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RESEARCH ARTICLE

STUDY BETWEEN DIABETIC AND NON DIABETIC PATIENTS CONDUCTION AFTER TOOTH EXTRACTION IN KHULNA CITY, BANGLADESH

Dr. Asma Begum¹ and Mohammad Shahiduzzaman Shardar²

1. Assistant Professor, (Dentistry) Shahid Sheikh Abu Naser Specialized Hospital, Khulna.
2. Assistant Professor, (Oral and Maxillofacial Surgery), Khulna Medical College, Khulna.

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Abstract

Background: Oral health is associated to general health and one of the most common chronic diseases is diabetes mellitus. Diabetes can have difficult effects on oral health. Several studies have shown that some oral disease like gingivitis, periodontitis, and periapical lesion can be complicated by the severity of diabetes.

Objective: To compare the healing after tooth extraction in diabetic versus non-diabetic patients.

Methodology: This prospective clinical trial consists of one hundred patients that were recruited in to two groups having 50 known diabetic (type 1 and type 2) and 50 non-diabetic. All Patients above ten years and both genders were included in this study through consecutive sampling. Patients with any other systemic illness and those on anticoagulants and steroids were excluded from the study. Tooth extraction was carried out for all patients under aseptic conditions, and these patients were recalled after one week for a clinical and radiological examination after tooth extraction assesses its healing status.

Results: Majority (40.0%) patients were hypertension in diabetic group and 31(62.0%) in non diabetic group. Mean negative attitude score was found 17.4 ± 3.3 in diabetic group and 15.6 ± 3.1 in non diabetic group. Twenty two (44.0%) patients were abnormal healing in diabetic group and 4(8.0%) in non diabetic group. The difference was statistically significant ($p < 0.05$) between two group.

Conclusion: Significantly better healing is higher in non diabetics patients compare than diabetic's patients after tooth extension.

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Introduction:-

Oral health is related to general health and one of the most prevalent chronic diseases is diabetes mellitus. Diabetes can have adverse effects on oral health and vice versa. Saliva analysis can be used as a non-invasive method to obtain information about diseases status like diabetes.¹

There is a strong level of evidence in the medical literature to support these findings; that diabetic patients are at an increased risk of infection or delayed healing following surgical procedures. While it may be tempting to assume that these findings would be reflective of patients undergoing oral surgery procedures, the idiosyncratic nature of the oral

Corresponding Author:- Dr. Asma Begum

Address:- Assistant Professor, (Dentistry) Shahid Sheikh Abu Naser Specialized Hospital, Khulna.

cavity make this difficult. The array of bacterial flora, the extent of local inflammation, and the composition of the hosts saliva all make for an unsterile environment.²

Several studies have shown that periodontitis can complicate the severity of diabetes by worsening the degree of glycemic control.³⁻⁷ In some studies, periodontal therapy aimed at eliminating infection and reducing inflammation has shown, at least in the short term, improvement in diabetes control.⁸⁻¹⁰

Compared to coronal caries; a relationship between DM and root surface caries has been more obvious.¹¹ Thus, individuals with T2DM have higher prevalence of root surface caries compared to nondiabetic individuals.^{12,13} This evidence is equivocal as some studies have found no difference in root surface caries between individuals with and without T2DM.¹⁴

Delayed and nonhealing of soft and hard tissues of the body are well-known complications of oral surgeries in diabetic patients. Therefore, it is very difficult to manage these patients undergoing oral surgeries including extraction procedures. Aggressive periodontitis more carries and poor oral hygiene in diabetic patients prone them comparatively more to dental extraction and delayed / nonhealing of these oral wounds.¹⁵ Extraction of teeth is one of the commonest oral surgical procedures in this medically compromised condition.

