The randomized physiologic assessment of thrombus aspiration in patients with acute myocardial infarction with ST-segment elevation (PATA STEMI)

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Background: Routine thrombus aspiration is superior to conventional primary percutaneous coronary intervention (PCI) in terms of improved myocardial perfusion in patients with acute myocardial infarction with ST-segment elevation (STEMI), but its clinical usefulness is still questionable. Myocardial perfusion after thrombus aspiration has not been evaluated by a quantitative index of microcirculatory resistance (IMR) in a randomised fashion.

Purpose: We performed a randomized, controlled clinical trial to evaluate impact of manual thrombus aspiration on microcirculatory resistance after primary PCI in 128 patients with the first STEMI randomly assigned to thrombus aspiration or conventional primary PCI group before coronary angiography.

Methods: The primary endpoint was defined as a mean value of IMRcorr in thrombus aspiration compared to conventional PCI group. Myocardial perfusion grade, resolution of ST-segment elevation, enzymatic infarct size, left ventricle remodeling and rate of adverse cardiac events were secondary endpoints.

Results: Manual thrombus aspiration, as compared with conventional PCI, resulted in significantly lower IMR corr (27.5±16.8 U vs. 39.9±32.7 U, P = 0.039). Treatment with thrombus aspiration, as compared with conventional PCI, resulted in similar rates of myocardial perfusion grade 0 or 1 (21,5% vs. 28,6%; RR 0,75; 95% CI, 0,41 to 1,38; P=0,36), complete resolution of ST-segment elevation (61,5% vs. 49,2%; RR 1,25; 95% CI, 0,91 to 1,71, P=0,16), similar infarct size (median AUC CK-MB: 4362 U/L (IQR: 696 to 15636 U/L) versus 4401 U/L (IQR: 996 to 15657 U/L), p=0.27), similar median value of WMSI (1,23 vs 1,23), LV sphericity volume index (0,43 vs. 0,41) and similar rate of LV remodeling (27,9 vs 18,5%, p=0,21). The rate of major adverse events (death, myocardial infarction, stroke or hospitalization for heart failure) between the groups was similar 4,6% vs, 11,1%, P=0,20. In a multiple regression model with the log-transformed IMR as dependent variable, after adjusting for clinical, angiographic and procedural variables, thrombus aspiration was not an independent predictor of lower IMR (28.4 U; 95% CI, 24.7 to 32.8 U, vs. 32.4 U; 95% CI, 28.1 to 37.4 U; estimate 0,877, 95%CI 0,715-1,077, P=0.21).

Conclusions: In our study, manual thrombus aspiration has nodeleterious effect on final infarct size. Although, routine thrombus aspiration leads to improvement in myocardial perfusion, it is not translated into increased myocardial salvage or lower final infarct size compared to standard pPCI.