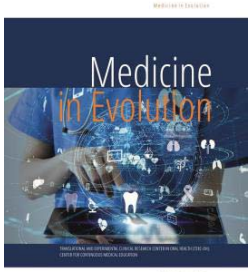
Smoking - a risk factor for oral health in young people and adolescents



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Abstract

Introduction: Smoking habits not only impact on malignant pathology and cardiovascular disease, but have a direct impact on the oral cavity, causing a wide range of effects, from tooth/dental fillings staining to periodontal disease, increased failure rates in dental implants, as well as oral cancer.

Aim and objectives: The aim of this study was to highlight the implications of smoking in the development of dental plaque.

Material and methods: We conducted an observational, retrospective study in which 157 young people aged 15-21 years were questioned about their smoking habits and then orally assessed.

Results: The oral assessments showed that more than half of the subjects in group 1 had yellowed teeth, compared to less than 20% of those in group 2. Scale as well as yellowed teeth was found in more than 50% of those in group 1, as opposed to only 18% of those in group 2. Halitosis was the next most pronounced symptom observed and more frequently present in young people in group 1 as opposed to group 2. Bleeding gums, gingivitis and periodontitis were present in lower percentages in the young people in the study, but the percentages were still higher in those in group 1 than in group 2.

Conclusion: Smoking is a predictor of tooth decay and has a negative impact on oral health.

Keywords: Dental plaque, smoking, social behavior

INTRODUCTION

Smoking is one of the major risk factors for human health, directly causing lung cancer and cardiovascular disease [1,2]. The impact of tobacco use on overall mortality is severe, according to the World Health Organization 6 million people die each year due to it [3]. However, the prevalence of tobacco use remains high globally, with a rate of 21% [4]. In Europe, more than 50% of adult males smoke an average of 15 cigarettes per day. Smoking has increasingly taken hold among young people.

Smoking habits not only impact on malignant pathology and cardiovascular disease, but have a direct impact on the oral cavity, causing a wide range of effects, from tooth staining/dental fillings to periodontal disease, increased failure rates in dental implants, and oral cancer [5]. According to the International Agency for Research on Cancer, the estimated number of incident cases of lip and oral cavity cancer worldwide in 2012 was 300,000, with an estimated 145,000 deaths [6]. Numerous studies have shown that tobacco plays an important role in the genesis of dental plaque and scale. Thus, a higher amount of scale was found on dental surfaces in smoking patients compared to the group of non-smoking patients. Most studies are limited to these clinical observations without elucidating the underlying mechanism(s) of plaque and scale.

As described above systemic and oral diseases share common risk factors, thus, in a recent review appropriate risk factor management procedures have been suggested to be adopted in both dental and other medical specialties such as [7]: smoking cessation, sugar reduction and weight control which have been proposed for patients at risk of developing periodontal disease, cavities, diabetes, heart disease and certain cancers.

Dental caries is known to be the most prevalent disease worldwide [7], yet most of these lesions are often concentrated in disadvantaged social groups: increased odds for dental caries (21-48%) have been recorded in patients with low educational/professional level, but also in those with low income [8] According to a population-based study that was conducted in Sweden between 1983 and 2003, the relatively unchanged tobacco consumption together with a significantly lower frequency of visits to dental services of smokers compared to non-smokers revealed a probable increasing trend in the prevalence of dental caries [8].

The influence of smoking on dental caries has been the subject of further research, with some authors suggesting an association between an increased risk of dental caries and smoking [9-11]. However, other authors in two of these studies (systematic reviews) [9,12] pointed to an overall poor quality of the included studies which prevented validation of the association between smoking and dental caries.

Aim and objectives

The aim of this study was to highlight the implications of smoking in the development of dental plaque.

MATERIAL AND METHODS

In order to achieve the proposed objectives, we conducted a retrospective observational study in which 157 young people aged 15-21 years were interviewed. The subjects who took part in this study were both smokers and non-smokers, and their choice was also based on the intention to obtain a group as homogeneous as possible in terms of age, living conditions and intellectual level. All the young people involved agreed and found it particularly beneficial to deal with this perceived difficult topic. The questionnaires were anonymous, relying on everyone's honesty in completing them. The questionnaire identified

people by age and gender only. Otherwise, it comprised 18 multiple-choice questions where young people only had to circle what suited them. The aim was to find out how old they were when they started smoking, the reasons for this habit, how much they smoked normally or in different environments.

These young people were also given an oral assessment and divided into two groups, one comprising smokers, ex-smokers and occasional smokers, and the second group consisting only of non-smokers.

The data obtained from the application of the questionnaire was entered into Excel, creating a database, which was then statistically processed, mainly looking at frequencies that were put into graphical representations.

