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## Poster Session 4 - Sunday, 16 October 2016 - 14:00 - 17:30

### Acute coronary syndrome - ST-elevation myocardial infarction

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#### Echocardiographic assessment of right ventricular function in inferior wall myocardial infarction and angiographic correlation to proximal right coronary artery stenosis and clinical outcome

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**Background:** Presence of right ventricular (RV) infarction imposes a higher risk of adverse events in inferior wall myocardial infarction (IWMI). In this study, we attempted to correlate various indices of RV function assessed by echocardiography with presence of a proximal right coronary artery (RCA) lesion in patients with first episode of acute IWMI.

**Methods:** In a prospective study, patients with first episode of acute IWMI underwent echocardiographic assessment within 24 h of symptom onset and indices of RV function viz. RV fractional area change (RVFAC), tricuspid annular plane systolic excursion (TAPSE), myocardial performance index (MPI) and tissue Doppler velocities from RV free wall were measured. Patients who underwent coronary angiogram (CAG) within one month and they were classified into group 1 and group 2 based on the presence or absence, respectively, of a significant proximal RCA lesion. Clinical outcome at 12 days.

**Results:** There were 158 patients with first episode of IWMI of which 119 patients underwent CAG. There was significant difference between group 1 i.e patients with significant proximal RCA lesion (n= 61) and group 2 i.e patients with out significant proximal RCA lesion (n = 58) in TAPSE ( $12.32 \pm 1.75$  vs  $18.32 \pm 2.37$ ,  $p < 0.001$ ), MPI by tissue Doppler ( $0.85 \pm 0.05$  vs  $0.63 \pm 0.04$ ,  $p < 0.001$ ) and in tissue Doppler systolic velocity from RV free wall ( $S' 9.20 \pm 0.79$  vs  $14.88 \pm 1.03$ ,  $p < 0.001$ ). There was a good inter observer correlation for TAPSE, MPI by TDI, and S' velocity. TAPSE  $\leq 16$  (sensitivity 93%, specificity 100%), MPI-TDI  $> 0.69$  (sensitivity 94.7%, specificity 93.5%), S'  $\leq 12.3$  (sensitivity 90.3%, specificity 94.3%) were useful in predicting presence of proximal RCA lesion. Among patients with proximal RCA lesion 13 patients had symptoms of right heart failure predominantly even with Fair LV systolic function.

**Conclusion:** RV function indices like TAPSE, MPI-TDI and S' velocity are useful in predicting proximal RCA lesion in first episode of acute IWMI.

Table 1.

variable	Gr I (61) with proximal RCA lesion	Gr II (58) with out proximal RCA lesion	P value
RVFAC	$21.94 \pm 7.73$	$42.24 \pm 2.05$	$< 0.001$
TAPSE	$12.32 \pm 1.75$	$18.32 \pm 2.37$	$< 0.001$
S'	$9.20 \pm 0.79$	$14.88 \pm 1.03$	$< 0.001$
MPI by Pw	$0.55 \pm 0.11$	$0.22 \pm 0.11$	$< 0.001$
MPI by TDI	$0.85 \pm 0.05$	$0.63 \pm 0.04$	$< 0.001$

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#### Heart rate turbulence prognostic value in patients with acute myocardial infarction

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**Background:** Heart rate turbulence (HRT) is the phenomenon of short-term fluctuations in the length of cardiac cycle immediately after ectopic ventricular beat. Its importance in assessing the long-term prognosis in patients after acute myocardial infarction (AMI) is widely debated today as HRT may reflect the degree of heart muscle electrical heterogeneity (which is a pathophysiological substrate for ventricular fibrillation) and therefore help to identify the cohort of patients with increased risk of sudden cardiac death.

**Objective:** to determine the significance of abnormal changes of the HRT parameters in their relationship with long-term prognosis in patients with AMI.

**Materials and methods:** 114 individuals who underwent hospital treatment in the intensive care unit of a National Institute of Therapy in Ukraine" for AMI had been observed. 25 patients (men – 16, women – 9) had been selected for further analysis, who had ventricular ectopic beats at 4-6 weeks of observation according to Holter ECG monitoring. Turbulence onset (To) and turbulence slope (Ts) were calculated using the commonly recognized algorithm. The patients were divided into subgroups according to presence of pathological and normal values of HRT markers: To  $> 0\%$  vs. To  $\leq 0\%$ , Ts  $< 2,5$  ms/RR vs Ts  $\geq 2,5$  ms/RR. Subgroups were compared to assess the risk of hospital and 6-month mortality and combined point (death / AMI) using the GRACE scale.

