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ROLE OF RECOMBINANT HUMAN EPIDERMAL GROWTH FACTOR IN WOUND HEALING OF CHRONIC LEG ULCERS

General Surgery

Dr. Reddi. Hemanthi* M.S., Associate professor of general surgery, SV Medical College, Tirupati
*Corresponding Author

ABSTRACT

Background: We conducted a study to assess the efficacy of EGF in accelerating the healing of chronic leg ulcers
Methods: In a single-blind, placebo-controlled clinical trial, 50 patients,(24 women and 26 men, age range: 25–75 years) were treated with topical EGF, and 50 controls (31 men, 19 women, age range: 28–72 years) were treated with normal saline dressing. Both groups were otherwise treated by wound debridement and irrigation with normal saline solution, systemic antibiotic therapy and daily wound dressing. The treatment and follow-up period was 6 weeks.
Results: After 6 weeks, average wound closure in the treatment group was significantly greater than in placebo (84% vs 26% p = 0.03). Complete wound closure as a result of treatment was observed in 12 patients in EGF group and in 2 patients from the Placebo group.This study demonstrates a potential effect of topical EGF in significantly speeding up wound healing in chronic leg ulcers.

KEYWORDS

rh EGF,chronic leg ulcers,wound healing.

Introduction:
Chronic leg ulcer is a silent epidemic affecting major portion of world population with estimated prevalence of 4.48/1000 population in India.Common chronic leg ulcers are venous,diabetic,ischaemic and decubitus ulcers.Management of these ulcers is a challenging task due to the local and systemic factors causing delayed wound healing.

Wound healing is a complex series of biological events involving re-epithelialization and granulation that are mainly mediated by several endogenously released growth factors such as epidermal growth factor (EGF), fibroblast growth factor (FGF) and transforming growth factor beta (TGFβ). Of these growth factors, EGF appears to be the most important. EGF promotes the proliferation and differentiation of mesenchymal and epithelial cells.

We conducted a study on 100 patients to assess the efficacy of recombinant human epidermal growth factor(rh EGF) in promoting wound healing in chronic ulcers.

Methods:
100 patients with chronic leg ulcers of size less than 25sq.cm and duration more than 6 weeks at initial presentation were randomly allotted to cases and control arms,with 50 members in each group.

Patients enrolled in cases arm were treated with EGF 1gm/10cm2 and evaluated once every week for 6 consecutive weeks with respect to wound size and severity,the presence of granulation tissue, edema, erythema and infection.Those in control group received only normal saline dressing. Patients in both the EGF and placebo groups had their wounds washed with normal saline and dressed every day. Wound dressing consisted of sterile gauze and adhesive tape only. No disinfecting solution, such as betadine, was used. EGF or placebo dressing was applied once a day, every day, for 42 consecutive days. Wound length and width was measured (in cm) using a measuring tape, from which the surface area of the wound was calculated using the formula for calculation of the regular geometric figure that best approximated to the shape of ulcer.Percentage wound closure was calculated using the formula:

$$\frac{\text{wound size after 6 week}}{\text{initial wound size}} \times \frac{100}{1}$$

Data were analyzed using the Chi-squared,logistic regression, Mann-Whitney U. More than 50% reduction in ulcer size considered as good wound healing.

Ulcer type	Total number in Cases Arm	>50%Healed Ulcers In Cases Arm	Total Number in Control Arm	>50%Healed Ulcers In Control Arm
Diabetic ulcers	21	20	23	6
Venous	16	14	14	4
Ischaemic	5	2	6	1
Decubitus	8	6	7	2
Total	50	42	50	13
% of healed ulcers		84%		26%

Results:
Results showed efficient contraction of chronic ulcers with rhEGF application between 8 to 26 days.

Ulcers treated with rhEGF healed better than ulcers dressed with normal saline alone i.e.84% vs 26% (P=<0.003),significant.

Recombinant human epidermal growth factor is proved in this study as a useful adjunct to conventional dressings and promotes healing of chronic leg ulcers.

In conclusion, our results support the contention that rhEGF, in addition to good foot care, is more effective than placebo in healing chronic leg ulcers, and that it may assist in reducing healing times.

Limitations of the study:
Follow up period is short to derive conclusions on long term healing of ulcers.

Certain variables like nutritional status,comorbidities are not standardised between cases and control groups.

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