

Original Research

Prognosis of dental implants in diabetic, hypertensive and smokers

¹Dr. Vishwajeet Singh Jamwal, ²Dr. Shalini, ³Dr. Yashoradha Rajee

^{1,2}MDS, Oral and Maxillofacial Surgery, Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh, India;

³BDS, Indira Gandhi Govt. Dental College and Hospital, Jammu, Jammu and Kashmir, India

ABSTRACT:

Aim and objectives: The present study was undertaken for assessing the prognosis of dental implants in diabetic, hypertensive and smokers. **Materials & methods:** A total of 20 diabetic, 20 hypertensive and 20 chronic smokers were enrolled in the present study. Another set of 20 healthy subjects who underwent dental implant procedure for missing mandibular first molar were enrolled. Oral examination was done and treatment planning was done. All the subjects underwent rehabilitation of missing mandibular first molar by dental implants. Implant procedures were carried out under local anesthetic procedures. Follow-up was done and prognosis of dental implants was assessed. All the results were recorded in Microsoft excel sheet. **Results:** Among diabetic groups, hypertensive group, smokers group and control group, success rate of dental implants was 90 percent, 85 percent, 75 percent and 95 percent respectively. **Conclusion:** Dental implants had excellent prognosis among diabetic and hypertensive patients. However; among smokers, their prognosis is significantly affected.

Keywords: Implant, diabetes, hypertension, smoking

Received: 18 January, 2022

Accepted: 22 February, 2022

Corresponding author: Dr. Vishwajeet Singh Jamwal, MDS, Oral and Maxillofacial Surgery, Dr. Harvansh Singh Judge Institute of Dental Sciences and Hospital, Panjab University, Chandigarh, India Email: VISH1806SINGH@GMAIL.COM

This article may be cited as: Jamwal VS, Shalini, Rajee Y. Prognosis of dental implants in diabetic, hypertensive and smokers. Int J Res Health Allied Sci 2022; 8(2): 55-57.

INTRODUCTION

Today, dental implants are one of the restorative methods to replace missing teeth. Implant survival is initially dependent on successful osseointegration following its placement. Any alteration of this biological process may adversely affect treatment outcome. 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. Smoking has its influence on general as well as oral health of an individual.¹⁻³ A primary relationship between smoking and coronary heart disease, stroke, subclinical atherosclerosis, chronic obstructive pulmonary disease, pneumonia, low birth weight, and various cancers has been established without doubt. Pregnant women who smoke tobacco have increased risk of stillbirth. As far as oral health is concerned, it increases the risk of periodontal disease, oral

precancerous and cancerous lesions, root caries, and peri-implantitis. It also causes taste derangement, staining of teeth and restorations, as well as delayed wound healing after extractions, periodontal procedures, and orthognathic surgeries. Smoking upregulates the expression of pro-inflammatory cytokines such as interleukin-1, which contributes to increased tissue damage and alveolar bone resorption. The prevalence of hypertension is increasing in individuals older than 60 years in developed countries. Patients with hypertension also require dental implant therapy. Thus, the influence of antihypertensive medications on peri-implant tissue has been of great interest.⁴⁻⁶ Hence; under the light of above mentioned data, the present study was undertaken for assessing the prognosis of dental implants in diabetic, hypertensive and smokers.

MATERIALS & METHODS

The present study was undertaken for assessing the prognosis of dental implants in diabetic, hypertensive

and smokers. A total of 20 diabetic, 20 hypertensive and 20 chronic smokers were enrolled in the present study. Another set of 20 healthy subjects who underwent dental implant procedure for missing mandibular first molar were enrolled. Oral examination was done and treatment planning was done. All the subjects underwent rehabilitation of missing mandibular molar by dental implants. Implant procedures were carried out under local anesthetic procedures. Follow-up was done and

Table 1: Age-wise distribution

Group	Mean (years)	SD
Diabetic	42.5	5.3
Hypertensive	45.6	4.8
Smokers	44.3	5.9
Controls	41.8	6.2

Table 2: Prognosis of dental implants among different study groups

Group	Success		Failure	
	N	Percent	N	Percent
Diabetic	18	90	2	10
Hypertensive	17	85	3	15
Smokers	15	75	5	25
Controls	19	95	1	5

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. For an implant to succeed there has to be an amalgamation of numerous factors, right from a good surgery to a good prosthesis and its proper maintenance. Clinical trials document a consistently high success rate for endosseous dental implants in partially and completely edentulous patients. Failures occur at a low rate, but tend to cluster in those with risk factors. Risk factor is anything that increases chances or possibility of failure.⁶⁻⁹ Peri-implant diseases should ideally be diagnosed in the early stages to prevent complications and achieve longevity. Although the implant survival rate would be the true endpoint for dental implant treatment, clinical surrogate endpoints are useful for detecting early onset of peri-implant disease. For this purpose, it is necessary to further investigate the influence of antihypertensive medications on peri-implant clinical endpoints.¹⁰
¹¹Hence; under the light of above mentioned data, the

prognosis of dental implants was assessed. All the results were recorded in Microsoft excel sheet.