RESULTS

Of the 157 people surveyed 43% were female and 57% male. While in the past smoking was mainly present in males, nowadays more and more females are taking up the habit, with more females than males being smokers.

The statistical analysis showed that 56.39% of the young people surveyed had never smoked, 10.16% smoked occasionally, 4.28% were former smokers and 21.96% were current smokers, which is similar to the global smoking rate presented in the introduction. It has also been observed that with increasing age more young people start smoking, this upward trend is supported by studies up to the age of 21- 23 years and then a decrease in this phenomenon and an increase in those who start to quit smoking. When asked why they started smoking, 40% of permanent smokers and 35% of occasional smokers answered influenced by friends, 31% of permanent smokers and 41% of occasional smokers took up smoking because they wanted to fit in. From these data we can draw, as in the graph above, the conclusion that it is the entourage that greatly influences the onset of the habit among young people and future adults. 24% of occasional smokers started out of curiosity and only 17% of permanent smokers, while the family environment seems to have a fairly strong influence, with 11% of permanent smokers claiming that their family made them smokers (Figure 1).

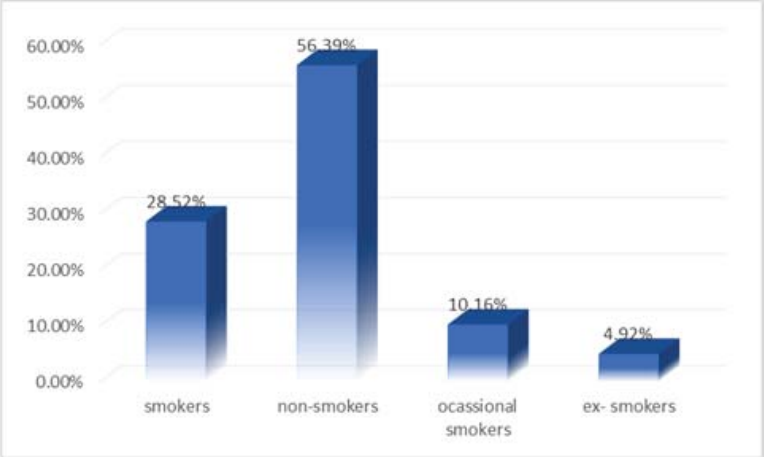

Figure 1. Frequency of smokers, non-smokers, occasional smokers and ex-smokers

Around the age of 19-20, the reason for smoking is often related to the erotic aspect of intimate life. From the desire to please, to the calming of conflictual situations caused by sentimental failures, apparently justifies the appeal to the "help" of cigarettes. At the same time, the use of alcohol and coffee is often associated with this, subjecting the body to numerous negative effects.

Among occasional smokers, it has been found that occasional smokers never smoke at home, unlike permanent smokers, but their number is not very high either, as they are probably young and fear their parents' reaction. Most young people smoke constantly at school, in the city on terraces and in clubs, so we could say that collective smoking predominates among young people and not solitary smoking. It was also found that 53% smoke less than 5 cigarettes a day and 29% smoke between 6 and 10 cigarettes a day, and only 18% could not give an answer to this question as they do not smoke daily.

Regarding the amount of tobacco consumed per day reported by permanent smokers it was found that 14% consume less than 5 cigarettes per day, 46% between 6 and 10 cigarettes per day 23% consume between 11 and 20 and 17% consume more than 21 cigarettes per day.

When asked why they started smoking 40% of permanent smokers and 35% of occasional smokers answered influenced by friends, 31% of permanent smokers and 41% of occasional smokers took up smoking because they wanted to integrate. From these data we can draw, as in the graph above, the conclusion that it is the entourage that greatly influences the onset of the habit among young people and future adults. 24% of occasional smokers started out of curiosity and only 17% of permanent smokers, while the family environment seems to have a fairly strong influence, with 11% of permanent smokers claiming that their family made them smokers. Around the age of 19-20 the reason for taking up smoking is often linked to the erotic aspect of intimate life. From the desire to please, to the calming of conflictual situations caused by sentimental failures, the appeal to the "help" of cigarettes is apparently justified. At the same time, the use of alcohol and coffee is often associated with this, subjecting the body to numerous negative effects. Occasional smokers admit that 41.93% smoke for relaxation, 22.58% do not know why, 22.58% are influenced by friends and 12.90 by boredom (Figure 26). Among permanent smokers 49.42% smoke for relaxation, 21.84% do not know why they smoke, 20.69% for boredom and 2.30% because of friends who smoke.

Both occasional smokers and permanent smokers admitted to suffering from certain problems related to smoking. 9.67% of occasional smokers admitted to being tired, 9.67% suffer from halitosis, 9.67% have scale deposits, and 70.96% suffer from nothing. Among permanent smokers 13.80% are tired, 24.80% suffer from halitosis, 35.63% have nothing, and 26.43% have scale deposits.

