

ELECTRONIC CIGARETTE AEROSOL: IMPACT ON EMBRYONIC LUNG MORPHOLOGY

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Introduction: Smoking is a major public health problem responsible for 700000 deaths/year in Europe. Conventional cigarettes (c-cig) exacerbates several health issues, such as chronic obstructive pulmonary disease, fibrosis and cancer. Tobacco use during pregnancy has serious consequences to infants, since they become more susceptible to develop congenital disorders, lung diseases and sudden death. Electronic cigarettes (e-cig) have emerged as an alternative to c-cig. Previous studies revealed that c-cig exposure impairs lung development, aggravates wheezing and triggers inflammation. However, nothing is known about the impact of e-cig aerosol during pulmonary development.

Aim: Our aim was to evaluate the effect of e-cig aerosol and c-cig smoke in the early chick embryonic lung.

Methods: Ex vivo lung explants were cultured in smoke/aerosol medium or unexposed medium (control) for 48 hours. Explants were assessed morphometrically. Additionally, TNF- α levels were evaluated by ELISA.

Results: When compared to controls, c-cig treated explants revealed a significant decrease, in all morphometric parameters, between 15 to 30%, while e-cig treated explants displayed a significant reduction only in lung total area and mesenchymal perimeter (roughly 10%). Lastly, c-cig explants presented a decrease in all morphometric parameters, between 11 to 26%, when compared to e-cig treated explants. Additionally, e-cig and c-cig treatment induced similar TNF- α release, that was nearly 7 times higher than control.

Conclusion: This study describes, for the first time, the impact of e-cigs on early lung development. The results revealed that e-cig aerosol impairs lung growth and promotes lung inflammation. However, its impact on early lung growth seems to be less detrimental than conventional cigarette smoke. Nevertheless, more

studies are required to fully understand the effect of the aerosol in embryo development. The validation of these effects will eventually lead to the development of new tobacco control recommendations to pregnant women in order to protect the fetus and child's health.