

rhGM-CSF(Leucogen)

1, 2, 3
2 1 3 1 1 1 1 2 1

The healing effect of rhGM-CSF on uninfected wounds

Seung Kyu Han², Byung Soo Kim¹, Aeree Kim³, Jae Hong Seo¹, Chul Won Choi¹,
Sang Won Shin¹, Yeul Hong Kim¹, Woo Kyung Kim², Jun Suk Kim¹

Department of Internal Medicine¹, Plastic Surgery², and Pathology³, School of Medicine, Korea University, Seoul, Korea

Background: rhGM-CSF has been shown to enhance the migration and proliferation of endothelial cells and to promote keratinocyte growth. This study was tried to evaluate the effect of rhGM-CSF dressing on the uninfected wounds. **Methods:** Thirty Sprague-dawley white mice(250-300g) were selected in this study. The number of wound with the diameter of 5 mm, was 3 in left and 3 in right at the symmetric sites, respectively. The site of rhGM-CSF dressing was decided by a randomization. rhGM-CSF(Leucogen) was diluted in the distilled water(5 μg/mL). The experimental wound group was dressed by 1 mL of distilled water mixed with rhGM-CSF and control wound group was dressed by 1 mL of distilled water. The dressing was done, every 24 hours. The criteria of comparison were the duration of wound healing duration, histologic findings and the bacterial culture of wound sites. **Results:** The duration of wound healing was 10.3± 1.7 days in experimental group and 10.2± 2.8 days in control group, without significant difference. There was no specific difference of histologic findings between both groups. The pathogen was not found, at all. **Conclusion:** It seems to be that rhGM-CSF has no prominent effect on the uninfected wound healing in the mice without immune suppression.

Key Words: rhGM-CSF, uninfected wound healing

가
(dendritic cells) ,
가 recombinant human
(rh) GM-CSF 가 (1-8)
, rhGM-CSF
, rhGM-CSF가
, rhGM-CSF 가

가 가
 1. Sprague-dawley (250-300 g) 30 rhGM-CSF dressing
 6 (Fig 1). pentobarbital sodium (Entobar) 2 mg/100g punch biopsy , 5 mm rhGM-CSF

2. rhGM - CSF

rhGM-CSF(Leucogen) 3 5 μ g/mL
 4 15
 rhGM-CSF
 3 1mL 3
 1mL 3
 가



Fig. 1. This figure is the gross appearance of a Sprague-dawley white mouse with six punched wounds on the back.

Saline tape(Opsite)
 24
 3. 가
 가
 가
 rhGM-CSF가
 2
 3
 rhGM-CSF가

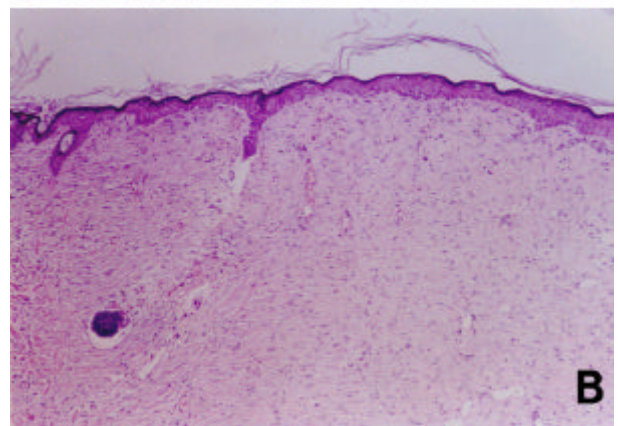
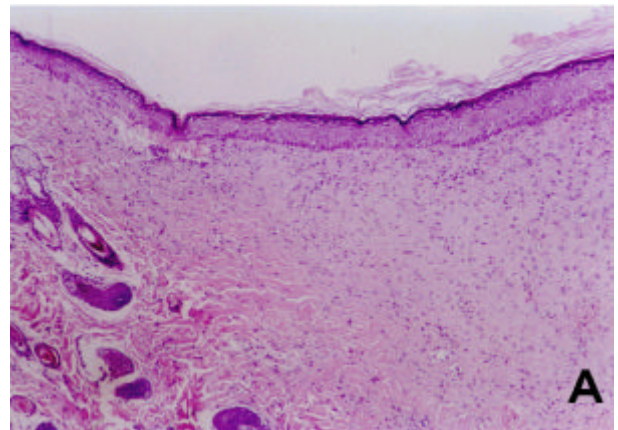


Fig. 2. (A) This figure is the microscopic findings(H&E Stain, X40) of the wounds at 3 days after dressing of the GM-CSF dressed experimental group. (B) This figure is the microscopic findings(H&E Stain, X40) of the wounds at 3 days after dressing of the GM-CSF undressed control group.

