



## PREVALENCE OF ORAL PREMALIGNANT LESIONS AND CONDITIONS IN PATIENTS WITH TOBACCO AND TOBACCO-RELATED HABITS REPORTING TO A DENTAL INSTITUTION IN PATNA

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### ABSTRACT

**Aims:** The purpose of this study was to determine, through a questionnaire about the prevalence of oral premalignant lesions and conditions in the population of patna city, having adverse oral habits of using tobacco and tobacco-related products in various forms, to analyze the adverse health effects of these habits with respect to the duration and frequency of consumption, and to analyze the patient motivation toward the cessation of this habit.

**Materials and Methods:** The study was conducted in the form of a questionnaire, comprising 12 questions. The subjects who were diagnosed with premalignant lesions or other conditions, based on the clinical examination, underwent this questionnaire survey. 368 subjects were included in this study during a period of 12 months. The obtained data was subjected to statistical analysis using the Epi Info™. The mean percentage proportion was used for data analysis. **Results:** The results showed that areca nut was the most popular product among young adults. The survey data suggested that only few of the patients had tried to stop these adverse habits at some point in their lives. The most common reason for this was, advice given by the dentist after the patients were made aware of these lesions. **Conclusion:** Although the number of cases due to adverse oral habits is rising, if awareness is created by a dentist among such patients, it can bring a ray of hope in changing these malevolent trends.

**KEYWORDS:** Oral premalignant lesion, tobacco, Areca-nut, tobacco cessation.

### INTRODUCTION

Chewing is one of the oldest ways of consuming tobacco leaves. Native Americans in both North and South America chewed the leaves of the plant, frequently mixed with lime and betel. The tradition of chewing betel leaf or pan is age old and deeply rooted in India and has developed into a major cultural and social norm. Predominantly in the Asian-Pacific region, smokeless tobacco and areca nut were used, either singly or in various combinations of 'betel quid' or 'pan'.<sup>[1]</sup>

Tobacco was introduced in India by Portuguese traders about 400 years ago. Although tobacco was initially smoked, it later became popular in a smokeless form. Of the 400 million individuals aged 15 years and above in India, 47% use tobacco in smoke form, while 16% use it in a smokeless form. About 250 million kilograms of tobacco is consumed each year.<sup>[2]</sup> Smokeless tobacco is used in diverse forms in different regions of India for chewing, holding in the mouth, or applying over teeth and gums. Smokeless tobacco is chewed, more often as betel quid (*paan*), consisting of betel leaves (*Piper betel*), areca nut (*Areca catechu*), slaked lime and catechu. A mixture of tobacco and slaked lime (*khaini*) is

kept in the mouth and sucked, or tobacco paste with molasses (*gudhaku*) are applied over the teeth and gums.<sup>[3]</sup> Betel quid chewing is widespread all over India, whereas, most other uses are popular in specific geographic regions. A link between betel quid chewing and oral cancer was suspected as early as 1908, and by late 1960s,<sup>[4]</sup> several studies had demonstrated the association between betel quid chewing and other forms of tobacco use and oral cancer in India.<sup>[5-7]</sup> Several oral lesions are associated with smokeless tobacco use, of which oral cancer and precancer are most serious. Since 1966, several cross-sectional epidemiological studies have been conducted on oral cancer and precancer, in different geographic areas chosen for specific tobacco habits.<sup>[8-11]</sup> Some oral mucosal lesions and conditions are specifically associated with quid-chewing habits such as-

- Lesions or conditions that are diffusely outlined, and involve more than one site or represent a widespread alteration, such as those due to mechanical or chemical trauma, and clinical lesions or conditions such as a chewer's mucosa, fall into this category; however, transient states of mucosa, such as quid stains, are excluded.<sup>[12]</sup>

- Lesions that are localized to the site where quid is regularly placed. These lesions are equivalent to snuff-induced lesions or tobacco-lime user's lesions, which arise only on the mucosa in contact with the quid.<sup>[8]</sup> Another important consideration is the relation between areca nut use and the development of oral cancer and its precursors, such as, leukoplakia and oral submucous fibrosis. The prevalence of oral leukoplakia in India varies from 0.2 to 5.2%.<sup>[12,13]</sup> In this study, we surveyed the answers to a set of questions answered by the patients reporting to the daily Outpatient Department. The patients who were diagnosed with oral precancerous lesions and conditions on clinical examination underwent this questionnaire, and the data obtained from it was used to determine the prevalence of oral premalignant lesions and conditions in the population of Patna city, who had

adverse oral habits of using tobacco and tobacco-related products in various forms. It was also used to analyze the adverse health effects of these habits with respect to the duration and frequency of consumption, as also the patient motivation toward cessation of the habit.

