

CLINICAL AND EPIDEMIOLOGIC STUDY OF POTENTIALLY MALIGNANT LESIONS AND CONDITIONS OF ORAL CAVITY IN RURAL AREAS OF SANGLI DISTRICT

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ABSTRACT:

Aim: Oral cancer has become a global health problem and has one of the lowest survival rates that remain unaltered despite recent therapeutic advances. Identification of oral potentially malignant lesions is very important in order to prevent malignant transformation. Tobacco usage in any form is an important etiologic agent for oral cancer. Western Maharashtra part of India is known for tobacco manufacturing but not many epidemiological studies have been conducted regarding oral pre-cancer and hence this research was planned in the rural areas of Sangli district, to study the prevalence of habit related oral potentially malignant lesions and conditions and to create awareness amongst the population about the deleterious effects of consumption of tobacco, areca nut and alcohol.

Methodology: This cross-sectional epidemiological study was carried out amongst 5676 total subjects in five rural areas of Sangli district, Maharashtra state, India to assess tobacco\ alcohol consumption habits and the association with potentially malignant disorders.

Results: The prevalence of tobacco usage &/or alcohol consumption was 20.59 %. Overall prevalence of oral potentially malignant disorders (PMD) in study population was 4.24%. Oral submucous fibrosis (2.38 %) was the commonest PMD followed by leukoplakia (1.50 %), lichen planus (0.19 %) and erythroplakia (0.17 %).

Conclusion: There was statistically significant association between prevalence of various oral PMDs and consumption of tobacco/alcohol. There is an urgent need for awareness programs to be undertaken by community health workers, dentists and allied medical professionals against tobacco abuse.

Key Words: Erythroplakia, Leukoplakia, Lichen planus, Oral Cancer, Oral Submucous fibrosis, Potentially Malignant Disorder



INTRODUCTION:

The concept of 'precancer' began way back in 1805 with a suggestion given by a European panel of physicians that there are benign diseases which will always

develop into invasive malignancy if followed for a long time. The term 'precancer' was first coined in 1875 by Victor Babes, a Romanian physician

[1]. This concept later widened to include a number of diseases in various organ systems. Subsequently in the literature, various terminologies appeared in relation to the 'precancer' concept like 'pre-malignant', 'preneoplastic', 'carcinoma prone' and 'intra-epithelial neoplasia' etc. Because of the continuing challenge and confusion surrounding the concept of oral cancer, world health organization (WHO) has periodically convened International Workshops. In 1978, WHO used the term 'precancer' which was further classified into 'lesions' and 'conditions'[2]. The most recent workshop convened by the WHO Collaborating Centre for Oral Cancer and Pre-Cancer in London in 2005, recommended the use of the term oral potentially malignant disorders (OPMDs) and elimination of the term 'precancer'[3]. However, the latest WHO monograph of Head and Neck Tumors (2005) uses the term 'epithelial precursor lesions'[4].

The term OPMDs indicates that not all disorders thus described will transform to invasive cancer, at least not within the lifespan of the affected individual, rather that there is a family of morphological alterations amongst which some may have an increased potential for malignant transformation. OPMDs are also indicators of risk of likely future malignancies elsewhere in (clinically normal appearing) oral mucosa and not only site specific predictors [3]. Estimates of the global prevalence of OPMDs range from 1–5%, although much higher prevalence is reported from South East

Asia, usually with a male preponderance, e.g. Sri Lanka (11.3%) [5], Taiwan (12.7%) [6] and some Pacific countries (Papua New Guinea 11.7%) [7]. Wide geographical variations across countries and regions are mainly due to differences in socio-demographic characteristics, the type and pattern of tobacco use and clinical definitions of disease. In Western countries, the overall prevalence is low and a decrease over time is observed. The age and gender distribution of OPMDs varies considerably mainly dependent on lifestyle, geographical location and ethnicity. Females are less commonly affected, largely reflecting greater use of relevant habits in men [8]. Average age of patients with OPMDs is 50–69 years, which is 5 years before occurrence of oral cancer. Unfortunately, in recent years 5% of OPMDs has been observed in persons under 30 [9]. The oral lesions in PMDs are usually found on the buccal mucosa, followed by gingiva, tongue and floor of the mouth. The various oral PMDs are listed in [Table 1].

