Pulmonary damages following electronic cigarette refill liquid exposure in rats: a comparison to nicotine.

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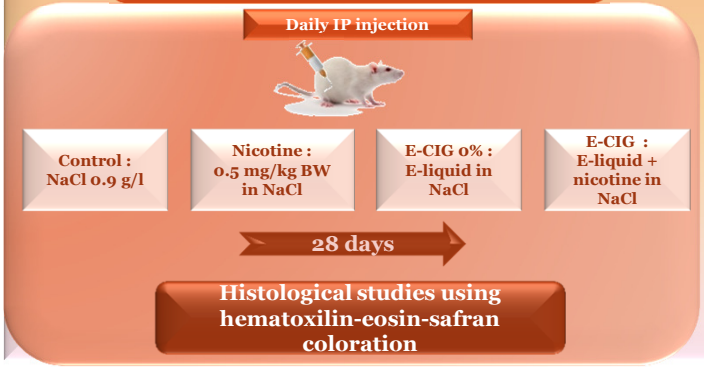
Introduction

Nicotine, contained in classic cigarettes is known to to have a wide variety of deleterious effects. Electronic cigarettes, as a substitute to nicotine, are becoming increasingly popular, although there is no evidence regarding their safety.

Aim

Our study was designed to compare nicotine alone to e-liquid with or without nicotine on lung histopathology in Wistar rats.

Materials & Methods

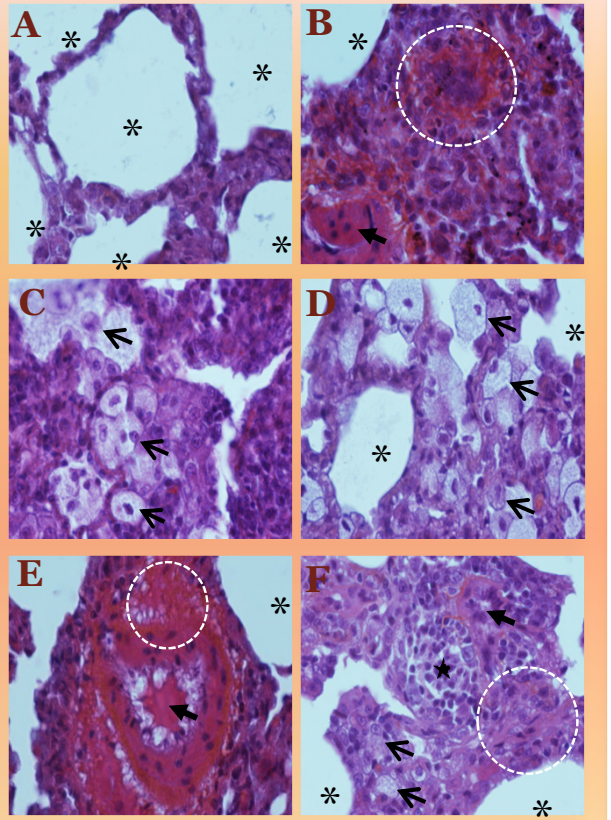


Results

Whereas nicotine treated rats exhibited periarteriolar fibrosis, lymphocytes infiltration and arteriolar obstruction, more critical alterations were observed after e-liquid without nicotine treatment: periarteriolar and peribronchiolar fibrosis, lymphocytes infiltration, arteriolar obstruction and giant cells. Treatment with e-liquid associated to nicotine led to the same important histopathological changes but with additional granulomas.

Conclusion

E-liquid, *per se* is able to induce lung toxicity. Furthermore, e-liquid promotes more damages than nicotine and the combination of two leads to even more disorders. E-liquid must be used with cautions.



Effect of e-liquid-induced lung injury. (A) Lung section of control rat demonstrating the normal alveolar structure (✲). (B) Section of the lung of nicotine-treated rat demonstrating marked changes: fibrosis (red staining), inflammation and arteriole obstruction (➘). (C and E) Sections of the lung of e-liquid-treated rat identifying inflammation and numerous giant cells (➘), fibrosis, and inflammation and (D and F) Sections of the lung of e-liquid with nicotine-treated rat highlighting giant cells, fibrosis, arteriole obstruction and granuloma (★). Hematoxylin, eosin, safran coloration, x400.