

Tooth mortality in relation with diabetics and non diabetic patients

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ABSTRACT

Background: Diabetes can affect the health of the teeth and surrounding structures. The purpose of the present study was to compare tooth mortality of diabetics & non diabetic patients considering mainly the degree of control & the duration of diabetes.

Methods: Tooth mortality of 100 adult diabetics & 100 non diabetic patients of the age groups 40 – 52 & 53 – 65 y. was examined. The diabetic group was further divided according to the control & duration of diabetic state. Student-T- test was used where indicated, the level of significance was 0.01.

Results: The results revealed a highly significant difference in the mean number of lost teeth between the poorly controlled diabetic patients & the control group & a non significant difference between the well control diabetics & the control group. Also revealed a non significant differences between the control group & both sub groups of patients of more than 10y. duration & less than 10y duration.

Conclusion: The results indicates that tooth mortality was greater in poorly controlled diabetics than the well controlled diabetics & the control group, with a highly significant differences. Tooth mortality was smaller in patients of more than 10 years duration than in those of less than 10 years with a non significant difference

Keywords: Tooth mortality, diabetic patients. (J Coll Dentistry 2005; 17(1): 61-65)

INTRODUCTION

Diabetes Mellitus is a group of metabolic disorders characterized by chronic hyperglycemia due to disturbances in the intrinsic production of insulin leading to abnormal fat, sugar & protein metabolism and it is known to affect oral disease progression^(1,2).

Diabetics suffer from microvascular changes, which develop over 10 to 15 years & are first diagnosed as renal, retinal & neural changes. Also changes in small vessels can be found in the oral tissues⁽¹⁾. Two basic types of diabetes mellitus have been described: Insulin - dependent diabetes mellitus (IDDM) & non - insulin dependent diabetes mellitus (NIDDM).

IDDM is most frequently found in young patients with an age of onset before 40 years. The patients are usually normal weight & are prone to develop ketoacidosis. They always require insulin for successful management. (NIDDM) is the most common form of diabetes mellitus. It is usually diagnosed in the middle years of life (after age 45). These patients are not usually prone to ketoacidosis & hyperglycemia may be present for years before diagnosis. It is generally occurs in obese individuals & can often be controlled by diet or by oral hypoglycemic agents^(3,4).

The studies that demonstrate the correlation between diabetes & periodontal disease found

the degree of control, the duration of diabetes & the presence of complications to the diabetes may alter the inflammatory response in the periodontal tissues⁽³⁾. Although the relationship between diabetes mellitus & periodontal diseases has been studied extensively, conflicting results have been obtained when the periodontal status of diabetic patients and that of their healthy controls has been compared in epidemiological studies⁽⁵⁻¹⁰⁾.

The statement that the teeth become loose in diabetes mellitus appeared for the first time in the encyclopedia Britannica in 1877. It has been suggested that periodontitis among diabetic patients was modified & did not have the same characteristic features of periodontal disease in non diabetic patients⁽³⁾. The purpose of this study was to compare the tooth mortality of diabetic & non diabetic patients, considering mainly the degree of control and the duration of diabetes.

MATERIALS & METHODS

The sample consisted of 100 diabetic patients (62 males & 38 females) attending the department of periodontics in the college of dentistry, university of Baghdad. The control group was selected from the patients attending this department also & having chronic periodontitis. They were 100 non diabetic patients (52 males & 48 females), who had at that time no known diseases & used no

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medication . The age groups selected were 40 – 52 y & 53 – 65 y .

The diabetic group was further divided into 2 subgroups according to their degree of control of the diabetic state , well controlled (n = 65) , & poorly controlled (n =35) . The control of diabetes was defined according to the level of HbA1 , which is a fraction of haemoglobin that reflects the glucose levels over the previous 6 – 8 weeks & provides information on the degree of diabetic control ⁽¹¹⁾ . Well control patients having the HbA1 not more than 8.5 while the poor controlled patients having the HbA1 equal or more than 9. So the diabetic patients were sent to the hospital to test the HbA1.

The diabetic patients were further sub divided according to the duration of diabetes into more than 10 years duration (n =38) & less than 10 years duration (n =62) ⁽¹⁾ . Full mouth examination was obtained & the missing maxillary & mandibular teeth were recorded . The difference between the diabetic & control groups was tested using Student's T-test. The level of significance was 0.01.

RESULTS

Distribution of the sample by age & sex is shown in table (1) . The sample is composed of 100 diabetic patients, 62 males (62%) & 38 females (38%). The sample also composed of 100 non diabetic control patients , 52 males (52 %) & 48 females (48 %).

Table (2) showed that the mean number of lost teeth per subject was smaller in the control group compared with the well controlled diabetics . This difference was found non significant (p > 0.01). Poorly controlled diabetics had more mean number of lost teeth than both the good controlled diabetics & the control non diabetic patients. The differences were found highly significant (p < 0.01) .

