

Analysis Of Periodontal Status Among Smokers And Non-Smokers - A Retrospective Study

Research Article

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Abstract

Periodontitis is defined as an inflammatory disease of the supporting tissue of the teeth caused by specific microorganisms or a specific group of microorganisms, resulting in progressive destruction of the periodontal ligament and alveolar bone with pocket formation, recession, or both. Smoking is a known risk factor and it adversely affects the periodontal health. The aim of the study was to analyse the periodontal status among smokers and non-smokers. We reviewed and analysed the data of 86000 patients between June 2019 and March 2020, among which a total of 2320 patients' details containing both smokers and non-smokers along with their periodontal status were collected. The documented information included patients age, gender, habits and periodontal score. Periodontitis among the smokers and non-smokers was predominant among 46-60 years (53.1%) of age group. The prevalence of Gingivitis was highly predominant among smokers (89.14%) and non-smokers (71.98%) when compared to periodontitis. On comparing the periodontal status, the highest prevalence of periodontitis with periodontal score was 2-5 among the non-smokers (46.3%) and smokers (47.62%). Within the limits of this study, periodontal score of 2-5 was highly prevalent among the smokers and non-smokers with periodontal disease being more prevalent among the non-smokers than the smokers, predominantly affecting the age group of 46-60 years. Hence, regular dental visits and enrollment of smokers in smoking cessation programs will prevent periodontitis among non-smokers and smokers respectively.

Keywords: Periodontitis; Smokers; Non-Smokers; Gingivitis, Periodontal Score.

Introduction

Periodontitis is defined as an inflammatory disease of the supporting tissue of the teeth caused by specific microorganisms, resulting in progressive destruction of the periodontal ligament and alveolar bone with pocket formation, recession, or both [1]. Dental plaque causes periodontal disease but risk factors can modify the host response to microbial aggression [2]. Diabetes, smoking, microbial tooth deposits and pathogenic bacteria are some of the known factors for the cause of periodontal disease.

For many diseases smoking is a known risk factor and increasing evidence suggests that smoking adversely affects the periodontal health [3]. The concept that smoking tobacco could also be detri-

mental to periodontal health isn't new. The newest plaque of the twentieth century is tobacco and its utilisation is still expanding around the world. 182 million smokers abide in India among the humongous population of 930 million worldwide tobacco users. By 2020 World Health Organization appraisal evaluated that tobacco related demise may surpass 1.5 million every year or 13% of all passing in India [4].

A major modifiable risk factor for health is the use of tobacco. Both the mental and physical dependence are included in Nicotine dependence. There are numerous unfriendly consequences for oral and dental being on smoking cigarettes [5]. Oral malignant growth, periodontal illness, delayed healing of extraction socket, a main source of tooth loss, discoloured teeth and tongue,

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awful breath, decreased feeling of taste and smell are among the impacts [4].

Nearly 60 years ago, Pindburg observed an association between acute Necrotizing ulcerative gingivitis and smoking [6]. Since then there are various studies and investigations on the role of tobacco smoking in the etiology of periodontal diseases. These studies suggest that smoking might be a single, modifiable environmental risk factor liable for excess prevalence of periodontitis within the population and features a direct influence on periodontal variables.

A number of studies were reviewed by the 1996 World Workshop in periodontitis and confirmed that “smoking entailed an overall increased risk for severe periodontal disease and estimated overall odds ratio 2.85” [7]. Earlier investigators had attributed the increased severity and prevalence of periodontitis was seen in smokers to the greater presence of plaque and calculus than compared to non-smokers. Besides, in chronic smokers the gingiva bleeds less and appears hardened as compared to that of non-smokers. The gingival inflammation is reduced in smokers due to the vasoconstrictive properties of cigarette smoke. However, on better understanding of the host response, evidence suggests that the effect of smoking on periodontal status is independent from the plaque index and oral hygiene of the individual. So this clearly suggests that smoking features a direct influence on periodontal tissues.

Individuals smoking have been associated with deeper pockets, pronounced radiographic evidence of furcation involvement, greater attachment loss and increased alveolar bone loss. The negative effect of smoking on periodontal issues, has an established biologic rationale. It has an immunosuppressive effect on the host, adversely affecting host- bacterial interactions and this alteration may be due to the change on the composition of subgingival plaque. The Conducive environment for some periodontal pathologies in the plaque may be provided by smoking and might be a risk factor in periodontal disease development.

