

PREVALENCE OF MUCOSAL LESIONS IN COMPLETE DENTURE WEARERS AND ITS ASSOCIATION WITH AGE AND GENDER: A RETROSPECTIVE STUDY

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ABSTRACT:

A complete denture with accurately extended borders, an optimal vertical dimension, finely finished and polished with no irregularities and proper hygiene maintenance are prudent to the success of the denture. A lack of these factors causes oral mucosal lesions. Complete denture wearing patients are often associated with the presence of various denture-related oral mucosal lesions. The purpose of this study is to evaluate the prevalence of denture-related oral mucosal lesions in complete denture patients and its association with age and gender. A retrospective study was done in a university based setting in Saveetha Dental College and Hospital, Chennai, India. Ethical clearance was obtained from SRB Saveetha Dental College, Chennai, India. The data collection was done from the Dental Information Archiving System (DIAS). It is a recording system of all the data related to the medical and dental history of patients and the treatment done in Saveetha Dental College and Hospital, Chennai, India. Data of 86000 patients between June 2019 and March 2020 was reviewed from the patients records and analysed that was documented in Saveetha Dental College and Hospital, Chennai, India. Data of 512 patients with complete denture prosthesis regarding oral mucosal lesions namely epulis fissuratum, angular cheilitis, traumatic ulcers and denture stomatitis was analysed. The data entered was tabulated and analysed for the prevalence of these oral mucosal lesions. Chi square test done to check the association with age and gender. Statistical analysis was done using SPSS Software for Windows, version 20.0. The prevalence of traumatic ulcers was 23%, that of angular cheilitis was 22%, epulis fissuratum was 31% and denture stomatitis was 24%. There was a significant association of these lesions with gender (more predominant in females). More importance should be given to these patients regarding oral hygiene and awareness programs should be carried out for dentists to update their skills.

Key Words: Complete denture, denture stomatitis, edentulism, oral mucosal lesions, angular cheilitis, traumatic ulcer, epulis fissuratum.

INTRODUCTION:

A complete denture is a fixed or removable dental prosthesis that replaces the entire dentition and associated structures of the maxillae or mandible (Academy of Prosthodontics, 1994). It is very important to record the fine intraoral details of the edentulous arches accurately for optimal retention, stability and support of the denture and prevent the development of oral mucosal lesions (Academy of Prosthodontics, 1994; Venugopalan *et al.*, 2014). This in turn depends on the skill of the operator (Ashok *et al.*, 2014). During border moulding if the impression is overextended at the borders, the final denture irritates the mucosa at the borders and this leads to epulis fissuratum. Epulis fissuratum is a benign hyperplasia of fibrous connective tissue which develops as a reactive lesion to chronic mechanical irritation produced by the flange of a poorly fitting denture (Jyothi *et al.*, 2017). On the other hand if the borders are underextended it leads to a lack of retention in the final prosthesis. This is uncomfortable to the patient. It is prudent for the clinician to record a correct vertical dimension which is comfortable to the patient during the procedure of jaw relation. If the vertical dimension recorded is decreased beyond optimal, it will lead to overclosure and hence angular cheilitis. Angular cheilitis is inflammation of one or both corners of the

mouth. Often the corners are red with skin break down and crusting. It can also be itchy or painful. In a similar fashion raised vertical dimension will cause immaturities that lead to temporomandibular jointpains.

If patients are not given proper oral hygiene instructions regarding timely cleaning of the dentures, the accumulation of plaque and stains on the denture cause denture stomatitis(Basha, Ganapathy and Venugopalan, 2018). Denture stomatitis is the inflammation of the gum tissue that is covered by dentures and is caused by the bacteria *Candida albicans* which also causes oral thrush . It is more commonly seen in the upper jaw area of elderly patients. Denture stomatitis can also result if the denture has improper polished areas or surfaces. A failure to give a balanced occlusion with lead to uneven pressure under the dentures which further leads to soreness. Excessive force at a particular area may lead to traumatic ulcer.

