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Evaluation of dental implants failures in smokers and healthy subjects

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ABSTRACT:

Introduction: The ill effects of tobacco on human health have been well demonstrated yet tobacco continues to find a very special place in the present day to day life probably because of the stimulant effects of nicotine.[5,] The present study was conducted to assess failure rate of dental implant in smokers and healthy subjects.

Materials & methods: 54 smokers (group I) and equal number of healthy subjects (group II) who received dental implant in last 5 years of both genders were recruited. Amount of bone loss around the implant over 1mm of bone loss in the first year and over 0.3 mm bone loss every subsequent year were considered as failures.

Results: Group I consisted of 68 patients (smokers) with 76 dental implants. Group II consisted of 54 patients (healthy subjects) with 78 implants. In group I, there were 16 and in group II, there were 3 dental implant failures. At first year, in group I, mean bone loss around implant was 1.21 mm and 0.5 mm in group II. Upto 5 years, in group I, mean bone loss around implant was 2.7 mm and 1.4 mm in group II. The difference was significant p< 0.05).

Conclusion: Smokers had higher dental implant failure rates as compared to healthy subjects.

Key words: Dental implant, Failure, Smoker

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INTRODUCTION

Dental implant (DI) is generally considered to be the ideal treatment of the tooth loss. The reason of tooth loss can be dental caries, periodontal diseases etc. This loss of teeth is mostly commonly in the aged population.[1] The best treatment modality for replacement of teeth is dental implant therapy. The prevalent age-range for implant therapy has been reported above 40 years or between 51 and 60 years, thus the patients who required dental implant therapy are usually associated with systemic comorbidities.[2]

A success rate of 90%-95% has been reported over the 10 years. Pain, infection and hemorrhage and occasionally neuropathy are early complications of implant. The success of dental implant therapy depends on several factors. Implants have got failure rates also. The reasons for implants failure are lack of osseointegration during early healing, infection of the peri-implant tissues and breakage. Among all, general condition of oral cavity is most common.[3]

Smoking has been considered a matter of pride since 5000- 3000BC. It was consumed either in form of chewable or non- chewable tobacco. The various forms of tobacco available in two forms: the smokeless and the smoking tobacco. Smoking tobacco includes cigarette, beedi, cigar, kretek, pipes, hookah, vaporizers etc whereas non- smoking tobacco includes chaini khaini, zarda, pan supari, mewa etc. Various harmful effect of tobacco on oral health and general health has been found.[4] Numerous studies depicting the ill effect of tobacco on body has been performed so far. Anti tobacco groups in Germany first came up with the possible harmful effects of tobacco and advocated against its consumption. The ill effects of tobacco on human health have been well demonstrated yet tobacco continues to find a very special place in the present day to day life probably because of the stimulant effects of nicotine.[5,] The present study was conducted to assess failure rate of dental implant in smokers and healthy subjects.

MATERIALS & METHODS

This study was conducted among 54 smokers and equal number of healthy subjects who received dental implant in last 5 years of both genders. All were informed regarding the study and their consent was obtained. Inclusion criteria comprised of patients age ranged 30-60 years and patients who received dental implant 5 years ago. Exclusion criteria consisted of patients with history of chemotherapy or radiation therapy and incomplete patient record.

Data such as name, age, gender etc. were retrieved from the patients record file. Amount of bone loss around the implant over 1mm of bone loss in the first year and over 0.3 mm bone loss every subsequent year were considered as failures. Any signs of infection close to the implant structure leading to instability and displacement of the implant were also recorded using intra- oral periapical radiographs as well as panoramic radiographs. The radiological finding was retrieved from patient case record. Results thus obtained were entered in MS excel sheet and data was presented as mean and median. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I (Smokers)	Group II (Healthy)
Number	54	54
Implants	76	78

Table I, graph I shows that group I consisted of 68 patients (smokers) with 76 dental implants. Group II consisted of 54 patients (healthy subjects) with 78 implants.

