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INCIDENCE OF ORAL MUCOSAL LESIONS IN PATIENTS VISITING A PRIVATE DENTAL INSTITUTION

[1]Fahmida Binti Abd Rahman, [2]Vivek Narayan, [3]Uma Maheshwari

[1]Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Science, Saveetha University, Chennai, India Mail Id : 151501005.sdc@saveetha.com
[2]Senior Lecturer, Department of Oral Medicine and Radiology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Science, Saveetha University, Chennai, India Email: viveknarayan@saveetha.com
[3]Department of Oral Medicine and Radiology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Science, Saveetha University, Chennai 600077 Mail Id: umamaheshwaritn@saveetha.com

Corresponding author
Vivek Narayan

Senior Lecturer, Department of Oral Medicine and Radiology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Science, Saveetha University, 162, PH Road, Chennai 600077 Tamil Nadu, India Contact no : +919962866419 Mail Id: viveknarayan@saveetha.com

Article Info
Volume 82
Page Number: 17075 – 17084
Publication Issue:
January - February 2020

Article History
Article Received: *18 October 2019*
Revised: *14 November 2019*
Accepted: *22 December 2019*
Publication: *29 February 2020*

Abstract:
Oral mucosal lesions act as a protective barrier against various harmful external agents. A wide variety of lesions and conditions either harmless or with serious complications may attack oral mucosa. Therefore, proper identification and treatment of these lesions play an important role in total oral health. It is a retrospective study. A total of 41439 patient records between January 2019 and December 2019 were evaluated in this study. Data such as age, gender, types of oral mucosal lesions were retrieved from the patient records of the private dental institution, Chennai. The data are then tabulated in Microsoft Excel and subsequently transferred to SPSS software for statistical analysis. Chi square test was done and the association between age and gender with types of oral mucosal lesions were found to be statistically significant. The incidence of oral mucosal lesions were 3.79 per 1000 per year. Overall, leukoplakia (27%) had the maximum predilection followed by smokers palate (23%). Patients in the age group of 41 to 50 years were having the highest predilection for oral mucosal lesions (27.7%). Out of the 5 categories of oral mucosal lesions, potentially malignant disorders (60%) were highly prevalent in our study. This can be attributed to the increase in various adverse habits such as smoking, chewing tobacco, tobacco products and many more. More awareness about tobacco and its harmful effects must be promoted in order to prevent the rising numbers in potentially malignant disorders and oral cancer.

Keywords**:** *Incidence; Oral mucosal lesions; Potentially malignant disorders; Smoking; Tobacco products.*

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I. INTRODUCTION

Oral health has an important role in the quality of life for an individual. Oral mucosa functions as an effective protective barrier and commonly attacked by pathologies that can be either harmful or harmless. Oral lesions may lead to impairment in speech and inability to eat (Dhanuthai *et al.*, 2016). Certain lesions may cause halitosis, dysesthesia or xerostomia. Factors such as deleterious habits, irregular or sharp teeth, ill-fitting prosthesis and poor oral hygiene can also contribute to the formation of oral mucosal lesions (Fleishman, Peles and Pisanti, 1985). Furthermore, other factors such as infection from bacteria, fungi, viruses, parasites, changes in immune system, systemic diseases, aging and neoplasia may also lead to oral mucosal lesions (Reichart, 2000). Epidemiologic studies impart information regarding prevalence, incidence and severity of oral disease in a particular population. It is essential to have the knowledge regarding distribution, etiology, risk factors and pathogenesis of oral mucosal lesions. This provides a timely primary prevention, early diagnosis and prompt treatment (Bhatnagar *et al.*, 2013). Several studies have documented the total range of possible lesions. The epidemiologic literature on oral mucosal diseases is still somewhat scanty even though the World Health Organization (WHO)," Guide to epidemiology and diagnosis of oral mucosal disease and conditions had been published in 1980. A study from Sankaranarayanan et al (Sankaranarayanan *et al.*, 1997) showed that India has one of the highest rates of oral cancer varying from over 20 per 100,000 and less than 2 per 100,000 in the Middle East . Oral cancer accounts for almost 30% of all cancer in India. The diagnostic marker for oral cancer is by the expression of MMP-9 in the tissue (Venugopal and Uma Maheswari, 2016).