The risk of malignant transformation in PMDs varies from site to site within the mouth, from population to population, and from study to study. Rates for malignant transformation in PMDs in hospital-based studies are consistently higher than for community based studies because of sampling bias [10,11,12]. There are also chances of under-reporting of cases of oral cancer in the developing world [13]. Majority of oral squamous cell carcinomas (OSCC) are related to tobacco in various forms, areca nut /

betel quid chewing, heavy alcohol drinking and dietary micronutrient deficiency. In the developing world, use of tobacco and areca nut, either alone or in combination, accounts for the vast majority of oral cancers and oral potentially malignant disorders [5]. WHO has recently classified areca nut as carcinogenic in human [14].

Oral cancer is a major problem and is of significant public health importance in India where it ranks among the top three types of cancer in the country. Age-adjusted rates of oral cancer in India are high, which are 20 per 100,000 population and accounts for over 30% of all cancers in the country as compared to 2-3% in UK and USA. It is 6.2 per 100,000 in males and 4.6 per 100,000 in females [15]. Unfortunately the five-year survival rate of OSCC has not significantly improved over the past decades and is still about 53–56%. Multiple reasons may be responsible for this fact like diagnosis at advanced stages which results in poor treatment outcome and economic burden to the patients, inadequate access to trained providers and limited health services and higher exposure to risk factors such as the use of tobacco in rural areas. The concept of a two step process of cancer development in the oral mucosa i.e. the initial presence of a precursor subsequently developing into cancer is well established. An Indian house-to-house survey showed that about 80 % of oral cancers were preceded by oral pre-cancerous lesions or conditions [16].

It is the need of the time to create awareness in the masses about the harmful effects of various habits like consumption of tobacco, areca nut and alcohol especially in relation to oral pre-cancer and cancer. As far as PMDs are concerned, correct diagnosis and timely treatment may help prevent malignant transformation in such lesions. Lack of awareness about signs and symptoms of OPMDs among general population and even physicians are believed to be responsible for the diagnostic delay of these entities. Western Maharashtra is one of the important hubs for tobacco manufacturing and studies have reported increased incidence of oral cancer in association with tobacco usage. But not many epidemiological studies have been conducted regarding PMDs of oral cavity and hence we have attempted to study the same in the rural areas of Sangli district.

AIMS AND OBJECTIVE: To study the prevalence of habit related oral potentially malignant disorders and to create awareness amongst the population about the deleterious effects of consumption of tobacco, areca nut and alcohol.

MATERIALS AND METHODS:

This Cross-sectional descriptive epidemiological study on prevalence of potentially malignant lesions and conditions was begun after obtaining ethical clearance from Institutional Ethics Committee. This study was carried out as Long Term Research Project (LTRG) granted by Maharashtra

University of Health Sciences (MUHS), Nashik. Five rural areas of Sangli district in Maharashtra state, which are in close vicinity to the institution like Budhgaon, Padmale, Palus, Karnal and Kumathe were included in the survey. The survey was carried out for a period of 11 months from January 2015 to November 2015. Prior permission from head of village (Sarpanch) was obtained before the start of survey. Informed written consent was obtained from all the participants after explaining the nature and purpose of research in local language (Marathi). Patient awareness and education regarding the deleterious effects of usage of tobacco, areca nut and alcohol related habits was done through distribution of pamphlets and talks. A poster depicting harmful effects of tobacco usage and various precancerous disorders was displayed in each Grampanchayat office for awareness purpose [Figure 1].

