

Original Research

Assessment of prevalence of periodontitis among smokers and non-smokers: A comparative study

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BDS

ABSTRACT:

Background: Periodontitis is a group of inflammatory diseases affecting the supporting tissues of the tooth (periodontium). During periodontitis, cigarette smoking may differentially affect neutrophil function, generally preventing elimination of periodontal pathogens, but, in heavy smokers also stimulated reactive oxygen species release and oxidative stress mediated tissue damage. Hence; the present study was undertaken for assessing the prevalence of periodontitis among smokers and non-smokers. **Materials & methods:** A total of 50 smokers and 50 non-smokers were enrolled in the present study. A mouth mirror and William's probe was used for doing the clinical and periodontal examination. CPI index was used for comparing the periodontal status in between patients of the two study groups. Codes and criteria of CPI index: Code-0=No periodontal disease (healthy periodontium); Code-1=Bleeding observed during or after probing; Code-2=Calculus or other plaque retentive factors either seen or felt during probing; Code-3=Pathological pocket 4 to 5 mm in depth. Gingival margin situated on black band of the probe; and Code-4=Pathological pocket 6 mm or more in depth. Black band of the probe is not visible.

Results: Among the smokers group, 30 patients were having code 2 (Calculus) of CPI score, while 8 and 9 patients were having code 3 (Shallow pockets) and code 4 (deep pockets) of CPI score respectively. Only 3 patients of the smokers group were having code 1 (Bleeding) of CPI score. Among the non-smokers group, 22 patients were having code 2 (Calculus) of CPI score, while 15 and 5 patients were having code 3 (Shallow pockets) and code 4 (deep pockets) of CPI score respectively. 8 patients of the non-smokers group were having code 1 (Bleeding) of CPI score. While comparing the CPI scores among smokers and non-smokers group, significant results were obtained. **Conclusion:** Smoking has a significant deleterious effect on the periodontal health.

Key words: Periodontal, Smoking

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INTRODUCTION

Periodontitis is a group of inflammatory diseases affecting the supporting tissues of the tooth (periodontium). The periodontium consists of four tissues: gingiva, alveolar bone and periodontal ligaments.¹⁻³ The periodontal diseases are highly prevalent and can affect up to 90% of the world wide population. Gingivitis, the mildest form of periodontal disease, is caused by the bacterial biofilm (dental plaque) that accumulates on teeth adjacent to the gingiva (gums).⁴ Tobacco smoking, mostly in the form of cigarette smoking, is recognized as the most important environmental risk factor in periodontitis. Periodontal diseases are a dynamic phenomenon with cyclical patterns of progression and resolution at any given site. Smoking is thought to impair the immune response and compromises the periodontal tissue's ability to heal, following a period of disease activity. It has been well demonstrated that there is a close-response relationship for tobacco use and the risk of the development of oral cancer.^{5,6}

During periodontitis, cigarette smoking may differentially affect neutrophil function, generally preventing elimination of periodontal pathogens, but, in heavy smokers also stimulated reactive oxygen species release and oxidative stress mediated tissue damage.⁶ Hence; the present study was undertaken for assessing the prevalence of periodontitis among smokers and non-smokers.

MATERIALS & METHODS

The present study was conducted to assess prevalence of periodontitis among smokers and non-smokers. A total of 50 smokers and 50 non-smokers were enrolled in the present study. Complete demographic details of all the patients was obtained. Only those patients were categorized as smokers in which smoking history of equal to or more than 5 cigarettes was present for a time period of minimum of 5 years. A mouth mirror and William's probe was used for doing the clinical and periodontal examination. The subjects which reported for routine dental check-up were enrolled in

the non-smoker group. CPI index was used for comparing the periodontal status in between patients of the two study groups.⁷

Codes and criteria of CPI index: Code-0=No periodontal disease (healthy periodontium); Code-1=Bleeding observed during or after probing; Code-2=Calculus or other plaque retentive factors either seen or felt during probing; Code-3=Pathological pocket 4 to 5 mm in depth. Gingival margin situated on black band of the probe; and Code-4=Pathological pocket 6 mm or more in depth. Black band of the probe is not visible. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi- square test was used for assessment of level of significance.