Smoking exerts a strong, chronic and dose dependent suppressive effect on gingival bleeding on probing. Bleeding on probing was less evident in smokers when compared to the non-smokers which indicates its effect on gingival blood vessels [8]. The exact mechanisms by which smoking suppresses gingival bleeding is not understood yet [9]. Based on the observation that smokers may present with a lower level of gingival inflammation, it has been speculated that the gingival blood flow in smokers may be lesser than in non-smokers [10, 11]. This would also induce a decreased

local host response, so smoking is assumed to affect the periodontal tissues mainly by the vascular and immunological response of the body [12].

The mechanisms that may predispose smokers to periodontitis remain to be fully elucidated, while there is overwhelming clinical evidence to associate smoking with destructive periodontal disease. Previously our team has a rich experience in working on various research projects across multiple disciplines [13-27]. The aim of this study was to analyse the periodontal status among the smokers and non-smokers.

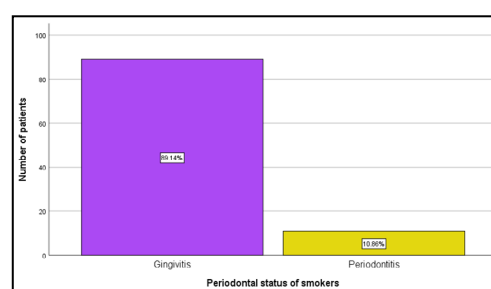
Material And Method

A retrospective study was conducted in a University setting. Ethical approval was obtained from the institutional ethical committee. We reviewed and analysed the data of 86000 patients between June 2019 and March 2020, among which a total of 2320 patients' details containing both 1160 smokers and 1160 non-smokers along with their periodontal status were collected. To evaluate and nullify the effect of all the other possible contributing factors, patients belonging to the same age group (15-60 yrs and above) with no other known systemic problems were selected for the study. The documented information included patients age, gender, habits and periodontal score. The collected data was reviewed and subjected to statistical analysis using IBM SPSS software version 20.0. Chi Square test was performed and the p value was determined to evaluate the significance of the variables.

Result And Discussion

In this study a total of 2320 patients were involved with an equal number of smokers and non smokers and with a mean age of 40 yrs. The prevalence of Gingivitis was highly predominant among smokers (89.14%) and non-smokers (71.98%) when compared to periodontitis among smokers (10.86%) and non-smokers (28.02%) (Figure 1 & Figure 2). Among the non-smokers, the highest prevalence of periodontal score was 2-5 (46.3%), followed by the prevalence of 1-2 (27.16%), 0-1 (14.81%) and the least being 5-8 (11.73%) (Figure 3). Among the smokers, the highest prevalence of periodontal score was 2-5 (47.62%), followed by the score of 1-2 (22.22%), 5-8 (16.67%) and the least being 0-1 (14.81%) (Figure 4). However, on comparing the association between the periodontal score and the smoking status of the study population, it was found to be statistically not significant with a p value >0.05 (Figure 5). According to the age group of the non-smokers, highest prevalence of periodontal score was 2-5 among the age group of 15-30 years (66.67%), 31-45 years (46.43%) and among the

Figure 1. Bar chart showing the distribution of smokers according to their periodontal status. X axis denotes the periodontal status of smokers and Y axis denotes the number of smokers in terms of percentage. The prevalence of Gingivitis (89.14%) was more among smokers than Periodontitis (10.86%).



age group of 46-60 years (45.86%), followed by the score of 1-2 among the age group of 15-30 yrs (33.33%), 31-45 yrs (26.43%), 46-60 yrs (27.62%). The least predominant periodontal score was 0-1 among the age group of 46-60 yrs (11.05%) and the score of 5-8 among the age group of 31-45 yrs (7.14%). However, it was statistically not significant with a p value >0.05 (Figure 6). And according to the age group of smokers, highest prevalence of periodontal score was 2-5 among the age group of 15-30 years (46.67%), 31-45 years (58.33%) and among the age group of 46-

60 years (50%), followed by the score of 1-2 among the age group of 15-30 yrs (33.33%), 31-45 yrs (19.44%), 46-60 yrs (18.97%). The most predominant periodontal score among the age group of 60 yrs and above was 5-8 (47.06%) whereas it was the least score among the age group of 31-45 yrs (8.33%). However, the association between the periodontal score and the age group of the smokers was found to be statistically significant with a p value <0.05 (Figure 7).

