

Prevalence of Habit-related Oral Lesions in Patients Visiting Dental College in Central Gujarat

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Abstract

Background: Oral cancer is the sixth most common cancer around the globe and one of the largest groups of cancer in the Indian subcontinent. The incidence and prevalence of oral precancerous lesions are rising due to an increase in number of people consuming tobacco and related products. This study aims to find the prevalence of use of tobacco, areca nut, and related products and associated oral mucosal lesions. **Materials and Methods:** It is a hospital-based prevalence study conducted at dental college in Central Gujarat. The study population were 1143 subjects having tobacco, areca nut, and related products associated oral mucosal lesions. A standardized extraoral and intraoral examination was performed by trained dental surgeons. All the details were entered into the specially designed pretested “Pro forma.” The unpaired “t” tests, Chi-square tests, and Fisher’s exact test were applied as required. $P < 0.01$ was considered statistically significant. **Results:** A total of 44,681 subjects (with a male-to-female ratio of 1.2:1) of above 15 years were examined. Among them, a total of 4667 (10.45%) subjects were having adverse habits in which a total of 1143 (24.5%) subjects were having oral habit-related lesions. Bidi smoking was a most prevalent habit (29.83%) followed by gutkha chewing (25.10%). Maximum patients were having habit of smoking from 11 to 15 years with frequency of 11 to 20 times/day, while in case of chewing, most of the patients were having habit for <5 years with frequency <10 times/day still more incidence of precancerous lesions were developed because of tobacco chewing. **Conclusion:** Prevalence rate of our study does not reflect the whole population but may prove valuable in planning future oral health studies. Increase in prevalence of oral submucous fibrosis, especially in lower age group in our study, is alarming.

Keywords: Prevalence study, Oral precancerous lesions, Oral cancer, Tobacco, Areca nut.

INTRODUCTION

Oral cancer is a global health problem with rising prevalence and mortality rates. It constitutes one of the largest groups of cancer in the Indian subcontinent with an incidence rate as high as 30–40%.^[1] The tobacco and areca nut habit have a major social and cultural role in communities throughout the Indian subcontinent, Southeast Asia, and parts of the Western Pacific.^[2] Mortality attributable to tobacco has been estimated to be 1 million every year in India, projected to be 1.5 million by 2020.^[3] India is the third largest producer and consumer of tobacco.^[4] Kheda district is one of the leading tobacco growing areas of India.^[5]

The adverse health effects associated with tobacco and areca (betel) nut use include addiction, oral and oropharyngeal cancer, and oral precancerous lesions and conditions.^[6,7] The early diagnosis and treatment of such lesions would go a long way in improving the overall health status of the population and preventing the otherwise irreversible condition.^[8]

Lack of adequate information to form a basis of effective preventive strategies prompted us to conduct this study with the objective of finding prevalence of use of tobacco and areca nut, their commercial preparations and different oral mucosal lesions associated with their use among the patients visiting OPD of Faculty of Dental Science, DDU, Nadiad, in Kheda district, Gujarat. Furthermore, their association with age, duration, and frequency of habits was studied.

MATERIALS AND METHODS

The present study was carried out in the Department of Oral Medicine and Radiology, Faculty of Dental Science, Dharmsinh Desai University, Nadiad, Gujarat. All the cases

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reporting to the dental outpatient department (total of 44,681 subjects) above the age of 15 for the oral complaints were studied. Information about this prevalence study was given to each participant in the vernacular language or in the language of understanding. The participation in this study was voluntary. The informed consent form (in Gujarati or English) was signed by each participant who wished to participate in this study before the oral examinations.

Each participant was interviewed by the trained interviewer. Structured questions related to vital statistics, education, details of oral harmful habits, especially related to tobacco and areca nut consumption, age of initiation, form of product used, pattern of use of substances and duration of habit, oral health-related complaints, and medical history were asked to each participant and the outcome for the same was recorded in the specially designed pretested "Pro forma."

A standardized extra- and intra-oral examination was performed by trained dental surgeons with the help of diagnostic instruments with necessary aseptic precautions and with both direct and indirect light. The following oral mucosal areas were examined sequentially in detail – lips, buccal and vestibular mucosa, hard and soft palate, tongue, floor of mouth, oropharynx, etc. Clinically, overt mucosal alterations were recorded. Special attention was given to the various forms of tobacco and areca nut habit-related oral mucosal lesions such as leukoplakia, oral submucous fibrosis (OSMF), smoker's palate, quid lesion, and oral cancer.

The statistical software, namely, SPSS 16.0 and Systat 13.0 was used for the analysis of the data and Microsoft Word 2007 and Excel 2007 have been used to generate graphs, tables, etc. The unpaired "t" tests, Chi-square tests, and Fisher's exact test were applied as required. $P < 0.01$ was considered statistically significant.

