

Prevalence of Tobacco-Associated Oral Mucosal Lesions in Patients Visiting a Tertiary Hospital of Chitwan, Nepal

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ABSTRACT

Introduction: Tobacco consumption in different forms is one of the biggest risk factors for the emergence of oral mucosal lesions (OML), including precancer and oral cancer. The habit's type and duration affect the nature and location of tobacco-associated OML.

Objectives: The objective of this study is to estimate the prevalence of tobacco-associated OML among patients visiting the dental outpatient department of a tertiary care hospital in Chitwan, Nepal.

Methods: A descriptive, cross-sectional study was done among 1666 patients visiting the dental outpatient department. Data collection was performed through personal interviews and clinical examination. Data was entered in MS Excel (2019) and analysis was performed using SPSS Version 22. Pearson's chi-square test was done to see the association between variables.

Results: Among 1666 subjects, 516 (30.97%) were tobacco users. Among the tobacco users, 247 (47.86%) were males and 269 (52.13%) were females. Among 516 tobacco users, tobacco-associated oral mucosal lesions (OML) were present in 98(18.99%) individuals. Leukoplakia was the most prevalent tobacco-associated OML among smokers, whereas tobacco-pouch keratosis was among tobacco chewers.

Conclusion: The results of the present study can be used as a reference to identify vulnerable groups of people and devise awareness campaigns and cessation programs that can motivate the population to quit tobacco.

Keywords: Oral mucosal lesion; prevalence; smokers; tobacco chewers.

INTRODUCTION

Tobacco is one of the prime causes of death, accounting for 1 in 10 deaths worldwide.¹

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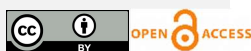
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As per the STEP wise approach to Surveillance (STEPS) survey (2019)



conducted in Nepal, tobacco use is a habit for 29% of the population aged 15 – 65.² The ill effects of tobacco in the oral cavity depend on the form, frequency, and duration of use.²⁻⁶ Nicotine, along with specific nitrosamines present in tobacco, act as potent carcinogens that have a profound effect on oral and systemic health.⁷ Kaur A⁸ et al. and Kommalapati RK⁹ et al. stated that poor

socioeconomic status and stress are the key determinants that allure individuals to develop a habit of tobacco consumption, thereby making the subjects prone to develop tobacco-associated oral mucosal lesions.^{8,9} The present study aims to estimate the prevalence of tobacco-associated OML among the patients visiting the dental outpatient department of the College of Medical Sciences, Chitwan, Nepal.

METHODS

The present descriptive cross-sectional study was conducted from July 15, 2024, to October 20, 2024, among the patients visiting the dental outpatient department of the College of Medical Sciences, Bharatpur, Nepal. Before starting the study, ethical clearance was obtained from the Institutional Review Committee (IRC), College of Medical Sciences and Teaching Hospital (COMSTH) vide reference number COMSTH-IRC-2024-041. Written informed consent was obtained from each participant before their inclusion in the study. Inclusion criteria were the patients above 18 years visiting the outpatient department of the aforementioned tertiary care hospital who are willing to participate in the study. Patients below 18 years, not consenting, mentally challenged patients, and medically compromised patients were excluded from the study. A non-probability sampling technique was used, and the sample size (n)

for the study was calculated using the formula,

$$\begin{aligned} n &= Z^2 \times p \times q / e^2 \\ &= (1.96)^2 \times 0.0425 \times 0.9575 / (0.02)^2 \\ &= 398 \end{aligned}$$

Where,

n = sample size

Z = 1.96 at 95% confidence interval

p = prevalence rate of tobacco users among the patients visiting the dental OPD, which was 4.25 %, according to Ehizele AO et al.¹

q = 1-p

e = margin of error, 2%.

Study participants were segregated into four groups based on age as Group A- less than 25 years, Group B- 26 to 50 years, Group C- 51 to 75 years and Group D- more than 75 years. Tobacco users were also segregated into three groups as Group I- tobacco consumption habit less than 5 years, Group II- Tobacco consumption habit 5-10 years, and Group III- Tobacco consumption habit more than 10 years.

Data collection was performed through personal interviews and clinical examination. Data extracted through the personal interview were the age, gender, and history of tobacco intake, whereas, tobacco-associated oral lesions were elucidated through clinical examination using basic dental diagnostic instruments. Any suspicious lesions like oral submucous fibrosis, verrucous carcinoma, and oral squamous cell carcinoma were

reconfirmed by histopathological examination.

Data entry was performed using Microsoft Excel (2019), and statistical analysis was done using Statistical Package of Social Sciences (SPSS) software version 22. The results were presented in numbers and percentages. The association between variables was tested using chi-square and Fisher exact tests.

