Research Article

JRAD Journal of Research and Advancement in Dentistry

J Res Adv Dent 2017;6:1s:75-78.

Effect of Smoking on Dental Implant Survival Rate: A Retrospective Study

Sujan Shetty[1*] Swarup Shetty A[2] Shilpa Shetty[3] Saket Banchhor[4] Jyoti Kumari[5] Kushboo Das[6]

[1]Associate Professor, Department of Periodontics, Triveni Institute of Dental Sciences Hospital and research Centre, Bilaspur, Chhattisgarh, India.
[2]Assistant Professor, Department of Prosthodontics, Sharavathi Dental College, Shivamoga, Karnataka, India.
[3]Post Graduate Student, Department of Prosthodontics, S D M College of Dental Science & Hospital, Dharwad, Karnataka, India.
[4]Post Graduate Student, Department of Periodontology, Rungta College of Dental Science & Research, Bhilai, India.
[5]Intern, Triveni Institute of Dental Sciences Hospital and research Centre, Bilaspur, Chhattisgarh, India.
[6]Intern, Triveni Institute of Dental Sciences Hospital and research Centre, Bilaspur, Chhattisgarh, India.

ABSTRACT

Background: Smoking habits either bidi or cigarette has a impact on survival rate of implant. Cigarette smoking results into impaired wound healing, leading to accelerated bone resorption, increased bone loss rate and reduced bone height of the alveolar ridge. The present study was conducted to assess the effect of smoking on implant success.

Materials & Methods: This study was conducted in department of Prosthodontics from year 2010 to 2012. It included 100 patients of both genders. Patients were divided into 2 groups. Group I {(Smoker(S)} – It included 50 patients and group II {(Non smoker (NS)} - It included 50 patients. A total of 100 implants were placed in 100 patients. Implant failure rate was assessed in both groups.

Results: Out of 100 patients, group I had 50 (males- 25, females- 25). Similarly group II had 50 (males- 25, females- 25). The difference was non – significant (P > 0.05). Patients < 40 years had 25 males and 25 females. Similarly age group 41-60 years had 25 males and 25 females. The difference was non – significant (P > 0.05). Implant with diameter < 3.75mm was placed in 15 males and 15 females. Implants with diameter 3.75- 4.5mm was placed in 20 males and 25 females. Implants with diameter >4.5mm was placed in 15 males and 10 females. The difference was non- significant (P > 0.05). Implants with < 10mm were placed in 13 males and 10 females, 10-11.5mm was placed in 25 males and 20 females, similarly > 11.5mm was placed in 12 males and 20 females. The difference was non significant (P > 0.05). In group I, 5 implants (10%) showed implant failure. Similarly, in group II, 2 patients (4%) showed failure. The difference was significant (P < 0.05).

Conclusion: Smoking has a deleterious effect on implant survival rate. Smokers are more prone to developed failure and complications. We found 10% of implant failure in our study.

Keywords: Failure, implant, smoker.

INTRODUCTION

Dental implants are getting importance nowadays and within few years if has replaced the fixed partial denture and removable partial denture as a treatment modality for missing teeth. The success of any implant based on many factors among which health of individual play important role. Survival rates for the implants are relatively high in normal healthy individuals and non pathological bone.[1]

Studies have reported success rates around 90–95% for endosseous dental implants. Implant

Received: Dec. 11, 2016: **Accepted:** Feb. 6, 2017
***Correspondence Dr. Sujan Shetty.**
Department of Periodontics, Triveni Institute of Dental Sciences Hospital and research Centre, Bilaspur, Chhattisgarh, India.
Email: shetsujan@gmail.com

pISSN 2278-0076
eISSN 2321-9270

failure is one of the complications that a patient faces. Implant failure is generally defined as the mobility of the implant either in the Osseo integrated period (early failure) or in the post loading period (late failure). Peri-implant radiolucency, pain, discomfort, and/or persistent infection at the implant size are the most common features of implant failure.[2] Smoking habits either bidi or cigarette has a impact on survival rate of implant. Cigarette smoking results into impaired wound healing, leading to accelerated bone resorption, increased bone loss rate and reduced bone height of the alveolar ridge. Studies have reported dental implant failures in the Osseo integrated period in smokers (S) than in nonsmokers (NS) and higher rates of post loading period failures.[3]

Other factors which can lead to implant failures are selection of implant design, length of implant, diameter of implant, bone quality, location of implant and abutment used etc. Proper oral hygiene is also required for longer survival. Implant failure due to smoking is one of the drawbacks. Hence patients with dental implant should avoid smoking and maintain proper oral hygiene.[4]

The present study was conducted to assess the effect of smoking on implant success.

