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ORIGINAL RESEARCH

Assessment of prognosis of dental implants among diabetic and non-diabetic patients

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ABSTRACT:

Background: The present study was conducted for assessing the prognosis of dental implants among diabetic and non-diabetic patients. **Materials & methods:** A total of 50 diabetic patients and 50 non-diabetic subjects were enrolled. Preoperative radiographic assessment of all the patients was done. All the subjects underwent dental implant therapy under local anaesthesia and under ideal aseptic conditions. Follow-up was done and radiographic evaluation of all the patients was done after one year. Presence of radiographic bone loss was considered as failure of dental implant therapy. Assessment of results were done using SPSS software. **Results:** Among subjects of diabetic and non-diabetic group, success rate was 94 percent and 96 percent respectively. Non-significant results were obtained while comparing the outcome among diabetic and non-diabetic subjects. **Conclusion:** Under controlled diabetic conditions, dental implants have excellent prognosis.

Key words: Dental implants, diabetic

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INTRODUCTION

A dental implant is one of the treatments to replace missing teeth. Their use in the treatment of complete and partial edentulism has become an integral treatment modality in dentistry. Dental implants have a number of advantages over conventional fixed partial denture. A dental implant is a structure made of alloplastic materials implanted into the oral tissues beneath the mucosa and/or periosteum and/or within or through the bone to provide retention and support for a fixed or removable dental prosthesis.[1- 3]

Diabetes is a complex metabolic disorder consisting of two main types: type 1, comprising approximately 5% of diabetes, and type 2, comprising 90%–95%. The prevalence of diabetes, especially type 2 diabetes, is rising in the United States, associated with increased prevalence of obesity, vulnerable minorities, and aging, in the setting of polygenic risk. While the annual incidence in the United States may have plateaued in recent years, the epidemic of diabetes and its risk factors occur worldwide. Although carbohydrate metabolism is most obviously deranged and is the basis for biochemical tests of the diagnosis, fat metabolism is also adversely affected, and abnormalities in protein metabolism, though more subtle, also exist. For example, fasting free fatty acid and triglyceride levels are elevated, and tissue uptake of amino acids, especially branch chain amino acids, in response to insulin is impaired.[4- 6] Hence; the present study was conducted for assessing the prognosis of dental implants among diabetic and non-diabetic patients.

MATERIALS & METHODS

The present study was conducted for assessing the prognosis of dental implants among diabetic and non-diabetic patients. A total of 50 diabetic patients and 50 non-diabetic subjects were enrolled. Complete demographic and clinical details of all the subjects was obtained. Only those subjects were enrolled those who had missing mandibular first molar and were schedule to undergo prosthetic rehabilitation for the same by dental implant therapy. Preoperative radiographic assessment of all the patients was done. All the subjects underwent dental implant therapy under local anaesthesia and under ideal aseptic conditions. Follow-up was done and radiographic evaluation of all the patients was done after one year. Presence of radiographic bone loss was considered as failure of dental implant therapy. Assessment of results were done using SPSS software.

RESULTS

Mean age of the diabetic and non-diabetic subjects was 44.5 years and 46.4 years respectively. Majority proportion of subjects of both diabetic group and non-diabetic group were males. Among subjects of diabetic and non-diabetic group, success rate was 94 percent and 96 percent respectively. Non-significant results were obtained while comparing the outcome among diabetic and non-diabetic subjects.