RESULTS

The present study involved 1666 patients aged between 18 and 80 years who visited the dental outpatient department of the College of Medical Sciences, Bharatpur, Nepal. The study population consisted of 52.7% males and 47.3% females.

The mean age of the study population was 41.65 ± 16.11 years. Out of 1666 patients, 516 (30.97%) were tobacco consumers, whereas tobacco-associated oral mucosal lesions were noted in 98 (5.88%) individuals. Among 516 tobacco users, 247 (47.86%)

were males and 269 (52.13%) were females. (Table 1).

Table 1: Demographic details of the study population.

Characteristics	Frequency	Percentage (%)
Age group (in years)		
<25	329	19.75
26 – 50	824	49.46
51 – 75	488	29.29
>75	25	1.50
Gender		
Males	782	56.93
Females	884	53.06
Tobacco Users		
Males	247	31.58
Females	269	30.42

The number of tobacco users in the age groups A, B, C, and D were 95, 255, 160, and 6, respectively. The prevalence of tobacco users among different age groups and the prevalence of tobacco-associated OML among tobacco users of different age groups are mentioned in table below. Similarly, Groups A, B, C, and D had 16, 45, 36, and 01 OML linked with tobacco respectively. (Table 2)

Table 2: Prevalence of tobacco-usage and tobacco-associated oral mucosal lesions among different age groups.

Prevalence of tobacco-usage among tobacco users of different age groups from the study population						
Tobacco Usage	Age Group (in years)				Total	p-value
	A	B	C	D		
Yes	95	255	160	6	516	0.573
No	234	569	328	19	1150	
Total	329	824	488	25	1666	

Prevalence of tobacco-associated oral mucosal lesions among tobacco users of different age groups from the study population						
Tobacco-associated OML	Age group (in years)				Total	p-value
	A	B	C	D		
Present	16	45	36	01	98	0.596
Absent	79	210	124	05	418	
Total	95	255	160	06	516	

Chi-square test, p-value <0.05 statistically significant.

Following table represents the distribution of tobacco associated oral mucosal lesions (OML) on the basis of genders. The most frequently occurring oral mucosal lesion among tobacco consumers was leukoplakia, followed by tobacco-pouch keratosis (TPK). The other tobacco-associated oral mucosal lesions noted among the tobacco users were oral submucous fibrosis (OSF), verrucous carcinoma (VC), and oral squamous cell carcinoma (OSCC (Table 3)

Table 3: Distribution of tobacco associated oral mucosal lesions on the basis of genders

Lesions	Male	Female	Total	p-value
LEUKOPLAKIA	24	22	46	0.0896
TPK	15	15	30	
OSF	09	05	14	
VC	00	01	01	
OSCC	05	02	07	
TOTAL	53	45	98	

Fisher exact test, p-value <0.05 statistically significant.

Table below depicts that Leukoplakia was the most common OML among smokers, and TPK was the most frequent OML found among smokeless tobacco users. Detailed distribution of Tobacco-associated OML among different forms of tobacco consumers is mentioned below. (Table 4)

Table 4: Distribution of tobacco-associated oral mucosal lesions among different forms of tobacco consumers.

Form	Lesion						p-value
	Leukoplakia	TPK	OSF	VC	OSCC	Total	
Smoking	27	0	0	0	01	28	0.0001
Smokeless	0	25	08	0	01	34	
Both	19	05	06	01	05	36	
Total	46	30	14	01	07	98	

Fisher exact test, p-value <0.05 statistically significant.

The tobacco-associated OML was more frequently noticed in individuals with a habit history of greater duration. The distribution of tobacco-associated OML with habit duration is mentioned in Table 5.

Table 5: Distribution of tobacco-associated oral mucosal lesions with habit duration.

Duration	Oral Mucosal Lesion (OML)						p-value
	Leukoplakia	TPK	OSF	VC	OSCC	Total	
I - <5 years	06	15	01	0	0	22	0.0011
II - 5-10 years	20	09	05	0	01	35	
III - >10 years	20	06	08	01	06	41	
Total	46	30	14	01	07	98	

Fisher exact test, p-value <0.05 statistically significant.

The buccal mucosa emerged as the most common location for OML linked to tobacco use, with labial and buccal vestibule closely following behind. The detailed distribution of tobacco-associated OML at various sites in the oral cavity has been mentioned in Table 6.

Table 6: Distribution of tobacco-associated oral mucosal lesions at various sites in the oral cavity.

