Abstract

OBJECTIVE:

To describe a patient with a massive Grade IV pressure ulcer that responded rapidly to treatment with topical phenytoin and to review the literature supporting the use of this therapy.

CASE SUMMARY:

A 55-year-old morbidly obese white man (266 kg), with respiratory failure secondary to obesity-hypoventilation syndrome and heart failure, developed pressure ulcers on his lower back and sacrum with the first 2 weeks of hospitalization. Traditional methods of treatment were unsuccessful, and by day 79, the wound involved the entire lumbosacral area and buttocks, and had extensive undermining and sinus tract formation. Within 2 days of applying topical phenytoin, fresh granulation was apparent. After 54 days of treatment, nearly all the sinus tracts were healed. Four months after treatment with topical phenytoin had facilitated the healing of the wounds, even though the patient's multiple underlying medical problems had not resolved.

DISCUSSION:

Phenytoin has been used in the healing of pressure sores, venous stasis and diabetic ulcers, traumatic wounds, and burns. Many of the existing clinical studies have methodologic flaws, such as inappropriate statistical analysis, inadequate control groups, and the absence of randomization and double-blinding. Nevertheless, all the studies have reported enhancement of wound healing, with insignificant adverse effects. Phenytoin may promote wound healing by a number of mechanisms, including stimulation of fibroblast proliferation, facilitation of collagen deposition, glucocorticoid antagonism, and antibacterial activity.

CONCLUSIONS:

Phenytoin promoted the healing of a massive necrotizing soft tissue wound that was unresponsive to conventional treatment. Clinical success in this difficult case and the other reports in the literature suggest that phenytoin is effective in would healing and deserves further investigation.

Ann Pharmacother. 1996 Jul-Aug;30(7-8):768-75.

Phenytoin in wound healing.

Anstead GM[1], Hart LM, Sunahara JF, Liter ME.

- [1]Department of Internal Medicine, Veterans Affairs (VA) Medical Center, Lexington, KY, USA.

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PMID:

8826558

[PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms, Substances

Publication Types

- Case Reports
- Review

MeSH Terms

- Administration, Cutaneous
- Animals
- Burns/drug therapy
- Clinical Trials as Topic
- Drug Approval
- Humans
- Male
- Middle Aged
- Obesity
- Phenytoin/adverse effects
- Phenytoin/pharmacokinetics
- Phenytoin/therapeutic use*
- Pressure Ulcer/drug therapy*
- Pressure Ulcer/pathology
- Wound Healing/drug effects*
- Wounds and Injuries/drug therapy
- Wounds and Injuries/economics

Substances

- Phenytoin

LinkOut - more resources

Medical

- Pressure Sores - MedlinePlus Health Information

Molecular Biology Databases

- PHENYTOIN SODIUM - HSDB

PubMed Commons home

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Topical phenytoin in wound healing.

Pendse AK[1], Sharma A, Sodani A, Hada S.

Author information

- [1]Department of Surgery, Ravindra Nath Tagore Medical College, Udaipur, Rajasthan, India.

Abstract

BACKGROUND:

Phenytoin, introduced in 1937 as an antiseizure medication, has since been reported to promote wound healing when applied as a topical agent. This study was undertaken to evaluate its effectiveness in chronic skin ulcers.

METHODS:

Seventy-five inpatients with chronic skin ulcers were included in this controlled trial. Forty patients were treated with topical phenytoin, and 35 patients with conventional saline dressings. Assessment of the wounds included wound area, bacteriologic cultures, and clinical assessment by blind observers at baseline and every 7 days thereafter over the 4-week treatment period.

RESULTS:

Wound area reduction was greater in the phenytoin group than in controls. Fifty percent of phenytoin-treated wounds had negative cultures by day 7, compared to 17% of controls. Healthy granulation tissue appeared earlier with phenytoin. At the end of the fourth week, 29 of 40 phenytoin-treated ulcers had healed completely versus 10 of 35 controls.

