

Clinical relevance of high-sensitive Troponin T in cardiovascular disease

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av

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Avhandlingen baseras på följande delarbeten:

- I. Bjurman C, Larsson M, Johanson P, Petzold M, Lindahl B, Fu ML, Hammarsten O.
Small changes in Troponin T levels are common in patients with non-ST-elevation myocardial infarction and are linked to higher mortality.
J Am Coll Cardiol. 2013 Oct 1;62(14):1231-8. doi: 10.1016/j.jacc.2013.06.050.
- II. Bjurman C, Petzold M, Venge P, Farbemo J, Fu ML, Hammarsten O.
High-sensitive cardiac troponin, NT-proBNP, hFABP and copeptin levels in relation to glomerular filtration rates and a medical record of cardiovascular disease.
Clin Biochem. 2015 Mar;48(4-5):302-7. doi: 10.1016/j.clinbiochem.2015.01.008.
- III. Bjurman C, Holmström A, Petzold M, Hammarsten O, Fu ML.
Assessment of a multi-marker risk score for predicting cause-specific mortality at three years in older patients with heart failure and reduced ejection fraction.
Cardiol J. 2014 Feb 14. doi: 10.5603/CJ.a2014.0017.
- IV. Bjurman C, Zywczyk M, Lindahl B, Carlsson T, Johanson P, Petzold M, Fu ML, Hammarsten O.
Decreased admissions and hospital costs with a neutral effect on mortality following lowering of the Troponin T cut-off point to the 99th percentile.
(manuscript)



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ABSTRACT

Background and aims: Troponin T (hs-cTnT) is a cardiac damage marker used in the diagnosis of non-ST segment elevation myocardial infarction (NSTEMI) and for prognostic assessment. Clinical decision-making should ideally be based on evidence. We therefore studied the prognostic significance of small changes in the level of hs-cTnT in patients with NSTEMI, the effects of renal insufficiency on levels of cardiac biomarkers, a risk assessment model including age, cystatin C (CysC) and hs-cTnT in heart failure, and whether a lowered hs-cTnT diagnostic cutoff value, from 40 ng/L to 14 ng/L (the 99th percentile), results in mortality changes and increasing health care expenditure.

Methods: Four study cohorts were used. Multiple biomarkers and clinical data were combined. The first study included 1178 patients with NSTEMI. The second study included 489 patients with different degrees of renal function who were referred for glomerular filtration rate (GFR) measurement, either by Cr51-EDTA or Iohexol clearance. The third study included 124 patients with heart failure and reduced left ventricular ejection fraction (HFREF). The fourth study included 39001 visits to the emergency department (ED) by patients with chest pain or dyspnea with at least one hs-cTnT measurement at the local hospital, before and after lowering the hs-cTnT diagnostic cutoff from 40 ng/L to 14 ng/L.

Results: In NSTEMI, a six-hour relative hs-cTnT change <20% was observed in 25 % of NSTEMI patients and was linked to increased mortality. Compared with patients with normal kidney function, the estimated increase in the cardiac biomarkers at a GFR of 15 ml/min/1.73m² varied from two-fold to 15-fold. In HFREF, a risk score including age, cystatin C (CysC) and hs-cTnT stratified mortality. The mortality among patients with chest pain or dyspnea in the ED did not change after lowering of the hs-cTnT cut-off from 40 ng/L to 14 ng/L; however, admissions and hospital costs decreased.

Conclusions: In NSTEMI, a small change in the hs-cTnT level was common and was linked to increased mortality. Troponin I levels are less dependent on the glomerular filtration rate compared with other studied cardiac biomarkers. A combination of different biomarkers might improve prognostic assessments in HFREF. Mortality did not change but hospital admissions were reduced after lowering of the hs-cTnT cutoff.

Key words: biomarkers, prognostic score, mortality, heart failure, myocardial infarction, renal dysfunction

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