The prevalence of oral mucositis is usually gravitated to a type of cancer (Chaitanya *et al.*, 2017). Oral cancer can be caused by smokeless tobacco (Muthukrishnan and Warnakulasuriya, 2018). Oral hygiene is also important among the population to prevent any oral disease (Subashri and Uma Maheshwari, 2016). Salivary markers are noninvasive diagnostic markers for the detection of malignant transformation of oral potentially malignant disorders (OPMD) (Maheswari *et al.*, 2018). People who are exposed to an environmental background radiation such as ultraviolet rays may develop a PMD called actinic cheilosis (Muthukrishnan and Bijai Kumar, 2017). Malignancy is characterized by anaplasia, invasiveness, and metastasis (Misra *et al.*, 2015). Validated clinical competencies could provide a model for countries developing an advanced training curriculum for Oral Medicine (Steele *et al.*, 2015). Previously our team had conducted numerous studies which include radiographic study (Patil *et al.*, 2018), (Rohini and Jayanth Kumar, 2017), review studies (Chaitanya *et al.*, 2018), (Dharman and Muthukrishnan, 2016), (Subha and Arvind, 2019), clinical studies (Choudhury, 2015), (Muthukrishnan, Bijai Kumar and Ramalingam, 2016). Now we are focusing on retrospective studies, the aim of this study is to determine the incidence of oral mucosal lesions among patients attending a private dental institution in Tamil Nadu, Chennai.

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II. MATERIALS AND METHODS

This is a retrospective study. A total of 41439 case records of patients were evaluated between the period of January 2019 and December 2019. The study was conducted on patients between the ages less than 20 to 70 years and above. Case records which were complete and all types of oral mucosal lesions were included for the study. Incomplete case records were excluded. Convenient sampling method was used and photographic verification was done for cross verification of data. All the data was verified by a single trained examiner. The university set up of the study provided easy accessibility to data and provided a population with similar ethnicity. Ethical approval for this study was obtained from the institutional ethical committee (SDC/SIHEC/2020/DIASDATA/0619-0320). Data regarding age, gender, presence or absence of oral mucosal lesions were performed and the data was tabulated in Microsoft Excel. The data was then transferred to SPSS for statistical analysis. Independent variables included gender and age and dependent variables were the oral mucosal lesions. Chi square analysis was done to find out the association between variables.

III. RESULTS AND DISCUSSION

In the present study, the total sample studied was 41439 case records of patients and among which males were 24051and females were 17388. Among the 41439 patients 1647 of them had oral mucosal lesions. In the 1647 patients with oral mucosal lesions 1433 (3.46%) of them were males and 214 (0.52%) were females (figure 1). Chi square analysis was performed to find out the association between the gender of the patients and the oral mucosal lesions. The p value was found to be 0.00 which was less than 0.05 and this indicates the association between the gender and the presence of oral mucosal lesions is statistically significant (figure 1). This is similar to a study done by (Al-Maweri *et al.*, 2015) which reported that there was a significant difference ($p<0.05$) between males (80.3%) and females (69.6%). The incidence of the oral mucosal lesions in the present study was found to be 39.74 per 1000 per year or 3.97%. Males were more likely to have oral mucosal lesions compared to females. This finding is in accordance to studies from (Patil, Doni and Maheshwari, 2015), (Castellanos and Díaz-Guzmán, 2008), (Mehrotra *et al.*, 2010) and in contrast with (Al-Mobeeriek and AlDosari, 2009) which reported higher prevalence of oral mucosal lesions in females with a value of 57.7%, but study from (Corbet, Holmgren and Philipsen, 1994) reported that there was no difference in the prevalence between both gender. The higher prevalence in males in our current study could be due to higher numbers examined on males compared to females and due to higher prevalence risk habits among males than females.

