



Prevalence of Oral Mucosal Lesions in a Group of Iranian Dependent Elderly Complete Denture Wearers

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ABSTRACT

Aim: Oral mucosal lesions are frequently observed in institutionalized elderly patients more than other age groups. The aim of this study was to determine the prevalence of epulis fissuratum and denture stomatitis and their associated causes in dependent elderly complete denture wearers.

Materials and methods: This study was conducted in dependent elderly complete denture's wearers living in four randomly selected nursing homes located in Tehran. Associated factors such as gender, age, use of medication, site of nursing home, denture quality and denture-wearing habit were studied.

Results: Overall, 674 patients were examined; 201 had complete denture. The prevalence of denture stomatitis was 36%. There was significant relationship among the prevalence of denture stomatitis with gender and denture wearing period ($p < 0.05$). The prevalence of epulis fissuratum was 16.4%. There was significant relationship among the prevalence of epulis fissuratum with gender, denture quality and denture wearing habit ($p < 0.05$).

Conclusion: In this particular dependent age group, the prevalence of oral mucosal lesions is high and the mentioned associated factors should be noticed.

Clinical significance: Dependent elderly complete denture wearers need more support and motivation for reducing the prevalence of these particular denture-associated oral mucosal lesions.

Keywords: Complete denture, Denture stomatitis, Epulis fissuratum, Dependent elderly.

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INTRODUCTION

Throughout the world, a demographic revolution is underway. The portion of older people is growing faster than of any other age group.¹ Approximately 600 million

are aged 60 years and over, and this number will double by 2025.² By 2050, it will be 2 billion, 80% living in developing countries.^{1,2} As in developing countries, the proportion of the older population in Iran has dramatically increased the last 2 decades, with the percentage of individual over 65 years old rising from 4% in 1985 to 9% in 2005. By 2050, it will be 26 million.³

Not only chronic systemic diseases are prevalent in old age,⁴ but also poor oral health and high prevalence rate of oral diseases has been seen.⁵ The negative impact of poor oral conditions on daily life is particularly significant among edentulous patients.^{6,7} Edentulism is prevalent among older people, especially dependent elderly and is highly associated with socioeconomic status.⁸ Removable dentures especially complete denture are frequent among older people.⁹ Again, the prevalence of removable denture shows considerable variation by socioeconomic status.⁸

Oral mucosal lesions are common in older people especially in institutionalized elderly.¹⁰ The majority of reported oral mucosal conditions in the elderly are benign in nature; however, some may become malignant, especially if local or systemic factors coexist, and there is possibility of widespread of infections to alimentary tract in immunocompromised and dependent elderly patients with denture stomatitis.^{10,11} The prevalence rate of denture stomatitis is reported within the range of 11 to 67% in complete denture wearers.¹⁰⁻²¹ The prevalence of denture stomatitis correlates strongly to denture hygiene or the amount of denture plaque, use of denture at night,¹¹ neglect of denture soaking at night¹² and use of defective and unsuitable dentures¹³ are also risk factors for denture stomatitis, as is tobacco, alcohol consumption,¹⁴ and medical condition.¹⁵⁻¹⁷ The lower the level of education the higher the prevalence of stomatitis, and the longer since the last dental visit, the higher the likelihood of denture-related lesions.¹⁴

Other major denture-related lesion is epulis fissuratum, its prevalence rates in old age denture wearers range from 5 to 26%.^{14,16,22-24} Epulis fissuratum is particularly frequent in person with ill-fitting and/or unretentive dentures.¹⁶ Also use of denture at night, infrequent dental visits, low education, dependency are factors associated with increased prevalence rate of epulis fissuratum.¹⁴

Because of the negative impact of the oral mucosal lesions especially denture stomatitis on general health of dependent elderly patients whom are characterized with serious medical, emotional problems and partial loss of social independence; and the scarcity of pertinent to oral mucosal research data from Iran, the aim of the study was to investigate the prevalence of denture stomatitis and epulis fissuratum and their associated causes in Iranian dependent individuals 65 years of age and older living in nursing home (institutionalized) in the broader region of Tehran, capitals of Iran in 2010.