A team of 6-8 trained investigators conducted the survey. A demographic detail, socioeconomic status, information related to tobacco usage (form, frequency and duration), alcohol consumption and other habits was recorded. Persons chewing at least one pouch of tobacco a day or smoking at least one cigarette a day for last 1 year were defined as tobacco chewers or smokers respectively [17, 18]. Detailed clinical and oral examination was conducted in day light with the help of diagnostic instruments. Different PMDs like leukoplakia, erythroplakia, oral submucous fibrosis (OSMF) and lichen

planus etc [Table 1] were clinically diagnosed based on features described in standard Oral Pathology Textbook. [19]. Oral hygiene of the subjects was assessed using oral hygiene index-simplified (OHI-S) developed by Green and Vermillion [20]. Socio economic status was assessed based on revised Kuppuswamy scale [21]. All records entered were cross-checked for correctness.

Inclusion-criteria:

Subjects with history of habits like usage of tobacco in any form or alcohol consumption

Subjects having clinical feature of any oral PMDS

Exclusion criteria:

Patients with white or red lesions other than PMDS of oral cavity

Patients with oral cancer

Subjects not willing to participate in the study

Statistical Analysis: The entire data obtained was analyzed by using Statistical Package for Social Sciences (SPSS) software and Chi-Square tests for association.

RESULT:

The study group constituted 1169 subjects with a history of tobacco usage in any form &/or alcohol consumption from amongst 5676 total subjects surveyed in five villages together. The prevalence of tobacco &/or alcohol

abuse in the study group was 20.59 % [Table 2].

Demographic Details

Out of 1169 subjects of study group, 898 subjects (76.81%) were males and 271 subjects (23.18%) were females. The subjects were divided into 10 year interval age groups (> 20 yrs; 21-30 yrs; 31-40 yrs; 41-50 yrs; 51-60 yrs; &> 60 yrs). Maximum subjects were in the age group of 51-60 years and marginal difference was noted in 10 year interval age groups above 30 years [Table 2].

According to revised Kuppaswamy classification of Socio-economic status January 2014; 65% people were in upper lower class IV; 23% people were in lower class V and 12 % were in lower middle class III. Lower socio- economic class group had higher prevalence of PMDs in association with usage of tobacco products, betel quid or smoking and the result is statistically significant at 5 percent level of significance [Table 3]

Oral hygiene status analysis among the study group revealed that 57% subjects had poor oral hygiene as compared to 21% and 22% subjects having fair and good oral hygiene respectively. Statistically significant relationship exists between various PMDs and oral hygiene status of the subjects at 5 percent level of significance [Table 4]

Analysis of Habits:

khaini chewing (31.39%) was the commonest habit followed by mishri (14.37%), betel quid (16.25%), mawa

(9.66%), gutka (2.56%) and areca nut (4.87%). Bidi smoking (8.98%) was higher than cigarette smoking (4.79%) followed by alcohol (7.13%). More than 1 habit group included patients with combination of two habits like both smoking and drinking, smoking and chewed tobacco or chewed tobacco and drinking alcohol. More than 2 habits group included patients with three habits like smoking, chewed tobacco and drinking alcohol. None of the female patients consumed only alcohol or used smoked tobacco. Among the mishri users, maximum subjects were females (82.46%) as compared to males in age group of above 50 years but in contrast gutka chewing habit was seen exclusively in males. Statistically significant difference is observed between usage of various habits and gender at 5 percent level of significance [Table 5]

The maximum frequency of consumption was 6-10 times daily for leukoplakia (43.81 %), erythroplakia (50 %), OSMF (44.44 %) and lichen planus (45.45 %) cases respectively. The maximum duration of consumption was > 10 years for leukoplakia which included periods as high as 30 years but was different for other lesions. The maximum duration was 6-10 years for erythroplakia (70 %), OSMF (53 %) and lichen planus (54.54 %) respectively. There is a statistically significant association and correlation between the frequency of consumption and duration of tobacco abuse in years and various PMDs [Table 6]

