

# Prevalence of Oral Mucosal Lesions in Relation to Tobacco and Alcohol Usage

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## Introduction

Premalignant lesions of the oral cavity represent an important target for cancer prevention. They can be detected by visual inspection and their importance derives from the high proportion of cases in which biopsy reveals dysplasia or even frank carcinoma. The strongest risk factors for these oral lesions are use of inhaled tobacco, chewing substitutes that usually include tobacco such as pan masala and betel nut quid and alcohol, Smoking and Chewing Tobacco.

The prevalence of oral precancerous lesions varies in different countries and suggests a variance from as much as 25% to as little as 0.2%.<sup>1</sup> In India it is estimated that 195 million people use tobacco, 62.46 million use alcohol. The incidence of oral mucosal lesions depends on the method, duration, frequency and intensity of use.<sup>2</sup>

Smokeless tobacco, which is chewed alone or with betel quid / paan, has a significant detrimental impact on the oral cavity. A wide variety of mucosal changes have been noted in habitual users of smoked and smokeless tobacco.<sup>3</sup> These changes most likely result from the many irritants, toxins, and carcinogens found naturally in cured or burned tobacco leaves, but may also arise from the mucosal drying effects, the high intraoral temperatures, intraoral pH changes, local alteration of membrane barriers and immune responses, or altered resistance to fungal and viral infections.

Alcohol could contribute to oral lesions, either directly or indirectly. Chronic exposure to ethanol may be associated with carcinogenic cytological changes in the oral mucosa, even in the absence of tobacco smoking.<sup>4</sup> In this study, subjects who visited dental outpatient clinic with the habit of smoking, chewing tobacco and consuming alcohol were examined for the prevalence of oral mucosal lesions

## Materials and Method

The study group constituted 998 patients, examined over a period of 1 year attending Sri Venkateswara Dental College and Hospital, Kanchipuram, South India.

Patients who visited the Dental outpatient department with the history of tobacco habits and alcohol consumption were selected for this study. Patients were explained orally about this study and those who were willing to reveal their personal habits and willing to undergo oral examination were taken as subjects. Patients who came for medical ailments met the physician first for their chief complaint and were later taken for oral examination in the dental clinic.

## Inclusion Criteria

1. Both male and females patients in the age of 18 years and above.
2. Patients who consent to reveal the tobacco and alcoholic habits and consent to subject themselves for oral examination.
3. Individual who practiced the habit for a minimum period of 6 months and still actively continuing the habit.

## Exclusion Criteria

1. Patients who were not willing to reveal the habits and/or subject themselves for oral examination.
2. Patients admitted for systemic diseases.
3. Individual who gave up the habit during the past 6 months.

A preformed case sheet, which included detailed recording of the patient's habits, was used for each individual. The oral habits section included questions about regular use of tobacco smoking, tobacco chewing, areca quid and alcohol consumption. All the patients were examined with the help of a mouth mirror and probe under adequate illumination. The lesions if present were photographed with the patient's consent. The collected data were compiled and statistical analysis was made.

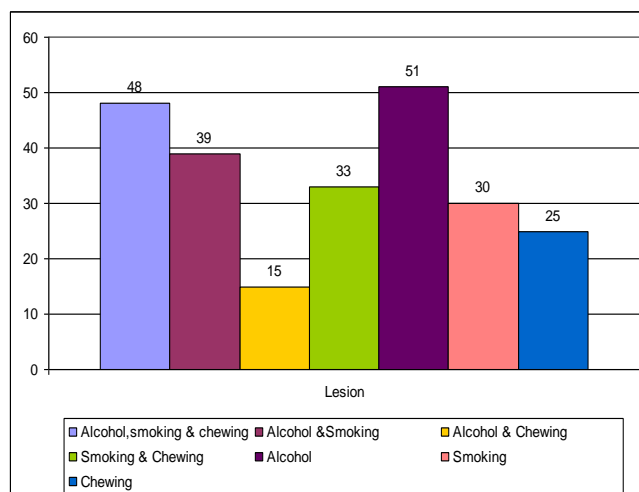
## Results

In this study of 998 individuals with habits, 760 (76.2%) were males and 238 (23.8%) were females, with the age range from 18 years to 80 years. The mean age of the study population was 42.7, in which it was 41.6 for males and 45.9 for females. (Graph 1) The different types of habit seen among them was shown in Table 1

