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Prevalence and Risk Factors of Denture Induced Stomatitis in Denture Wearers Attending Khanzad Dental Teaching Center in Erbil city

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Abstract

Background: Denture induced stomatitis often referred to as denture sore mouth and prosthetic stomatitis, denotes inflammation of the oral mucosa, particularly the palatal mucosa that are in close contact with the denture base.

Objective: To evaluate the prevalence and risk factors of denture induced stomatitis in complete denture wearers attending Khanzad Teaching Dental Center.

Patients and Methods: This study included one hundred consecutive upper denture wearers from prosthetic department in Khanzad Teaching Dental Center , the age range of the patients was 39-85 years .Different factors such as age, gender, denture age ,wearing time and hematinic parameters investigated and recorded .The diagnosis of denture stomatitis was done by clinical examination .The data entered and analyzes by (SPSS software version 25).

Results: The prevalence of denture stomatitis was 20%. Non significant relashionship in the prevalence of denture stomatitis with age, gender, denture age, wearing time , type of denture and heamtinic deficiency.

Conclusion: Because denture stomatitis is the most prevalent inflammatory reaction that affects denture wearers and is typically asymptomatic, it is better to schedule a routine dental check for them to allow early detection of any abnormalities to treat it and the choice of treatment depends on the cause of change. in many denture wearers the removal of traumatic as well as maintaining good oral hygiene and hygiene of dentures produce positive outcomes.

Keywords: Denture stomatitis , Denture wearers , Hematinic deficiency

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Introduction

The most common oral health disorders among the elderly population are tooth loss and denture use. Denture stomatitis is the medical term for the illness that affects persons who wear removable dentures[1]. Denture stomatitis is often known as denture sore mouth [2]. A partial or complete prosthesis may cause this condition, which is marked by erythematous lesion and inflamation of the palatal area under the

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denture [3]. Between 15% to 70% of people who wear dentures may have this condition [4]. The cause of dentures stomatitis is multifactorial have seen in old age, systemic disorders, heamtinic difeciency that enhance candidal infection , wearing denture during sleep and poor oral hygiene that leads to plaque build upon the denture[5]. There are two main categories of risk factors for denture stomatitis: those that are connected to the prosthesis and those that are infectious. The trauma brought on by an uncomfortable denture, poor oral and prosthetic hygiene, the age of the denture, and night time or continuous denture wear are all prosthesis-related issues [6]. According to microbiological research, a quantitative rise in yeast infection is linked to denture stomatitis[7].Candida albicans has been proposed as causal factor in denture stomatitis[8]. In 60–65% of the people wear the prosthetics,candida-associated denture stomatitis has been identified[9].The nutritional elements that may have a role in the development of oral fungal illnesses including iron , folic acid , and vitamins which have recieved a little consideration in many studies , these factors had been to have a role in alteration of oral mucosal integrity[10]. Therefore , the present study was designed to asses the prevalence and risk factors of denture induced stomatitis in complete denture wearers attending Khanzad Teaching Dental center in Erbil City/Iraq.

Patients and Methods

This prospective cross-sectional study was conducted in the prosthetic department in Khanzad Dental Teaching Center which is a specialized center for Kurdistan Board of Medical Specialities in Erbil City/ Iraq. From January till June 2022. The study protocol was approved by the scientific Ethics Committee from the Kurdistan Higher Council of Medical Specialities according to the World Medical Association Declaration of Helsinki, and all the participants provided written informed consent prior enrollment. All participant aged above 18 years old. Male and females, wearing at least upper denture (partial or complete) for more than one year duration were included in this study. Age, gender, duration of denture usage, denture wearing time (day or day and night) were reported in a case sheet. All the dentures made from acrylic material.

Excluding criteria :

1.Patients on long term antibiotic.

2.Corticosteroid inhalors patients .

3. Immune compromised patients.

Verbal and written consent was tacken from the patients to engage them in the study .After clinical examination of the patient on a dental chair under light with mirror.Patients were sent for collecting a venus blood sample at Kings lab in Erbil city for hematinic assesment including (Complete blood count , Serum Ferritin , Folate and B12).Each patient was performed an oral rinse for 1 minute with 10 ml sterile phosphate-buffered saline(PBS) which gives a quantitative density of the fungal candida [11] .The value 18 nanograms per milliliter in male and 9 ng/ml (female) were accepted as normal range for serum ferritin , 3 ng/ml for folic acid and 200 picograms /ml for vitamin B12 respectively [12].

Statistical Analysis

Data were analyzed using the statistical package for social sciences(SPSS, version 25). Chi square test of association was used

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to compare proportions.Fishers exact test was used when the expected frequency (value) was less than 5 of more than 20% of the cells of the table .A P value of _< 0.05 was considered as statistically significant.

