



Prevalence of Oral Mucosal Lesions among East Godavari Sample Population - A Descriptive Study

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Received: February 07, 2023

Published: February 25, 2023

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Abstract

Background: The oral mucosa protects the mouth from trauma, pathogens, and carcinogenic agents. It can be affected by a wide range of conditions, some of which are harmless while others cause complications. Identification and treatment of these lesions are critical components of overall oral health care.

Aim: The present study was conducted to evaluate the prevalence of oral mucosal lesions among East Godavari sample population.

Materials and Methods: A clinical descriptive proforma based study was conducted among the patients visiting the Department of Oral Medicine and Radiology, East Godavari, Andhra Pradesh, India for a period of two years. Intra oral examination of the soft tissues was carried out for the presence of oral mucosal alterations. The obtained findings were tabulated and performed statistical analysis using SPSS software version 23.

Results: Among 37,744 subjects participated in the study, OML were observed in 14.6% subjects. The most common lesions were linea alba 1922 (5%) followed by physiological pigmentation 1098 (2%), smoker's melanosis 586 (1.5%), smokers palate 330 (0.8%), frictional keratosis 304 (0.8%), oral submucous fibrosis (0.1%), leukoplakia 272 (0.7%), traumatic fibroma 76 (0.2%), lichen planus 38 (0.1%) & miscellaneous 180 (0.4%).

Conclusion: The increased frequency of oral mucosal changes is associated with increased age, habits and medical history of the subjects. Periodic examinations and evaluation of mucosal lesions aid in demographic and geographic distribution.

Keywords: Oral Mucosal Alterations; Oral Lesions; Prevalence

Introduction

An oral mucosal lesion (OML) is defined as any abnormal change in the colour, surface, swelling, or integrity of the oral mucosal surface. OMLs can impair patients' daily quality of life by interfering with mastication, swallowing, and speech, as well as causing symptoms of burning, irritation, and pain [1]. A correct diagnosis is the first step in proper clinical management of a patient with an oral

lesion. As a result, oral soft tissue examination is critical and should be performed methodically [2].

Furthermore, oral mucosal lesions are caused by poor oral hygiene, sharp teeth, and poorly fitting dentures. Many factors can influence disease pattern, including patient awareness, lifestyle changes, and increased interest in oral health [3]. As the oral cavity

is frequently exposed to many factors like trauma, pathogens & carcinogenic agents, the oral mucosa becomes vulnerable for manifestations of several lesions like traumatic fibroma, frictional keratosis, smokers melanosis, smokers palate, leukoplakia, etc. The data on this context among East Godavari population, to the best of our knowledge is lacking and thus, the current study was conducted to determine the prevalence and types of OMLs in the general population of East Godavari, Andhra Pradesh, India.

Materials and Methods

The present study was carried out as a clinical descriptive proforma based study among the patients visiting the Department of Oral Medicine and Radiology, Lenora Dental College, East Godavari, Andhra Pradesh, India for a period of 2 years. The study protocol was approved by the institutional ethical committee following the Helsinki rule of declaration, and informed consent was obtained from the participants. The study included 37,744 subjects in total. Subjects who provided written informed consent to participate in the study and agreed to be clinically evaluated by oral examination were included in the study. Subjects who could not have an intraoral examination due to insufficient mouth opening, medically compromised, and who did not provide informed consent were excluded from the study.

Case history proforma was used to record the demographic information and the complete history. The general and physical examinations and thorough intraoral examination were performed using mouth mirrors under artificial illumination. Intraoral examination of the soft tissues was carried out for the presence of mucosal alterations like linea alba, physiological pigmentation, Fordyce’s granules, smokers melanosis, smokers palate, oral submucous fibrosis, frictional keratosis, leukoplakia, leukoedema, angular cheilitis, traumatic fibroma, smokeless tobacco pouch keratosis, candidiasis, herpes labialis, lichenoid reaction, geographic tongue, fissured tongue, lichen planus and miscellaneous. Normal variants, tobacco-related tongue lesions, potentially malignant disorders and oral malignancies, reactive lesions, inflammatory lesions, and pigmented lesions were the seven major groups of oral lesions. The recorded data was statistically analysed using Statistical Package for the Social Sciences version 23. The relationship between age and gender and oral mucosal disorders, as well as the prevalence of various oral mucosal lesions was determined by Chi-square test.

