Diabetes and dental implant prognosis

¹Dr. Japnit Kaur Samlok, ²Dr. Zabin Mirza, ³Dr. Fozia Sultana, ⁴Dr. Divya Vyas, ⁵Dr. Vrishti Bansal

¹Associate Dentist, Dentist Multispeciality Clinic, Sec 46, Noida, U.P., India(Corresponding Author)

²Associate Dentist, Dentique Dental Clinic and Implant Centre, Rajouri, J. K., India

³Senior Lecturer, Department of Periodontics and Implantology, Himachal Institute of Dental Sciences, Paonta Sahib, H.P., India ⁴Reader, Department of Pedodontics and Preventive Dentistry, Himachal Institute of Dental Sciences, Paonta Sahib, H.P., India ⁵Reader, Department of Periodontics and Implantology, Himachal Institute of Dental Sciences, Paonta Sahib, H.P., India

Abstract:

Background: This study was carried outfor evaluating the prognosis of dental implants among diabetic patients. **Materials & methods:**This study included fifty people whose diabetes was under control, and fifty healthy adults who acted as controls. Each patient's Performa was crafted following the establishment of a comprehensive clinical profile. Each participant was put through an extensive oral examination. All patients' hemodynamic and biochemical profiles were assessed at the start of treatment. Only patients who met these criteria were considered for inclusion in a prosthetic rehabilitation program for a missing mandibular first molar. Everyone who needed treatment received dental implants. Prognoses were made for each patient after 6 months based on their imaging and clinical data. **Results:** Patients in the control group averaged 44 years old, whereas those in the non-diabetes group were 53. In both categories, males made up the majority of those who took part. The success rate of dental implant therapy in adults with well-controlled diabetes was 80%, compared to 96% in the control group. The dental implant therapy outcomes for both groups were similar. **Conclusion:** Under strictly controlled glycemic parameters, dental implant therapy for diabetic people has demonstrated good outcomes.

Key words: Diabetes, Dental, Implants

Introduction:

A dental implant is one of the treatments to replace missing teeth. Around 600 AD, the Mayan population used pieces of shells as implants to replace mandibular teeth. In 1809, J. Maggiolo inserted a gold implant tube into a fresh extraction site. In 1930, the Strock brothers used Vitallium screws to replace missing teeth. A post-type endosseous implant was developed by Formiggini (the father of modern implantology) and Zepponi in The subperiosteal implant was the 1940s. developed in the 1940s by Dahl in Sweden. In 1946 Strock designed a two-stage screw implant that was inserted without a permucosal post. The abutment post and individual crown were added after this implant completely healed. The desired implant interface at this time was described as ankylosis. In 1967, Dr.Linkow introduced blade implants, now recognized as endosseous implants. Dental implants became a scientific cornerstone after the serendipitous invention of Dr.Branemark who helped in the evolution of the concept of osseointegration (direct, rigid attachment of the implant to the bone without any intervening tissue in between two implants)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%.⁴

Hence; the present study was conducted for assessing prognosis of dental implants in diabetic patients.

Materials & methods:

This study included fifty people whose diabetes was under control, and fifty healthy adults who acted as controls. Each patient's Performa was crafted following the establishment of a comprehensive clinical profile. Each participant was put through an extensive oral examination. All patients' hemodynamic and biochemical profiles were assessed at the start of treatment. Only patients who met these criteria were considered for inclusion in a prosthetic rehabilitation program for a missing mandibular first molar. Everyone who needed treatment received dental implants. Each patient's prognosis was determined after 6 months using a radiological and clinical evaluation.

Results:

Patients in the control group averaged 44 years old, whereas those in the non-diabetes group were 53. In both categories, males made up the majority of those who took part. The success rate of dental implant therapy in adults with well-controlled diabetes was 80%, compared to 96% in the control group. The dental implant therapy outcomes for both groups were similar.

| Group | Success | | Failure | | Total | p- value |
|---------------------------|---------|------------|---------|------------|---------------|----------|
| | Number | Percentage | Number | Percentage | Number (%) | |
| Controlled diabetic group | 40 | 80 | 10 | 20 | 50 (100%) | 0.188 |
| Control group | 48 | 96 | 2 | 4 | 50 (100%) | |

 Table 1: Comparison of prognosis of dental implant therapy

Discussion:

Today, dental implants are one of the restorative methods to replace missing teeth. Improvements in implant design, surface characteristics, and surgical protocols made implants a secure and highly predictable procedure with a mean survival rate of 94.6 % and a mean success rate of 89.7 % after more than 10 years.⁵ Implant survival is initially dependent on successful osseointegration following placement. Any alteration of this biological process adversely affect treatment may outcome. Subsequently, as an implant is restored and placed into function, bone remodeling 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 leads us to evaluation of certain risk factors. One of the controversial discussed diseases is diabetes mellitus. 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 2008.6

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The aim of the study conducted by Ayele S et al⁷was to compare the marginal bone loss (MBL) around dental implants in a group of diabetic patients in relation to a matched group of nondiabetic patients. The present dental record-based retrospective study included patients selected from individuals treated with dental implants at one specialist clinic in Malmö, Sweden. Patients were excluded if they had history of periodontitis and/or were treated for periodontal disease. The study group included 710 implants installed in 180 patients (mean age 60.3±13.0 years), 349 implants in 90 diabetic (21 T1DM and 69 T2DM patients), and 361 implants in 90 non-diabetic patients. The results suggested that jaw (greater MBL in the maxilla), diabetes (greater MBL for diabetic patients, and worse for T1DM patients), bruxism (greater MBL for bruxers), and smoking (greater MBL for smokers and former smokers) had a statistically significant influence on MBL over time.Patients with diabetes have an estimated greater MBL over time compared to non-diabetic patients. The difference was greater in patients with diabetes type 1 compared to patients with diabetes type 2. Bruxism, smoking, and implant location (maxilla) were also associated with a higher loss of marginal bone around implants over time.Awareness of the possible influence of diabetes on the long-term outcomes of dental implant treatment is important, in order to be able to minimize the possibility of a high MBL with time, which can eventually lead to the loss of the implant.

Conclusion:

Under strictly controlled glycemic parameters, dental implant therapy for diabetic people has demonstrated good outcomes.

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