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PREVALENCE OF ORAL MUCOSAL LESION AMONG PATNA POPULATION – A SURVEY

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ABSTRACT

Oral mucosa is an effective protective barrier and is commonly affected by lesions that may be innocuous to those that are malignant. Aim of this study was to study the prevalence of oral mucosal lesions in Patna population. Out of 2500 subjects, 1585 were males and 915 were females. The maximum number of participants were in the age group of 25-34 years. Habit of Cigarette smoking was found in 160 subjects. In smokeless form, Khaini in 435 and Gutkha habit in 320 subjects were seen. Oral mucosal lesions were present in 950 of which 335 lesions were non-tobacco users and 615 subjects were tobacco users. Tobacco pouch keratosis was seen in 240 subjects (29.81%) followed by OSMF in 145 (18.01%) among tobacco users. Lichen planus was the most common oral mucosal lesion in 85 subjects (5.01%) among non-tobacco users. The study population is predominantly male. Smokeless tobacco, particularly Khaini and Gutkha, is a significant concern in this population, while smoking tobacco and alcohol consumption are less prevalent. The presence of lesions in over one-third of the participants highlights a potential health issue within this population. There is a strong relationship between tobacco use and the occurrence of oral mucosal lesions.

INTRODUCTION

Oral mucosa is an effective protective barrier and is commonly affected by lesions that may be innocuous to those that are malignant. Oral lesions impair with the functioning of an individual leading to impaired speech and inability to eat. The lesions may cause halitosis, dysesthesia, or xerostomia. These symptoms may affect the social and everyday life of an individual. Deleterious habits, irregular or sharp teeth, ill-fitting prosthesis and poor oral hygiene are other factors that determine the occurrence of oral mucosal lesions (S. Rohini et al, 2020). Although the terms dental health and oral health are used almost synonymously when stating the goals for oral health, such statements are usually valid only for dental health. This may lead to severe underestimation of the need for total health care. When planning measures for improving oral health, the lack of data may lead to a risk of overlooking diseases of the soft tissues in, and adjacent to, the oral cavity. Prevalence data of oral mucosal lesions are available from many countries, but the information is usually restricted to very few lesions in each survey. Epidemiological studies can provide an important vision for understanding the prevalence, extent, and severity of oral disease in population. Nowadays the importance of oral health to life quality is not in our world[3]. It is important to know the prevalence of oral mucosal lesions/conditions in the general population as it has a significant negative effect on the oral health, irrespective of the etiology, which will affect the quality of life. Proper management of a patient with an oral lesion starts with an accurate diagnosis. There are lesions whose diagnosis can be made based on data gathered during the history. Oral diseases are major public health problem. Among them oral cancer is at the top of the list. Oral Cancer is the 6th most common cancer in the world which accounts for 350,000 new cases and 128,000 deaths annually. The most common oral precancerous lesions are oral leukoplakia, erythroplakia, nicotina palati and oral sub mucous fibrosis. Other include candidiasis, recurrent herpes labialis, hairy tongue, lichen planus etc. The overall prevalence of pre-cancerous lesion among patients attending hospital in certain places of India range between 2.5% to 8.4% (Samar Ali Faraz et al, 2019). These lesions cause disturbance in day-to-day activities as they interfere with the consumption of food, causing pain, burning sensation, facial asymmetry, and others. In contrast, other normal variants of oral mucosa do not cause harm but can be misdiagnosed as a potentially life-threatening condition. This makes it necessary for us to have the proper knowledge about oral lesions (OLs) and the normal variants for proper management. These lesions vary depending on geography, race, culture, ethnicity, food, or deleterious habits (Abhishek Gupta et al, 2022). The present study was conducted to study the prevalence of oral mucosal lesions in Patna population. The objectives are to evaluate the patients for history of tobacco habits, to evaluate oral mucosa of patients visiting the hospital for oral mucosal lesions and to study the incidence of Oral mucosal lesions in relation to habits and in control group.