The various oral mucosal lesions are categorised into 5 groups which are 1. Candida related oral lesions, 2. Potentially malignant disorders, 3. Reactive white lesions, 4. Pigmented lesions and 5. Ulcers and mucositis. Among these 5 groups, the most of the oral mucosal lesions were potentially malignant disorders (59.5%) which is followed by reactive white lesions (21.8%), ulcers and stomatitis (9.29%), candida related oral lesions (7.59%) and finally the least of the oral mucosal lesions were pigmented oral lesions (1.76%) (table 1). Among the potentially malignant disorders, leukoplakia had the highest predilection (27.81%) followed by smokers palate (22.59%), oral submucous fibrosis (OSMF) (6.86%),

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lichen planus (2.06%), erythroplakia (0.12%) and erythroleukoplakia (0.06%). This finding is similar to study from (Toum *et al.*, 2018) in which leukoplakia was the most common potentially malignant disorder (0.22%). In the category of reactive white lesions, tobacco pouch keratosis had the maximum predilection (14.94%) followed by frictional keratosis (5.22%) and chemical burn (1.64%). In ulcers and mucositis, traumatic ulcers had the highest presence (6.19%) followed by herpes labialis (2.98%) and mucositis (0.12%). Among the candida related lesions, denture stomatitis had the highest occurrence (3.89%) followed by angular cheilitis (1.7%), oral thrush (1.46%) and erythematous candidiasis (0.55%). Finally the least among the oral mucosal lesions is the pigmented lesions and in that only smokers melanosis was present (1.76%) (table 1). Based on study from (Feng *et al.*, 2015)the highest prevalence for OMLs was fissured tongue (3.15%), followed by recurrent aphthous ulcer (1.48%), traumatic ulcer (1.13%) and angular cheilitis (0.86%). On comparing the results of the current study with the results of the study by Feng et al, fissured tongue and recurrent aphthous ulcers were not seen in the present study and angular cheilitis was almost twice that of the value of Feng et al and traumatic ulcer was almost 5 times that of the result of Feng et al. These variations can be due to the sample size of both the studies. The present study had a bigger sample size than that of Feng et al and more number of oral mucosal lesions were observed in the present study.

In our study, certain types of oral mucosal lesions were more prevalent in a particular age group. Reactive white lesions were more prevalent in the age group of 20 years and less (0.61%). In all the other age groups potentially malignant disorders rank the highest (59.5%) among all the types of lesions. In contrast with findings from (Gambhir et al., 2011) which reported that potentially malignant disorders like leukoplakia, lichen planus were the second most common findings in the study (22.2%). This variation in the ranking of the potentially malignant disorders in the study by Gambhir et al and the current study could be because of the ethnicity and sample size. In the age groups 21 - 30 years, 31 - 40 years, 41 - 50 years and 51 - 60 years, the second highest was the reactive white lesions which were 6.74%, 6.5%, 5.34% and 1.88% respectively. Ulcers and mucositis were the second most common in the age groups 61 - 70 years and 70 years and greater and was found to be 1.03% and 0.12% respectively (figure 2). Chi square analysis was performed to find out the association between different age groups and different types of oral mucosal lesions. The p value was found to be 0.00 which was less that 0.05 and hence the association between age groups and the types of oral mucosal lesions are found to be statistically significant and oral mucosal lesions were more prevalent in the age group 41 - 50 years (figure 2). The finding is in contrast with a study from (Al-Maweri et al., 2015) which revealed that the highest prevalence of oral mucosal lesions was in the age of 60-69 years old (80.8%). The increase in incidence of OMLs with increased age can be attributed to the fact that older people had long standing oral habits compared to younger populations and this variation with the current study could be due to ethnicity of the population of (Al-Maweri et al., 2015).

Among the different genders, females had the highest predilection for candida related oral lesions (4.07%) followed by ulcers and mucositis (3.4%), potentially malignant disorders (3.28%) and reactive white lesions (2.25%). Males had the highest predilection

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for potentially malignant disorders (56.22%) followed by reactive white lesions (19.55%), ulcers and mucositis (5.95%), candida related oral lesions (3.52%) and the least occurrence was pigmented lesions (1.76%). Chi square analysis was done to find out the association between types of oral mucosal lesions and different genders. The p value was found to be 0.00 which is less than 0.05 and the association between types of oral mucosal lesions and gender was found to be statistically significant (figure 3). In the distribution of oral mucosal lesions based on gender, it can be observed that a study from (Gambhir et al., 2011) reported carcinomas and potentially malignant disorders had the highest prevalence (80%) among males in comparison to all types of lesions. On comparing the results of their study and the present study, the present study did not have any malignancies but males had the predilection for potentially malignant disorders which was in accordance with the study done by (Gambhir et al., 2011) and in their study females were more likely to be affected with soft tissue tumors and infections which was also partially in accordance with the present study where females were more affected for candida related oral lesions which is a fungal infection.

