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Editorial Article

Risks of E-cigarettes on oral health and increased susceptibility to oral cancer

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Electronic cigarettes, commonly referred to as e-cigarettes or vapes, have surfaced as a prevalent alternative to traditional smoking. Marketed as a "safer" option, these devices administer nicotine through vaporized liquids, thereby attracting a substantial demographic, particularly young adults. Nonetheless, the prevailing perception of e-cigarettes as harmless is increasingly being scrutinized by emerging research, particularly within the domain of oral health.[1]

The oral cavity represents a primary site of exposure to e-cigarette aerosols, rendering it particularly vulnerable to their effects. Research has established a direct correlation between e-cigarette usage and an elevated risk of dental caries.[2,3] The vapor emitted from e-cigarettes modifies the oral microbiome, leading to an increased prevalence of pathogenic bacteria. These harmful microorganisms heighten the susceptibility of epithelial cells to infection, thereby rendering e-cigarette users more vulnerable to oral diseases.[4] Furthermore, investigations have demonstrated that the periodontal health of e-cigarette users is generally inferior when compared to non-smokers.[5,6] E-cigarette use is also associated with the development of oral mucosal lesions, including nicotinic stomatitis, contact stomatitis, and candidiasis, which may have significant long-term health ramifications.[6]

A particularly concerning aspect of e-cigarette use is the potential association with carcinogenesis. Research indicates that e-cigarette vapor can induce alterations in DNA methylation in oral epithelial cells, a process that is well-documented in cancer development.[7] This hypermethylation may impact genes responsible for cell growth and damage, such as HDAC7 and MTOR, raising concerns regarding the role of e-cigarettes in the development of oral cancer.[8]

Clinical cases have also been documented that link e-cigarette use to the onset of oral squamous cell carcinoma (OSCC), even among young and otherwise healthy individuals. One notable case involved a 19-year-old male who developed OSCC following chronic e-cigarette use, an age group typically not associated with this type of cancer.[9] This situation raises significant concerns about the carcinogenic potential of e-cigarettes, particularly for younger populations.

E-cigarette liquids comprise various chemicals, including nicotine, flavorings, propylene glycol, and vegetable glycerin. Upon vaporization, these chemicals can generate harmful by-products such as formaldehyde, a recognized carcinogen.[2,3] Studies have demonstrated that the concentration of formaldehyde in e-cigarette aerosols can exceed that found in conventional cigarettes, particularly when devices are utilized at elevated voltages.[10] This presents considerable health risks, not only to the oral cavity but also to other organs. In addition to formaldehyde, flavoring compounds utilized in e-liquids may decompose during vaporization, producing toxic aldehydes. These compounds further contribute to the chemical burden on oral tissues, potentially leading to cellular damage and long-term health implications.[10]

In conclusion, while electronic cigarettes are frequently promoted as a safer alternative to traditional tobacco smoking, their implications for oral health warrant serious consideration. The potential for increased risk of dental caries and periodontal disease, along with their possible involvement in carcinogenesis, underscores the significant dangers posed to

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the oral cavity by e-cigarettes. As the prevalence of vaping continues to surge, particularly among younger demographics, there exists an urgent necessity for further research and enhanced public awareness regarding the detrimental effects of e-cigarettes on oral health. The dental community must assume a pivotal role in educating patients about these risks, advocating for preventive measures, and promoting healthier alternatives for nicotine cessation.

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Authors' contribution

AYA conceived the idea, and wrote the initial draft of the article, AYA, ATA and RMA critically revised the final draft. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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