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Review

Executive summary

Systematic reviews of wound care management: (2) Dressings and topical agents used in the healing of chronic wounds

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Health Technology Assessment
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Background

Wound dressings are designed to keep the wound clean and free from contamination and also to promote wound healing, particularly in chronic wounds where there may be significant tissue loss.

Objectives

This review evaluates the evidence for effectiveness and cost-effectiveness of dressings and topical preparations in pressure sores, leg ulcers and surgical wounds healing by secondary intention.

Methods

Nineteen electronic databases, including MEDLINE, EMBASE, CINAHL and the Cochrane Wounds Group's specialised trials register and wound care journals were searched until October 1997. Organisations, manufacturers, researchers and healthcare professionals concerned with wound care were contacted for additional trials. The reference sections of obtained studies were also searched for further trials.

Inclusion criteria

Randomised controlled trials (RCTs), published or unpublished, which assessed the effectiveness of a dressing or topical agent in the treatment of pressure sores, leg ulcers, sinuses and surgical wounds healing by secondary intention were included in the review. Where a particular dressing was not evaluated by an RCT, prospective controlled trials were included. Studies were only included if they reported either the proportion of wounds healed within a time period or the percentage or absolute change in wound area.

Data extraction and synthesis

Trial data were extracted by one researcher and checked by a second. The results from each study were calculated as odds ratios and/or effect sizes and where appropriate, similar studies have been pooled in a meta-analysis.

Results

Surgical wounds healing by secondary intention

Only five studies met the inclusion criteria. All the studies were of poor quality and had small sample size. One study found a statistical benefit for wet-to-dry dressings compared with topical applications of aloe vera. However, neither of these products is commonly used in the UK.

Pressure sores

Twenty-eight trials evaluated 31 comparisons of treatments for the healing of pressure sores. The majority of trials were of poor quality. A single report suggested that the topical application of insulin was of significant benefit for wound healing when compared with standard nursing care. A meta-analysis of five reports comparing a hydrocolloid dressing with a traditional treatment suggested that treatment with the hydrocolloid resulted in a statistically significant improvement in the rate of pressure sore healing.

Leg ulcers

Sixty studies were included that had evaluated dressings or topical agents in arterial and venous ulcers. Both mononuclear cultured cells in culture medium and topical ketanserin significantly increased healing rates compared with a control preparation in one trial of arterial leg ulcers. Collagen sponges appeared to be effective in two trials of leg ulcers but there were insufficient data to determine the significance of these results.

Nine trials compared hydrocolloids with traditional dressings for venous ulcers but meta-analysis demonstrated no significant difference in the proportion of ulcers healed over the trial period. Two trials compared semi-permeable films with traditional dressings; one found a larger reduction in wound area under the film dressing but the other found no significant difference in healing rates. Two trials compared foam dressings and traditional or control therapies; one favoured the foam dressing but the other found no difference between treatments. Woven zinc oxide paste bandage was more effective

than either an alginate dressing or a zinc oxide-impregnated stockinette in one trial.

In two trials comparing different hydrocolloids, no significant difference in healing rates was found. Comparisons of hydrocolloids with foam dressings found no difference in effectiveness.

In trials of topical agents, allopurinol and dimethyl sulfoxide improved healing in one trial compared with inert powder. Of two trials comparing hyaluronic acid with control, one found a difference in daily healing rate and the other found no difference in proportion of ulcers healed over the trial period.

Four trials compared biological dressings with traditional therapies. None found statistically significant differences in results.

Two trials compared dressings with topical preparations. There was no difference in the proportion of ulcers healed between patients treated with cryopreserved cultured allografts or a hydrocolloid, though the former-treated ulcers had a higher rate of epithelialisation. A collagen dressing was more effective than treatment with daily antiseptic.

A comparison of buffered acidifying ointment and ointment reported there was no difference in the proportion of ulcers healed, but there was a higher rate of epithelialisation with the buffered ointment group. In another, trial there were higher healing rates when two amino acid solutions were compared with two groups treated in saline soaks.

Publication bias

A funnel plot of all trials showed no evidence of publication bias. However, publication bias was indicated in a comparison of traditional and hydrocolloid dressings.

Cost-effectiveness analysis

Nine trials provided data on costs of dressing materials and nursing visits. Six evaluated cost-effectiveness in pressure sore treatments and three papers reported cost-effectiveness data in leg ulcer trials.

Conclusions

Implication for practice

There is little evidence to indicate which dressings or topical agents are the most effective in the treatment of chronic wounds. However, there is evidence that hydrocolloid dressings are better than wet-to-dry dressings for the treatment of pressure sores. In the treatment of venous ulcers, low adherent dressings are as effective as hydrocolloid dressings beneath compression bandaging.

Recommendations for research

Research methodology could be significantly improved and commissioning groups may wish to consider the following aspects for future research.

- The number of patients in a trial should be based on an *a priori* sample size calculation.
- A truly objective outcome measure should be used or wound healing should be expressed as both percentage and absolute change in area.
- For each patient a single reference wound should be selected.
- Experimental groups should be comparable at baseline.
- Head-to-head comparisons of contemporary dressings are required and should use agents that are recommended for wounds of a similar nature.
- A complete and thorough description of concurrent treatments, including secondary dressings, should be given in trial reports.
- Assessment of outcomes should ideally be blind to treatment, or completely objective.
- Survival rate analysis should be adopted for all studies that assess wound healing.
- Studies to determine the biological mechanisms involved in wound healing are needed.
- Future trials should include cost-effectiveness and quality of life assessments, as well as objective measures of dressing performance.
- Economic evaluations should be incorporated within trials that are sufficiently large to detect appropriate economic and clinical outcomes.
- To prevent publication bias and ensure the inclusion of unpublished trials in systematic reviews, those involved in primary research should make their data available to those undertaking systematic reviews.

Publication

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NHS R&D HTA Programme

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The Standing Group on Health Technology advises on national priorities for health technology assessment. Six advisory panels assist the Standing Group in identifying and prioritising projects. These priorities are then considered by the HTA Commissioning Board supported by the National Coordinating Centre for HTA (NCCHTA).

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The views expressed in this publication are those of the authors and not necessarily those of the Standing Group, the Commissioning Board, the Panel members or the Department of Health. The editors wish to emphasise that funding and publication of this research by the NHS should not be taken as implicit support for the recommendations for policy contained herein. In particular, policy options in the area of screening will be considered by the National Screening Committee. This Committee, chaired by the Chief Medical Officer, will take into account the views expressed here, further available evidence and other relevant considerations.

Reviews in *Health Technology Assessment* are termed 'systematic' when the account of the search, appraisal and synthesis methods (to minimise biases and random errors) would, in theory, permit the replication of the review by others.

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