v. 4, n. 36, 2024

International Journal of Health Science

CLINICAL ANALYSIS OF THE INFLUENCE OF "E-CIGS" ON PREDISPOSITION TO CARIES: CASE REPORT

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Abstract: Introduction: Electronic Cigarettes ("E-Cigs") have emerged as an innovative therapeutic alternative to combat smoking. Although they are considered less harmful to health compared to conventional cigarettes, their composition includes substances such as propylene glycol, glycerin, flavoring additives and, in some cases, nicotine, which can directly impact oral health. They can unbalance the pH, affecting the demineralization and remineralization of teeth and promoting bacterial adhesion. **Objective:** To report a clinical case of a patient using an electronic cigarette and suffering from carious disease, seeking to correlate the use of "E-Cigs" with the formation of cavities, based on the clinical aspects collected in the anamnesis and available scientific evidence. **Case report:** The patient, a 22-year-old young man, attended the UNIT-PE school clinic, and reported daily use of electronic cigarettes for five years, attracted by the flavors and the belief that they would not cause harm to his health. He preferred sugary flavors and experienced a constant feeling of dry mouth. The clinical examination revealed carious lesions in nine teeth, some stationary and one in an advanced stage, requiring endodontic treatment. Treatment included guidance on oral hygiene and awareness of the risks of using "E-Cigs", followed by necessary restorations and referral to the endodontic clinic. **Conclusion:** This case highlights the need for additional studies to inform users and dental professionals about the prevention of cavities associated with the use of "E-Cigs". Future research should address the extent to which e-cigarette aerosols increase the incidence of cavities. In short, this case report emphasizes the importance of adequate awareness and prevention of oral health risks related to the use of Electronic Cigarettes.
Keywords: E-cigs; Electronic cigarette; Dental caries.

INTRODUCTION

According to the World Health Organization (WHO), the smoking epidemic is one of the biggest threats to global public health, worrying health authorities around the world[1, 2]. In response, it has become imperative to implement strategies to combat the damage caused by the consumption of conventional cigarettes. In this context, electronic cigarettes were introduced into the market as a potential solution, arousing the interest of young people and adults, whether smokers or not, over the last two decades[3].

However, despite presenting less harm to health compared to traditional cigarettes (CT)[4], may contain nicotine in different concentrations, as well as other toxic products in their composition, such as propylene glycol, vegetable glycerin, lead, carcinogenic and cytotoxic agents, often not disclosed by manufacturers[5,6]. In this scenario, in high doses, nicotine in the body has an inhibitory effect, which can inhibit the activity of the parasympathetic system in the salivary glands[5].

Additionally, electronic cigarettes (EC or E-cigs) present a range of attractive chemical flavors, being cited by young people as the main incentive to start and maintain their use[7]. Numerous flavors have been developed and added to vaporization device liquids, ranging from tobacco flavors to sweet options, menthols and various combinations, aiming to increase the appeal of electronic cigarettes among consumers[2,8].

Therefore, this variety of flavors can have a negative impact on oral health, as the intake of sugars decreases the pH in the oral cavity and in the biofilm, creating an acidic environment in which the proliferation of aciduric microorganisms occurs. These microorganisms, which also have the ability to generate acids, contribute to maintaining a low pH in the environment. This context

increases the chances of carious lesions occurring [9].

In view of the above, this study aims to report a clinical case of a patient using an electronic cigarette and suffering from caries disease, seeking to correlate the use of "E-Cigs" with the formation of cavities, based on the clinical aspects obtained in the anamnesis. and available scientific evidence.

CASE REPORT

Patient J.G.R.N., male, 22 years old, attended the UNIT school clinic in the dentistry discipline, reporting noticing black stains on his teeth. The clinical examination showed carious lesions in eleven teeth, varying between active and inactive lesions and one in an advanced stage, requiring endodontic treatment.