MATERIALS AND METHODS

This cross-sectional study was conducted on dependent elderly complete denture wearers aged 65 years and over attending in four randomly selected nursing home located in two regional area of Tehran. The dependent elderly patients who had natural teeth, fixed and removable partial dentures, and those were completely edentulous with no prosthesis were excluded from study. Also Individuals, who refused to participate, those could not take part in decision-making process, and those were imbed and too ill or unable to communicate were excluded from the study. Permission was obtained from the homes board directors for conducting the survey; and based on ethical background; we considered the dignity and satisfaction of the elderly patients according to ethical principles in dental care for the frail or dependent elderly¹⁷ and ethical standard of Islamic Azad University. Complete explanation and recognition of the procedure had described with different level of understanding, and also when discussing the consent process for them, their competence and decision-making capacity were considered. The information on the overall health and the administration of medication was provided by the resident's medical notes and nursing staff.

Before examination, the author explained to the selected individuals the aim of the study, the importance of oral diseases associated with complete dentures. Written instruction on oral and denture hygiene measures was also provided. Medical data were collected through interviews between the participant elderly and the caregivers. Subsequently, a calibrated clinician with training in recognizing oral lesions, using a wooden spatula, a portable light and a mouth mirror, carried out oral examination.

Denture stomatitis is defined as localized or diffuse erythema involving a part of or the entire denture covered mucosa or as granular or papillary inflammatory lesion involving the central part of the hard palate and the alveolar ridge.¹⁹ Epulis fissuratum is defined as inflammatory hyperplastic lesion of the mucosa in contact with denture borders. Patient reported discomfort in the absence of inflammation and inflammatory hyperplasia was not recorded as denture stomatitis and epulis fissuratum. All diagnoses were clinically and smears for yeast were not taken. It should be mentioned that the understudied patients who suffered from oral mucosal pathologic lesions were referred to the executives of the nursing home in order to perform treatment.

Factors such as age, gender, site of nursing home (poor and rich area), denture wearing habits (noncontinuous and continuous), quality of denture, and use of medications (antihypertensive and antidepressant vs other medications) that the literatures suggest may be associated with denture stomatitis and epulis fissuratum were studied.¹⁰⁻¹² Quality of denture was recorded unfavorable if the denture dislodged when the patient opened his/her mouth moderately wide without strain.¹⁰

The research data compromised information from the subject's interview and intraoral examination. The prevalence rates of dentures stomatitis and epulis fissuratum was determined and the associated factors were statistically analyzed by Chi-square and Fischer's exact tests; if there were any statistically significant differences, the differences were considered significant at 0.05 level.

RESULTS

In four randomly selected nursing homes, 2,723 individual lived in which 674 individual were dependent elderly aged 65 years and over. Among them 238 individuals had complete dentures, 25 patients refused to participate in study, and 12 individuals who were too ill dependent elderly complete denture wearers were excluded from study; of 201 individuals 18 (11%) aged between 65 and 75 years and 183 (89%) aged 75 years and over, including 63 (31.5%) men and 138 (68.5%) women were examined. A total of 137 out of the 201 individuals used antidepressant and antihypertensive drugs. Seventy-seven of complete dentures had favorable quality. Thirty-nine individual residents in rich area nursing home and 162 individuals in poor area nursing homes respectively. Among them 139 (68%) individual wore complete dentures continuously. Thirty-eight (19%) patients wore complete denture 5 years and less, and 163 (81%) more than 5 years respectively. The prevalence rate of denture stomatitis was 36% (74 patients out of 201) with confidence interval (CI): 30.1 to 43.5%. Out of the 74 patients with denture stomatitis, 31 (15.4%)

patients had inflammatory papillary hyperplasia (type III) and 43 (20.6%) had denture stomatitis types I and II respectively.

There was not a significant relationships among the prevalence of denture stomatitis with age, quality of denture, use of medication and site of living (p-value < 0.5) (Table 1). There was a significant relationship among the prevalence of the denture stomatitis with gender and denture wearing habits (p-value < 0.05) (Table 2).

