Smokeless tobacco use and related oral mucosal changes in Bengali Women

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Abstract

Background: Tobacco use is called the single most cause of preventable cause of death all over the world. The various study confirmed that smokeless tobacco use is directly related to oral cancer and pre-cancer. The prevalence of smokeless tobacco use varies widely in different countries and states based on age group, gender, with varied socioeconomic, cultural and educational backgrounds. Context: Bengali female population. Aim: Explore the pattern of smokeless tobacco use and oral mucosal changes caused by it. Methods: 155 women aged 15 years and above were selected. Face-to-face interview was conducted using a structured questionnaire. Data were summarized and statistically, analysis was done. Statistical Analysis Used: Chi-square test and univariate logistic regression done. Results: The prevalence of current smokeless tobacco use was found to be 18.7%. On univariate logistic regression, it was found that there was a significant association between smokeless tobacco use and less educated females, odds ratio 0.4209 (0.1855–0.9550) family income less than 10,000, odds ratio 3.9773 (1.3047–12.1242), and oral changes odds ratio 0.2693 (0.1027–0.7061). Conclusions: Health care providers, as well as social workers, should give all efforts to bring the women from behind the curtain and educate them about the hazards of smokeless tobacco use.

Keywords: Females, oral changes, smokeless tobacco, West Bengal

Introduction

Oral Cancer is an important public health problem globally, especially in South East Asia. In India, at least 90% of cases of Oral and Oropharyngeal cancers are caused by tobacco and more than half among them are by smokeless tobacco.[1]

Smokeless tobacco can be described as tobacco products that produce nicotine without smoke and they are commonly used by chewing or snuffing.[2]

In smokeless tobacco products, there are around 36 known carcinogens; among which tobacco-specific nitrosamines are the most abundant carcinogens in Indian products. These arise from nitrosation during the process of drying tobacco leaves.[1] Chewing tobacco-related oral lesions are mainly due to carcinogen itself or as a protective mechanism by oral mucosa.[3]

The risk of females using smokeless tobacco for oral cancer is 8 times higher than male smokeless tobacco users. There is also a high chance of adverse reproductive outcomes and cardiac problems in female smokeless tobacco users.[1]

Apart from carcinoma it also causes gingival inflammation, attachment loss, tooth wear as well as various potentially malignant disorders such as leukoplakia and oral submucous fibrosis in the oral cavity.[1,3]

Though traditional values and social norms do not favor smoking tobacco products by women, yet smokeless tobacco use in females...
is culturally acceptable in India. At present, more than 70 million women age 15 and older use smokeless tobacco in India. Low cost and easy availability can be easily blamed for this. While performing laborious and difficult tasks females of low socioeconomic category use smokeless tobacco to suppress their hunger. Parental use, peer pressure, as well as promotional advertisement, also play an important role in the habit of smokeless tobacco.\[3\]

As per GATS-2; 14.2% of women use tobacco in India. Among them, 12.8% are current smokeless tobacco user and 11.1% are daily smokeless tobacco users.\[4\]

For thousands of years, betel quid chewing was a socially accepted practice and part of the culture and religious customs in India. As soon as tobacco came from America by Portuguese traders in early 1600, it was added as an ingredient in betel quid. This combination is still widely used. In early 1970, areca nut containing new smokeless tobacco products was marketed.\[5\]\[6\]

At present in India, a smokeless form of tobacco practice is more than smoking tobacco. Especially among teenagers, the use of commercially available sachet is more popular.\[5\]

These product preferences varied by gender as well as geographical location. These preferences are very complicated for females. Betel quid is mostly preferred by females of northeast and south India. Women of eastern, western, and central parts of India prefer smokeless tobacco products mainly for dental applications. Khaini is preferred by females of eastern, northeastern, and central region; whereas Gutka is mainly used by women of the central and northeastern regions. As per data, very few north Indian females use smokeless tobacco.\[1\]

Many deeply rooted misconceptions are associated with the use of smokeless tobacco among females. Such as it is believed that some form of smokeless tobacco makes a woman feel better from morning sickness during pregnancy and it can reduce bad breath as well as causes mental relaxation.\[8\]

Misconception, incomplete knowledge, as well as lack of awareness about its ill effect, can be blamed for the widespread use of smokeless tobacco products. They are also the major obstacles formulating effective tobacco control policies.

In India, tobacco consumption varies from state to state, even two geographically different locations in the same state. Therefore, to make proper policy, it is very important to gather information regarding the pattern of tobacco habits among the local population.\[3\]

Hence, our study was aimed to explore the pattern of smokeless tobacco use among females of West Bengal, the predictors associated with it as well as mucosal changes due to smokeless tobacco use among females.

