Growth differentiation factor-15 is associated with myocardial infarction and death at 30 and 90 days in ED patients with suspected acute coronary syndrome

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Background: Growth differentiation factor (GDF)-15 is a novel biomarker of cardiac stress that may be an accurate predictor of mortality and acute myocardial infarction (AMI) in patients with acute chest pain. However, data from US populations are lacking.

Purpose: Our objective was to determine whether GDF-15 is an independent predictor of index, 30-day, and 90-day day AMI and death in a US cohort of ED patients with possible acute coronary syndrome.

Methods: This study was a secondary analysis of the STOP-CP (High Sensitivity Cardiac Troponin T to Optimize Chest Pain Risk Stratification) trial, which prospectively enrolled adults (≥21 years) presenting to eight emergency departments in the US with suspected AMI (1/25/2017-9/6/2018). Blood sampling was performed at baseline and 3 hours later, and hs-TnT, NT-pro-BNP, and GDF-15 assays were performed at a central laboratory. The primary outcome was the composite of AMI and all-cause death at index visit, 30 days, and 90 days and secondary outcomes were AMI and death separately. Multivariable logistic regression models were fitted for the outcomes at each timepoint with the following independent variables: age, sex, number of cardiac risk factors, ECG findings, hs-TnT, and NT-pro-BNP. Odds ratios (ORs) are reported per 100 ng/L increase in GDF-15 levels.

Results: In 1,428 patients the median age was 58 (IQR: 49, 66) years and 25% (353/1,428) had a history of coronary artery disease. The median GDF-15 level was 1,233 pg/mL (IQR: 754, 2206) at baseline and 1,363 pg/mL (IQR: 851, 2434) at 3 hours. The composite outcome of AMI or death occurred in 12% (169) at index visit, an additional 2% (34) at 30 days, and an additional 3% (37) at 90 days. In multivariable regression models, GDF-15 was independently associated with the composite outcome of AMI or death at 30 days (OR ng/L 1.01, 95% CI 1.00-1.02) and 90 days (OR 1.01, 95% CI 1.01-1.02), but not during the index visit (OR 1.00, 95% CI 1.00-1.00). It was also associated with both AMI (OR 1.01, 95% CI 1.00-1.02) and death (OR 1.01, 95% CI 1.01-1.02) separately at 90 days, but was only associated with death (OR 1.01, 95% CI 1.01-1.02) at 30 days.

Conclusion: Among adult ED patients with suspected AMI, GDF-15 was independently associated with subsequent 30-day and 90-day AMI or death. These data suggest a potential role for GDF-15 in risk stratifying ED patients with regard to future cardiac events.