Following the oral evaluations, it was observed that more than half of the subjects in group 1 have yellow teeth, as opposed to less than 20% in group 2. Scale as in the case of yellowed teeth was found in more than 50% of those in group 1 as opposed to only 18% of those in group 2. Halitosis was the next most pronounced symptom observed and more frequently present in young people in group 1 as opposed to group 2. Bleeding gums, gingivitis and periodontitis were present in lower percentages in the young people in the study, but the percentages were still higher in group 1 than in group 2 (Figure 2).

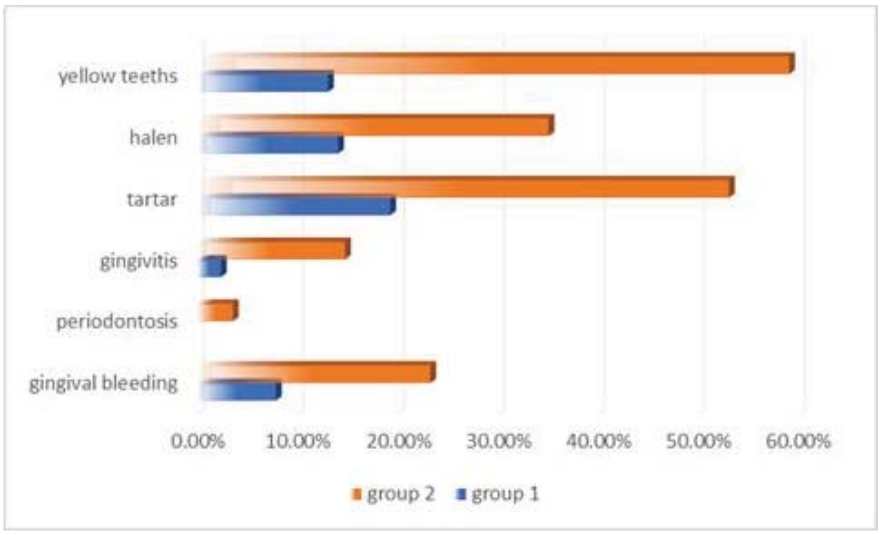

Figure 2. Results of oral evaluation

On objective examination of the oral cavity, 62% of the young people in group 1 had untreated carious lesions, compared with 44% in group 2. The number of fillings was higher in group 2, so we could also deduce that the oral hygiene of group 2 is better than group 1. At least one extracted tooth was found in 34% of the youngsters in group 1, as opposed to 22% of those in group 2 (Figure 3) Although the percentage is higher in those in group 1, we can state that the percentages in both groups is worrying if we refer to the age of the youngsters taken in the study.

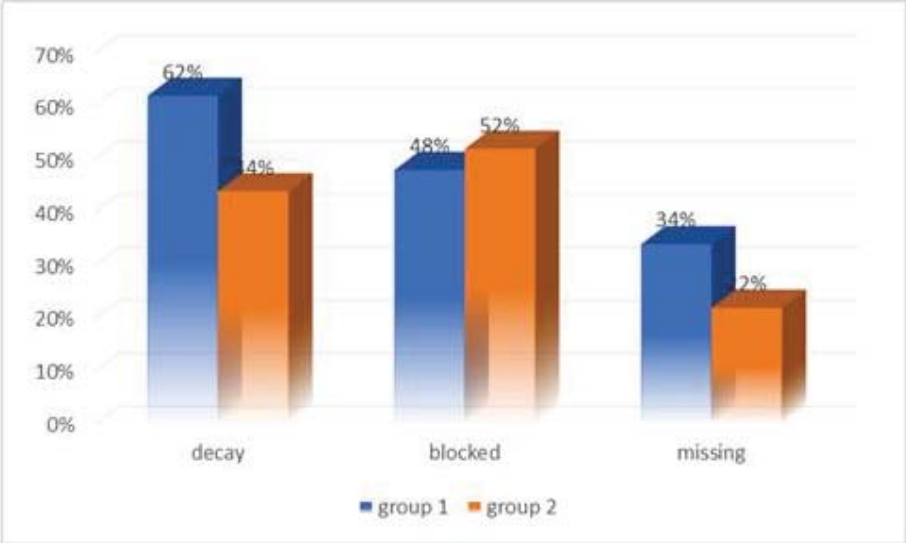

Figure 3. Tooths status after oral evaluation of the two groups

DISCUSSIONS

This study demonstrated an association between smoking habits and the prevalence of dental cavities, dental yellowing, and halitosis, with a 30% increase in the risk ratio for developing dental cavities in smokers compared to non-smokers. In a systematic review [11] the effect of tobacco smoking on dental cavities in adult smokers was evaluated and revealed, that there is a significant association between smoking exposure and an increased risk of

dental cavities. Bernabé *et al.* [12], in a study that included 955 adult patients, evaluated the impact of daily smoking on the 4-year net increase in the number of decayed, filled and missing teeth, also reported an increased incidence of dental cavities in smokers, with the authors concluding that smoking was independently related to cavity development, with a 70% increase in the incidence rate of decayed teeth for smokers compared to non-smokers.