MATERIALS & METHODS

This study was conducted in department of Prosthodontics from year 2010 to 2012. It included 100 patients of both genders. Patients were informed regarding the study and a written consent was taken. Patients' demographic data such as name, age, gender etc. was recorded. History of smoking was also recorded. Following inclusion and exclusion criteria was used.

Inclusion:- Patients with missing maxillary and mandibular teeth and sufficient amount of bone.

Exclusion:- Patients with systemic disorders, mentally disabled individuals, patients who had had renal, liver and bone marrow transplants, drug dependency, psychological problems, a history of head and neck radiation and chemotherapy treatment; and Patients with insufficient bone quantity.

Patients were divided into 2 groups. Group I {(Smoker(S)} – It included 50 patients and group II {(Non smoker (NS)} - It included 50 patients. A total of 100 implants were placed in 100 patients. Results were tabulated and subjected for correct inferences. P value < 0.05 was considered significant.

RESULTS

Table I shows that out of 100 patients, group I had 50 (males- 25, females- 25). Similarly group II had 50 (males- 25, females- 25). The difference was non – significant (P > 0.05). Table II shows that patients < 40 years had 25 males and 25 females. Similarly age group 41-60 years had 25 males and 25 females. The difference was non – significant (P > 0.05). Graph I shows that implant with diameter < 3.75mm was placed in 15 males and 15 females. Implants with diameter 3.75-4.5mm was placed in 20 males and 25 females. Implants with diameter >4.5mm was placed in 15 males and 10 females. The difference was non-significant (P > 0.05).

Graph II shows that implant with < 10mm were placed in 13 males and 10 females, 10-11.5mm was placed in 25 males and 20 females, similarly > 11.5mm was placed in 12 males and 20 females. The difference was non significant (P > 0.05).

Graph III shows that in group I, 5 implants (10%) showed implant failure. Similarly, in group II, 2 patients (4%) showed failure. The difference was significant (P < 0.05).

DISCUSSION

Implants are getting importance over the last few years. They have becoming the treatment of choice for missing teeth. Failures in implants are also common. Systemic conditions have high impact on success or failure of implant.[5]

Smoking has proven to be detrimental in achieving and maintaining good oral health. The correlation between smoking and periodontal disease, root caries, delayed wound healing, and oral cancers has been documented. Additionally, the literature contains reports of decreased ability to achieve osseo integration in smokers compared to nonsmokers; however, the reasons for this are not clear. Smoking has a strong influence on the

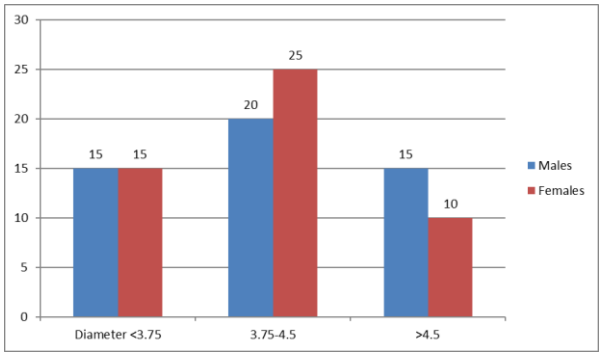
Table I Distribution of patients.

Total - 100			
Group I {(Smoker(S)} (50)		Group {(Non smoker (NS)} II (50)	
Male	Female	Male	Female
25	25	25	25

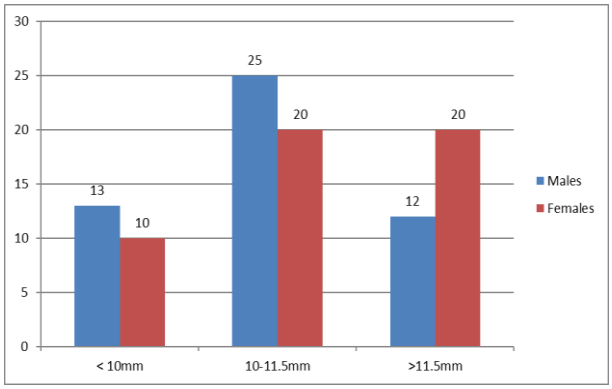
Table II Distribution of patients according to age group.