## MATERIALS AND METHODS

The present study was conducted in the Department of Oral Medicine and Radiology. A set of 12 questions were used as the means for data collection [Table 1]. Patients who were clinically diagnosed with an oral premalignant lesion or condition were included in this survey. The following were the clinical presentations of the lesions or conditions seen in patients selected for the questionnaire format:-

**Table 1: Questionnaire.**

1	Do you currently smoke tobacco or do you have any other habits on a daily basis or less than a daily basis?
2	On an average how many of the following products do you currently consume each day/week (cigarettes, <i>bidi</i> , <i>mawa</i> , tobacco)?
3	Since how many years have you had the habit(s), and what was the frequency of it, in a day?
4	Have you smoked daily in the past or had a habit of eating tobacco or betel-nut-related stuff?
5	Have you ever noticed any symptoms of burning sensation or reduced mouth opening?
6	Have you ever noticed any kind of discoloration associated with your buccal mucosa?
7	Have you ever visited a healthcare facility for any complaint regarding your habit?
8	Do you currently use smokeless tobacco instead of tobacco (smoke)?
9	Have you ever undergone any kind of treatment in the past for any kind of lesions?
10	Have you ever tried to stop smoking after you got notified about the presence of any lesions?
11	Have you ever read warnings on the dangers of smoking cigarettes on packets or TV?
12	Will you be quitting tobacco after this questionnaire session?

### Oral submucous fibrosis

Oral submucous fibrosis (OSMF) was diagnosed on the basis of clinical criteria, including oral ulceration, paleness of the oral mucosa, a burning sensation (particularly in the presence of spicy foods), hardening of the tissue, and presence of characteristic fibrous bands. The condition was associated with restricted mouth opening and protrusion of the tongue, causing difficulty in eating, swallowing, and phonation.

### Quid-induced keratosis

The buccal mucosa characteristically showed either bilaterally or unilaterally, ill-defined, whitish-gray discoloration that could be rubbed off.

### Tobacco pouch keratosis

It was characterized by one or more of the following characteristics: Change in color, wrinkled appearance, thickening of the mucosa, scrapable or non-scrapable epithelial surface, and a presence of ulceration.

### Habit-induced oral lichen planus

The lesion was characteristically noticed in the region associated with the placement of the quid. It was visible as fine, white, wavy, parallel lines that did not overlap or

criss-cross, radiating from a central erythematous area; which was originally described as a lichen-planus like lesion.

### Commissural leukoplakia associated with tobacco used in smoke form

The lesions have been characteristically noticed in the commissural area and extended posteriorly to involve the buccal mucosa along the occlusal plane. These lesions presented as a white, non-scrapable patch, with a characteristic 'cracked-mud' appearance.

### Statistical analysis

Statistical analysis was performed with the help of Epi Info™. Descriptive statistical analysis was performed to calculate the means, with the corresponding standard deviations (SD). The test of proportion was used to find the standard normal deviate (Z), to compare the difference in proportions, and the chi-square ( $\chi^2$ ) test was performed to find the associations. The odds ratio (OR) with 95% confidence interval (CI) had been calculated to find the risk factors. Multiple logistic regression analysis was performed to estimate the risk factors along with the confounding variables.  $P \leq 0.05$  was taken to be statistically significant.

## RESULTS

The mean age (mean  $\pm$  S.D.) of the patients was 40.12  $\pm$  14.88 years, with a range of 18-76 years, and the median age was 38.0 years. The test of proportion showed that the proportion of the patients with age <46 years (72.2%) was significantly higher ( $Z = 6.51$ ;  $P < 0.01$ ). The test of proportion showed that the proportion of males (72.2%) was significantly higher than that of females (27.8%) ( $Z = 6.33$ ;  $P < 0.01$ ) [Table 2]. The mean age (mean  $\pm$  S.D.) of males was 40.71  $\pm$  14.76 years, with a range of 18-76 years, and the median age was 39.0 years. The mean age (mean  $\pm$  S.D.) of females was 35.95  $\pm$  14.42 years, with a range of 17-68 years, and the median age was 27.0 years. The chi-square ( $\chi^2$ ) test showed that there was significant association between the age groups and gender of the patients ( $P < 0.01$ ). On evaluating the addiction habits, the proportion of patients with the habit of smoking (34.8%) was significantly higher, followed by chewing areca nut (28.1%) and chewing tobacco (18.1%) ( $P < 0.05$ ) [Table 3]. On comparison of the different lesions, the proportion of patients with

leukoplakia (41.6%) was significantly higher followed by keratosis (24.8%) and OSMF (24.4%) ( $P < 0.05$ ). Only 9.2% had lichen planus [Table 4]. A significant association was found between the age and personal addiction of the patients ( $P < 0.01$ ). All types of personal addictions were found, more prevalent among patients with age < 45 years ( $P < 0.05$ ). The chi-square ( $\chi^2$ ) test showed that there was a significant association between the age groups and oral lesions of patients ( $P < 0.01$ ). The highest prevalence of keratosis (30.2%), followed by leukoplakia (42.5%) and lichen planus (33.8%) were found in the 35-44-year age group and that of OSMF was found in the 25-34-year age group ( $P < 0.01$ ).