In other studies, it has been shown that smoking may influence the incidence of dental cavities through its negative impact on patients' saliva, which includes a higher number of bacteria (Streptococcus mutans) [13] and a decreased buffering effect that may increase susceptibility to develop dental cavities [13, 14], accounting for 25% of the variability in cavity risk [23]. Furthermore, in other studies smoking has been associated with lower concentrations of salivary secretory immunoglobulin A (IgA) [15], which has a proven role in specific defense mechanisms in the oral cavity [16]. Together with other antimicrobial substances, IgA action limits microbial adhesion to epithelial and dental surfaces thus contributing to the stable maintenance of the oral cavity [17, 18]. Smoking is also associated with lower salivary cystatin activity, and cystatin C [19] which contributes to oral health by inhibiting certain proteolytic enzymes is suggested to have a contributory effect on the formation of cavity lesions when in interaction with acid demineralization [20].

With increasing age, there is a greater likelihood of patients with missing or filled teeth and therefore a conditional lower likelihood of incident dental cavity lesions.

Dental caries lesions consist of a dynamic process resulting from an imbalance between demineralization and remineralization of the tooth surface [21]. The onset time of dental cavities recorded in the present study was 13.5 months. As far as the authors are aware, this is the first time such a statistic has been calculated. Despite the methodology implemented in the patient data collection and monitoring system, these statistics should be interpreted with caution as they depend on recall appointments. Further refinement is needed to obtain more accurate measurements due to the possibility of earlier diagnosis.

Smoking is considered a risk factor, but educating the patient only on smoking cessation is not enough to prevent periodontal disease in a person, but as mentioned above this prophylaxis should be combined [22, 23]. If young people, who take up smoking, would be inspired to learn more about the unhealthy practice, if they would receive good and convincing advice at the right time, if they would realize from the first signs of intoxication the danger of the poisons they want to put into their lungs for the rest of their lives, perhaps, or certainly countless further sufferings could be avoided without any expense, on the contrary, with an obvious gain.

Following the reform and the wishes of the population in general, all public institutions have set up smoking places. Thus, even in the Faculty of Dental Medicine in Timisoara, students can smoke in such a place, equipped with an ashtray, set up in the faculty courtyard. First of all, this measure supports non-smokers by giving them the opportunity to choose between passive smoking or not [24].

Their self-image is hard to change, with many smokers unable to get used to the idea of being non-smokers. At the same time, people who have quit smoking say they now find it hard to imagine themselves as smokers. In fact, it is just a matter of habit [25].

Many young people see smoking as "a bad habit", saying: "it's a vice I enjoy, I indulge myself with a cigarette". As a smoker, there is a tendency not to see the addiction but to see smoking as pleasure. This is a misperception. Research shows that tobacco is as addictive as heroin and cocaine. In fact, smoking is a complex whole because it is both a habit and an addiction, these two elements combined make smoking a habit that is very difficult to quit.

Limitations of this study include the short-term follow-up which may have an impact on the prevalence rate of cavity lesions and the lack of control for dietary and oral hygiene habits (given that it was a questionnaire survey based study with questions predominantly

related to smoking) which may have provided a more accurate estimate of the effect of smoking on dental cavities. However, the study sample consisted of patients taken in the study who received information about good dietary and oral hygiene habits and smoking cessation as per the protocol on dental hygiene appointments. It has been previously stated in the literature that smoking may be associated with decreased oral hygiene habits with increased plaque accumulation [22, 24, 25] either related to decreased frequency of brushing and flossing or due to increased salivary lipid levels [26]. Further investigations should focus on longer follow-up controlled studies to refine estimates of both the association of smoking with dental cavities and the time of onset for dental cavity lesions.

CONCLUSIONS

Most adolescents and young people smoke constantly at school, in the city on terraces and in clubs, so we could say that collective smoking predominates among young people and not solitary smoking.

It is the entourage that greatly influences the beginnings of this vice in teenagers, young people and future adults.

Smokers who had been smoking for at least one year since their initiation were also asked why they continue to smoke. The vast majority said that they do it out of a sense of pleasure, of relaxation.

Long-term nicotine consumption brings with it dental health problems such as gingivitis and periodontal disease.

In conclusion, and given the limitations of this study, smoking habits are a predictor for dental cavities, having a negative role on oral health, in young people and adolescents.

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