Prevalence of Denture Stomatitis Among Complete Denture Wearers in Aljouf

Mostafa I Fayad [(1)], Mostafa M Hosny[(2)], Hassan M Sakr[(3)] and Fahd Nasser Alkahtany[(4)]

ABSTRACT

Aim: The purpose of this study was to determine the prevalence of denture stomatitis and study the associated factors in complete denture wearers among residence of Aljouf Region, Saudi Arabia.

Materials and methods. Two hundred fifty-six complete denture wearers participated in this cross- sectional study. Patients were recruited from Outpatient clinics, College of Dentistry, Aljouf University. Associated factors such as age, gender, income, level of education, denture-wearing at night, Length of denture use, frequency and method of denture cleaning were studied. All data were obtained by intra-oral examination. Bivariate correlation (Spearman Rho), crosstabs descriptive analysis and frequency analysis were performed. The prevalence rate of denture stomatitis was determined and the associated factors were statistically analyzed.

Results. The prevalence of denture stomatitis was 23.4 % (60 patients). There was a statistically significant relationship between the prevalence of denture stomatitis with age, Level of education, Length of denture use, denture wearing at night, frequency and method of denture cleaning ($p < 0.05$). There was no significant relationship between the prevalence of denture stomatitis with gender and income of the patient. ($p > 0.05$)
Conclusions. The presence of denture stomatitis in complete denture wearers was strongly related to patient age, level of education, denture wearing at night, frequency and method of denture cleaning.

INTRODUCTION

Denture-related oral mucosal lesions (DML) may represent acute or chronic reactions to denture plaque, yeast, constituents of the denture base material, poor retention and mechanical injury.

1. Assistant Professor of Removable Prosthodontics, Faculty of Dental Medicine, Al- Azhar University.

2. Lecturer of oral Medicine and Periodontology, Faculty of Dental Medicine, Al- Azhar University.

3. Assistant Professor of Removable Prosthodontics, Faculty of Dental Medicine, Al- Azhar University. Associate Professor of Removable Prosthodontics, College of Dentistry, Al Baha University. Saudi Arabia.

4. Assistant Professor, Biomedical Dental Sciences Department, Dean College of Dentistry, Al Baha University. Saudi Arabia.

Nearly a half of denture wearers present at least one denture-related mucosal lesion, with the three most common denture-related mucosal lesions among elderly wearers of removable denture being denture stomatitis, angular cheilitis, and traumatic ulcer.[1-3]

Denture related oral mucosal lesions may represent acute or chronic reactions to denture base materials, denture plaque, yeast, poor retention and mechanical trauma.[4]

Denture stomatitis is an inflammatory process of the oral mucosal areas that underlie a removable denture and may affect from 15% to more than 70% of denture wearers.[5] Associations have been reported between denture stomatitis and oral Candida infection or denture colonization, mucosal trauma, poor denture hygiene, and wearing dentures at night.[6] Moreover, results of studies have shown conflicting results on the role of saliva pH, smoking, and sugar consumption in patients with denture stomatitis.[7,8]

Denture stomatitis is classified into three types, Newton type1: Hyperaemia, which is associated with trauma; Newton type 2: Generalized erythema; and Newton type 3: Papillary hyperplasia only resolved by surgery.[9]

Risk factors for denture stomatitis should be studied with multivariable techniques because some of the factors are interrelated.[10] The purpose of this study was to determine the prevalence of denture stomatitis among complete denture wearers in Aljouf Region and to determine if the frequency of the denture stomatitis is related to age, sex, income, level of education, the length of denture use, frequency and denture cleaning methods.

PATIENTS AND METHODS

Two hundred fifty-six complete denture wearers (164 male and 92 female) were randomly selected from patients presenting to the outpatient department (OPD) of College of Dentistry, Aljouf University, Saudi Arabia. The sample size was determined by considering a Type I error of .05 and a power of .8 .