Material And Methods:-

This prospective clinical trial was performed in the Oral and Maxillofacial surgery department, Khulna Medical College Hospital, Khulna from January 2017 to December 2017. We selected 100 patients through consecutive sampling for this study. Out of these 100 selected patients, 50 were diabetics, and 50 were non-diabetics. Appropriate ethical approval was obtained from the hospital authorities. Bangladeshi origin patients aged 15-80 years of both gender were included in the study. Patients with any other systemic illness and those patients on anticoagulants and steroids were excluded from the study. Random blood sugar was performed on all patients with positive history of diabetes. 200 mg/ dl was the upper limit, and all patients above this level of blood glucose level were postponed with a written referral to a physician for management. A random blood sugar level of up to 170mg/ dl to 180mg/dl was considered as controlled level and a blood glucose level above 180mg/dl as uncontrolled diabetes mellitus. A thorough history was taken. A comprehensive clinical examination was carried out. Verbal consent was taken before the start of the procedure; vital signs were monitored. Patients well oriented in time and space were given local anesthetic 2% lidocaine with 1:80000 adrenaline. Atraumatic extraction was carried out under proper anxiety reduction protocol. The socket was squeezed with gentle manual pressure between thumb and 1st two fingers to reduce greenstick fracture of the buccal cortex, to achieve hemostasis, and to promote healing by bringing the margins of tooth extraction. Proper post-operative instructions, painkillers, and antibiotics were advised. Patients were recalled after one week for a clinical and radiological examination of the extraction tooth to know about the healing status. Data were analyzed using SPSS Version 23. Descriptive statistics like frequency and percentages were calculated for gender, type of extracted tooth, quadrant of the extracted tooth, the status of diabetes, controlled/uncontrolled, healing of extraction site (normal or abnormal). Mean, and the standard deviation was calculated for age. Chi-square test was applied to compare healing of extraction tooth between diabetic and non-diabetic patients. P value < 0.05 was considered significant.

Results:-

Table 1:- Socio-demographic, anthropometric, clinical and relevant characteristics of participants in the diabetic and non diabetic groups.

	Diabetic (n=50)	Non diabetic (n=50)	P value
Mean age (years)	57.0±6.7	55.9±7.6	^a 0.444 ^{ns}
Sex			
Male	22 (44.0%)	24 (48.0%)	^b 0.688 ^{ns}
Female	28 (56.0%)	26 (52.0%)	
Occupation			
Employed	10 (20.0%)	14 (28.0%)	^b 0.349 ^{ns}
Not employed	40 (80.0%)	36 (72.0%)	
Mean BMI (kg/m ²)	29.6±5.2	28.7±4.9	^a 0.375 ^{ns}
Smoking			

Smoker	23 (46.0%)	20 (40.0%)	^b 0.544 ^{ns}
Non smoke	27 (54.0%)	30 (60.0%)	
Oral health			
Mean plaque index	2.8±0.8	2.9±0.6	^a 0.481 ^{ns}
Mean gingival index	2.7±0.7	2.8±0.6	^a 0.445 ^{ns}
Mean probing pocket depth (mm)	5.4±0.9	5.7±1.1	^a 0.139 ^{ns}
Mean clinical attachment (mm)	7.4±0.6	7.3±1.0	^a 0.546 ^{ns}
Complication			
Hypertension	20 (40.0%)	31 (62.0%)	^b 0.027 ^s
Atherosclerosis	6 (12.0%)	7 (14.0%)	^b 0.766 ^{ns}
Nephropathy	3 (6.0%)	2 (4.0%)	^b 0.646 ^{ns}
Retinopathy	14 (28.0%)	15 (30.0%)	^b 0.825 ^{ns}
Neuropathy	25 (50.0%)	22 (44.0%)	^b 0.547 ^{ns}
Cardiovascular disease	5 (10.0%)	7 (14.0%)	^b 0.538 ^{ns}
Diabetes care profile			
Mean barrier to adherence score	26.7±2.7	26.3±2.3	^a 0.427 ^{ns}
Mean negative attitude score	17.4±3.3	15.6±3.1	^a 0.002 ^s
Mean positive attitude score	12.5±2.2	12.7±1.4	^a 0.589 ^{ns}
Mean support score	33.9±3.2	33.1±3.2	^a 0.214 ^{ns}

s= significant; ns = not significant

^aP value reached from unpaired t-test

^bP value reached from chi square test

Majority (40.0%) patients were hypertension in diabetic group and 31(62.0%) in non diabetic group. Mean negative attitude score was found 17.4±3.3 in diabetic group and 15.6±3.1 in non diabetic group. Which were statistically significant (p<0.05) but others variable were not statistically significant (p>0.05) between two group.

Table 2:- Status of tooth extraction in the diabetic and non diabetic groups.

Status of extraction	Diabetic (n=50)	Non diabetic (n=50)	p value
Normal healing	28 (56.0%)	46 (92.0%)	0.001 ^s
Abnormal healing	22 (44.0%)	4 (8.0%)	

s= significant

P value reached from chi square test

Twenty two (44.0%) patients were abnormal healing in diabetic group and 4(8.0%) in non diabetic group. The difference was statistically significant (p<0.05) between two group.

