

## EVALUATION OF TOBACCO CONSUMPTION PATTERN AND ASSOCIATED POTENTIALLY MALIGNANT DISORDERS: A CROSS SECTIONAL STUDY

Pragati Kempwade<sup>1</sup>, Avinash Kshar<sup>2</sup>, Raghavendra Byakodi<sup>3</sup>, Sunil Awale<sup>4</sup>, Amruta Madhukar Bansode<sup>5</sup>, Karishma Mujawar<sup>6</sup>

1.Senior lecturer, Department Of Oral Medicine And Radiology, AME's Dental College And Hospital, Raichur, Karnataka.

2.Professor And Head, Department Of Oral Medicine And Radiology, Vasantdada Patil Dental College And Hospital, Sangli, Maharashtra.

3.Professor, Department Of Oral Medicine And Radiology, Vasantdada Patil Dental College And Hospital, Sangli, Maharashtra.

4.Senior Lecturer, Department Of Oral Medicine And Radiology, Vasantdada Patil Dental College And Hospital, Sangli, Maharashtra.

5.Senior lecturer, Department Of Oral Medicine And Radiology, Chatrapati Shahu Maharaj Shikshan Sanstha's Dental College And Hospital, Aurangabad, Maharashtra.

6.Senior lecturer, Department Of Conservative Dentistry And Endodontics, Tatyasaheb Kore Dental College And Research Centre, Kolhapur, Maharashtra.

### ABSTRACT:

**Introduction:** The incidence and prevalence of oral potentially malignant lesions is on the rise due to an increased number of people practicing tobacco related habits.

**Material and Methods:** 500 patients with tobacco related habits attending our Department of Oral Medicine and Radiology enrolled in study. All the enrolled subjects were then interviewed for their habits and clinically examined for the presence of any oral lesions on the dental chair in artificial illumination using clinical examination tools and all the data recorded in a preformed case history format. Chi square test was used to assess the statistical significance of the study parameters.

**Results:** Males had a higher prevalence and comprised of the sample. The commonest habit in this study sample was smokeless tobacco use followed by tobacco in smoke form. Out of the 500 patients with habits 130 (26%) had potentially malignant disorders (PMDs). Among 130 PMDs leukoplakia was the commonest followed by tobacco pouch keratosis.

**Conclusions:** This study provided information about the habit trends in the patients visiting this institution. The study may serve as a useful tool in educating the users about the deleterious effects of oral tobacco.

**Key words:** OPMD, PMD, Habits.

### INTRODUCTION:

India is geographically large country, divided into states, all states differ their socioeconomic status, educational, cultural and traditions.<sup>[1]</sup> The Indian situation of tobacco consumption is worse because of high prevalence of tobacco smoking, chewing habit, which covers the spectrum of socioeconomic and ethnic groups and spread over the urbanized areas as well as rural

areas.<sup>[1]</sup> Tobacco is consumed in various forms in India which includes smoking as well as smokeless tobacco. cigarette smoking more preferably used in urban areas where as bidi is the most popular smoking product in rural areas. paan masala, gutkha and mawa are also popular and widely consumed in many parts of India. Oral tobacco such as mishri is widely used as topical applications on teeth and gums in rural areas.<sup>[2]</sup> Smoking

and chewing have been stated to be associated with oral lesions such as oral submucous fibrosis (OSF), leukoplakia, and oral lichen planus, and these lesions have potential for malignant transformation. The prevalence of OSF in India varies between 0.03% and 3.2% and prevalence of oral leukoplakia in India varies from 0.2%-5.2% according to various studies conducted. Also, higher occurrence of leukoplakia and cancer are observed in OSF patients and it is believed to be an important risk factor for oral cancer.<sup>[3]</sup>

In a World Health Organization (WHO) Workshop, held in 2005, the term “potentially malignant” was preferred above “pre-malignant” or “precancerous”.<sup>[4]</sup> The term potentially malignant disorders, as it conveys that not all lesions and conditions described under this term may transform to cancer, rather that there is a family of morphological alterations amongst which some may have an increased potential for malignant transformation.<sup>[5]</sup> Epidemiologic studies provide information regarding the prevalence, incidence, and severity of oral disease in a specific population. Collection of such information provides evidence to educate users about the deleterious effects of such habits and helps to reduce the consumption or to completely stop such habits. The purpose of the present study was to know the prevalence of tobacco associated lesions among patients with these habits and to correlate the oral habits with potentially malignant oral lesions among this subset of the population.

