Biomarker may be able to help predict risk of heart failure, cardiovascular death

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Certain measures of the blood biomarker cardiac troponin T (cTnT), a cardiac-specific protein, using a highly sensitive test, are associated with the development of heart failure or cardiovascular death in older adults, according to a study that will appear in the December 8 issue of *JAMA*. The study is being released early online because it will be presented at the American Heart Association's annual meeting.

"Older adults comprise the majority of new-onset heart failure (HF) diagnoses, but traditional risk-factor prediction models have limited accuracy in this population to identify those at highest risk for hospitalization or death," according to background information in the article. Blood-based biomarkers, including troponins, have been advocated for use as supplemental to clinical risk factors to identify older adults at high risk for adverse cardiovascular outcomes, but studies examining the prognostic value of these markers have reported inconsistent results.

Prior studies have used standard troponin assays that are only able to detect circulating troponin levels in a small proportion of individuals. Recently, a highly sensitive cardiac troponin T assay has been developed, designed to improve accuracy. "This assay has detected circulating cTnT in almost all patients with chronic HF or ischemic heart disease and provides independent prognostic information with respect to HF admission and cardiovascular death in these patients," the authors write.

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Medicine, Baltimore, and colleagues examined the ability to detect a measurable cTnT concentration in older adults using the highly sensitive cTnT assay and whether higher concentrations would be associated with a greater risk of new-onset HF and cardiovascular death. The researchers analyzed data from the Cardiovascular Health study and included 4,221 community-dwelling adults ages 65 years or older without prior HF who had cTnT measured using the highly sensitive assay at the beginning of the study (1989-1990) and repeated after 2 to 3 years (n = 2,918). Concentrations of cTnT were equal to or more than the limit of detection in 2,794 participants (66.2 percent).

During a median (midpoint) follow-up of 11.8 years from the initial cTnT measurement, 1,279 participants experienced new-onset HF and 1,103 cardiovascular deaths occurred, with a greater risk of both end points associated with higher cTnT concentrations. Also, the risks of HF and cardiovascular death were higher among those participants with detectable compared with undetectable levels at follow-up, irrespective of the baseline level.

Analysis indicated that for participants with measurable cTnT levels at the beginning of the study, an increase of more than 50 percent was associated with an increased risk of HF and a greater risk of cardiovascular death, adjusting for baseline cTnT and risk factors. In contrast, a decrease of more than 50 percent was associated with a risk-factor adjusted lower risk of HF and lower risk of cardiovascular death compared with those participants with 50 percent or less change.

For the prediction of both outcomes, the addition of baseline cTnT measurements to clinical risk factor models only modestly but statistically significantly improved classification.

"Detectable cTnT levels as measured by a highly sensitive assay were present in the majority of community-dwelling older adults in this

cohort, and higher concentrations—within a normal range established for a younger general population—reflect a greater burden of cardiovascular risk factors and imaging evidence of cardiac disease. Independent of these comorbidities, cTnT concentrations were associated with risk of new-onset HF and cardiovascular death. Furthermore, longitudinal changes in cTnT concentrations were common in this cohort and correspond with a dynamic change in risk levels over time," the authors conclude.

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