Materials and Methods

This is a cross-sectional study of tobacco usage among women, which was conducted in different private clinics and oral health screening camps around different districts of West Bengal. Institutional Ethical Committee, Department of Physiology, University of Calcutta, Kolkata. Ethical Approval Date-7.4.17.

Patients above 15 years who had no systemic disease and willing to participate in this study were included.

Staff for the study chiefly consisted of medical social workers and oral pathologists.

Study Procedure

Medical social workers were trained for the duration of 3 months to take data from the study sample.

First, the purpose of the study was explained to the study participants and informed consent was obtained from them. A face-to-face interview was conducted and their oral cavity was clinically examined using mouth mirror and explorer under daylight to rule out if any tobacco-related oral lesion was present. All the oral lesions were clinically diagnosed as per the WHO criteria and color atlas of oral pathology.

Information regarding demographic characteristics was collected using a questionnaire formatted both in English and local language Bengali. Along with these, information regarding their tobacco habits was assessed using the WHO steps questionnaire.

The questionnaire and the study procedures were approved by the institutional human ethical committee, Department of physiology of the University of Calcutta. The validity and reliability of the questionnaire were pretested.

Statistical analysis

For statistical analysis, data were entered into a Microsoft Excel spreadsheet and then analyzed by SPSS 24.0. and Graph Pad Prism version 5. Unpaired proportions were compared by Chi-square test or Fischer’s exact test, as appropriate. P value ≤0.05 was considered statistically significant.

Results

Out of all females approached for the study, total of 155 women agreed to be a participant for the study. The prevalence of deleterious chewing habits in our study is 18.7% (29 chewers out of 155 participants).

The age range of study participants was 16 to 81. Majority of the participants was a housewife (68.4%) and below the level of
Bhattacharjee, et al.: Smokeless tobacco related oral mucosal changes in Bengali women

The distribution of age, educational qualification, place of residence, monthly income, and occupation of participants has been shown in Table 1.

In our study, no female participants had a habit of smoking. No tobacco consumption was reported among minor age groups (<18 years). The lowest age for oral habit is 25 in our study.

The different forms of tobacco used by the women of West Bengal are shown in Figure 1.

Distribution of different oral changes due to deleterious oral habits among female patients is described in Figure 2.

The association between the habit of smokeless tobacco and areca nut chewing and several factors has been shown in Table 2.

In our study; association of tobacco chewing habit with less educational qualification (P = 0.0353), ≤10,000 family income (P = 0.0102), and oral changes (P = 0.0052) were statistically significant.

Though more number of housewives took part in this study yet the association between tobacco chewing habits and occupational groups were not statistically significant (P = 0.9407)

Under univariate analysis significant risk of chewing tobacco was found 0.4209 (OR‑0.4209 [0.1855, 0.9550]; P = 0.0353) times more for less‑educated women, 3.9773 (OR‑3.9773 [1.3047, 12.1242]; P = 0.0102) times more women with family income Rs ≤ 10,000 per month and 0.2693 (OR‑0.2693 [0.1027, 0.7061]; P = 0.0052) times more risk for women who had oral lesions.

**Discussion**

As per district level household and facility survey-4; 2012–13, the prevalence of women who use any kind of smokeless tobacco was 22.9%. In an urban area, it was 18.5% and in a rural area, it was 24.8%. In our study, it was found that the prevalence of female smokeless tobacco chewers was a little low (18.7%).

The prevalence of female smokeless tobacco users found in the northeastern states of India is very high (51%) compared to our study.

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**Table 1: Distribution of Study population based on socio demographic variables**

| Variables                  | Frequency | Percentage |
|----------------------------|-----------|------------|
| Age                        |           |            |
| 15-20                      | 14        | 9.0%       |
| 21-30                      | 35        | 22.6%      |
| 31-40                      | 44        | 28.4%      |
| 41-50                      | 39        | 25.2%      |
| 51-60                      | 12        | 7.7%       |
| 61-70                      | 8         | 5.2%       |
| 71-80                      | 2         | 1.3%       |
| 81-90                      | 1         | 0.6%       |
| Total                      | 155       | 100.0%     |
| Occupation                 |           |            |
| Cook                       | 2         | 1.3%       |
| Doctor                     | 1         | 0.6%       |
| Farmer                     | 1         | 0.6%       |
| House wife                 | 106       | 68.4%      |
| Service                    | 9         | 5.8%       |
| Labor                      | 7         | 4.5%       |
| Nurse                      | 2         | 1.3%       |
| Pharmacist                 | 1         | 0.6%       |
| Student                    | 20        | 12.9%      |
| Tailor                     | 2         | 1.3%       |
| Teacher                    | 4         | 2.6%       |
| Total                      | 155       | 100.0%     |
| Place of residence         |           |            |
| Rural                      | 123       | 79.4%      |
| Urban                      | 32        | 20.6%      |
| Total                      | 155       | 100.0%     |
| Educational qualification  |           |            |
| Uneducated                 | 26        | 16.8%      |
| Primary                    | 33        | 21.3%      |
| Secondary                  | 45        | 29.0%      |
| H.S.                       | 31        | 20.0%      |
| Graduate                   | 13        | 8.4%       |
| Post-graduate              | 7         | 4.5%       |
| Total                      | 155       | 100.0%     |
| Monthly income             |           |            |
| <2000                      | 5         | 3.2%       |
| 2000 to <5000              | 22        | 14.2%      |
| 5000 to <10000             | 26        | 16.8%      |
| 10000 to 15000             | 20        | 12.9%      |
| >15000                     | 82        | 52.9%      |
| Total                      | 155       | 100.0%     |

