Biomarkers effective for diagnosing cardiac cause of syncope in ED patients

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Measuring B-type natriuretic peptide (BNP), N-terminal proBNP (NTproBNP), and high-sensitivity cardiac troponin (hs-cTn) T and I provides useful diagnostic and prognostic information in ED patients with syncope, a recent study found.

The multicenter prospective study included 1,538 patients over 45 years of age who presented with syncope to an ED. Their BNP, NT-proBNP, hs-cTnT, and hs-cTnI concentrations were measured in a blinded fashion, and two physicians adjudicated whether the patients had cardiac syncope based on all information available, including cardiac workup and one-year follow-up. Results were published by *Circulation* on Feb. 25.

Cardiac syncope was adjudicated in 15.2% of the patients, and all four biomarkers were significantly higher in patients with cardiac syncope than those without. The biomarkers' diagnostic accuracy for cardiac syncope, as quantified by the area under the curve (AUC), was 0.77 to 0.78 (95% CI, 0.74 to 0.81), which was superior to the EGSYS (Evaluation of Guidelines in SYncope Study) score. Combining BNP/NT-proBNP with hs-cTnT/hs-cTnI further improved diagnostic accuracy (AUC, 0.81).

The study also looked at major adverse cardiac events within 720 days (defined as death, CPR, life-threatening arrhythmia, implantation of pacemaker/implantable cardioverter defibrillator, acute myocardial infarction, pulmonary embolism, stroke/transient ischemic attack, intracranial bleeding,

or valvular surgery) and found moderate-to-good prognostic accuracy with the biomarkers (AUC, 0.75 to 0.79). The biomarkers were superior to three comparators (ROSE and OESIL scores and San Francisco Syncope Rule) but inferior to the Canadian Syncope Risk Score, leading study authors to conclude that they could be clinically useful.

“The clinical utility of these biomarkers likely is highest in the subgroup of patients in whom the ED diagnosis remains unclear” after standard diagnostic tests, the study authors said. From this population, the biomarkers could identify patients who are safe to discharge from the ED, they explained. “For instance, cut-offs of <22.9 pg/mL for BNP, <97 pg/mL for NT-proBNP, <8 ng/L for hs-cTnT, and <2.9 ng/L for hs-cTnI allowed [the study] to identify ~30% of eligible patients with a mortality risk at 30 days of 0%,” the study authors wrote.

Limitations of the study include that the results do not apply to patients who present with syncope in a setting other than the ED or who are age less than 45 years, the authors said. They recommended additional research to determine which components of the patient history, comorbidities, physical examination, and electrocardiogram results could increase the diagnostic and prognostic yield of the studied biomarkers.