

## **Evaluation of oral mucosal lesions amongst study population of Orissa**

*Running title: Oral mucosal lesions*

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### **ABSTRACT**

Tobacco consumption associated with lesions such as leukoplakia, oral submucous fibrosis (OSMF), smoker's palate, erythroplakia, lichenoid reaction etc. This study was done to determine the mucosal lesions among both genders resulted from use of tobacco products. 2800 subjects age ranged 18-60 years were assessed for occurrence of PMDs, and tobacco related lesions. 37.1% (266) were potentially malignant disorders and 62.9% (450) were other tobacco related lesions. The difference found to be significant ( $P < 0.05$ ). Smoking resulted in 53 PMDs, and 136 other TRLs and chewing tobacco resulted in 157 PMDs and 237 TRLs and both forms resulted in 55 PMDs and 77 TRLs. The difference found to be significant ( $P < 0.05$ ). Under smoking, most common lesion was leukoplakia seen in 30, erythroplakia in 24 and palatal hyperkeratosis in 136. Chewing form had leukoplakia seen in 50, OSMF in 107, lichenoid reaction in 147 and tobacco pouch keratosis in 90. Both forms resulted in leukoplakia seen in 20, OSMF in 35, lichenoid reaction in 50 and tobacco pouch keratosis in 27. The difference found to be significant ( $P < 0.05$ ). Most commonly occurring potentially malignant disorder was leukoplakia and tobacco related lesions was lichenoid reaction.

**Key words:** Leukoplakia, Smoking, Tobacco

### **Introduction**

The consumption of tobacco products is on rise. The main cause behind this is modernization, urbanization and status symbol [1]. Tobacco is consumed in various forms such as smokeless tobacco and smoking tobacco. Smokeless tobacco comprised of gutkha, pan masala, chaini khaini, betel quid, arecanut etc [2]. Smoking form of tobacco such as cigarette, bidi, hookah, hookli and cigar etc. are commonly used among all age groups. The consumption of cigarette

is higher among young adults nowadays compared to previous years. The effect of social media, lack of awareness about harmful effects and urbanization are leading cause [3]. Parental history of smoking also plays an effective role. High prevalence of tobacco associated lesions such as tobacco pouch keratosis, leukoplakia, oral submucous fibrosis (OSMF), smoker's palate, erythroplakia, lichenoid reaction etc. have been reported in literature. Thus, the chances of potentially malignant disorders as well as oral cancer increases significantly [4].

Appearance of red and white lesion should raise the suspicion of potentially malignant disorders or oral cancer in oral cavity. Oral cancer is 6<sup>th</sup> commonly occurring cancer of body and leading cause of mortality [5]. It is highly prevalent among men owing to their higher use in this gender. These lesions are more in Asian continent [6]. The chances of malignant conversion of non-homogenous leukoplakia and OSMF is quite high, hence early recognition of lesions may be helpful in development of oral cancer. Numerous studies have been conducted depicting occurrence of tobacco lined oral mucosal lesions in Indian subcontinental.<sup>7</sup> Considering this, the present study aimed at determining mucosal lesions among both genders resulted from use of tobacco products.

## **Methodology**

### **Study design**

This study was conducted over the period of 6 months from June 2019 to December 2019 in the department of Oral Medicine & Radiology after obtaining the ethical approval from institutional ethics committee. The study protocol was prepared and presented in front of ethical clearance committee which after scrutinizing accepted it. All enrolled subjects were agreed to participate which was recorded in written in form of their consent in vernacular language.

### **Sample size**

The sample size comprised of 2800 subjects in age range of 18- 60 years of either gender. Inclusion criteria used was subjects with at-least 1-year history of tobacco usage in any form (smoking/ smokeless) and those giving consent. Exclusion criteria was pregnant women and those not willing to participate. Sample size was finalized based on formula:  $N = \frac{z^2 p (1-p)}{d^2}$ , where P = prevalence of disease, z was to calculate, 95% confidence interval, and d = acceptable margin of error (0.05).

