Prognosis of dental implants in diabetic patients

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Abstract

Background: This study was conducted to assess the prognosis of dental implants in subjects having diabetes mellitus. **Material and methods**: 100 participants in all participated in the study. The individuals were split into two groups: the first group included 50 healthy subjects and the second group included 50 diabetes subjects. Patients with partially missing maxillary and/or mandibular arches who later underwent oral rehabilitation with dental implants had their medical histories, dental x-rays, and clinical records retrieved. Based on the assessment of their glycated hemoglobin (HbA1c) measurement at the time of implant implantation, this differentiation was made. According to the American Diabetic Association (ADA), those with HbA1c levels below 6.5% are classified as non-diabetic (healthy), whereas those with levels above 6.5% are classified as diabetic. **Results**: In this study, there were 70 females and 30 males. The success rate of dental implants in the control group as well as case group was 93& and 69%, accordingly. Total 600 implants were placed in subjects including both study groups. The case group, which consisted of well-controlled diabetic patients, received 450 implants, while the control group got 150. The distribution of implants among the gender cohorts shows females receiving more implants (63%) than males (37%). On observing the dissipation of implants in accordance with the location, the mandible turned out to be a more popular site (75%) than the maxilla (25%). **Conclusion**: Based on the results of this study, it was concluded that the prognosis of dental implants among subjects having diabetes mellitus was good.

Keywords: implant, diabetes, prognosis

Introduction

Dental implant survival is initially dependent on successful osseointegration following placement. Any alteration of this biological process by excessive surgical trauma, infection, or metabolic upset may adversely affect treatment outcomes.[1] Subsequently, as an implant is restored and placed into function, bone remodelling becomes a critical aspect of implant survival in responding to the functional demands placed on the implant restoration and supporting bone. The critical dependence on bone metabolism for implant survival may be heightened in patients with diabetes.[2] Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin that it produces. The number of people with diabetes increased from 153 million (95% uncertainty interval = 127, 182) in 1980 to 347 million (95% uncertainty interval = 314, 382) in 2008.[3] These trends highlight the urgency for a better understanding of diabetes as well as for improving the care of patients with diabetes. Hence, this study was conducted to assess the prognosis of dental implants in subjects having diabetes mellitus.

Material and methods

100 participants in all participated in the study. The individuals were split into two groups: the first group included 50 healthy subjects and the second group included 50 diabetes subjects. Patients with partially missing maxillary and/or mandibular arches who later underwent oral rehabilitation with dental implants had their medical histories, dental x-rays, and clinical records retrieved. Based on the assessment of their glycated hemoglobin (HbA1c) measurement at the time of implant implantation, this differentiation was made. According to the American Diabetic Association (ADA), those with HbA1c levels below 6.5% are classified as non-diabetic (healthy), whereas those with levels above 6.5% are classified as diabetic.

The participants with HbA1c 6.5% were enlisted into the control group in accordance with the aforementioned standards. Patients who had HbA1c readings between 6.5% and 8% were categorized as having well-controlled diabetes and included in the case group. Patients having a HbA1c level of less than 8% were disqualified from the trial because they were deemed to have poorly managed or uncontrolled diabetes. The mean ages of the participants in the diabetic and healthy groups were, respectively, 58.74 and 54.98 years. A MS Excel spreadsheet

was used to enter the data and amend and code it. Numbers and percentages were used to explain and illustrate the sample's characteristics.

Results
Table 1: gender-wise distribution of subjects

Gender	Number of subjects	Percentage
Males	30	30%
Females	70	70%
Total	100	100%

There were 70 females and 30 males in the study.

Table 2: prognosis of dental implants in the case group and control group

Group	Success rate
Control group	93%
Case group	69%

The success rate of dental implants in the control group as well as case group was 93& and 69%, accordingly. Total 600 implants were placed in subjects including both study groups. The case group, which consisted of well-controlled diabetic patients, received 450 implants, while the control group got 150. The distribution of implants among the gender cohorts shows females receiving more implants (63%) than males (37%). On observing the dissipation of implants in accordance with the location, the mandible turned out to be a more popular site (75%) than the maxilla (25%)

Discussion
Diabetes mellitus (DM) is a pandemic disease with an alarming growth rate.[4] 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.[5] 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.[6] 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. In Saudi Arabia, DM is of great concern as it has been ranked seventh on a globa l platform with about 39 million diabetic people in the country.[7]

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Marchand et al[8] assessed the success of dental-implant treatment in patients with diabetes. Dental-implant treatment is an efficient means of replacing lost teeth. However, diabetes can be considered a relative contraindication for this type of treatment because of the slightly higher failure rate compared with populations without diabetes. Prerequisite selection of suitable diabetic patients, eradication of co-morbidities (poor oral hygiene, cigarette-smoking, periodontitis), stabilization of glycaemic control (HbA(1c) at around 7%) and preventative measures against infection can increase the success of dental implantation in diabetic patients to a satisfactory rate of 85-95%. It was concluded that implant surgery is never a matter of urgency; thus, diabetes patients with the best chances of success should be conjointly selected and prepared by both dental and diabetes clinicians.

Farzad et al[9] investigated how many diabetic patients and types of cases that are treated with dental implants in our clinic; and assessed the outcome of such treatment. Medical records from 782 patients were examined in patients treated by the Brånemark method for partial or total edentulism with implant supported bridges. From these records, 25 patients (3.2%) with diabetes before implant treatment (136 implants) were identified and further studied with respect to age, gender, type of diabetes, treated jaw, degree of edentulism, bone graft, implant survival, periimplant inflammation, bleeding on probing, and radiographic bone loss. Furthermore, the patients' opinion about the outcome of the treatment was registered. The implant success rate was 96.3% during the healing period and 94.1% 1 year after surgery. Of all 38 bridges, one was lost. Few complications occurred and all patients, except for one, were satisfied with the treatment. It was concluded that diabetics who undergo dental implant treatment do not encounter a higher failure rate than the normal population, if the diabetics' plasma glucose level is normal or close to normal as assessed by personal interviews.

Conclusion

Based on the results of this study, it was concluded that the prognosis of dental implants among subjects having diabetes mellitus was good.

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6154