

Research Article

Frequency and Distribution of Common Oral Mucosal Lesions (Aphthous Ulcers, Geographic Tongue) Among Dental Patients

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Abstract

Oral mucosal lesions (OMLs) can show different patterns based on demographics, oral hygiene, and other risk factors. OMLs need to be detected early for diagnosis and management for the risk of prognosis. This cross-sectional study investigated the occurrence of oral mucosal lesions with an emphasis on aphthous ulcers and geographic tongue, in patients of a tertiary care dental hospital with a dental outpatient population. 300 patients above the age of 18-35 were targeted in this study in a time span of six months with the use of non-probability, consecutive sampling. The data collection methods involved a clinical expert examination and the development of a survey tool based on the (WHO) guide to the oral health survey 2013. The data were analyzed statistically by the application of descriptive and inferential statistics using SPSS version 26.0. The study reported the presence of oral mucosal lesions in 160 (53.3%) of the participants, while 140 (46.7%) were found to be lesion free. The study cited the presence of aphthous ulcers (16.3%) and geographic tongue (11.7%) as the most common lesions, while traumatic ulcer (8.0%), fissured tongue (6.7%), oral candidiasis (4.3%), frictional keratosis (3.0%), leukoplakia (2.0%) and lichen planus (1.3%) were noted to be less common lesions. The lesions in the tongue (36.3%) and buccal mucosa (26.2%) were frequently found. The study also noted the prevalence of oral mucosal lesions to be higher in the female population in comparison to the male population ($p = 0.039$). This study observed the frequent occurrence of common oral mucosal lesions in the young adult dental patient population. The study also noted the frequent occurrence of aphthous ulcers and geographic tongue. Every dental visit should include a routine oral mucosal examination for the purpose of early detection and better patient care.

Keywords: Lesions, Oral Mucosal, Dental, Alcer, Tongue.

INTRODUCTION

Good oral health is necessary for good overall health and helps people socialize without feeling self-conscious or being in pain. There are many types of Oral Mucosal Lesions (OMLs). Some are benign and self-limiting, while others can be malignant. OMLs are lesions on the oral mucosa that can be the result of inflammation, infection, trauma, etc. OMLs can be very challenging to diagnose because of the many causes and the frequent overlap in the symptoms of lesions. WHO estimates that oral diseases affect about 3.5 billion people, and due to a lack of preventative

care, oral health issues are a real concern for developing countries (1, 2).

OMLs are important in oral medicine and often are seen in routine dental examinations. There are several factors that can lead to a change in the prevalence of OMLs, including, but not limited to, ethnicity, age, lifestyle, gender, and socioeconomic status. The many differences in sample sizes, study designs, and ways to diagnose have led to a wide variance in the prevalence of OMLs. There are many reasons people seek dental care and current studies show that OMLs have the highest prevalence, demonstrating the importance of a thorough

examination of dental tissues during every dental appointment (3, 4).

One of the most commonly diagnosed OMLs is recurrent aphthous ulcers, and they are the most common ulcerative condition. They form shallow, painful, and recurring ulcers with a red halo and a yellowish-gray pseudomembrane. Factors like genetics, emotional stress, nutritional deficiencies, and food allergies have all been linked to the presence of these ulcers. These even impede one's oral hygiene causing a deterioration in one's quality of life. Geographic tongue, or benign migratory glossitis, is the appearance of alternating white and red areas on the top surface of the tongue. The red areas are devoid of papillae and at the edges of the white areas. It is a benign and migratory condition. Geographic tongue is often diagnosed based on observation and physical examination and imposes no risk to the patient. There is no need for testing. The condition is usually asymptomatic. Some patients experience a burning sensation or discomfort when they eat spicy, acidic, or hot food. The prevalence of geographic tongue in the general population is reported to be between 1% and 3%. There are significant variations in different geographic and ethnic populations. Thorough examination and accurate documentation of oral mucosal lesions are vital elements of effective dental practice. There are limited studies and data available on oral mucosal lesions and their prevalence in many developing countries. The distribution of common oral lesions among dental patients can aid the development of enhanced diagnostic, preventive, and oral healthcare services (2,3).