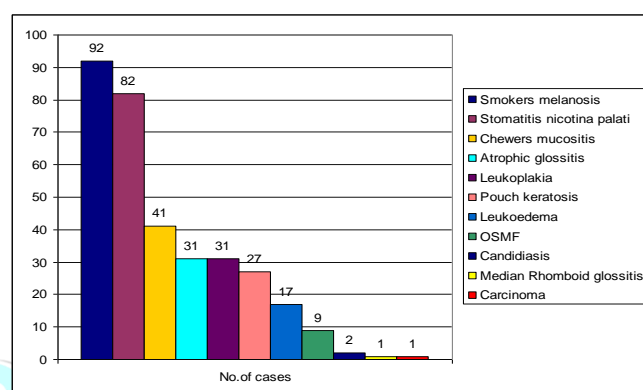
Out of the 998 individuals examined 275 of the individuals were found to have 334 lesions. Among

them, 227 (82.5%) of the males and 48 (17.5%) of the females had lesions. Based on the age, 2.5% of the individuals had lesions less than 30 years of age, 16.4% of them between 30 - 39, 40% of the between 40 - 49, 19.6% between the age group of 50 -59 and 21.5% of them were above the age of 60.(Graph 2)

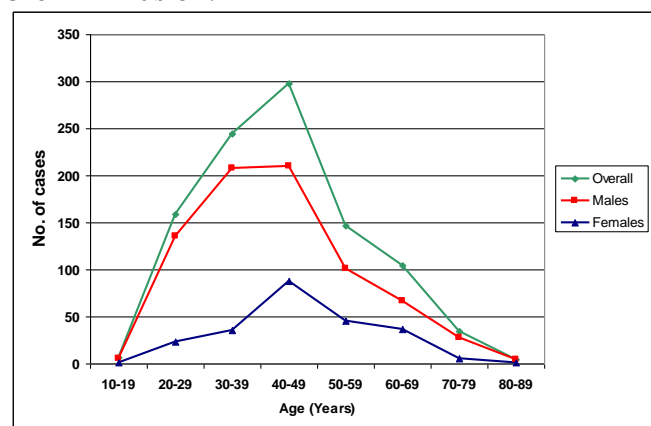
Lesions were present in 30% of the smokers, 25% of tobacco chewers, 51% in alcoholics, 39% of individuals had alcohol and smoking habit, 15% of the individuals consumed alcohol and chewed tobacco, 33% of the individuals smoked and chewed tobacco and 48% of the individuals smoked, chewed tobacco and consumed alcohol. (Graph 3) The mean frequency and duration of various habits among different habit groups are tabulated. The lesions found in 275 individuals and the distribution of different lesions by habits is shown in Graph 4. Assessment of odds ratio and risk estimate for individual habits were done as shown in Table 2.



Graph 3: Prevalence of lesions based on habits



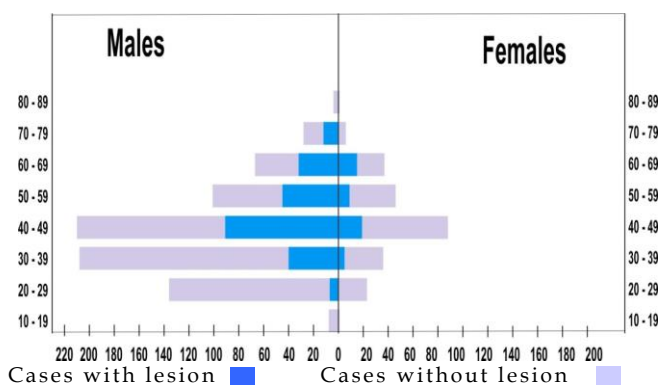
Graph 5: Distribution of different lesions



Graph: 1 Age and Sex of the study population

Table: 1 Habits in the study population

Habits	Number
Smoking	208
Chewing tobacco	273
Alcohol	37
Alcohol & Chewing	33
Smoking & Chewing	99
Smoking & Alcohol	248
Smoking, Alcohol & Chewing	100



Graph 2. Study Population with and without lesion

Table: 2 Odds ratio and risk estimate for individual habits

	Mean	Lesion		OR	95% CI	
		Present	Absent		Lower	Upper
Smoking Duration	> 7	40 (19.2%)	50 (27.9%)	11.95	4.782	29.883
	< 7	6 (2.9%)	104 (50%)			

	Mean	Lesion		OR	95% CI	
		Present	Absent		Lower	Upper
Alcohol Duration	> 15	11 (29.7%)	5 (13.5%)	3.5	0.903	14.153
	< 15	8 (21.6%)	13 (35.1%)			

	Mean	Lesion		OR	95% CI	
		Present	Absent		Lower	Upper
Tobacco Duration	> 10	46 (16.8%)	60 (22.6%)	20.57	8.356	50.646
	< 10	6 (2.2%)	161 (59.0%)			

