Poor Outcome in Subsets of Renal Failure Patients
Undergoing Coronary Artery Bypass Surgery: Mortality Results From a Cohort of 4,069 Patients
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Background: Renal failure increases mortality in CABG patients. We studied the effect on mortality of renal failure (creatinine 2mg/dl) - both non-dialysis dependent (NDDRF) and dialysis dependent (DDRF) - in high risk subsets of CABG patients.

Methods: This is a retrospective cohort study of 4069 consecutive adult patients who had CABG from 1993 to 2002. The mortality data was obtained from the National Death Index.

Results: The patient characteristics: age 67 ± 12 years, men 73% and LV ejection fraction (EF) 49% ± 16%. Over 3.9 years, 899 (22%) patients died. There were 3796 patients with normal renal function, and 273 (7%) with renal failure: 201 (5%) NDDRF and 72 (2%) DDRF. Patients with renal failure had a 5-year mortality of 56%, compared to 22% in patients with normal renal function (p=0.0001), with 50% in NDDRF, and 70% in DDRF. When corrected for the differences in the populations, both NDDRF and DDRF were independent predictors of mortality. In subset analysis, the 5-year mortalities in NDDRF and DDRF patients were even higher in patients with LVEF ≤40% (59 and 74%), age ≥65 years (60 and 70%) and redo-CABG status (64 and 100%). Besides renal dysfunction, LV dysfunction, advanced age and redo-CABG status were independent predictors of mortality.

Conclusions: 1) CABG patients with renal failure have a >50% mortality at 5-years, being higher in DDRF patients 2) In renal failure patients, LV dysfunction, advanced age, and redo-CABG status increase the 5-year mortality to prohibitive levels.

Echocardiography was performed at baseline and at 1, 2, 3 and 4 months of observation. In Group A, 20 μg/kg GM-CSF (bolus) was administered subcutaneously, daily, for 15 days.

The data was collected from the National Death Index.

Background: Lack of efficient regenerative capacity of the post-infarcted adult heart has prompted an intensive search for alternative sources of cells capable of repopulating the injured myocardium. In this study, we hypothesized that skin-derived epithelial progenitor cells (EPs) can engraft and express cardiac tropomyosin isoforms in adult rat hearts. The epidermis was removed from the ears of green fluorescent protein (GFP) transgenic C57 mice. Host non-transgenic C57 mice were given MI via open-chest left anterior descending coronary artery ligation. At the time of MI, GFP+ EPs or saline were injected at 2 sites near the infarct zone. Mice were sacrificed at 1, 3 and 6 weeks and immunofluorescence was performed on heart sections to detect GFP, cardiac, and myofilaments.

Conclusion: Skin-derived progenitor cells engrafted the infarcted myocardium to repopulate lost cardiomyocytes. The abundance, accessibility, and autologous nature of the skin may provide an exciting new therapeutic strategy for MI. ELISA and qPCR were used to assess the expression of cardiac-specific genes in the engineered hearts. The results indicated that the transgenic progenitor cells were capable of differentiating into cardiomyocytes in vivo, as evidenced by the detection of cardiac troponin I (cTnI) and α-actinin expression in the engineered myocardium.
Edaravone-early (2.5±1.8%) and Edaravone-immediately (3.2±1.8%) group compared with Edaravone-late (23.5±3.3%) and Edaravone-immediately (24.5±5.3%) were significantly lower than control group (p<0.01).[Results] 1)Infarct size as a percent of the area at risk in control was 42.8±5.2%. Edaravone-early and Edaravone-immediately group. [Conclusions] Single bolus administration of Edaravone before reperfusion significantly reduced both infarct size (2.5±1.8%) and myocardial necrosis (3.2±1.8%) compared to control group (23.5±3.3%) and Edaravone-late (24.5±5.3%) group respectively. The protective effects of Edaravone administration on post-ischemic myocardial injury were dose-dependent.

**Conclusion:** Pts. with AMI have increased CD34+, CD117+ and CD34+ precursor cell mobilisation after ischemic events. Acute myocardial infarction is a stimulus for CD117+ and CD34+ progenitor cell mobilisation and Epo may play a role in its regulation.

**Intracellular Calcium Regulates Tumor Necrosis Factor-Alpha-Induced Embryonic Stem Cell Migration**

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Background: Previously we have shown that after systemic injection of murine embryonic stem cells (ESCs), these cells home to the hearts of mice suffering from myocarditis. The purpose of this study was to visualize the migratory pattern of ESCs during TNF-α-induced chemotaxis and to test the association between intracellular calcium concentra- tion ([Ca2+]i) and ESC motility.

