Determinants of high sensitivity troponin T concentration in acute heart failure versus chronic heart failure

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Background: High sensitivity troponin T (hs-TnT) is a useful biomarker for early detection of myocardial injury. Recent data proposes this biomarker as a prognostic factor in heart failure (HF). Still, there is little evidence regarding the influence of different factors upon hs-TnT concentration in acute HF versus chronic HF.

Methods: HF patients consecutively hospitalized in the cardiology clinic of our hospital from January 2011 to December 2014 were screened for this study. Patients with hs-TnT evaluation on admission were included in our sample. Taking into consideration the symptoms on admission the patients were divided in 2 groups: acute decompensated (ADHF) and chronic stable heart failure (CHF). Patients with acute coronary syndromes, pulmonary embolisms, and in hospital mortality were excluded. Clinical, laboratory and echocardiographic parameters were recorded for all patients on admission. Survival status was assessed in June 2018.

Results: Our sample consisted of 371 HF patients, 55.3% with ADHF.

In the ADHF subgroup 54.6% were female, with a mean age of 73.6 ± 9.71 years. 20.5% had reduced ejection fraction and 29.3% had mid-range ejection fraction. In the CHF subgroup 57.2% were female, with a mean age of 70.8 ± 10.68. In this subgroup 51.8% were patients with reduced ejection fraction and 28.3% had mid-range ejection fraction.

In CHF subgroup hs-TnT concentration was significantly higher in those with chronic kidney disease vs normal kidney function (32.66 [IQR 26.72-39.51] vs 25.35 [IQR 22.11-34.92] pg/ml, p<0.001) but was not influenced by other comorbidities such as atrial fibrillation, hypertension, ischemic heart disease or anemia. In CHF patients hs-TnT directly correlated with age (r=0.234, p=0.003) and NT-proBNP (r=0.481, p<0.001).

In ADHF subgroup there were higher hs-TnT concentrations compared to CHF subgroup (22.21 [IQR 12.75-33.25] vs 12.54 [IQR 7.65-21.11] pg/ml, p<0.001) but there were no significant correlations between high levels of hs-TnT and other comorbidities. This suggests that decompensation itself is the main determinant of high hs-TnT concentration in this subgroup.

Conclusion: In ADHF, the main determinant of higher troponin levels was the heart failure decompensation itself. In patients with chronic HF, troponin rise was influenced by other co-morbidities, mainly chronic kidney disease.