Temporal changes of biomarkers in myocardial infarction patients with non-obstructive compared to obstructive coronary arteries

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Background: About 5–10% of all myocardial infarction (MI) patients have non-obstructive coronary arteries (MINOCA). The pathobiology of MINOCA is largely unknown compared to myocardial infarction with obstructive coronaries (MI-CAD).

Purpose: To investigate whether baseline concentrations and temporal changes of circulating biomarkers may offer insights into the activation of pathophysiological pathways in MINOCA compared to MI-CAD.

Methods: From the PLATelet inhibition and patient Outcomes (PLATO) trial, we retrospectively identified 114 patients with MINOCA (adjudicated MI, coronary stenoses <50% and excluding patients with previous coronary revascularization) and 2750 patients with MI-CAD (adjucated MI and stenoses ≥50%) with available biomarker data. Concentrations of high sensitivity cardiac troponin T (hs-cTnT), C-reactive protein (CRP) and N-terminal pro-B-type natriuretic peptide (NT-proBNP) were centrally measured by immunoassays in plasma samples obtained at randomization/baseline (median 15 hours from index event) and after one month. Differences in biomarker concentrations and their changes were evaluated by Wilcoxon-Mann-Whitney tests and data at one month were also analysed with adjusted linear regression models.

Results: In MINOCA patients, median concentrations decreased during one month from 238 to 9 ng/L for hs-cTnT, from 3.5 to 1.6 mg/L for CRP and from 507 to 228 pmol/L for NT-proBNP (Figure 1 and 2). In MI-CAD patients, median concentrations decreased from 198 to 13 ng/L for hs-cTnT, from 3.2 to 2.3 mg/L for CRP and increased from 372 to 566 pmol/L for NT-proBNP. Compared to MI-CAD, the baseline concentrations were higher in MINOCA for NT-proBNP (p=0.011), but similar for hs-cTnT (p=0.555) and CRP (p=0.834). However, patients with MINOCA had statistically larger reductions of concentrations from baseline to one month for hs-cTnT (p=0.002), CRP (p=0.005) and NT-proBNP (p<0.001) as compared to patients with MI-CAD. At one month, concentrations were lower in MINOCA than MI-CAD patients for all three biomarkers, which remained significant after adjustment for the baseline biomarker concentration, clinical characteristics and medications (p<0.001).

Conclusions: In MINOCA compared to MI-CAD patients, higher concentrations of NT-proBNP and similar concentrations of hs-cTnT and CRP at baseline indicate a higher degree of acute myocardial dysfunction but similar degree of acute myocardial injury and inflammation. Furthermore, concentrations of these biomarkers were lower at one month in MINOCA, suggesting other or less remaining underlying disease processes after MI in MINOCA than MI-CAD.

Figure 1. Temporal changes in unadjusted biomarker concentrations of hs-cTnT and CRP in MINOCA and MI-CAD patients.

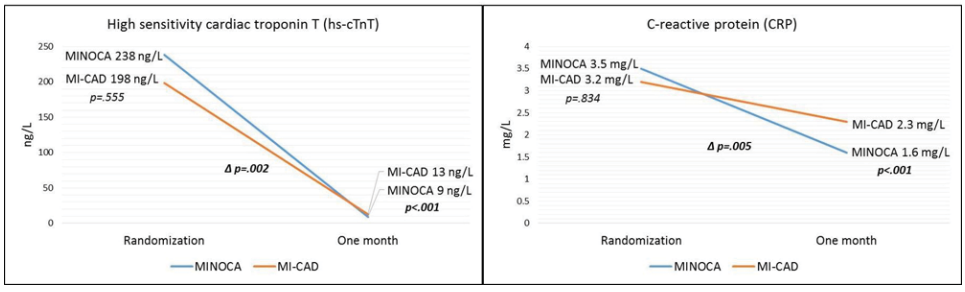

Figure 2. Temporal changes in unadjusted biomarker concentrations of NT-proBNP in MINOCA and MI-CAD patients.