Prevalence of PMDs

Overall prevalence of OPMDs in study population was 4.24%. No PMD was noted in subjects without any habit. Male predominance was noted amongst the various PMDs. The most common PMD observed was OSMF (2.38%) [Figure 2] followed by leukoplakia (1.50%) [Figure 3], Lichen planus (0.19%) [Figure 4] and Erythroplakia (0.17%). There is statistically significant association between prevalence of various OPMDs and consumption of tobacco/alcohol. [Table 7]

DISCUSSION:

Tobacco consumption is one of the biggest maledictions that the modern society faces today. It is not confined to any religion, caste or country and has widely spread across the globe due to social, economic and political factors. WHO predicts that tobacco deaths in India may exceed 15 lakhs annually by 2020. Thus with 25 crore tobacco consumers, India is sitting on the verge of an unparalleled health crisis. There is wide variation in the type of smokeless tobacco or areca nut usage in India across different regions like chewing khaini, mawa, gutka, betel quid, or applying mishri to teeth and gums. According to results of the Global Adults Tobacco Survey (GATS) in India, tobacco with lime (khaini) is the most common form of tobacco chewing which can be prepared by the user, the vendor or purchased as a ready-made product. The next most commonly used product is gutka followed by betel quid with tobacco. There are various other tobacco

products used in India that contain pieces of areca nuts along with tobacco and lime. In India, at present smokeless tobacco is used by 25.9% of all adults [21]. Epidemiological studies conducted in diverse cultures across the world have confirmed the fact that usage of tobacco/areca nut in any form or alcohol consumption can cause oral precancer and cancer. With this background we conducted a survey to study the prevalence of habit related OPMDs and to create awareness amongst the population about the deleterious effects of consumption of tobacco, areca nut and alcohol.

In our study, the number of males with tobacco usage habit was more as compared to females. This finding is in accordance with similar studies conducted in various regions like Ambala (Haryana) [22], Sangamner (Maharashtra) [23], Telangana (Andhra Pradesh) [24], Madhya Pradesh [25], South India [26] and Pune (Maharashtra) [27]. Male predominance may be due to socio-cultural characteristics associated with tobacco consumption habit in males. Maximum subjects were in age group 51-60 years and marginal difference was noted in 10 year interval age groups above 30 years. It has been observed that habit of tobacco usage increases with age. Major determinants may be exposure to parental, sibling or peer group pressure, easy availability of tobacco in any form, aggressive promotion and advertising and low cost [28]. Findings of our study in this regard are in accordance with other such

studies. Krishnan et al^[29] have reported maximum usage of areca related compounds and tobacco in age group of 45-54 years. Hari Vinay et al^[24] have reported maximum subjects in age group 30-39 years (33.9%) and minimum subjects in age group of 60 years and above (4%), where as contrasting results have been noted by D Sujatha et al^[30]. They have reported male predominance in age group of 21-30 years and 51-60 years in females with decline in number of male patients with advancing age where as reverse proportion was observed in females.

Low socio-economic and educational status of people residing in rural areas has led to the increasing practice of chewing or smoking tobacco in most of the population. In this aspect we also noted that maximum subjects with habit were from lower socio-economic class. This finding is similar to the studies conducted by Kawatra A et al^[23], Gupta BK et al^[31], HadiKhoram et al^[32], Sandeep Kumar et al^[25], Gupta T et al^[22], Doifode et al^[33], Khandekar et al^[34] and Burungale et al^[35]. We noted a statistically significant increase in the prevalence of OPMDs and low socio-economic status. Similar finding is also noted by Kadashetti et al^[36] and Chandra Shekar BR^[37]. The link between socio-economic status and oral health is well established and socio-economic status per se is an important risk factor for various diseases. The individuals with low income and less education were more likely to chew tobacco/betel quid, smoke cigarettes, drink alcohol and eat

less fruits or vegetables^[38]. In both high and low income countries around the world, low socio-economic status has found to be significantly associated with increased oral cancer risk even after adjusting for potential behavioural confounders. Social disadvantage causes health disadvantage and long term illness is more common among lower social groups^[39]. The awareness on causative factors for OPMDs and oral cancer is also significantly lesser in lower socio-economic status categories than upper. These factors possibly explain the higher prevalence of OPMDs and oral cancer among these subjects.

