

# Elevated glucose associated with undetected heart damage

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A new study led by researchers at the Johns Hopkins Bloomberg School of Public Health suggests that hyperglycemia (high blood sugar) injures the heart, even in patients without a history of heart disease or diabetes. Researchers found that elevated levels of glycated hemoglobin (HbA1c), a marker for chronic hyperglycemia and diabetes, were associated with minute levels of the protein troponin T (cTnT), a blood marker for heart damage. The high-sensitivity test they used detected levels of cTnT tenfold lower than those found in patients diagnosed with a heart attack. The findings, which are published in the latest issue of the *Journal of the American College of Cardiology*, suggest that hyperglycemia may be related to cardiac damage independent of atherosclerosis.

"Hyperglycemia and diabetes are known to be associated with an increased risk for heart attack and coronary disease and our study sheds some light on what may be happening," said Elizabeth Selvin, PhD, MPH, senior author of the study and associate professor in the Bloomberg School's Department of Epidemiology. "Our results suggest that chronically elevated glucose levels may contribute to [heart damage](#)."

For the study, the researchers followed 9,662 participants from the Atherosclerosis Risk in Communities (ARIC) study. None of the participants had [coronary heart disease](#) or history of heart failure. Higher levels of HbA1c were associated in a graded fashion with elevated levels of high-sensitivity cTnT. This relationship was present at HbA1c levels even below the threshold used to diagnose diabetes. Using conventional tests, troponin T can be detected in 0.7 percent of the population and is

associated with heart attacks and death. With the high-sensitivity cTnT test, low levels of troponin were found in 66 percent of the study population.

"Our study hints at other potential pathways by which diabetes and elevated glucose are associated with heart disease. Mainly, glucose might not only be related to increased atherosclerosis, but potentially elevated [glucose levels](#) may directly damage cardiac muscle," said Jonathan Rubin, MD, general internal medicine fellow at the Johns Hopkins School of Medicine. He was lead author of the study while studying at the Johns Hopkins Bloomberg School of Public Health.

**More information:** Additional authors of "Chronic Hyperglycemia and Subclinical Myocardial Injury" include Kunihiro Matsushita, MD, PhD, and Josef Coresh, MD, PhD, of the Bloomberg School of Public Health; and Christine M. Ballantyne, MD, and Ron Hoogeveen, PhD, of the Baylor College of Medicine.

Provided by Johns Hopkins University Bloomberg School of Public Health

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