Results

The current study included 37,744 patients, and the prevalence of oral lesions in this study sample was 5514 (14.6%). Lesions were predominantly seen in males 67.5% than in females 32.4%

and in the age group of 35-44 years 31.5% out of which the most common lesions were linea alba 1922 (5%), physiological pigmentation 1098 (2%), smoker’s melanosis 586 (1.5%), smoker’s palate 330 (0.8%), frictional keratosis 304 (0.8%), oral submucous fibrosis 42 (0.1%), leukoplakia 272 (0.7%), leukoedema 58 (0.1%), angular cheilitis 58 (0.1%), traumatic fibroma 76 (0.2%), lichen planus 38 (0.1%) and miscellaneous 180 (0.4%); Smokeless tobacco pouch keratosis, Candidiasis, Herpes labialis, lichenoid reaction, geographic tongue, fissured tongue were negligible. Tobacco-related lesions were observed in 16.5% of the subjects, tongue lesions (0.3%), PMD and oral malignancies (6.4%), inflammatory lesions (1.5%), normal variants (59%), reactive lesions (6.8%), Pigmented lesions (11.9%). Table 1 shows the prevalence of OMLs according to clinical presentation, while Table 2 shows distribution of OMLs according to gender and age. A large number of lesions were found on the cheek/buccal mucosa, followed by the palatal region and vestibule (Table 3).

S. No	Condition	Frequency	Percentage
1	Mucosal alterations	5514	14.6
2	Linea alba	1922	5
3	Physiological pigmentation	1098	2
4	Fordyce’s granules	178	0.4
5	Smoker’s melanosis	586	1.5
6	Smoker’s palate	330	0.8
7	Frictional keratosis	304	0.8
8	Oral submucous fibrosis	42	0.1
9	Leukoplakia	272	0.7
10	Leukoedema	58	0.1
11	Angular cheilitis	58	0.1
12	Traumatic fibroma	76	0.2
13	Smokeless tobacco pouch	8	Negligible
14	Candidiasis	6	Negligible
15	Herpes labialis	20	Negligible
16	Lichenoid reaction	10	Negligible
17	Geographic tongue	12	Negligible
18	Fissured tongue	6	Negligible
19	Lichen planus	38	0.1
20	Others	180	0.4

Table 1: Distribution of oral mucosal lesions according to clinical presentation.

Tobacco related lesions	Sex		Age range			
	Male	Female	17-24	25-34	35-44	>44
Tobacco pouch keratosis	6	2	0	0	3	5
Smoker's palate	248	82	0	12	126	192
Smoker's melanosis	352	234	0	89	256	241
total	606	318	0	101	385	438
percentage	11%	5.8%	0	1.9%	7%	7.9%
Potentially malignant disorders and malignancies	Sex		Age range			
	Male	Female	17-24	25-34	35-44	>44
Leukoplakia	224	48	0	59	88	125
Lichen planus	26	12	5	10	11	12
OSMF	34	8	0	4	17	21
Carcinoma	3	2	0	0	2	3
Total	287	70	5	73	118	161
Percentage %	5.1%	1.2%	0.1%	1.3%	2.1%	2.9%
Normal variants	Sex		Age range			
	Male	Female	17-24	25-34	35-44	>44
Linea alba	1046	876	236	452	568	666
Fordyce's granules	106	72	26	43	59	50
Leukoedema	34	24	4	13	26	15
Total	1186	972	266	508	653	866
Percentage	21.5%	17.6%	4.8%	9.2%	11.8%	15.7%
Reactive lesions	Sex		Age range			
	Male	Female	17-24	25-34	35-44	>44
Traumatic fibroma	48	28	3	26	32	15
Frictional keratosis	167	137	8	16	187	93
Total	215	165	11	42	219	108
Percentage	3.8%	2.9%	0.1%	0.7%	3.9%	1.9%
Inflammatory lesions	Sex		Age range			
	Male	Female	17-24	25-34	35-44	>44
Angular cheilitis	22	36	8	16	19	15
Herpes labialis	15	5	10	4	3	3
Candidiasis	4	2	0	0	3	3
Total	41	43	18	20	25	21
Percentage	0.7%	0.7%	0.3%	0.3%	0.4%	0.3%
Tongue lesions	Sex		Age range			
	Male	Female	17-24	25-34	35-44	>44
Fissured tongue	4	2	2	0	0	4
Geographic tongue	5	7	4	3	3	2
Total	9	9	6	3	3	6
Percentage	0.1%	0.1%	0.1%	0.05%	0.05%	0.1%
Pigmented lesions	Sex		Age range			
	male	female	17-24	25-34	35-44	>44
Physiologic pigmentation	409	252	286	334	226	226
Percentage	12.4%	7.4%	4.5%	5.1%	6.05%	4.09%

Table 2: Distribution of oral mucosal lesions according to gender and age.

Site	Frequency	Percentage
Cheek/buccal mucosa	3152	57.1%
Vestibular region	856	15.5%
Tongue	326	5.9%
Lip/labial mucosa	252	4.5%
Palate	879	15.9%
Gingiva	49	0.8%

Table 3: Distribution of oral mucosal lesions according to location.

