How safe are e-cigarettes?

December 2 2019, by Ryan O'hare

Earlier this year vaping hit the headlines with reports of deaths in the United States linked to the use of e-cigarettes.

Vaping was the common factor, but a toxicologist from Imperial College London suggests the deaths could have been caused by oils or other

unlicensed substances being added to the e-cigarette, rather than the approved contents of e-liquids.

While the jury is still out on the long-term health impacts of vaping, the evidence suggests that in the short to mid-term at least, switching from tobacco cigarettes to e-cigarettes could reduce the harm to smokers by as much as 95 percent.

So is vaping to be embraced by smokers as a means to quit harmful tobacco, or shunned as another potentially health-harming habit?

Imperial's Ryan O'Hare spoke to Alan Boobis, Emeritus Professor of Toxicology at the College, to find out more.

There have recently been reports of a small number of deaths in the United States linked to vaping. What's going on?

"There's been a sudden, dramatic increase in the number of individuals showing serious and sometimes fatal harm from something they're inhaling, from using an e-cigarette. But it is extraordinary unlikely this is a consequence of the use of a normal, approved e-cigarette.

"In the UK we're not seeing this type of effect at all—there's one case in about five years of lung damage similar to that reported in the U.S., and we don't even know if that was caused by e-cigarettes."

Do we know what happened to these people, what sort of damage there was inside their lungs?

"There's some evidence at least some of them inhaled an oil and that this caused reactive changes in the lung and substantial numbers of them had

what's called 'lipoid pneumonia', others had a reactive lung toxicity. The consequence is that your respiration becomes impaired, your lung starts to fail, and that causes respiratory death."

Should e-cigarette users in the UK be concerned?

"I think the lesson to be learned from the U.S. experience would be know what it is you're putting into your product, and you should always use an e-cigarette and e-liquid from a reputable dealer.

"I think the problem in the U.S. is the use of a range of substances in the modifiable e- cigarette allowing them to inhale non-conventional products which are not nicotine containing. So for example, we know that a lot of the people with lung injury were inhaling some cannabis product—that of course is not advised and nor would it be legal in the UK."

Does the amount of vapour that's inhaled, or the flavourings used, have any effects on the harm?

"Well obviously the harm or the effects of a product depends upon the amount that's in it, so exposure is a key factor as well as toxicological potency. The amounts of the flavourings that are put in are to some extent self-limited because they would not be very pleasant if they're in excess—so you don't want too much of a flavouring.

"We use these same flavourings in foods, like mint or coffee, and some of the flavourings are also used in conventional cigarettes, like menthol to give it a mint flavour. And we have a significant amount of information on cigarette users with and without exposure to menthol and there are some publications suggesting effects, but I would say the balance of evidence is that menthol itself does not appear to be causing

any harm in these individuals on its own.

"We've tried for a long time to get people to stop smoking. There's a hardcore 15 percent or so of the population that continues to smoke and it's very difficult to get that number lower.

"E-cigarettes provide a way of delivering nicotine more effectively [than other nicotine substitutes] and, if used appropriately, I think they will help reduce the harm and the deaths caused by conventional cigarettes.

"We should be trying to get the balance right between not promoting something which is intrinsically safe—because cigarettes are not intrinsically safe—but at the same time recognizing they have a role to play in [public health](link) and harm reduction."

Does the evidence suggest that e-cigarettes are actually safe?

"A toxicologist will try not to use the word 'safe', but we probably could conclude that they're not very harmful. But their long-term effects, in a few people, remain unknown—that's the trade-off of reducing the harm caused by conventional cigarettes.

"I think it's fair to say that if you use a product from a reputable source to vape, then it's going to be a lot less harmful to you, than if you were to use conventional cigarettes.

"By 'a lot less harmful', I can't put a definite number on it, but I would say between probably no less than 90-95 percent less harmful."

Provided by Imperial College London

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