Graph I Distribution of patients

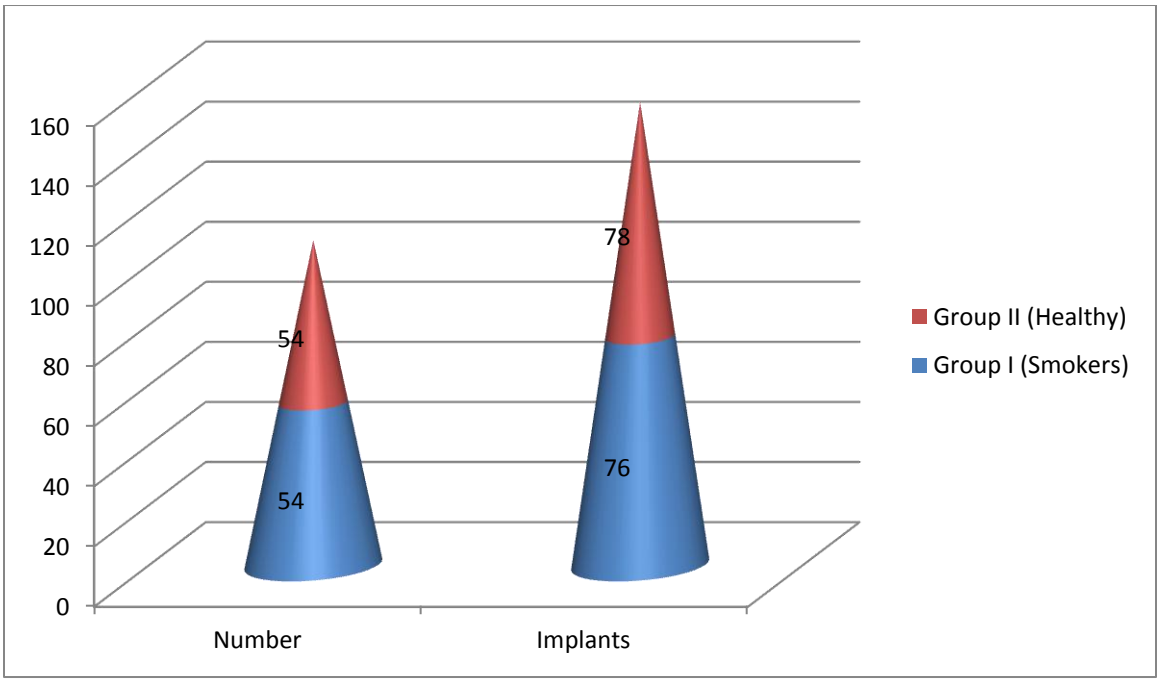
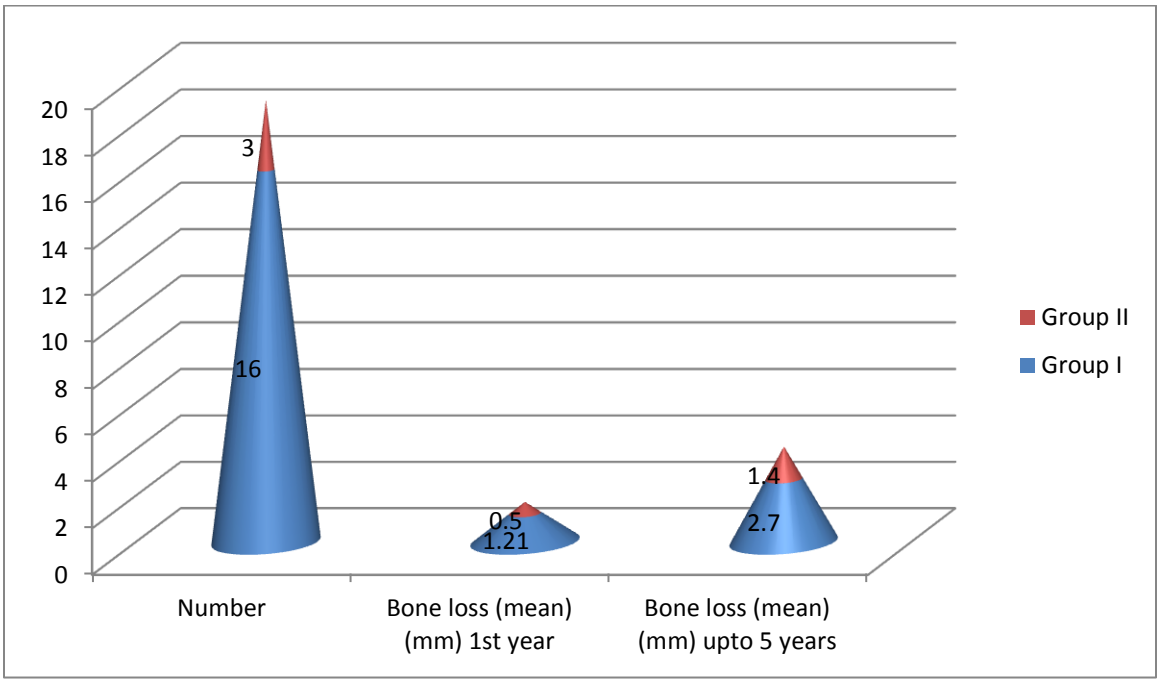


