

Effects of Vaping Nicotine vs Traditional Cigarette Smoking on Periodontal Patients

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RESEARCH QUESTION:

How does vaping nicotine affect individuals with periodontitis compared to traditional cigarette smoking?

ABSTRACT

Vaping is becoming increasingly popular as an attempt to decrease traditional smoking. Chemicals found in cigarettes are known to be harmful to the periodontium. Nicotine, found in both inhalants, is a vasoconstrictor that causes a reduction in the inflammatory response. This leads to less bleeding and gingival crevicular fluid (GCF) flow in those that smoke cigarettes versus those that vape. Due to e-cigarettes new prevalence, additional research is required to understand its long-term effects on periodontitis.

INTRODUCTION

- E-cigarette (E-cigs) components can have detrimental effects on enamel and soft tissues (see Figure 1).²
- Traditional cigarettes have over 7,000 chemicals, at least 250 are known to be harmful.⁹
- Periodontitis: An inflammatory disease of the periodontium that can be made worse due to chemicals in smoking products.¹⁰ Periodontitis is characterized by:
 - alveolar bone loss¹⁰
 - clinical attachment loss (CAL)¹⁰
 - bleeding on probing¹⁰
 - other complexities such as furcation involvement and occlusal trauma¹⁰

Table 1. Traditional Smoking vs Juul

Type of nicotine inhalation	Amount of nicotine (mg) per cig / juul	Equivalence
Traditional cigarette	~36mg	20 cigarettes
JUUL	40mg	1 Juul

Table 1: Comparing the average cigarettes nicotine levels to those of the popular vape brand Juul.^{7,8} Data adapted from Healthline and NCBI.^{7,8}

REVIEW OF LITERATURE

- Non-smokers that pick-up vaping are two times as likely to develop periodontal disease and three times more likely to develop gingival diseases.¹
- E-cigarette users are more likely to have higher clinical attachment loss measurements compared to non-smokers.³
- Frequent vaping causes an increased risk for rampant decay, decreased connective tissue turnover, and a higher chance of periodontal disease and tooth loss.²
- Vaping interferes with the host immune response, which causes further tissue damage³ and lower GCF production.⁵
- Both cigarette and e-cigarette users experience a reduced level of gingival bleeding due to the presence of nicotine.¹ However, there was more bleeding and other signs of inflammation in individuals who vape.^{4,5,6}
- JUUL pods, one type of e-cig, have about 40mg of nicotine compared to a pack of traditional cigarettes with about 36mg of nicotine (see Table 1).^{7,8}
- Individuals that use e-cigarettes have shown to have less plaque accumulation than those who smoke cigarettes, but more than non-users.¹
- E-cigarettes are just as likely as cigarettes to contribute to periodontal disease⁴

DISCUSSION

- E-cigarettes were initially meant for smoking cessation, yet younger generations (originally non-users) have increased the use of vapes.²
- Smoking decreases the host immune response, which increases the risk for periodontal diseases.¹¹
- Limitations of the Research: E-cigarettes are a new technology, so there's limited research available on the chronic effects; small sample sizes, no information regarding patient homecare, and whether or not they have active disease.

Figure 1. Ingredients Found in Vape Juice

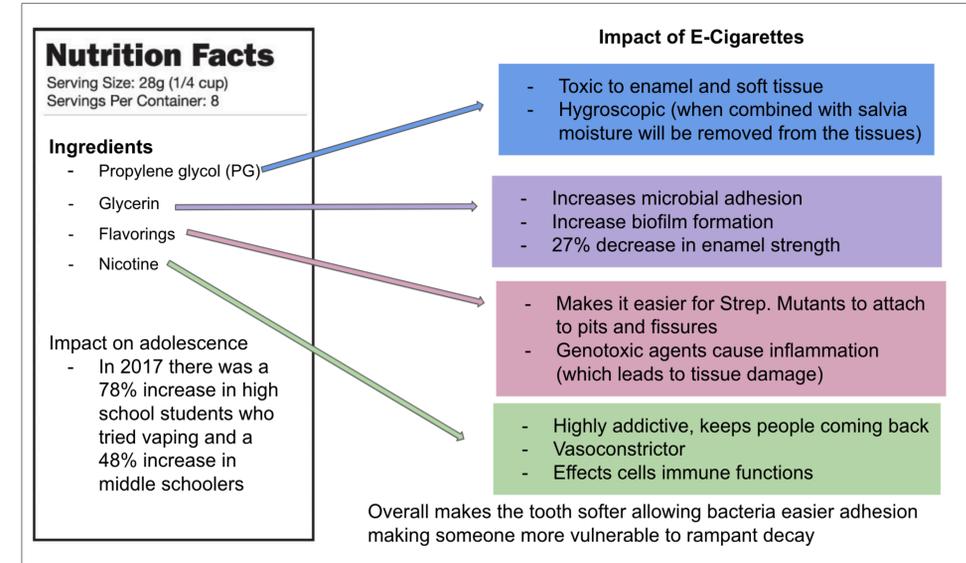


Figure 1: Ingredients of vape juice and how each component effects the periodontium.² Data adapted from Dental Economics.²

CONCLUSION

Individuals who switch from traditional cigarettes to vapes have shown improvements in their healing abilities due to an increase in blood flow.⁵ However, both cigarettes and e-cigarettes contain several chemical components which have harmful effects on the immune system's inflammatory response.^{2,11} Since today's vaping population mostly consists of younger generations, researchers in the future will have more of an understanding of its long-term effects on periodontitis.

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