In our study group, statistically significant relationship existed between various PMDs and oral hygiene status and nearly half of the population had poor oral hygiene as compared to 21% and 22% subjects having fair and good oral hygiene respectively. Our results are similar to study conducted by Shenoy RP et al^[40]. They have stated that poor oral hygiene in tobacco users is compounded by lack of awareness on the presence of oral disease even though a majority of subjects had undergone primary schooling. Chandra Shekar BR^[37] has shown a positive correlation between poor oral hygiene status and lower socio-economic status. Jha R and Parmar D^[41] have reported statistically significant increased prevalence of PMDs with decreased oral hygiene status. Contrasting finding has been shown in the study conducted by Gupta T et al^[22] where oral hygiene of one thirds of study population was poor and very few had

good oral hygiene. Anirudh Shukla^[42] in their study of PMDs in patients with habit of tobacco usage has also reported poor oral hygiene in 29.41% of cases. The poor oral hygiene status in tobacco users is mainly due to poor awareness of cause and effect relationship of hygiene and disease. Other causes are lack of education and social practices.

Loco-regional variations do exist in the type and form of tobacco consumed. Western Maharashtra is known for tobacco manufacturing and smokeless "spit" tobacco is commonly consumed in this region as khaini, zarda (tobacco with slaked lime) or mishri (baked powdered tobacco). We observed khaini to be the most common smokeless tobacco form used. Comparable results are noted by epidemiological studies conducted by Burungale et al^[35], Shukla A^[42], Narasannavar et al^[43], Talole KS^[44] and Reddy M.G.S. et al^[45]. Zarda was found to be the most popular tobacco form used in the study conducted by AmbekarDM et al^[46] in a hospital setting in Navi Mumbai. Joshi U. et al^[47] have reported that Mawa- masala (63.7%) and Gutka (57.6%) are the preferred forms of chewing tobacco consumed in Jamnagar district of Guajrat.

Many people believe that tobacco has medicinal value when used as mishri, gudhaku, bazaar, or creamy snuff for curing or palliating common discomforts such as toothache, headache or stomach ache^[27, 48]. Mishri is commonly applied to the teeth and gingiva, often for the

purpose of cleaning the teeth. Statistically significant female predominance (82.46%) in age group of above 50 years was noted in mishri users in our study group. Comparable results have been noted in a survey conducted by Sinha D^[49] among 100,000 individuals in Maharashtra using mishri for cleaning the teeth. They found 22% mishri users and the prevalence among women to be 39%. Juveria Syed Ali Hussain^[50] has also reported higher usage of smokeless tobacco in form of mishri and gutka followed by smoking and both forms.

About 19% of tobacco consumption in India is in the form of cigarettes while 53% is smoked as bidis, the rest is used mainly in the smokeless form. Bidis tend to be smoked by lower economic classes. Bidi smoking may be one of the few affordable sources of immediate gratification in rural population. We observed a low prevalence of smoking [bidi smoking (8.98%), cigarette smoking (4.79%)] as opposed to few other studies. D Sujatha et al^[30] have noted an overall higher prevalence of smoking followed by smokeless tobacco, areca nut chewing and alcohol drinking. Acharya Siddharth PG et al^[51] have reported tobacco smoking habit to be more common in the middle-aged and elderly male patients than females in their survey from Bagru-Khurd of Rural Jaipur, Rajasthan. They are of the opinion that elderly population is more affected because the younger generation is more aware of the ill effects of tobacco consumption. High prevalence of smoking habit in comparison to

chewing habit was also noted in the study conducted by Gupta T et al [22] where bidi was smoked by more than half of the subjects. Mishra SS et al [52] have also reported higher prevalence of smoking (34.7%) as compared to chewing areca nut (28.2%) or tobacco (18.1%) in a study conducted at dental institution in Aurangabad. Kaur Harjeet et al [53] have reported bidi smoking as the most prevalent habit, followed by tobacco and gutka chewing.