The present study had limitations such as the reliability of the findings and diagnosis present in the case records; this is because the findings are dependent on the skills of the oral diagnostician who made the initial clinical examination and diagnosis. This is again due to the retrospective type of the study design. All the lesions involved in the study are clinically diagnosed and no histopathological examination was performed. Future scope of the study can include a prospective and multicentric study design and patients habits and other etiological factors.

IV. CONCLUSION

Within the limit of our study, it can be concluded that male patients were commonly affected with oral mucosal lesions compared to female patients. The oral mucosal lesions were more prevalent in the 41 - 50 years age group and females had slightly higher occurrence of candida related oral lesions when compared to males. Among the various oral mucosal lesions, potentially malignant disorders were the highest in number.

AUTHOR CONTRIBUTIONS

Fahmida contributed towards data collection, data analysis, and manuscript preparation. Dr.Vivek Narayan contributed as a guide in performing this study.

CONFLICT OF INTEREST

There were no conflicts of interest declared by authors

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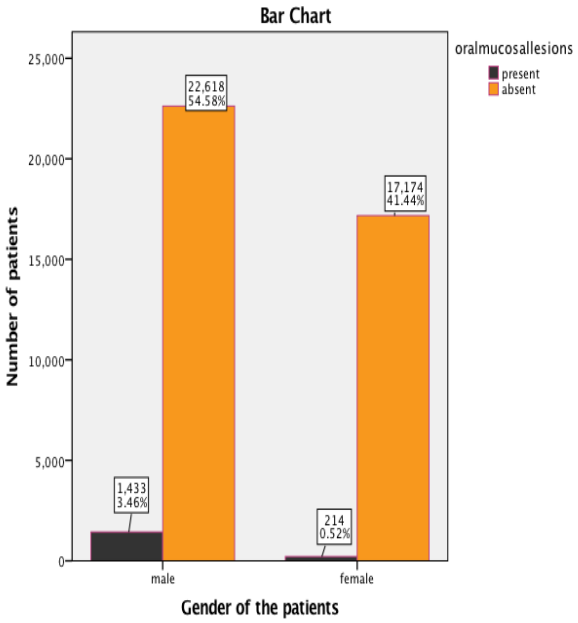

Figure 1 represents the association of gender of the patients with presence (black) and absence (orange) of oral mucosal lesions and the X axis represents gender of the patients and Y axis represents the number of patients. Chi square test was done and the association was found to be statistically significant as the p value= 0.00 (<0.05). Male patients were commonly affected with oral mucosal lesions compared to female patients.

Category	Oral lesions	Number, (%)	Total, (%)
Candida related oral lesions	Angular cheilitis	28 (1.70%)	125(7.59%)
	Oral thrush	24 (1.46%)	
	Denture stomatitis	64 (3.89%)	
	Erythematous candidiasis	9 (0.55%)	
Potentially malignant disorders	Leukoplakia	458 (27.81%)	980(59.50%)
	Lichen planus	34 (2.06%)	
	OSMF	113 (6.86%)	
	Smokers palate	372 (22.59%)	
	Erythroleukoplakia	1 (0.06%)	

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	Erythroplakia	2 (0.12%)	
Reactive white lesions	Chemical burn	27 (1.64%)	359(21.80%)
	Frictional keratosis	86 (5.22%)	
	Tobacco pouch keratosis	246 (14.94%)	
Pigmented lesions	Smokers melanosis	29 (1.76%)	29(1.76%)
Ulcers and mucositis	Traumatic ulcer	102 (6.19%)	153(9.29%)
	Mucositis	2 (0.12%)	
	Herpes labialis	49 (2.98%)	
Total		1647(100%)	

Table 1 depicts the different categories of oral mucosal lesions and the total number of the types of oral mucosal lesions in each category. The table reveals that potentially malignant disorders (59.5%) are the highest followed by reactive white lesions (21.8%), ulcers and mucositis (9.29%), candida related oral lesions (7.59%) and pigmented oral lesions (1.76%).

