Lung symptoms common among users of e-cigarettes and related products

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One-third of people using e-cigarettes or related products reported symptoms associated with lung or respiratory tract impact or injury, according to an analysis of a 2016 national survey, to be presented at the

American Heart Association's Scientific Sessions 2020.

"Although many people continue to view vaping or using e-cigarettes and related products as safe—or at least safer than smoking combustible cigarettes—the use of these products can be risky," said Thanh-Huyen T. Vu, M.D., Ph.D., senior author of the study and research associate professor of epidemiology in the department of preventive medicine at the Northwestern University Feinberg School of Medicine in Chicago. "Recent outbreaks of e-cigarette- or vaping-associated lung injury—known as EVALI—have raised significant public health concerns about the impact of vaping on lung health. However, information is limited about clinical symptoms related to the use of different types of e-cigarettes and related products, especially information on symptoms among otherwise healthy individuals."

To help fill that knowledge gap, researchers analyzed the survey responses of more than 1,400 current e-cigarette and related products users, ages 18 to 64, evenly divided among male and female, who took part in a national, online survey in 2016. Participants reported the specific electronic cigarette vaping devices and related products they used. Additionally, from a list of 13 specific symptoms they selected the ones they believed might be caused by their vaping and reported any other symptoms they thought they experienced as a result of vaping.

Researchers specifically focused on five symptoms that were among the list of those identified by the U.S. Centers for Disease Control and Prevention (CDC) as being associated with e-cigarette- or vaping-associated lung injury: cough, shortness of breath, nausea, stomach pain and chest pain. Researchers also analyzed whether specific product choices influenced the occurrence of these symptoms, after adjusting for demographic factors, cigarette smoking and the frequency and duration of e-cigarette and related products use.

The researchers found:

- More than half (55%) of respondents had one or more of the symptoms.
- One third (33%) reported having one or more of the five e-cigarette- or vaping-associated lung injury (EVALI)-like symptoms; cough and nausea were the most common.
- The proportion of respondents reporting EVALI-like symptoms was higher among those who were younger than age 45, Hispanic, current cigarette smokers or current users of other tobacco products such as pipes or smokeless tobacco.
- Compared with those using non-refillable devices, people were 70% more likely to report EVALI-like symptoms if they used devices refilled by pouring in more e-liquid, and 95% more likely to report these symptoms if they used devices with refillable cartridges.
- People who reported mixing their own e-liquid were 40% more likely to report EVALI-like symptoms.
- People who used flavored e-cigarettes were 71% more likely to report EVALI-like symptoms.
- After vaping-related lung injuries and deaths spiked in 2019, investigators at the U.S. Centers for Disease Control and Prevention identified one possible cause of the lung damage to be vitamin E acetate, an additive used in some cannabis-containing e-liquids purchased from the Internet or from sources other than legal marijuana dispensaries.

"Our results indicate that e-cigarette- or vaping-associated lung injury symptoms were not an oddity, a brief occurrence or solely related to the use of THC (the psychoactive component of cannabis) or vitamin E acetate, both of which were pegged as possible contributors to EVALI outbreaks in the past year or so," Vu said. "Health care professionals need to assist patients in better understanding the full risks and potential

harms of using e-cigarettes and related products."

Although the survey was conducted in 2016, the researchers believe that the findings are relevant and important today. Vu said use of e-cigarettes and related products has increased since 2016, despite increased public health concern, and new device options proliferate—with an increasing numbers of product choices to tempt potential users and to attract current users to new products.

"While these findings are from an adult survey, they are also important for youth. We know from previous reports that youth and teens who vape are likely to experiment with altering their liquids and devices and to choose flavored products," said study co-author Rose Marie Robertson, M.D., FAHA, deputy chief science and medical officer of the American Heart Association and co-director of the Association's Tobacco Center of Regulatory Science which supported the study. "Public health messages should be designed for parents and guardians or other adults working closely with youth, such as teachers and coaches, to increase the understanding of the relation of e-cigarette use with serious health risks."

According to the 2020 National Youth Tobacco Survey, 3.6 million U.S. youths currently use e-cigarettes, and among current users, more than eight in 10 reported using flavored e-cigarettes. The American Heart Association supports an aggressive, three-pronged initiative involving research, policy advocacy and youth activation to combat the teen vaping epidemic in the U.S.

"We know that almost 90% of cigarette smokers are addicted before the age of 20 and nicotine has very profound effects on the developing brain," said Aruni Bhatnagar, Ph.D., FAHA, co-director with Dr. Robertson of the American Heart Association's Tobacco Center of Regulatory Science and a professor of medicine at the University of

Louisville School of Medicine, in Louisville, Ky. "This study provides a clear message that despite the belief that e-cigarettes are less harmful or maybe some people even believe completely innocuous, that there is harm, which is even perceived by the people who use them."

Bhatnagar said a more rigorous evaluation is needed to better understand the subclinical changes in the lungs and the circulatory system and whether those changes are immediate or accrue over a lifetime or over an extended period of time to cause an actual cardiovascular or pulmonary event.

Recently, concerns have been raised about whether vaping-related lung damage might make people more likely to become infected with the COVID-19 virus and to become seriously ill if they do.

"Although further research is needed on the association of vaping with EVALI and the association of lung injury with COVID-19, the existing evidence indicates that there should be concern, and it is worth avoiding this risk by not vaping," Vu said.

More information: This abstract will be presented in Session LF.APS.01 - Substance Use and CVD: Nicotine, Marijuana and Other Drugs.

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