

New Approach Of Bone Marrow-Derived Mesenchymal Stem Cells And Human Amniotic Epithelial Cells Applications In Accelerating Wound Healing Of Irradiated Albino Rats

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Abstract

BACKGROUND AND OBJECTIVES:

Irradiated wound healing is a highly complex and dynamic process. The latest technology making a huge difference in this process is stem cell therapy. The goal of this study was to evaluate the use of bone marrow-derived mesenchymal stem cells (BM-MSCs) or human amniotic epithelial cells (HAECs) in the healing of irradiated wounds.

METHODS AND RESULTS:

Forty five male albino rats were subjected to whole body 6 gray gamma radiations. One day post irradiation, full-thickness incisional wound was created in the tibial skin. The rats were randomly equally divided into three groups. The incisions of the first group (gp I) were injected intra-dermally with saline before stitching and those of both the second (gp II) and the third groups (gp III) were intradermally injected with BM-MSCs and HAECs before stitching respectively. Animals were sacrificed after the third, seventh and fourteenth days postoperative. The healing process was assessed histopathologically. CXCL-5, SDF-1 and Transforming growth factor-beta 1 (TGF- 1) expression were also detected in biopsies from all wounds. Expression of TGF- 1 in gp I was more than the other groups leading to severe inflammation, deficient healed dermis and delayed reepithelialization. SDF-1 expression was high in gp II while CXCL-5 expression was high in gp III causing accelerated wound healing. BM-MSCs showed a great effect on the quality of the dermis, while superiority of the epithelium and its appendages were achieved in HAECs group.

CONCLUSIONS:

Using BM-MSCs and HAECs could be used safely in case of irradiated wounds

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