RESULTS

A total of 44,681 subjects (with a male-to-female ratio of 1.2:1) were examined among them, a total of 4667 (10.45%) subjects were having adverse habit of either chewing or smoking form of tobacco and areca nut-related products, in which a total of 1143 (24.5%) subjects were having oral habit-related lesions, which became the study population in our study. Considering the age of subjects having oral lesions, maximum patients were in the age group of 21–30 years ($n = 283$, 24.7%) followed by 31–40 years ($n = 279$, 24.4%).

Oral carcinoma was commonly seen in the age group of 51–60 years ($n = 11$, 29.7%) followed by 41–50 years and 60+ years ($n = 8$, 21.6%) (Table 1).

Habit of bidi smoking is significantly associated in cases of oral leukoplakia ($n = 221$, 81.3%) and smoker's palate ($n = 112$, 83%). While habit of smokeless form of tobacco and areca nut in the form of gutkha containing tobacco ($n = 268$, 42.8%) and mawa chewing ($n = 209$, 33.4%) is significantly associated in cases of OSMF. Pan chewing (containing tobacco and

areca nut) ($n = 12$, 16.4%) and tobacco chewing with slaked lime ($n = 40$, 54.8%) are significantly associated in cases of tobacco quid lesion (Table 2).

When duration of tobacco smoking is compared with frequency of occurrence of lesion, we have observed that as the duration of tobacco smoking increases, the frequency of occurrence of lesion increases ($P < 0.01$) (Table 3). Same way, when frequency of tobacco smoking is compared with frequency of occurrence of lesion, we have observed that as the frequency of tobacco smoking increases, the frequency of occurrence of lesion increases ($P < 0.01$) (Table 4).

When duration of tobacco chewing and frequency of tobacco chewing is compared with frequency of occurrence of lesion, we have observed that there is no correlation with duration and

Table 1: Age-wise distribution of habit-related lesion

Age (years)	Leukoplakia (%)	OSMF (%)	Tobacco quid (%)	Smokers palate (%)	Carcinoma (%)
11–20	2 (0.7)	22 (3.5)	4 (5.5)	2 (1.5)	0 (0.0)
21–30	24 (8.8)	244 (39.0)	10 (13.7)	4 (3)	1 (2.7)
31–40	48 (17.6)	186 (29.7)	16 (21.9)	20 (14.8)	9 (24.3)
41–50	78 (28.7)	91 (14.5)	20 (27.4)	32 (23.7)	8 (21.6)
51–60	82 (30.8)	61 (9.7)	14 (19.2)	46 (34.1)	11 (29.7)
60+	38 (14.0)	22 (3.5)	9 (12.3)	31 (23)	8 (21.6)

Table 2: Habit wise details of the lesion

Habit	Leukoplakia (%)	OSMF (%)	Tobacco quid (%)	Smokers palate (%)	Carcinoma (%)
Smoking bidi	221 (81.3)	0 (0.0)	0 (0.0)	112 (83.0)	8 (21.6)
Smoking cigarette	51 (18.8)	0 (0.0)	0 (0.0)	23 (17.0)	5 (13.5)
Smokeless gutkha containing tobacco	0 (0.0)	268 (42.8)	11 (15.1)	0 (0.0)	8 (21.6)
Smokeless mawa	0 (0.0)	209 (33.4)	10 (13.7)	0 (0.0)	2 (5.4)
Smokeless pan containing tobacco	0 (0.0)	41 (6.5)	12 (16.4)	0 (0.0)	2 (5.4)
Smokeless tobacco with slaked lime	0 (0.0)	108 (17.5)	40 (54.8)	0 (0.0)	12 (32.4)

Table 3: Lesion according to the duration of tobacco smoking

Duration (years)	Leukoplakia (%)	Smoker's palate (%)	Carcinoma (%)
0–5	29 (10.7)	15 (11.1)	1 (7.7)
6–10	97 (35.7)	18 (13.3)	3 (23.1)
11–15	121 (44.5)	35 (25.9)	4 (30.8)
15+	25 (9.2)	67 (49.6)	5 (38.5)

Table 4: Lesion according to the frequency of tobacco smoking

Frequency	Leukoplakia (%)	Smoker's palate (%)	Carcinoma (%)
0–10 times	108 (39.7)	39 (28.9)	2 (15.4)
11–20 times	102 (37.5)	50 (37.0)	3 (23.1)
20+	62 (22.8)	46 (34.1)	8 (61.5)

frequency of tobacco chewing in cases of OSMF and tobacco quid lesion ($P < 0.01$).

While in cases of oral cancer, as the duration and frequency of tobacco and areca nut chewing and smoking increase, the frequency of occurrence of lesion increases ($P < 0.01$).