All of the participants provided written informed consent before enrollment in the study. The study protocol was approved by the local ethics committee according to the World Medical Association Declaration of Helsinki.[11]

Patient Population and data collection

The population for this study consisted of denture wearers resident in Al-Jouf Region, Saudi Arabia, ranging in age from 41 to 70 years (mean 54.2 years) were included in the study. All of the participants wore at least one complete denture, none were receiving anti-inflammatory or antifungal treatment and all were able to respond to a questionnaire. (Table 1) patients completed the questionnaire regarding sociodemographic information such as age, sex, level of education and income The questionnaire also requested information about denture related factors regarding the frequency and type of denture cleaning, Length of denture use, and nocturnal denture wear.

Table (1) *The questionnaire filled in by the patients.*

Patient Age	41-50Y	51-60 Y	61-70 Y
Sex	Male	Female	High
Income	Low	High	
Level of Education	Non	Low	
Wearing Dentures at Night	May Be	Never	
Time-Length of Denture Usage	1-5 Y	5-10Y	> 10 Y
Frequency of Denture Cleaning	Every Week	Every 3 Days	Every Day
Method of Denture Cleaning	Tooth Brush	Tooth Paste/Soap	Cleansing Tablets

Clinical examination

Prior to the examination, patients rinsed their mouth thoroughly with water and were examined under light source. Patients with denture stomatitis were identified. The clinical diagnosis was established and classified according to the Epidemiology guide for the diagnosis of oral mucosal diseases.[12]

Denture stomatitis was identified by means of clinical examination. Correlation, if any, with etiological factors, was assessed. Denture stomatitis was presumed when the mucosa under a denture-bearing surface was erythematous and was classified according to the modified version of the Newton classification.[13]

Statistical analysis

The variables were analyzed on all patients, using the SPSS software (20.0). The prevalence rate of dentures stomatitis was determined and the associated factors were statistically analyzed by Bivariate correlation (Spearman Rho), crosstabs descriptive analysis and frequency analysis. The level of statistical significance was set at p < 0.05..

RESULTS

The total of 256 subjects were screened, of these 164 (64.1%) were males and 92 (35.9%) were females. The age group (41-50 Y) include 58 patients, while the age group (51-60 Y) include 126 patients. The prevalence of denture stomatitis in this study was 23.4% (60 patients). [Figure 1]

The presence of any stage of denture stomatitis was positively associated with patient age, wearing dentures at night and length of denture use. While education level, frequency and method of denture cleaning have a negative correlation with the incidence of denture stomatitis.   No significant association was found between the presence of denture stomatitis and patient income or patient gender. (Table 2)

Old age patient group (61-70 years) showed a higher incidence of stomatitis (34.7%) more than
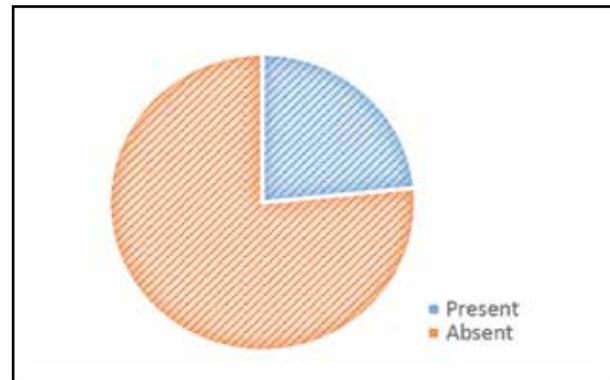

Fig. (1) The prevalence of denture stomatitis.

(51-60 years) age group and (41-50 years) age group as the incidence of stomatitis were

20.6% and 15.5 % respectively.

Low income patients group (218 patients) and high-income patients group (38 patients) showed incidence of denture stomatitis with 23.9% and 21.1% respectively.

Non-educated patients (75 patients) showed a higher incidence of stomatitis (34.7%) more than low and highly educated group. (28.0%)

Patients who wore their denture during the night showed a higher incidence of stomatitis (26.4%) than those who did not (17.1%).

The most common method of cleaning dentures was the use of toothbrush method (43.8%) then toothpaste/soap (42.2%). The use of cleansing tablet was the third method (14.1%). Patients who use toothbrush method showed a higher incidence of stomatitis (35.7%).