**Table 2: Gender of the patients.**

Gender	Number	Percentage (%)
Male	266	72.2
Female	102	27.8
Total	368	100

**Table 3: Addiction of the patients.**

Addiction	Number	Percentage (%)
Smoking	128	34.8
Smoking and chewing tobacco	49	13.3
Chewing tobacco	67	18.1
Chewing areca nut	103	28.1
Chewing tobacco and areca nut	21	5.7
Total	368	100.0

**Table 4: Oral lesions of the patients.**

Oral lesion	Number	Percentage (%)
Leukoplakia	153	41.6
OSMF	90	24.4
Keratosis	91	24.8
Lichen planus	34	9.2
Total	368	100.0

The chi-square ( $\chi^2$ ) test showed that there was a significant association between personal addiction and the oral lesions of patients ( $P < 0.01$ ). The highest prevalence of keratosis was found among tobacco chewers (44.5%), leukoplakia among smokers (75.8%), and OSMF among areca nut chewers (79.3%) ( $P < 0.01$ ). However, the prevalence of lichen planus was found to be equally distributed among all types of personal addictions ( $P > 0.05$ ). On risk analysis, multiple logistic regressions, after adjusting the confounding factors, showed that the risk of keratosis was 2.89 times for chewing tobacco, the risk of leukoplakia was 29.14 times for smoking, and the risk of OSMF was found to be 13.93 times for chewing areca nut. Also, it was noticed that males in the younger age group were more addicted toward smokeless tobacco, while males in the older age group were more commonly seen to have a *bidi* smoking habit. On the other side, in females, especially in the older age group, application of *mishri* was most

commonly seen. The most common form of smokeless tobacco form was *mawa* chewing. Cigarette smoking was almost uncommon, and was very rarely noticed in the middle-aged group, in a very small ratio (0.2).

The final part of the questionnaire showed that a number of patients who were diagnosed with a lesion, underwent cessation of habit after eventually getting notified about the lesions. It was observed that almost every patient who had a premalignant mucosal change, had visited a healthcare facility in the past and was advised to undergo cessation of the habit; but the population who actually underwent cessation were less than 20% (17% males and 15% females).

## DISCUSSION

From the above results, it has been noticed that a slight male predominance is seen among the total study participants, especially in the age group of 24-44 years (2.62:1). Vellappaly *et al.* in a cross-sectional study observed a ratio of 2.58:1 and Kawatra *et al.* noticed a ratio of 3.6:1.<sup>[14,15]</sup> The total prevalence of smokeless tobacco was the highest among females, that is, 67.98%, and the habit of smoking was highest in males, that is, 26.56%, whereas, a high prevalence among men (53%) and women (49%) of Pune (Maharashtra) was reported by Mehta *et al.*<sup>[11]</sup> The addiction for areca nut

chewing was more (50.5%) than for tobacco in the age group of 25-34 years. Keratosis was noticed in about 60.9% and 22.7% among tobacco- and areca nut-related compound chewers, respectively. The prevalence of OSMF among the study patients with a history of addiction for both mixed chewing habits (quid) was 14.3%. Similarly, a high percentage of individuals (66.5%) consuming these compounds was reported by Pandya *et al.*<sup>[16]</sup> Consistent with the present study, Shah *et al.* reported that *paan masala* (without tobacco) chewers developed the condition in about half the time compared to quid users (with 75% of paan masala chewers developing the disease within 4.5 years).<sup>[17]</sup> The prevalence of leukoplakia in the present study was estimated at 28.6% in tobacco chewers and 57.1% in patients having mixed chewing habits. Mehta *et al.* observed 3.48% of these lesions among Mumbai police, but they had not segregated the group of smokeless tobacco.<sup>[18]</sup> It was stated that the elimination of betel nut influence may prevent leukoplakia and 26% of the cases of malignant transformation to oral carcinoma. There seems to be an association between the use of quid that incorporates tobacco and the occurrence of white lesions.<sup>[10,19]</sup>

The management of these oral lesions depends on the type of quid-related lesions. The first option is no treatment, accompanied by discontinuation of the betel quid habit, and an appropriate follow-up.<sup>[20]</sup>

## CONCLUSION

Successful prevention in the early stages of these conditions may lead to improvement in symptoms. The quid habit has a major social and cultural role in communities throughout the Indian subcontinent, Southeast Asia, and locations in the Western Pacific. An active preventive approach is required to limit the potential for development of oral cancer.

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