Review Article

DENTAL IMPLANTS IN DIABETIC PATIENTS

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ABSTRACT

Diabetes is one of the commonest metabolic syndrome which a clinician will come across during his or her practice. Theoretically it has been implied that the patient presents with poor wound healing and an impaired immune response hence not a very good candidate for elective surgical procedures including dental implants. Diabetes however is not considered an absolute contraindication for implant treatment. This article aims to include data about the recent clinical studies which have been done on diabetic patients and also the surgical protocol which is being followed.

INTRODUCTION

The number of people with diabetes in the world is expected to approximately double between 2000 and 2030, based solely upon demographic changes. The greatest relative increases will occur in the Middle Eastern Crescent, sub-Saharan Africa, and India. The greatest absolute increase in the number of people with diabetes will be in India.[1]

Diabetes is a chronic metabolic syndrome which is associated with abnormal metabolism of carbohydrates, proteins and fats. It is classified as type 1 type2 and gestational diabetes.

MATERIAL AND METHOD

An electronic search was performed on a personal computer (P.C) for work published till the year 2018 using keywords diabetes, implants, surgical techniques, dental implants. Search was performed on national library of medicine, chochrane oral healthcare research, and medline healthcare database. A total of 73 articles were screened.

Inclusion criteria included clinical trials and studies on diabetic patients. Animal studies and peer reviews were excluded. After screening a total of 13 articles were included in the review.

RESULT

After a thorough review of the articles they were arranged according to the chronological order of publication of the study. The study methodology, sample size, nature of sample and the outcome was evaluated.

DISCUSSION

Majority of the studies have invariably shown that success rate of implants in diabetics is quite similar to that of the general population. However with higher sample size a few studies indicated a higher failure rate in diabetic patients. Diabetic patients show a higher incidence of mucosal infections, peri implantitis and a slower healing rate. Studies have shown a lower increase in bone density in diabetics in short term compared to healthy individuals. Delayed loading protocols have been shown to be more promising for these patients. Diabetic patients have shown a higher rate of soft tissue infections including peri implantitis and mucositis and the incidence has been correlated to a higher HbA1c levels. Although patients with well controlled diabetes showed a similar clinical outcome as compared to healthy individuals. It has been suggested to use chlorhexidine mouth wash in diabetic patients which has lead to a significant improvement in success rate. Surgical procedures such as flapless surgery and using growth factors such as in PRP have been speculated to improve the clinical outcome. Current studies tend to show no clinically significant difference with either of these protocols. There was no change in crestal bone levels or bone density using either of these techniques.

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	author	Study design and follow up	Number of subjects per group	Diabetes type and nature	Implants placed/failed	Mean survival rate
1.	Agrawal KK, Rao J *et al* [2] 2017	parallel group, double-blinded RCT. Comparing flap vs flapless in delayed loading in controlled type 2 diabetics	92 (46 per group)	Type 2 conntrolled	3 /46 failed in flapless, 2/46 in full thickness flap	Survival rate was similar, post operative swelling lesser in flapless group
2.	Eskow CC et. Al [3] june 2017	2 year prospective study on implant complication and survival in uncontrolled type 2 diabetics	24 patients	Type 2 uncontrolled (Hba1c 8-12 %)	2/57 implants	96.8 percent after 2 years , 29 percent showed periimplantitis
3.	yadav *et al* [4] Oct 2016	A Parallel Group RCT, Comparing crestal bone loss with flapless vs flap in controlled type 2 diabetics	88 patients	Type 2 controlled	100 percent success rate	Mean marginal bone loss similar (average of 1.5 mm)after 12 months
4.	Dogan *et al.* [5] 2015	7 month clinical prospective study measuring inflammatory cytokines around implants in controlled diabetics	13 patients with diabetes, 7 healthy patients	Type 2 controlled	100 percent success	No difference seen
5.	Ibrahim *et al* 2015 [6]	RCT assessing bone height with and without prp in controlled diabetic patients	14 male patients receiving 2 implants each with and without prp	Type 2 controlled	100 percent success	No difference seen
6.	Gómez-Moreno G *et al* [7] 2014	3 year prospective study for periimplant evaluation in type 2 diabetics	67 patients divided according to HbA1c levels (<6,6.1-8,8.1-10, >10.1)	Variable control	100 % success	Incidence of periimplantitis correlated to higher levels of HbA1c
7.	khandelwal at al. [8] 2013	16 week randomised trial evaluating success of SLA vs Modified large grit SLA in moderately controlled diabetics	24 patients received 48 implants allocated to SLA and modified SLA	Moderately controlled type 2 (HbA1c 8-11 %)	100% success	No difference with radiofrequency analysis values using SLA or modified SLA implants
8.	malik *et al.* [9] 2012	9 week prospective study evaluating bone density with and without prp in controlled diabetics	14 patients received 2 mini implants each, one without prp and other with prp	Type 2 well controlled	100 percent success	No difference in bone density with and without prp
9.	Ibarajan A. *Et al* [10] 2012	Short term clinical study evaluating implants in controlled diabetics	5 patients	Type 2 controlled	100 percent success	No difference in incidence of bone loss or periimplantitis compared to healthy population
10.	Oates TW *et al* [11] 2009	6 week prospective study comparing implant stability in non diabetic with diabetic patients using RFA	10 non diabetic 20 diabetic	Variable control (8.1-12.5 % HbA1c)	100 percent success	Diabetic patients with HbA1c >8.5 % showed lower levels of implant stability at 6 weeks
11.	Baishi *et al.* [12] 2007	Clinical study evaluating stability of 18 immediately loaded dental implants in controlled diabetic using RFA	1 patient reviewing 18 immediately loaded implants	Well controlled type 2 diabetic, on insulin	100 % success rate	Implant stability decreased by 12.5% at 30 days but increased thereafter
12.	Olson JW *et al.* [13] 2000	Clinical prospective study evaluating implant success in diabetic patients	89 male	Type 2 variably controlled	16/178 implants failed	88 % after 6 months
13.	Morris HF *et al.* [14] 2000	Prospective 36 month study evaluating implant success rate in diabetic patients	633 patients receiving 2,887 implants	Type 2 variably controlled	-	9.1 percent failed in diabetics , 4.5 % failed in non diabetics

A shortcoming of this review has been the limited number of studies included. A lot of clinical trials had a small sample size and a small follow up period to significantly assess the outcome. More number of studies are required to assess clearly the affect of diabetes on long term success of dental implants.

Nonetheless the results have been promising. Dental implants are no longer an absolute contraindication for diabetic patients. A thorough assessment of diabetic control along with proper atraumatic surgical management of these patients would lead to a predictable clinical outcome.

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