Age group	Male	Female
<40 years	25	25
41-60 years	25	25
Total	50	50

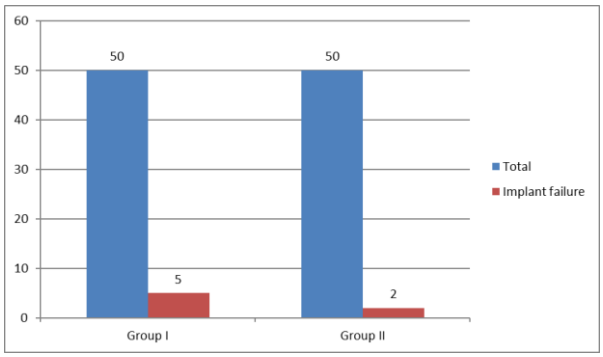
Graph I Distribution of patients according to diameter of implants.



Graph 2: Distribution of patients according to length of implant.



Graph 3: Implant failure in both groups.



complication rates of implants: it causes significantly more marginal bone loss after implant placement, it increases the incidence of peri-implantitis and affects the success rates of bone grafts.[6]

The present study was conducted to assess the effect of smoking on implant survival rate. We included 100 patients with 100 implants placed in 2 years period. Patients were divided into 2 groups. Group I {(Smoker(S)} – It included 50 patients and group II {(Non smoker (NS)} - It included 50 patients. We found that implant with 3.75- 4.5mm diameter was placed in 20 males and 25 females. Maximum patients were having this dimension implants. Our results are in agreement with Cesar Neto et al.[7] We found that maximum implants had length of 10-11-5mm (45). This is in agreement to Gormon et al.[8] We found that in smokers group out of 50 implants, 5 showed failures. The prevalence rate of 10% was recorded. This is similar to results of Stephan G et sl.[9]

Baig and Rajan[10] evaluated the relationship of tobacco smoking and the failure rates of dental implants. They suggested that smokers have higher failure rates and complications following dental implantation and implant related surgical procedures and that the failure rate of implants placed in grafted maxillary sinuses of smokers is more than twice that seen in NS.

The failure rate of implants placed in the maxillary arch is higher though the mechanism is not understood. Studies indicated higher failures of implants in grafted maxillary sinuses, higher rate of infection and impaired wound healing after second stage surgery. Medical conditions such as diabetes and osteoporosis may compound the risks of

implant failures in such patients. Smokers should be advised to stop smoking during the healing period and where possible prior to dental implant therapy and they should seek counselling help to stop the habit altogether.[11]

CONCLUSION

Smoking has a deleterious effect on implant survival rate. Smokers are more prone to developed failure and complications. We found 10% of implant failure in our study.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. El Askary AS. Clinical review on implants failure: Clinical reports. JD News. 2000; 8:11-5.

2. Leonhardt A, Dahlén G, Renvert S. Five-year clinical, microbiological, and radiological outcome following treatment of peri-implantitis in man. J Periodontol. 2003; 74: 1415-22.

3. Duyck J, Naert I. Failure of oral implants: Aetiology, symptoms and influencing factors. Clin Oral Investig. 1998; 2: 102-14.

4. El Askary AS, Meffert RM, Griffin T. Why do dental implants fail? Part II. Implant Dent. 1999; 8:265-77.

5. MacFarlane GD, Herzberg MC, Wolff LF, Hardie NA. Refractory periodontitis associated with abnormal PMN leukocyte phagocytosis and cigarette smoking. J Periodontol. 1992; 63: 908–913.

6. Siana JE, Rex S, Gottrup F. The effects of cigarette smoking on wound healing. Scand J Plast Reconstr Surg. 1989; 23: 207–209.

7. Cesar-Neto JB, Duarte PM, Sallum EA, Barbieri D, Moreno H Jr, Nociti FH Jr. A comparative study on the effect of nicotine administration and cigarette smoke inhalation on bone healing around titanium implants. J Periodontol. 2003; 74: 1454-9.

8. Gorman LM, Lambert PM, Morris HF, Ochi S, Winkler S. The effect of smoking on implant survival at second-stage surgery: DICRG Interim Report No 5. Dental Implant CLinical Research Group. Implant Dent. 1994; 3:165-8.

9. Stephan G, Vidot F, Noharet R, Mariani P. Implant-retained mandibular overdentures: A comparative pilot study of immediate loading versus delayed loading after two years. J Prosthet Dent. 2007; 97: 138-45.

10. Baig MR, Rajan M. Effects of smoking on the outcome of implant treatment: A literature review. Indian J Dent Res. 2007; 18:190-5.

11. Lekholm U, Zarb GA. Patient selection and preparation. In: Brånemark P-I, Zarb GA, Albrektsson T. Tissue-Integrated Prostheses: Osseointegration in Clinical Dentistry. Chicago: Quintessence. 1985:199–209.