

Development of Oral Potentially Malignant Disorders in Tobacco Using Population in Union Territory, Chandigarh – An Observational Study

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Abstract

Introduction: Oral potentially malignant disorders (OPMDs) are characterized by suspicious mucosal changes in oral mucosa that predispose it to malignancy. It is a general consensus that OPMDs show higher risk of malignant changes within the first 5 years of diagnosis, if not promptly treated. Agreeably, tobacco is the most important etiological factor in this scenario. In our pilot study, we attempted to observe the frequency of OPMD in a cohort of tobacco users in Union Territory, Chandigarh. **Materials and Methods:** The study was undertaken in rehabilitation colonies under the Municipal Corporation Chandigarh using a household survey approach. The sociodemographic forms were filled out for the participants. Risk assessment was done on: Using tobacco in any form. Presence of any chronic nonhealing ulcer. After obtaining the written informed consent, the oral pathologist conducted the visual inspection of oral cavity. The subjects with clinical lesions underwent vital staining using 1% toluidine blue. The results of the test were categorized as positive and negative staining. Demonstration of self-examination of the mouth was given to all the participants. **Results:** The results are mentioned in tables provided. **Discussion:** High prevalence of oral and oropharyngeal cancers in India is due to tobacco usage. Changes in oral tissues developing in tobacco consumers have greater potential for malignant transformation as those developing in nonconsumers. **Conclusion:** In conclusion, we attempted to put forth 3 A's i.e., Awareness, Action and Agreement.

Keywords: Community, potentially malignant, self-examination, tobacco, toluidine blue stain, white/red patch

INTRODUCTION

The two terms a clinician should be aware of while examining oral cavity are oral squamous cell carcinoma (OSCC) and oral potentially malignant disorders (OPMDs). While OSCC presents as a distinctive disease entity with characteristic morphological and clinical features, OPMDs, on the other hand, are usually innocuous red/white patches and deceptive in appearance and can easily go undiagnosed. As far as signs and symptoms are concerned, OPMDs can be largely asymptomatic as against typical signs and symptoms of OSCC.

The term OPMD,^[1,2] accepted by the WHO,^[3] recognizes the fact that any suspicious white/red lesion or condition in the oral mucosa, predisposes it to field effect of malignancy.^[4,5]

Numerous disorders have been associated with an increased risk of OSCC, including leukoplakia, erythroplakia, oral lichen planus, oral submucous fibrosis, palatal lesions of reverse cigarette smoking, discoid lupus erythematosus, and some inherited disorders, such as dyskeratosis congenita and Fanconi anemia. It is a general consensus that OPMDs show higher risk of malignant changes within the first 5 years after diagnosis.^[6]

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This data should make us address the fact that all white/red lesions might not progress to OSCC, but all OSCCs start from an innocuous red/white mucosal change. Epidemiological data on the prevalence of oral leukoplakia have shown ranges from 0.7% to 24.8%. Furthermore, malignant transformation rate of leukoplakia is 3%–6%.^[7,8]

Among the various etiological factors, the usage of tobacco in any form such as cigarettes, gutkha, beedi, etc., remains the single most major etiology in the development of OPMD. *Arvind Muthukrishnan and Saman Warnakulasuriya* claim that smokeless tobacco predisposes to increased risk of oral cancer and OPMD development in an individual.^[9] The Indian data suggest that the relative risk of developing oral cancer is 2.82 for smokers and 5.98 for chewers.^[10]

As OPMDs are usually asymptomatic or mildly symptomatic, community screening and careful oral examination of population at risk presents a viable method of early diagnosis and nipping the cancer in the bud. It goes a long way to reduce the burden of oral cancer as oral cancer accounts for over 140,000 deaths annually across the world. Over 300,000 people are diagnosed with oral cancer each year.^[11]

In this study, we undertook a screening program in a rehabilitation colony of Union Territory, Chandigarh to screen the OPMDs and study their association with tobacco use.

MATERIALS AND METHODS

Inclusion criteria

Current tobacco users

- Subjects who have quit tobacco for 6 months
- New tobacco users for 6 months
- Any nonhealing ulcer for more than 1 month
- White or red painless patch.

