Clinical Implications of cTnI Elevation Curve following Primary Percutaneous Coronary Intervention

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Background: Cardiac troponin release pattern after thrombolytic therapy for acute myocardial infarction was found to be a reliable predictor for infarct size and post-infarct complications and prognosis. We previously described the release kinetics of troponin after primary percutaneous coronary intervention (PPCI) for ST elevation myocardial infarction (STEMI), yet its possible prognostic implications and relation to infarct-related parameters have not been explored.

Methods: We prospectively collected cardiac troponin I levels from blood samples of 175 consecutive patients who were hospitalized due to STEMI and underwent PPCI. Clinical (baseline and at index hospitalization), electrocardiographic and echocardiographic data were obtained for all patients. Mean peak troponin levels and the mean time until the peaking of troponin were calculated for the entire study cohort.

Results: The mean peak troponin I level was 69 µg/L and the mean time from the first measurement until its peaking was 9 hours. On multivariate analysis, later peaking was associated with TIMI flow grade of 0 or 1 at the initiation of angiography and with lack of regression of > 70% in the total ST-elevation (:ST-E) on the ECG obtained immediately after PPCI. Higher peak values were associated with a TIMI flow grade of 0 or 1 either at the initiation of angiography or at the end of the PCI procedure and with lack of regression of >70% in the :ST-E at the end of the PCI. For hospitalization associated outcomes, higher peak levels were positively associated with lower ejection fraction at discharge, with cardiogenic shock and with ventricular arhhythmias occurring > 24 hours of hospitalization.

Conclusions: Cardiac troponin elevation kinetics following PPCI for STEMI is a simple and reliable method for possible prediction of infarct size and infarct-associated complications. Timing of the peaking and the absolute values are influenced by the presence or lack of early reperfusion.