RESULTS

Mean age of diabetic patients, hypertensive patients, smokers and controls was 42.5 years, 45.6 years, 44.3 years and 41.8 years respectively. Among diabetic groups, hypertensive group, smokers group and control group, success rate of dental implants was 90 percent, 85 percent, 75 percent and 95 percent respectively.

present study was undertaken for assessing the prognosis of dental implants in diabetic, hypertensive and smokers.

In the present study, mean age of diabetic patients, hypertensive patients, smokers and controls was 42.5 years, 45.6 years, 44.3 years and 41.8 years respectively. Among diabetic groups, hypertensive group, smokers group and control group, success rate of dental implants was 90 percent, 85 percent, 75 percent and 95 percent respectively. Our results were in concordance with the results obtained by previous authors who also reported similar findings. Sghaireen 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. 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%; $p = 0.365$).¹¹ Seki K et al evaluated the influence of antihypertensive medications on clinical peri-implant tissue parameters. Thirty-five patients received a total of 77

anodized dental implants. Based on the history of the use of antihypertensive medications, the patients were divided into two groups: the group taking antihypertensive medications (AH group) and the group of healthy patients (H group). Implants were followed up clinically and radiologically, with a focus on the peri-implant soft tissue parameters probing pocket depth, bleeding on probing, modified plaque index, and marginal peri-implant bone level stability. None of the implants were lost, and no technical failures occurred. The mean follow-up duration was 7 years and 1 month. A significant difference was observed in the probing pocket depth 3.8 ± 1.3 mm in the AH group and 3.0 ± 0.7 mm in the H group. In the AH and H groups, 26.5% (9/34) and 4.7% (2/43) of the patients were diagnosed with peri-implantitis at the implant level, respectively. Their findings suggested some correlations between antihypertensive medication use and clinical parameters in anodized peri-implant tissue.¹²

CONCLUSION

Dental implants had excellent prognosis among diabetic and hypertensive patients. however; among smokers, their prognosis is significantly affected.

REFERENCES

1. Katyayan P.A., Katyayan M., Shah R.J. Rehabilitative considerations for dental implants in the diabetic patient. *J. Indian Prosthodont. Soc.* 2013;13:175–183.
2. Naujokat H., Kunzendorf B., Wiltfang J. Dental implants and diabetes mellitus-a systematic review. *Int. J. Implant. Dent.* 2016;2:5.
3. Howe M.S., Keys W., Richards D. Long-term (10-year) dental implant survival: A systematic review and sensitivity meta-analysis. *J. Dent.* 2019;84:9–21.
4. Chrcanovic B.R., Albrektsson T., Wennerberg A. Diabetes and oral implant failure: A systematic review. *J. Dent. Res.* 2014;93:859–867.
5. Gomez-Moreno G., Aguilar-Salvatierra A., Rubio Roldan J., Guardia J., Gargallo J., Calvo-Guirado J.L. Peri-implant evaluation in type 2 diabetes mellitus patients: A 3-year study. *Clin. Oral Implants Res.* 2014;26:1031–1035.
6. De Bruyn H, Collaert B. The effect of smoking on early implant failure. *Clin Oral Implants Res.* 1994;5:260–4.
7. Gorman LM, Lambert PM, Morris HF, Ochi S, Winkler S. The effect of smoking on implant failure at second- stage surgery. DICRG Interim Report No 5. Dental Implant Clinical Research Group. *Implant Dent.* 1994;3:165–8.
8. Bain CA, Moy PK. The association between the failure of dental implants and cigarette smoking. *Int J Oral Maxillofac Implants.* 1993;8:609–15.
9. Wallace RH. The relationship between cigarette smoking and dental implant failure. *Eur J ProsthodontRestor Dent.* 2000;8:103–6.
10. Moy PK, Medina D, Shetty V, Aghaloo TL. Dental implant failure rates and associated risk factors. *Int J Oral Maxillofac Implants.* 2005;20:569–70
11. Sghaireen, Mohammed Ghazi et al. “Comparative Evaluation of Dental Implant Failure among Healthy and Well-Controlled Diabetic Patients-A 3-Year Retrospective Study.” *International journal of environmental research and public health* vol. 17,14 5253. 21 Jul. 2020, doi:10.3390/ijerph17145253
12. Seki K, Hasuike A, Iwano Y, Hagiwara Y. Influence of antihypertensive medications on the clinical parameters of anodized dental implants: a retrospective cohort study. *Int J Implant Dent.* 2020;6(1):32. Published 2020 Sep 16. doi:10.1186/s40729-020-00231-9