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Original Article

Comparison Between Transepicardial Cell Transplantations: Autologous Undifferentiated Versus Differentiated Marrow Mesenchymal Stem Cells

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Abstract:

Background: *Marrow-derived mesenchymal stem cells (MSCs) have been heralded as a source of great promise for the regeneration of the infarcted heart. There are no clear data as to whether or not in vitro differentiation of MSCs into major myocardial cells can increase the beneficial effects of MSCs. The aim of this study was to address this issue.*

Methods: *To induce MSCs to transdifferentiate into cardiomyocytes and endothelial cells, 5-Azacytidine and vascular endothelial growth factor (VEGF) were used, respectively. Myocardial infarction in rabbits was generated by ligating the left anterior descending coronary artery. The animals were divided into three experimental groups: I) control group, II) undifferentiated mesenchymal stem cell transplantation group, and III) differentiated mesenchymal stem cell transplantation group. The three groups received peri-infarct injections of culture media, autologous undifferentiated MSCs, and autologous differentiated MSCs, respectively. Echocardiography and pathology were performed in order to search for improvement in the cardiac function and reduction in the infarct size.*

Results: *Improvements in the left ventricular function and reductions in the infarcted area were observed in both cell transplanted groups (Groups II and III) to the same degree.*

Conclusions: *There is no need for prior differentiation induction of marrow-derived MSCs before transplantation, and peri-infarct implantation of MSCs can effectively reduce the size of the infarct and improve the cardiac function.*

Keywords:

Myocardial infarction ، Stem cell ، Bone morrow ، Differentiation

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