Oral lesions were shown to not be merely localized conditions and can signify systemic disease, malnutrition, immunological conditions, or adverse drug reactions. As a result, the examination of oral tissues becomes imperative after a dental examination. Lesions like recurrent aphthous stomatitis, oral candidiasis, leukoplakia, and lichen planus may warrant the further investigation of related conditions to determine their potential for malignancy. Dentists may identify lesions early and, in turn, improve the outcomes for their patients through early diagnosis, treatment, and the initiation of a referral pathway (7,8).

Epidemiological studies conducted in hospitals become a valuable resource for the study of the distribution and frequency of oral lesions in a particular population. This type of research allows practitioners to become aware of the disease patterns and may provide a foundation

for developing preventive and educational programs for those populations identified to be at the greatest risk. Moreover, an understanding of the distribution of lesions aids in formulating a differential diagnosis during the course of an oral examination. Epidemiological studies become vital to developing new health care approaches to countries that lack health care services (3,9).

Recurrent aphthous stomatitis has reported prevalence rates between 5% and 25% in the population and remains the most common ulcerative condition of the oral mucosa. It has been observed that even though the disease generally resolves on its own, it can cause many issues that affect both the function of the mouth and the quality of life. In addition, geographic tongue is seen in about 3% of the world's adult population and is a generally harmless tongue condition that causes inflammation and results in lesions that move on the tongue. Even though these are normally not an issue, patients will commonly go to the dentist due to the pain or discomfort or due to the concern of the appearance of these lesions (10,11).

Because of the high rate of lesions on the oral mucosa that are seen in practice, and due to the high impact they have on the oral and general health of patients, a constant search is crucial. Common lesions on the oral mucosa that are seen frequently among dental patients provide relevant information that is important for the clinician, the researcher, and the public health worker. This evidence will help improve oral health in the general population (2,7).

METHODOLOGY

A cross-sectional study focused on the lesions of the oral mucosa in the Outpatient Department of a tertiary care dental hospital. It was limited to a period of six months, and specifically focused on aphthous ulcers and geographic tongue. All procedures followed the ethical principles of the Declaration of Helsinki. Prior to this study, the purpose and procedures were explained to all participants in order to obtain their written informed consent to participate.

Participant personal information was kept confidential. Participation was optional. The OpenEpi sample size calculator (Version 3.01) for prevalence studies estimates the required sample size for a 95% confidence level, 5% margin of error, and prevalence estimates from earlier studies. To enhance the study's statistical power, 300 participants were

included. Non-probability consecutive sampling was employed. This means patients were sampled consecutively from the targeted population's defined group. In this case, all eligible patients who visited the dental outpatient department during the designated study period were invited to participate.

Male and female participants were included aged between 18 and 35, who visited the dental outpatient department for either a dental examination or treatment, and who provided informed consent. The exclusion criteria were a history of oral malignancy; current patients undergoing chemotherapy or radiotherapy; patients with severe systemic diseases who would be unable to undergo an oral examination; patients who would be unable to open their mouths adequately for a clinical examination; and patients who declined to participate.

The principal investigator conducted the data collection and had prior training and calibration in clinical diagnosis of oral mucosal lesions. Calibration was done with guidance from a consultant of Oral Medicine and was done to achieve diagnosis consistency. Intra-examiner reliability was assessed by performing multiple examinations on a selected group of patients, which showed good agreement. To collect data in a uniform manner, a clinical examination form was designed following the guidelines of the World Health Organization (WHO) in the Oral Health Surveys (5th Edition, 2013). As a part of the clinical examination, data on age, gender, marital status, education level, and residence were collected.

An examination was performed on the participants following the standard procedures of infection control and using a dental chair with adequate illumination, disposable mouth mirrors, sterile gauze, and periodontal probes, if needed. All the participants were examined

for lesions of the oral mucosa, which could be on the lips and labial mucosa, buccal mucosa, tongue, floor of the mouth, gingiva, and both the hard and soft palates. Findings of lesions were based on their morphology, surface characteristics, color, size, and the anatomical location. Typical lesions that were found included oral lichen planus, leukoplakia, frictional keratosis, and oral candidiasis, which were diagnosed according to the described clinical diagnostic criteria in oral medicine reference texts. In cases where diagnosis was not clear, the participant was sent to the Oral Medicine Department to confirm the diagnosis prior to data entry.

The presence and type of oral mucosal lesions was the main outcome variable. The remaining variables included the site of lesions and the participants' demographics. The remaining variables included the site of lesions and the participants' demographics. All information was recorded in a data collection template immediately after the clinical assessment to reduce the risk of recall and transcription biases. The data collection templates were reviewed for completeness and accuracy on a daily basis prior to data collection in the electronic database.