RESULTS

In the present study, a total of 50 smokers and 50 non-smokers were enrolled. Mean age of the patients of the smokers group and non-smokers group was 38.4 and 41.9 years respectively. 18 and 15 patients of the smokers group belonged to the age group of 31 to 40 years and 41 to 50 years respectively. 15 and 17 patients of the smokers group belonged to the age

group of 31 to 40 years and 41 to 50 years respectively. Among the smokers group, there were 29 males and 21 females while in the non-smoker group there were 26 males and 24 females. 33 smokers of urban residence while remaining 17 smokers of rural residence. 29 non-smokers were of urban residence while remaining 21 non-smokers were of rural residence.

In the present study, among the smokers group, 30 patients were having code 2 (Calculus) of CPI score, while 8 and 9 patients were having code 3 (Shallow pockets) and code 4 (deep pockets) of CPI score respectively. Only 3 patients of the smokers group were having code 1 (Bleeding) of CPI score. Among the non-smokers group, 22 patients were having code 2 (Calculus) of CPI score, while 15 and 5 patients were having code 3 (Shallow pockets) and code 4 (deep pockets) of CPI score respectively. 8 patients of the non-smokers group were having code 1 (Bleeding) of CPI score. While comparing the CPI scores among smokers and non-smokers group, significant results were obtained.

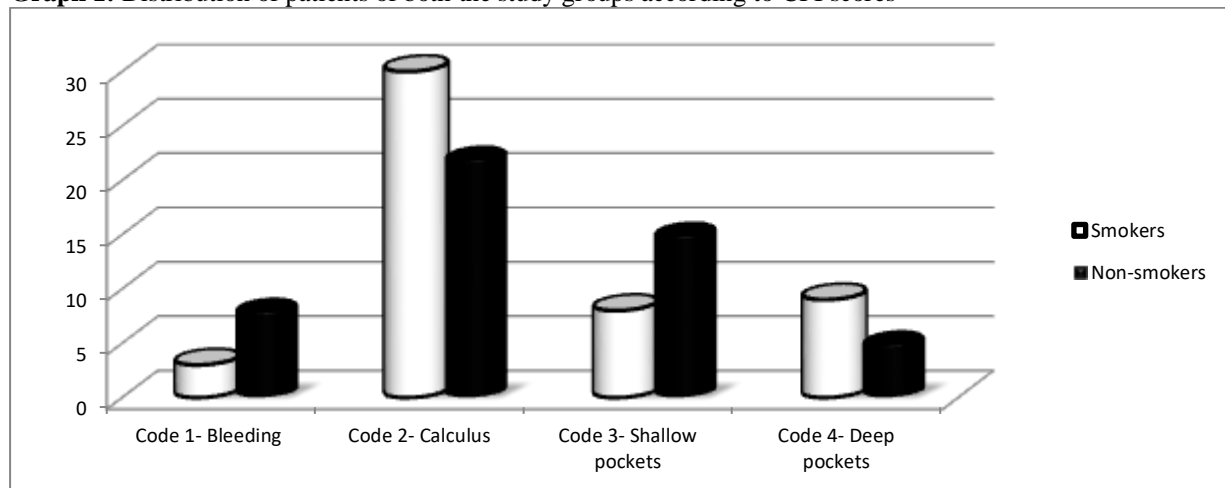
Table 1: Demographic data

Parameter		Smokers	Non-Smokers
Age group (years)	Less than 30	7	10
	31 to 40	18	15
	41 to 50	15	17
	More than 50	10	8
Gender	Males	29	26
	Females	21	24
Residence	Rural	33	29
	Urban	17	21

Table 2: Comparison of CPI scores among smokers and non-smokers group

CPI score	Smokers	Non-smokers
Code 1- Bleeding	3	8
Code 2- Calculus	30	22
Code 3- Shallow pockets	8	15
Code 4- Deep pockets	9	5
Chi- square	46.22	
p-value	0.020 (Significant)	

Graph 1: Distribution of patients of both the study groups according to CPI scores



DISCUSSION

Cigarette smoking is a risk factor for several diseases, and recent evidence strongly suggests an adverse effect on periodontal health. The nature of the relationship between smoking and periodontal disease is not clear. Smoking causes defects in neutrophil function, impairs inflammatory and immune responses to periodontal pathogens, and exerts both systemic and local effects. Smoking is associated with an increased rate of periodontal disease in terms of alveolar bone loss and attachment loss, as well as pocket formation. Nicotine, the major component of cigarette smoke, may weaken host defences to the bacterial invasion induced by plaque.⁸ Hence; the present study was undertaken for assessing the prevalence of periodontitis among smokers and non-smokers.

