Histological study on the possible curative effect of platelet-rich plasma on different skin lesions induced in adult male albino rats

Review Article

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ABSTRACT

Background: Platelet rich plasma (PRP) is considered a fraction of plasma with a large number of platelets compared to whole blood. Platelets act as a rich source of growth factors promoting wound-healing and cytokines such as vascular endothelial growth factor (VEGF), transforming growth factor-β (TGF-β), platelet-derived endothelial cell growth factor (PDGF).Diabetic wounds are a significant burden on diabetic patients as they don't readily respond to conventional wound treatments. Recent researches are focusing on finding an appropriate and cost effective treatment for managing the diabetic skin wounds. On the other hand, burn is a major cause of traumatic injury to the human body causing tissue damage. It primarily affects the skin and mucous membranes. After a burn injury, infection and organ damage are the most common causes of death.

Aim of the Work: The aim of this study was to assess the possible curative effect of PRP on different skin injuries like diabetic skin wounds and skin burns.

Materials and Methods: The diabetic skin wounds study included 30 adult male Albino rats with an average body weight of 150 - 200 gm. They were divided into the following groups: Control group (10 rats): healthy rats without wounds induction or diabetes. Group I (10 rats): diabetic rats with non-treated skin wounds, wounds were treated with local saline injections 500 µL at wounds margins and dressings of sterile gauze. Group II (10 rats): diabetic rats with PRP treated skin wounds, wounds were treated with local PRP injections at wounds margins 500 µl as a single dose. Each group was subdivided into 2 subgroups A and B according to the time of scarification after 14 and 21 days respectively.

The burn study included 30 male albino rats they were divided into the following groups: Control group (6 rats): healthy rats without 2nd degree skin burn wound induction. Group I (12 rats): rats with 2nd degree skin burn wounds were subdivided equally into 2 subgroups: 2a which was sacrificed at day zero to confirm the induction of 2nd degree skin burn and 2b where wounds were treated with local saline injections 500 µL at wounds margins and then sacrificed after one week. Group II (12 rats): rats with treated 2nd degree skin burn wounds: rats were injected intradermally by 500 µL of PRP in saline solution, then rats were sacrificed after one week.

Results: In both studies the treatment groups with PRP showed a significant improvement in wound closure, epidermis regeneration, increased collagen deposition and increased E-cadherin immune reactivity as compared to the non -treated groups.

Conclusion: The treatment with PRP on diabetic skin wounds and skin burns showed a rapid rate of wound healing regarding the epidermis regeneration, keratinocytes morphology, establishment of cell junctions and collagen deposition in the regenerated dermis.

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