Exclusion criteria

- No apparent mucosal changes
- Oral lesion clinically diagnosed as any other disease.

It was a prospective, observational study. The study was undertaken in rehabilitation colonies under the Municipal Corporation Chandigarh using a household survey approach. Each colony was labeled as a cluster. All the study clusters were listed and the basic demographic information including the number of houses and residing population in each cluster were obtained from available records and the auxiliary nurse midwife (ANM) and multipurpose workers of respective areas were involved in this data retraction process. The present pilot work comprised household survey of 500 houses in one cluster. The household survey was undertaken by the Nation Service Scheme (NSS) volunteers for each cluster who were supervised by respective ANM/multipurpose workers of concerned cluster. The primary purpose of house-to-house survey was to get the detailed sociodemographic profile of each household visited and to identify the individuals at risk for developing OPMD using a structured interview schedule. The structured

interview schedule had been developed by experts in the field concerned. The items on risk assessed the following risk factors in dichotomous responses:

- Using tobacco in any form
- Presence of any chronic nonhealing ulcer due to reasons like sharp tooth or ill-fitting dentures.

The NSS volunteers were given training to conduct the survey based on the inclusion and exclusion criteria mentioned above and fill out the sociodemographic form [Image 1]. If anyone or more risk factors were found present, the individuals concerned were referred for clinical examination by an oral pathologist. The NSS volunteer gave a referral card to family member concerned. The clinical examination was conducted by our team at a predesignated time and place in the near vicinity of subject's residence as mentioned on referral card. After obtaining the written informed consent, the oral pathologist conducted the visual inspection of oral cavity. If there is no frank oral lesion, the subject was offered health education on tobacco cessation and this would be the endpoint for this group. The subjects who have presence of either of the following indications will undergo vital staining using 1% toluidine blue.

- White/red nonscrappable patches
- Nonhealing painless ulcer.

The results of the test were categorized as positive and negative staining. The test was considered positive if the oral lesion retained the stain postcounterstaining, irrespective of the degree of blueness. The negative subjects were given health education on tobacco cessation and this was the endpoint for this group. The positive stained ones were given health education through pictorial medium and counseled for tobacco cessation. They would be further followed up in 3 months. The present study is a joint venture of "Parivartan" and a private organization (corporate social responsibility funding).

RESULTS

- Total houses screened by the NSS workers in the cluster – 500

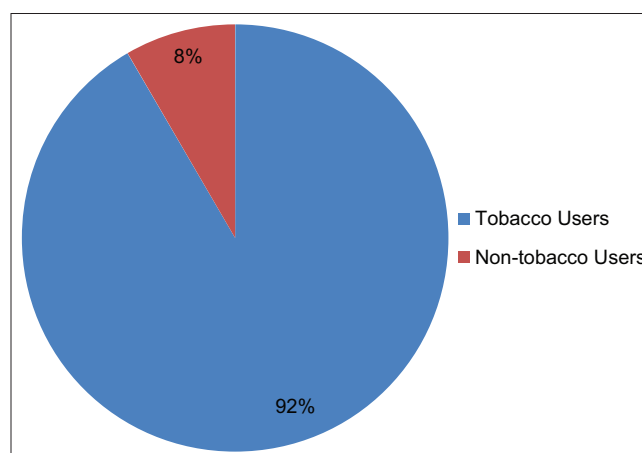


Figure 1: Subjects who visited the camp

- Total individuals screened-520
- Individuals who visited the camp – 119 (tobacco user – 109, i.e., 92%, nontobacco users with risk factors – 10, i.e., 8%) as shown in Figure 1.

The segregation of tobacco users is shown in Figure 2.

Out of total tobacco users, clinical lesion (white/red patch) was seen in 56% of individuals as shown in Figure 3.

On analysis of the occurrence of clinical lesions in individuals using different forms of tobacco, it was observed that 86% of individuals using both smoked and smokeless forms showed presence of lesions, as shown in Figure 4.

