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Prevalence of smoker's palate and smoker's melanosis among patients visiting a private dental college

Nor Syakirah binti Shahroom[1], Manjari Chaudhary[*2], Iffat Nasim[3]

[1]Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India
[2]Department of Oral Medicine and Radiology, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India
[3]Department of Conservative Dentistry and Endodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

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ABSTRACT

Tobacco consumption including smoked or smokeless type is harmful for the oral mucosa as it promotes the development of oral cancer and oral mucosal lesions such as leukoplakia, smoker's palate (nicotinic stomatitis), smoker's melanosis and other types of lesions. A retrospective study was conducted in a dental hospital from July 2019 till March 2020. A total of 146 patients diagnosed with smoker's palate, smoker's melanosis or both were included in this study. The data variables including socio-demographic and patients diagnosed with smoker's palate and smoker's melanosis were recorded and analyzed using SPSS Statistical software Version 20. Smoker's palate and smoker's melanosis were prevalent in 50-59 years and predominant in males. In this present study, smoker's palate (53.4%) was more prevalent followed by smoker's melanosis (24%) and smoker's palate and melanosis (22.6%). There was statistically insignificant association between the age and types of oral mucosal lesion ($p>0.05$). It can be concluded that smoker's palate was more prevalent followed by smoker's melanosis and both in which 50-59 years age and male group were more predominant.

*Corresponding Author

Name: Manjari Chaudhary
Phone: +919326518695
Email: manjaric.sdc@saveetha.com

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INTRODUCTION

Tobacco dependence is a serious public health problem. Smoking or chewing tobacco are deleterious to oral health and it promotes the development of oral cancer, premalignant lesions and other oral mucosal lesions such as leukoplakia, smoker's palate (nicotinic stomatitis), smoker's melanosis and chewer's mucosa (Mirbod and Ahing, 2000; Steele, 2015; Muthukrishnan and Kumar, 2017; Warnakulasuriya and Muthukrishnan, 2018). In potentially malignant disorder, the alteration to the oral mucosa can alter the expression of Matrix MetalloProteinase-9 (Venugopal and Maheswari, 2016). Consumption of tobacco especially smoked form are not only harmful to the smoker's but may also affect the health of the infants or adults who inhale the smoke. It may cause the development of other chronic diseases such as pulmonary diseases, cardiovascular diseases, gastroenteral diseases and malignancies (Luo *et al.*, 2007). Very rarely, metastatic malignancies of the oral cavity occur (Misra *et al.*, 2015). Cancer treated with radiotherapy is more

prevalent to oral mucositis compared to chemotherapy (Chaitanya *et al.*, 2017). Sometimes, cancer patients may experience neuropathic pain (Chaitanya, 2018; Subha and Arvind, 2019). Thus, it is said that general health and oral health are both equally important (Subashri and Maheshwari, 2016; Choudhury *et al.*, 2015; Rohini and Kumar, 2017; Patil *et al.*, 2018). In India, it was estimated that 47% of the individuals who consumed tobacco use tobacco where 72% smoke bidis and 12% smoke cigarettes (Singla and Verma, 2016). Various commercial preparations are known as pan masala and gutkha have become available in India (McCullough *et al.*, 2010).

Oral mucosal lesions are frequently seen in elderly and males (Jindal *et al.*, 2006; Patil *et al.*, 2013; Rohini *et al.*, 2020). The elderly population have high risk in developing pathologies due to increasing development of systemic diseases, age-related metabolic changes, nutritional deficiencies, medication-related and deleterious habits such as tobacco and alcohol consumption (Rohini *et al.*, 2020). While treating elderly patients, it is important to take a proper drug history as some drugs may cause changes to the oral mucosa (Muthukrishnan *et al.*, 2016). The type, frequency and duration of tobacco usage may influence the clinical appearance, location and extent of the oral mucosal lesion (Bhonsle *et al.*, 1992; Behura *et al.*, 2015). Severe effects of the long term usage of tobacco may be seen on the oral mucosa (Aljabab *et al.*, 2015).

Another name for smoker's palate is nicotinic stomatitis. It is an asymptomatic lesion usually associated with cigar, heavy pipe, cigarette smoking and reverse smoking. The clinical features of smoker's palate include changes in colour to white with multiple red dots seen in the hard palate and small elevated nodule (Singla and Verma, 2016). It may also cause inflammation to the opening of minor salivary glands due to chronic heat during smoking. It is painless but may be associated with itching or burning sensation (Singla and Verma, 2016). A biopsy is used for diagnosing oral mucosal lesions and is known as the gold standard (Dharman and Muthukrishnan, 2016).

The term smoker's melanosis was first coined by (Hedin, 1977). It is a benign pigmentation of the oral mucosa (Neville *et al.*, 2008). It is clinically characterized by a brown to black colouration of the gingiva, palate, buccal mucosa, larynx and pharyngeal wall (Mattoo, 2014). Due to heat from the smoke and stimulation of melanocytes, it results in increased deposition of melanin (Hedin *et al.*, 1993). Histopathological features included para to ortho keratotic stratified squamous epithelium with prominent granular layer, melanin pigmentation, prominent stratum granulosum, bulbous rete ridges, dense and collagenous connective tissue with mild chronic inflammatory infiltrate (Mattoo, 2014).

Thus, the aim of this study was to evaluate the prevalence of smoker's palate and smoker's melanosis among patients visiting a private dental college in Chennai, India.

MATERIALS AND METHODS

A retrospective study was conducted involving patients visiting a dental hospital from July 2019 till March 2020. Ethical approval for the study was granted by the Institutional Ethics Committee with the following ethical approval number SDC/SIHEC/2020/DIASDATA/0619-0320.

All available cases sheets were reviewed and analyzed. A total of 146 patients were selected based on the inclusion and exclusion criteria. The inclusion criteria were patients diagnosed with smoker's palate and smoker's melanosis. Exclusion criteria were patient without any history of a smoking habit. Cross-verification was done using photographs and reviewed by the second reviewer to minimize bias.

Data were retrieved from the records which include socio-demographic data such as age and gender and patients diagnosed with smoker's palate and smoker's melanosis. Data analysis was done using Statistical Package for Social Sciences SPSS version 20. A Chi-square test was used to determine the association between the age and oral mucosal lesion.

RESULTS AND DISCUSSION

One hundred and forty-six patients were selected. Among them, all patients were males. The mean age was 48.4 and ranged from 20 to 79 years old and categorized into six age groups: 20-29 years, 30-39 years, 40-49 years, 50-59 years, 60-69 years and 70-79 years.

The most common lesions were smoker's palate (53.4%), smoker's melanosis (24%) and combination of smoker's palate and smoker's melanosis (22.6%) as shown in Figure 1. X-axis represents types of oral mucosal lesion and Y-axisrepresents the number of patients. Smoker's palate (blue), Smoker's melanosis(green) and smoker's palate and smoker's melanosis together (brown). Smoker'spalate (53.4%) was the highest followed by smoker's melanosis (24%) andsmoker's palate and smoker's melanosis together (22.6%).

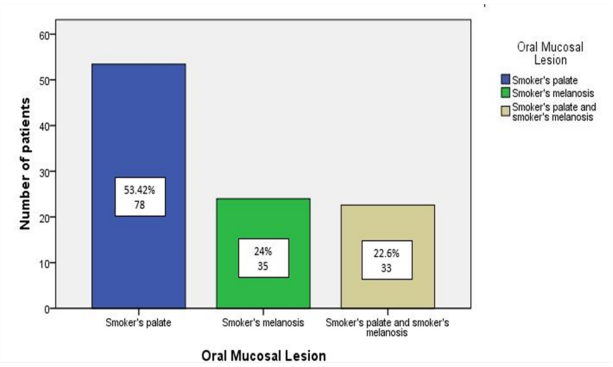

Figure 1: The bar chart showing the frequency distribution of types of oral mucosal lesions

