

Effect of degradable fibrin glue transmitting vascular endothelial growth factor on the neoangiogenesis of myocardial infarction tissues. [Chinese]

Authors: Adila A., Ma X., Liu F., Chen B.-D., Ma Y.-T.

Publication Date: 2008

Abstract:

Background: Vascular endothelial growth factor (VEGF) may promote the neoangiogenesis of myocardial infarction (MI) tissues. However, it is inapplicable to transmit VEGF through the systemic intravenous infusion, and repeated direct myocardial injection induces the damage of normal myocardial structure. Objective: To approach the possibility of VEGF transplantation via degradable fibrin glue on promoting the neoangiogenesis in the MI and ischemic regions, and to observe the variation of heart function of rat models. Design, time and setting: A randomized control animal experiment was carried out in the Coronary Heart Disease VIP Laboratory of the First Affiliated Hospital of Xinjiang Medical University from January 2007 to April 2008. Materials: The recombination protein VEGF121 was constructed by using resin chromatography method to obtain VEGF fibrin glue. Twenty-eight SD rats of 9 weeks old were adopted in this study. Thirteen of them were processed into the ligation of left anterior descending coronary artery, taken as MI group, whereas other 15 animals received the opening of pericardium only, taken as non-MI group. Methods: Immediately following the induction of MI, the VEGF gel and blank gel in the MI group were transplanted into the infarct regions, while those of the non-MI group binded to the anterior wall of left ventricle, and another three rats were untreated, serving as the controls. Main outcome measures: The heart function was detected by echocardiography after 4 weeks posttransplantation, then the rats were sacrificed, and the harvested hearts were determined for the immunohistochemistry and blood vessel measurement analysis. Results: The capillary density of the rats transplanted with VEGF gel in the MI and non-MI groups was significantly higher than that in the blank gel group ($P < 0.001$); And the capillary density of ischemic region was significant higher than that of septum region ($P < 0.01$). VEGF gel transplantation could improve the heart function of the rats, but no significant differences were found ($P = 0.248.2$). Conclusion: The degradable materials can transplant VEGF to the non-MI and MI regions in rats, and regenerate obviously the capillary density; It is feasible to transmit vaso regeneration factor to myocardium using fibrin glue.