#### **AIM AND OBJECTIVES OF THE STUDY**

1. To assess various tobacco consumption pattern.
2. To assess the potentially malignant disorders in individuals with tobacco smoking, chewing and mixed habits.
3. To find a correlation between the potentially malignant disorders with the type, duration and frequency of tobacco smoking, chewing and mixed habits.

#### **MATERIALS AND METHODS:**

##### **STUDY POPULATION**

This cross sectional study was carried out in individuals with the habit of using tobacco (smokeless, smoke form or mixed). 500 patients attending the Department of Oral Medicine and Radiology of our institute were included in the study. Patients who were unwilling to give the complete habit details were excluded. An ethical clearance was obtained from the institutional review board.

Based on the type of the quid used the patients were divided into following groups:

Category I - Tobacco + Lime

Category II - Betel Leaf + Lime + Tobacco

Category III - Betel Nut + Betel Leaf + Lime + Tobacco

Category IV - Processed Tobacco + Processed betel (Gutakha, Mawa)

Category V - Mishri

Category VI - Bidi

Category VII - Cigarette

Category VIII - Mixed habits

(Mixed habits- more than one habit)

### **INCLUSION CRITERIA**

1. Subjects having habit of tobacco consumption (smokeless, smoking or mixed) for atleast a period of 1 year.

2. Subjects above 18 years.

### **EXCLUSION CRITERIA**

1. Subjects with oral lesion secondary to systemic disease which is not associated with tobacco consumption.

2. Subjects with oral lesions which were not tobacco associated.

All the patients fulfilling the above criteria were informed about the study which is being conducted and only those who agreed to be a part of study were enrolled in the study. Informed consent was obtained. All the enrolled subjects were then interviewed for their habits and clinically examined for the presence of any oral lesions on the dental chair using clinical examination tools under artificial illumination and all the data recorded in a preformed case history format.

All the details of the patients were recorded:

1) Patient's Name

2) Patient's Age and Sex.

3) Habits – Type of quid used

4) Duration of habit

4) Frequency of tobacco chewing per day

### **STATISTICAL ANALYSIS**

The data obtained from the study was tabulated and analysed using statistical methods.

Chi square test is used to assess association between variables like type, duration and frequency of tobacco used with occurrence on PMDs.

### **RESULTS:**

#### **Study subjects:**

Mean age in male was 46.58 years and SD was 15.66, Mean age in female was 50.16 years and SD was 12.83, Mean age in entire study population was 47.15 years and SD was 15.29.

#### **Habit patterns:**

Among smokeless form of tobacco users highest prevalence of use of tobacco + lime was seen followed by mishri, Betel leaf+ Tobacco+ Lime and gutakha or mawa. Among 33 (6.6%) patients who had habit of using tobacco in smoke form 21 (4.2%) were cigarette smokers and 12 (2.4%) were bidi smokers.

#### **Habit frequency and duration:**

Patients who were using tobacco more than 10 years were more followed by duration of

usage 1-5 years and 6-10 years. Highest number of patients consumed tobacco 1-5 times a day followed by 6-10 times a day and >10 times a day.

#### **Lesions associated with habits:**

In our study highest number of leukoplakia was seen followed by tobacco pouch keratosis, oral submucous fibrosis, Smoker's palate. There was significantly higher ( $p < 0.0001$ ) occurrence of oral lesions among males 126 (96.92%) compared to females 4 (3.07%). Higher occurrence of lesion among males was seen in all lesions but it was statistically significant among leukoplakia ( $p = 0.025$ ), tobacco pouch keratosis ( $p = 0.018$ ), OSMF ( $p = 0.03$ ).

Highest prevalence of PMDs 65 (50%) were found among 45-64 years age group followed by 42 (32.30%) in 25-44 years age group, 17 (13.07%) in >65 years age group and 07 (5.38%) in < 25 years age group. Highest occurrence 25 (62.5%) of PMDs were seen among tobacco + lime users 54 (41.53%) followed by mixed form of tobacco users 25 (19.23%), Gutakha or Mawa 15 (11.53%), betel leaf+ tobacco + lime user 15 (11.53%), betel leaf + betel nut + tobacco + lime users 12 (9.23%), bidi smokers 4 (3%), mishri users 4 (3%) and cigarette smokers 1 (0.76%). There was statistically significant ( $p < 0.000002$ ) difference in occurrence of lesions among different type of tobacco consumption.