**Results:** There was a significant correlation revealed between To and Ts ( $R = -0,70$ ,  $p < 0,05$ ), To and left ventricular ejection fraction (LV EF) ( $R = -0,46$ ,  $p < 0,05$ ), Ts and LV end-systolic diameter (ESD) ( $R = -0,46$ ,  $p < 0,05$ ), Ts and LV EF ( $R = +0,55$ ,  $p < 0,05$ ) on echocardiography in 8-10 days after AMI. Patients with abnormal values of To ( $> 0\%$ ) in 4-6 weeks of

observation were characterized with significantly decreased LV EF in 8-10 days after AMI (40,5 (32,0; 42,9)% vs 53,0 (48,5; 61,0)%,  $p = 0,019$ ), increased risk on GRACE scale for hospital mortality (7,5 (4,5, 29,0)% vs 2,0 (1,5, 3,0)%,  $p = 0,056$ ), hospital mortality / AMI (24,0 (20,0, 37,5)% vs 16,0 (11,5; 17,0)%,  $p = 0,018$ ), 6-month mortality (15,5 (9,0, 44,0)% vs 5,0 (3,5; 7,5)%,  $p = 0,056$ ), 6-month mortality / AMI (38,0 (31,5; 59,0) vs 25,0 (19,0; 27,5)%,  $p = 0,045$ ). Analysis of Ts relation to the risk on GRACE scale showed no such differences with increase in LV ESD (4,00 (3,80; 4,30) cm vs 3,50 (3,20; 3,90) cm,  $p = 0,044$ ), decrease in LV EF (46,0 (27,0; 53,0)% vs 52,5 (48,5; 61,0)%,  $p = 0,089$ ) in 8-10 days after AMI, as well as increase of mean heart rate to (75 (70; 81) bpm vs 69 (63; 70) bpm,  $p = 0,030$ ) in 4-6 weeks term of observation.

**Conclusions:** Pathological values of HRT indices in 4-6 weeks after AMI are strongly associated with decreased LV contractility in short-term observation and higher risk of adverse events in 6-month catamnesis, validating the need for more detailed study of their role as a prognostic marker.

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### Impact of Direct stenting on myocardial reperfusion and clinical outcome of patients with ST-segment elevation myocardial infarction

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**Background:** Myocardial reperfusion following primary percutaneous coronary intervention (PPCI) is limited due to atheroembolic events in patients with ST-segment elevation myocardial infarction (STEMI) despite epi-cardial recanalization.

**Objectives:** We aimed to evaluate the impact of direct stenting without pre-dilatation, on myocardial reperfusion and clinical outcomes of patients with STEMI undergoing PPCI.

**Methods:** Consecutive 78 patients were randomly assigned to the direct stenting or balloon pre-dilatation after selective aspiration thrombectomy. Epicardial and myocardial reperfusion were assessed according to Thrombolysis In Myocardial Infarction (TIMI) flow scale and TIMI myocardial perfusion (TMP) grade. A post-PCI Index of microcirculatory resistance (IMR) was assessed with thermodilution curves during maximal hyperemia using a pressure sensor/thermistor-tipped guidewire. One year clinical outcome was compared.

**Results:** Direct stenting was feasible in 34 of 39 patients who were initially randomized (DS group) and stenting after balloon pre-dilatation was done to 39 patients (Pre-dilatation group). There were no significant differences in baseline characteristics. Final TIMI grade 3 flow (93.1% vs 82.1 %,  $p=0.25$ ), final TMP grade 3 (64.3% vs 53.8%,  $p=0.6$ ) and peak CK-MB level

(178 vs. 190 ng/dL,  $p=0.73$ ) were comparable between DS and Pre-dilatation group. Complete resolution of ST-segment elevation occurred more frequently in DS group (57.1%) than in Pre-dilatation group (29.4%) without significance ( $p=0.25$ ). Post-procedural IMR showed lower tendency (23.3±16.5 vs. 29.4±19.9 mmHg·sec,  $p=0.38$ ) in DS group than Pre-dilatation group. IMR could not be measured in 5 patients, including 1 in DS and 4 in Pre-dilatation group, due to cardiogenic shock after stenting. At one year, 3 cardiac death had occurred in Pre-dilatation group (0% vs 7.7 %,  $p = 0.24$ ).

**Conclusion:** The DS without pre-dilatation has a tendency of improving myocardial perfusion and better clinical outcome compared with Pre-dilatation group. When anatomically and technically feasible, the use of DS technique may be considered in patients with STEMI undergoing primary PCI.

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### Improving diagnosis of rethrombosis after the effective system thrombolytic therapy using the con-tinuous ECG monitoring in patients with STEMI

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**Aim:** To study the diagnostic value of ST segment re-elevation episodes, registered in STEMI patients after effective TLT during the telemetry ECG- monitoring.

**Methods.** The study included 117 patients with STEMI, 97 men and 20 women at the age of 59 (52; 64) years, who underwent after 150 (105, 240) minutes from the start of heart attack an effective systemic thrombolytic therapy. After 3-24 hours after TLT a selective coronary angiography with the assessment of infarct-related artery on the TIMI classification with the following PCI has been conducted. Before and after PCI a telemetric ECG using a 'Astrokard® - Telemetry' complex (CJSC 'Meditec', Russia) was performed with the online analysis of the dynamics of ST segment on the 12-leads in automatic mode with the subsequent medical verification.

**Results.** The patients were divided into 2 groups. Group 1 included 85 patients (72.6%), without new ST-segment deviations from contour lines. According to the coronary angiography in 77 patients of this group (90.6%) coronary artery thrombosis symptoms have not been identified, unstable atherosclerotic plaque was visualized. 8 patients (9.4%) of group 1 were diagnosed with thrombotic occlusion of the infarct-related artery. Group 2 included 32 patients (27.4%), who after the effective TLT had the episodes of ST-segment re-elevation of 1 mm or more in infarction-related leads, lasting at least 1 minute. According to coronary angiography in Group 2 in 27 of 32 patients (84.4%) the signs of thrombosis infarct-related coronary artery have been found, which was significantly

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