

Prevalence of Teeth Loss and Its Relation to The Oral Health Behaviors among Type 2 Diabetic and Non Diabetic Patients

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Abstract

Background: Diabetes can affect the health of the teeth and the surrounding structures that are increased the risk of developing periodontal disease that resulting destruction of the bone and the periodontal tissues that lead to greater teeth loss than those without diabetes.

Objectives: The aim of this study to compare the teeth loss of the diabetic and non-diabetic patients considering the age, sex , duration of the disease and oral health behaviors.

Methods: Teeth loss of 67 adult diabetics and 67 non-diabetic patients of age 45-74 years old were examined also diabetic group was compared according to the duration of the disease. The oral health behavior including the frequency of the tooth brush per day, cleaning method, and tobacco use were compared among the diabetic and non-diabetic groups.

Results: There is highest significant difference in mean number of the teeth loss between the diabetics and non diabetics with non significant difference between the patients of more than 10 years and less than 10 years of the duration. The diabetics showed significantly higher frequency of the tooth brush and tobacco use than non-diabetic group and the teeth loss decreased with increased the frequency of the tooth brush.

Conclusions: The teeth loss was greater in diabetics than non-diabetics, when the duration of the disease was increased there was increased in teeth loss. The study indicated that diabetic subjects should improve their oral hygiene practices.

Keywords: Teeth loss, diabetic patients, oral hygiene.

الخلاصة

الخلفية: مرض السكري يمكن أن يؤثر على صحة الأسنان وتراكيبها مما يسبب ازدياد الالتهابات في الأنسجة المحيطة بالأسنان حيث يؤدي إلى تحطم العظم الداعم للأسنان والأنسجة حول الأسنان الذي يؤدي إلى فقدان الأسنان أكثر من أولئك الغير مصابين بمرض السكري.

الأهداف: هدف هذه الدراسة المقارنة بين فقدان الأسنان لدى مرضى المصابين بالسكري وغير المصابين بالسكري اعتماداً على العمر، جنس، مدة المرض وسلوك الفم الصحية.

طرق العمل: تمت المقارنة بين فقدان الأسنان لدى 67 مريض مصاب بالسكري و67 مريض غير مصابين بالسكري من العمر 45-74 سنة أيضاً قورنت طبقاً لمدة المرض. ان ممارسات الفم الصحي تضمنت عدد استخدام فرشاة الأسنان باليوم، طريقة التنظيف، واستعمال التبغ حيث قورنت بين مج امج المصابين بالسكري وغير المصابين بالسكري.

النتائج: هناك فرق معنوي عالي في عدد الأسنان المفقودة بين المصابين بالسكري وغير المصابين بالسكري مع عدم وجود فرق معنوي في فقدان الأسنان للمصابين لأكثر من 10 سنوات و للمصابين لأقل من 10 سنوات. اظهرت النتائج نسبة أعلى من استعمال التبغ وفرشاة الأسنان لدى مجموعة المصابين بالسكري من غير المصابين بالسكري وان فقدان الأسنان يقل بازدياد استخدام فرشاة الأسنان.

الاستنتاجات: فقدان الأسنان كان أعظم لدى المرضى المصابين بالسكري من غير مصابين بالسكري، وكلما زادت مدة المرض زاد عدد الأسنان المفقودة. أشارت الدراسة بأن مرضى السكري يجب أن يحسنوا من ممارساتهم الصحية.

Introduction

Diabetes mellitus is a complex syndrome. It is characterized by abnormalities in carbohydrate, lipid, and protein metabolism due to disturbance in the intrinsic production of the insulin that result either from deficiency in insulin or from resistance to metabolism of insulin⁽¹⁾.

There are two basic types of diabetes mellitus: Type 1: insulin dependent diabetes mellitus (IDDM). While Type 2: non-insulin dependent diabetes mellitus (NIDDM). IDDM is mostly found in children and young patients with an age before 40 years and required insulin injection treatment. While NIDDM is most common form and found in people over 45 years. It generally occurs in obese peoples and the body cannot make enough insulin and control by diabetic pills and diet⁽²⁾.

There are many complications of this disease such as retinal, neural, and vascular changes. The changes in small vessels can be found in the oral tissues⁽³⁾. As well as a systemic disorder, the disease affects the oral cavity. Investigators have reported several oral lesions and conditions associated with the disease. These include among others, xerostomia, burning mouth, altered taste sensation, gingivitis, periodontal disease, candidal infection and lichen planus⁽⁴⁻⁶⁾.