There was increasing trend of development of lesion is seen with tobacco pouch

keratosis, OSMF, Smoker's palate also but difference was not statistically significant. There was statistically significant ( $p = 0.39$ ) increased occurrence of oral PMDs with increased duration of usage. Among patients with >10 years of tobacco usage, 68 (52.30%) showed PMDs followed by patients with 6-10 years of tobacco usage 31 (23.85%) showed PMDs and patients with 1-5 years of tobacco usage 31 (23.85%) showed PMDs.

Highest number of PMDs were seen with frequency of tobacco consumption of 1-5 times a day followed by 6-10 times a day and >10 times a day. Among those who used tobacco 1-5 times a day 81 (62.3%) showed presence of PMD followed by among those who used tobacco 6-10 times a day 26 (20%) showed PMD and among patients who used tobacco >10 times a day 23 (17.7%) patients diagnosed with PMD.. and among those who use occasionally none showed PMD.

#### **DISCUSSION:**

In our study it was observed that prevalence of oral habits were much higher in males as compared to females and it in accordance with studies done by Rani et al.<sup>[48]</sup>, Saraswathi et al.<sup>[3]</sup> Higher frequency of tobacco use among males may be due to males are more socially active as compared to females. It is also noted that use of tobacco is often prompted by friends, these may later lead to addiction and long term use.

Cross-sectional studies play important role in estimating the incidence and prevalence of a

disease in the population and identifying high-risk sub population.<sup>[3]</sup> In our study highest age group affected was 45-64 years followed by 25-44 years and >65 years age group. Mean age in male was 46.58 years and SD was 15.66, Mean age in female was 50.16 years and SD was 12.83, Mean age in entire study population was 47.15 years and SD was 15.29. Our findings are consistent with Desai et al.<sup>[6]</sup> and Keluskar V et al.<sup>[7]</sup>

It have been also observed that smoking and chewing of tobacco and betel quid have synergistic effect in oral carcinogenesis and subjects with mixed habits are substantially high-risk population.<sup>[8]</sup> In our study it was observed that prevalence of tobacco use in smokeless form was much higher than smoking form. Among smokeless form of tobacco users highest prevalence of use of tobacco + lime was seen followed by mishri, Betel leaf+ Tobacco+ Lime and gutakha or mawa. It is consistent with the study done by Nair P et al.<sup>[9]</sup>, Keluskar V et al.<sup>[7]</sup>, Gupta PC et al.<sup>[10]</sup> Higher prevalence of consumption of smokeless tobacco use may be due to easy and wide availability, low cost as compared to smoking form. Highest number of patients consumed tobacco 1-5 times a day followed by 6-10 times a day and >10 times a day. Our findings are consistent with Sujatha et al.<sup>[11]</sup>

The 26.0% prevalence of PMDs in patients with habits in the present study is in accordance with Patil PB et al.<sup>[8]</sup> Our finding is higher in comparison to study done by Saraswathi et al.<sup>[3]</sup> and Chung at al.<sup>[12]</sup> Our findings are lower than Nair P et al.<sup>[9]</sup>

In this study, population included only those patients attending to the department having tobacco related habit. All routine patients attending to the department were not included so the prevalence of PMD higher as compared to other studies. In our study region most of the patients were unskilled, uneducated and unaware of harmful effects of tobacco related habit as well as lower economic status. Large number of patients were farmers, industrial workers which require substantial amount of physical energy and concentration this can be stressful. Also peer pressure, prompt by friends and relatives lead to initiation of habit, addiction and long term use.

In our study it was observed that highest prevalence of leukoplakia followed by tobacco pouch keratosis, oral submucous fibrosis, Smoker's palate and lichenoid oral lesion. Our findings are in accordance with studies done by Sujatha et al.<sup>[11]</sup>, Patil PB et al.<sup>[8]</sup>, Saraswathi et al.<sup>[3]</sup> who found that high prevalence of leukoplakia than other lesion.