Methods: We used high speed optical sectioning microscopy to observe and record the behavior of ESCs. A direct viewing chemotaxis chamber with two concentric wells (Dunn chamber) allowed us to establish a linear concentration gradient of TNF-α. ESCs were suspended in a physiological buffer and maintained at 37 °C. Cell movement was monitored every two minutes over a three hour period, using concentrations of TNF-α of 2.0-10.0 ng/ml (n=45). Changes in [Ca2+]i were measured with the fluorescent dye fura-2/AM.

Results: At these concentrations of TNF-α we found that ESCs migrated towards TNF-α in a dose-related manner with mean rates of 1.3-3.6 µm/min. The total movement of the ESCs also varied with different concentrations of TNF-α. Furthermore, TNF-α induced the formation of pseudopodia, which in turn played an important role in migration and homing of stem cells.

Conclusion: These results demonstrate that ESCs are highly motile and respond to different concentrations of TNF-α in a dose related manner. Also, an increased [Ca2+]i has a positive effect on such a migration of ESCs. These mechanisms may play a critical role in heart-specific homing of ESCs, after systemic injection.

**The Role of Collateral Circulation in the Acute Phase of ST-Segment Elevation Myocardial Infarction Treated With Primary Coronary Intervention**

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Background: The role of collateral flow in the first hours of infarction remains unclear. Our aim was to determine whether angiographic evidence of coronary collateral flow has a beneficial effect on infarct size and left ventricular function in acute myocardial infarction (MI) treated with early primary coronary intervention (PCI).

Methods: Between 1994 and 2001 1074 patients with acute MI treated with early PCI, TIMI 0 or 1 flow at first contrast injection and technical adequate angiograms for collateral flow detection were analysed.

Results: Comparing collateral flow grade 0, 1 and 2/3, increased collateral flow was associated with lower incidence of Killip class ≥ 2 at presentation (12.2% versus 9.8% versus 4%, p for trend 0.01), decreased use of intra aortic balloon pumping (IABP) post-PCI (11.2% versus 25.2% versus 47%, p for trend 0.005), better clinical long term outcome (MUGA) (MUGA):21.2% versus 25.4% versus 29.2%, p for trend 0.04) and smaller enzymatic infarct size (LDH₉₀) (1947±1553 U/l and 1893±1549 U/l versus 1221±767 U/l, p<0.001). These beneficial effects are particular present in LAD related infarcts.

Conclusion: Presence of angiographically detectable collateral flow on enzymatic infarct size and pre- and post-intervention hemodynamic conditions in patients with acute MI treated with early PCI, in particular when Rentrop grade 2/3 is present and in LAD related infarcts.

**The Protective Effect of Edaravone on Myocardial Damage During Ischemia-Reperfusion in Rabbit Heart**

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Background: A free radical scavenger, edaravone has the ability to stimulate prostacyclin release, which may improve reperfusion and may have a beneficial effect on myocardial injury after ischemia-reperfusion injury. We hypothesized that edaravone attenuates myocardial damage in the ischemia-reperfusion rabbit heart.

Methods: All rabbits underwent sustained coronary artery occlusion (CAO) for 30 min followed by 180 min of reperfusion. 1)Control(n=8), 2)Edaravone-early (n=8, 3mg/kg i.v):10 min after reperfusion, 3) Edaravone-late:10 min after reperfusion, and Edaravone-late (n=8, 3mg/kg i.v):10 min after reperfusion were studied.

Infarct size was determined by TTC staining. The percentage of apoptosis cells (nuclear DNA fragmentation detection via fluorescence microscopy) was calculated and DNA ladder was prepared from the ischemic area.

Results: 1)Infarct size as a percent of the area at risk in control was 42.8±6.5%. Edaravone-early (23.5±3.3%) and Edaravone-late (24.5±5.3%) were significantly reduced infarct size (p<0.01) compared with control group. However, when edaravone was present 5 min after reperfusion, protection was completely abolished (39±6.4% vs. 28±4.2% for control). 2) The findings of DNA fragmentation were significantly(p<0.01) decreased in Edaravone-early (2.5±1.8%) and Edaravone-late (3.2±1.8%) group compared with control (15±3.9%) and Edaravone-late (13±3.3%) .DNA laddering were attenuated in Edaravone-early and Edaravone-late immediately group.

Conclusions: Single bolus adminis-