A complete denture with accurately extended borders, an optimal vertical dimension, finely finished and polished with no irregularities along with good esthetics and proper hygiene maintenance (Subasree, Murthykumar and Dhanraj, 2016) are prudent to the success of the denture (Ariga *et al.*, 2018). A lack of these factors causes oral mucosal lesions. Dental sores is a common problem with multifactorial etiology and multiple mode of therapy (Ganapathy *et al.*, 2016)(Jain, Ranganathan and Ganapathy, 2017). The prevalence of these lesions have not been extensively mentioned in literature(Ganapathy *et al.*, 2016; Vijayalakshmi and Ganapathy, 2016). Hence This study aims to evaluate the prevalence of mucosal lesions in complete denture wearers.

MATERIALS AND METHODS

A retrospective study was done in a university based setting in Saveetha Dental College and Hospital, Chennai, India. Ethical clearance was obtained from SRB Saveetha Dental College, Chennai, India. The data collection was done from the Dental Information Archiving System (DIAS). It is a recording system of all the data related to the medical and dental history of patients and the treatment done in Saveetha Dental College and Hospital, Chennai, India. Data of 86000 patients between june 2019 and march 2020 was reviewed from the patients records and analysed that was documented in Saveetha Dental College and Hospital, Chennai, India. Data of 512 patients with complete denture prosthesis regarding oral mucosal lesions namely epulis fissuratum, angular cheilitis, traumatic ulcers and denture stomatitis was analysed.

The data entered was tabulated and analysed for the prevalence of these oral mucosal lesions. Frequency distribution of different or different oral mucosal lesions was determined.

Statistical analysis was done using SPSS Software for Windows, version 20.0.

Inclusion criteria

1. Patients wearing complete denture
2. Patients wearing single complete dentures.

Exclusion criteria

1. Implant supported bridges
2. Removable partial dentures
3. Patients with systemic complications

RESULTS AND DISCUSSION:

Out of the 512 complete denture patients, 52% were males and remaining 48% were females. 90% of the patients were in the age group of 50-75 years. The prevalence of traumatic ulcers was 23%, that of angular cheilitis was 22%, epulis fissuratum was 31% and denture stomatitis was 24% as depicted in graph1 with a mean of 2.43 and standard deviation of 1.103 (figure 1). The association between oral mucosal lesions and gender was found to be statistically insignificant (table 1); Chi-square value : 7.523, df:6, p value : 0.06, however the prevalence of traumatic ulcers was more in males than females and prevalence of epulis fissuratum was more in females than males (figure 2). The association between oral mucosal lesions and age was found to be statistically insignificant (table 2); Chi-square value : 3.073, df: 9, p value : 0.961, however the prevalence of epulis fissuratum was more in the age groups of <40 years compared to other age groups (figure 3).

Denture-related stomatitis was recorded in 24% of the participants in this study. This finding is similar to the prevalence of 39.7% reported in an older study in a Greek community-dwelling denture population (Kossioni, 2011) , but is increased compared with the prevalence of 22.3% recorded in a Greek elderly institutionalised population (Karkazis and Kossioni, 1993) . The occurrence is within the limits of

the values reported in studies from other countries Bristol Dental School/UK 27.0, Athens Dental School/Greece (Athanasouli *et al.*, 1990) 39.7, Marmara Dental School/Turkey (Kulak-Ozkan, Kazazoglu and Arikan, 2002) 44.0, Chulalongkorn University/Thailand (Jeganathan, Payne and Thean, 1997) 10.5, Rural population/Brazil (Freitas *et al.*, 2008) 58.2. Gender, age, smoking habits and cleanliness of the dentures were not found to be significantly associated with any particular type of denture stomatitis (Subasree, Murthykumar and Dhanraj, 2016; Ganapathy, Kannan and Venugopalan, 2017). Only papillary hyperplasia was significantly related to the frequency of denture cleaning (Kossioni, 2011). Continuously wearing the dentures increases the duration of local trauma, particularly in the case of ill-fitting dentures (Selvan and Ganapathy, 2016). In a study, it was found that poor retention of the maxillary denture, lead to increased movement during function, was associated with increased prevalence of denture stomatitis (Duraisamy *et al.*, 2019). The prevalence of all types of denture-related stomatitis was greater in men, but not statistically significant. This could be related to the increased frequency of smoking among men, particularly in older age. MacEntee *et al.* (MacEntee, Glick and Stolar, 2008) also reported an increased prevalence of denture-induced lesions (stomatitis, hyperplasia, angular cheilitis) in men. However, most authors reported that denture stomatitis was more frequently observed in women (Shulman, Rivera-Hidalgo and Beach, 2005)(Mikkonen *et al.*, 1984)(Figueiral *et al.*, 2007)(Jainkittivong, Aneksuk and Langlais, 2002) but those findings were not always statistically significant.