Table II Failure rate in both groups

Failure	Group I	Group II	P value
Number	16	3	0.001
Bone loss (mean) (mm) 1st year	1.21	0.5	0.02
Bone loss (mean) (mm) upto 5 years	2.7	1.4	0.001

Table II, graph II shows that in group I, there were 16 and in group II, there were 3 dental implant failures. At first year, in group I, mean bone loss around implant was 1.21 mm and 0.5 mm in group II. Upto 5 years, in group I, mean bone loss around implant was 2.7 mm and 1.4 mm in group II. The difference was significant $p< 0.05$).

Graph II Failure rate in both groups



DISCUSSION

Smoking tobacco leads to stomatitis nicotiana palatine (smoker's palate), smoker's melanosis, coated tongue, oral candidiasis and periodontal diseases. It is the major cause of oral pre-cancerous lesions such as leukoplakia, palatal changes associated with reverse smoking and ultimately oral cancer (squamous cell carcinoma).[6] Smoking has deleterious effect on periodontium. Studies have shown that the accumulation of advanced glycation end (AGE) products leads to periodontal inflammation.[7] There is production of reactive oxygen species due to enhanced interactions between AGEs and their receptors RAGE. This interaction is the reason for state of oxidative stress.[8] Recent studies revealed that there is production of pro inflammatory cytokines such as IL-6, IL1β and TNF-α in the periodontal tissues which is responsible for alteration in the phagocytic and chemotactic functions of the neutrophils. AGE is also liable for mediating endoplasmic reticulum mediated stress induced nuclear kappa B pathway.[9] The present study was conducted to assess failure rate of dental implant in smokers and healthy subjects.

In this study, group I consisted of 68 patients (smokers) with 76 dental implants. Group II consisted of 54 patients (healthy subjects) with 78 implants. Subhas et al[10] found that the mean age in group I was 47±3 years, in group II was 45± 4 years and in group III was 43±4years. The mean duration of T2DM among smokers and non smokers was 9.4 ± 2.4 and 7.9 ± 1.3 years in group 1 and 8.3±5 and 9.4±3 years in group II respectively. Mean peri implant PI (p= 0.001), BOP (p= 0.02) and PD (p = 0.003) were found to be significantly higher in the patients suffering from uncontrolled type 2 diabetes mellitus than the well controlled diabetics or the healthy controls. No statistically significant differences were observed in periodontal probing depth

(p=0.43), PI (p=0.567) and crestal bone loss (p= 0.13) between smokers and non smokers in the poorly controlled diabetic individuals. In the healthy control group statistically significant differences were seen in periodontal probing depth (p= 0.003), plaque index (p= 0.002) and crestal bone loss (p =0.001). BOP however did not show statistically significant differences between smokers and non smokers (p = 0.23) in patients without type 2 diabetes mellitus as well as in patients with well controlled blood glycemic level.

We found that in group I, there were 16 and in group II, there were 3 dental implant failures. At first year, in group I, mean bone loss around implant was 1.21 mm and 0.5 mm in group II. Upto 5 years, in group I, mean bone loss around implant was 2.7 mm and 1.4 mm in group II. Javed F et al[11] who have reported the levels of pro inflammatory cytokines to be comparatively more in smokers as compared to non smokers in healthy subjects however in patients having poorly controlled type 2 diabetes mellitus, smoking did not have much effect. Daubert DM et al[12] have reported chronic uncontrolled hyperglycemia and tobacco smoking to be independent risk factors for not only periodontal diseases but also peri implant pathologies.

CONCLUSION

Authors found that smokers had higher dental implant failure rates as compared to healthy subjects.

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