

EVALUATION OF DENTAL IMPLANT STABILITY IN SMOKERS

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ABSTRACT

Aim: Implants are the ideal treatment for endogenous people and, on the other hand, we encounter people who have tobacco use, including cigarette smoking, which requires implantation, but smoking reduces the chances of success in treatment. The aim of this study was to evaluate the sustainability of dental implants in smokers.

Materials & Method: This retrospective cohort study was conducted in 2017. The statistical population consisted of 110 people, in non-smoker patients (60 samples) and smokers (50 samples). After collecting data, data was analyzed by SPSS 23 software.

Results: There is a significant relationship between BOP and PPD with smoking, and these factors contribute to the sustainability of the implant, so the implant's stability is low in smokers.

Conclusion: In general, smoking is one of the important factors affecting the failure rate of dental implants. According to the results, the rate of failure of dental implants in smokers is higher than that of non-smokers.

Key words: : Implants, Cigarette, Implant Sustainability.

Introduction

The teeth may be missed due to the reasons such as gum disease, fractures caused by impact and decay. Dental implants can be used to replace missed teeth.¹ The implant success rate has significantly increased through development of surgical techniques and modern radiographic methods. However, different problems and failures appear during the treatment or after that arising from biological and biomechanical factors such as bacterial contamination, diabetes, trauma and smoking. The above mentioned cases can reduce the success rate of dental implants and lead to their failure.²

One of the most important and riskiest factor, reducing the success of dental implants, is smoking cigarette. Smoking cigarette significantly affects side effects of inflammation and infection around the implant.³ Dental implants failure is divided into two groups; the initial one, between surgical and prosthetic phases and it can be due to a disorder in the process of tissue restoration and late failure, because of Peri-implant around the implant.⁴ Cigarette is a late failure.⁵ As it was seen in the study of Bain *et al*, implant failure was more in smokers than non-smokers (11.28% against 4.76%).⁶ Also, a study was conducted in 1996, indicating that implant failure has a direct relationship with the number of cigarette, people who smoked more cigarettes than the other ones, smoked less, allocated higher percentage to themselves.⁷ Bone loss in smokers was more than non-smokers, shown in the study of Wenstrom.⁸

Numerous findings showed that dental implant failure of upper jaw is more than lower one.⁹⁻¹¹ To have a successful process of dental implant in smokers, they need to stop smoking because it not only threatens the beauty of teeth but also increases gum inflammation and periodontal diseases as well as speed of jaw bone loss and nitrogenous toxic compounds disrupt healing process of wounds and threatens the success of surgeries such as sinus lift and bone graft, of the common ones for putting dental implants.¹² The current study was conducted aiming to investigate the dental implant sustainability in smokers.

Materials & Method

This retrospective cohort study was conducted in 2017. The statistical population consisted of 110 subjects including two groups of non-smokers patients (60 samples) and smoker ones (50 samples). Inclusion criterion in the study was elapse of at least 20 months of implanting and exclusion criterion was diabetes. The questionnaire was developed and the information related to the age, gender, the time of implantation in month and smoking were completed, checking the patients' files. All patients were precisely examined using dentistry unit light source, the condition of the tooth in front of the implant, BOP (Bleeding on probing) and PPD (Pocket probing depth) were recorded. After collecting the data, they were analyzed using SPSS23 software.

Results

Sixty smokers and fifty non-smokers entered the study, the number and frequency percentage have been reported in table 1, differentiated by gender.

Non-smoker				Smoker			
Male		Female		Male		Female	
N	%	N	%	N	%	N	%
32	33.5%	28	46.7%	29	58%	21	42%

Table 1: The number and frequency percentage of participants in the study.

The average age of non-smoker patients was with the mean of 49.16 and standard deviation of 10.11 and smoker ones were with the mean of 48.12 and standard deviation of 10.39. the rate of BOP (Bleeding on probing) and PPD (Pocket probing depth) can be seen in table 2. Given the table above and Chi square test, a significant relationship was observed between the rate of BOP (Bleeding on probing) and PPD (Pocket probing depth) by smoking cigarette ($p=0.00$, $p=0.25$). Since there is a significant

relationship between BOP (Bleeding on probing) and PPD (Pocket probing depth) by smoking and these factors contribute implant sustainability, therefore, the rate of implant sustainability is low in smokers.

Properties	Frequency Distribution of Non-smokers	Frequency Distribution of Smokers
BOP		
Degree 0	78.3%	46
Degree 1	21.7	54
PPD		
1 millimeter	25	52
Healthy	75	48

Table 2: the frequency of Bleeding on Probing (BOP) and Pocket Probing Depth (PPD).

Discussion

The relationship between implant sustainability and smoking was observed in the current study. In a study subjected to comparison of gum health indexes in people, receiving smoker and non-smoker dental implants, Recken *et al* showed different degrees of BOP and PPD by smoking, consistent with current study and gum inflammation was significantly more in smokers than non-smokers.² A study, conducted in 2017, showed that the rate of implant failure in smokers was more by increasing the length and severity of smoking habit.¹³ In their study, Alessandro *et al* showed that there is a direct relationship between the patients with active periodontitis, having known beauty problems, and the rate of implant sustainability. This study was also consistent with the current one.¹⁴ In a study, Cavalli investigated the prevalence of Mucositis Peri Implant and Peri-implant in non-smoker patients, the results of which consisted with those of current study.¹⁵ The data of study by Tsigarida showed that smoking, even in clinical health conditions, consists a rich population of Pathogenesis, in both groups of smokers and non-smokers, Mucositis Peri Implant seems to be a critical event in the progress of disease, making the high risk societies for this damage. However, replacing ecology with various methods in smoker and non-smokers showed the need for personal treatment to control and prevent the disease in these groups that wasn't that much consistent with the current study.¹⁶ Another study was conducted in 2013 about this, indicating that there is a direct relationship between smoking and the risk of implant failure.¹⁷ A study showed smoking habits, in analyzing a variable, associated factors with implant survival, the status of smoking (smoking or non-smoking), the rate of smoking, inactive smoking and the time when they stopped smoking to the time of implantation. In the analysis of several variables of factors, having a relationship with implant survival, it was shown that there is a direct relationship between smoking and implant sustainability, same as current study.¹⁸ In some other studies, the direct relationship between the rate of smoking and implant sustainability had been also reported.¹⁹⁻²² The results of Leikholm showed that there was a significant difference in the rate of bone loss around

the implant in non-smokers and smokers.²³ It was shown in another study that there isn't a relationship between smoking and the rate of dental implant sustainability while one of required factors hadn't been considered, that wasn't consistent with the current study.²⁴ Another study, hasn't considered smoking as a risky factor and introduced its negative effect limited to the length of dental implants, wasn't consistent with the current study.²⁵

Conclusion

Generally, cigarette is one of important and effective factors on the rate of dental implant failure. Given the obtained results, the rate of dental implant failures is more in smokers than non-smokers. By quitting the cigarette or even decreasing the number of daily cigarette, implant failure can be dramatically reduced. Smokers are recommended to be trained for quitting cigarette before implantation and if they can't quit, they are recommended to minimize the number of cigarette as many as possible. Keeping the mouth and teeth clean is of great importance beside other trainings.

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