

E-cigarettes may not be a healthier alternative to traditional cigarettes.



E cigarette. (Source: Jacek Halicki, WikimediaCommons)

Electronic cigarettes (e-cigarettes), also known as electronic nicotine delivery systems were introduced in the 2000s, as a healthy alternative to cigarettes. However, data showing that e-cigarettes are truly less of a health hazard than traditional cigarettes is limited. Some studies have shown that e-cigarettes vapour has equal or more levels of cytotoxic metals and silicate particle than traditional cigarette smoke. Immunological effects of e-cigarettes have been studied using non-vapourised e-cigarette liquid or condensate. Such studies do not mimic the physiological conditions that e-cigarette users are exposed. Additionally, data shows that e-cigarette vapour contains higher levels of toxins such as including free radicals, particulates, formaldehyde, nitrosamines, volatile

organic compounds and polycyclic aromatic hydrocarbons than that e-cigarette liquid.

A study conducted by Scott *et al.*, utilized a novel method to develop e-cigarette vapour condensate that is physiologically similar to the vapour e-cigarette users are exposed to. Scott *et al.*, demonstrated that e-cigarette vapour condensate (ECVC) has a dose-dependent cytotoxic and apoptotic effects on alveolar macrophages (AMs) that is both nicotine dependent and independent.

Researchers also showed that ECVC enhances production of reactive oxygen species (ROS), inflammatory cytokines, chemokines and metalloproteins in AMs, as well as reduced phagocytic ability of AMs. Overall this effect was less pronounced when AMs were exposed to nicotine free-ECVC. Finally, researchers showed that negative effects of ECVC is attenuated by addition of the anti-oxidant N-acetyl-cysteine (NAC). Suggesting that ROS and aldehydes play a role in the effects of ECVC.

Overall, despite many limitations to this study highlighted in the discussions section of the original article. This study shows a significant cytotoxic effect of ECVC, as well as attenuation of phagocytic activities on AMs. This warrants the need for further research that elucidates the effects of e-cigarettes exposure on lung function and health.

Journal Article: Scott *et al.*, 2018. [Pro-inflammatory effects of e-cigarette vapour condensate on human alveolar macrophages.](#)Thorax

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