During the anamnesis, through targeted questions, the patient said he had been using electronic cigarettes for 5 years, every day. He also reported that he started using it because he heard "it was not harmful to health", in addition to the wide range of flavor and fragrance options that attracted him to constant use. The patient also spoke of his preference for sugary flavors - "I use watermelon, strawberry and banana a lot" - reporting a continuous "feeling of dry mouth". Furthermore, the practice of constant oral hygiene was mentioned, but proved insufficient given the history of several carious lesions. Initially, guidance was provided on appropriate oral hygiene and awareness of the individual's smoking habits, aiming to ensure the success of the treatment. Then, the treatment plan began, which included the necessary restorations with composite resin. During consultations, extensive lesions were identified during the cavity preparation procedure, reaching the dentin.

After completing the restorative dentistry treatment, which involved nine consultations, the patient was referred to the endodontics clinic. The patient's follow-up lasted for a year, during which there were reports of attempts to improve habits, without success. After the students changed disciplines, the recurrence of carious lesions resulted in the patient being monitored by other students at the Dentistry clinic.

Ensuring effectiveness in the treatment of a patient with multiple carious lesions requires the adoption of a comprehensive approach, covering both etiological factors and the search for functional and aesthetic recovery. An adverse impact on oral health is evident when correlated with elements such as diet, specific habits, poor oral hygiene and lack of dental appointments.

DISCUSSION

Nicotine, present in electronic cigarettes, exerts a sympathetic vasoconstrictor effect, leading to a reduction in blood flow in the salivary glands. This results in a significant decrease in the production of saliva, a fundamental fluid in preventing tooth decay. The reduction in salivary secretion caused by nicotine can compromise the ability to neutralize acids and remove food residue from the oral cavity, creating an environment favorable to the development of cavities[7].

Furthermore, saccharides present in ECs contribute to a significant two-fold increase in biofilm formation, and a 27% reduction in enamel hardness, as indicated by a study published in the Journal of the American Dental Association[10,11].

The compounds found in humectants, which are used as nicotine solvents to impart flavors, demonstrate high viscosity. This characteristic facilitates the adherence of these products to the dental film, making remineralization difficult and, consequently, increasing the risk of potential cariogenicity[12]. When the oral cavity is subject to these changes, there is a

propensity for the proliferation of bacteria, especially *Streptococcus mutans*, When the oral cavity is subject to these changes, there is a propensity for the proliferation of bacteria, especially Streptococcus mutans, recognized as the main agent causing cavities, even at reduced pH levels resulting from the consumption of electronic cigarettes[13].

CONCLUSION

When exploring this case report, it is essential to consider the multifactorial complexity of tooth decay, a disease influenced by variables such as oral hygiene, diet and genetic predisposition. Although the evidence presented here suggests a possible association between the use of electronic cigarettes and the formation of cavities, it is crucial to highlight that cavities are the result of a complex interaction of several factors.

Deepening the analysis, the composition of electronic cigarettes reveals a scenario that is potentially harmful to oral health. Components such as propylene glycol, glycerin and nicotine present in vaporized liquids can contribute to drying out the oral mucosa, reducing salivary production and unbalancing oral pH. This more acidic environment encourages the proliferation of cryogenic bacteria, creating ideal conditions for the emergence of carious lesions.

Furthermore, the addition of flavorings and sugars to E-cig liquids can intensify the adhesion of bacteria to teeth, increasing the risk of cavities. Although conclusive studies on the direct relationship between e-cigarette use and tooth decay are still pending, understanding the potential impacts of these devices on oral health is essential.

Given this panorama, the need to conduct more comprehensive research stands out, to fill scientific gaps and provide more accurate information about the effects of electronic cigarettes on oral health. This evidence-based approach is crucial to inform more effective preventive interventions and public health policies. Therefore, the importance of not only raising awareness among oral health professionals, but also users, about the potential risks associated with the habit of E-cigs is emphasized, promoting a holistic and informed approach to mitigating damage to oral health.

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