A previous study reported smoker's melanosis was the most commonly observed oral change with 43.28% followed by leukoderma (27.05%) and smoker's palate (22.76%) (Aljabab *et al.*, 2015). Similarly, in a study done by (Behura *et al.*, 2015), smoker's melanosis was more prevalent among patients with habits with 29% and smoker's palate with 6% (Behura *et al.*, 2015). Few studies reported that smoker's palate was the second most prevalent oral mucosal lesion (Mathew, 2008; Alshayeb, 2019; Rohini *et al.*, 2020). No study has reported any prevalence on the combination of both smoker's palate and smoker's melanosis.

In this present study, the prevalence of smoker's palate and smoker's melanosis was predominant among males (100%). Similarly, several studies reported that the prevalence was higher in males with none female patients (Mathew, 2008; Patil *et al.*, 2013; Behura *et al.*, 2015; Kamala, 2019). This may be the fact that a large number of men were reported to have the habit of consuming smoked or smokeless tobacco. According to age distribution, 20-29 years (11%), 30-39 years (13.7%), 40-49 years (24%), 50-59 years (31.5%), 60-69 years (15.8%) and 70-79 years (4.1%) as shown in Figure 2. X-axis represents age and Y-axis represents the number of patients.20-29 years (blue), 30-39years (green), 40-49 years (brown), 50-59 years (purple), 60-69 years (yellow) and 70-79 years (red). 50-59 years (31.5%) was the highest followed by 40-49years (24%), 60-69 years (15.8%), 30-39 years (13.7%), 20-29 years (11%) and70-79 years (4.1%).

This present study reported that there was no statistical significant difference between age and oral mucosal lesion (p>0.05). Within the smoker's palate, 50-59 years (28.2%) was the highest followed by 40-49 years (21.8%), 60-69 years (17.9%), 20-29 years (16.7%), 30-39 years (12.8%) and 70-79 years (2.6%) as shown in Figure 3. X-axis represents the age and Y-axis represents types of oral mucosal lesions.Smoker's palate (blue), Smoker's melanosis (green) and smoker's palate and smoker's melanosis (brown). Smoker'spalate (15.07%), smoker's melanosis (7.53%) and smoker's palate with smoker'smelanosis (8.9%) are all highest in50-59 years which are statistically insignificant. (Chi-square test was done, p-value: 0.479, p>0.05).

Within the smoker's melanosis, 50-59 years (31.4%) was the highest followed by 40-49 years (25.7%), 30-39 years (20%), 60-69 years (11.4%), 20-29 years (5.7%) and 70-79 years (5.7%). Within smoker's palate and smoker's melanosis, 50-59 years (39.4%) was the highest followed by 40-49 years (27.3%), 60-69 years (15.2%), 30-39 years (9.1%), 70-79 years (6.1%) and 20-29 years (3%).

According to the age, this present study reported that 50-59 years' age group was more prevalent to be diagnosed with smoker's palate or smoker's melanosis. Similarly, previous studies reported that oral mucosal lesions were commonly seen in elder patients (Patil *et al.*, 2013; Alshayeb, 2019; Saberi *et al.*, 2019; Rohini *et al.*, 2020). Elderly individuals are vulnerable to oral mucosal lesions when compared to younger individuals (Rohini *et al.*, 2020). Studies reported that there was an association between oral mucosal disorders with ageing (Moreira, 2005) and smoking and age are significant risk factors for oral mucosal lesion (Gönül, 2011). However, this study revealed that there was no statistically significant difference between age and oral mucosal lesion in line with this previous study (Alshayeb, 2019).

Smoker's palate and smoker's melanosis were commonly seen in patients with a smoking habit. Sometimes, smoker's melanosis can be seen in patients with mixed habits (Behura *et al.*, 2015). Studies revealed that bidi smoking manifested smoker's palate more often and found to be more harmful than cigarette smoking (Kumar *et al.*, 2010; Singla and Verma, 2016). The most common site of smoker's melanosis was buccal mucosa of the patient who smoked using pipe and in the palate in reverse smoking lesion (Müller, 2010).

