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HEPATOCYTE GROWTH FACTOR GENETICALLY MODIFIED BONE MARROW-DERIVED MESENCHYMAL STEM CELLS TRANSPLANTATION PROMOTES ANGIOGENESIS IN A RAT MODEL OF HINDLIMB ISCHAEMIA

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Objectives Angiogenic gene therapy and cell-based therapy for peripheral arterial disease (PAD) have been studied intensively

currently. This study aimed to investigate a new strategy whether combining mesenchymal stem cells (MSCs) transplantation with ex vivo human hepatocyte growth factor (HGF) gene transfer was more therapeutically efficient than the MSCs therapy alone in a rat model of hindlimb ischaemia.

Methods One-week after establishing hindlimb ischaemia models, Sprague-Dawley rats were randomised to receive HGF gene-modified MSCs transplantation (HGF-MSC group), untreated MSCs transplantation (MSC group), or PBS injection (PBS group), respectively.

Results Three-weeks after injection, angiogenesis was significantly induced by both MSCs and HGF-MSCs transplantation, and capillary density was the highest in the HGF-MSC group. The number of transplanted cell-derived endothelial cells was greater in HGF-MSC group than in MSC group after 1 week treatment. The expression of angiogenic cytokines such as HGF and VEGF in local ischaemic muscles was more abundant in HGF-MSC group than in the other two groups. In vitro, the conditioned media obtained from HGF-MSCs cultures presented proproliferative and promigratory effects on endothelial cells.

Conclusions HGF gene-modified MSCs transplantation therapy may induce more potent angiogenesis than the MSCs therapy alone. Engraftment of MSCs combined with angiogenic gene delivery maybe a promising therapeutic strategy for the treatment of severe PAD.