POSTER SESSION

1100 Percutaneous Intervention: Pharmacologic and Biologic Adjuncts

Monday, March 08, 2004, 3:00 p.m.-5:00 p.m.
Morial Convention Center, Hall G
Presentation Hour: 3:00 p.m.-4:00 p.m.

1100-55 Intravenous Mesenchymal Stem Cell Therapy Early After Reperfused Acute Myocardial Infarction Improves Left Ventricular Function and Alters Ventricular Electrophysiologic Properties


Background: Direct intramyocardial injection of stem cells improves LV function. However, the injection of immature cells has been associated with an increased risk of ventricular arrhythmias. We hypothesized that the IV infusion of allogeneic mesenchymal stem cells (MSCs) without immunosuppression after acute MI would improve LV function but might be accompanied by pro-arrhythmic electrical remodeling.

Methods: An apical MI was induced in swine by balloon occlusion-reperfusion of the mid-LAD. Animals received either no treatment, or, 30 minutes after reperfusion, Dil-labeled allogeneic bone marrow derived MSCs (3.2±0.4 x 10^6 cells) were infused IV. LV function was evaluated by LV cineangiography and wall thickness by echocardiography. Epicardial effective refractory periods (ERPs) were determined at 3 month sacrifice. Spectral imaging by confocal microscopy was used to identify Dil in tissue specimens.

Results: At 3 months, MSC treated pigs (n=7) had significantly higher LVEF than controls (n=8) (50±1% vs 44±1%, p=0.015), as well as significantly higher LV systolic pressure (144±5 mmHg vs 119±6 mmHg, p=0.01). The mean increase in LVEFD over time tended to be greater in the control group (48±6cm/s vs 32±6cm/s, p=0.09). The wall thickness of normal, non-infarcted myocardium increased significantly more in controls than in treated animals. ERPs of the MSC group were significantly shorter than controls at all pacing cycle lengths in LV peri-infarct, LV free wall (FW), and right ventricular (RV) FW (225±6, 227±6, 225±6 ms, vs. 251±6, 247±7 ms, all p<0.002). The mean slope of the ERP restitution curves was steeper in the MSC group than in controls (1.6±0.8 vs 1.7±0.6 ms, p=0.002). Dil was identified in the lungs and myocardium of treated animals.

Conclusions: IV infusion of MSCs soon after reperfused acute MI in swine improves LV function, lessens compensatory hypertrophy of non-infarcted myocardium, shortens ERP, and steepens the ERP restitution curve. Clinical trials assessing the efficacy of IV MSC therapy after MI in humans should include arrhythmia monitoring.

1100-56 Comparison Between Intracoronary Infusion and Direct Transendocardial Injection of Mesenchymal Stem Cells in a Dog Acute Ischemia Model

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Background: Experimental data suggest that mesenchymal stem cell (MSC) therapy contributes to healing after acute myocardial infarction (AMI). The ideal route of administration is still controversial.

Methods: A total of 10 dogs were divided in three groups: a)Control n=3; b)Intracoronary (IC) n=3 and c) NOGA guided transendocardial injections (TEI) n=4. All animals had an anterior wall AMI induced by ligation of LAD artery for three hours and then reperfused. The animals received cell therapy (100 million MSCs/Osiris) 1 wk after AMI and were sacrificed 2 wks after cell therapy. 2D-echo was performed immediately before AMI, cell therapy and sacrifice. NOGA mapping was performed immediately before cell therapy and sacrifice. Ischemic area was measured by NOGA. ANOVA was performed.

Results: The 2D-echo findings concerning the fraction (EF) and diastolic dimension (EDD), end-systolic dimension (ESD), and ischemic area are presented in table 1. The TEI group had a statistically significant increase in EF (p<0.006), a reduction in EDD (p<0.04), a reduction in ESD (p=0.02), and more importantly a reduction in ischemic area (p=0.006) when compared to the control group. All the other comparisons did not reach statistical significance (p>0.05).

1100-6 Women Remain at Higher Risk for Retropertoneal Hematoma After Percutaneous Coronary Intervention in the Era of Glycoprotein IIb/IIIa Inhibitors and Vascular Closure Devices

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Background: The incidence, clinical features, and determinants of retropertoneal hematoma (RPH) after percutaneous coronary intervention (PCI) have been previously described. We examined these variables in the current era of widespread glycoprotein (GP) IIb/IIIa inhibitors and vascular closure devices (VCDs).

Methods: 3,230 PCI procedures were performed from January 2000 to August 2003. There were 22 cases of radiographically documented RPH. Cases were compared to a random sample of 60 controls using chi-square and logistic regression.

Results: The incidence of RPH was 6.8/1000 cases. Mean age±SD was 67±12 years in RPH vs. control, p=0.007. All cases had blood loss anemia and at least two of the above clinical features. Mean hospital stay was longer in RPH cases (2.2±1.3 vs. 1.7±1.5 days, p=0.06). The use of GP IIb/IIIa inhibitors and the VCD method of vascular closure did not have an effect on the risk of RPH. There was no association between RPH and autopsy of PCI (elective vs. emergent), duration of procedure, heparin dose, ACT level, arterial sheath size, insertion of a venous sheath, or prior femoral artery puncture. Female sex was most strongly associated with RPH (OR 4.2, 95% CI 1.7-14.5). Angiographic analysis revealed that a higher femoral artery puncture in relation to the femoral head (superior third of the femoral head and higher vs. mid third and lower) was also associated with RPH (OR 4.2, 95% CI 1.3-14.9).

Conclusion: With the widespread use of GP IIb/IIIa inhibitors and VCDs, being a woman remains a significant risk factor for RPH, as does a more superior femoral artery puncture. Awareness of the determinants and clinical features of RPH may aid in prevention, early recognition, and prompt treatment.