MATERIALS AND METHODS:

This study was carried out as a prospective study among patients visiting a dental college, Patna, Bihar (2025). A total of 2500 patients visiting the hospital were

examined. After study review, Institutional Ethical Committee approval was obtained (125/BIDSH/IEC/2024-25). Informed consent was taken from every patient. The patient details were recorded in a predetermined proforma to record all necessary details. The patient pro forma contained information such as name, age, sex, occupation, chief complaint, past medical and dental history, family history, and personal habits (oral hygiene habits and oral habits). The patients were examined by dental surgeons. On intra oral examination, presence of any intra-oral lesion was recorded. The characteristic features of oral mucosal lesions including location, size, colour, type of lesion, margins, surface, discharge, and duration of lesions were also recorded. Patients with the age above 18 years were included in this study. Patients not willing to part of survey were excluded. The study was conducted for duration of 1 month. Participation in the study was voluntary and no incentives was provided to the participants. Data were entered into an Excel spreadsheet. Categorical data are presented as frequency (n) and percentage (%). A Chi-square test was performed to assess the statistical significance of this association. Analysis was performed using statistical analysis software (SPSS, version 22). P-values less than 0.05 were considered statistically significant.

RESULTS:

Table 1. Demographic details of the subjects

Parameters		Frequency (n)	Percent (%)
Gender	**Female**	915	36.6
	Male	1585	63.4
Age	**18-24**	515	20.6
	25-34	705	28.2
	35-44	515	20.6
	45-54	365	14.6
	55-64	240	9.6
	≥65	160	6.4
Smoking Tobacco	**Bidi**	20	0.8
	Cigar	5	0.2
	Cigarette	160	6.4
Smokeless Tobacco	**Gutkha**	320	12.8
	Khaini	435	17.4

	Pan masala	85	3.4
	Gul	5	0.2
	Zarda	5	0.2
Alcohol	**Occasionally**	5	0.2
	Sometimes	65	2.6
	Weekly	5	0.2
Oral Mucosal lesion	**Absent**	1550	62
	Present	950	38

The table presents demographic information (Gender, Age), substance use patterns (Smoking Tobacco, Smokeless Tobacco, Alcohol), and the presence of Lesions within the studied population.

Observations:

- **Gender Distribution:** The male population (63.4%) significantly high than the female population (36.6%) in the study.
- **Age Distribution:** Most participants fall within the younger to middle-aged adult groups, with the highest frequencies in the 25-34 (28.2%) and 18-24 (20.6%) age ranges.
- **Smoking Tobacco:** Cigarette smoking is the most common form of smoking tobacco (6.4%), followed by Bidi (0.8%) and Cigar (0.2%), though overall smoking tobacco use appears relatively low.
- **Smokeless Tobacco:** Smokeless tobacco use is considerably more prevalent than smoking tobacco. "Khaini" (17.4%) and "Gutkha" (12.8%) are the most frequently used forms, followed by "Pan masala" (3.4%). "Gul" and "Zarda" are rarely used (0.2% each).
- **Alcohol Consumption:** Alcohol consumption is generally low, with "Sometimes" being the most reported frequency (2.6%), followed by "Occasionally" and "Weekly" (0.2% each).
- **Lesion Presence:** A substantial portion of the study population (38%) presents with lesions, while 62% are absent of lesions. This suggests a notable prevalence of lesions within the studied group.

