Poster Session 1116MP Moderated Poster Session...Contrast Echoangiography Prognosis for Improvement in Ventricular Performance Following Infarction of Intervention II

Monday, March 31, 2003, Noon-1:00 p.m.
McCormick Place, Hall A

Noon

1116MP-203
Intact Microvascular Integrity Predicts Improvement in Left Ventricular Function After Revascularization in Patients With Chronic Coronary Disease

Kim-Heng Tong, Todd Belck, Sali Khatkhat, Sanjiv Kaul, Kevin S. Wei, University of Virginia, Charlottesville, VA

Background: Identifying viability (V) in patients with left ventricular (LV) dysfunction and coronary artery disease (CAD) is important, as revascularization may improve LV function and outcomes. We hypothesized that the presence of microvascular integrity identifies patients with chronic LV dysfunction who will benefit from revascularization (R).

Methods: 90 patients with LV ejection fraction (EF) < 40% were enrolled. 2D echo was performed at baseline, 3, 6, and 12 months. End-diastolic (EDV) and systolic volumes (ESV) and LVbVt were measured. Microvascular integrity was assessed from regional perfusion during continuous infusions of Definity and intermittent ultraharmonic imaging from apical 4- and 3-chamber views, and scored in each of 16 myocardial segments as 1 - no enhancement, 2 - partial enhancement, 3 - full enhancement. A perfusion score index (PSI) was derived from (Total perfusion score/number of segments visualized). Patients with PSI > median were defined as viable, and the others as nonviable.

Results: Agreement between MCE and CMR for the identification of viable versus nonviable myocardium was 80% (kappa = 0.61). The correlation between MCE and contractile reserve was 0.80 (p < 0.0001) and that between CMR and contractile reserve was 0.69 (p < 0.0001). There was good correlation between MCE and CMR for the assessment of the extent of myocardial necrosis after AMI. Both techniques reliably predicted contractile reserve.

Methods: Fifty patients underwent low power continuous MCE using IV Optison® 7-10 days after reperfusion therapy with t-PA. The extent of necrosis was quantified by two blinded observers who used the contrast score index (CSI: 0&0.2 vs. 0.5-0.8, p<0.01; 0.5-0.8 vs. 0.9-1.0, p<0.001; 0.9-1.0 vs. 1.1-1.3, p<0.0001). The correlation coefficient between MCE and contractile reserve was 0.80 (p < 0.0001) and that between CMR and contractile reserve was 0.69 (p < 0.0001).

Conclusion: There was good correlation between MCE and CMR for the assessment of the extent of myocardial necrosis after AMI. Both techniques reliably predicted contractile reserve.

1116MP-206
Myocardial Contrast Echocardiography Using Low Power Continuous Imaging Early After Acute Myocardial Infarction Accurately Predicts Late Functional Recovery

Rajesh Janarthanan, Jonathan Swinburn, Kim Geaves, Roxy Senior, Northwick Park Hospital, Harrow, United Kingdom

Background: Microvascular perfusion is a pre-requisite for ensuring viability early after acute myocardial infarction (AMI). For adequate assessment of myocardial perfusion, both myocardial oxygen volume and velocity need to be evaluated. Low power continuous myocardial contrast echocardiography (MCE) can rapidly assess myocardial blood volume and velocity.

Methods: Fifty patients underwent low power continuous MCE using IV Optison® 7-10 days after AMI. Myocardial perfusion (contrast opacification assessed at 15 cardiac cycles after destructive imaging) and wall thickening were assessed at baseline. Regional and global left ventricular (LV) function was reassessed 12 weeks after AMI.

Results: Out of the 297 dysfunctional segments, MCE detected no contrast enhancement at 15 cardiac cycles in 172 segments. Of these 160 (93%) segments failed to show improvement. MCE demonstrated homogeneous contrast opacification in 77 segments, of which 65 (84%) showed recovery of function. Furthermore, the greater the extent and intensity of contrast opacification at baseline, the better the LV function at 12 weeks (p<0.001, r = 0.91). Almost all patients with <40% perfused, but dysfunctional myocardium failed to demonstrate functional recovery. Amongst clinical, biochemical, ECG and MCE parameters in the multiple regression analysis, only MCE (p < 0.001) and peak CK (p < 0.001) proved to be independent predictors of functional recovery.

Conclusion: Low power continuous MCE is an accurate and rapid bedside technique to identify microvascular perfusion post AMI. This technique may be utilized to reliably predict late recovery of function in dysfunctional myocardium after AMI.

1116MP-204
Predictor of the Extent of Myocardial Necrosis and Contractile Reserve After Reperfusion Therapy Following Acute Myocardial Infarction: Comparison Between Myocardial Contrast Echocardiography and Contrast Enhanced Cardiovascular Magnetic Resonance

Rajesh Janarthanan, James CG Moon, Dudley J. Pennell, Roxy Senior, Northwick Park Hospital, Harrow, United Kingdom, Royal Brompton Hospital, London, United Kingdom

Background: Both myocardial contrast echocardiography (MCE) and contrast enhanced cardiovascular magnetic resonance (CMR) can identify myocardial necrosis following acute myocardial infarction (AMI). We sought to compare the relative accuracy of these techniques in the assessment of the extent of myocardial necrosis post AMI and its impact on contractile reserve.

Methods: Twenty-five patients with AMI underwent low power continuous MCE using IV Optison® and gadolinium-DTPA enhanced CMR 7-10 days after reperfusion therapy with thrombolysis. Segments that demonstrated little or no contrast opacification on MCE or more than 50% delay in myocardial enhancement on CMR were defined as nonviable. Contractile reserve was evaluated 12 weeks later by an assessment of either resting systolic function or low dose dobutamine stress (for segments with persistent dyskinesy.)

Results: Agreement between MCE and CMR for the identification of viable versus necrotic myocardium was 92% (kappa = 0.01). The correlation between the two techniques for the detection of the number of necrotic segments was excellent (r = 0.84; p < 0.0001). The correlation coefficient between MCE and contractile reserve was 0.80 (p < 0.0001) and that between CMR and contractile reserve was 0.69 (p < 0.0001).

Conclusion: There was good correlation between MCE and CMR for the assessment of the extent of myocardial necrosis after AMI. Both techniques reliably predicted contractile reserve.

12:24 p.m.