Figure 5 shows the inference of toluidine blue test (TBT) on the clinical lesions in individuals using different forms of tobacco.

DISCUSSION

All red and white patches or ulcers do not turn into oral cancer, but every oral cancer starts from a red and white patch or an ulcer. This is a singular enough reason to emphasize the importance of early diagnosis of oral mucosa for any dysplastic changes.

High prevalence of oral and oropharyngeal cancers in India is due to tobacco chewing, beedi smoking, and drinking.^[12]

The term, OPMD, as accepted by the WHO, recognizes the fact that any suspicious white/red lesion or condition in the oral mucosa, predisposes it to field effect of malignancy.^[4,5]

In her large Hungarian studies, Bánóczy concluded that there was a greater tendency for malignant transformation in leukoplakias not associated with tobacco.^[13]

In a study conducted in 2001, Banoczy *et al.* reported higher prevalence rate of leukoplakia in smokers, and intervention studies show regression of the lesion after stopping the habit.^[14]

Out of the 119 subjects who visited our camp, 8 % of them had clinically detectable mucosal change in the absence of any tobacco habit [Figure 1]. The reasons for the same were found to be an offending sharp edge of the decayed tooth causing chronic injury. This is in comparison with 13.5% of the individuals in a study by Garg *et al.*^[15]

Our observation revealed that 56% of the tobacco users developed clinically detectable red or white mucosal changes, whereas it was 86.5% in the case of the study by Garg *et al.*^[15]

Garg *et al.* in their findings commented that changes in oral tissues developing in tobacco consumers have greater potential for malignant transformation as those developing in nonconsumers.^[15] This finding, along with the findings of

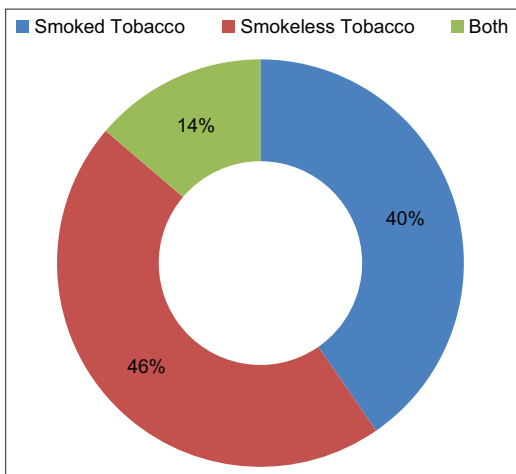


Figure 2: Types of tobacco users

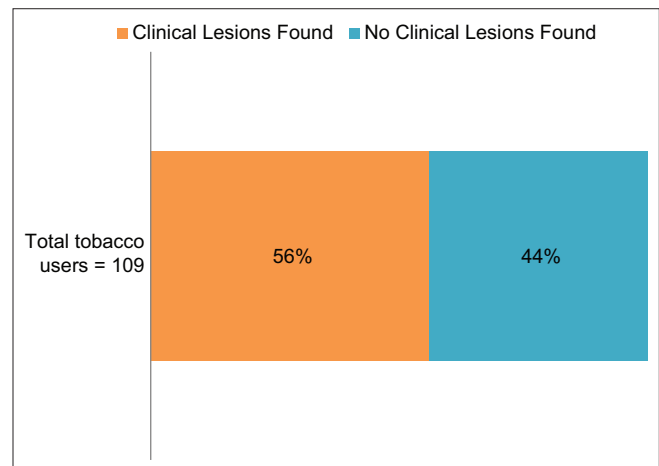


Figure 3: Frequency of clinical lesions found

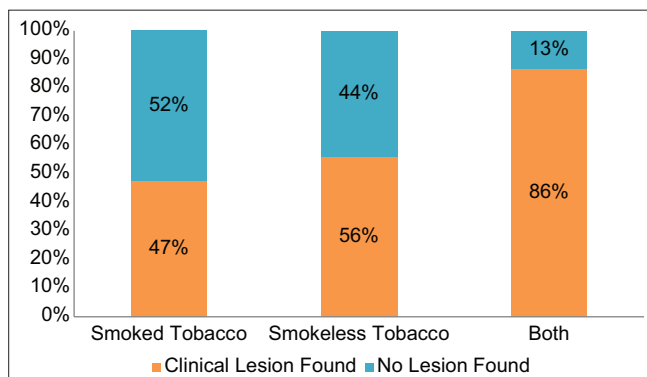


Figure 4: Occurrence of clinical lesions in individuals using different forms of tobacco

