

The Effects of E-Cigarettes on Caries Development

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TAKEAWAYS FOR DENTISTS

- Ask patients whether they are using e-cigarettes.
- Explain the dangers of e-cigarettes to patients.
- Stress the importance of teeth brushing after e-cigarette use.

INTRODUCTION

- The vapour from e-cigarettes consists of aerosol droplets containing propylene glycol, glycerine, flavours, and nicotine.
- This vapour may adhere to the teeth due to its viscosity.
- Bacteria then readily adheres to the teeth via saliva and starts to proliferate and potentially degrade the teeth.

OBJECTIVE

- To examine the effects of e-cigarettes on the growth of *streptococcus mutans*, the formation of biofilm, and the expression of certain virulent genes.

METHODS

- Normal teeth were harvested from healthy donors and screened to confirm that they had not been previously degraded by microbial interaction.
- Bacteria was cultured in the presence of e-vapour.
- The study established three scenarios to examine the effect of e-vapour and cigarette smoke on the growth of bacteria:
 1. E-vapour with nicotine
 2. E-vapour without nicotine
 3. Cigarette smoke
- Healthy teeth were exposed to e-vapour twice a day for 24 hours and then exposed to the bacteria.

RESULTS

- The presence of e-vapour promoted the growth of ***streptococcus mutans***.
- In all three scenarios (e-vapour with nicotine, e-vapour without nicotine, cigarette smoke) there was an increase in cell growth of the bacteria.
- Cell growth in nicotine-rich vapour was comparable to cigarette smoke.
- Bacteria exposed to e-vapour showed greater expression of virulent genes.

CONCLUSIONS

- Aerosols produced by e-cigarettes adhere to teeth.
- The presence of the aerosol on the tooth increased the adhesion and growth of bacteria as well as the formation of biofilms responsible for caries.