Results

One hundred denture wearers were included in this study. Their mean age (SD) was 62.1 (9.5) years, the median was 63 years, and the age range was 39-85 years. the prevalence of denture induced stomatitis was 20% as shown in Figure(1).

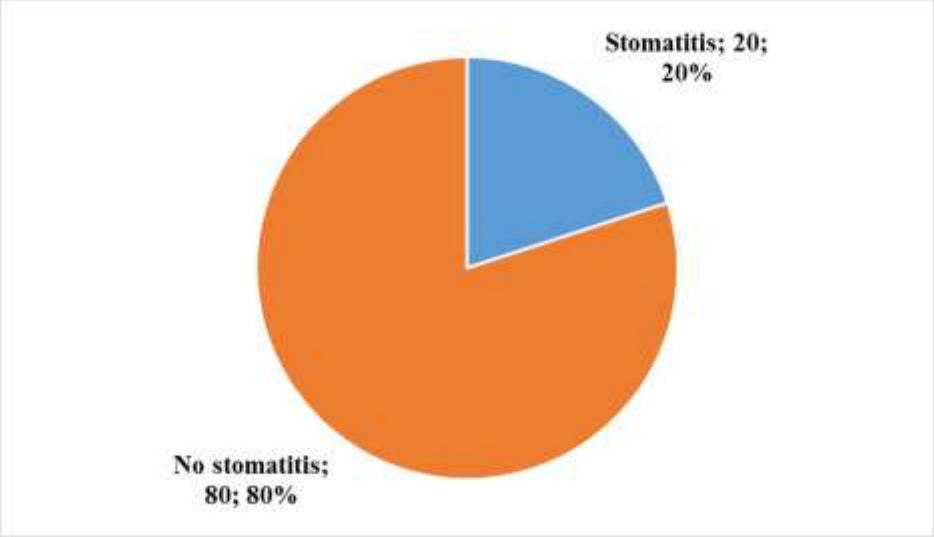

Figure (1): Prevalence of denture induced stomatitis

It is evident in table 1 that only 12 persons were aged less than 50 years old, and the largest proportion (38%) were aged 60-69 years. No significant association was detected between age and prevalence of stomatitis (p = 0.614). The prevalence of denture stomatitis among males (22.8%) was higher than the prevalence among females (16.3%) but the difference was not significant (p = 0.419) Table (1).

Table (1): Association between age and gender with the prevalence of denture induced stomatitis

		Denture induced stomatitis		
		Positive	Negative	
	N	No. (%)	No. (%)	p
Age				
< 50	12	4 (33.3)	8 (66.7)	
50-59	27	5 (18.5)	22 (81.5)	
60-69	38	6 (15.8)	32 (84.2)	
≥ 70	23	5 (21.7)	18 (78.3)	0.614*
Gender				
Male	57	13 (22.8)	44 (77.2)	
Female	43	7 (16.3)	36 (83.7)	0.419**
Total	100	20 (20.0)	80 (80.0)	

*By Fisher's exact test. **By Chi square test

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The highest prevalence of stomatitis (27.8%) was among those wearing dentures for 10 years or higher, but the association was not significant with the duration of wearing denture (p = 0.614). No significant association was detected between stomatitis with type of denture, whether upper partial or upper complete (p = 0.912), and with denture wearing during day or day and night (p = 0.407) as presented in Table (2).

Table (2): Association between denture age, type of denture and denture wearing time with the prevalence of denture induced stomatitis

		Denture induced stomatitis		
	N	Positive	Negative	
denture age (years)				
< 5	51	10 (19.6)	41 (80.4)	
5-9	31	5 (16.1)	26 (83.9)	
≥ 10	18	5 (27.8)	13 (72.2)	0.614**
type of denture				
Upper partial	29	6 (20.7)	23 (79.3)	
Upper complete	71	14 (19.7)	57 (80.3)	0.912**
Denture wearing				
Day only	63	11 (17.5)	52 (82.5)	
Day and night	37	9 (24.3)	28 (75.7)	0.407**
Total	100	20 (20.0)	80 (80.0)	

**By Chi square test

Non-significant association was detected between stomatitis and the following blood parameters: complete blood count (p = 0.101), serum ferritin (p = 0.101), serum B12 (p = 1.000), and serum folate (p = 0.173), as presented in Table (3).

Table (3): Association between hematological parameters with the prevalence of denture induced stomatitis

		Denture induced stomatitis		
	N	Positive	Negative	
CBC				
Normal	83	14 (16.9)	69 (83.1)	
Abnormal	17	6 (35.3)	11 (64.7)	0.101*
S. Ferritin				
Normal	83	14 (16.9)	69 (83.1)	
Deficient	17	6 (35.3)	11 (64.7)	0.101*
S. B12				
Normal	83	17 (20.5)	66 (79.5)	
Deficient	17	3 (17.6)	14 (82.4)	1.000*
S. Folate				
Normal	85	15 (17.6)	70 (82.4)	
Deficient	15	5 (33.3)	10 (66.7)	0.173*
Total	100	20 (20.0)	80 (80.0)	

* By Fisher's exact test

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Complete blood count (CBC) was regarded abnormal in some cases due to alteration in red and white blood cell level.