According to the duration of diabetes, the table showed that the mean number of lost teeth was smaller in patients more than 10 years duration than the patients of less than 10 years duration. It was also smaller in the control group than both diabetic subgroups but the differences were found non significant .

Figure 1 (A) showed the distribution of diabetic patients both males & females by the number of teeth lost and their percentages. The higher percentage of patients lost 6 or more teeth, they represent 79 % of the total sample (92.1 % females & 71 % Males). Figure 1 (B) showed the distribution of non diabetic patients

according to the number of missing teeth, both for males & females. 53 % of the total sample showed 6 or more lost teeth (56.25 % females & 50 % males).

Regarding the age distribution of diabetic patients according to the number of missing teeth , figure 2(A) showed that 89.4 % of the age group 40 – 52 y had 6 or more teeth lost, while 69.8 % of the age group 53 – 65 years showed this lost.

Figure 2(B) showed the age distribution of non diabetic patients according to the number of missing teeth. It showed that 30.7% of the age group 40-52 years had 6 or more teeth lost while 57.1% of the age group 53-65 years showed this loss. Figure (3) showed the distribution of lost teeth according to the tooth type in the diabetic & non diabetic patients. The highest percentages were those affecting the lower first molars and the least were the lower canines.

DISCUSSION

Results of this study showed that there was a non significant difference in the mean number of lost teeth between the well controlled diabetic group and the control non diabetic group. This may indicate that well controlled diabetics can be treated as the healthy control from periodontic point of view. There was a highly significant difference in the mean number of lost teeth between the poor controlled diabetic group and the control group. This result was in accordance with many studies ^(1, 3, 7, 12-14) & disagree with a study done by Oliver et al (1993)⁽¹⁸⁾ which found that tooth loss was similar among diabetics & the control group. This could be explained that in poor control diabetics , the metabolic imbalances in the tissues may lower the resistance of diabetics to infection , thus influence the initiation, development & progression of periodontal disease . Also impaired neutrophil chemotaxis has been found in diabetic patients & may be another factor in the decreased response to inflammation ⁽¹⁵⁻¹⁷⁾ .

Regarding the duration of diabetes, results showed that the mean number of lost teeth was found smaller in diabetic patients more than 10 years duration in comparison to patients of less than 10y . duration. This result disagree with other studies ^(14, 19, 20) . This may be attributed to the highest percentage of well controlled diabetic patients in our study & it was demonstrated that patients with good metabolic

control exhibited less loss of attachment & bone loss than poorly controlled patients inspite of long diabetes duration ⁽²¹⁾. Both diabetic & non diabetic females showed the higher percentage with 6 or more missing teeth than males, but the diabetic females had much higher percentages than non diabetic females .This agree with other studies ^(7,22).

Regarding the age ,our results showed that the higher percentage of patients with 6 or more lost teeth was for the age group 40-52years & more than the age group 53-65 years, this may be explained that from the 65 well controlled patients of our study, about 38 patients (58.4%) are of the age group 53-65years, the remainder 27 patients (41.5%) are of the age group 40-52 years.

In conclusion, diabetes mellitus is a definite risk factor for periodontal disease & the diabetic patients having periodontal disease should be treated to eliminate the periodontal inflammation.

The significance of differences :-

Well controlled diabetics – controls group (N.S. P>0.01), Poor controlled diabetics– control group(highly significant p<0.01), Well controlled diabetics – poor controlled diabetics (highly significant p<0.01), Control group – more than 10 years duration diabetics (p>0.01, N.S.), Control group – less than 10 years duration diabetics (p>0.01, N.S.) , More than 10 years duration – less than 10 years duration (p>0.01, N.S.).

Table (1) Distribution of the sample by age & sex Diabetic patients

Age (Years)	Male		Female		Total	
	No	%	No	%	No	%
40 –52	23	49	24	51	47	47
53 – 65	39	74	14	26	53	53
Total	62	62	38	38	100	100
40 – 52	27	41.5	38	58.5	65	65
53 – 65	25	71.4	10	28.6	35	35
Total	52	52	48	48	100	100

Table (2) Mean number of lost teeth per Non- Diabetic Patients

	Mean Number of Missing Teeth	
	Mean	S D
Controls (n = 100)	6.85	5.132
Diabetics (n = 100)	10.02	5.114
Diabetics well controlled (n = 65)	7.13	3.147
Diabetics poor controlled (n = 35)	15.371	3.546
Duration more than 10 y (n = 38)	9.736	6.923
Duration less than 10 y (n = 62)	11.645	11.746