The most common frequency of cleaning dentures was every 3 days (46.1%) then every week (42.2 %). Patients who clean the denture every week showed a higher incidence of stomatitis (51.7%).

There was a statistically significant relationship between the prevalence of denture stomatitis with age, Level of education, Length of denture use, denture wearing at night, frequency and method of

denture cleaning (p < 0.05). There was no significant relationship between the prevalence of denture stomatitis with gender and income of the patient. (p > 0.05) (Table.2)

Table (2): *Correlation between denture stomatitis and studied risk factors.*

	Spearman's rho Correlations	
Age	Correlation Coefficient	.157
	Sig. (2-tailed)	.012
Sex	Correlation Coefficient	.080
	Sig. (2-tailed)	.204
Education Level	Correlation Coefficient	-.125
	Sig. (2-tailed)	.047
Income	Correlation Coefficient	-.020
	Sig. (2-tailed)	.750
Wearing Dentures at Night	Correlation Coefficient	.118
	Sig. (2-tailed)	.060
Length of Denture Use	Correlation Coefficient	.133
	Sig. (2-tailed)	.033
Frequency of Denture Cleaning	Correlation Coefficient	-.114
	Sig. (2-tailed)	.068
Method of Denture Cleaning	Correlation Coefficient	-.174
	Sig. (2-tailed)	.005

DISCUSSION

In the present study a questionnaire identifying sociodemographic factors and the patient's habits about complete dentures was developed. Various studies have used questionnaires mostly non-standardized, custom-made with conventional dentures.[14,15]

The prevalence of denture stomatitis in this study was 23.4 % (60 patients). This result was in agreement with Atashrazm [16] who mentioned that the prevalence rate of denture stomatitis is reported within the range of 11 to 67% in complete denture wearers.

Many studies showed that the prevalence of denture stomatitis strongly correlates to denture hygiene, use of denture at night,[17] neglect of denture cleansing.[18] The lower the level of education the higher the prevalence of stomatitis, and the lower frequency of denture cleaning, the higher the like hood of denture-related lesions.[19] This in agreement with the results of this study which showed that there was a statistically significant relationship between the prevalence of denture stomatitis with age, Level of education and denture wearing at night, frequency and method of denture cleaning (p < 0.05).

In the present study, no significance difference in denture stomatitis prevalence was found between men and women. This finding supports the study of Corbet et al.[20] and Turker et al. [15] who also found no difference in denture stomatitis prevalence between both gender. Asif[9] in contrast to this result found significance difference in denture stomatitis prevalence between men and women, this difference may be attributed to different population.

Turker et.al[15] found that there was no statistically significant differences in their study due to age, this was in contrast to the result of this study which showed that there was a statistically significant relationship between the prevalence of denture stomatitis with age. This difference may be due to different sample size and different population.

In this study based on the time-length of denture usage, the patients who have denture stomatitis were using their dentures statistically significantly longer than the ones who have healthy tissues. This finding supports the studies of Coelho et al. [21] who reported that stomatitis occurs around the borders of an ill-fitting complete denture, but as the flange continues to irritate the tissue, a productive inflammation develops. Moskona and Kaplan[22] reported that all denture related lesions increase with the length of denture use.

It has been found that all denture related lesions increases with time-length of denture usage. The results of the presented study also

support the findings of Moskona [22] and Coelho et al. [23] who reported that the frequency of denture-induced stomatitis increases as the time-length of denture usage increases. But they mentioned that the patient age was not a determinant factor in stomatitis prevalence, this was at variance with the result of this study.

CONCLUSION

The present study demonstrated that among complete denture wearer, the prevalence of denture stomatitis was (23.4 %). Several sociodemographic and denture related characteristics were risk factors for denture stomatitis. Patient age, level of education, denture wearing at night, frequency and method of denture cleaning have strong impact on health of oral mucosa. As a result, the complete denture wearers should be educated in the importance of maintain their oral and dentures hygiene in optimum level.

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