SN	Site	Number of Tobacco-associated OML
1.	Right buccal mucosa	12
2.	Left buccal mucosa	14
3.	Both right and left buccal mucosa	36
4.	Labial mucosa	12
5.	Vestibular mucosa	17
6.	Tongue	5
7.	The floor of the mouth	2

DISCUSSIONS

Tobacco consumption is a prime etiology for various forms of cancer and has emerged as a burden of public health globally.¹⁰ The prevalence of tobacco usage in the current hospital-based study is 30.97 %, which is consistent with the study conducted by Bhattarai R et al.¹¹, where the authors reported a 35.68% prevalence of tobacco usage in their study population. The current study revealed that, out of 516 tobacco users, 269 (52.13%) were females, while 247 (47.86%) were males. This is in contrast to

the study conducted by Ehizele AO et al.¹ Vinaya Swetha T et al.⁴, where the authors reported male predominance in tobacco consumption.

In the present study, among the tobacco consumers, 180(30.88%) were smokers, 125(25%) consumed smokeless tobacco, and 211 (40.89%) consumed both forms of tobacco, which is in contrast with the study conducted by Kommalapati RK et al.⁹, where 86.80% were smokeless tobacco consumers and only 13.21% were smokers. One of the factors contributing to the rising number of

tobacco smokers in Chitwan is, its educational and corporate hub, having substantial percentage of the cosmopolitan population with sophisticated tobacco consumption habits.

In this study, tobacco-associated OML were present only in 98 (18.99%) percent of the tobacco consumers, among them, leukoplakia was the most prevalent (46.93%), followed by TPK (30.61%), OSF (14.28%), OSCC (7.14%), VC (1.02%). Results are consistent with the study conducted by Vinaya Swetha T et al.⁴, Patil PB et al.⁶, and Priya MK et al.¹² 45.91 % tobacco-associated OML in the current study were noticed in the tobacco consumers of age group 26-50 years, followed by 36.93 % in the age group of 51-75 years.

Leukoplakia is the most prevalent tobacco-associated OML found in smokers, whereas TPK is the most prevalent tobacco-associated OML found in individuals with the habit of smokeless tobacco consumption. OSF was found in individuals who consumed either smokeless or both forms of tobacco. OSCC was mostly noted in the individuals who consumed both forms of tobacco. In this study, leukoplakia occurred in smokers and individuals who consumed both forms of tobacco. Among 46 cases of leukoplakia, 47.82% cases occurred in females, which is in contrast to the study conducted by Patil PB et al.⁶ The reason for the greater occurrence of leukoplakia can be attributed to the pattern

of tobacco consumption existing in this part of the country. The prevalence of OSF in the present study is high (14.28%) when compared to the study conducted by Saraswathi TR et al.¹³, and Ikeda N et al.¹⁴ The reason for this could be the greater prevalence of smokeless tobacco consumers in the study population. The same reasons could be attributed to the greater number of TPK noticed among the smokeless tobacco users of the study population.

A significant association was noted between the duration of tobacco usage and the occurrence of OML. Halves of the cases of TPK were noticed in tobacco users with a habit duration of less than 5 years. Only one case of VC and 85.71% of OSCC cases were noted in tobacco users with a habit duration of more than 10 years.

The most frequent site for the occurrence of tobacco-associated OML in the present study was buccal mucosa (63.26%), followed by vestibular mucosa (17.34%), lower labial mucosa (12.24%), lateral border of the tongue (5.10%) and floor of the mouth (2.04%). Similar findings have been reported by Vinaya Swetha T et al.⁴, where the authors reported 84% of lesions in the buccal mucosa. However, Zain RB et al.¹⁵ reported labial mucosa as the most common site (53.3%) for tobacco-associated OML¹⁵ The reason for that is the different types and styles of tobacco consumers in their study population.¹⁵

The present study depicts the prevalence of tobacco users and the prevalence of tobacco-associated oral mucosal lesions noted among the patients visiting the outpatient department of a tertiary care hospital in Chitwan, Nepal. The results of the present study can be used as a guide to help the institution and other relevant authorities design tobacco-cessation and oral health education programs that will inspire the population to give up tobacco. The shortcomings of the present study include its single-center design, comparatively small sample size, brief duration, and lack of participation from various ethnic groups. Since the study was

cross-sectional, a causal association could not be proven.

CONCLUSION

The present study noted a maximum number of tobacco-associated oral mucosal lesions in the age group ranging from 26 – 50 years. A relationship between the duration of use and the frequency of occurrence of tobacco-associated OML was also evident. The results of the present study can be used to pinpoint vulnerable groups of people and devise awareness campaigns and cessation programs that can motivate the population to quit tobacco.

Conflict of Interest: None.

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