THE EFFECTS OF ENDOTHELIAL PROGENITOR CELL TRANSPLANTATION ON MYOCARDIAL INFARCTION IN MICE

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Objectives Endothelial progenitor cells (EPC) are thought to be engaged in neovascularisation after myocardial infarction (MI). In most cases, however, autologous EPC seem to be insufficient for recovery. EPC transplantation is a promising therapy for MI. The purpose of the present study was to explore the potential mechanism in EPC transplantation after MI.

Methods Mononuclear cells were obtained from enhanced green fluorescent protein (EGFP) transgenic BALB/c mice. Cells were induced cultured, identified for EPC and transplanted into the border zone of infarct myocardium. Frozen sections of myocardium were inspected for EGFP positive cells 7 days after transplantation. Expressions of stromal cell-derived factor-1 α (SDF-1 α) and vascular endothelial growth factor (VEGF) in the border zone were measured 3 days after surgery. Microvessel density and fibrosis in the border zone as well as cardiac function were assessed 4 weeks after surgery.

Results EGFP positive cells formed circular structures 7 days after transplantation. Compared with vehicle, the expressions of SDF-1 α and VEGF in the border zone were enhanced 3 days after EPC transplantation (p<0.05, p<0.01 respectively). Microvessel density was increased and fibrosis was decreased in the border zone 4 weeks after EPC transplantation (p<0.05, p<0.01 respectively). Fractional shortening was higher with smaller left ventricular end-diastolic dimension and end-systolic dimension after EPC treatment compared to vehicle (p<0.05).

Conclusions EPC transplantation could improve cardiac function and ameliorate cardiac remodelling after MI in mice via participation in neovascularisation and paracrine effects of SDF-1 α and VEGF.