### Discussion

Study on the prevalence of oral mucosal lesions in tobacco habits and alcohol consumption has been done in different parts of the world, differences do exist as the methodologies and sample size vary. The prevalence of oral mucosal lesions in this study (27.6%) is close to the prevalence observed in Thailand (28.4%) and in South London (28.1%).<sup>5</sup>

The various risk habits found in this study are tobacco smoking, chewing, alcohol consumption and a combination of two or three of these. There was correlation between oral mucosal lesions like smokers melanosis, stomatitis nicotina palate, betel chewers mucosa, leukoplakia, leukoedema, oral submucous fibrosis, atrophic glossitis, pouch keratosis, median rhomboid glossitis, candidal infection, cancer to the above habits and found to be consistent with other studies.<sup>2</sup>

Smokers melanosis (27.5%) had the highest incidence. Hedin CA and Axell T. found smokers had significantly more oral surfaces pigmented than non tobacco users.<sup>6</sup> Tobacco smoking stimulates oral melanocytes to a higher melanin production along with genetic factors.

The second most prevalent oral mucosal lesion was stomatitis nicotina palate (24.5%). This finding was much higher than in Ljubljana and in Sweden which were population based.<sup>7,8</sup> The third most prevalent lesion was betel chewers mucositis (12.2 %), consistent with that of a Northern hill tribe of Thailand (13.1%).<sup>9</sup> In our study, this lesion was totally associated with tobacco chewing and was seen more prevalent among females.

The fourth most prevalent lesions were leukoplakia and atrophic glossitis (9.2% respectively). The result of leukoplakia was slightly higher than that of Ching – Hung Chung<sup>1</sup> (7.44%)<sup>1</sup> and Rooban T et al. <sup>2</sup> (6.6%). In India, oral leukoplakia was reported in people who either smoked and/or had a betel quid chewing habit. Alcohol has been found to increase the risk of oral leukoplakia in the presence of tobacco but the independent association between alcohol and leukoplakia remains unclear. The findings in our study showed that there is a strong association between leukoplakia and toxic habits.

Atrophic glossitis (9.2%) seen in our study group was higher than the finding of Axell T , who showed the prevalence of 3% in Thai, 1.3% in Malaysian <sup>6</sup> and 1.1% in Swedish populations.<sup>8</sup> Chronic consumption of alcohol causes oral mucosal atrophy. It has systemic effects such as malnutrition and immunosuppression also

Regarding pouch keratosis (8%), our finding was consistent with that of Axell T <sup>6</sup>. The development of this lesion is most strongly influenced by habit duration and also by the brand of tobacco used, early onset of spit tobacco use, total hours of daily use, amount of tobacco consumed daily, and number of sites routinely used for placement.

Oral submucous fibrosis was found in nine individuals (2.6% of our study) and is strongly associated with tobacco chewing habits. The predominant use of areca nut results in comparatively an earlier onset of the disease and fibrous bands formation, whereas chewing of areca nut with tobacco, betel leaves and lime results in later onset of the disease.<sup>10</sup>

Candidal infection (0.5%) and median rhomboid glossitis (0.2%) were associated with smokers in our study<sup>11</sup>. Oral cancer was seen in one individual in the buccal mucosa and tongue.

Comparison of the frequency of development of lesion among the various habit groups showed the Atrophic glossitis was the only lesion and has highest prevalence of lesion (51%) among “only alcohol consumption group”. But the prevalence of atrophic glossitis reduced when the individuals had multiple habits. The “only chewers” group presented with 25% of chewer’s mucositis. Betel quid habit i.e leaf with areca nut, slaked lime and tobacco was more when compared to the commercial forms of areca nut. Females presented with chewer’s mucositis and pouch keratosis and males presented with oral submucous fibrosis.

Areca nut is the most important etiologic factor of submucous fibrosis. The nut contains many alkaloids, arecoline being the most abundant, is shown to stimulate collagen synthesis by fibroblasts. According to Reichart PA and Philipsen HP, chewer’s mucositis may be a precursor lesion of oral submucous fibrosis.<sup>12</sup>

A high prevalence of lesions of 48% was seen among individuals with all the three habits. The effect of individual habit in causation of various lesions showed either increased frequency or increased duration, supported by a higher mean age of individuals with lesion when compared to individuals without lesions. Assessment of odds ratio showed smoking for more than 7 years had an 11.95 times higher risk when compared to those who smoked for less than 7 years. Individuals who consumed alcohol for more than 15 years had an 3.56 times higher risk of developing a lesion and chewers who had used tobacco for more than 10 years had an 20.57 times higher risk of developing a lesion.

## Conclusion

Oral health professionals should incorporate prevention and cessation services in their routine and daily practice and prevalence study of oral mucosal lesion related to habits will help dentist to provide more effective community based health promotion programs.

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