

Autologous Skin Cell Therapy for Diabetic Ulcers and Trauma Injuries: A Pilot Clinical Trial at a Single Center

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INTRODUCTION:

This research presents an innovative method for wound care by utilizing suspensions of autologous skin cells, including keratinocytes and fibroblasts, in a 10% platelet-rich plasma (PRP)-enriched medium to promote the healing of full-thickness skin wounds. The approach aims to address the limitations of split-thickness skin grafts, such as trauma, pain, scarring, and the need for large donor sites, by harnessing the patient's own skin cells and PRP, which can be harvested at the bedside.

MATERIALS & METHODS:

This study is conducted at Hospital Canselor Tuanku Muhriz from December 2021 to December 2023. This is a prospective, single-center clinical trial included seven participants in which five with diabetic wounds and two with traumatic wounds. The clinical outcomes were assessed for up to 12 weeks.

RESULTS:

The research revealed no significant difference in the healing rates between diabetic foot ulcers (DFU) and traumatic wounds. However, there was a significant reduction in wound size observed after 10 days ($p < 0.03$). Further examination within the groups indicated a significant decrease in ulcer size in DFUs at 21, 49, and 77 days post-treatment, while trauma wounds exhibited significant size reduction after 5 days (from 22008.0 ± 1599.350 to 1782.0 ± 1659.600 mm², $p < 0.05$). The study did not identify significant changes in CRP and tWBC levels post-treatment, suggesting a low risk of infection. Notably, there was a significant reduction in VAS pain scores observed as early as five days post-treatment.

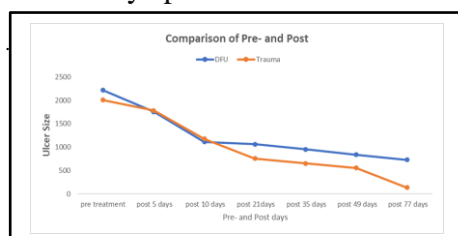


Figure 1: Comparison of ulcer size pre and post treatment



Figure 2: a) wound size pre-treatment, b) post-5 days, c) post 10 days, d) post 35 days e) complete wound healing post 77 days.

DISCUSSIONS:

Wound healing in diabetic patients presents a complex challenge, often characterized by a considerably slower process due to compromised immune systems. Nonetheless, over 80% of diabetic foot ulcers (DFUs) and 90% of traumatic wounds witnessed reductions in size after 11 weeks, with no significant difference observed in healing rates. This underscores the efficacy of the 'Skin Cell Drop' method in DFUs, comparable to its effectiveness in traumatic wounds, and without the risk of infection. Moreover, the reduction in VAS pain scores aligns with previous findings highlighting the potential benefits of PRP in alleviating pain.

CONCLUSION:

This study's findings affirm the safety and efficacy of the 'Skin Cell Drop' treatment for healing full-thickness skin wounds in both diabetic foot ulcer (DFU) and trauma patients. By surmounting various limitations associated with split-thickness skin grafts (SSG), this method presents a promising alternative autologous therapy option.

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