CONCLUSIONS Primary LV unloading with an axial flow catheter for 30 or 60 minutes before, not after, coronary reperfusion is associated with reduced infarct size, increased cardioprotective signaling, and improved mitochondrial integrity. These preclinical findings are supported by improved survival among patients treated with an axial flow catheter before, not after reperfusion.

CATEGORIES CORONARY: Acute Myocardial Infarction

KEYWORDS Cardioprotection, Mechanical circulatory support, Myocardial infarction, acute

TCT-245
The Randomized Physiologic Assessment of Thrombus Aspiration in Patients with Acute Myocardial Infarction with ST-segment Elevation (PATA STEMI) Trial: final results

Dejan Orlic,1 Miodrag C. Ostojić,2 Branko Beleslin,3 Milica Labudovic Borovic,4 Dejan Milasinovic,3 Milorad Tesic,1 Goran Stankovic,1 Milorad Zivkovic,3 Sinisa Stojkovic,1 Milan Nedeljovic3
1Clinical Center of Serbia, Belgrade, Serbia; 2Medical School University of Belgrade, University City Hospital “Zvezdara” Belgrade, Belgrade, Serbia and Montenegro; 3Institute for histology, Belgrade, Serbia

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 randomized fashion.

METHODS We performed a randomized, controlled clinical trial to evaluate impact of manual thrombus aspiration (the Eliminate aspiration catheter, Terumo Medical Supply, Japan) 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. 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. 28.8%; 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 = 0.21). There were no inter-group differences in baseline clinical characteristics between the groups. In a multiple regression model with the log-transformed IMRcorr as dependent variable, after adjusting for clinical, angiographic and procedural variables, thrombus aspiration was not an independent predictor of lower IMR corr (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). Histopathological examination confirmed successful thrombus aspiration in 89.6% of patients.

CONCLUSIONS The efficacy of manual thrombus aspiration was not an independent predictor of reduced microcirculatory resistance. Reduction in microcirculatory resistance of 12.3% achieved by routine manual aspiration is not sufficient to allow echocardiographic or clinical improvement in STEMI patients at mid-term follow-up.

CATEGORIES CORONARY: Thrombus / Thrombectomy and Embolic Protection

KEYWORDS Acute myocardial infarction, Coronary microcirculation, Thrombectomy

TCT-246
Impact of thrombus age on efficacy of manual thrombus aspiration: subanalysis form the PATA STEMI trial

Dejan Orlic,1 Jelena Kostić,2 Milica Labudovic Borovic,4 Milorad Tesic,1 Dejan Milasinovic,3 Branko Beleslin,3 Sinisa Stojkovic,1 Goran Stankovic,1 Miodrag C. Ostojić1
1Clinical Center of Serbia, Belgrade, Serbia; 2Institute for histology, Belgrade, AK; 3Institute for histology, Belgrade, Serbia; 4Medical School University of Belgrade, University City Hospital “Zvezdara” Belgrade, Belgrade, Serbia and Montenegro

BACKGROUND The composition of thrombus in infarct-related artery is related to the age of thrombus. It has not been analyzed the impact of thrombus age on the efficacy of manual thrombus aspiration in STEMI patients assessed by invasive and quantitative method of measuring microcirculatory resistance.

METHODS Out of 128 patients randomly allocated to either routine manual thrombus aspiration or standard pPCI, 75 patients underwent thrombus aspiration of which 10 patients had crossover. The efficacy of thrombus aspiration was assessed by determining the index of microcirculatory circulation. The age of thrombus was assessed after hematoxolin eosin staining. Fresh thrombi were rich in erythrocytes with no signs of lysis of nuclei. Lytic thrombi had signs of lysis and collagen fibers, while organized thrombi had thick collagen bands.

