One in three adults with Type 2 diabetes may have undetected cardiovascular disease

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1 in 3 adults with Type 2 diabetes may have undetected cardiovascular disease. Elevated levels of two protein biomarkers that indicate heart damage were associated with undetected or symptomless cardiovascular

disease in adults with Type 2 diabetes compared to those without Type 2 diabetes, according to new research published today in the *Journal of the American Heart Association*.

Tests for high-sensitivity cardiac troponin T and N-terminal pro-B-type natriuretic peptide biomarkers are used to measure injury and stress to the heart. These tests are routinely used to diagnose heart attack and heart failure. However, mildly elevated concentrations of these proteins in the bloodstream may be an early warning sign of changes in the structure and function of the heart, which may increase the risk for future heart failure, coronary heart disease or death.

"What we are seeing is that many people with Type 2 diabetes who have not had a heart attack or a history of cardiovascular disease are at high risk for cardiovascular complications," said study co-author Elizabeth Selvin, Ph.D., M.P.H., a professor of epidemiology at Johns Hopkins Bloomberg School of Public Health in Baltimore. "When we look at the whole population of people diagnosed with Type 2 diabetes, about 27 million adults in the U.S., according to the CDC, some are at low risk and some are at high risk for cardiovascular disease, so the open question is "Who is most at risk?" These cardiac biomarkers give us a window into cardiovascular risk in people who otherwise might not be recognized as highest risk."

Researchers analyzed health information and blood samples for more than 10,300 adults collected as part of the U.S. National Health and Nutrition Examination Survey from 1999 to 2004. The aim was to determine if the previously unrecognized cardiovascular disease with no symptoms could be determined by elevated levels of the cardiac protein biomarkers among people with and without Type 2 diabetes. Study participants had reported no history of cardiovascular disease when they enrolled in the study.

Using stored blood samples from all study participants, researchers measured levels of two cardiac biomarkers. Mortality statistics were collected from the National Death Index. After adjusting for age, race, income and cardiovascular risk factors, they assessed the associations among elevated troponin and N-terminal pro-B-type natriuretic peptide with risk of death from cardiovascular death or all causes.

The study found:

- One-third (33.4%) of adults with Type 2 diabetes had signs of undetected cardiovascular disease, as indicated by elevated levels of the two protein markers, compared to only 16.1% of those without diabetes.
- Among the adults with Type 2 diabetes, elevated levels of troponin and Nterminal pro-B-type natriuretic peptide were associated with an increased risk of all-cause death (77% and 78% increased risk, respectively) and cardiovascular death (54% and more than double the increased risk, respectively), compared to normal levels of these proteins in the blood. This elevated risk remained after adjusting for other cardiovascular risk factors.
- After adjusting for age, elevated levels of troponin were more common in people with Type 2 diabetes overall and across categories of age, sex, race/ethnicity and weight. In contrast, N-terminal pro-B-type natriuretic peptide levels were not elevated in people with Type 2 diabetes compared to those without Type 2 diabetes when adjusted for age.
- The prevalence of elevated troponin was significantly higher in people who had Type 2 diabetes for a longer period of time and who did not have well-controlled blood sugar levels.

"Cholesterol is often the factor that we target to reduce the risk of cardiovascular disease in people with Type 2 diabetes. However, Type 2 diabetes may have a direct effect on the heart not related to cholesterol

levels. If Type 2 diabetes is directly causing damage to the small vessels in the heart unrelated to cholesterol plaque buildup, then cholesterol-lowering medications are not going to prevent cardiac damage," Selvin said. "Our research suggests that additional non-statin-related therapies are needed to lower the cardiovascular disease risk in people with Type 2 diabetes."

Much research has focused on studying how traditional risk factors such as high blood pressure and cholesterol impact cardiovascular health, however, new evidence suggests that screening for certain cardiac biomarkers should be added to routine assessment of traditional cardiovascular risk factors.

"The biomarkers analyzed in this study are very powerful in systematically categorizing patients based on their health status. Measuring biomarkers more routinely may help us focus on cardiovascular prevention therapies for people with Type 2 diabetes who are at higher risk," she added.

This is one of the first studies to use participants that truly reflect the general population. However, since the data did not allow identification of heart disease, heart failure, stroke events or cardiovascular complications, more research needs to be done to determine if routine measurement of these biomarkers may reduce cardiovascular complications in this population.

According to the American Heart Association's 2023 Statistical Update, 102,188 U.S. deaths in 2020 were attributed to diabetes (including Type 1 and Type 2 diabetes) and an estimated 1.64 million deaths globally.

Co-authors are Michael Fang, Ph.D., M.H.S.; Dan Wang, M.S.; Olive Tang, M.D., Ph.D., M.H.S.; John William McEvoy, M.B., B.Ch., B.A.O., M.H.S., M.Ed., Ph.D.; Justin B. Echouffo-Tcheugui, M.D.,

Ph.D.; and Robert H. Christenson, Ph.D.

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