*Distribution of various sociodemographic and socioeconomic variables with smokeless tobacco consumption habits

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Bhattacharjee, et al.: Smokeless tobacco related oral mucosal changes in Bengali women

Mishra et al. in 2015 studied smokeless tobacco use in urban women in Mumbai and found 13.44% to 25.19% prevalence of smokeless tobacco use among them in the seven clusters. They also found that 0.50% of women only use tobacco in smoked form. The data of our study matches with the study, GATS India survey 2009–2010, conducted by the International Institute of Population Sciences, Mumbai on behalf of MOHFW, Government of India. They found a prevalence of 18.4% among

Table 2: Factors associated with Chewing habit

|                       | Nil | Yes | Total | Odds ratio | Chi-square value | P    |
|-----------------------|-----|-----|-------|------------|------------------|------|
| Age in years          |     |     |       |            |                  |      |
| <35                   | 59  | 10  | 69    | 1.6731 (0.7209-3.8830) | 1.4540 | 0.2278 |
| Row %                 | 85.5 | 14.5 | 100.0 |            |                  |      |
| Col %                 | 46.8 | 34.5 | 44.5  |            |                  |      |
| ≥35                   | 67  | 19  | 86    | 3.3891 (1.1565-9.6027) | 7.3841 | 0.0066 |
| Row %                 | 77.9 | 22.1 | 100.0 |            |                  |      |
| Col %                 | 53.2 | 46.8 | 55.5  |            |                  |      |
| TOTAL                 | 126 | 29  | 155   |            |                  |      |
| Row %                 | 81.3 | 18.7 | 100.0 |            |                  |      |
| Col %                 | 100.0 | 100.0 | 100.0 |            |                  |      |
| Occupation group      |     |     |       |            |                  |      |
| Housewife             | 86  | 20  | 106   | 0.9675 (0.4047-2.3130) | 0.0055 | 0.9407 |
| Row %                 | 81.1 | 18.9 | 100.0 |            |                  |      |
| Col %                 | 68.3 | 69.0 | 68.4  |            |                  |      |
| Others                | 40  | 9   | 49    |            |                  |      |
| Row %                 | 81.6 | 18.4 | 100.0 |            |                  |      |
| Col %                 | 53.2 | 46.8 | 55.5  |            |                  |      |
| TOTAL                 | 126 | 29  | 155   |            |                  |      |
| Row %                 | 81.3 | 18.7 | 100.0 |            |                  |      |
| Col %                 | 100.0 | 100.0 | 100.0 |            |                  |      |
| Education group       |     |     |       |            |                  |      |
| Less Educated         | 43  | 16  | 59    | 0.4209 (0.1855-0.9550) | 4.4289 | 0.0353 |
| Row %                 | 72.9 | 27.1 | 100.0 |            |                  |      |
| Col %                 | 34.1 | 55.2 | 38.1  |            |                  |      |
| More Educated         | 83  | 13  | 96    |            |                  |      |
| Row %                 | 86.5 | 13.5 | 100.0 |            |                  |      |
| Col %                 | 54.9 | 45.1 | 61.9  |            |                  |      |
| TOTAL                 | 126 | 29  | 155   |            |                  |      |
| Row %                 | 81.3 | 18.7 | 100.0 |            |                  |      |
| Col %                 | 100.0 | 100.0 | 100.0 |            |                  |      |
| Place of residence    |     |     |       |            |                  |      |
| Rural                 | 98  | 25  | 123   | 0.5600 (0.1798-1.7440) | 1.0224 | 0.3119 |
| Row %                 | 79.7 | 20.3 | 100.0 |            |                  |      |
| Col %                 | 77.8 | 86.2 | 79.4  |            |                  |      |
| Urban                 | 28  | 4   | 32    |            |                  |      |
| Row %                 | 87.5 | 12.5 | 100.0 |            |                  |      |
| Col %                 | 22.2 | 13.8 | 20.6  |            |                  |      |
| TOTAL                 | 126 | 29  | 155   |            |                  |      |
| Row %                 | 81.3 | 18.7 | 100.0 |            |                  |      |
| Col %                 | 100.0 | 100.0 | 100.0 |            |                  |      |
| Family income/month   |     |     |       |            |                  |      |
| ≤10000                | 49  | 4   | 53    | 3.9773 (1.3047-12.1242) | 6.5982 | 0.0102 |
| Row %                 | 92.5 | 7.5  | 100.0 |            |                  |      |
| Col %                 | 38.9 | 13.8 | 34.2  |            |                  |      |
| >10000                | 77  | 25  | 102   |            |                  |      |
| Row %                 | 75.5 | 24.5 | 100.0 |            |                  |      |
| Col %                 | 61.1 | 38.9 | 65.8  |            |                  |      |
| TOTAL                 | 126 | 29  | 155   |            |                  |      |
| Row %                 | 81.3 | 18.7 | 100.0 |            |                  |      |
| Col %                 | 100.0 | 100.0 | 100.0 |            |                  |      |
| Oral changes          |     |     |       |            |                  |      |
| Present               | 64  | 23  | 87    | 0.2693 (0.1027-0.7061) | 7.7852 | 0.0052 |
| Row %                 | 73.6 | 26.4 | 100.0 |            |                  |      |
| Col %                 | 50.8 | 49.2 | 51.1  |            |                  |      |
| Absent                | 62  | 6   | 68    |            |                  |      |
| Row %                 | 91.2 | 8.8  | 100.0 |            |                  |      |
| Col %                 | 49.2 | 50.8 | 43.9  |            |                  |      |
| TOTAL                 | 126 | 29  | 155   |            |                  |      |
| Row %                 | 81.3 | 18.7 | 100.0 |            |                  |      |
| Col %                 | 100.0 | 100.0 | 100.0 |            |                  |      |

