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 & 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 is 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 & 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 1) were injected intra-dermally with saline before stitching and those of both the second (gp 2) and the third group (gp 3) 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-B1) expression were also detected in biopsies from all wounds. Expression of TGF-B1 in gp 1 was more than the other groups leading to severe inflammation, deficient healed dermis and delayed reepithelization. SDF1 expression was high in gp 2 while CXCL-5 expression was high in gp 3 causing accelerated wound healing.

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

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