The recorded data was organized and analyzed using the Statistical Package for Social Sciences (SPSS) version 26.0. Descriptive statistics were used to analyze the study variables. Gender, age groups, and education and residence status, as well as the types and sites of oral mucosal lesions, were categorical variables and were reported as frequency and percentages. The presence of oral mucosal lesions and the demographic variables were evaluated for association using the Chi-square test. In this regard, the threshold for statistical significance was set at a p-value of less than 0.05.

RESULTS

Table 1. Demographic Characteristics of the Study Participants (N = 300)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–21	82	27.3
	22–25	91	30.3
	26–30	74	24.7
	31–35	53	17.7
Gender	Male	136	45.3
	Female	164	54.7
Marital Status	Single	212	70.7
	Married	88	29.3
Educational Level	Secondary	64	21.3
	Intermediate	95	31.7

	Graduate	108	36.0
	Postgraduate	33	11.0
Residence	Urban	193	64.3
	Rural	107	35.7

Table 1 presents demographic data for all 300 participants in this research. The greatest number of participants were in the 22-25 year old age group (30.3%), and the second most represented age group was the 18-21 year old age (27.3%). There were more females

(54.7%) than males (45.3%), more participants were single (70.7%), had a relatively higher level of education (36.0%), and lived in the city (64.3%). Participants to this research were generally young, educated, and of adult age, and lived in the city.

Table 2. Frequency of Common Oral Mucosal Lesions among Participants (N = 300)

Oral Mucosal Lesion	Frequency (n)	Percentage (%)
Aphthous Ulcers	49	16.3
Geographic Tongue	35	11.7
Traumatic Ulcer	24	8.0
Fissured Tongue	20	6.7
Oral Candidiasis	13	4.3
Frictional Keratosis	9	3.0
Leukoplakia	6	2.0
Lichen Planus	4	1.3
No Oral Mucosal Lesion	140	46.7
Total	300	100.0

Table 2 shows how frequently certain lesions were identified in participants' oral mucosa. 160 (53.3%) had lesions while the remaining 140 (46.7%) were without lesions. Aphthous ulcers were the most numerically significant lesions (16.3%) and the others were: geographic

tongue (11.7%), traumatic ulcer (8.0%) and fissured tongue (6.7%). Oral candidiasis, frictional keratosis, leukoplakia and lichen planus were the remained of the identified lesions and were less frequently observed.

Table 3. Distribution of Oral Mucosal Lesions According to Age Group (N = 160*)

Age Group (Years)	n (%)
18-21	46 (28.8)
22-25	54 (33.8)
26-30	37 (23.1)
31-35	23 (14.3)
Total	160 (100.0)

The age groups shown in table 3 shows in which category participants with oral mucosal lesions fall. The most significant number of lesions was seen in the 22-25 year age cohort, at 33.8%, with the next most at 28.8% in the

18-21 year cohort. In older participants, the prevalence decreased. The least number of lesions were in the 31-35 year age cohort, at 14.3%.

Table 4. Distribution of Oral Mucosal Lesions According to Gender (N = 160)

Gender	Lesion Present n (%)	No Lesion n (%)	Total
Male	67 (49.3)	69 (50.7)	136
Female	93 (56.7)	71 (43.3)	164
Total	160	140	300

Table 4 shows the gender distribution of oral mucosal lesions. A greater number of females had oral mucosal lesions (56.7%) compared to

males (49.3%) and more males had no lesions. This means that in the current study, oral mucosal lesions were more common in females.

Table 5. Anatomical Site of Oral Mucosal Lesions (N = 160)

Site of Lesion	Frequency (n)	Percentage (%)
Tongue	58	36.3
Buccal Mucosa	42	26.2
Labial Mucosa	25	15.6
Gingiva	14	8.8
Floor of Mouth	8	5.0
Hard/Soft Palate	7	4.4
Lips	6	3.7
Total	160	100.0

Table 5 shows the location of oral mucosal lesions. The lesions affected the tongue most frequently (36.3%) and the buccal mucosa (26.2%) and labial mucosa (15.6%) were affected as well. Lesions that involved the

gingiva, floor of mouth, palate, and lips were less frequent. The tongue and buccal mucosa were the most frequent sites of oral mucosal lesions.