*The association between smokeless tobacco chewing and areca nut-chewing habits and several factors.
Bhattacharjee, et al.: Smokeless tobacco related oral mucosal changes in Bengali women

A study conducted by Dasgupta et al. found that the least educated, poor women, having minimal knowledge about the harmful effects of tobacco are more prone to smokeless tobacco use. These findings are consistent with our observation. In our study, we also found that the less educated women and women whose family income was below 10,000 are more prone to smokeless tobacco use.

Rani et al. as well as Dasgupta et al. found that the prevalence of smokeless tobacco use was very high among females above 35 years. This finding does not match our observations.

We could not find any increased prevalence of smokeless tobacco use among women above 35 years age.

Our study was conducted in different places of West Bengal with a different number of samples. On the other hand, a study conducted by Dasgupta et al. is in a particular location. This could be the main reason behind the result difference.

A various study reported that most common oral mucosal alterations due to chewing tobacco use are oral squamous cell carcinoma, oral verrucous carcinoma, leukoplakia, erythroplakia etc.

In 2019, Tejasvi studied oral mucosal lesions and various quid chewing habit patterns and confirmed the association between betel, tobacco, and various oral lesions.

In our study, we also observed a positive relation between smokeless tobacco use and oral mucosal alterations among females.

We conducted our study in different parts of West Bengal so it can be considered as more generalized research to get any data related to oral habits and changes caused by them among females of whole West Bengal.

The study population was taken from different oral health screening camps as well as private dental clinics. Hence, the study population was a mixture of females with a different attitude towards oral habits and their effect on the oral cavity.

In our study, the majority of our participants were housewives. They are the most neglected group for any kind of study related to oral habits and their effect. Hence, our study is unique in this perspective.

The information collected for this study was based on the participants’ self-report. Hence, there was a high chance of under-report their habit of smokeless tobacco use.

Therefore the observed prevalence of smokeless tobacco use might be underestimated. Hence, the study may have suffered from social desirability bias and recall bias in addition to the small sample size.

Previously it was believed that females do not consume tobacco much. This study brings forth some hidden truth that females are not lagging behind their male counterparts.

In our society due to social barriers, smoking habits are not very common among Indian females; but the prevalence of smokeless tobacco use is high and increasing day by day.

Due to a lack of awareness and knowledge regarding the use of smokeless tobacco and its ill effect; the habit is engulfing our female society.

Though there is a huge role of preventive initiatives on control of oral cancer incidence and mortality; yet there is a very limited study that addresses the role of primary health care on the female population to reduce the rate of oral cancer incidence and mortality.

With minimal equipment, primary health care providers can easily identify risk factors and perform an early diagnosis to provide basic care for oral cancer and precancer patients.

As primary health care providers work more on females in India, they should perform oral health examination routinely for them to detect oral precancer and cancer in a very early stage as well as increasing the chance of survival and cure.

Based on the study report we recommend that periodically observation, as well as counseling by primary health care provider, is very much needed.

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Conflicts of interest
There are no conflicts of interest.

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