E-cigarettes – did you know?

Reena Wadia gives you all the information you need to know about e-cigarettes
History
The initial concept of an electronic cigarette (e-cigarette) was patented in 1965 by Herbert Gilbert. Only one company was making e-cigarettes in 2005, but today there are 466 brands in a market estimated to be worth £1.8 billion (Iacobucci, 2014).

Current usage
In 2012, there were an estimated 600,000 users of e-cigarettes in the UK. Their use had more than doubled from 2.7% of the population in 2010 to 6.7% in 2012 (Dockrell et al., 2013).

Estimates suggest that in 2014 there were well in excess of two million regular users of e-cigarettes (www.ash.org.uk).

Design
E-cigarettes are designed to mimic the look and feel of conventional cigarettes. They essentially consist of a lithium battery, an atomiser and a fluid filled cartridge.

The atomiser comprises of a storage part for liquid, a resistance and a wick.

Operation
The liquid evaporates when heated, by activating the battery part of the device that delivers electrical current to the resistance. E-cigarettes are used in a similar manner to tobacco cigarettes: the user takes puffs of aerosol and exhales visible aerosol.

Depending on the e-cigarette device, activation of vaporisation of the e-liquid may occur when ‘drawing’ on the device, or by use of a switch, which activates the atomiser to vaporise liquid that can then be drawn into the lungs. This process is usually termed ‘vaping’.

Chemical components
The studies considering the chemical components of e-cigarettes give a wide variation in results, perhaps due to the diverse range of e-cigarettes available.

In January 2014, 7,764 unique flavours of e-cigarette solutions were reported (Kmiotowicz, 2014) with categories ranging from tobacco, menthol, dessert and fruit.

The levels of toxicants in the aerosol have been found to be one to twofold lower than in cigarette smoke, but higher than with a nicotine inhaler (Goniewicz et al., 2014). The nicotine concentrations of the solutions can range from 0 to 36 mg/ml.

A puff of the e-cigarette with the highest nicotine content has been shown to contain 20% of the nicotine contained in a puff of a conventional cigarette (Goniewicz et al., 2013).

However, actual nicotine delivery from an e-cigarette is likely to be affected by a number of factors including the users’ smoking behaviour.

Furthermore, the actual nicotine concentrations may differ from that labelled on the product (Trehy et al., 2011).

In addition to nicotine, e-cigarette solutions contain numerous other ingredients, including humectants and other contaminants.

Smoking cessation tool
It has been suggested that e-cigarettes might assist in smoking cessation but current data shows mixed results (Etter, 2010).

Health and safety
At present, little is known of the health consequences of e-cigarette use.

This is reflective of the relatively short period that e-cigarettes have been available as well as the variability in e-cigarette devices.

The World Health Organisation has stated: ‘The safety of e-cigarettes has not been scientifically demonstrated’ and ‘the potential risks they pose for the health of users remain undetermined’ (www.who.int).

Regulation
E-cigarettes are currently regulated as general consumer products.

Once the EU Tobacco Products Directive comes into effect in member states in May 2016, e-cigarettes containing up to 20 mg/ml of nicotine will come under this directive.

Above that level, or if manufacturers and importers decide to opt into the medicines regulation, such products will require authorisation by the Medicines and Healthcare Products Regulatory Agency as over the counter medicines, in the same way as nicotine replacement therapy (www.ash.org.uk).

References


Iacobucci G (2014) WHO calls for ban on e-cigarette use indoors. BMJ 349: g5335


www.who.int/tobacco/communications/statements/electronic_cigarettes/en/ retrieved 31/3/15

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