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Impact of LV remodeling after acute myocardial infarction on systolic and diastolic performance
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Abstract

Myocardial performance index (MPI) is clinically relevant measurement of global LV function with quantitative and prognostic significance in pts with coronary heart disease.

Aim: To evaluate the interaction between remodeling process and global LV function after AMI, we investigated which of well known echocardiographic and Doppler indices of LV remodeling have an impact on MPI.

Methods: Using conventional echocardiographic Doppler methods, LV ejection fraction (LVEF), and diastolic volume indices (ESV), and systolic volume index (ESV), wall motion score index (WMSI), mean inflow peak E and A velocities, E/A ratio, Color M mode velocity propagation (Vp), E/A ratio, deceleration time (DT), aortic flow jet systolic phase (ET) scorde compression (RCT) and relaxation time (IVRT) intervals were measured.

Assessment of LV function was done in first week, after one and after three months.

Results: Forty-nine consecutive patients with first AMI were divided in two groups according cut off value of MPI. In patients with MPI <0.80, group I (13) there were significantly higher values of EDV (255.86±17.99 vs 170 564±12.92, p=0.020) and ESV (141 18±18 vs 95 885±69, p=0.002) in first week after AMI comparing with pts from group II (22) with MPI>0.80. MPI was closely related in both groups with ESV/r (r=-0.280, p=0.001) and WMSI (r=-0.323, p=0.002) and E/A (r=0.254, p=0.049). By repeated measurements analysis, there was no significant difference in ESV between two groups. ESV values significantly decreased during three months in group II (p=0.027), but in group I ESV didn’t change (p=0.621). After three months values of ESV were significantly higher in group I comparing with II (119 132±59 vs 88 04, p=0.003).

By multivariate regression model, in early phase of LV remodeling, index of global LV dysfunction in group I was in close relation with EDV (p=0.360, p=0.014) and WMSI (r=0.380, p=0.01), but after three months of remodeling process, MPI is more closely related to ESV (r=0.485, p=0.002).

Conclusions: Increased values of MPI (>0.80) could be simple and good predictor for high and progressive degree of LV remodeling in patients after first AMI. In early phase of LV remodeling, dominant factors of LV dysfunction are close to LV geometry changes, but in late phase these factors could be myocardial properties of LV diastolic filling.

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T-wave alternans determinants in patients after acute anterior myocardial infarction

T-wave alternans (TWA) has been proposed as a potential marker of susceptibility to ventricular tachycardia/ fibrillation in several groups of patients, equivalent to EP study. In addition, the effects of left ventricular function on the prognostic value of TWA are under intensive investigation.

We conducted analysis of occurrence TWA in homogeneous population of patients with acute MI and to determine factors influencing results.

In the prospective study we examined 66 consecutive patients with first MI of anterior wall type (72% of patients with PCI and 28% of patients with PCIs). The TWA test was performed at 30 days. alternans was present in 14 pts (TWA+), absent in 41 (TWA) and in 14 pts it was undetermined or not performed (AF, desability).

Results: There were no differences in gender, age, treatment, time from symptoms to PCI and extent of coronary stenosis. The maximum early TWA+ cases were observed in the first hours after PCI procedure. The negative correlation of TWA+ appearance with confirmed myocardial viability was noted in patients with presence of EF recovery as increase >5% (EF+) was assessed. By repeated measurements analysis, there was no significant difference in ESV between TWA+ pts and not performed EF+ measurements at baseline ECHO. All 30-day ECHO indices were significantly worse in TWA+ pts. Ef+ was significantly more frequent in TWA+ pts. Moreover, despite 100% survival rate in both groups, TWA+ pts had significantly more cardiac events after discharge due to ischemic (heart failure, need for revascularization) and TWA+ cardiac events.

Conclusions: Presence of TWA could be predicted by perfusion and contractility indices and extent of myocardial necrosis but neither with ECG nor standard ECHO indices. Short-term prognosis could be predicted by TWA, perfusion or contractility indices, however further study is needed to determine their additive effects.

