

Dental researchers examine hidden health impact of electronic cigarettes

December 12 2013, by Elyse Bloom

The electronic cigarette (e-cig) was introduced in the U.S. in 2007 and offers nicotine-addicted individuals an alternative to smoking tobacco. E-cigs have been marketed as a safe alternative to tobacco smoking and most are similar enough in appearance to be mistaken for conventional cigarettes, so it is not surprising that their popularity is increasing worldwide, especially among young people. To date, however, there has been little research on the impact of e-cigs on public health.

Deepak Saxena, associate professor of basic science and craniofacial biology, and Xin Li, assistant professor of basic science and craniofacial biology, both at the College of Dentistry, are working to close the gap between marketing and science by using oral cavity and various systems biology approaches to reveal the health impact of e-cigs. The FDA and the American Lung Association have cautioned that e-cig users are unknowingly inhaling vaporized chemicals including diethylene glycol. "The issue is urgent," notes Saxena, "as a recent survey conducted among students at eight U.S. colleges found that 12 percent of e-cig users had never smoked a conventional cigarette."

E-cigs use a heating device to vaporize nicotine and other ingredients which simulate the visual, sensory, and behavioral aspects of smoking without the combustion of [tobacco](#). The main difference between e-cigs and conventional cigarettes is that e-cigs do not contain tobacco, although they do contain nicotine, which is harmful to the body and is associated with toxicity and addiction. E-cigs employ a mechanism to heat up liquid nicotine, which turns into a vapor that smokers inhale and

exhale, a process known as "vaping."

Each nicotine cartridge in an e-cig can provide 200 to 400 puffs, equivalent to two to three packs of cigarettes. "Due to the frequency of puffing, depth of inhalation, and length of vaping," says Li, "e-cig users may actually absorb higher concentrations of nicotine and other toxins than conventional tobacco smokers."

Since the initial interaction of [nicotine](#) from e-cigs with the human body occurs first in the [oral cavity](#), Saxena and Li will collect saliva and oral mucosa from College of Dentistry patients who are e-cig users to determine the relative abundance of oral bacteria and changes in DNA in these patients in order to compare them with the effects found among conventional cigarette smokers.

Provided by New York University

Citation: Dental researchers examine hidden health impact of electronic cigarettes (2013, December 12) retrieved 21 November 2023 from <https://medicalxpress.com/news/2013-12-dental-hidden-health-impact-electronic.html>

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