Angular cheilitis is a mucocutaneous lesion with presence of deep fissures and ulcerated appearance affects the angles of the mouth. It is associated with a variety of factors such as nutritional, systemic and drug related factors in combination. Angular cheilitis was found in 22% of the sample, which is comparable to the finding recorded by Corbet *et al.* (18%) (Corbet, Holmgren and Philipsen, 1994) and Marij a in Slovenia (16%) (Corbet, Holmgren and Philipsen, 1994; Kovac-Kavcic and Skaleric, 2000). It was more frequently found in the 41-60 years age-group and had more predilection for females.

The denture irritation hyperplasia or papillary hyperplasia and traumatic ulcer is caused by chronic injury of the tissue in contact with the ill-fitting denture border (Silva *et al.*, 2011)(Ajay *et al.*, 2017). In this study, we found that denture-related oral mucosal lesions were more common in age group of 61-80 years (25.4%), this was also seen in study by da Silva *et al.*(Silva *et al.*, 2011), in which 70% patients were above age of 40 years. The prevalence of epulis fissuratum in this study was 31%.

Epulis fissuratum was most frequent denture related lesions (Mozafari *et al.*, 2012). Other researchers reported a frequency of 18–33% for denture related lesions (Shahsavari *et al.*, 2016),(Mujica, Rivera and Carrero, 2008)(Kuc, Samaranayake and Heyst, 1999)(Scully, 2008). A higher prevalence of oral mucosal lesions can be due to old unstable dentures, poor oral health status and lack of regular oral examinations (Motaleb Nejad and Shirvani, 2002)(Corbet, Holmgren and Philipsen, 1994)(Kannan and Venugopalan, 2018). There could be a direct relationship between duration of denture- wearing and oral mucosal lesions.

Limitation of our study is that it is done in an institutional setting, hence there are limited samples. Awareness programs can be arranged for dentists to improve their skill with respect to complete dentures (Ashok and Suvitha, 2016).

CONCLUSION:

Based on the results of this study, it could be concluded that there is no association of oral mucosal lesions with age and gender. It is imperative to give proper oral hygiene instructions to complete denture wearers as this could minimize the occurrence of mucosal lesions. Awareness programs can be arranged for dentists to improve their skill with respect to complete dentures.

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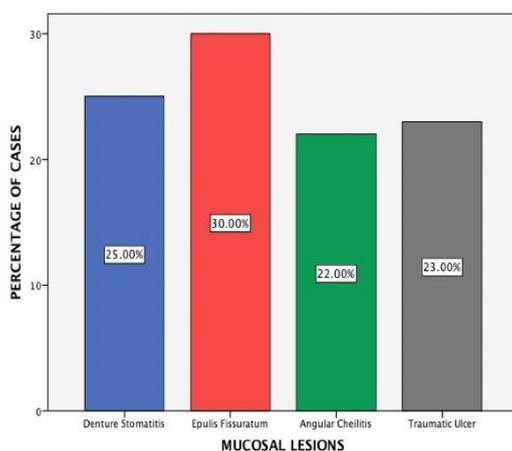


FIGURE 1: Bar graph depicting the prevalence of oral mucosal lesions. X axis represents oral mucosal lesions and Y axis represents the percentage of these lesions. The prevalence of denture stomatitis was 25% (blue colour), epulis fissuratum was 31% (red color), angular cheilitis was 22% (green), and traumatic ulcers was 23% (grey). The prevalence of epulis fissuratum was 30% among all lesions which is higher than the other lesions.