Areca nut can be chewed as such or in form of gutka, pan masala or mawa. It can also be used as an ingredient of betel quid. We noted a low prevalence of areca nut consumption (3.67%). Similar results are observed by other epidemiological studies [23,31]. Contrasting finding is reported in study conducted by Narasannavar A [43] and Kaur Harjeet et al [53]. They report a high prevalence of gutka users (54.3%). Kawatra A et al have observed that areca nut chewers outnumber the tobacco chewers in age group of less than twenty five years and so the mortality due to complications of premalignant lesions is early. There may be possibility of easy availability, at a low price with good fragrance that the younger generation is fond of areca nut related compound like gutka and older for tobacco only [23].

The daily frequency and duration of tobacco/betel quid chewing are the major predictors of risk for occurrence of OPMDs or cancer and it is a known fact that increased frequency of tobacco/betel quid chewing increases

the likelihood of development of OPMDs and oral cancer. Constant contact with the tobacco/betel quid while chewing makes it likely that the carcinogens in the tobacco/betel quid act as contact carcinogens. Statistically significant association and correlation was observed between the frequency and duration of tobacco consumption in years and various OPMDs in our study. Similar results are noted by other researchers [23, 36, 43-46]. Kawatra et al [23] are of the opinion that the individuals consuming areca nut compounds (gutka) are predisposed to oral premalignant lesions earlier as compared to tobacco chewers and that these lesions are significantly associated with the duration and frequency of consumption. They feel that the so called "Safe sweet supari" and "paan masala" consumed by the youngsters is more dangerous than chewing tobacco.

There is statistically significant association between prevalence of various OPMDs and consumption of various forms of tobacco/alcohol in our study. We observed an overall prevalence of OPMDs to be 4.24% with male predominance. No PMD was noted in subjects without habit of tobacco & \or alcohol. Wide variation has been noted in prevalence of OPMDs in various epidemiological studies conducted across India [22, 24, 25, 35, 43, 45]. In our study, OSMF (2.38 %) was the commonest PMD followed by leukoplakia (1.50%), lichen planus (0.19 %) and erythroplakia (0.17%). Comparable results are noted in the study conducted by Sandeep Kumar

et al [25], Burungale et al [35], Anirudha Shukla [42] and Narasannavar A [43]. In contrast to our finding, Sujata D et al [30] and Talole KS et al [44] have reported leukoplakia to be the most common PMD. Differences in the overall prevalence of PMD and that of OSMF and leukoplakia could be due to the variation in study settings, study design and differences in forms of tobacco used in rural population across different parts of India.

There is an urgent need for awareness programs to be undertaken by community health workers, dentists and allied medical professionals against tobacco abuse. Mass health education regarding intake of proper nutrition and cessation of oral deleterious habits has to be undertaken in war footing by government and non-government agencies using all communication media and man power. It is hoped that our results will form the basis for a wider state level or a national level survey of OPMDs. Screening and detection aids such as vital stains, visualization aids like Vizilite®, Velscope® and Oral CDX® brush biopsy can be used to increase the number of PMD cases diagnosed at an early stage. We advocate long term follow up of the diagnosed cases of OPMDs to prevent further complications.

CONCLUSION:

The overall prevalence of OPMDs was 4.24% with male predominance and was significantly associated with consumption of various forms of

tobacco/alcohol. Khaini chewing was the commonest habit followed by usage of mishri, betel quid, mawa, gutka, areca nut, bidi and cigarette smoking and alcohol consumption. OSMF was the commonest PMD followed by leukoplakia, lichen planus, erythroplakia and statistically significant correlation existed between occurrence of PMDs and frequency and duration of tobacco consumption.