Figure(2): Clinical picture showing diffuse erythematous lesion on the palatal area under complete upper denture for a male patient

Figure (3): Clinical picture showing erythematous lesion on the palatel area under complete upper denture for a female patient

Figure (4) : Clinical picture showing a normal pink palatal area for a male patient under complete upper denture

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Discussion

Removable dentures have a risk of damaging oral tissues, and frequent oral mucosal lesions are linked to their use. Following the insertion of the dentures, the dental surgeon is responsible for educating the patient on how to maintain oral health and scheduling a post-insertion recall appointment[13]. For a better understanding of the prevalence and pathogenesis of oral disease, epidemiological studies are a key component. The variance between researches may be explained by different diagnostic and participant inclusion criteria [14]. Among the 100 participants who agreed to take part in this study, the mean age was 62.1 and 57% of the sample were men. Seventy one 71% participants wore upper complete dentures and twenty nine 29% wore upper partial dentures. Among them 63% wore their dentures daily while 37% did not take their dentures out at night. The prevalence of denture stomatitis among denture wearers was 20% and the risk factors for denture induced stomatitis were hematinic deficiency and denture usage age with nocturnal denture wearing. However, when comparing to study done in Pakistan , this research revealed a higher incidence of denture stomatitis comparing to (3%) of 100 patients in a study conducted by Azeem *et al* in Lahore medical and dental college [15] and more than 14% of Elisenda et al study [16] while in contrast to this result, Atashrazm and Sadri reported a higher prevalence of (36%) in a study done in Tehran on four randomly selected nursing home [18], also lower than found by Fayad et al., who did a study on 256 denture wearers from outpatient clinics of AL Jouf University in Saudi Arabia in July 2018[4]. Same findings were also found in many reports which is higher comparing to our study [6,14,17].These discrepancies between studies might be due to differences in research methodology like age of the study group, oral hygiene status of them , size of the population demographics and the criteria used to recognize oral lesions.

Regarding the impact of patient age on the prevalence denture induced stomatitis, conflicting opinions seem to exist. Some researches emphasize on the significance of patient age on this disease .In this study a total of 100 patients, 12 persons were aged less than 50 years and the largest population (38%) were aged from 60-69 years old between males and females. In the term of 9age group, result of our study showed no correlation between denture stomatitis and patient age, in agreement with several studies [8,17,18] While, this finding was disagreed with many other studies that reported a higher prevalence among elderly populations [4,13,15] .Furthermore, this is due to good instruction from their dentists for cleaning their dentures .

According to this study, non significant association observed between gender and prevalence of denture stomatitis ($p = 0.419$) , male patients displayed the disorder more frequently than female. The prevalence among male patients was (22.8%) higher than the prevalence among females (16.3) .This outcome disagree with many studies showing that women are more likely to have denture stomatitis[14,19,20], this might be the result of larger number of male participated in this study and smoking is more common in males but, the reverse, found by Atashrazm and Sadri when they had

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conducted a study on dependant elderly complete denture wearers with a female predeliction [18] thats may be due to women wear complete denture more continuousley than men due to esthetic reason,and female patients have more candidal load on the basis anemia and hormonal disturbance.

Based on the duration of denture wearers in this study, subjects showed stomatitis in patients who were wearing dentures for 10 years and more, comparing to those who were wearing dentures for less than ten years the highest prevalence of denture stomatitis (27.8%) was among those wearing dentures for 10 years or more , still the association with incidence of denture stomatitis was not significant ($p = 0.614$) and this finding disagree with reports by Fayad ,Emami and Atashrazm [4,8,18] which mentioned that denture age is good predisposing factor for denture stomatitis mainly due to roughness of denture, ill fitting and accumulation of palque due to inadequate cleaning of their dentures. However , other authors, demonstrated that denture age is not associated with prevalence of this disorder in agreement with our findings [6,19] this may be due to a good oral health for the patients and their awareness about daily cleaning for their prosthesis.

With respect to type of prosthesis many opinions were reported by investigators. Some are agreed with our finding as there is no significant relation in denture stomatitis prevalence with types of denture either upper complete denture or upper partial denture. As Sharma and Dutta study[19] while Kaomongkolgit *et al* [14] pointed out a reverse to this result when he observed partial denture wearers had a considerably higher prevalence of denture stomatitis than complete denture wearers , this may be due to the population studied were younger individuals and the proportion of using complete dentures will increse with age progression. However, some investigators reported more denture stomatitis in complete denture wearers [20] this may be due to the fact that greater area of palate being covered by the denture and prevented from cleansing saliva being subjected to anaerobic condition. These variations may be due to different sample size and population with different age range among the participants.