DISCUSSION

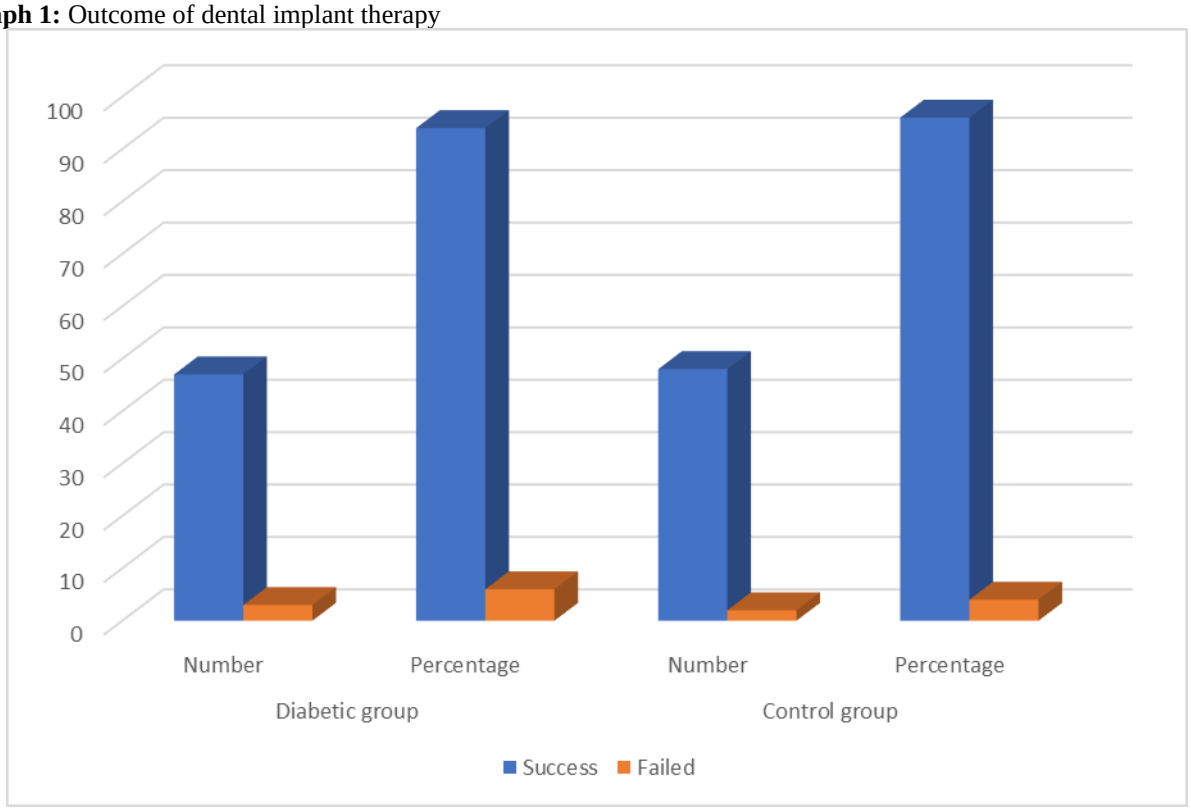
In ancient times, either removable or fixed partial dentures were the treatment modalities for the missing teeth. Dental implants have emerged as new treatment modality for the majority of patients and are expected to play a significant role in oral rehabilitation in the future. A dental implant is a surgical component that interfaces with the bone of the jaw or skull to support a dental prosthesis such as a crown, bridge, denture, facial prosthesis or to act as an orthodontic anchor. 90%–95% has been reported as the success rate of implants over the 10 years. Although it has become the treatment of choice for most of the dentists, still, the complications arising from dental implant placement are the biggest challenge.[6-8]

Diabetes is a heterogeneous complex metabolic disorder characterized by elevated blood glucose concentration secondary to either resistance to the action of insulin, insufficient insulin secretion, or both. The major clinical manifestation of the diabetic state is hyperglycemia.

Table 1: Outcome of dental implant therapy

Outcome	Diabetic group		Control group	
	Number	Percentage	Number	Percentage
Success	47	94	48	96
Failed	3	6	2	4
Total	50	100	50	100
Chi-square value	-1.1313			
p-value	0.1178			

Graph 1: Outcome of dental implant therapy



However, insulin deficiency and/or insulin resistance also are associated with abnormalities in lipid and protein metabolism, and with mineral and electrolyte disturbances. The vast majority of diabetic patients are classified into one of two broad categories: type 1 diabetes mellitus, which is caused by an absolute or near absolute deficiency of insulin, or type 2 diabetes mellitus, which is characterized by the presence of insulin resistance with an inadequate compensatory increase in insulin secretion.[9- 12] Hence; the present study was conducted for assessing the prognosis of dental implants among diabetic and non-diabetic patients.

Mean age of the diabetic and non-diabetic subjects was 44.5 years and 46.4 years respectively. Majority proportion of subjects of both diabetic group and non-diabetic group were males. Among subjects of diabetic and non-diabetic group, success rate was 94 percent and 96 percent respectively. Non-significant results were obtained while comparing the outcome among diabetic and non-diabetic subjects. Al Ansari, Y et al evaluated the impact of diabetes mellitus on dental implant failure rates and marginal bone loss (MBL). An electronic search was undertaken in three databases, plus a manual search of journals. Meta-analyses were performed as well as meta-regressions in order to verify how the odds ratio (OR) and MBL were associated with follow-up time. The review included 89 publications. Altogether, there were 5510 and 62,780 implants placed in diabetic and non-diabetic patients, respectively. Pairwise meta-analysis showed that implants in diabetic patients had a higher failure risk in comparison to non-diabetic patients (OR 1.777, $p < 0.001$). Implant failures were more likely to occur in type 1 diabetes patients than in type 2. The difference in implant failure between the groups was statistically significant in the maxilla but not in the mandible. The MBL mean difference (MD) between the groups was 0.776 mm ($p = 0.027$), with an estimated increase of 0.032 mm in the MBL MD between groups for every additional month of follow-up ($p < 0.001$). There was an estimated decrease of 0.007 in OR for every additional month of follow-up ($p = 0.048$). In conclusion, implants in diabetic patients showed a 77.7% higher risk of failure than in non-diabetic patients.[13]

Sghaireen, M. G 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. 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%; $p = 0.365$).[14]

CONCLUSION

Under controlled diabetic conditions, dental implants have excellent prognosis.

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