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TABLES

Premalignant lesions	Premalignant conditions
Leukoplakia	Lichen Planus
Erythroplakia	Oral submucous fibrosis
Reverse smoking or smokers palate	Syphilis (third stage)
Actinic cheilosis	Discoid lupus erythematosus
Candidal leukoplakia	Epidermolysis bullosa
Plummer-Vinson syndrome	
Xeroderma Pigmentosum	
Dyskeratosis congenital	

Table 1: Potentially Malignant Disorders (PMDs)

Number of people surveyed in rural areas	Number of people with H/O tobacco/alcohol abuse	Gender	
		M	F
Padmale 1221	201	125	76
Kumthe 963	204	148	56
Palus 2017	476	428	48
Bhudgaon 803	168	103	65
Karnal 672	120	94	26
Total 5676	1169 (20.59 %)	898(76.81%)	271 (23.19 %)
Age Groups (years)		Gender	
		M	F
<=20	4	4	-
21-30	96	75	21
31-40	242	211	31
41-50	293	215	78
51-60	300	237	63
Above 60	234	156	78

Table 2: Age and Gender wise distribution of the total population surveyed in rural areas

Socio economic status In Total Population surveyed N = 1169	OPMDs	SOCIO-ECONOMIC STATUS							
		UPPER CLASS (I)	UPPER MIDDLE CLASS (II)	LOWER MIDDLE CLASS (III)		UPPER LOWER CLASS (IV)		LOWER CLASS (V)	
				N	%	N	%	N	%
Upper lower class IV = 65 %	Leukoplakia N=85	0	0	11	12.94	55	64.70	19	22.35
Lower class V 23 %	Erythroplakia N=10	0	0	1	10	6	60	3	30
Lower middle class III = 12 %	OSMF N=135	0	0	16	11.85	88	65.18	31	22.96
	Lichen Planus N=11	0	0	2	18.18	7	63.63	2	18.18
Hypothesis	Test used	Level of significance	Calculated value	Degree of freedom		Table value		Decision	
Socio Economic status among the various PMD's are not independent	Pooled chi square test	0.05	0.058952	4		9.487729		Accept the hypothesis	

Table 3 - Distribution of Socio- economic Status among various OPMDs

Oral hygiene status In Total Population surveyed %	OPMDs	ORAL HYGIENE STATUS						
		GOOD		FAIR		POOR		
		N	%	N	%	N	%	
Good N=667 57%								
Fair N= 245 21%	Leukoplakia N=85	19	22.35	18	21.17	48	56.47	
Poor N= 257 22%	Erythroplakia N=10	2	20	2	20	6	60	
Total N= 1169 100%	OSMF N=135	29	21.48	28	20.74	78	57.77	
	Lichen Planus N=11	3	27.27	2	18.18	6	54.54	
Hypothesis	Test Used	Level of Significance	Calculated value	Degree of freedom		Table value		Decision
There is relationship between Oral hygiene status and various PMD's	McNemar's Chi Square test	0.05	1.1324	13		22.3620325		Accept the Hypothesis

Table 4 - Distribution of Oral Hygiene Status among total people surveyed and OPMDs

Habits					Total		Males		Females	
					No	%	No	%	No	%
Smokeless tobacco					868	74.25	608	70.04	260	29.95
Khaini n=367 (31.39) (%)	Mishri n=168 (14.37) (%)	betel quid n=190 (16.25) (%)	Mawa n=113 (9.66) (%)	Ghutka n=30 (2.56) (%)						
M= 298 81.19 %	M=29 17.54 %	M= 153 80.53%	M=98 86.73%	M= 30 100 %						
F= 69 18.81 %	F= 139 82.46 %	F= 37 19.47%	F=15 13.27%	F= 0						
Areca Nut					57	4.87	46	80.70	11	19.30
Smoking tobacco					161	13.77	161	100	00	00
Beedi 105 (8.98 %)		Cigarette 56 (4.79 %)								
Alcohol					83	7.11	83	100	00	00
Total					1169	100%	898	76.81%	271	23.19 %
Number of habits										
>1 habit					253	21.64	233	25.94	20	7.38
>2 habits					49	4.19	49	100	00	00
Hypothesis	Test Used	Level of Significance	Calculated value	Degree of freedom	Table value	Decision				
There is significant difference between various habits according to gender	Chi Square test for trend	0.05	4.7707	4	9.4877	Accept the Hypothesis				