DISCUSSION

Smoking as well as smokeless tobacco are consumed in urban as well as rural population of our country. Gutkha is specifically aimed at our young generation.^[9-11] India has 33% of male smokeless tobacco users. Approximately 52% of oral cancers in India are attributed to use of smokeless tobacco products. Evidence of early onset of the tobacco habits and reports of increase in the prevalence of oral pre-cancer and cancer among young generation raise serious concerns of an impending oral cancer epidemic in our country. The age incidence of oral cancer in India is going down and is significantly lower than reported in the rest of the world.^[12,13]

Areca nut is the fourth most commonly used substance of abuse in the world after tobacco, alcohol, and caffeine. A substantial proportion of the world's population is engaged in chewing areca nut and this habit is endemic throughout the Indian subcontinent. Because of its ancient history, its use is socially acceptable among all sections of society, including women.^[14,15] During the period of our study (2010–2012) among the total OPD patient 46,681, 4667 (10.45%) had habit of consuming tobacco or tobacco with areca nut in various forms. That was somewhat higher when compared to studies conducted by Muttappallymyalil *et al.* (5.5 %)^[16] and Hanspal *et al.* (8.2%)^[17] which is alarming. According to a study done by Narain *et al.*, 11.2% were tobacco users which is almost same as compared to our study.^[18,19]

Findings of a study conducted by Mahawar *et al.* said that oral precancerous lesions are almost present in one out of every three persons who are using tobacco for more than 5 years.^[20]

In this study, it was observed that chewing 723 (63.25%) is more preferable form of consumption of tobacco than smoking 420 (36.75%). Same results (52.5% chewers and 35.4% smokers) were found in a study conducted by Hanspal *et al.*^[17] According to Makwana *et al.*; in Gujarat in 2007, prevalence of chewing and smoking was 66.23% and 14.61%, respectively.^[21]

Male predominance is seen in our study which is in accordance with other previous studies.^[1,22,23] Male predominance in OSMF is noted in a study conducted in Bagalkot district by Prabhu *et al.*^[8] and also in China by Tang *et al.*^[24] Reddy *et al.* and

Chaturvedi *et al.* in India also observed male predominance in OSMF.^[25,26] A study done by Bokor-Bratic *et al.*, Axell *et al.*, and Lbasi *et al.* showed that oral leukoplakia occurred more frequently in men.^[2,27,28] This may be due to high prevalence of tobacco consumption habits among males, as they have easy access of money and tobacco.

Prevalence of oral leukoplakia in India varies from 0.2% to 5%.^[23,29] In our study, prevalence of leukoplakia was 0.5% that is in coordination with other studies. The most common age group having oral leukoplakia in our study was between 51 and 60 years.

Prevalence of OSF in India varies between 0.03% and 3.2% according to various studies.^[8,23] We found 1.34% prevalence of OSMF in our study. According to study done by Sharma *et al.* in 2012, prevalence of OSMF was 3.39%.^[30] In our study, OSMF occurred in the age group of 21–40 years which is in accordance with the study of Reddy *et al.*^[25] According to a study done by Prabhu *et al.* and by Murti *et al.*, it was mostly found in 35–44 years age group.^[8,31] According to the study done by Hazare *et al.*, mean age is 28.8 ± 10.4 years which is relatively younger age group when compared with leukoplakia.^[32]

In our study, prevalence of smoker's palate was 0.3% with male predominance. It occurs in middle age and elderly person.^[34] According to study conducted by Desai *et al.* in 2012, prevalence of smoker's palate was 4.53% which is very high as compared to our study.^[35] In the large survey of Saudi Arabia, one-third of all smokers presented with smoker's palate.^[33]

Quid lesions until now have been considered as benign lesions due to lack of evidence them as precancerous lesions.^[19] Smokeless tobacco was used with lime which inflicts the toxic effects on the oral mucosa. However, long direct contact causes chemical and mechanical injury to mucosa so lesions are related with site of placement.^[36] According to Nair *et al.*, 15% of tobacco users in chewing form develop quid lesions.^[37] In our study, 10% of tobacco chewers developed quid lesions which is somewhat less.

Bidi smoking was found to be more prevalent habit in cases of leukoplakia and smoker's palate which was consistent with Mehta *et al.* and Chiroda *et al.*^[36]

The result of our study showed duration and frequency of smoking habits is directly proportional to the occurrence of lesion which is consistent with Gupta *et al.* and Marija.^[27]

According to a study of Nair *et al.* and Bathi *et al.*, relative risk of the development of OSMF increased with the frequency of chewing habit.^[11,13] However, according to a study done by Reddy *et al.* and Mahawar *et al.*, relative risk and severity of OSMF increased with duration, frequency, and type of chewing habits.^[20,25] This is in accordance with literature which explains that areca nut has high alkaloid arecoline and tobacco ingredients like nitrosamine which are absorbed more in the patients who keep it for longer duration and swallow it.^[20,25] In this study, dose–response relationship was not significant in OSMF.

CONCLUSION

This study provided information about the habit trends in the patients and correlation of various habits with oral lesions. Prevalence rate does not reflect the whole population but may prove valuable in planning future oral health studies. Increase in prevalence of OSMF, especially in lower age group, is alarming. There is an urgent need for appropriate prevention and cessation strategies for smoking and smokeless tobacco products.

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