Fig. 1.a. Gender wise distribution of subjects

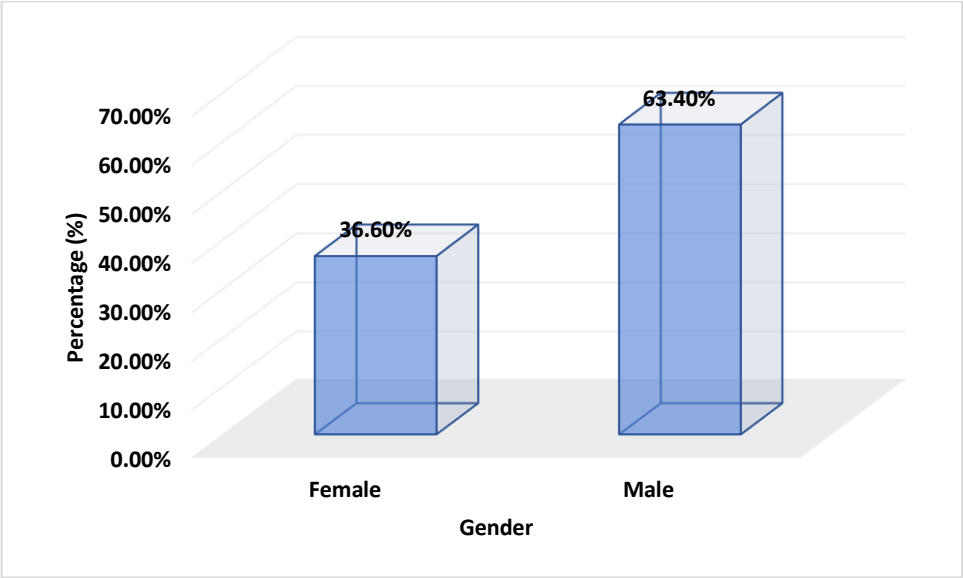

Fig. 1.b. Age wise distribution of subjects

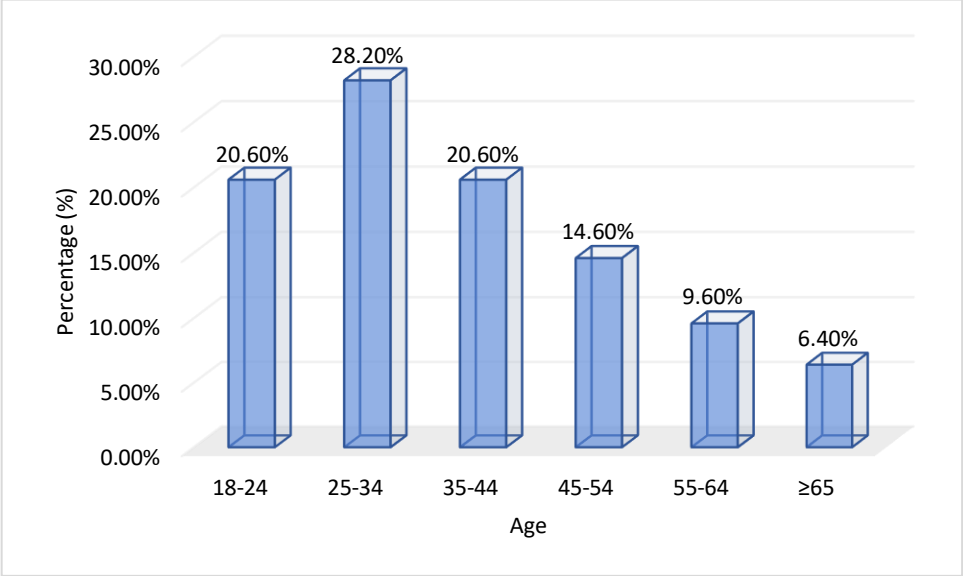

Table 2. Association between Tobacco use and Oral Mucosal Lesions

Parameters		Non- Tobacco User		Tobacco User		Total		Chi-square, df, P value
		n	%	n	%	n	%	
Oral Mucosal lesion	**Absent**	1360	54.40%	190	7.60%	1550	62.00%	148.603, 1, 0.0001
	Present	335	13.40%	615	24.60%	950	38.00%	
Total		1695	67.80%	805	32.20%	2500	100.00%	

Observation:

Overall, Tobacco Use: Out of 2500 individuals, 805 (32.20%) are tobacco users, while 1695 (67.80%) are non-tobacco users.

Overall Mucosal Lesion Presence: 950 individuals (38.00%) have mucosal lesions, whereas 1550 individuals (62%) do not.

Mucosal Lesions in Non-Tobacco Users: Among non-tobacco users (total 1695), 1360 individuals (54.40% of the total study population) do not have mucosal lesions. However, 335 non-tobacco users (13.40% of the total study population) do have mucosal lesions, indicating that mucosal lesions can occur even in individuals who do not use tobacco.

Mucosal Lesions in Tobacco Users: Among tobacco users (total 805), a significantly higher proportion, 615 individuals (24.60% of the total study population), have mucosal lesions. Only 190 tobacco users (7.60% of the total study population) do not have mucosal lesions.

Comparison and Relationship:

The percentage of individuals with mucosal lesions is notably higher among tobacco users (615 out of 805, which is approximately 76.40% of tobacco users have lesions) compared to non-tobacco users (335 out of 1695, which is approximately 19.76% of non-tobacco users have lesions). This strongly suggests a positive association between tobacco use and the presence of mucosal lesions. Tobacco users are much more likely to have mucosal lesions than non-tobacco users. In summary, while mucosal lesions can be present in non-tobacco users, there is a clear and strong correlation indicating that tobacco users have a substantially higher prevalence of mucosal lesions compared to non-tobacco users.