Figure 2. Bar chart showing the distribution of non-smokers according to their periodontal status. X axis denotes the periodontal status of non-smokers and Y axis denotes the number of non-smokers in terms of percentage. The prevalence of Gingivitis (71.98%) was more predominant among non-smokers when compared to periodontitis (28.02%).

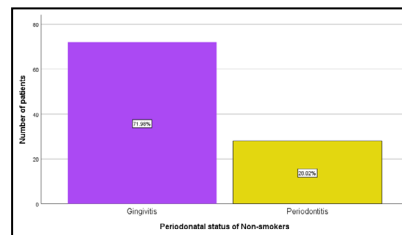


Figure 3. Bar chart showing the distribution of non-smokers according to their periodontal score. X axis denotes the periodontal score of non-smokers and Y axis denotes the number of non-smokers. The periodontal score of 2-5 was more predominant among the non-smokers when compared to other scores.

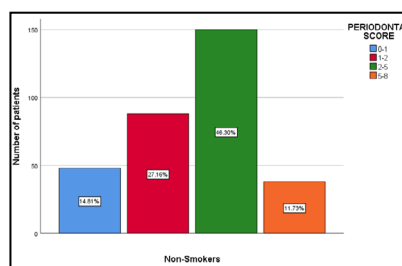


Figure 4. Bar chart showing the distribution of smokers according to their periodontal score. X axis denotes the periodontal score of smokers and Y axis denotes the number of smokers. The periodontal score of 2-5 was highly predominant among smokers when compared to other scores.

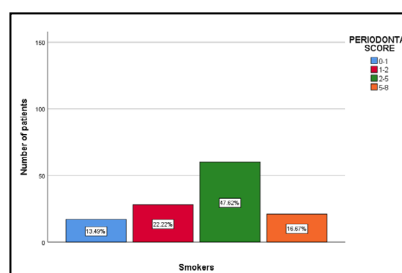


Figure 5. Bar chart depicts correlation of periodontal score based on the smoking status of the study population. X axis denotes the smoking status of the study population based on their periodontal score and Y axis denotes the number of patients. The prevalence of periodontal score of 2-5 was most predominant among smokers and non-smokers. However, the association between the periodontal score and the smoking status of the study population was found to be statistically not significant with a p value >0.05. Pearson's Chi Square= 2.690, df= 3, p value= 0.442 (>0.05).

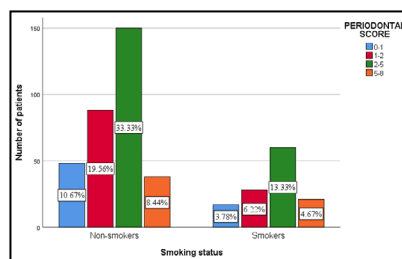


Figure 6. Bar chart depicts correlation of periodontal score based on the age group of the non-smokers. X axis denotes the age group of the non-smokers based on their periodontal score and Y axis denotes the number of patients. The prevalence of periodontal score of 2-5 was more predominant among the non-smokers under the age group of 15-30 years. However, the association between the periodontal score and the age group of the non-smokers was found to be statistically not significant with a p value >0.05. Pearson's Chi Square= 10.100 df= 6, p value= 0.121 (>0.05).