Periodontal diseases are chronic infectious that affect the gums and bone supporting the teeth if untreated that lead to tooth loss and the gingivitis if left untreated will progress to periodontitis that characterized by destruction of soft tissue and bone. Because the bacteria produced toxin that cause inflammatory response, this

causes the body attack and destroy the tissue and bone supporting the teeth, as the disease progresses there is more destroying the tissue and bone so the teeth become loose and mobile that lead to teeth lost⁽⁷⁾. The statement that the teeth become loose in diabetic patient appeared for the first time in the encyclopedia Britannica in 1877, it had been suggested that the periodontitis among the diabetic patients was modified and did not have the same characteristic features of the periodontal disease among the non-diabetic patients⁽⁸⁾. Therefore, the periodontitis associated with systemic disease such as diabetes mellitus that have high risk of attachment loss and the tooth become mobile because of inflammation and decrease resistance to the infection⁽⁹⁾. Since tooth mortality or the number of missing teeth is good indicators of past periodontal disease, the number of lost teeth should be integrated in health messages to the general population. Medical colleagues and diabetic patients should be urged to consider oral health as an important factor for periodontal disease control⁽¹⁰⁾.

On the other hand, diabetes mellitus is a chronic disease that may impact on personal behavior and socioeconomic status. Therefore, caution should be taken when assessing the impact of the path physiology of diabetes on oral health status when these factors are not considered⁽¹¹⁾. Therefore, further researches are needed to assess diabetic oral health behavior; diabetics need for oral health education and to determine the obstacles in acquiring proper oral health behaviors among the diabetic patient.

This study was carried out with the following objectives:

To assess and compare the prevalence of teeth loss among a group of adult diabetics versus their age and gender-matched non-diabetic (control group) considering the duration of the disease and to evaluate the oral health behaviors among diabetics and non-diabetic group and its relation to the teeth loss.

Methods

This study was start from 1/9/2009 till 1/3/2010 in karbala city, the sample was composed of 67 subjects of diabetic patients and 67 healthy (control group). The subjects of diabetic group was selected from the diabetic clinics of the primary health center that had no history of local or any other systemic disease (only diabetes mellitus) and not under medication therapy, while the control group included age-grouped and sex-matched healthy volunteers who attended the primary health center suffering from periodontal disease with no history of diabetes, any local or systemic disease, not under any medication therapy. The age range was between 45 to 74 years. The subjects were informed about the study and consent was obtained from each patient before the start of clinical examination. The data were gathered by questionnaire, clinical examination. The investigators controlled completion of the questionnaire which included questions about medical history and oral health behaviors. Medical history records were included duration of the diabetes, current medication, according to the duration the diabetic group subdivided into more than 10 years and less than 10 years⁽³⁾. The oral health behaviors included the frequency of the tooth brush per day and the type of oral cleaning methods tooth brush only or both tooth brush with dental floss.

Also they asked about the regular dental visit and if they are smokers or not. The clinical examination included full mouth exam-ination and the missing maxillary and mandibular teeth were recorded.

Statistically data were collected and analyzed using SPSS program version 12. The data were analyzed descriptively and comparison between the groups was done using student t-test, Chi-square, as well as Mann Whitney tests whenever applicable.

Results

The distribution of the participating subjects in relation to age, sex is shown in table(1). The sample composed 67 diabetic patients 47.76 % male and 52.24 % female. While the control group composed of 67 non diabetic patients 44.78 % male and 55.22 % female.

Table (2) and figure (1) showed that the mean number of the loss teeth for the diabetic group was higher than the control group in all age groups with highly significance differences($p < 0.01$) for groups of 45-54 years and 55-64 years respectively except the age group 65-74 years the mean number of the loss teeth for the control group was higher than diabetic group with non significance differences ($P > 0.05$). For all the subjects the mean number of the teeth lost was higher in diabetic group than non-diabetic group (healthy) with high significance difference between then ($p < 0.01$).

The comparison of the prevalence of teeth loss according to the sex is shown in table (3). The results showed for the diabetic groups mean number of the teeth loss was higher in female than male but the results were not statistically significant ($P > 0.05$). While for control group the mean number of loss teeth was higher in female than male with highly

significance difference ($p < 0.01$). Also for all the subjects the mean number of the loss teeth was higher in female than male with significance difference ($p < 0.05$).

According to the duration of the disease the results showed the mean number of lost teeth was higher in the patients less than 10 years duration than the patients more than 10 years duration of the diabetes with statically non significance difference ($p > 0.05$) as shown in table (4). In relation of the duration of the disease with mean number of the teeth the results showed the teeth loss was increased with the duration was increased as shown in figure (2).