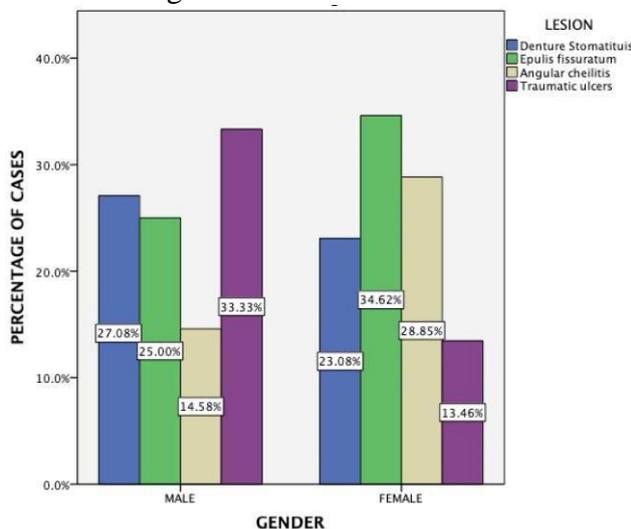


FIGURE 2 : Bar graph showing association between mucosal lesions and gender. X-axis represents the gender as male and female and Y-axis represents the percentage of oral mucosal lesions. Pearson's Chi square test was done and the association was found to be not significant. Chi-square value : 7.523, df:6, p value : 0.06, however the prevalence of traumatic ulcers was more in males than females and prevalence of epulis fissuratum was more in females than males.

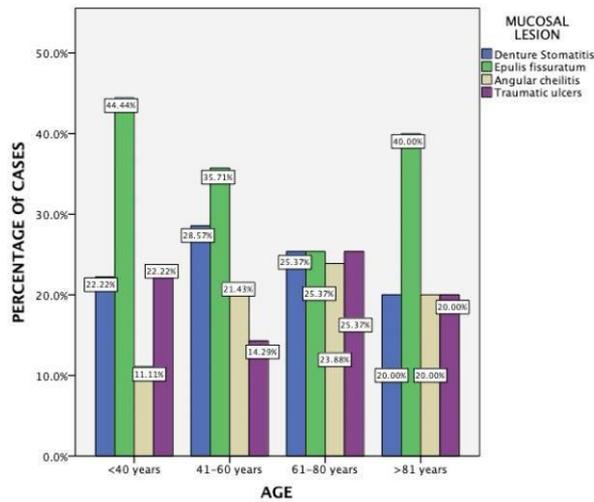


FIGURE 3 : Bar graph showing association between mucosal lesions and different age groups . X-axis represents the age group and Y-axis represents the percentage of oral mucosal lesions. Pearson's Chi square test was done and the association was found to be not significant. Chi-square value : 3.073, df: 9, p value : 0.961, however the prevalence of epulis fissuratum was more in the age groups of <40 years compared to other age groups.

		GENDER		Chi square value	P value
		MALE	FEMALE		
LESION	Denture Stomatitis	27.1%	23.1%	7.523	0.067
	Epulis fissuratum	25.0%	34.6%		
	Angular cheilitis	14.6%	28.8%		
	Traumatic ulcers	33.3%	13.5%		

*The chi-square statistic is significant at the 0.05 level.

TABLE 1: Association between oral mucosal lesions according to different gender. The p value is more than 0.05 hence there the association of oral mucosal lesions and gender is insignificant.

		AGE				Chi square value	P value
		<40 years	41-60 years	61-80 years	>81 years		
LESION	Denture Stomatitis	22.2%	28.6%	25.4%	20.0%	3.073	0.961
	Epulis fissuratum	44.4%	35.7%	25.4%	40.0%		
	Angular cheilitis	11.1%	21.4%	23.9%	20.0%		

	Traumatic ulcers	22.2%	14.3%	25.4%	20.0%		
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*The chi-square statistic is significant at the 0.05 level.

TABLE 2 : Association between oral mucosal lesions and different age groups. The p value >0.05 hence there is no significant association between oral mucosal lesions and different age groups.