The health of the oral mucosa is harmed when removable dentures are worn at night because wearing dentures at night lengthens the duration of local trauma, particularly when they are ill-fitting. Additionally, it increases the mucosal exposure to microorganisms on the dentures' fitting surface and reduse the protective effect of saliva. Despite the higher rates of day and night wearing dentures [3,21] comparing to those who take it out (17.5) in this study , the prevalence still not significant . In contrast , Sharma and Dutta have showed significant of denture stomatitis with nocturnal wearing of denture when was conducted on 580 cases in India[19] they came out with a finding that those who wear denture at night were 26 times more prone to get denture stomatitis comparing to those who take it out overnight as nocturnal wearing increases the duration of trauma especially in the case of ill fitting dentures, this variation with outcomes may be due to good oral health of our participants with daily cleansing of their dentures.

Patients with malnutrition, deficiency in vitamin B12, folate, or iron may also be more susceptible to candida-related denture

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stomatitis [5]. The aetiology of oral candidosis has been linked in part to iron deficieny anemia[22]. A lack of vitamin B12 can cause a number of oral symptoms, such as recurrent oral ulcer, xerostomia, intolerance to dental prosthesis[21]. In accordance with Elina pailloud *et al*., [10] we did not find a relation between deficiencies in these elements and the development of oral candidosis which increase the possibility of denture stomatitis. This may reflect the good oral health of the patients and healthy food intake with daily cleaning or their dentures.

Conclusions

Because denture stomatitis is the most prevalent inflammatory reaction that affects denture wearers and is typically asymptomatic, it is better to schedule a routine dental check for early detection of abnormalities and their treatment. The choice of treatment depends on the cause of change .In many denture wearers , the removal of trauma as well as good oral hygiene and hygiene of dentures produce positive outcomes. Patients with denture stomatitis were treated with Nystatin 100.000 IU oral drop four times daily for two weeks then follow-up

Recommendations

Encouraging denture wearers to consult dentists about any abnormal changes in the oral cavity. Educate denture wearers to daily cleaning of their dentures.

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Ethical clearance: Ethical approval was obtained from the College of Medicine / University of Diyala ethical committee for this study.

Conflict of interest: Nil

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نسبة انتشار و العوامل المؤدية لالتهاب الفم لدى مرتدي اطقم الاسنان عند المرضى المحالين الى مركز خانزاد التعليمي لطب الاسنان في مدينة أربيل

دريا دلير هدايت [١] ، علي فخري الزبيدي [٢]

الملخص

خلفية الدراسة: التهاب الفم الذي يشار إليه غالبًا باسم التهاب الفم بسبب طقم الاسنان، يشير إلى التهاب الغشاء المخاطي للفم ، وخاصة الغشاء المخاطي للحنك واللثة المغطى بقاعدة طقم الأسنان.

اهداف الدراسة: لتقييم مدى انتشارالعوامل المسببه لالتهاب الفم لدى مرتدي أطقم الأسنان الذين احيلوا الى مركز خانزاد التعليمي لصحه الفم والاسنان

المرضى والطرائق: اشتملت هذه الدراسة على مائه من مرتدي اطقم الاسنان العلويه المحالين الى قسم صناعه الاسنان في مركز خانزاد لطب الأسنان ، وتراوحت الفئه العمريه للمرضى بين ٣٩-٨٥ عاما، وتم تسجيل عوامل مختلفة مثل العمر ، والجنس ، وعمر طقم الأسنان ، ووقت الارتداء ، وتأثيرفقر الدم كما وتم تشخيص التهاب الفم سريريا ، ومن ثم إدخال البيانات وتحليلها بواسطه برنامج SPSS الاصدار ٢٥

النتائج: كان نسبه انتشار التهاب الفم بسبب اطقم الاسنان ٢٠% ولم يكن هناك علاقه دات قيمه في انتشار التهاب الفم مع العمر ، والجنس ، وعمر طقم الأسنان ، ووقت ارتداء طقم الأسنان ونوعه و نقص الدم بسبب فيتامين بي ١٢ والفيريتين و الفوليك .

الاستنتاجات: مرض التهاب سقف حلق الفم منتشر بين مرتدي اطقم الاسنان خصوصا الاطقم العلويه الجزئيه او الكامله لذا نقترح على اطباء الاسنان ابداء النصائح والتعليمات الخاصه بنظافه الفم واطقم الاسنان.

الكلمات المفتاحية: التهاب الفم ، مرتدي اطقم الأسنان ، فقر الدم

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