Predicting risk for deadly cardiac events

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A marker commonly used to determine if a patient is having a heart attack can also be used to identify stable patients at high risk for deadly cardiac events, according to a new study led by investigators at Brigham and Women's Hospital (BWH). Using a test that is more sensitive than what is currently used in U.S. hospitals and clinics, the research team found that nearly 40 percent of patients with type 2 diabetes and stable heart disease had abnormal blood levels of the protein troponin. Patients with elevated levels of troponin were twice as likely as their counterparts to die from heart attack, stroke or other cardiovascular causes within five years. The team also found that a key therapeutic intervention known as coronary revascularization, frequently used in patients with heart attack and an abnormal troponin, did not lower stable patients' elevated troponin levels or their risk of deadly cardiac events.

The findings are published in the August 13, 2015 issue of *The New England Journal of Medicine*.

"The patients in our study were not having symptoms of a heart attack, and yet a remarkably high proportion of them had an abnormal troponin, suggesting they were experiencing ongoing injury to their hearts," said lead author Brendan Everett, MD, MPH, of BWH's Divisions of Cardiovascular Medicine and Preventive Medicine. "This test was able to identify patients at increased risk of heart attack, heart failure, or death, even after we accounted for other patient characteristics and risk factors. In the future, if we can understand what causes the abnormal troponin, we may be able to identify new strategies to treat this group of high-risk patients. One strategy we tested in this study - opening the

coronary arteries of stable patients with abnormal troponin - did not reduce the risk of future heart attack or death."

Everett and colleagues measured troponin concentrations from more than 2,200 patients who had both type 2 diabetes and stable heart disease using a highly sensitive test (a high-sensitivity electrochemiluminescence assay) that is currently in use in Europe, and is being studied for use in the U.S. After five years, 27 percent of the patients with abnormal troponin levels went on to die of a heart attack, stroke, or cardiovascular causes, compared to 13 percent of patients with normal troponin levels.

Half of the patients involved in the trial received prompt coronary revascularization - a procedure to open the coronary arteries using either stents or coronary bypass graft surgery. However, the procedure did not appear to reduce the risk of cardiovascular-related death in these stable patients with elevated troponin, nor did it reduce troponin levels.

"We know that circulating troponin concentrations reflect ongoing injury to the heart's muscle tissue, but the causes of this ongoing injury are not completely clear. In the right clinical situation, we would typically interpret the abnormal troponin levels as indicative of an ongoing heart attack, which we often treat by finding the blocked artery and opening it; however, our results indicate that such procedures do not reduce the risk of future heart attack or death in these patients," said Everett. "We need alternative strategies to improve outcomes in this group of high-risk patients."

Researchers note that further studies to understand what causes abnormal troponin and why patients with abnormal troponin are at greater risk for cardiovascular-related death may lead to alternative treatment options and interventions for patients.

Provided by Brigham and Women's Hospital