

Evidence-Based Emergency Medicine

Clinical Synopsis

TAKE-HOME MESSAGE

There is insufficient evidence to recommend a particular type of dressing for partial-thickness burns. Limited evidence supports the use of hydrocolloid, silicon nylon, hydrogel, silver-impregnated dressings, polyurethane film, and biosynthetic dressings. No evidence was identified to support the use of silver sulfadiazine over alternatives.

METHODS

DATA SOURCES

The authors searched the Cochrane Central Register of Controlled Trials (CENTRAL) and the Cochrane Wounds Group Specialized Register (May 29, 2008), MEDLINE (1950 to May 2008), EMBASE (1980 to May 2008), and CINAHL (1982 to May 2008).

STUDY SELECTION

The review included randomized controlled trials examining various burn dressings, frequently using silver sulfadiazine as a control. Dressing types included the following:

- Hydrocolloids (eg, DuoDerm; ConvaTec Ltd, Skillman, NJ): 5 studies; 314 patients
- Polyurethane films (eg, Tegaderm; 3M, St. Paul, MN): 2 studies; 106 patients
- Hydrogels (eg, Curagel; Kendall, Mansfield, MA): 2 studies; 115 patients
- Silicon-coated nylon (eg, Mepitel; Molnlycke Health Care, Norcross, GA): 2 studies; 142 patients

An installment of the Systematic Review series:

No Clear Winner Among Dressings for Partial-Thickness Burns

EBEM Commentator Contact

J. Adam Oostema, MD

Dale J. Ray, MD

Grand Rapids Medical Education Partners/Division of Emergency Medicine, Michigan State University, Grand Rapids, MI

Commentary

Approximately 500,000 patients present to US emergency departments (EDs) for burns each year, but fewer than 10% (40,000) are admitted to hospitals.¹ It is therefore the responsibility of emergency physicians to initiate appropriate wound dressings for the majority of burn victims.

In treating partial-thickness burns, dressing strategies are divided into 2 general categories: (1) open methods, consisting of topical antimicrobials; and (2) closed methods, which use various occlusive dressings.¹

This Cochrane Review summarizes the literature addressing closed methods of treating partial-thickness burns. The Cochrane authors found the literature for each dressing type to be limited both in quantity and in methodological quality. Thus, there are insufficient data to recommend a spe-

cific dressing in the management of partial-thickness burns.

Although this review did not specifically address the efficacy of silver sulfadiazine, 6 of the 7 closed dressings examined were superior to silver sulfadiazine dressings with respect to time to complete healing, which is consistent with other reports in the literature suggesting quicker healing with interventions ranging from collagenase ointment with bacitracin² to honey.³ The practice of routinely treating partial-thickness burns with silver sulfadiazine should be reexamined.

RESULTS

Twenty-six studies met the inclusion criteria and generally enrolled similar patient populations. Patients were recruited from the ED, outpatient settings, and tertiary burn centers. They were organized according to study intervention.

- Biosynthetic skin substitutes (eg, Biobrane; Smith & Nephew, Largo, FL): 10 studies; 441 patients
- Silver impregnated (eg, Acticoat; Smith & Nephew, Largo, FL): 3 studies; 162 patients
- Hydrofiber (eg, Aquacel; ConvaTec Ltd): 2 studies; 152 patients

Studies addressing topical skin agents, full-thickness burns, hand burns, and biological skin replacements were excluded. The primary outcomes included time to complete wound healing and change in wound surface area over time. Secondary outcomes included number of dressing changes, pain, patient satisfaction, infection rate, need for surgery, cost, and hospital length of stay.

DATA EXTRACTION AND SYNTHESIS

Studies were reviewed by 2 authors independently and data were abstracted using standardized forms. The authors abstracted and pooled data from eligible studies by using appropriate analytical methods according to the *Cochrane Handbook*, version 5.0.0. Studies were assessed for the adequacy of randomization and allocation concealment, blinding of providers and participants, potential selection bias after allocation, and completeness of follow-up.

Overall study quality was rated poor to very poor. Fewer than 50 patients were enrolled in half of the included studies, and only one study enrolled more than 100 patients. Six of 26 studies used an adequate randomization strategy and 5 documented allocation concealment. Only 3 trials used blinded assessment of wound healing. Baseline clinical characteristics were comparable.

The results of included studies were largely reported separately for each type of intervention because of wide variation in study design, comparators, and outcomes measured.

Burns treated with hydrocolloid, polyurethane film, hydrogel, biosynthetic, and silver-impregnated dressings appear to heal more rapidly than those treated with silver sulfadiazine dressings. There was no difference in healing times between biosynthetic dressings and hydrocolloids or between fiber dressings and silver sulfadiazine.

All intervention dressings except silver-impregnated dressings appear to reduce patient discomfort compared with silver sulfadiazine or chlorhexidine dressings. Hydrocolloid, silicon-coated, and silver-impregnated dressings reduce the number of required dressing changes.

Incidence of infection was difficult to estimate because of inconsistent reporting and vague definitions of this outcome. No studies demonstrated a statistically significant difference between any of the modalities investigated, although there was a trend toward lower infection rates in 2 trials for burns treated with silver sulfadiazine.

1. Singer AJ, Tiara BR, Lee CC. Thermal burns. In: Marx JA, Hockberger RS, Walls RM, eds. *Rosen's Emergency Medicine: Concepts and Clinical Practice*. 7th ed. Philadelphia, PA: Mosby/Elsevier; 2010:764-765.

2. Soroff H, Sasvary D. Collagenase ointment and polymyxin B sulfate/bacitracin spray versus silver sulfadiazine cream in partial-thickness burns: a pilot study. *J Burn Care Rehabil*. 1994;15:13-17.
3. Subrahmanyam M. A prospective randomised clinical and histological study of superficial burn wound healing with honey and silver sulfadiazine. *Burns*. 1998;24:157-161.

This is a systematic review abstract, a regular feature of the *Annals' Evidence-Based Emergency Medicine (EBEM)* series. Each features an abstract of a systematic review from the Cochrane Database of Systematic Reviews and a commentary by an emergency physician knowledgeable in the subject area. The source for this systematic review abstract is: Wasiak J, Cleland H, Campbell F. Dressings for superficial and partial thickness burns. *Cochrane Database Syst Rev* 2008, Issue 4: CD002106. DOI:10.1002/14651858.CD002106.pub3. The *Annals EBEM* editors assisted in the preparation of the abstract of this Cochrane systematic review.

Systematic Review Author Contact

Jason Wasiak
 Victorian Adult Burns Service
 The Alfred Hospital
 Prabran, Melbourne, Victoria, Australia
 E-mail: J.Wasiak@alfred.org.au