Discussion

Infectious diseases (bacterial or viral), systemic diseases (metabolic or immunologic), drug-related reactions, or adverse habits such as tobacco, betel quid, or alcohol consumption can cause oral mucosal conditions and diseases [4]. Oral mucosal lesions have been reported to affect 4.9% to 64.7% of people with various habits, depending on the population studied. These lesions can be caused by tobacco or betel nut use, infections, or as a result of trauma or prosthesis. [5] Patients with a middle-to-low socioeconomic status were included in the current study. In comparison to the general population, these factors may increase the prevalence of OMLs. Patil, *et al.* [4] discovered that 64% of patients had one or more oral mucosal lesions in their study. The prevalence of mucosal changes or lesions in the current study was 14.6%, which was lower than the findings of Mujica, *et al.* [5] and Espinoza, *et al.* [6] The overall prevalence rate of OML was 14.6% according to Bhatnager, *et al.* [7] 16.8% according to Cebeci, *et al.* [8] 15.0% according to Al Mobeeriek, *et al.* [9] and 11.33% according to Shivakumar, *et al.* [10] Among the 37744 patients, 5514 (14.6%) had oral mucosal changes. Oral lesions were found in 3756 males, accounting for 67.3% of total examined patients, and 1758 females, accounting for 31.6%. Patients ranged in age from 17 to 75 years. Oral lesions were more prevalent among males (67.3%) than females (31.6%), and there was a significant statistical difference between males and females which is in accordance to the study conducted by Kamala, *et al.* [2] in which there was male predominance (70.8%) in the study compared to females (29.1%), Castellanos, *et al.* [11] Patil, *et al.* [4] and Mehrotra, *et al.* [12] The higher prevalence of lesions in males could be attributed to the greater number of males examined, the higher prevalence of tobacco use by males, and the greater access they have to tobacco-sales outlets.

In our study, the most commonly affected age group was 45-44 years, which differs from the study conducted by Kamala, *et al.* [2]

in which the commonly affected age group was >44 years. Some studies have found that older patients have a higher prevalence of OMLs than younger patients. There is a link between oral mucosal disorders and aging. Infections, nutritional factors, metabolic changes, medication, prosthetic use, and habits of alcohol or tobacco use are all factors that contribute to changes in the oral mucosa as we age. The longer a habit is practiced, the longer it takes for lesions to develop [13].

Normal variants were the most common OMLs in the current study, diagnosed in 6.3% of the study population, followed by linea alba (5%), Fordyce granules (0.4%), and leukoedema (0.1%). Fordyce granules were more common on buccal and labial mucosa and were more common in men than in women.

Tobacco-related lesions were the second most common OMLs in this study (0.94%). The most common tobacco-related lesion was tobacco pouch keratosis (24%), followed by smoker's palate and lichenoid reactions to tobacco, which strongly correlates with the study conducted by Kamala, *et al.* [2] In India, the use of smokeless tobacco is very common. Tobacco or tobacco-containing products are chewed, sucked, applied to gums, or inhaled. Tobacco pouch keratosis is caused by habitually placing spit tobacco in the mucobuccal fold in the mandibular anterior or buccal regions where the mucosa is in direct contact with snuff or chewing tobacco. Mathew, *et al.* found 0.84% prevalence of tobacco pouch keratosis in their study. It was only observed in men, most likely due to men's chronic and heavy tobacco use. [14] Patil, *et al.* [4] found nicotinic stomatitis (43%) to be the most common lesion, whereas Mujica, *et al.* [5] and Cebeci, *et al.* [8] found denture stomatitis (18%) and anatomical changes (7%) as the most common lesions respectively. Tongue lesions were found in 0.32 % of all patients. Geographic tongue was the most commonly reported tongue lesion, seen in

0.21% of the study population, followed by fissured tongue, seen in 0.10% of the population, with a significant statistical difference between the genders.

1.1% of all patients showed the presence of potentially malignant disorders and oral malignancies, with the most common lesion being reported leukoplakia, which was seen in 0.7% of all patients, followed by oral submucous fibrosis, which was seen in 0.1% of all patients, oral lichen planus, which was seen in 0.1% of all patients, and others including lichenoid reactions, which were seen in 0.18% of all patients. In the study population, inflammatory lesions were insignificant. The most common lesion recorded was angular cheilitis (0.1%), with a statistically significant difference between genders. Pigmented lesions were found in 2% of all patients, with physiologic pigmentation being the most common.