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Prediction of clinical outcomes with first-pass cardiac resonance imaging after a first acute myocardial infarction
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Aim: To test the capability of Contrast Cardiac Rresonance First-Pass Imaging of predicting the occurrence of cardiac events after a first myocardial infarction treated with fibrinolysis.

Methods: 27 patients admitted on Coronary Care Unit because of a first myocardial infarction, treated with fibrinolysis between the first 6 hours and showing left ventricular dysfunction on echocardiography were selected. Transversal and longitudinal cine images were performed on acute phase, and then at one, six and twelve months. Cardiac Resonance Imaging was done at the 7th-14th day after the event. Images were acquired immediately after the administration of a bolus of Gadolinium (0,2 ml/kg)using a FIESTA sequence.

We considered three patterns according to the distribution of contrast normal if contrast equal to remote myocardium, hypointense in <50% (Hypo<50%) a dark core, necrosis occupying less than 50% of the transmural extent of the myocardium on the infarcted area was observed, and hypointense >50% (Hypo>50%) if the dark zone extended into more than 50% of the myocardial wall.

Follow-up consisted of outpatient visits every first, third, and twelfth months.

Data regarding occurrence of angina, re-infarction, revascularization procedure (ischaemic events) and cardiac failure and death (nonischemic events) were collected.

Results: 22% of patients showed normal distribution pattern, 13 (48%) Hypo<50% and 12 (44%) Hypo>50%. 21/27 patients (78%) had an event and 16/27 (59%) patients had a nonischemic event. First-pass contrast imaging was related to the happening of events (50% normal, 61% Hypo>50%, 100% Hypo<50%, Log Rank=0,0044), and nonischemic events (50% normal, 31% Hypo<50%, 92% Hypo>50%, Log Rank=0,0009). A nonsignificant trend toward relation of First-pass pattern with cardiac disfunction on follow up was found.

Conclusions: First-Pass Contrast Cardiac Resonance Imaging after a first fibrinolysis myocardial infarction predicts the occurrence of cardiac events, especially nonischemic events.

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Comparison of low-dose dobutamine echocardiography with low-dose dipiridamol technetium-99m tetrofosmin scintigraphy in detection of myocardial viability after primary coronary angioplasty
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In recent years, diagnostic testing to evaluate the presence and extent of viable, but dysfunctional myocardium has become an important component of the clinical assessment of patients after acute myocardial infarction. The aim of the present study was: to compare low-dose dobutamin echocardiography (LDE) results in detecting myocardial viability with low-dose Dipiridamol Technetium-99m Tetrofosmin Scintigraphy (SPECT) in patients immediately after acute myocardial infarction (AMI) treated with primary coronary angioplasty (PCA), and b) to investigate influence of detected viability on systolic function.

Methods: We prospectively enrolled 44 patients with first AMI treated with PCA. LDE and SPECT with low doses Dipiridamol (0.28 mg/kg in four minutes) was performed 7-10 days after acute event. The dysfunctional segments were defined as viable if they exhibited improvement in their thinning by at least 1 grade with dobutamine infusion, in 2 or more segments, or tracer uptake >50% after Dipiridamol infusion by SPECT. Regional wall motion was scored in each segment of a standard 16-segment model, by both techniques.

Results: Among 249 asynergic segments: segments on echocardiography, 151 (60.6%) showed the presence of myocardial viability by LDE, and 187 (70.1%) by Tetrofosmin SPECT. The hypoperfusion areas were assessed in 151 (60.6%) investigated segments during LDE and 60 (24.9%) segments without tracer uptake during Dipyridamole SPECT. We found agreement between results of both test in 81.1% segments (72% (p=0.01) report with LDE and 70% (p=0.01) report with SPECT. Sensitivity for detecting viability by LDE was 89.7%, specificity 90.3%, and diagnostic accuracy 85.5% comparing to Dipyridamole SPECT.

Conclusion: Tetrofosmin SPECT score index (WMSI) decreased from 1.61±0.38 at rest to 1.19±0.16 at the peak of Dobutamine infusion, in patients with viability confirmed with both techniques (t=8.6713; p<0.001). WMSI decreased less in patients with viable seg-

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