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Periodontal Health of Diabetic Patients in Khartoum

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ABSTRACT: *Diabetes mellitus and periodontal disease are strongly related to each other. This study was conducted to evaluate and compare periodontal health of diabetic patients' type II and non-diabetic patients. The study was carried out in Sudan 2003. 50 dentate diabetic patients and 50 non-diabetic periodontal patients aged 30-55 years were randomly selected. Random blood sugar was done. All subjects were examined for periodontal parameters. Most of the subjects were found to suffer periodontal problems. Diabetics showed more periodontal disease parameters than controls but statistically insignificant. The results of this study suggest that diabetic patients are at higher risk of periodontal disease.*

Keywords— *diabetes mellitus; periodontal disease; periodontal parameters*

I. INTRODUCTION

Periodontal disease is a chronic inflammatory disease of the tissues that attach and support the teeth to the jaws (Offenbacher S 1996). Bacterial plaque is the initiator of periodontal disease but whether it affects a particular subject and its degree of progression depend on the host defence system (Kinane. D. F and Marshall. G.J 2001). The term diabetes mellitus describes a group of syndromes characterized by hyperglycemia, altered metabolism of lipids, carbohydrates and protein as a result of a defect in insulin secretion, insulin action or both (Arulmozhi DK et al 2004). As the disease progresses tissue or vascular damage ensues leading to severe diabetic complications such as retinopathy, neuropathy, nephropathy, cardiovascular complications (Bastaki S 2005). In poorly controlled diabetic patients abnormalities in granulocyte chemotaxis, phagocytosis and microbicidal activity have been described (Loureiro et al 2007). Diabetes represents a risk factor for periodontitis and periodontitis increases the risk of diabetic complications (Deshpande. K et al 2010). Periodontal disease has been labelled the "sixth complication of diabetes mellitus" (Löe. H 1993).Type I as well as type II diabetes increase the risk and severity of periodontitis (Deshpande. K et al 2010).Both diabetes and periodontal disease share a common pathogenesis that involves an enhanced inflammatory response (Southerland J.H 2005) and genetic predisposition (Oliver RC and Tervonen T 1994. Many studies showed high incidence of plaque (Novaes et al 1991), gingivitis and attachment loss in diabetics compared with non-diabetic (Campus et al (2005). Epidemiologic studies in diabetic adults have often shown an increase in extent and severity of periodontitis (Tervonen and Oliver1993). Metabolic imbalance in tissues may lower the resistance of diabetics to infection and thus influence development and progression of periodontal disease (Ervasti et al 1985)
The objectives of the studywere to evaluate the periodontal health of diabetic patients and to compare periodontal health status of diabetic with non-diabetic patients.

II. MATERIAL AND METHODS

The study was performed in Khartoum University, in Sudan during the period January to May 2003. The study was a randomized control study. The protocol of which was approved by the faculty board of faculty of Dentistry; University of Khartoum. An introduction letter was given to the diabetic centre and an informed consent was signed by each patient. The patient information was collected through direct patient interviewing and examination, study of patient hospital records, and discussion with the patient physician. Subjects are one hundred dentate patients, 50 of them were diabetic patients type 2 randomly selected from patients routinely attending diabetic centre and the other 50 were non-diabetic patients with periodontal problems. Inclusion criteria for the subjects were age group of 30 to 55 years and regular attender of diabetic centre. Exclusion criteria for test group were: less than 30 years or above 55, patients with acute complications, patients that came for surgical dressing and patients with edentulous sextants and smokers. Prior to periodontal examination the

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participants were assessed, examined and investigated for diabetes using random blood sugar. All participants were assessed for previous dental treatment as well as previous periodontal problems experienced.Then all subjects were examined for periodontal status dividing each jaw into three sextants and the higher score was recorded for each sextant. All sextants were examined and the following parameters were recorded: plaque index (according to the criteria of Silness and Loe (1964), gingival index (according to the criteria of Loe and Silness (1963), attachment loss, and probable pocket depth. All parameters were recorded with recommended probing pressure, using Williams Graduated Periodontal Probe. All readings were done by two examiners (periodontists) with the help of an assistant for recording. Data was analysed by statistician using SPSS program. Comparison between case and control were done using t test and the significance level was pre-decided at the 5%.

III. RESULTS

Table (1) showed the previous dental treatments, 60% of participantshad been to dentist before for teeth extraction, 30% underwent restorations while 10% of the subjects underwent scaling. Table (2) showed the previous periodontal problems, all participantsexperienced periodontal complain; gingival bleeding (40%), loosened teeth (34%), abscess formation (14%) and (12%) other periodontal complains

Table 1: Types of previous dental treatment done for participants.

