

Oral presentation

Treatment of Diabetic Wound Healing: Application of Bone Marrow Mesenchymal Stem cells

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Abstract

Background:

Accelerating wound healing is now considered as a principle clinical treatment and increasing the quality and speed of healing which has always been emphasized by the scientists. Wound healing is a process that occurs after skin injury .One of the medical science objectives is attempting to heal a wound in a shorter time span, with fewer side effects. Clinicians have been searching for ways to obtain "super normal" wound healing. MSC populations in cells derived from Bone Marrow tissue has been studied as an alternative source of MSCs, providing multipotent differentiation . We aimed to evaluate the wound contraction and stem cell properties on managing full-thickness wounds in vivo.

Methods: This experimental study was carried out on 54 adult male diabetic Wistar rats weighing 200-250 gr, and ages of 3-4 months. A square 1.5*1.5 wound was made on the back of the neck. The rats were divided into control and two experimental groups. Additionally, the control and experimental groups were separated into three subgroups corresponding to 4, 7, and 14 days of study. Mesenchymal stem cells isolated from BONE MARROW, Cell collected and cultured. The control group did not receive any treatment. In first experimental group, MSCs was used once on the wound. The second experimental group received 1% phenytoein cream on the wound. For histological studies, samples were taken from the wound and adjacent skin. This tissue was examined using histological staining (H&E). Wound surface and wound healing were evaluated. Data were analyzed by using one-way ANOVA with post hoc Tukey test and ($P<0.05$) was significant.

Results: The results of microscopic study showed histological parameters in wounds bed (the number of fibroblasts, blood vessels, neutrophils and macrophages) in the experimental group were significantly different than the control group. The macroscopic and microscopic evaluations showed that the percentage of wound healing on different days in the control and experimental group were significant ($P< 0.05$).

Conclusion: The beneficial activity of MSCs in wound healing is complemented by the effects of growth factors and ECM produced by the native placenta tissue cells. Using Mesenchymal stem cells on open wounds will accelerate the healing process.

Key words: Diabetic wound healing, Open skin wound, Rat, Mesenchymal stem cells