

Title:

OXIDATIVE STRESS AND INFLAMMATION IN MONOCYTE-MACROPHAGE CELL LINE (THP1 CELLS) EXPOSED TO E-CIGARETTE AEROSOLS

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Abstract:

Electronic cigarettes have increased in popularity over the past decade as a safer alternative to tobacco. Vaping has a low risk of cancer but experimental and clinical data suggest that inhaling e-cigarette aerosols may alter the immune response. In this study, we examined the effects of e-cigarette smoke on cultured THP1 cells, a monocyte-macrophage cell line. Smoke extract (ECSE) was prepared using four different flavours of liquids. THP1 cells were exposed to ECSE for 24 hours and changes in intracellular IL-1b, IL-10, oxidative stress and proinflammatory transcription factor NF-kB were assessed in flow cytometry. Control cells were also treated with nicotine, tert-butyl hydroperoxide, BSO, lipopolysaccharide (LPS), and smoke from traditional cigarettes (CSE). As a result of ECSE exposure, intracellular IL-1b and IL-10 levels decreased. Moreover, ECSE, but not CSE generated significant shifts of central tendency lines on binary fluorescence scatterplots towards the DCF axe, which points to an important redox imbalance. Depletion of GSH produced similar, but more significant changes. These results demonstrate dysregulation of redox balance in cells exposed to ECSE which may be a potential toxicological risk to EC users.