## **Method**

All enrolled subjects were made to sit on dental chair comfortably. A thorough oral examination was performed by two independent oral physicians under natural light. A questionnaire was prepared which comprised of information such as name, age, gender, education level, history of tobacco use (arecanut, fresh leaf, slaked lime, catechu, cardamon, cloves, sundried tobacco etc), frequency of usage, amount, intensity etc. Occurrence of tobacco associated mucosal lesions were carefully examined and recorded in terms of appearance, location, margins, color etc. On the basis of history, location and clinical

appearance, the lesions were labelled as potentially malignant disorders which were confirmed histopathologically. WHO criteria of clinical diagnosis were adopted.

### Statistical analysis

Data was clubbed together which was studied (BM SPSS Statistics for Windows, version 20.0) and entered in MS excel sheet. Results were expressed in number and percentages. Level of significance was determined using Mann Whitney U test where P value < 0.05 was regarded significant.

### Results

Table 1 shows that among 2800 subjects, male comprised of 1700 and female 1100. 476 (28%) males and 240 (21.8%) female had mucosal lesions. The overall prevalence found to be 25.5%.

Table 2 shows that 37.1% (266) were potentially malignant disorders and 62.9% (450) were other tobacco related lesions. The difference found to be significant ( $P < 0.05$ ).

Table 3, graph 1a shows that smoking resulted in 53 PMDs, and 136 other TRLs and chewing tobacco resulted in 157 PMDs and 237 TRLs and both forms resulted in 55 PMDs and 77 TRLs. The difference found to be significant ( $P < 0.05$ ). Graph 1b shows that under smoking, most common lesion was leukoplakia seen in 30, erythroplakia in 24 and palatal hyperkeratosis in 136. Chewing form had leukoplakia seen in 50, OSMF in 107, lichenoid reaction in 147 and tobacco pouch keratosis in 90. Both forms resulted in leukoplakia seen in 20, OSMF in 35, lichenoid reaction in 50 and tobacco pouch keratosis in 27. The difference found to be significant ( $P < 0.05$ ).

### Discussion

Tobacco is the leading cause of mucosal lesions. Leukoplakia is white patch which cannot be characterized clinically which is not associated with any lesion except the use of tobacco [8]. The most common site of occurrence is buccal mucosa, tongue and labial mucosa. OSMF is mostly associated with arecanut use and seen in buccal mucosa, lips, soft palate, uvula and tongue [9]. Tobacco contains arecoline and arecoline products, nicotine, aromatic hydrocarbons etc. These carcinogen products are harmful leading to cancer. The occurrence of these lesion among smokers in any form is indicative of the fact that they are potential candidate to have cancer [10]. The present study aimed at determining mucosal lesions among both genders resulted from use of tobacco products.

We observed that 37.1% (266) were potentially malignant disorders and 62.9% (450) were other tobacco related lesions. Vellappally Set al[12] observed that 22.7% tobacco chewers and 12.9% regular smokers had oral mucosal lesions. Mathew et al<sup>13</sup> in their study enrolled 1190 subjects of both genders. 41.2% exhibited presence of one or more mucosal lesions, 6.55% had Fordyce's condition, 5.79% had frictional keratosis, 5.71% had fissured tongue, 3.78% had leukoedema, 2.77% had smoker's palate, 2.01% had recurrent aphthae, oral submucous fibrosis, 1.76% had oral malignancies, 1.59% had leukoplakia, 1.5% had median rhomboid glossitis, 1.3% had candidiasis, 1.2% had lichen planus and 1.17% had

varices. Results showed that traumatic ulcer and oral hairy leukoplakia was seen in 1.008%, denture stomatitis, geographic tongue, betel chewer's mucosa and irritational fibroma in 0.84%, herpes labialis, angular cheilitis (0.58%), and mucocele (0.16%). Behura SS et al in their study observed that tobacco smokers had higher prevalence of oral lesions and men higher cases of smoker's melanosis [14].

Kamala et al out of 1730 patients 975 (56.3%) had a habit of tobacco consumption and 687 (70.4%) had OMLs. Males were 656 (67.28%) and females were 319 (32.71%). Smoking was seen in 305 (46.49%), chewing in 220 (33.53%) and mixed (both smoke and smokeless) tobacco consumption in 131 (19.96%). 49.2% (539) had habit of tobacco chewing. The most commonly affected age group was 36–45 years followed by 46–55, 26–35, and >55 years [15]. Saraswathi et al in their study found 4.1% oral soft tissue lesions and 1.1% had smoker's melanosis followed by stomatitis nicotina in 0.89% and leukoplakia in 0.59% [16].

