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Effect of Active Ceramic Resources in Cutaneous Wound Healing and Expression of its Related Cytokines

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Introduction

Cutaneous wound healing is a highly orchestrated process comprising a number of well-defined temporally overlapping phase. These include the migration of inflammatory cells to the wound site, and re-establishment of an epithelial barrier (re-epithelization), and the deposition of matrix by fibroblast [1]. We attempt to find out that active ceramic resources has effects on cutaneous wound healing. And furthermore, we investigate its related mechanism and expression of cytokines of cutaneous wound healing which is accelerated by active ceramic resources.

Materials and Methods

After anesthesia, a four quadrilateral full-thickness wound were made on the back of each rat. Each rats had following four treatment lesions and as follows; (a) Plain lesion; Plain ointment treat, (b) 5% KO lesion; 5% active ceramic resources based with plain oint, (c) 10% KO lesion, (d) 15% KO lesion. After treat, there are examined that the wound contraction rates, histopathological findings and immunohistochemical findings(p-Smad2/3, TGFβ1, Smad3).

Results

Topical applied KO(5%, 10% and 15%) lesions were found to accelerate wound closure, re-epithelization, and its related cytokine(p-Smad2/3) was suppressed. Especially, 10%, 15% KO lesions were accelerate wound closure significantly at day 3, 4 post-wounding and its related p-Smad2/3 was also suppressed. All KO lesions were accelerated mildly wound closure at day 6 post-wounding, but it has no significance.

Discussion

Several paper show that Smad3 may mediate *in vivo* signaling pathways that are inhibitory to wound healing, as its deletion leads to enhanced re-epithelization and contration wound area. [2]. This study shows that topical active ceramic resources oint application accelerated wound closure, re-epithelization and p-Smad2/3 suppression. This is revealed that suppression of p-Smad2/3 induced by active ceramic resources effects re-epithelization, and cutaneous wound closure.

Conclusively, active ceramic resources has effects in cutaneous wound healing by acceleration of re-epithelization of keratinocytes and depression of its related cytokine, p-Smad2/3.

References

1. **Singer, A. J. N.** Engl. J. Med. 1999, **341**, 738-746.
2. **Ashcroft G. S.** Nature Cell Biol. 1999, **1**, 260-266.