In the present study, a total of 50 smokers and 50 non-smokers were enrolled. Mean age of the patients of the smokers group and non-smokers group was 38.4 and 41.9 years respectively. 18 and 15 patients of the smokers group belonged to the age group of 31 to 40 years and 41 to 50 years respectively. 15 and 17 patients of the smokers group belonged to the age group of 31 to 40 years and 41 to 50 years respectively. Among the smokers group, there were 29 males and 21 females while in the non-smoker group there were 26 males and 24 females. 33 smokers of urban residence while remaining 17 smokers of rural residence. 29 non-smokers were of urban residence while remaining 21 non-smokers were of rural residence. Gautam DK et al evaluated the periodontal health status among cigarette smokers and non-cigarette smokers, and oral hygiene measures. The study included 400 male (200 cigarette smokers and 200 non-smokers) aged 18-65 years. The subjects were randomly selected from the patients attending dental out-patient department of civil hospital and Himachal Dental College. Community Periodontal Index (CPI) score was recorded for each patient and a questionnaire was completed by each patient. Periodontal condition as assessed by CPI score showed that there was statistically significant difference in the findings between cigarette smokers and non-smokers. They observed positive association was observed between periodontal disease and cigarette smoking.⁹

In the present study, among the smokers group, 30 patients were having code 2 (Calculus) of CPI score, while 8 and 9 patients were having code 3 (Shallow pockets) and code 4 (deep pockets) of CPI score respectively. Only 3 patients of the smokers group were having code 1 (Bleeding) of CPI score. Rosa *et al.*, reported that nicotine increased the secretion of interleukin-6 and tumor necrosis factor alpha in osteoblasts and production of tissue-type plasminogen activator, prostaglandin E₂, and matrix metalloproteinase, thereby tipping the balance between bone matrix formation and resorption toward the latter process.¹⁰

In the present study, among the non-smokers group, 22 patients were having code 2 (Calculus) of CPI score, while 15 and 5 patients were having code 3 (Shallow pockets) and code 4 (deep pockets) of CPI score respectively. 8 patients of the non-smokers group were having code 1 (Bleeding) of CPI score. While comparing the CPI scores among smokers and non-smokers group, significant results were obtained. Leite FRM et al reviewed articles on the association between tobacco smoking and periodontitis, as it has been hypothesized that smoking affects the course of periodontitis through impairment of immunological and vascular mechanisms. Searches of articles indexed in PubMed, Scopus, and Embase were performed up to and including May 2017. Search strategy included MeSH and free terms: periodontitis, periodontal diseases, smoking, tobacco use, tobacco, tobacco products, cigarette, pipe, and cigar. Only original prospective longitudinal studies that investigated the association between smoking and periodontitis incidence or progression were included. Results were shown as combined risk ratio. Meta-regression and subgroup analyses were used to explore potential sources of heterogeneity. Twenty-eight studies were included in the review; of these, only 14 presented data that could be included in the meta-analysis. Pooled adjusted risk ratios estimate that smoking increases the risk of periodontitis by 85% (risk ratio=1.85, 95% CI=1.5, 2.2). Meta-regression demonstrated that age explained 54.2% of the variability between studies, time of follow-up explained 13.5%, loss to follow-up 10.7%, criteria used to assess the periodontal status explained 2.1%, and severity of periodontitis explained 16.9%. Smoking has a detrimental effect on the incidence and progression of periodontitis.¹¹

CONCLUSION

From the above results, the authors conclude that smoking has a significant deleterious effect on the periodontal health. However; further studies are recommended.

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