The results of the oral health behavior questionnaire are illustrated in Table(5). The results showed better oral health habits regarding tooth

brushing frequency among the diabetic patients in comparison to the control group ($P < 0.01$). However, use of tooth brush with or without dental floss and dental visits were better in healthy group than diabetic group, with highly significant differences were found between the two groups ($P < 0.01$). Also, there were highly statistically significant differences between the both groups relative to current tobacco use. In comparison of the prevalence of teeth loss according to the frequency of the tooth brush per day the results was showed the highest mean tooth loss with those with never use of the tooth brush in day and the mean lost of teeth was decreased with increased the frequency of the tooth brush in the day in both diabetic and non diabetic groups figure (3).

Table 1. distribution of diabetic and healthy subjects by age and sex.

Subjects	Age (years)	male		female		Total	
		No.	%	No.	%	No.	%
Diabetic patients	45-54	12	17.91	13	19.40	25	37.31
	55- 64	16	23.88	19	28.36	35	52.24
	65-74	4	5.97	3	4.48	7	10.45
	Total	32	47.76	35	52.24	67	100
Non diabetic	45-54	15	22.39	15	22.39	30	44.78
	55- 64	14	20.90	21	31.34	35	52.24
	65-74	1	1.49	1	1.49	2	2.98
	Total	30	44.78	37	55.22	67	100

Table 2. mean number of teeth loss among diabetic and healthy subjects according to age.

Age(year)		No.	mean	SD	P-value
45 - 54	Diabetic	25	11.52	8.06	0.000
	healthy	30	3.50	1.89	
55 - 64	Diabetic	35	13.89	7.77	0.004
	healthy	35	9.20	9.72	
65 -74	Diabetic	7	10.73	7.58	0.55
	healthy	2	14.50	6.36	
total	Diabetic	67	6.81	7.78	0.000
	healthy	67	12.67	7.85	

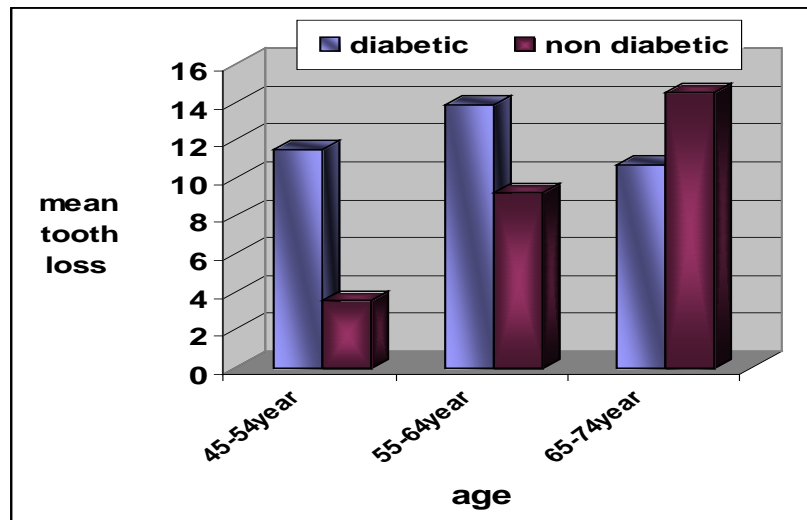


Figure 1. Relation between the mean tooth loss and the age.

Table 3. mean number of teeth loss among diabetic and healthy subjects according to sex.

subjects	sex	No.	mean	SD	P-value
Diabetic	Male	32	11.90	7.56	0.501
	female	35	13.37	8.15	
healthy	male	30	3.93	3.28	0.004
	female	37	9.13	9.48	
total	Male	62	8.04	7.09	0.031
	female	72	11.19	9.05	

Table 4. mean number of teeth loss among diabetic subjects according to the duration of the disease.

	No.	mean	SD	P-value
less than 10 year	49	12.06	7.90	0.254
more than 10 year	18	14.33	7.70	

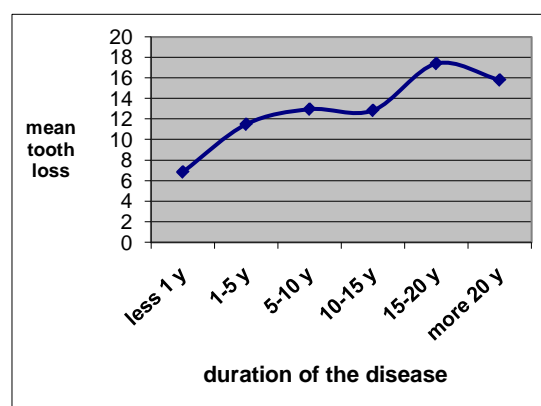


Figure 2. Relation between the mean tooth loss and the duration of the disease.

