	Frequency (%)
No OPMD	95.73%
Erythroplakia	0.07%
Erythro leukoplakia	0.03%
Leukoplakia	0.28%
Oral sub mucous fibrosis	1.58%
Dyskeratosis congenita	0.03%
Smokeless tobacco keratosis	0.52%
Palatal lesion associated with reverse smoking	0.13%
Chronic candidiasis	0.05%
Lichen planus	0.81%
Discoid lupus erythematosus	0.05%
Syphilitic glossitis	0.02%
Acthnic cheilitis (lip)	0.7%

Table 4: Association between Oral potentially malignant disorders and associated risk factors.

Variables	Odds ratio	95% Confidence Interval	p-value
Use of tobacco	3.241	0.041 -0.303	0.01*
Use of areca nut	7.176	0.747 -6.503	0.001*
Use of Alcohol	1.517	0.002 -0.128	0.05*

*statistically significant

majority of participants (11.9%) from lower socioeconomic class (SES) reported using tobacco, followed by upper lower class (8.1%), upper middle class (5.1%), upper class (3.0%), and upper middle class (5.1%) (Figure 1).

Based on how often participants used smokeless tobacco, the majority (45.1%) reported using gutkha, followed by raw tobacco (18.0%), toothpowder (13.8%), snuff (9.0%), tobacco with slaked lime (4.61%), tobacco with pan/quid (4.61%), and tobacco in any other form (4.61%). The most popular location for holding smokeless tobacco in the mouth was the buccal vestibule (49.62%), which was followed by the labial vestibule (18.33%), the floor of the mouth (13.56%), the chew and spit (9.23%), and the swallow (9.23%). In terms of the type of tobacco used for smoking, bidi accounted for 55% of all uses, followed by cigarettes (36%), and other forms of smoking (9%).

The current study indicated that the prevalence of OPMD was 4.27% among tobacco users and 0% among non-users. (Table 2) Oral sub mucosal fibrosis (OSMF) accounted for 1.58% of all cases, with Lichen planus (0.81%), smokeless tobacco keratosis (0.52%), Leukoplakia (0.28%), palatally associated with reverse smoking (0.13%), actinic cheilitis (0.7%), Erythroplakia (0.07%), Chronic candidiasis (0.05%), discoid lupus erythematosus (0.05%), Erythro leukoplakia (0.03%), dyskeratosis congenital (0.03%), and syphilitic glossitis (0.02%) respectively (Table 3).

The incidences of OPMD and tobacco usage are positively correlated. Compared to non-users, tobacco users had a 3.241-fold increased incidence of OPMD (CI-0.041-0.303, p-0.01). The consumption of areca nut has also been found to be strongly linked to OPMD; it increases the incidence of OPMD by 7.17 (CI: 0.747-6.503, p-0.001) times. Alcohol use was also found to be substantially linked to OPMD; it raises the risk of OPMD by 1.51 (CI- 0.002-0.128, p-0.05) times (Table 4).

Gender is also linked to the OPMD. In comparison to females, males had a 2.54 (1.10-2.42,p-0.01) times increased chance of getting OPMD. When compared to age groups below 30, those between the ages of 18 and 30 showed 1.84 (1.32-2.15, p-0.001) times higher chance of developing OPMD (Table 5). When we questioned people if they were aware of the negative effects of tobacco use, 99% said they were, and 1% said they were not.

Table 5: Association between Oral potentially malignant disorders and age and gender.

Variables		Odds ratio	95% Confidence Interval	p-value
Gender	Female	1.00		
	Male	2.54	1.10 -2.42	0.01*
Age	More than 30 years	1.00		
	Less than 30 years	1.84	1.32 -2.15	0.001*

DISCUSSION:

The current study's objective was to ascertain the frequency and association of oral potentially malignant condition in Gwalior district tobacco and areca nut users. Tobacco usage was widespread in India, with 20.3% of women and 47.9% of men using tobacco in one way or another.^[12] The current study indicated that the prevalence of tobacco use was found to be 30%, similar findings were also reported by Srivastava et al^[13] and Pahwa et al^[14] this was primarily motivated by its inexpensive and simple availability of tobacco in India. Numerous factors influence and determine tobacco use like social norms; advertising and the economy; cultural aspects such as acculturation, customs surrounding tobacco use, and the tobacco industry's historical background in different communities; individual factors such as perceptions, self-image, and peers; and environmental factors such as advertising and economics.

