Medical Xpress

E-cigarette flavours pose unknown harm risk

January 6 2017

Credit: CC0 Public Domain

Electronic cigarette users are more at risk of lung damage if they use flavourings such as menthol and butterscotch, according to a new study by scientists at the University of Salford.

Scientists say that 'vaping' flavours contain toxins, including harmful

substances that are not inhaled by users of standard tobacco cigarettes.

And they claim the huge variety of non-standard vaping liquids is exposing people, particularly younger smokers, to unknown risks.

Studies have shown that vaping liquids contain aldehydes, compounds which can cause damage to lungs, but the Salford study is the first to test flavoured liquids – inhaled as 'smoke' - on normal lung tissue.

All proved toxic

"We are talking about flavours which are normally ingested in food where tissue is much different from tissue in the lungs," explains Dr Patricia Ragazzon of the Biomedical Research Centre at the University of Salford.

"When inhaled, some of the flavours we tested proved to be substantially toxic, with prolonged exposure killing bronchial cells completely."

The experts, who publish their findings in the journal *Science Progress*, studied 20 liquid refills in nine flavours - cherry, strawberry, ice-mint, menthol, tobacco, blueberry, vanilla, bubble-gum and butterscotch – bought from shops, chemists and over the internet.

In laboratory tests on cell lines of human bronchial tissue, both embryonic and adult cells were exposed to vapour at a range of concentrations over 24, 48 and 72 hours. All proved toxic to the cells varying from less toxic (fruit flavours) to moderately to highly toxic (menthol, bubblegum, coffee, butterscotch and tobacco).

"We showed that cells can recover after 48 hours but not once they were exposed for 72 hours or more, which has serious implications for regular smokers," said Dr Ragazzon.

Unregulated products

Moreover whilst adult cells were less impacted, the majority of samples proved moderately to highly toxic to the embryonic cells.

Of additional concern, she notes, is the huge variation of flavours and their component ingredients: "The composition of refills is highly irregular - some are natural flavours, some are single compounds, some are synthetic flavours, - there are so many varied products on the market, it's difficult to gauge their harmfulness," added Dr Ragazzon.

"Our work supports the opinion that e-cigarettes and especially the ingredients of the e-liquid, which can change in structure after the process of heating, have not been thoroughly characterised or evaluated for safety."

More information: Toxicological and analytical assessment of e-cigarette refill components on airway epithelia, *Science Progress* (2016). DOI: 10.3184/003685016X14773090197706

Provided by University of Salford