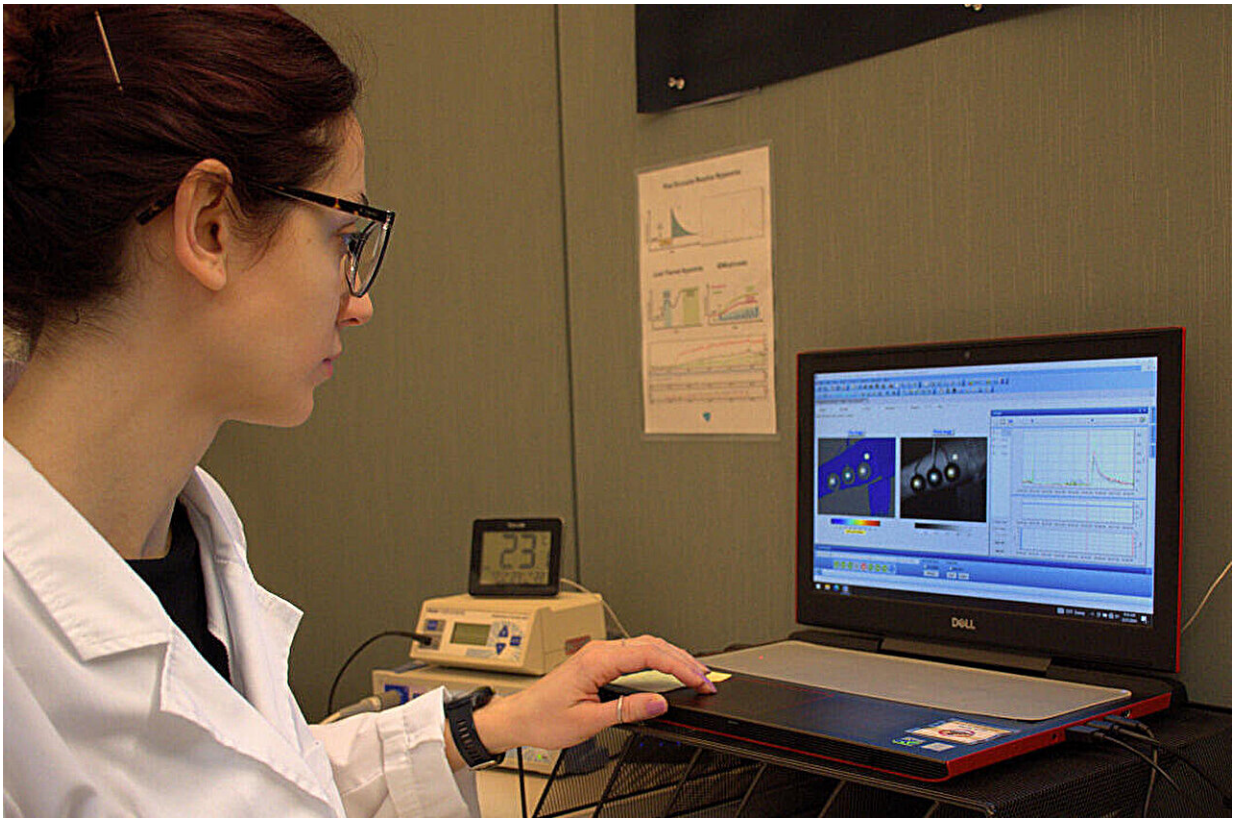
Regular e-cigarette use could lead to premature vascular dysfunction, study finds

March 6 2024, by Sian Wilkerson



Tijana Simovic, a Ph.D. student at VCU, co-authored a recent study that shows young and regular users of e-cigarettes exhibit a reduced blood vessel function. Credit: Paula Rodriguez Miguelez, Ph.D.

Regular electronic cigarette use has been linked with signs of premature vascular dysfunction, raising concerns about potential long-term health

effects, according to a study by Virginia Commonwealth University researchers.

A recent study published through VCU's Vascular and Integrative Physiology Laboratory in the journal *Angiogenesis* found that among healthy adults ages 21 to 31, frequent users of e-cigarettes presented premature vascular dysfunction when compared with nonusers. The lab is part of the Department of Kinesiology and Health Sciences in the College of Humanities and Sciences.

"We have observed that young and regular users of e-cigarettes exhibit a reduced blood vessel function, which is a sign associated with worse cardiovascular health," said Tijana Simovic, a Ph.D. student at VCU who was recently awarded a predoctoral fellowship from the American Heart Association to complete part of this investigation. She co-authored the study with Chloe Matheson, who earned her bachelor's degree in health, physical education and exercise science from VCU and is now pursuing a Ph.D. at the University of Maryland.

In the study, researchers completed an evaluation of small and larger blood vessels to assess their functionality in 21 regular users of e-cigarettes and 21 nonusers who demographically matched the first group. The authors identified that those individuals who have used e-cigarettes for longer than three years exhibit more extensive damage affecting different types of blood vessels. Changes in blood vessel function and structure are considered early markers of cardiovascular disease risk.

Smoking is a significant cause of cardiovascular disease risk, with the Centers for Disease Control and Prevention linking it to 1 in 4 deaths related to heart and vascular damage.

"The scientific community recognized the harmful cardiovascular effects of traditional cigarettes decades after their widespread adoption,"

Simovic said. "With the rapidly growing popularity of e-cigarettes among young individuals, we should not wait 50 years to identify their potential impact on heart and blood vessel health."

Research published by the National Center for Health Statistics in July showed that 11% of adults ages 18 to 24 use e-cigarettes. An overall increase in e-cigarette use has also been noted by the CDC's Morbidity and Mortality Weekly Report, with e-cigarette unit sales increasing by more than 46% between January 2020 and December 2022.

E-cigarettes, which entered the U.S. marketplace in 2007 and have been the most commonly used tobacco product among American youth since 2014, are often perceived as safe, at least in comparison with traditional tobacco products.

Paula Rodriguez-Miguelez, Ph.D., a professor in VCU's Department of Kinesiology and Health Sciences, emphasized that the new study identified early signs of dysfunction in young individuals who appear to be healthy. This raises concerns about potential long-term effects that could be evident after a few decades of e-cigarette usage.

Determining whether the signs of vascular dysfunction seen in the study can be reversed will require further research, Rodriguez-Miguelez added.

More information: Chloe Matheson et al, Evidence of premature vascular dysfunction in young adults who regularly use e-cigarettes and the impact of usage length, *Angiogenesis* (2024). DOI: 10.1007/s10456-023-09903-7

Provided by Virginia Commonwealth University