[gw22-e0951]

EXPERIMENT STUDY ON ROLE OF CARDIAC TISSUE MASS CULTURED EX VIVO POST-MI ON MSC MIGRATION

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10.1136/heartjnl-2011-300867.658

Background MSCs have the potential to improve cardiac function, but the mechanisms of MSCs homing to heart post-implantation are not completely clear.

Objective To investigate the role and possible mechanisms of cardiac tissue mass cultured ex vivo which isolated from myocardial infarction rats on MSC migration. DESIGN, TIME AND SETTING: An observational experiment in vitro based on cells and tissues was conducted at the Chongqing Key Laboratory of Neurology between May 2009 and December 2009.

Methods Rats' myocardial infarction models were established and cardiac tissue masses were cultured. MSCs were isolated from bone marrow of SD rat by density gradient centrifugation and adherence screening method and were labelled with DAPI. A transwell model was used to co-culture for 48 h. MAIN OUTCOME MEASURES: Quantitative cell count under fluoroscope was conducted on migrating cells. Qualitative surface markers CD44 and CD34 were tested using immunohistochemistry and vitality of MSCs transmigration to undersurface of poly-carbonic acid membranes were tested by viola crystalline staining. Immunofluorescent staining was used to evaluate CXCR4 expression on MSCs. Immunohistochemistry staining was used to detect expression of SDF-1 on cardiac sections.

Results Number of MSCs transmigrating in MI group and Sham group is 22.50±1.44 and 12.29±1.89 respectively. Compared with Sham group, it is statistically significant ($p<0.05$). No cell was observed in NC group. Migrating cells with CD44-positive but CD34-negative expression are consistent with MSC characteristic. The membrane molecular CXCR4 was positively expressed on the migrating cells. SDF-1-positive expression was observed on cardiac tissue sections both in MI and Sham group rather than in NC group. Compared with Sham group, the optical density (OD) value was higher in MI group.

Conclusion Rats' cardiac tissue post-MI could promote migration of MSCs which might be relevant to SDF-1-CXCR4 axis.