The table presents the association between the habit of tobacco use and the presence of oral mucosal lesions. A Chi-square test was performed to assess the statistical significance of this association. The results yielded a Chi-square value of 148.603 with 1 degree of freedom (df), and a P-value of 0.0001. The extremely low P-value (<0.0001) indicates a highly statistically significant association between tobacco use and the presence of oral mucosal lesions. This suggests that the observed difference in lesion presence between tobacco users and non-tobacco users is not due to random chance, and there is a strong relationship between tobacco use and the occurrence of oral mucosal lesions. Specifically, individuals who use tobacco are significantly more likely to have oral mucosal lesions compared to non-tobacco users.

Fig. 2. Comparison of oral mucosal lesion presence between tobacco users and non-tobacco users

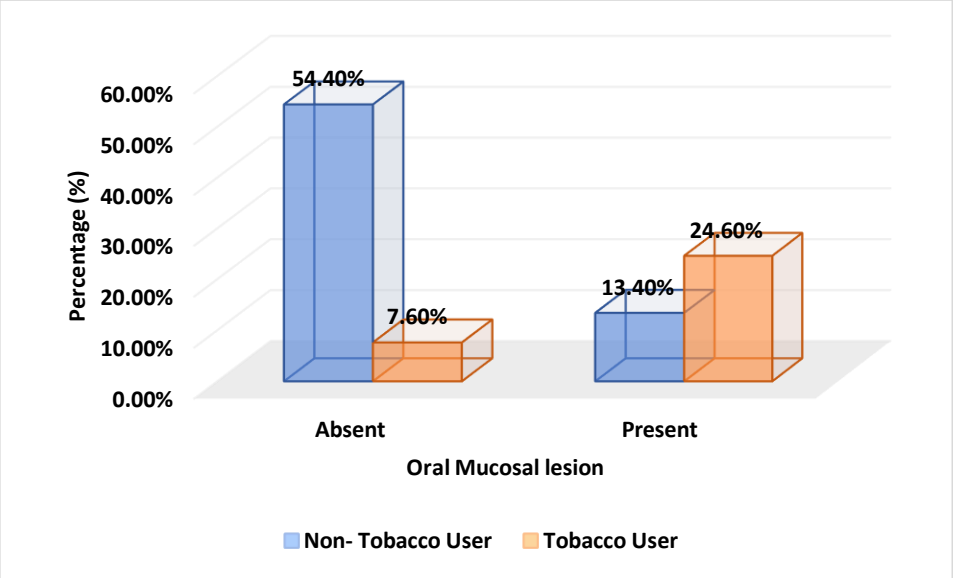

Table 3.a. Prevalence of oral mucosal lesion (OMLS) in non-tobacco users

Oral Mucosal lesion (OMLs)		Non- Tobacco User (N=1695)		
		n	Overall prevalence (%)	Prevalence among OMLs (N=355) (%)
Bone	Ameloblastoma	5	0.29%	1.41%
	Dentigerous cyst	5	0.29%	1.41%
	OKC	5	0.29%	1.41%
Infectious	Candidiasis	15	0.88%	4.23%
	Herpes labialis	15	0.88%	4.23%
	Angular cheilitis	0	0.00%	0.00%
	Herpes zoster	5	0.29%	1.41%
Malignancy	Carcinoma	0	0.00%	0.00%
	Squamous cell carcinoma	0	0.00%	0.00%
	Ulceroproliferative growth	5	0.29%	1.41%
Mucocutaneous	Pemphigus vulgaris	5	0.29%	1.41%

OPMDs	Leukoplakia	0	0.00%	0.00%
	Lichen planus	85	5.01%	23.94%
	OSMF	0	0.00%	0.00%
	Pigmented Lichen planus	20	1.18%	5.63%
	Pre-leukoplakia	0	0.00%	0.00%
	Verrucous leukoplakia	0	0.00%	0.00%

