

IMPACT OF SMOKING ON PERIODONTAL HEALTH

Kiruthika Patturaja¹, Arvina Rajasekar², Iffat Nasim³,

¹Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai - 600 077.

²Senior Lecturer, Department of Periodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai - 600 077.

³Professor and HOD, Department of Conservative Dentistry and Endodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai - 600 077.

¹151501048.sdc@saveetha.com

²arvinar.sdc@saveetha.com

³Iffatnasim@saveetha.com

ABSTRACT:

Periodontal disease is one of the most common chronic diseases in adults. It is an inflammatory disease affecting the soft and hard tissues of the oral cavity. It is associated with various risk factors. Tobacco is one of the potent risk factors for periodontal disease. The aim of the present study was to find the impact of smoking on periodontal health. A retrospective study was conducted using the case records of patients in a private institution between June 2019 to March 2020. A total of 200 male patients (Group 1: 100 smokers; Group 2: 100 non-smokers) were recruited. Data regarding the periodontal status of the patients were collected from their records. Descriptive and inferential statistics were done using SPSS software. The present study showed that smokers had a high prevalence of periodontitis (37.5%) when compared to non-smokers (8.5%). Whereas, non-smokers had a high prevalence of gingivitis (41.5%) when compared to smokers (12.5%). Also, there was a statistically significant association between smoking and periodontal health ($p=0.000$). The findings of the present study showed that smokers had increased risk of periodontitis than non-smokers.

Keywords: Gingivitis; Periodontitis; Smoking; Tobacco.

INTRODUCTION:

Periodontitis is a group of inflammatory diseases affecting the supporting tissues of the tooth tooth like gingivae, alveolar bone and periodontal ligament (CARRANZA'S CLINICAL PERIODONTOLOGY, 2013). Gingivitis which is a mild form of periodontal disease is reversible due to bacterial biofilms on teeth adjacent to gingiva. While periodontitis is due to advanced gingivitis resulting in loss of connective tissue and alveolar bone causing major tooth loss (Armitage, 1999). Major risk factors for periodontitis include diabetes mellitus, smoking and periodontal pathogens (Genco, 1996).

Smoking is a risk factor for initiation, extent and severity of periodontal disease (Hayman et al., 2011). Smokers have been found to have more debris and calculus deposits than non-smokers (Pindborg, 1947). Smoking has been found to have an adverse effect on hosts by altering the host-bacterial interaction due to change of composition in subgingival plaque where specific structural alteration to lipid derived 3-OH fatty acid present in saliva and oral mucosa reduce inflammatory potential (Kazor, Taylor and Loesche, 1999; Buduneli et al., 2011). Smokers exhibit decreased bleeding upon probing, increased clinical loss of attachment, gingival recession and tooth mobility independent of age, gender and systemic condition (Machuca et al., 2000).

Smokers have been found to have increased number of neutrophils but decreased activity which elevates the oxidative burst thus causing tissue destruction by direct toxic effect from tobacco (Shirodaria et al., 2000); (Ramesh, Sheeja S. Varghese, et al., 2016; Priyanka et al., 2017). Also, smoking increases the levels of pro-inflammatory mediators in gingival crevicular fluid which play a role in the increased susceptibility for osteoclastic bone destruction in smokers (Khalid et al., 2017); (Khalid et al., 2016); (Varghese et al., 2015; Mootha et al., 2016). These findings suggest that smoking exerts a strong, chronic and dose dependent effect on periodontal tissues. Tobacco smoking affects the oral environment causing destruction of periodontal structures causing periodontitis (Luzzi et al., 2007; Sreedevi, Ramesh and Dwarakanath, 2012).

There are a variety of treatments available for treating periodontitis including regenerative and resective procedures. (Thamaraiselvan et al., 2015); (Panda et al., 2014); (Ravi et al., 2017); (Ramesh, Sheeja Saji Varghese, et al., 2016); (Avinash, Malaippan and Dooraiswamy, 2017); (Ramesh, Ravi and Kaarthikeyan, 2017; Kavarthapu and Thamaraiselvan, 2018; Ramamurthy and Mg, 2018; Ramesh et al., 2019). However, smoking exerts a negative impact on all treatment modalities.

In this context, the present study was undertaken to find the impact of smoking on periodontal health.

MATERIALS AND METHODS:

A retrospective study was conducted to find out the impact of smoking on periodontal health. The study was done using the case records of patients in a private institution between June 2019 to March 2020. Prior permission to utilize the data for study and analysis was obtained from the Institutional Research Committee of the University under ethical approval number SDC/SIHEC/2020/DIASDATA/0619-0320.