In our study it was found that statistical significant higher occurrence of oral lesions was seen among males as compared to females which is consistent with studies done by Patil PB et al.<sup>[8]</sup>, Ranganathan et al.<sup>[13]</sup>, Ahmad MS et al.<sup>[14]</sup>

In present study highest prevalence of lesions 65 (32.8%) were found among 45-64 years age group followed by 42 (22.1%) belongs to 25-44 years age group, 17 (21.6%) in >65 years age group and 07 (18.4%) in < 25 years age group which is in accordance

with Bhatnagar P et al.<sup>[15]</sup> In our study it was observed that highest prevalence of OSMF was seen among 45-64 age group. These findings are consistent with study done by Rangnathan et al.<sup>[13]</sup> Possible reason of occurrence of PMDs in 45-64 years of age group could be physical stress, financial burden middle age group. Also stressed life, mental burden due of economic crises can affect middle aged population which has resulted in practice of habit which lead to presence of more lesions among this group.

The type of alteration of lesions varies with type of tobacco used and the way it is used.<sup>[16]</sup> In our study it was found that increased occurrence of PMDs with increased duration of tobacco exposure. There was statistically significant ( $p=0.39$ ) increased occurrence of oral PMDs with increased duration of usage. Duration of consumption can be considered as significant predictor of risk of occurrence of lesion. Our findings are consistent with Behura SS et al.<sup>[16]</sup> and Sujatha et al.<sup>[11]</sup>

Highest number of PMDs were seen with frequency of tobacco consumption of 1-5 times a day followed by 6-10 times a day and >10 times a day. Our findings are in contrast with Sujatha et al.<sup>[11]</sup> and Behura SS et al.<sup>[16]</sup> who found that increased frequency of tobacco usage was associated with increased risk of lesion and who also found that significant correlation between frequency and duration and occurrence of lesion.

## CONCLUSION:

In this study, 500 subjects were screened for various tobacco related habit pattern and various potentially malignant disorders associated with them. The patients who visited to our institute were enrolled in the study. The data obtained from the study was recorded and statistical analysis of these data was carried out. The result of the present study revealed existing habit pattern and associated PMDs in the population where this study has been conducted. The limitations of this study include potential information bias as present study relied on history given by the patient, there are chances that patient may hide information. Another possible flaw could be detection bias as the researcher was aware of the habit history of the patient prior to oral examination. In future research the examiner can be blinded to the habit details and should examine the oral cavity first to prevent such bias. Further studies with larger sample size and in the general population need to be performed. The findings from this study can be used to design case control or cohort studies to further understand the relation between habits and PMDs. Studies of this nature could potentially help clinicians in identifying high-risk population and help in early diagnosis and helps to prevent the occurrence of lesions by providing better oral health programs.

**TABLES:****Table 1: Distribution of the study subjects based on their age group and sex.**

Age group	Sex		Total (%)
	Female (%)	Male (%)	
< 25 years	0 (0)	38 (9.0)	38 (7.6)
25-44 years	32 (40.5)	158 (37.5)	190 (38.0)
45 -64 years	32 (40.5)	166 (39.4)	198 (39.6)
>65 years	15 (19.0)	59 (14.0)	74 (14.8)
Total	79 (15.8)	421 (84.2)	500 (100.0)

**Table 2: Distribution of lesions based on type of tobacco consumption**

		Leukoplakia	Tobacco pouch keratosis	OSMF	Smoker palate	Total
Smokeless	Tobacco + lime	22 (16.92%)	28 (28.54%)	2 (1.55%)	0 (0.0)	54 (41.53%)
	Betel leaf +Tobacco +Lime	07 (5.38%)	04 (3%)	3 (2.3%)	0 (0.0)	15 (11.53%)
	Betel leaf +betel nut +Tobacco +Lime	03 (2.3%)	0 (0.0)	9 (6.92%)	0 (0.0)	12 (9.23%)
	Gutakha/ Mawa	02 (1.55%)	0 (0.0)	12 (9.23%)	0 (0.0)	15 (11.53%)
	Mishri	03 (2.3%)	0 (0.0)	0 (0.0)	0 (0.0)	04 (3%)
Smoking	Cigarette	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.76%)	01 (0.76%)
	Bidi	0 (0.0)	0 (0.0)	0 (0.0)	4 (3%)	4 (3%)
Mixed	Mixed habit	9 (6.92%)	7 (5.38%)	7 (5.38%)	2 (1.55%)	25 (19.23%)
	Total	46 (35.38%)	39 (30%)	33 (25.38%)	7 (5.38%)	130 (100%)
	p value	0.003	0.00001	<0.0001	<0.0001	0.000002

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