

Original Research

Prognosis of dental implants in diabetic patients

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ABSTRACT:

Aim of the study: To study Prognosis of dental implants in diabetic patients. **Materials and methods:** A total of 50 patients with poorly controlled diabetes were included in the study population. Participants were prescribed antibiotics for one week post-surgically, analgesics given as required. After a minimum of 4 months of healing, the participants received implant-supported fixed dental prostheses. Participants were seen 13 to 16 months after implant placement to evaluate implant complications and HbA1c levels, and were then recalled for a long-term follow up which occurred between 21 and 34 months post-surgery to assess implant survival and success by a single examiner. **Results:** The number of implants evaluated was 80. We observed that diabetic patients have high probability of implant failure. The number of failed implants increased with elevated HbA1c %. The results were found to be statistically significant. **Conclusion:** Poorly controlled diabetes mellitus can lead to poor dental implant health and implant failure within a short period of time.

Keywords: Diabetes mellitus, implant, dental implant, HbA1c

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INTRODUCTION

Diabetes mellitus (DM) is a pandemic disease with an alarming growth rate. In recently published (2017) statistics on the planetary burden of DM by the International Diabetes Federation (IDF), there are about 425 million adults living with diabetes, and this is estimated to go up to 629 million by 2045. These growing numbers are translated in terms of raising mortality rate, diminishing quality of life and enormous financial burden incurred on the individual in addition to the government. The number of infants born to conditional diabetic mothers is also on the rise with an estimate of one in five live births in the Middle East and North Africa region (MENA). With its increasing incidence, gestational diabetes has been classified as a separate entity in addition to the existing type 1 and

type 2 DM.¹⁻³

Diabetes mellitus is a chronic metabolic disorder that leads to hyperglycemia, which raises multiple complications caused by micro- and macroangiopathy. Diabetic patients have increased frequency of periodontitis and tooth loss, delayed wound healing, and impaired response to infection. In 1980, more than 150 million people worldwide were affected and that number had grown to 350 million by 2008. This trend highlights the need for better understanding of diabetes and its therapy and its impact on dental implant rehabilitation. In the past, diabetes was long time seen as a relative risk factor to dental implants. In contrast, today, there is a change in paradigm. Recent studies offer indirect evidence for diabetes patients benefiting from oral rehabilitation based on dental implant

therapy.⁴⁻⁶ After tooth loss, patients avoid food which needs more effort to masticate which can lead to an adverse nutrition with poor metabolic control. A sufficient dental rehabilitation allows the patient to improve nutrition and the metabolic control. On the other hand, it is still unclear how quality of diabetes therapy and duration of disease influence the success of dental implants.⁷⁻⁹ Hence, the present study was conducted to assess the prognosis of dental implants in diabetic patients.

MATERIALS AND METHODS

The present study was conducted for assessing the prognosis of dental implants in diabetic patients. We selected participants with poorly-controlled type 2 diabetes mellitus that received dental implants as part of a randomized comparative study of implant surfaces. A total of 50 patients were included in the study population. Participants were prescribed antibiotics for one week post-surgically, analgesics given as required. Participants were seen 13 to 16 months after implant placement to evaluate implant complications and HbA1c levels, and were then recalled for a long-term follow up which occurred between 21 and 34 months post-surgery to assess implant survival and success by a single examiner. The statistical analysis of the data was done using SPSS version 11.0 for windows. Chi-square and Student's t-test were used for checking the significance of the data. A p-value of 0.05 and lesser was defined to be statistically significant.

RESULTS

In the present study, a total of 50 patients were evaluated. The number of implants evaluated was 80. Table 1 shows the implant survival rate over a follow up period of 2 years. We observed that diabetic patients have high probability of implant failure. The number of failed implants increased with elevated HbA1c %. The results were found to be statistically significant.

Table 1: Implant survival rate over a follow up period of 2 years

HbA1c level (%)	No of patients evaluated	No of implants evaluated	Failed implants
6.1-8.0	15	15	2
8.01-10.0	12	25	5
10.1-12.0	15	25	10
12.1-13.9	8	15	10
TOTAL	50	80	27

DISCUSSION

Diabetes mellitus is a chronic disorder of carbohydrate metabolism characterized by hyperglycemia, reflecting distortion in physiological equilibrium in utilization of glucose by tissue, liberation of glucose by liver and

production-liberation of pancreatic anterior pituitary and adrenocortical hormone. The debilitating characteristic of diabetes mellitus was known as early as in second century AD, when Aretaeus named it as diabetes means "a siphon" as he perceived that the condition was characterized by melting down of flesh and limb into urine. Various modern research and discoveries have shown that diabetes mellitus, more or less, affects every tissues of body directly or indirectly through late complications.⁷⁻¹⁰

Sghaireen, Mohammed Ghazi et al compared the failure rate of dental implants between well-controlled diabetic and healthy patients. A retrospective study of case-control design was conceptualized with 121 well-controlled diabetic and 136 healthy individuals. Records of subjects who had undergone oral rehabilitation with dental implants were retrieved. Post-operative evaluation was carried out for all patients for about three years to assess the immediate and long-term success of the procedure. From a total of 742 dental implants, 377 were placed in well-controlled diabetic patients (case group) and 365 in healthy subjects (control group). A comparable (9.81%), but non-significant ($p = 0.422$) failure rate was found in the case group in comparison to the control group (9.04%). A non-significant ($p = 0.392$) raised number (4.98%) of failure cases were reported among females in comparison to males (4.44%). In respect to arch, the mandibular posterior region was reported as the highest failure cases (3.09%; $p = 0.411$), with 2.29% of cases reported in the mandibular anterior ($p = 0.430$) and maxillary posterior ($p = 0.983$) each. The maxillary anterior region was found to have the least number (1.75%; $p = 0.999$) of failure cases. More (4.98%; $p = 0.361$) cases were reported to fail during the functional loading stage in contrast to osseointegration (4.44%; $p = 0.365$). A well-controlled diabetic status does not impose any additional risk for individuals undergoing dental implant therapy.¹⁰

Eskow CC et al evaluate survival and clinical complications of dental implants following placement in type 2 diabetes individuals having poor glycemic control. Adult participants ($n=24$) with poorly controlled type 2 diabetes ($8.0\% \leq \text{HbA1c} \leq 12.0\%$) received two or more transgingival dental implants. Survival was evaluated after one (23 participants, 72 implants) and two (20 participants, 59 implants) years. Clinical complications were evaluated in 18 participants (52 implants) after 21–34 months. Relationships between complications and stratified HbA1c levels were assessed using Pearson's correlation test. Survival rates were 98.6% (71/72 implants) after 1 year and 96.6% (57/59 implants) after 2 years. Complications were identified in 29% of participants with peri-implant mucositis, the most common event. Complications correlated directly with number of implants across

HbA1c strata (0.42, $R^2=0.66$). There was no correlation between HbA1c and the occurrences of complications or mucositis. The 2-year evaluation supports the broader application of implant therapy in type 2 diabetes individuals with poor glycemic control in demonstrating high survival rates with limited complications.¹¹

CONCLUSION

Within the limitations of the present study, it can be concluded that poorly controlled diabetes mellitus can lead to poor dental implant health and implant failure within a short period of time.

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