Dental Treatment	Percentage
Scaling	10%
Extraction	60%
Fillings	30%
Other treatment	0%

Table (2): Percentage of previous periodontal problems:

Previous periodontal problems	Percentage of participants
Bleeding	40%
Loosened teeth	34%
Abscess formation	14%
Others	12%

PLAQUE INDEX

Figure 1: The mean plaque index. Insignificant difference between the 2 groups:

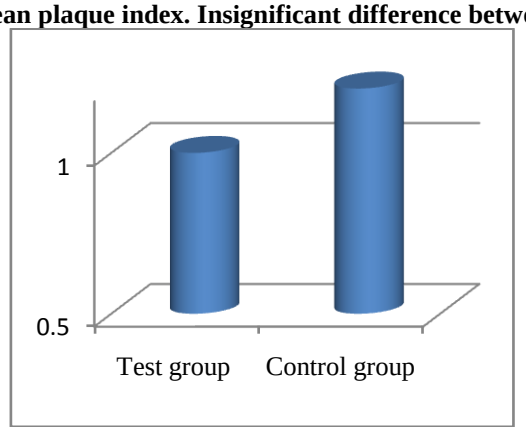
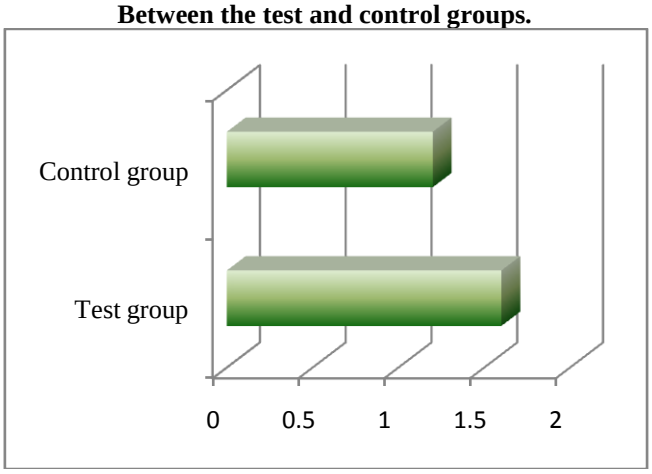


Table 3: Significant difference in the mean gingival index (P value= 0.009) Between the test and control groups.

Group	Gingival index x□ ± SD
Test	1.6±0.9
Control	1.2±0.9

Figure 2: Significant difference in the mean gingival index (P value= 0.009)

Between the test and control groups.



ATTACHMENT LOSS

Table 4: There was a statistically significant difference between the two groups (P value 0.002) reflecting the increase in attachment loss in the test group.

Group	Attachment loss $\bar{x}$ ± SD
Study	5.0±2.3
Control	3.5±2.3

Figure 3: Significant difference in attachment loss between the two groups:

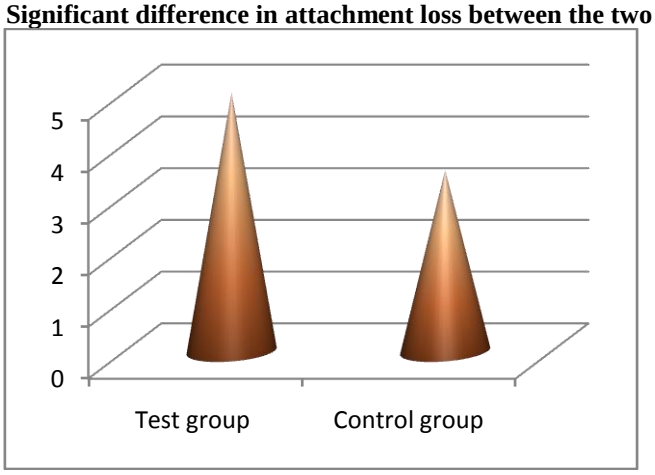


Table (5) the mean pocket depth for study and control groups (Insignificant difference in mean (P value 0.6)

Group	Pocket depth mean $\bar{x}$ ± SD
study	2.2±2.2
control	2.4±2.1

IV. DISCUSSION

In this study, the periodontal health of diabetics was studied versus a control of patients attending a specialized periodontal department. However a positive association in the results between the test and control group in this study may support that, diabetic patients are at high risk for periodontitis. This is because diabetic patients were not compared with healthy controls, but with patients attending for periodontal treatment. This fact indicates that, the control patients suffered a periodontal problem which enforces them to seek treatment, while the test group did not complain of any periodontal problem. All participants had been to dentist before, but had visited mostly for extraction of teeth which support the suggestion that diabetics' tendency towards edentulism is high. This agrees with the results of Moore et al (1998). In spite of previous visits to dentists, 40% of subjects experienced gingival bleeding, 34% complained of loosened teeth, as well as abscess formation indicating that diabetics are at higher risk for periodontal disease which is consistent with Cianciolaet al (1982).However

comparing periodontal parameters between test and control revealed the following; there was no statistical difference between the two groups in plaque index. This result is consistent with those of (Novaeset al 1991), but it contradictswith (Siudikiene et al 2005). The mean gingival index of diabetic patients was higher than that of the control group (1.6±0.9 and 1.2±0.9 respectively). This result support that the gingival alteration in diabetic could be the result of diabetic vascular changes that alter tissue response to bacterial insults. These results are consistent with the results of (Lopez et al 2003), the results showed statistically significant difference between the test and control group (p=0.009). The results of this study concerning the attachment loss, showed statistically significant difference between the test and control group (p=0.002). These agree with finding of Campus et al (2005) and disagree with finding of and Tervonen and Karjalainen (1997).Concerning probable pocket depth there was no statistically significant difference between diabetics and non-diabetics (p value = 0.6), this result is consistent with the results of Rylandar et al (1980)

V. CONCLUSION

Diabetes mellitus affects negatively the periodontal health, leading to gingivitis and periodontitis and tooth loss. Diabetic patients should be instructed in meticulous oral hygiene measures, and be informed of the importance of routine dental check-ups. Dental unit and a dentist and dental hygienist must be part of any set up caring for diabetic patients. Acknowledgement: I would like to pass my sincere thanks and appreciation to my supervisor prof. Ibrahim A. Ghandour, and to Dr Nahid El Ameen.

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