Table 5 - Gender wise distribution of habits

OPMDs	Frequency of consumption			TOTAL	Duration in years			TOTAL
	< 5times	6-10 times	>10 times		≥5	6-10	>10	
LEUKOPLAKIA (85)	34.98 % (n=30)	43.81 % (n=37)	21.21 % (n=18)	100 %	17 % (n=14)	35 % (n=30)	48 % (n=41)	100 %
ERYTHROPLAKIA (10)	30 % (n=3)	50 % (n=5)	20 % (n=2)	100 %	10 % (n=1)	70 % (n=7)	20 % (n=2)	100 %
OSMF (135)	37.03 % (n=50)	44.44 % (n=60)	18.51 % (n=25)	100 %	31 % (n=42)	43 % (n= 58)	26 % (n=35)	100 %
LICHEN PLANUS (11)	36.36 % (n=4)	45.45 % (n=5)	18.18 % (n=2)	100 %	18.19 % (n=2)	54.54 % (n=6)	27.27 % (n=3)	100 %
Mantel –HaenszelChi Square test, calculated value = 0.87143, degree of freedom = 6, table value= 12.59159					Mantel –HaenszelChi Square test, calculated value= 0.003178 , degree of freedom = 6, table value= 12.59159			
OPMDs	r (Correlation of frequency and duration in years)		r ²	1-r ²	SQRT (1- r ²)	t test	Table value at 5 percent l.o.s.	Decision
LEUKOPLKIA (85)	-0.53783573		0.289267	0.710733	0.84305	-0.63796	4.3	Accept the Hypothesis
ERYTHROPLAKIA (10)	0.882497503		0.778802	0.221198	0.470317	1.876388	4.3	Accept the Hypothesis
OSMF (135)	0.893932075		0.799115	0.200885	0.448202	1.994483	4.3	Accept the Hypothesis
LICHEN PLANUS (11)	0.57655666		0.332418	0.667582	0.817057	0.70565	4.3	Accept the Hypothesis

TABLE 6– Distribution and Correlation of frequency of consumption and duration of tobacco usage in various OPMDs

Type of Lesion Total = 241 (20.61 %)	TYPE OF TOBACCO HABIT								
	Smokeless Form						Smoking Form		Other Habits
	Khaini %	Mishri %	Betel Quid %	Mawa %	Areca nut chewing %	Gutkha %	Bidi smoking %	Cigarette smoking %	Alcohol %
Leukoplakia (N= 85) M=73, F= 12	33.29 N=29	21.03 N=18	13.81 N=12	8.20 N=7	3.11 N=3	2.17 N=2	7.63 N=6	4.07 N=3	6.03 N=5
Erythroplakia (N=10) M= 7, F = 3	3.99 N=4	2.29 N=2	1.62 N=2	0.96 N=1	----	1.14 N=1	---	---	---
OSMF (N=135) M= 124, F = 11	4.95 N=7	3.45 N=5	11.93 N=16	8.04 N=11	37.91 N=51	19.56 N=26	7.12 N=10	2.46 N=3	4.58 N=6
Lichen Planus(N=11, M= 7, F =4)	63.63 N=7	36.36 N=4	--	---	----	---	---	---	---
Hypothesis	Test Used	Level of Significance	Calculated value	Degree of freedom	Table value	Decision			
There is statistical significant association between habits and various PMD's	Chi Square test	0.05	1.42378	6	14.067	Accept the Hypothesis			

Table 7: Prevalence and Gender wise distribution of tobacco/alcohol abuse in association with OPMDs

FIGURES:



Figure 1: Poster showing depicting harmful effects of tobacco usage and various precancerous disorders



Figure 2: Clinical photograph of Leukoplakia involving right labial mucosa and commissure



Figure 3: Clinical photograph of OSMF showing reduced mouth opening



Figure 4: Clinical photograph of Lichen planus (reticular pattern) on right labial mucosa