CONCLUSIONS:

Topical phenytoin appears to be an effective, inexpensive, and widely available therapeutic agent in wound healing. Further clinical use and evaluation is merited.

PMID:

8444538

[PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms, Substances

Publication Types

- Clinical Trial
- Controlled Clinical Trial

[The effect of systemic and local irradiation on wound macrophages and the repair promoting action of phenytoin sodium].

[Article in Chinese]

Song S[1], Cheng T.

Author information

- [1]Third Military Medical University, Department of Radiation Medicine, Chonqing.

Abstract

OBJECTIVE:

To study the effect of systemic and local irradiation on wound macrophages (M phi) and the pair promoting action of phenytoin sodium on irradiation-impaired wound healing.

METHODS:

Wound M phi was collected by polyvinyl alcohol sponges which were implanted in a rat dorsum incision. The number of M phi, phagocytic function of wound M phi, and the release of tumor necrosis factor (TNT alpha) and interleukin-1 (IL-1) from wound M phi, and wound breaking strength (WBS) were respectively investigated.

RESULTS:

WBS was deceased after 6Gy systemic irradiation and 20Gy local irradiation, and phenytoin sodium improved WBS in normal wound and radiation-impaired wound. After 6Gy systemic irradiation the phagocytic function of wound M phi, the release of TNF alpha and IL-1 from wound M phi, as well as the number of M phi in wound, were significantly decreased on days 3, 5, 8 after wounding. After 20Gy local irradiation, the ratio of M phi in wound cells was significantly decreased on days 3, 5, 8, 13 after wounding, but the function of macrophage was not significantly decreased. Phenytoin sodium significantly increased the number of wound M phi, improved the phagocytic function of M phi, and the release of TNF alpha and IL-I from wound M phi on days 3, 5, 8 days after wounding despite the rats were radiated or not.

CONCLUSION:

The results indicated that the decrease of number and function of wound M phi play an important role in the impairment of early wound healing by systemic irradiation.

Phenytoin sodium accelerated normal and irradiation-impaired wound healing by increasing the number of wound M phi and improving the M phi function.

PMID:

9596980

[PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms, Subst

Topical phenytoin in the treatment of split-thickness skin autograft donor sites: a comparative study with polyurethane membrane drape and conventional dressing.

Yadav JK[1], Singhvi AM, Kumar N, Garg S.

Author information

- [1]Mahatma Gandhi Hospital, Rajasthan, India.

Abstract

The effectiveness of topical phenytoin as a wound healing agent was compared with that of OpSite (Smith & Nephew) and a conventional topical antibiotic dressing (Soframycin, Roussel) in a controlled study of 60 patients with partial-thickness skin autograft donor sites on the lower extremities. Mean time to complete healing (complete epithelialization) was 6.2 +/- 1.6 days in the phenytoin-treated group (30 patients), compared to 8.6 +/- 2.2 days with OpSite (15 patients), and 12.6 +/- 3.4 days in the 15 Soframycin-treated patients. The differences between the treatment groups were significant at $P < 0.001$. Mean pain scores were also lower in the phenytoin-treated group, 0.40 +/- 0.55 vs. 0.66 +/- 0.60 with OpSite ($P < 0.05$) and 1.4 +/- 0.50 with the conventional dressing ($P < 0.001$). Both phenytoin and OpSite were superior to the Soframycin dressing with respect to bacterial contamination and wound infection as measured by Gram stains of wound smears, swab and aspirate (OpSite) cultures, and clinical assessments ($P < 0.001$) carried out on the fifth day of treatment. No local or systemic adverse effects of the three agents used were noted. Phenytoin appears to be an effective, low-cost and safe method for the treatment of partial-thickness skin graft donor sites, comparing very favourably with, and in some aspects superior to, occlusive dressings. Further clinical use and evaluation of topical phenytoin are merited.