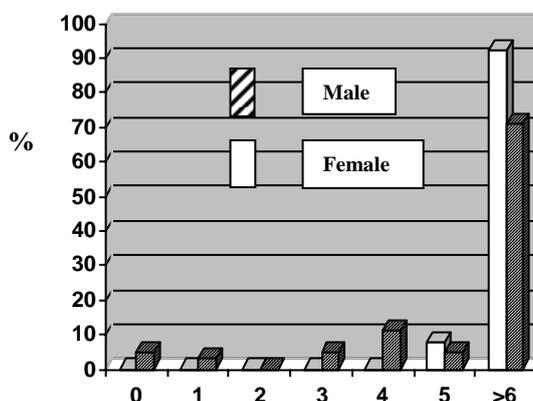


Figure 1 (A) :- Distribution of Diabetic Patients According to The Number of Lost Teeth by Sex

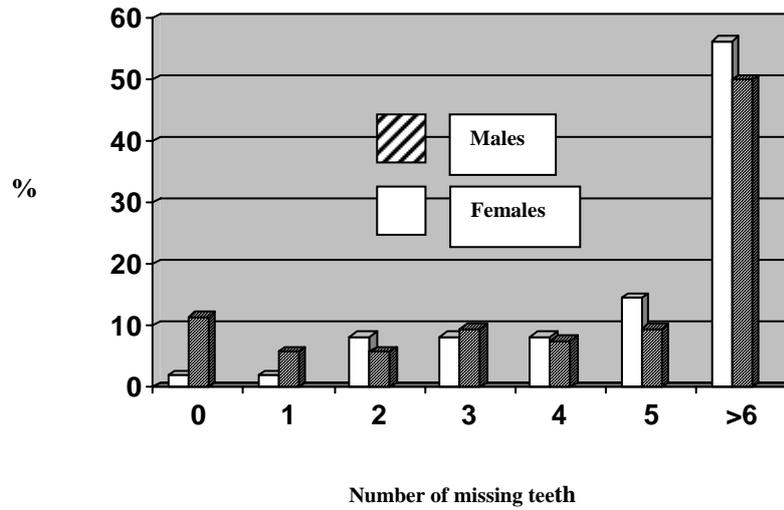


Figure 1(B) :- Distribution of Non Diabetic Patients According to The Number of Missing Teeth by Sex

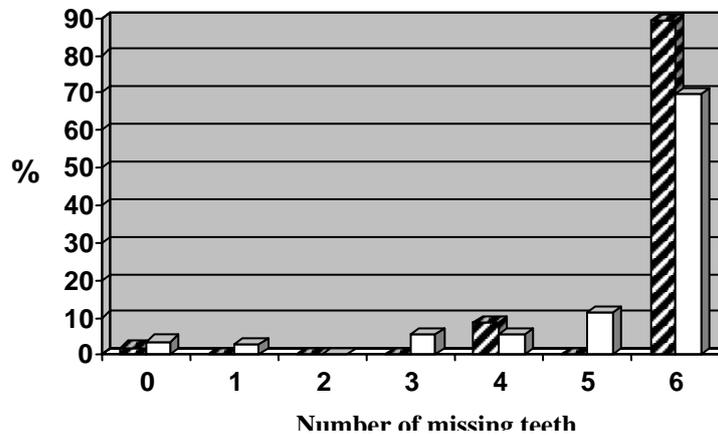


Figure 2 (A): Age Distribution of Diabetic Patients According to The Number of Missing Teeth.

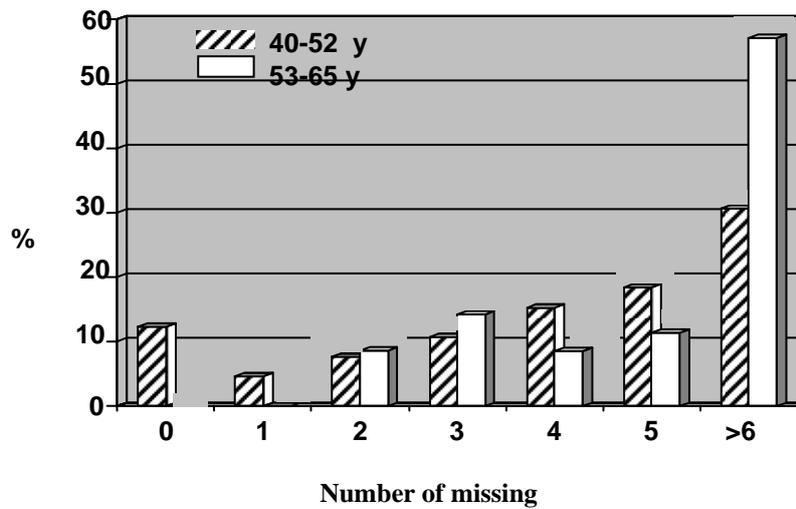


Fig.2(B) :- Age distribution of non diabetic patients according to the number of missing teeth .

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