

Skin Wound Healing in Diabetic Cutaneous Wounds after Topical Application of Aloe Vera Gel and Transforming Growth Factor- β (TGF- β) expression

*Nasrin Takzaree, Alireza Partoazar, Hamidreza Barikani, Alireza Takzaree, Masoumeh Majidi Zolbin

*Department of Anatomy and Histology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.

takzaree@sina.tums.ac.ir

Abstract:

Background: One of the most important issues in medical sciences is wound healing and repair. Application of natural ingredients and herbs for treating ulcers has been in the history of human life. Aloe Vera is a medicinal plant used to treat various skin diseases. The effects of using Aloe Vera gel on the healing process were investigated by microscopic methods, cell counting, and TGF- β gene expression in the wound bed. In this study we evaluated, effects of aloe vera gel on the Diabetic wound healing through the microscopic techniques and cell counting.

Methods&Materials:

In this experimental study, Diabetes was induced through intraperitoneally injection of Streptozocin (STZ), sixty 60 Wistar rats weighing 200-250 grams were placed under general anesthesia in sterile conditions. 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. In 1st experimental group, Aloe Vera was used twice on the wound. The 2nd experimental group received Aloe Vera over treatment once on the wound. The positive control group did not receive any treatment. For histological studies, samples were taken from the wound and adjacent skin. This tissue was examined using histological staining (H&E) and Masson's Trichrome. Wound surface and wound healing were evaluated separately. TGF- β gene expression was analyzed by RT-PCR.

Results: The macroscopic and microscopic evaluation showed that wound healing increased because the fibroblast numbers in two experimental groups improved compared with control group. The percentage of wound healing on different days in the experimental and control groups were significant. Data were analyzed by using one-way ANOVA test and $P < 0.05$ was significant.

Discussion&Conclusion: Present study showed that the twice application of topical aloe vera mucilage can result in rapid wound healing in rats. Application of Aloe Vera gel will increase TGF- β gene expression, ultimately accelerating the wound healing process.

Key words: Diabetic Wound healing, Aloe Vera gel, Open skin wound, TGF- β