Table 5. Oral health behavior of the diabetic and healthy (control) subjects.

variable		Diabetic patient	Healthy (control)	p-value
Frequency of tooth brush	Non	28.4 %	47.8 %	0.01
	Irregular	17.9 %	20.9 %	
	1/day	31.3 %	16.4 %	
	2/day	13.4 %	11.9 %	
	3/day	9.0 %	3.0 %	
Oral cleaning methods	Tooth brush	83.8 %	94.4 %	0.000
	Tooth + dental floss	16.2 %	5.6 %	
Regular dental visit	Yes	10.4 %	16.4 %	0.007
	No	50.7 %	35.8 %	
	sometimes	38.8 %	47.8 %	
Tobacco use	No	76.1 %	95.5 %	0.000
	yes	23.9 %	4.5 %	

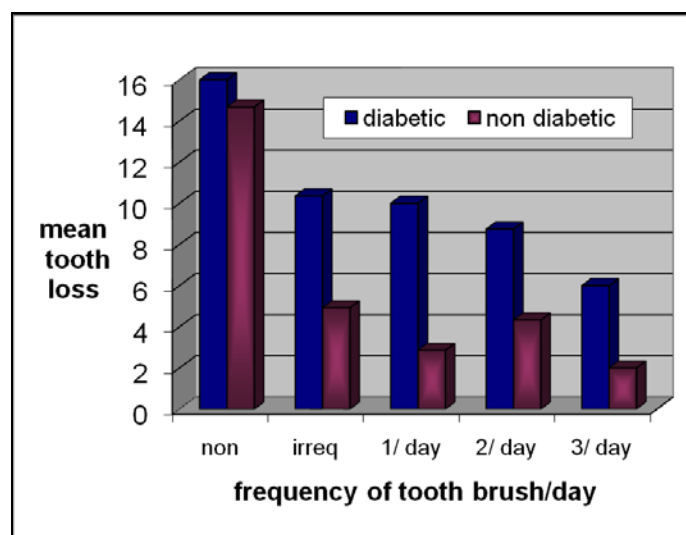


Figure 3. Relation between the mean tooth loss and the frequency of tooth brush.

Discussion

Results of this study showed that there was highly significant differences in the mean of the lost teeth between the diabetic group and control group this results in agreement with many studies^(12, 13) and disagree the other study which found the teeth loss was the similar among the diabetic and the control group⁽¹⁴⁾. This may attributed to the metabolic imbalance in the tissue with lower resistance to the infection that developed and progression of the periodontal disease. Also the impairment neutrophil chemo taxis has been found in the diabetic

patients that lead to increase the response to the inflammation⁽¹⁵⁾. furthermore the diabetic patient have prolonged exposure to hyperglycemia and poor glycemia control and microvascular changes and impair immunity to infection and increased glucose concentration in the saliva that increased plaque formation and providing food source for the bacteria⁽¹⁶⁾. Regarding to sex the results showed the mean tooth loss of teeth was higher in female than male this in agreement with other studies^(17,18). According to the duration of the disease the results showed the mean number of lost teeth was higher in the

patients less than 10 years duration than the patients more than 10 years duration of the diabetes with statically non significance difference this results in agreement with some study⁽¹⁹⁾ and disagreed with other studies who found the mean tooth loss was higher in diabetic patients more than 10 years than those more than 10 years⁽²⁰⁾.

The results of the oral health behaviour showed better oral health habits regarding tooth brushing frequency among the diabetic patients in comparison to the control group this results disagree with other studies who found the frequency of tooth brushing was higher among non-diabetic subjects than in the diabetic group⁽²¹⁾. Also, there were higher tobacco use in diabetic group than healthy group this result disagree with other studies who found the found that tobacco use in diabetic subjects and oral health behaviour were similar to those of non-diabetic subjects but diabetics were somewhat less likely to visit their dentists for routine examination^(11, 22).

In Conclusion of this study the diabetes mellitus is definite risk factor for tooth loss regardless to the duration of the disease. As well as the tooth loss was higher in the female than male with good oral health behavior but with increased tobacco use comparing healthy subjects.

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