Electronic- Cigarettes and their Growing Impact on Oral Health

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• Electronic devices that vaporize propylene glycol or polyethylene glycol based liquid, and flavoring agents into an aerosol mist delivering varied concentrations of nicotine.
• Introduced to North America in the early 2000’s
• Initially introduced as an aid to smoking cessation
  o Little evidence to support this claim
  o American Heart Association issued a policy statement that suggests that clinicians should not recommend e-cigs as primary cessation aids, and if a patient is using e-cigs, he or she should be advised to consider a quit date for using them and not plan to use them indefinitely
  ▪ Scott L. Tomar et. al.
• Increased use of e-cigarettes and vaporisers (vapes) especially among youth
• Less data and information is known about these devices because they are relatively novel
• Increased pressure by WHO to regulate and restrict use of these devices
• The FDA issued a rule categorizing all electronic cigarettes as “tobacco” products thus subjecting them to the same regulatory requirements as traditional cigarettes.
• No information available regarding the effects of e-cigs on periodontal/gingival oral health effects, especially in response to e-cig flavoring agents and nicotine.
• Little is known and taught in dental schools about the harmful effects of e-cigarettes
  o Dental students surveyed about their knowledge of these devices, and 38% stated they would feel “somewhat uncomfortable” educating patients about the health effects of cigarettes
  ▪ Martín Carreras-Presas. Et al.
Sundar, Isaac K. et al.:

- Periodontal ligament and gingival fibroblasts as well as epithelial cells are the most abundant structural cells in periodontal tissue, and are the direct targets of e-cigs upon vaping.
- There is more data surrounding conventional cigarette smoke and has shown to cause more deleterious effects on oral and periodontal health.
- Conventional smoking is associated with tooth loss, periodontal attachment loss, deeper periodontal pockets, more extensive alveolar bone loss and destruction of connective tissue - leading to an increased risk of periodontitis.
- In vitro study showed e-cigs with flavorings cause increased oxidative/carbonyl stress and inflammatory cytokine release in human periodontal ligament fibroblast.
- E-cigarettes affect the regenerative potential of human progenitor cells due to increased inflammatory.
- However, the role of e-cig vaping and its association with carbonyl stress, inflammation, and DNA damage-triggered senescence on oral/periodontal epithelium remains unknown.
- Data showed that e-cig aerosol cause increased oxidative/carbonyl stress and inflammatory responses in gingival epithelium, with greater response by flavored e-cigs.

Tatullo, Marco et al.

- Conversely, Tatullo, Marco et al. argue that there was a progressive improvement in the periodontal index and general health perception of patients who switched from conventional smoking to e-cigarette smoking.
- Many patients reported an interesting reduction in the need to smoke.
- According to the study the e-cigarette can be considered as a valuable alternative to tobacco cigarettes, but with a positive impact on periodontal and general health status.
• Limited long term success of the study because patients were only followed for 120 days, and small sample size (350 patients)

Conclusion:

• According to some studies, ECs are less harmful than conventional cigarettes
• Because they are relatively novel devices when compared to conventional smoking, little evidence is available about their long term effects on general and overall health.
• Epidemiologic research of health outcomes also has not caught up with expanding use of e-cigs
• A Food and Drug Administration (FDA) study concluded that ECs contain carcinogens at lower levels in comparison to conventional cigarettes, while a second FDA study stated that ECs are safer than conventional cigarettes because carcinogenic substances are reduce
• The high levels of nicotine dosing suggest these products may increase the risk of experiencing periodontal damage
• E-cigs carry their own range of health risks that have not yet been fully understood
• Although they are “more safe”, the increased use of these devices warrants more research to allow health professionals to educate patients on the risks
References:


