Circulating Copeptin: a Novel Early Marker for the Detection of Acute Myocardial Infarction

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PURPOSE

• Early diagnosis of acute myocardial infarction (AMI) with cardiac biomarkers of myocardial necrosis is limited since these biomarkers start to rise hours after the onset of AMI.

• Although recent findings suggest that the C-terminal portion of provasopressin (copeptin), a marker of acute endogenous stress, is a promising diagnostic marker for the detection of AMI in patients presenting early after symptom onset, its release pattern over the first few hours remains to be elucidated.

• We studied the temporal release pattern of copeptin and conventional cardiac biomarkers including high-sensitivity cardiac troponin T (hs-cTnT) in patients with ST-elevation AMI.

METHODS

• This study included 145 patients undergoing successful primary percutaneous coronary intervention (PCI) for a first ST-elevation AMI presenting within 12 hours of symptom onset enrolled in the neurohormonal substudy of the HEBE III trial, evaluating the effect of a single bolus of erythropoietin after successful primary PCI on left ventricular ejection fraction (LVEF)

• Blood samples were taken on admission, at 3, 6, and 24 hours after PCI.

• Copeptin was detected with a commercially available sandwich immunoluminometric assay.

RESULTS

• Mean age was 61 ± 12 years, 76% was male and 47% had an anterior AMI.

• After multivariable adjustment, a lower BMI and a shorter symptom onset to reperfusion time were related to higher levels of copeptin on admission.

• Copeptin levels on admission were not related to enzymatic infarct size as reflected in the peak of creatinin kinase (CK), CK isoenzyme (CK-MB), or cTnT.

Figure 1. A shorter time from symptom onset to reperfusion was related to a higher copeptin level on admission

Figure 2. Temporal release pattern of copeptin vs. CK-MB, cTnT, and hs-cTnT. While copeptin levels were at a maximum immediately after symptom onset and normalized to below the 99th percentile in 10 hours, CK-MB, cTnT, and hs-cTnT peaked later after 14 hours of symptom onset and decreased more gradually.

CONCLUSIONS

Copeptin has a distinct release pattern in patients with ST-elevation AMI, peaking within the first hour after symptom onset before conventional cardiac biomarkers and dropping quickly. These data suggest that copeptin might be of incremental diagnostic value in the early hours after onset of AMI.

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