

# Teen obesity, diabetes or high blood pressure may lead to prematurely aged arteries

May 6 2020

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Teenagers who have obesity, type 2 diabetes or high blood pressure may be more likely to have signs of premature blood vessel aging compared to teens without those health conditions, according to new research

published today in the *Journal of the American Heart Association*, an open access journal of the American Heart Association.

Over five years, researchers evaluated 141 teens with [normal weight](#); 156 who had [obesity](#); and 151 who had type 2 diabetes, with an average age of 17.6 when the study began. At the end of five years, the teens with either obesity, type 2 diabetes or high systolic blood pressure—major risk factors for heart attacks and strokes later in life—were significantly more likely to have thicker and stiffer carotid arteries, the main blood vessel that leads to the brain.

"Our study demonstrates that the slow changes in [blood vessels](#) that lead to the development of atherosclerosis begins early in life," said lead study author Justin R. Ryder, Ph.D., assistant professor of pediatrics and associate director of research for the Center for Pediatric Obesity Medicine at the University of Minnesota Medical School in Minneapolis. Atherosclerosis is the slow narrowing of the arteries usually associated with natural aging, and it increases the risk of heart attacks, strokes and other [cardiovascular events](#).

"Having obesity, type 2 diabetes or high systolic blood pressure were each independently associated with and equally predictive of having thicker and stiffer arteries among this group of young people. What surprised our team the most was that participants with higher systolic blood pressure compared to their peers in the study had a very similar risk as those with obesity or type 2 diabetes for thicker and stiffer blood vessels over time," said Ryder.

Carotid artery health was assessed by non-invasive ultrasound and pulse wave velocity. The ultrasound measured the thickness of the inner two layers of the blood vessel, known as carotid intima-media thickness. The pulse wave velocity gauges how fast blood flows through the vessels to determine arterial stiffness. Both measures were taken at the beginning

of the study and five years later. The analysis concluded teens with obesity, type 2 diabetes or high systolic blood pressure had greater change in the thickness and stiffness of their arteries, compared to participants in the group with normal weight. This would suggest a greater risk of early heart attacks or strokes among the teens with obesity, type 2 diabetes or high systolic blood pressure.

"Although type 2 [diabetes](#) is treated aggressively in the U.S., obesity needs to be treated just as vigorously because it has the same increased risk for premature aging of the blood vessels, which is an early sign of cardiovascular dysfunction and a precursor to cardiovascular diseases in adulthood," according to Ryder.

Strengths of the study included its large study size of almost 150 teens in each group, for a total of 448 participants, and objective measurements of carotid artery health five years apart. A limitation of the research is that the teens will not be followed into adulthood to track if the premature aging of their [blood](#) vessels results in heart attacks, strokes and other cardiovascular conditions.

Provided by American Heart Association

Citation: Teen obesity, diabetes or high blood pressure may lead to prematurely aged arteries (2020, May 6) retrieved 26 April 2024 from <https://medicalxpress.com/news/2020-05-teen-obesity-diabetes-high-blood.html>

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