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E-cigarettes as a source of toxic and potentially carcinogenic metals

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Abstract

Background and aims: The popularity of electronic cigarette devices is growing worldwide. The health impact of e-cigarette use, however, remains unclear. E-cigarettes are marketed as a safer alternative to cigarettes. The aim of this research was the characterization and quantification of toxic metal concentrations in five, nationally popular brands of cig-a-like e-cigarettes.

Methods: We analyzed the cartomizer liquid in 10 cartomizer refills for each of five brands by Inductively Coupled Plasma Mass Spectrometry (ICP-MS).

Results: All of the tested metals (cadmium, chromium, lead, manganese and nickel) were found in the e-liquids analyzed. Across all analyzed brands, mean (SD) concentrations ranged from 4.89 (0.893) to 1970 (1540) µg/L for lead, 53.9 (6.95) to 2110 (5220) µg/L for chromium and 58.7 (22.4) to 22,600 (24,400) µg/L for nickel. Manganese concentrations ranged from 28.7 (9.79) to 6910.2 (12,200) µg/L. We found marked variability in nickel and chromium concentration within and between brands, which may come from heating elements.

Conclusion: Additional research is needed to evaluate whether e-cigarettes represent a relevant exposure pathway for toxic metals in users.

Keywords: Carcinogens; Electronic nicotine delivery devices; Non-cigarette tobacco products.

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Figures

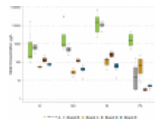


Figure 1 Distribution of metal concentration within...

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