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Titel des Beitrags: Local erythropoietin and endothelial progenitor cells improve regional cardiac function in acute myocardial infarction.

Abstract: Expanded endothelial progenitor cells (eEPC) improve global left ventricular function in experimental myocardial infarction (MI). Erythropoietin beta (EPO) applied together with eEPC may improve regional myocardial function even further by anti-apoptotic and cardioprotective effects. Aim of this study was to evaluate intramyocardial application of eEPCs and EPO as compared to eEPCs or EPO alone in experimental MI. In vitro experiments revealed that EPO dosed-dependently decreased eEPC and leukocyte apoptosis. Moreover, in the presence of EPO mRNA expression in eEPC of proangiogenic and proinflammatory mediators measured by TaqMan PCR was enhanced. Experimental MI was induced by ligation and reperfusion of the left anterior descending coronary artery of nude rats (n = 8-9). After myocardial transplantation of eEPC and EPO CD68+ leukocyte count and vessel density were enhanced in the border zone of the infarct area. Moreover, apoptosis of transplanted CD31 + TUNEL + eEPC was decreased as compared to transplantation of eEPCs alone. Regional wall motion of the left ventricle was measured using Magnetic Resonance Imaging. After injection of eEPC in the presence of EPO regional wall motion significantly improved as compared to injection of
eEPCs or EPO alone. Intramyocardial transplantation of eEPC in the presence of EPO during experimental MI improves regional wall motion. This was associated with an increased local inflammation, vasculogenesis and survival of the transplanted cells. Local application of EPO in addition to cell therapy may prove beneficial in myocardial remodeling.