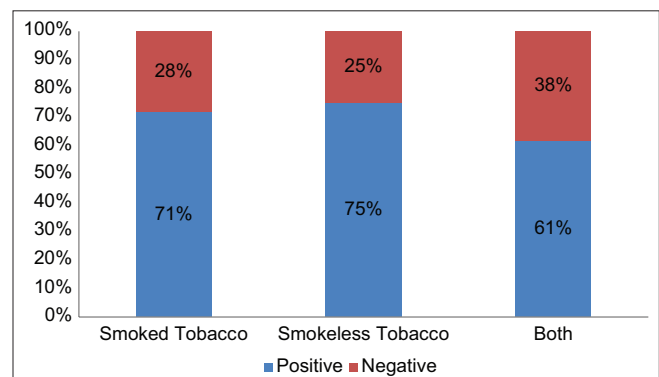


Figure 5: 1% toluidine blue test inference

Image 1: Sociodemographic form filled by the NSS workers

Banoczy *et al.*^[14] vehemently underlines the need for prompt management of oral mucosal changes in tobacco users.

Among the tobacco users, 40% of them used smoked forms of tobacco (primarily beedi), 45% used smokeless forms of tobacco, whereas 13% of them used both forms [Figure 2].

It is a general consensus that OPMDs show higher risk of malignant changes within the first 5 years after diagnosis.^[6] In our observation, 56% of the total tobacco users had clinically detectable lesions as painless white or red oral mucosal changes [Figure 3]. This was less in comparison with around 94.3% of the patients with high-risk lesions in the study by Garg *et al.*^[15]

In their study, Garg *et al.*^[15] found that in the short duration, group lesions seen in purely chewers and those having mixed habits had a greater proportion of High risk lesion (HRL) (35% and 23%, respectively) as compared with those seen in purely smokers (12%).^[15] Our observation revealed that as high as 86% of the individuals detected with clinical lesions used both forms of tobacco as compared to 56% and 47% using exclusively smokeless and smoked forms, respectively [Figure 4]. The increased percentage of individuals with clinical lesions was more in mixed users probably because of the cumulative effect of smoke as well as local contact of tobacco to the oral mucosa exposing it to onslaught of potential carcinogens. This observation found resonance with 61% of these lesions showing retention of the stain (TBT + ve) when subjected to vital staining.

TBT + vity was found in 71% of the total tobacco users with clinically detectable lesions, thus indicating possible dysplastic changes in them [Figure 4]. Definitely, further confirmation would be done by taking biopsy samples from these lesions further on in the study.

CONCLUSION

We would like to put forth 3 A's, i.e., awareness, action, and agreement.

Awareness

1. Tobacco is the primary cause of development of OPMD in susceptible population
2. Community should be made aware of the early signs of OPMD through pictorial methods, group talks, etc
3. Advertisements of telltale signs of OPMD, underlining the importance of self-examination of mouth on oral care products might play an important role in creating awareness in the society at large.

Action

1. Not all red and white patches turn into oral cancer, but every oral cancer starts from a red and white patch. This is a singular enough reason to emphasize the importance of early diagnosis of oral mucosa for any dysplastic changes
2. Implementation of community program for screening of OPMD is the need of the hour
3. Training of personnel to undertake oral visual examination, vital staining, and performing tissue biopsies at community levels should be done.

Agreement

1. Orientation of the individuals toward the mucosal changes in their mouth are of utmost importance to encourage tobacco cessation
2. Self-examination of mouth as an objective, tangible, and reproducible tool cannot be overemphasized in early diagnosis of OPMD.

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Conflicts of interest

There are no conflicts of interest.

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