Oral Mucosal lesion (OMLs)		Non- Tobacco User (N=1695)		
		n	Overall prevalence (%)	Prevalence among OMLs (N=355) (%)
Salivary gland disorders	Mucocele	10	0.59%	2.82%
	Sialolithiasis	15	0.88%	4.23%
Soft tissue	AV malformation	5	0.29%	1.41%
	Squamous papilloma	0	0.00%	0.00%
	Traumatic fibroma	20	1.18%	5.63%
Tobacco-related	Smoker's palate	0	0.00%	0.00%
	Smoker's melanosis	0	0.00%	0.00%
	Tobacco pouch keratosis	0	0.00%	0.00%
Tongue	Geographic tongue	15	0.88%	4.23%
	Glossitis	0	0.00%	0.00%
Typical gingival	Gingival fibromatosis	5	0.29%	1.41%
	Pyogenic granuloma	35	2.06%	9.86%
Ulcer	Minor apthous ulcer	30	1.77%	8.45%
	Non healing ulcer	5	0.29%	1.41%
	Traumatic ulcer	20	1.18%	5.63%
	Herpetic ulcer	5	0.29%	1.41%
	Ulcerative gingivitis	5	0.29%	1.41%

Oral Mucosal lesion (OMLs)		Non- Tobacco User (N=1695)		
		n	Overall prevalence (%)	Prevalence among OMLs (N=355) (%)
Others	Burning mouth syndrome	5	0.29%	1.41%
	Epulis fisturatum	5	0.29%	1.41%
	Exophytic proliferative growth	0	0.00%	0.00%
	Osteomyelitis in left angle of mandible	5	0.29%	1.41%
	Peripheral giant cell granuloma	5	0.29%	1.41%

Table 3.b. Prevalence of Normal variants in non-tobacco users

Normal variants	Non- Tobacco User (N=1695)	
	n	Overall prevalence (%)
Frictional keratosis	5	0.29%

Table 4.a. Prevalence of Oral Mucosal lesion (OMLs) in tobacco users

Oral Mucosal lesion (OMLs)		Tobacco User (N=805)		
		n	Overall prevalence (%)	Prevalence among OMLs (N=680) (%)
Bone	Ameloblastoma	0	0.00%	0.00%
	Dentigerous cyst	0	0.00%	0.00%
	OKC	0	0.00%	0.00%
Infectious	Candidiasis	0	0.00%	0.00%

	Herpes labialis	0	0.00%	0.00%
	Angular cheilitis	5	0.62%	0.74%
	Herpes zoster	0	0.00%	0.00%
Malignancy	**Carcinoma**	5	0.62%	0.74%
	Squamous cell carcinoma	5	0.62%	0.74%
	Ulceroproliferative growth	60	7.45%	8.82%
Mucocutaneous	**Pemphigus vulgaris**	0	0.00%	0.00%
OPMDs	**Leukoplakia**	110	13.66 %	16.18%
	Lichen planus	15	1.86%	2.21%
	OSMF	145	18.01%	21.32%
	Pigmented Lichen planus	0	0.00%	0.00%
	Pre-leukoplakia	10	1.24%	1.47%
	Verrucous leukoplakia	5	0.62%	0.74%
	Erosive lichen planus	0	0.00%	0.00%

Oral Mucosal lesion (OMLs)		**Tobacco User (N=805)**		
		n	**Overall prevalence (%)**	**Prevalence among OMLs (N=680) (%)**
Salivary gland disorders	**Mucocele**	0	0.00%	0.00%
	Sialolithiasis	0	0.00%	0.00%
Soft tissue	**AV malformation**	0	0.00%	0.00%
	Squamous papilloma	5	0.62%	0.74%
	Traumatic fibroma	0	0.00%	0.00%

Tobacco-related	**Smoker's palate**	30	3.73%	4.41%
	Smoker's melanosis	5	0.62%	0.74%
	Tobacco pouch keratosis	240	29.81%	35.29%
Tongue	**Geographic tongue**	0	0.00%	0.00%
	Glossitis	10	1.24%	1.47%
Typical gingival	**Gingival fibromatosis**	0	0.00%	0.00%
	Pyogenic granuloma	0	0.00%	0.00%
Ulcer	**Minor apthous ulcer**	0	0.00%	0.00%
	Non healing ulcer	20	2.48%	2.94%
	Traumatic ulcer	5	0.62%	0.74%
	Herpetic ulcer	0	0.00%	0.00%
	Ulcerative gingivitis	0	0.00%	0.00%