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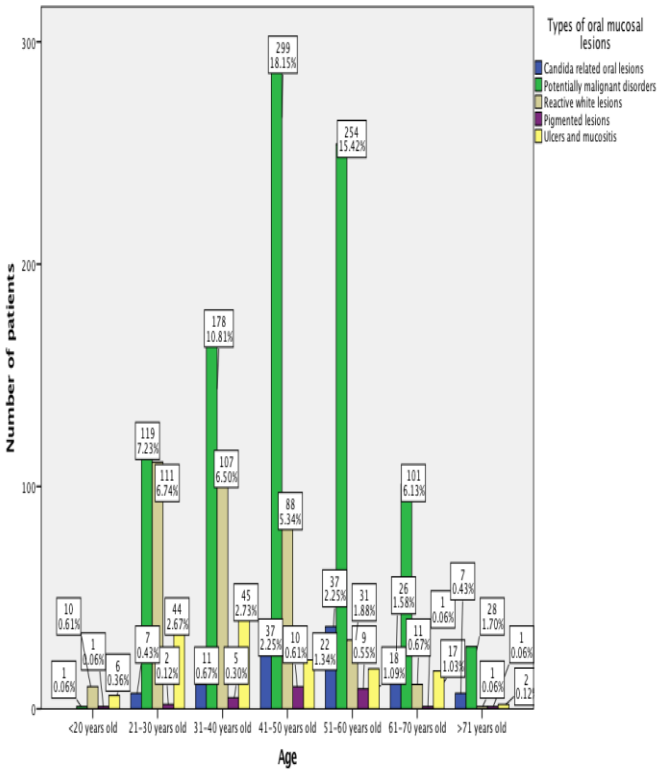

Figure 2 represents association between age groups and types of oral mucosal lesions like candida related oral lesions (blue), potentially malignant disorders (green), reactive white lesions (light green), pigmented lesions (violet) and ulcer and mucositis (yellow). The X axis represents the age and Y axis represents the number of patients having oral mucosal lesions. Chi square test was done and the association was found to be statistically significant with p value =0.00 (<0.05). The oral mucosal lesions were more prevalent in the 41 - 50 years age group.

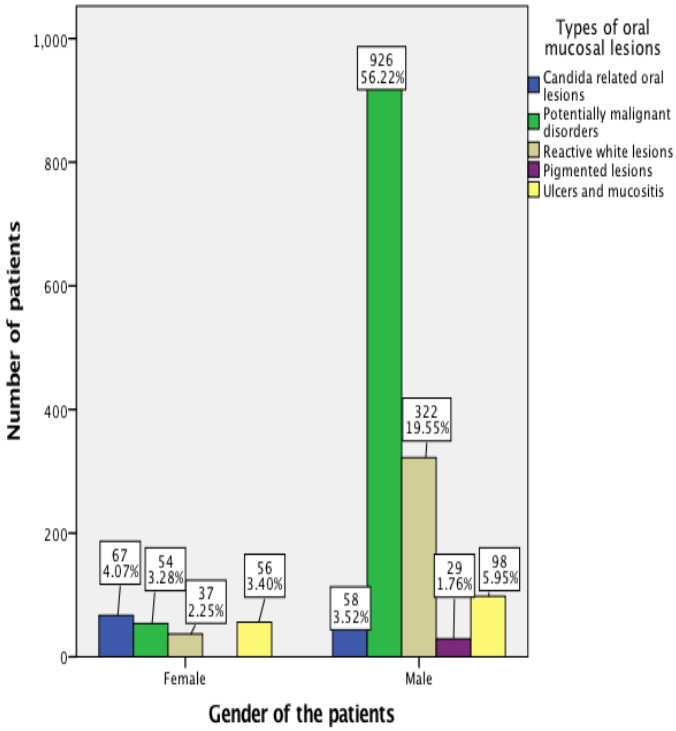

Figure 3 represents association between gender and types of oral mucosal lesions and the X axis represents gender of the patients and Y axis represents the number of patients having oral mucosal lesions. Chi square test was done and the association was found to be statistically significant with p value =0.00 (<0.05). Males had the highest occurrence of potentially malignant lesions, reactive white lesions, pigmented lesions and ulcers and mucositis when compared to females. Females had slightly higher occurrence of candida related oral lesions when compared to males.