In our survey, men used tobacco at a higher rate than women. These results were in line with research by Shrivastava et al,^[13] Sujatha et al,^[15] and Behura et al^[16] that revealed harmful oral practices were more common in men. This discrepancy may be due to the fact that men are more likely than women to have ready access to tobacco products, or it could be because many male vocations demand a significant physical expenditure and a high degree of focus, such as drivers, factory workers etc who work odd hours. This may cause tension, and stress combined with peer pressure may cause the development of bad dental habits. Individuals between the ages of 18 and 30 had higher tobacco addiction rates. Similar results were also reported by Grover et al.^[17] a notably greater percentage of adolescents who smoked were those whose father or closest friend did. In general, young individuals were more perceptive to criticism from their older brother or best friend than from their parents. They knew that smoking was bad for you in general, but they had no idea of any particular health risks. One significant influencing factor in the decision of young individuals to start using tobacco is peer pressure.

The majority of tobacco users in this study were from lower socioeconomic classes; comparable results were also found in a study by Bhan et al.^[18] In India, the underprivileged have a higher prevalence of tobacco use and are more exposed to the negative effects of tobacco use. According to a review by Hiscock, people from lower socioeconomic backgrounds tend to smoke more, and their attempts to quit are less likely to be successful. These reasons include: less support from the community, a strong addiction, a lower motivation to quit, a higher chance of not completing behavioural and pharmacological interventions for tobacco quitting, psychological issues like low self-efficacy, and marketing from the tobacco industry.^[19]

In the current study, the prevalence of OPMD among tobacco users was 4.27%. Oral submucous fibrosis was the most common kind, followed by leukoplakia, smokeless tobacco keratosis, and lichen planus. This is similar to a study done in Karnataka by Pahwa et al. where the prevalence of OPMD was 3.75%. The prevalence of OSMF, leucoplakia, and erythroplakia was 2.60%, 1.22% and 0.04%, in that order. In a related study conducted in Indore, Madhya Pradesh in 2015, Kumar et al^[20] reported greater rates of lichen planus (1.38%), leukoplakia (4.02%), and OSMF (8.06%), with erythroplakia being the least prevalent OPML (0.24%). In the current study, OPMD was diagnosed in tobacco users of any kind, and consumption of alcohol and areca nuts elevated the risk of developing OPMD. In line with the current study, Pehwa et al.^[14], Pimple et al.,^[21] and Kumar et al.^[20] noted that all individuals with OPML were found to be tobacco user. The present study reported that the OPMD was more commonly occur in males. These results are consistent with research by Kumar et al.^[20], Pimple et al^[21]. Balsaraf and others^[22] Additionally, Shivakumar et al^[23] noted that chewers have a roughly by five times increased risk of developing OPMD compared to non-chewers.

According to our research, using tobacco products in addition to alcohol and areca nuts raises the risk of OPMD. Many malignancies, particularly those

of the mouth and throat, are predisposed to by alcohol. Alcohol usage is associated with an increased risk of cancer, which is dependent on the type of alcohol consumed and how often it is consumed. Like many other research, ours found that chewing BQ on a daily basis was associated with a greater chance of acquiring OPMDs. There was another positive relationship found by Worakhajit et al. ⁽²⁴⁾ Kumar S et al. ⁽²⁰⁾ Younger age groups had a higher prevalence of OPMD; Pehwa et al. similarly found comparable results. According to our research, men are more likely than women to have OPMD. Pehwa et al. similarly observed comparable findings ⁽¹⁴⁾. This is due to the fact that, in contrast to men, female tobacco usage is not socially acceptable in central India.

CONCLUSION:

There is a chance that oral illnesses with malignant potential will eventually develop into cancer. Oral potentially malignant diseases were reported to be present in 4.27% of cases overall. more common occurrence of oral sub mucous fibrosis in the study population. The use of tobacco products, areca nut, intake of alcohol were found to be a risk factor for emergence of potentially cancerous mouth diseases. Younger age groups and men were shown to be at higher risk. Improved attempts to avoid this condition can be made possible by the identification of these risk factors. Those who have if this problem has already shown, advice to lessen the likelihood of this risk factor exposure, which could stop additional advancement of this illness. Since early intervention is essential to successful prevention, the right actions should be performed in this regard. The current policies for quitting tobacco need to be reviewed and strengthened. In particular, strategies to support smoke-free homes and workplaces, as well as comprehensible anti-tobacco/smokeless advertisements and label warnings should be encouraged. Additionally, school and mass media-based education campaigns that raise awareness of the health risks associated with tobacco use and the advantages of quitting should be supported. It appears vital to empower Indian healthcare professionals to advocate for tobacco cessation. Future research should include more longitudinal studies. Also other etiological factors such as dietary factors, oral hygiene practice and genetic predispositions should be explored.

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Conflicts of interest

There are no conflicts of interest.

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