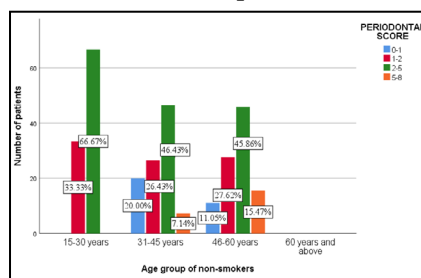
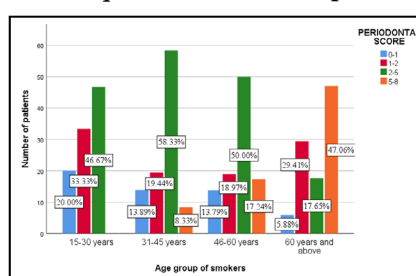


Figure 7. Bar chart depicts correlation of periodontal score based on the age group of the smokers. X axis denotes the age group of the smokers based on their periodontal score and Y axis denotes the number of patients. The prevalence of periodontal score of 2-5 was more predominant among the smokers under the age group of 31-45 years. However, the association between the periodontal score and the age group of the smokers was found to be statistically significant with a p value <0.05. Pearson's Chi Square= 20.419 df= 9, p value= 0.015 (<0.05).



Tobacco smoking is considered as the absolute most preventable reason for driving worldwide mortality and the main source of tooth loss in adults being the periodontal disease. Females were purposely excluded from the study for the main purpose that it would be difficult to recruit females who admit that they smoke. Since patients with any known systemic problems were not included, it was considered reasonable that comparisons reflected on the influence of smoking on periodontium. Whereas in contrast to the present study, Chilcan institutional study represented 70.7% of female samples [28].

Gingival bleeding is considered as an important sign associated with gingivitis and periodontitis. There is some evidence that tobacco may be associated with expression of lesser symptoms in periodontal inflammation. In this study, there were significantly less periodontal issues among the smokers than the non-smokers, which is in agreement with earlier studies [29-32].

In the NHANES III [33], the smoking attributable fraction of periodontitis for current smokers was almost 82% in the age group of 20-49 and near 84% among those aged 50 years or more likely reflects the decreased prevalence of smoking and the greater prevalence of severe periodontal disease seen in older individuals. In our current study periodontitis among the smokers and non-smokers was predominant among 46-60 years (53.1%) of age group. In the present study the mean age of the periodontitis patients was 40 yrs which was in accordance with the study by Sreedevi et al.[34], and Luzzi et al.[35], showing a mean age of 35.12 yrs and 40.6 yrs respectively on the highest prevalence of periodontitis.

In the current study, periodontal score was interpreted using Russell's periodontal score, in which the score of 0-1 showed healthy

gingiva or simple gingivitis, 1-2 showed beginning of destructive periodontal disease, 2-5 showed established destructive periodontal disease and the score of 5-8 showed terminal disease. According to the current study, established destructive periodontal disease with a score of 2-5 was the most predominant among smokers and non-smokers. In accordance, shah et al., [36] showed an evident negative influence of tobacco, particularly for probing depth and clinical attachment loss. There was a tendency of greater probing depth and clinical attachment loss means in all regions analyzed in smokers than in non-smokers. Similarly sreedevi et al., [34]. showed a comparison of probing depth among smokers and non-smokers in which it was higher among smokers than non-smokers but it was not statistically significant.

This study was done to know the effect of smoking on the periodontium by studying the clinical parameters. To evaluate and nullify the effect of all the other possible contributing factors, patients belonging to the same age group (15-60 yrs and above) with no other known systemic problems were selected for the study. Although some of the previous studies [37, 3, 38] included subjects who had quit smoking for a period of 2-5 years or more under the non-smokers category, it was decided in this study to exclude former smokers so as to eliminate any long term effect of smoking on periodontal tissues. The discoveries from the present examination of patients calls for attention to the necessities for building up a suitable instructive, preventive and treatment measures combined with successful reconnaissance for tobacco end. Our institution is passionate about high quality evidence based research and has excelled in various fields [39-49].

The limitation of the study conducted includes provision of not getting fully reliable data from the self reported amount of tobacco of the individuals, reduction or the availability of location

specific datas. Hence, the results of this study must be interpreted within the limitations of this study and further cohort studies must be done including larger sample size. Such study should also include other associated parameters like, systemic medical condition, plaque index, current smokers or not, duration, etc.

Conclusion

Within the limits of this study, periodontal score of 2-5 was highly prevalent among the smokers and non-smokers. Irrespective of their habits, periodontal disease was more prevalent among both the population in the age group between 46-60 years. Hence regular dental visits and enrollment of smokers in smoking cessation programs will prevent periodontitis among non-smokers and smokers respectively.

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