One of the limitations in this study was small sample size. However, bias was minimized by cross-verification and random stratified sampling method. Besides, this study was more focused on smoker's palate and smoker's melanosis. Classification of other types of oral mucosal lesion can be done in the future study.

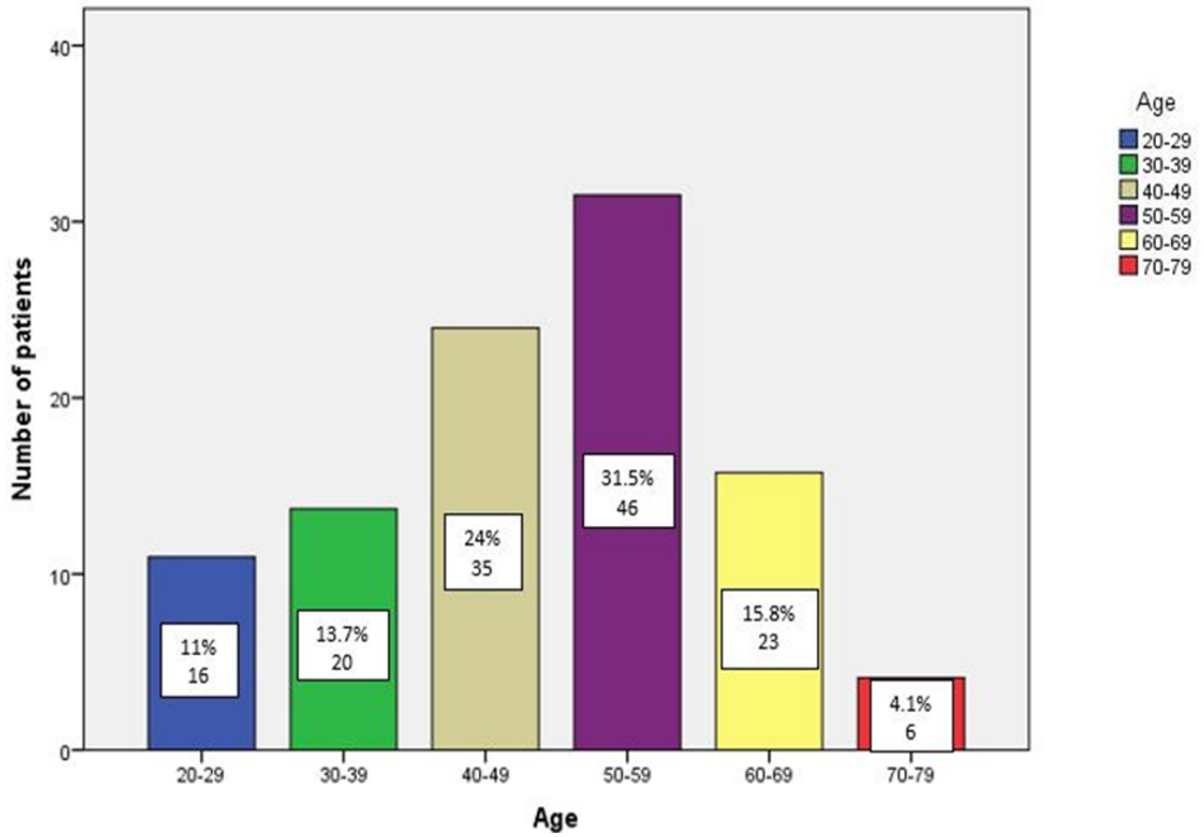

Figure 2: The bar chart showing the frequency distribution based on age

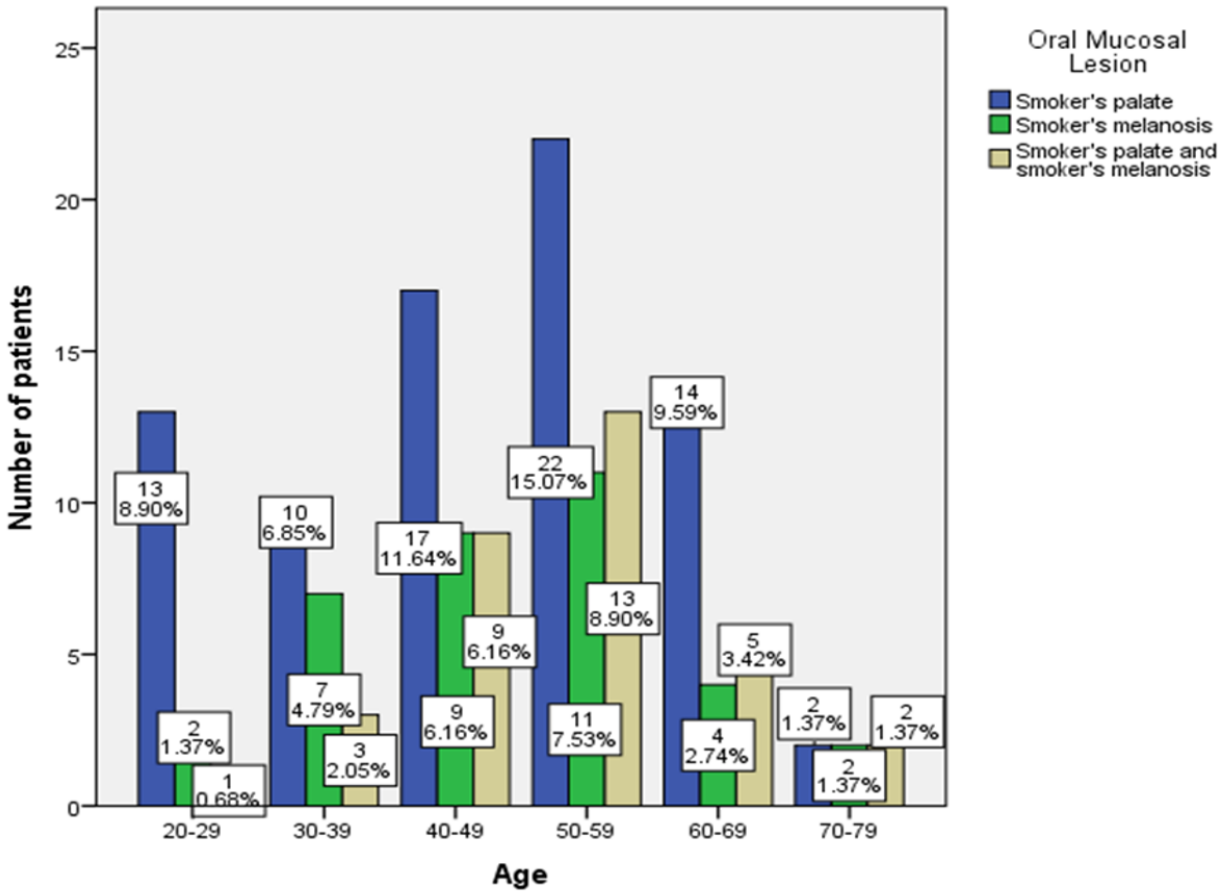

Figure 3: The bar chart represents the association of age with oral mucosal lesion

CONCLUSION

In conclusion, the most prevalent oral mucosal lesion in the present study was smoker's palate followed by smoker's melanosis and combination of smoker's melanosis and smoker's palate. This type of oral mucosal lesion was predominant in males and 50-59 years. Anti-tobacco counselling and cessation of smoking habit should be advised and the ill-effect of tobacco to the health should be explained to the patients.

Author contributions

First author (Nor Syakirah binti Shahroom) performed the analysis, interpretation and wrote the manuscript. Second author (Dr. Manjari Chaudhary) contributed to the conception, data design, analysis, interpretation and critically revised the manuscript. Third author (Dr. Iffat Nasim) participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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