Table 6. Association between Gender and Presence of Oral Mucosal Lesions (Chi-Square Test)

Variable	Lesion Present n (%)	No Lesion n (%)	χ^2	p-value
Male (n=136)	67 (49.3)	69 (50.7)		
Female (n=164)	93 (56.7)	71 (43.3)	4.28	0.039
Total (N=300)	160 (53.3)	140 (46.7)		

Participants with at least one oral mucosal lesion

Table 6 shows findings on gender and oral mucosal lesions. More females in the study reported lesions (56.7%) compared to males (49.3%). Results of a Chi-square test show a significant association between gender and oral mucosal lesions ($\chi^2 = 4.28$, $p = 0.039$). It may be possible to say gender was significantly associated with reporting oral mucosal lesions.

DISCUSSION

This paper examined the frequency of specific oral mucosal lesions in dental patients aged 18-35. 53.3% of participants had oral mucosal lesions. This shows the presence of lesions is common in everyday dental practice. Since the sample was taken from a hospital, the prevalence of lesions is likely to be much greater than in a sample from the community, as patients who seek hospital care likely have more severe or symptomatic cases of oral lesions than patients in the community. Many of the hospital-based epidemiological studies have shown that dental patients also present with a variety of oral mucosal lesions (12). In this study, the most common oral mucosal lesions were aphthous ulcers, with a prevalence of 16.3%. This is consistent with studies that describe recurrent aphthous stomatitis as common oral mucosal lesions encountered in the clinic and other studies that describe

recurrent aphthous ulcers as the most common oral mucosal lesions(13).

The second most common lesion was geographic tongue, with a prevalence of 11.7%. While the prevalence of this study is greater than most studies, variations may be altered due to ethnicity, age, diagnosis, criteria, and other factors. A recent Pakistani survey of tongue lesions described geographic tongue as one of the most common tongue irregularities. This finding further highlights the necessity of including tongue examination as part of a dental check-up (13).

In the current study, tongue and buccal mucosa lesions were the most common. Similar findings have been described in other studies. Lesions of a traumatic, inflammatory, and ulcerative nature most commonly involve these sites as a result of their exposure to constant irritation and to local factors of the surrounding environment. This justifies the importance of the careful examination of these sites during a dental check-up for the early identification and management of oral mucosal disorders (14).

In terms of the frequency of lesions of the oral mucosa, females had a higher frequency than males, and this difference was statistically significant ($p = 0.039$). Similar differences have been noted in other studies, with the explanation for this difference being factors such as hormonal situations, psychology and social related factors, the way females approach health care and take a more proactive

role, and even some factors of the immune system. However, the other studies have shown that the relationship of gender to oral mucosal diseases is not the same in all populations, and more research is needed that goes beyond single center studies (15).

Considering all the findings of the present study, it is clear that oral mucosal examination should be part of a dental check-up. Simple lesions of the oral mucosa may, in some cases, be a warning sign of a more serious underlying condition. In these situations, the patient should be immediately referred for a more detailed examination. The aim of future studies should be to widen the sample and the study population in order to establish more accurate epidemiological data in this field and to improve preventive oral health care (13).

CONCLUSION

This research identified the prevalence of oral mucosal lesions in dental patients aged 18–35 in this region. More than 50% of the sample population had at least one oral mucosal lesion. The most frequently identified lesion was an aphthous ulcer, followed by geographic tongue. Participants in this study frequently exhibited lesions of the tongue and the buccal mucosa. In view of the study's findings, the oral mucosa should be examined as part of each routine dental visit. This will enhance early identification of lesions and improve oral health.

Limitations of Study

The cross-sectional design of this study did not permit the assessment of the association of the risk factors with the oral mucosal lesions. This study was conducted in one tertiary care dental hospital and the limited age range of participants also restricts the external validity of the study. This study also had the absence of histopathological confirmation of the lesions that were diagnosed, and no other supporting data to enhance the findings of this study.

Future Suggestions

Subsequent studies should be conducted with a larger sample, multi-centring in order to obtain broader epidemiological data, and be designed as longitudinal studies to assess the risk factors, and the prevalence and incidence of oral mucosal lesions. Incorporating available histopathological assessments and advanced clinical diagnostic assays may enhance the preventive and management strategies in this population.

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