The prevalence rate of the epulis fissuratum was 16.4% (33 out of the 201 patients). There was not a significant relationship among the prevalence of epulis fissuratum with age and site of living (p-value < 0.5) (Table 3). There was a significant relationship among the prevalence of the epulis fissuratum with gender, quality of denture and denture wearing habits (p-value < 0.05) (Table 4). The anatomic location of epulis fissuratum was more in the labial vestibule

of the mandible than in maxilla. Among these studied complete denture wearers 13% (26 patients out of the 201) had both denture stomatitis and epulis fissuratum, however anatomic locations of denture stomatitis was more in maxilla and epulis fissuratum more in the mandible.

DISCUSSION

Oral health is an important part of the quality of life of any individual especially in elderly. Ageing, edentulousness and complete denture wearing causes changes to oral mucosal epithelium, decreasing the ability to epithelial regeneration and subsequently, the resistance of the organism to microbial and traumatic factors. So, it is not surprising that the part of the dependent elderly of the present study experienced denture stomatitis and epulis fissuratum.

Denture stomatitis was the more frequent lesion (36%), an expected finding as suggested by other investigators

Table 1: Distribution of understudied complete denture wearers based on denture stomatitis in terms of age, quality of denture, site of living and use of medication

Denture stomatitis/associated factors	Not present (n = 127)	Present (n = 74)	p-value
Age			
• 65-75 years	12 (9.5%)	6 (8%)	
• 75 years and over	115 (90.5%)	68 (92%)	
Quality of denture			
• Favorable	51 (39.5%)	26 (35%)	<0.5 NS*
• Unfavorable	76 (60.5%)	48 (65%)	
Site of living			
• Rich area	27 (21%)	12 (16.5%)	
• Poor area	100 (79%)	62 (83.5%)	
Use of medication			
• Antidepressants and antihypertensive	88 (70%)	49 (67.5%)	
• Other drugs	39 (30%)	25 (32.5%)	

NS* : Not significant

Table 2: Distribution of understudied complete denture wearers based on denture stomatitis in terms of the gender, years of denture using and denture wearing period

Denture stomatitis/associated factors	Not present (n = 127)	Present (n = 74)	p-value
Gender			
• Men	52 (41%)	11 (15%)	<0.05 S*
• Women	75 (59%)	63 (85%)	
Denture wearing period			
• Noncontinuous	58 (33%)	4 (5.4%)	
• Continuous	69 (66%)	70 (96.4%)	

S* : Significant

Table 3: Distribution of understudied complete dentures wearers based on epulis fissuratum in terms of the age and site of living

Denture stomatitis/associated factors	Not present (n = 168)	Present (n = 33)	p-value
Age			
• 65-75 years	15 (9%)	3 (9%)	<0.5 NS*
• 75 years and over	153 (91%)	30 (91%)	
Site of living			
• Rich area	32 (19%)	7 (21%)	
• Poor area	136 (81%)	26 (79%)	

NS* : Not significant

Table 4: Distribution of understudied complete denture wearers based on epulis fissuratum in terms of the gender, quality of denture and denture wearing period

<i>Epulis fissuratum/associated factors</i>	<i>Not present (n = 168)</i>	<i>Present (n = 33)</i>	<i>p-value</i>
<i>Gender</i>			
• Men	59 (35%)	4 (12.1)	<0.05 S*
• Women	109 (65%)	29 (87.9)	
<i>Quality of denture</i>			
• Favorable	71 (43%)	6 (18%)	
• Unfavorable	97 (57%)	27 (82%)	
<i>Denture wearing period</i>			
• Noncontinuous	59 (35.1%)	3 (9%)	
• Continuous	109 (64.9%)	30 (91%)	

