Can Vaping Increase Cardiovascular Disease Risk?

Findings show that among popular e-cigarette flavors, cinnamon and menthol do the most harm to cells lining the inside of blood vessels.

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As the popularity of e-cigarettes continues to rise in the United States, more studies are examining both the positive and negative effects of these devices that are advertised to be healthier than traditional cigarettes. Now, a paper published in the Journal of the American College of Cardiology reveals that the flavorings used in these substitutes for smoking tobacco might place people at increased risk for cardiovascular disease, reports Stanford Medicine.

Researchers examined the effect of six different popular e-liquid flavors—fruit, tobacco, sweet tobacco with caramel and vanilla, sweet butterscotch, cinnamon and menthol—on human endothelial cells. Endothelial cells line the interior of blood vessels and play a critical role in heart and cardiovascular health.

Several of the flavorings exhibited a moderately toxic effect on endothelial cells. But the cinnamon- and menthol-flavored e-liquids drastically diminished the number of living cells in a culture, or cell viability, despite the absence of nicotine. In addition, scientists noted that these two e-cig flavorings significantly interfered with the ability of cells to form structures linked to the growth of new blood vessels.

Cells exposed to the e-liquids also experienced an increase in the levels of molecules known to damage DNA and those associated with programming the death of cells. Those that came into contact with cinnamon, caramel and vanilla flavorings showed an increased uptake of low-density lipoproteins and lipids—processes associated with inflammation and endothelial dysfunction—as well as a decreased ability to migrate to heal wounds and scratches.

Investigators also compared nicotine levels in the blood serum of people who vaped and those who smoked regular cigarettes. Results showed that after 10 minutes of smoking at a constant rate the amount of nicotine in the blood of individuals in both groups was similar.

“This study clearly shows that e-cigarettes are not a safe alternative to traditional cigarettes,” said Joseph Wu, MD, PhD, the director of the Stanford Cardiovascular Institute and a professor of cardiovascular medicine and of radiology and the study’s senior author. “It’s important for e-

cigarette users to realize that these chemicals are circulating within their bodies and affecting their vascular health."

For more on e-cigarettes, read "Can Smoking E-Cigarettes Damage Your DNA?" and "E-Cigarettes Expose Users to Toxic Metals."