PMID:

8357478

[PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms, Subs

A polyurethane dressing is beneficial for split-thickness skin-graft donor wound healing.

Akita S[1], Akino K, Imaizumi T, Tanaka K, Anraku K, Yano H, Hirano A.

Author information

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Abstract

Few comparative studies have been performed on the various wound-dressing materials or methods proposed for use. To clarify the efficacy of wound dressing, 35 patients (17 females, aged 44.8+/-26.86 years and 18 males, aged 35.4+/-29.70) were subjected to a prospective study comparing a polyurethane dressing and a hydrogel dressing for split-thickness skin donors from the lateral thighs. We examined their clinical usefulness such as accelerated healing time, frequency of changing the dressing, degree of pain, or amount of exudates, and performed moisture meter analysis at 1 month and 1 year after re-epithelialization, which reflects the quality of the stratum corneum and subsequent scarring. The polyurethane dressing was superior to hydrogel in the wound healing time, amount of exudates, and frequency of dressing changes: the hydrogel was better for regulating the degree of pain. There was a positive correlation between transepidermal water loss and the effective contact coefficient, which indicates skin barrier function and affected by skin surface electrolytes and reflects water content, in moisture meter analysis ($r(2)=0.32$, $p<0.01$). Transepidermal water loss returned to the control level at 1 year after healing with both dressings. The effective contact coefficient of the polyurethane wound was significantly lower than that of hydrogel at 1 month ($p<0.01$), while both dressing wounds demonstrated significantly higher values at both 1 month and 1 year compared to the control ($p<0.01$). The polyurethane dressing is therefore superior both clinically and in moisture meter analysis.

PMID:

Abstract

OBJECTIVE:

The efficacy of topical phenytoin in the treatment of diabetic foot ulcers was evaluated in a controlled inpatient study.

RESEARCH DESIGN AND METHODS:

Fifty patients were treated with topical phenytoin, and 50 patients matched for age, sex, and ulcer areas, depth, chronicity, and infection were dressed with dry sterile occlusive dressing.

RESULTS:

Both groups improved, but the ulcers treated with topical phenytoin healed more rapidly. Mean time to complete healing was 21 days with phenytoin and 45 days with control. The differences seen were statistically significant (P less than 0.05) via the chi 2 test.

CONCLUSIONS:

Phenytoin appears to be useful as a topical agent in promoting the healing of diabetic foot ulcers.

Role of phenytoin in wound healing--a wound pharmacology perspective.

Talas G[1], Brown RA, McGrouther DA.

Author information

- [1]Department of Plastic and Reconstructive Surgery, University College London Medical School, UK. rmhkgyt@ucl.ac.uk

Abstract

Topical agents used for the enhancement of wound healing are designed to act locally and, therefore, do not undergo classic systemic metabolic modification. This commentary reviews the potential role of a vulnerary agent, phenytoin, (PHT), from a wound pharmacology perspective. This agent may have the potential to alter the dynamics of wound healing, suggesting a therapeutic use for the stimulation of chronic wounds. Oral PHT therapy is used widely for the treatment of convulsive disorders, and about half the patients treated develop gingival overgrowth as a side-effect. This apparent stimulatory effect has prompted its assessment in wound healing. Investigations into the mechanisms of gingival overgrowth also provide clues to its action in wound healing, and important similarities and differences are discussed. It appears also that both gingiva and skin are important extrahepatic sites for xenobiotic metabolism, and analysis of the biochemical mechanisms should lead to the design of safer analogues for wound healing. On the other hand, differences between the pharmacokinetics of topical PHT in these tissue situations indicate that different formulations are required for gingival and cutaneous wound healing and during the changing course of wound healing itself.

Topical phenytoin in wound healing.

Pendse AK[1], Sharma A, Sodani A, Hada S.

Author information

- [1]Department of Surgery, Ravindra Nath Tagore Medical College, Udaipur, Rajasthan, India.

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