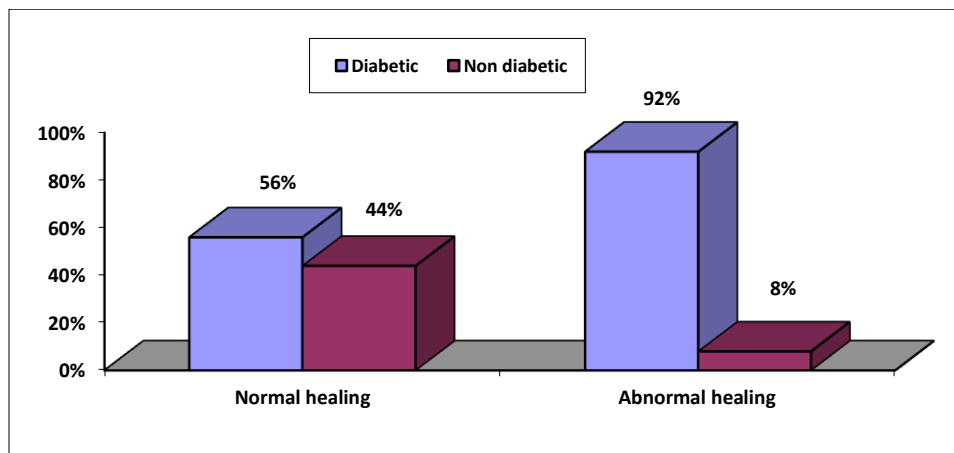


Figure 1:- Status of tooth extraction in the diabetic and non diabetic groups.

Discussion:-

In this study observed that the majority (40.0%) patients were hypertension in diabetic group and 31(62.0%) in non diabetic group. Mean negative attitude score was found 17.4±3.3 in diabetic group and 15.6±3.1 in non diabetic group. Which were statistically significant ($p<0.05$) but others variable were not statistically significant ($p>0.05$) between two group. In study of Khader et al.¹⁶ observed the age of the patients in the treatment group ranged from 42 to 73 years with a mean (SD) of 57.1 (6.9) years, and the age of patients in the control group ranged between 37 and 72 years with a mean of 55.6 (7.9) years. All patients maintained the same dietary habits, medications and smoking status over the entire follow-up period. Weight did not change significantly in both groups over the follow-up periods. Regarding molecular pathology, hyperglycemia is a stimulus for bone resorption, inhibition of osteoblast differentiation, and a reduced capacity for bone recovery.¹⁷ Arrieta-Blanco et al.¹⁸ in a study of 144 patients (70 diabetic and 74 non-diabetic) found no significant difference in mean caries between the two groups. The prevalence of carious lesions was 7.39% in diabetic patients and 6.91% in non-diabetics.¹⁸ Another study with a sample of 600 patients (300 with diabetes and 300 healthy) showed that the prevalence of dental caries was higher in non-diabetics (32.3%) than in diabetics (13.6 %).¹⁹ Mohamed et al.²⁰ reported hypertension was also more common in the cases than the controls (31.8% versus 14.9%, $P<0.001$). A more appropriate screening of unidentified individuals with T2DM among the controls as suggested by Borrell et al.²¹ would have contributed to the internal validity of the results. Although the control group may represent dental attendees in the general Khartoum population, it is possible that the recruitment procedure of the diabetic patients introduced a bias since a convenience sample attending the Jaber Abolez Diabetes Center was utilized.²² Nevertheless, the socioeconomic status did not differ between the cases and controls in this study. Consistent with previous studies, the T2DM patients presented with more visible dental plaque, more missing teeth and were more likely to suffer from chronic periodontitis compared with the non-diabetic controls.^{23,24} Although the T2DM patients presented with limited sugary drink consumption and low frequency of smoking, PI was significantly higher among the cases than the controls. Presence of more dental plaque and poorer oral hygiene among diabetic compared to non-diabetic subjects have been reported in a number of studies and might be attributed to DM patients having higher levels of glucose in gingival crevicular fluid (GCF) and saliva.²⁴ More diabetic patients were presented to oral surgeons for extraction of teeth as compared to non-diabetic patients.²⁵

In this study showed 22 (44.0%) patients were abnormal healing in diabetic group and 4(8.0%) in non diabetic group. The difference was statistically significant ($p<0.05$) between two group. Khan et al.²⁶ reported in his study Diabetic patients had significant greater abnormal healing of the extraction sockets than in non-diabetic patients ($p=0.000$). Extraction sites in diabetic patients most often have abnormal healing as they have more chances of dental infections.²⁷ Huang et al.²⁸ determined whether there was a difference in delayed healing following dental extractions for Type 2 diabetics on oral hypoglycemics. They reported that type 2 diabetics heal normally after tooth extraction. Their results are consistent with our results. But our results are in contrast with the study of Fernandes,²⁹ who reported an increase chance of abnormal healing in type 2 diabetes.

Conclusion:-

Significantly better healing is higher in non diabetics patients compare than diabetic's patients after tooth extension.

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