Oral Mucosal lesion (OMLs)		**Tobacco User (N=805)**		
		n	**Overall prevalence (%)**	**Prevalence among OMLs (N=680) (%)**
Others	**Burning mouth syndrome**	0	0.00%	0.00%
	Epulis fisturatum	0	0.00%	0.00%
	Exophytic proliferative growth	5	0.62%	0.74%
	Osteomyelitis in left angle of mandible	0	0.00%	0.00%
	Peripheral giant cell granuloma	0	0.00%	0.00%

Table 4.b. Prevalence of Oral Mucosal lesion (OMLs) in tobacco users

Normal variants	Tobacco User (N=805)	
	n	Overall prevalence (%)
Frictional keratosis	35	4.35%

DISCUSSION

The prevalence of oral and maxillofacial diseases varies depending on the region, country, and data source. An oral lesion is any abnormal alteration in colour, surface aspect, swelling, or loss of integrity of the oral mucosal surface. Although a proportion of OMLs are benign and require no active treatment, some may present with significant pathology. Besides, OMLs can interfere with the daily quality of life in affected patients. Oral lesions are usually mystified by their aetiology, which may be viral, fungal, bacterial, related, or even without definite aetiology. Understanding the prevalence of oral mucosal lesions may facilitate the prevention, appropriate diagnosis, and prompt treatment of the disease

Oral mucosal conditions and diseases may be caused by infectious diseases (bacterial or viral), systemic diseases (metabolic or immunologic), drug-related reactions, or lifestyle factors such as the consumption of tobacco, betel quid, or alcohol.

Epidemiological studies provide valuable information on the prevalence, spread, and severity of diseases. The importance of epidemiological studies stems from the fact that diseases do not occur or spread equally across all populations and may be more prevalent in certain races, cultures, social -economic status, age groups, or gender. This is also true for oral lesions. Oral lesions can be considered a reflection of general health. Given the malignancy potential and possible implications of oral lesions, knowledge of the prevalence and epidemiological characteristics of these lesions is of great importance for maintaining general health.

The study results are categorised into two groups: habits-related lesions and non-habits-related lesions. Out of 2500 subjects, 1585 were males and 915 were females in the study. The maximum number of participants were in the age group of 25-34 years. Habit of Cigarette smoking was found in 160 subjects. In smokeless form, Khaini in 435 and Gutkha habit in 320 subjects were seen.

Oral mucosal lesions were present in 950 of which 335 lesions were non-tobacco users and 615 subjects were tobacco users. Tobacco pouch keratosis was the most common oral mucosal lesion and was seen in 240 subjects (29.81%) followed by OSMF in 145 (18.01%) among tobacco users. Lichen planus was the most common oral mucosal lesion and was seen in 85 subjects (5.01%) among non-tobacco users.

In a review study by Mumcu et al., it was reported that the most prevalent oral condition in the Spanish population is coated tongue, in American adults is chewing tobacco

lesion, in Brazil is focal epithelial hyperplasia, in South Africa, Argentina, and Mexico is labial pits, and in Turkey is oral melanosis.

Delavarian et al. reported that the most common oral condition in a normal population in Mashhad, Iran, was coated tongue. In a study by Fleishman et al., the most commonly observed condition was the vesiculobullous disease. Tayebali et al. reported that the most common oral conditions in their population were pigmentation, white and red lesions, and exophytic lesions, in that order. In a study by Saintrain et al., where red and white lesions were counted separately, the most common lesions were reported to be red lesions, ulcers, and white lesions, in that order.

Sujatha S. Reddy et al reported that the most common lesion was CM (59.5%) followed by SMF (22.8%), leukoplakia (8%), LR (6.5%), OC (2.7%), and LP (0.5%). Kaveri Hallikeri et al reported that the prevalence of oral habit was found to be much higher in males as compared to females. Prevalence of OMLs between both sexes observed were PMDs such as OSF, leukoplakia, lichen planus, erythroplakia, and OSCC 26.9, 10.35, 5.5, 0.66, and 9.94%, respectively, in males. Other mucosal changes such as pan encrustation hyperkeratosis were also recorded.

In conclusion, the present study establishes the prevalence of OMLs in patients attending the institution. The study data can serve as a useful tool in educating the patients with deleterious habit of chewing form of tobacco. A regular and frequent examination of oral cavity is emphasized among the tobacco habitual. There is a strong relationship between tobacco use and the occurrence of oral mucosal lesions.

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Conflicts of interest

There are no conflicts of interest.

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