A total of 200 male patients (Group 1: 100 smokers; Group 2: 100 non-smokers) were recruited. Patients with systemic diseases, patients under long term medications were excluded from the study. Data regarding the periodontal status of the patients were collected from their records. Descriptive (frequency distribution and percentage) and inferential statistics (chi-square test) were done using SPSS software.

RESULTS AND DISCUSSION:

A total of 200 male patients were recruited in the present study. The mean age of the patients were 36.11 years. Among the 100 smokers, 25 of them (12.5%) had gingivitis and 75 of them (37.5%) had periodontitis. Among the 100 non-smokers, 83 of them (41.5%) had gingivitis and 17 of them (8.5%) had periodontitis. The prevalence of periodontitis was more among smokers and prevalence of gingivitis was more among non smokers. Also, the association between smoking status and periodontal health status was assessed using chi-square test and was found to be statistically significant with a p value of 0.000. (Figure 1)

The present study assessed the impact of smoking on periodontal health. In our study, smokers had higher prevalence of periodontitis compared to non-smokers. Weijden et al, in a comparative study on evaluation of periodontitis between smokers and non-smokers found increased prevalence of periodontitis among smokers (Van der Weijden et al., 2001). Haber et al, in an evidence based study reported smoking as a major environmental risk factor and smokers as a high risk group in periodontitis prevalence (Haber et al., 1993). Taani et al studied the association of oral hygiene status in smokers and non-smokers showed a significantly increased prevalence of poor oral hygiene with more plaque and calculus deposits in smokers (Taani, 1997). Our finding is in accordance with the previous studies.

In the present study, non-smokers had higher prevalence of gingivitis compared to smokers. Lie et al, in a comparative study showed that non-smokers had an increased prevalence of gingivitis when compared to smokers (Lie *et al.*, 1998). Dietrich et al, reported that smoking had a strong, chronic and dose dependent suppressive effect on gingival bleeding on probing (Dietrich, Bernimoulin and Glynn, 2004). Smokers have lower risk of gingival inflammation due to decreased gingival blood flow causing decreased local host response when compared to non smokers (Morozumi *et al.*, 2004). Experimental studies on plaque induced gingivitis suggests that gingival inflammation causing redness, bleeding and exudation are not evident in smokers when compared to non-smokers (Bergström and Preber, 1986). Our finding is in agreement with the previous studies.

Also, the association between smoking status and periodontal health status was statistically significant in the present study. Similar findings were reported by Sreedevi et al, Martinez-Canut et al and Gautham et al. (Sreedevi, Ramesh and Dwarakanath, 2012); (Martinez-Canut, Lorca and Magán, 1995); (Gautam *et al.*, 2011). These studies showed positive association between smoking and periodontitis.

The present study showed that smoking has a negative impact on periodontal health and smokers are more prone to develop periodontitis than non-smokers.

CONCLUSION:

Within the limitation of the study, it can be concluded that periodontitis was more prevalent in smokers than non-smokers. Also, there was statistically significant association between smoking and periodontitis.

AUTHORS CONTRIBUTION:

Kiruthika Patturaja performed the analysis, interpretation and drafted the manuscript. Arvina Rajasekar contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Iffat Nasim participated in the study and revised the manuscript. All the three authors equally contributed to the manuscript.

CONFLICTS OF INTEREST:

None declared.

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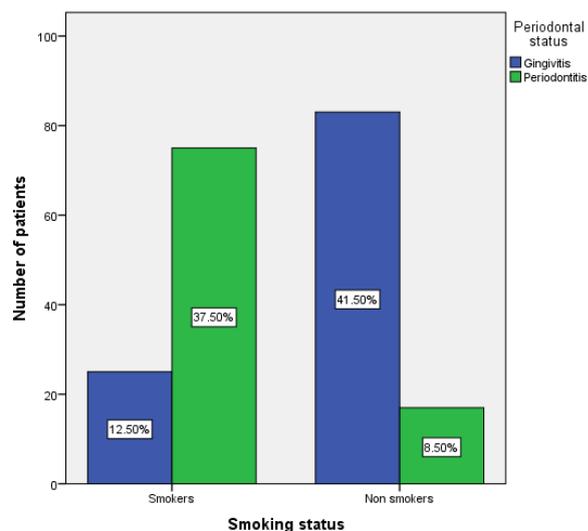


Figure 1: Bar graph depicting association between smoking status and periodontal status of the patients. X axis represents smoking status and Y axis represents the number of patients. Smokers had higher prevalence of periodontitis when compared to non-smokers. Gingivitis was more prevalent among non-smokers than smokers. Association between smoking status and periodontal status was statistically significant (Chi-square analysis; p value=0.000).