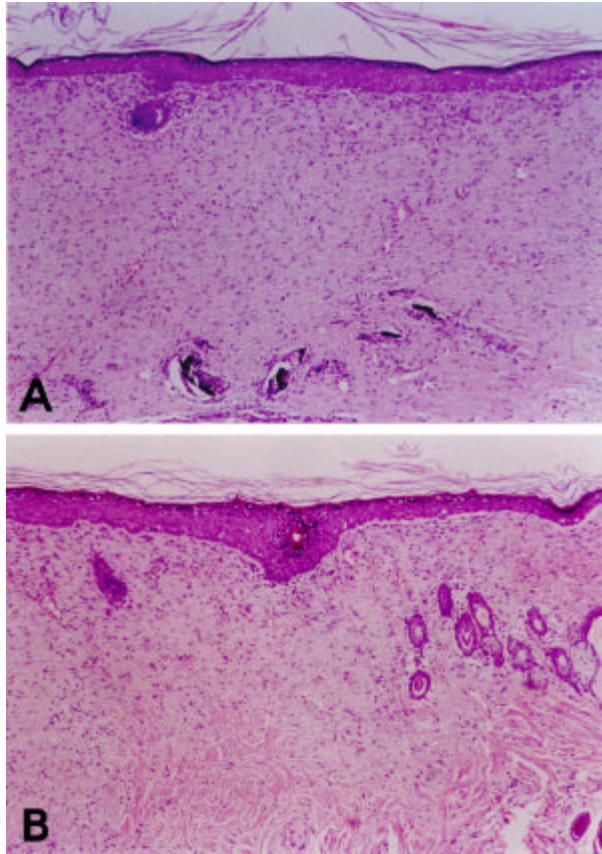


Fig. 3. (A) This figure is the microscopic findings(H&E Stain, X40) of the wounds at 6 days after dressing of the GM-CSF dressed experimental group. (B). This figure is the microscopic findings(H&E Stain, X40) of the wounds at 6 days after dressing of the GM-CSF undressed experimental group.

(Fig. 2, 3).

rhGM-CSF가
keratinocyte 가

(1-3), rhGM-CSF 가

rhGM-CSF (4).

. Arnold (5) 10
2 rhGM-CSF 50
μ g 4
가 , Marques (6)
40
rhGM-CSF 400 μg

rhGM-CSF 가

. hydroxyurea
rhGM-CSF
Stagno (7)

가 rhGM-CSF가 가 가 가

rhGM-CSF (2,8).

Grazybowski (8)

Pseudomonas
rhGM-CSF가 dressing
dressing

rhGM-CSF가 가

가 10.3 ± 1.7 , 가 10.2 ± 2.8
가

가

± ()

Paired t test P 0.05

가

가 가

punch biopsy
rhGM-CSF

가

20 10

가 가

rhGM-CSF

가 가

rhGM-CSF

5 μg/mL
rhGM-CSF

가 가 가

rhGM-CSF(Leucogen)

LG

- macrophage colony-stimulating factor and granulocyte colony-stimulating factor: Differential action on incisional wound healing. *Surgery* 115;325-334, 1994
2. Kucukcelebi A, Carp SS, Hayward PG, Hui P-S, Cowan WT, Ko F, Cooper DM, Robson MC: Granulocyte-macrophage colony stimulating factor reverses the inhibition of wound contraction caused by bacterial contamination. *Wounds* 4;241-246, 1992
 3. Vyalov S, Desmouliere A, Gabbiani G: GM-CSF--induced granulation tissue formation: Relationships between macrophage and myofibroblast accumulation. *Arch B Cell Pathol* 63;231-239, 1993
 4. Braunstein S, Kaplan G, Gottlieb AB, Schwartz M, Walsh G, Abalos RM, Fajardo TT, Guido LS, Krueger JG: GM-CSF activates regenerative epidermal growth and stimulates keratinocyte proliferation in human skin *in vivo*. *J Invest Dermatol* 103;601-605, 1994
 5. Arnold F, O'Brien J, Cherry G: Granulocyte monocyte-colony stimulating factor as an agent for wound healing. *J Wound Care* 4;400-402, 1995
 6. Marques da Costa R, Jesus FM, Aniceto C, Mendes M: Double-blinded randomized placebo-controlled trial of the use of granulocyte-macrophage colony-stimulating factor in chronic leg ulcers. *Am J Surg* 173;165-168, 1997
 7. Stagno F, Guglielmo P, Consoli U, Fiumara P, Russo M, Giustolisi R: Successful healing of hydroxyurea-related leg ulcers with topical Granulocyte-macrophage colony-stimulating factor. *Blood* 94;1479-1480, 1999.
 8. Grzybowski J, Janiak MK, Oidak E, Lasocki K, Jolanta W-W, Cheda A, Malgorzata A-B, Pojda Z: New cytokine dressing . Stimulation of oxidative burst in leukocytes *in vitro* and reduction of viable bacteria within an infected wound. *Int J Pharmacol* 184;179-187, 1999

1. Jyung RW, Wu L, Pierce GF, Mustoe TA: Granulocyte-