RESULTS In 49 patients thrombus size allowed histologic examination with hematoxolin eosin staining. Fresh thrombus was found in 25 patients and lytic or organized thrombus was found in 24 patients. There were no differences in baseline clinical characteristics between the group with fresh and old thrombi: 59.7±10.55 vs. 57.9±13.07, P = 0.06, 76.0 vs. 75.8% male patients, risk factors: >2 44.0 vs. 16.7%, P = 0.06, patient delay median 45 (IQR 15-127.5) vs. 60 (IQR 28.75-222.5) min, P = 0.17, total ischemic time 166 (IQR 131.25-302.5) vs. 202.5 (IQR140.0-333.75), P = 0.21, antecedent angina 56.0 vs. 50.0%, P = 0.08, the rate of anterior STEMI 40.0 vs. 29.2%, P = 0.63 and total ST-segment deviation 16.2±8.94 vs. 16.7±9.91, P = 0.85, respectively. There were no inter-group differences in angiographic and procedural characteristics: multi vessel disease (48.0 vs. 50.0%, P = 0.69), TIMI 0 or 1 at baseline (44.8 vs. 87.5%, P = 0.72), TIMI 3 after completion of pPCI (96.0 vs. 97.9%, P = 0.52). Thrombus length (12.3±8.86 vs. 12.4±8.12, P = 1) and final MBG 0 or 1 (20.0% vs. 33.3%, P = 0.29). Resolution of ST-segment elevation (80.0 vs. 50.0%, P = 0.027) and IMRcorr (23.2±13.65 vs. 37.2±27.32, P = 0.032) were lower in the group with fresh thrombi compared to old thrombi. There was a trend towards lower rate of distal embolizations in the group with fresh thrombi (8.0 vs. 22.9%, P = 0.074). However, there were no differences in infarct size (AUC CK 41542.7±31052.9 vs. 44712.1±25186.1, P = 0.71), LVEF (55.2±11.67 vs. 54.0±10.63, P = 0.72), WMSI (1.37±0.37 vs. 1.29±0.20, P = 0.61) or remodeling rate (0.25% vs. 25.0%, P = 1) between the groups with fresh and old thrombi.

CONCLUSIONS The manual aspiration of fresh thrombi leads to improved myocardial perfusion in STEMI patients as compared with old thrombi. However, we were unable to identify clinical or angiographic characteristics to be associated with fresh thrombi. In addition, improved myocardial perfusion was not associated with improved clinical outcome in patients with fresh compared to old thrombi.

CATEGORIES CORONARY: Thrombus / Thrombectomy and Embolic Protection

KEYWORDS Acute myocardial infarction, Coronary microcirculation, Thrombectomy

TCT-247
Hypothyroidism is a Prognostic Marker in ST-elevation Myocardial Infarction Patients Undergoing Primary PCI

Wenyao Wang,1 Yuejin Yang,1 Yida Tang1
1Fuwai Hospital, National Center for Cardiovascular Diseases, CAMS & PUMC, Beijing, China

BACKGROUND Previous studies have suggested that thyroid dysfunction is associated with the mortality in patients with acute myocardial infarction, but whether the thyroid function status is associated with the prognosis of primary PCI has not been evaluated sufficiently.

METHODS Consecutive 1079 patients with ST-elevation myocardial infarction (STEMI), who were hospitalized in Fuwai hospital from January 2010 to December 2012, were enrolled into this study. Patients underwent primary PCI treatment and thyroid function profile evaluation within the first 12 hours after admission. The duration
of follow-up is two years and the primary endpoint was major adverse cardiovascular events (MACE), including all-cause death, non-fatal myocardial infarction and target vessel revascularization (TVR).

**RESULTS** There were 149 patients with hypothyroidism (13.81%, including low-T3 syndrome, subclinical hypothyroidism and clinical hypothyroidism) and 16 patients with subclinical hyperthyroidism. After adjusting for conventional risk factors (age, gender, smoke, diabetes mellitus, dyslipidemia, hypertension), fT3 level was significantly correlated with log-CKMB ($r = -0.218$, $p < 0.001$), log-cTnI ($r = -0.231$, $p < 0.001$), and LVEF ($r = 0.463$, $p < 0.001$), indicating that the hypothyroidism is related with myocardial injury and damaged cardiac function. There are total 86 MACEs during two-year follow-up. The incidence of MACEs were 14.09% in patients with hypothyroidism and 6.99% in patients without hypothyroidism, respectively. In multivariable Cox survival analysis, hypothyroidism is the prognostic factor for MACE (OR: 3.7; 95% CI: 2.6 - 6.5) and TVR (OR: 2.3; 95% CI: 1.7 - 7.2). As for non-fatal myocardial infarction, hypothyroidism was not a significant predictor (OR: 2.8; 95% CI: 0.6 - 8.9). Subclinical hyperthyroidism did not show any impact on prognosis.

**CONCLUSIONS** Hypothyroidism is associated with cardiac markers and damaged cardiac function in STEMI. In two-year follow-up, hypothyroidism is a predictor for MACE and TVR in STEMI patients treated with primary PCI. Further studies on treatment of MI with thyroid dysfunction are needed.

**CATEGORIES** Coronary: Acute Myocardial Infarction

**KEYWORDS** Primary PCI, ST-segment elevation myocardial infarction