## Conclusion

Authors found that most commonly occurring potentially malignant disorder was leukoplakia and tobacco related lesions was lichenoid reaction.

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### **Legends for illustrations**

### **Tables**

**Table 1: Presence of tobacco mucosal lesions among study population**

| Gender | Total | Mucosal lesions | Percentage |
|--------|-------|-----------------|------------|
| Male   | 1700  | 476             | 28%        |
| Female | 1100  | 240             | 21.8%      |
| Total  | 2800  | 716             | 25.5%      |

**Table 2: Type of lesions**

| Type                                | Male | Female | Total       | P value |
|-------------------------------------|------|--------|-------------|---------|
| Potentially malignant               | 190  | 76     | 266 (37.1%) | 0.02    |
| Other tobacco related lesions (TRL) | 286  | 164    | 450 (62.9%) | 0.05    |
| Total                               | 476  | 240    | 716         |         |

*P < 0.05, Significant, Mann Whitney U test*

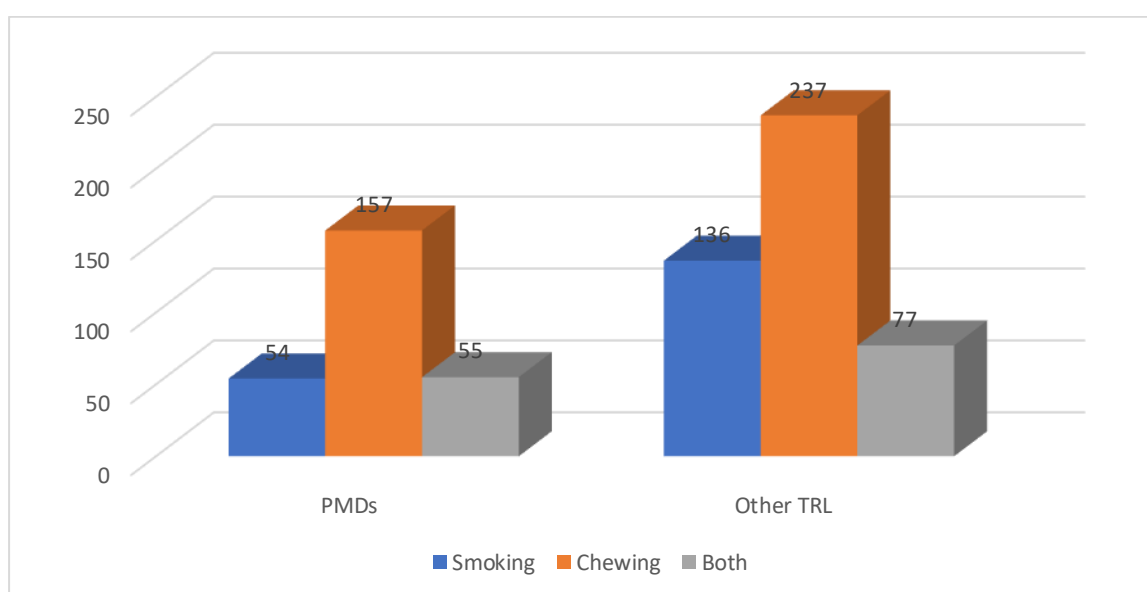
**Table 3: Form of tobacco and associated lesions**

| Lesions | Smoking | Chewing | Both | P value |
|---------|---------|---------|------|---------|
| PMDs    | 54      | 157     | 55   | 0.001   |

|                         |     |     |     |      |
|-------------------------|-----|-----|-----|------|
| Other TRL               | 136 | 237 | 77  |      |
| Total                   | 190 | 394 | 132 |      |
| Type of lesion          |     |     |     |      |
| Leukoplakia             | 30  | 50  | 20  | 0.01 |
| Erythroplakia           | 24  | 0   | 0   |      |
| OSMF                    | 0   | 107 | 35  |      |
| Lichenoid reaction      | 0   | 147 | 50  |      |
| Palatal hyperkeratosis  | 136 | 0   | 0   |      |
| Tobacco pouch keratosis | 0   | 90  | 27  |      |

$P < 0.05$ , Significant, Mann Whitney U test

**Graph 1a: Tobacco association**



**Graph 1b: Tobacco associated lesions**

