

Investigating the Effect of Cigarette Smoking on Gingival Diseases

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Abstract

Background: Gingival, or periodontal disease, is prevalent in adults with severity incrementing with cigarette smokers. Smoking is a widely known health issue, with its problems affecting adolescents and young adults. Cigarette smoking predisposes its heavy users to a faster progression of periodontal disease and alters therapeutic progress in periodontal diseases. **Objectives:** We focus in this paper on gingival disease in smokers, and only relevant studies will be discussed. **Methodology:** PubMed database was used for articles selection, according to which periodontal diseases and smoking articles were obtained and reviewed. **Conclusion:** In summary, smoking is associated with higher prevalence of gingival disease and worse complications, thus advising cessation is important. Moreover, dentists should teach proper oral care to their patients, and raise awareness on consequences of smoking.

Keywords: gingival disease, smoking, periodontal disease

INTRODUCTION

Gingival, or periodontal disease, is prevalent in adults with severity incrementing with cigarette smokers ^[1]. Smoking predisposes its heavy users to a faster progression of periodontal disease and alters therapeutic progress in periodontal diseases ^[2]. Dental health practitioners would do well to advocate proper oral hygiene, including smoking cessation, within their patient encounters and public teaching opportunities. The scope of this review lies within smoking, its relation to periodontal diseases, including clinical factors and progression, cessation effects and therapeutic outcome.

METHODOLOGY

PubMed database was used for articles selection using the following keywords: Periodontal Disease, and Smoking. The inclusion criteria were the studies discussing periodontal disease features and smoking, cessation of smoking, and therapeutic management of periodontal disease in smokers. Exclusion criteria were all other articles which did not have one of these topics as their primary endpoint.

DISCUSSION

In young adult smokers, pigmentation of gums becomes more apparent than in their non-smoker counterparts ^[3]. This darkening of color is due to activation of melanocytes which in turn overproduces melanin ^[4]. Researchers have argued

whether the number of cigarettes per day have an effect on gingival discoloration. Marakoglu et al. mentioned that melanin pigmentation had no relation with number of cigarettes per day ^[5]. On the other hand, Kato et al. concluded in their study that sufficient discoloration becomes apparent at five cigarettes per day ^[6]. An age-related variance in darkened gingival pigment was proposed in recent studies, as they mentioned that younger populations had less marked reduction in pigmentation upon smoking cessation ^[3]. Monitoring smoking cessation has been proposed by measurement of reduced gingival color in a recent study, as it

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could serve as a baseline and support for quitters [6]. Moreover, smokers who invest in cessation often benefit with a significant reversibility of existing periodontal disease [2].

Cigarettes and its Social Impact

Cigarettes have been widely studied in terms of its components and effects on all health including short, as well as, long term impacts. Cigarettes contains thousands of chemicals, such as nicotine, anthracyclic hydrocarbons, heavy metals and chemical carcinogens. The main addictive chemical is nicotine which is converted into a lot of metabolites inside the body. The major metabolite is cotinine through which we can track the smoking behavior and monitor it via its concentrations in the plasma [7, 8]. While smoking can be coerced by sociocultural pressure and media consumption, it is becoming less prevalent in well-educated communities. In some communities, smoking is socially and traditionally disapproved in females, this is attributed to values and husband views regarding smoking [9]. In other communities, young males are increasingly becoming smokers due to social and economic factors [1]. Smoking cigarettes can be combined with other recreational (inhaled or chewed) drugs, for an elevated enjoyment. In the Yemeni population, a certain leaf is chewed for its alleged physical and psychological effects. The amphetamine-like chewable plant, known to locals as khat (*catha edulis*), contains phenylalkylamine, norpseudoadrenaline, alpha aminopropiophenone, tannins, vitamins, minerals and flavonoids. Khat users, often males, reported having khat prior to using tobacco [10]. As a result, awareness of potential side effects and complications of all these substances should be initiated in the community.

Impact of Smoking on Gingival Diseases Development

A lot of studies, have shown the major impact of smoking on molecular, inflammatory, and immune aspect of gingiva. Smoking induces an inflammatory process on a molecular levels, decreasing immunoglobulin –Ig- G and A (especially IgG2), alters the humoral immunity response and rises the levels of inflammatory markers such as CRP, interleukin (IL-6), E and P selectins, Alpha 1-antitrypsin (A1AT) and haptoglobin (an acute phase reactant) compared to non-smokers [11].

Chemical components in the cigarettes increase the process of collagen degradation, leading to soft tissue –gingival damage. Additionally, cigarettes are associated with increased levels of subgingival microbiota which will escalate the pathologic bacteria, proportionate to the duration and quantity of the consumption. Furthermore, cigarettes are associated with increased calculus levels, less oxygen saturation in gingiva, decreased angiogenesis and lesser blood flow. All previous factors are believed to be associated with less wound healing, increased gingival thickness and higher chances of inflammation (periodontitis) [12].

Clinical effects and Complications

Cigarette smoking is associated with increased risk of gingival bleeding upon probing (BUP), which can be used as an indicator to reflect the general degree and extent gingival

inflammation in the clinical setting [13]. Additionally, cigarette smoking is associated with increased gingival thickness, which has a major dental therapeutic impact on the smokers, especially during root coverage procedures rendering some management options less effective, like in scaling and root planing [14]. Furthermore, recent studies mentioned that cigarettes smoking is associated with gingival diseases and risk of cancer (lung and pancreatic) [15]. Studies also have elicited a link between chronic gingivitis (due to smoking and poor oral hygiene) and oral carcinoma [16, 17]. Thus, maintenance of a healthy oral hygiene should be a priority of health programs considering the aforementioned life-threatening diseases [18].

CONCLUSION

Dentist needs to assure that a proper oral care is taught to their patients. This includes actively advocating smoking cessation, raising awareness on consequences of non-cessation, and highlighting cessation benefits. Studies and reviews have proven the major role of cigarettes in development of periodontal disease. Moreover, smoking has multiple complications, and it even affects the treatment efficacy. However, further studies are needed to establish the complete effects of smoking on the pathophysiology of periodontal diseases and its effects on the treatment with larger study populations and longer follow up periods. On the other hand, smoking cessation can reverse the negative effects of smoking in periodontal disease; accordingly, this step should be an integral part of the treatment.

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