S* : Significant

within the range (22-67%) among institutionalized older adults.¹⁴⁻²¹ Nevertheless, any comparison between epidemiological surveys is difficult, as they vary in the methodology, sample size and diagnostic criteria, while the interexaminer variability causes further confusion. Although current thinking suggests an interplay of various factors in the pathogenesis of the disease. *Candida albicans* has been implicated as the causative organism.¹⁶ In the present study beside denture wearing habits; gender had significant relationships with the denture stomatitis. The reason for high rate of this disease in women may be attributed to the denture wearing habits of women, because women wear complete denture more continuously than men due to esthetic reason.¹⁰ Numerous studies present high rate of prevalence of denture stomatitis in women than in men and the prevalence increased with age.⁹⁻¹¹ Some studies present high rate of the prevalence of the denture stomatitis in the men rather than women.^{8,20} It may be associated with the selected population for the study, for example tobacco or alcohol abuse in the selected men population. Our finding that individual who wore nonacceptable complete denture had higher prevalence of denture stomatitis than those wore acceptable complete denture, however, it was not statistically significant. This conflict with the findings of other²¹ who found the individual with stable complete denture had higher denture stomatitis. One of the interesting finding of this study was the presence of vacuum suction in all maxillary complete denture of individuals who had inflammatory papillary hyperplasia (31 out of the 201 complete denture wearers). In Iran, denturists usually make maxillary complete denture with vacuum suction because they believe that it can improve retention and stability of the maxillary complete denture, however soft tissue inflammation and overgrowth is usually associated with the presence of vacuum suction. It should be emphasized to determine its association with inflammatory papillary hyperplasia, other study with large sample should be conducted. Poor hygiene and continuous use of dentures are considered to be major

predisposing factors in the manifestation of the denture stomatitis. Although denture stomatitis usually does not reflect a serious disease or abnormality, with denture wearing as direct cause of the lesion, it should be realized that severe infections by *Candida* species may occur in the immunocompromised host.¹⁹ Thus, it is important that, instructions related to denture hygiene measures are given to the elderly, and those living in protected environments. The institutional staff must be instructed and trained in the necessary procedures.¹¹ As recently shown oral health care education programs can improve caregivers' knowledge, attitudes and oral health care performances for dependent elderly.¹⁸

The prevalence of the epulis fissuratum was 16.4% in these selected populations of denture wearers. This lesion has been reported in 5 to 26% of elderly denture wearers.^{11,14,18} Epulis fissuratum is seen more frequently in women than in men and is usually located in the mucobuccal or mucolabial folds.¹⁴⁻¹⁶ Beside gender, this condition was seen more in patients with continuous denture wearing habits and unretentive and nonstable complete denture. In addition to the effect of the amount of time dentures are worn, the high prevalence of this lesion in nonacceptable complete denture may be associated with more parafunctional movement which can traumatize the mucosa. Also patients in the age group 75 years and over presented the higher frequency of the lesion, but it was not statistically significant. Some investigators mentioned that low education, tobacco and alcohol use, and infrequent dental visits are factors associated with increased prevalence rate of epulis fissuratum.¹⁴ In this study the prevalence of this lesion was more in labial (79%) and lingual (9%) vestibule of mandible than labial (6%) vestibule of maxilla. This conflict with the findings of other²² who found the individuals with high prevalence of epulis fissuratum in anterior region of maxilla than anterior region of mandible, however more research reported the high prevalence of epulis fissuratum in the mandible than in the maxilla.^{23,24}

The high prevalence of epulis fissuratum in the mandible may be attributed to the more parafunctional movement of lower complete denture than upper complete denture.¹⁶ The high prevalence rate of this lesion in individual with ill-fitting denture and in anterior region of mandible may be correlated. Because ill-fitting dentures cause more parafunctional movement of denture and the side effect of the parafunctional movement is trumatization of mucosa and formation of hyperplastic soft tissue in vulnerable anatomic region.¹⁰

CONCLUSION

The present study demonstrated that among dependent elderly people wearing complete dentures the prevalence of denture stomatitis and epulis fissuratum is high. Denture wearing habits, poor quality denture and poor oral hygiene have negative impact on health of oral mucosa. Although denture stomatitis usually does not reflect a serious disease, there is possibility of widespread oral mucosa and alimentary tract infection in immunocompromised and dependent elderly patients.

CLINICAL SIGNIFICANCE

This particular group of population due to poor general health status, reduced demand for dental and prosthetic care, in addition to a lack of support services and generally poor socioeconomic status require special clinical attention and follow-up. Regular oral examination by a dentist should be part of the continuous multidisciplinary medical care provided to this expanding group of patients.

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