1% of all patients had reactive lesions. Frictional keratosis was the most common reactive lesion, affecting 0.8% of the study population. Traumatic fibroma, which was observed in 0.2% of all patients, is another reactive lesion. Mechanical irritation from denture trauma, lip biting, calculus deposits, sharp margins of teeth and fillings, and long-term habits such as cheek biting and tongue thrusting are the most common causes of irritation fibromas [15]. They can occur anywhere in the oral cavity, but the buccal mucosa and lip were the most common sites in our study.

Normal anatomical variants and tobacco-related lesions were the most common OMLs found on the buccal mucosa in this study. In their study, Ali, *et al.* [13] found 49.1% of OMLs on the buccal mucosa, whereas Ghanaei, *et al.* [14] and Patil, *et al.* [4] found oral mucosal lesions on the tongue and hard palate, respectively.

Conclusion

“Oral health is Overall health”. As no patient with mucosal alterations was aware of the risk of whether the mucosal alterations affect the quality of life, routine examination of the oral cavity is valuable in identifying several oral diseases and establishing early diagnosis and accurate treatment to get a better prognosis.

It was concluded that the prevalence of oral mucosal lesions was 14.6% among the East Godavari population, which could be attributed to a lack of awareness or ignorance about oral health. The lesions were discovered in people with adverse habits such as smoking and smokeless tobacco. Males were found to have more oral mucosal lesions than females. As a result, screening and early

detection of such oral lesions in at-risk populations are required to reduce morbidity and mortality associated with oral cancer. The results of this study can be used to investigate the relationship between habits and oral lesions. More research of this type could aid clinicians in identifying high-risk populations.

Conflicts of Interest

Nil.

Bibliography

1. El Toum S., *et al.* “Prevalence and Distribution of Oral Mucosal Lesions by Sex and Age Categories: A Retrospective Study of Patients Attending Lebanese School of Dentistry”. *International Journal of Dentistry* 8.4 (2018): 1-6.
2. Kamala A Kamble., *et al.* “Prevalence of Oral Mucosal Lesions in Western Maharashtra: A Prospective Study”. *Journal of Indian Academy of Oral Medicine and Radiology* 29.6 (2017): 282-287.
3. Amen Faiq., *et al.* “Prevalence of Oral Mucosal Lesions in Patients Attending Oral Diagnosis Clinic at School of Dentistry, University OF Sulaimani”. *IOSR Journal of Dental and Medical Sciences* 9.14 (2015): 62-66.
4. Patil S., *et al.* “Prevalence and distribution of oral mucosal lesions in a geriatric Indian population”. *Canadian Geriatrics Journal* 18.2 (2015): 1114.
5. Mujica V., *et al.* “Prevalence of oral soft tissue lesions in an elderly Venezuelan population”. *Medicina Oral, Patologia Oral y Cirugia Bucal* 5.13 (2008): 270-274.
6. Espinoza I., *et al.* “Prevalence of oral mucosal lesions in elderly people in Santiago, Chile”. *Journal of Oral Pathology and Medicine* 8.32 (2003): 571-575.
7. Bhatnagar P., *et al.* “Prevalence study of oral mucosal lesions, mucosal variants, and treatment required for patients reporting to a dental school in North India: In accordance with WHO guidelines”. *Journal of Family and Community Medicine* 5.20 (2013): 4148.
8. Cebeci AR., *et al.* “Prevalence and distribution of oral mucosal lesions in an adult Turkish population”. *Medicina Oral, Patologia Oral y Cirugia Bucal* 6.14 (2009): 272277.

9. AlMobeeriek A and AlDosari AM. "Prevalence of oral lesions among Saudi dental patients". *Annals of Saudi Medicine* 8.29 (2009): 365368.
10. Shivakumar GC., *et al.* "Prevalence and site distribution of oral mucosal lesions in patients attending outpatient clinics of Oxford Dental College, Bangalore". *Journal of Indian Association of Public Health Dentistry* 7.15 (2010): 6973.
11. JL and DíazGuzmán L. "Lesions of the oral mucosa: An epidemiological study of 23785 Mexican Patients". *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology* 25.105 (2008): 7985.
12. Mehrotra R., *et al.* "Prevalence of oral soft tissue lesions in Vidisha". *BMC Research Notes* 15.3 (2010): 1-6.
13. Ali M., *et al.* "Prevalence of oral mucosal lesions in patients of the Kuwait University Dental Center". *Saudi Dental Journal* 11.25 (2013): 111118.
14. Ghanaei FM., *et al.* "Prevalence of oral mucosal lesions in an adult Iranian population". *Iranian Red Crescent Medical Journal* 24.15 (2013): 600604.
15. S Rohini., *et al.* "Prevalence of oral mucosal lesions among elderly population in Chennai: A survey". *Journal of Oral Medicine and Oral Surgery* 6.26 (2020): 1-5.