Systematic review of the use of honey as a wound dressing
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Authors' objectives
To investigate the use of topical honey for superficial burns and wounds, through a systematic review of randomised controlled trials (RCTs).

Searching
The following sources were searched: MEDLINE from 1966 to January 2000; EMBASE from 1980 to January 2000; CINAHL from 1982 to 2000; PsycLIT from 1982 to 2000; PubMed for July 2000; and the Cochrane Library (online, July 2000). A broad free text search was undertaken, and studies published in any language were considered.

The reference lists of the retrieved reports and reviews were examined for additional trials. The Internet was also searched; in particular, an online journal 'World Wide Wounds' was accessed. The date of the last search was 1 August 2000. Unpublished reports and abstracts were not considered. The authors were not contacted for original data.

Study selection
Study designs of evaluations included in the review
RCTs.

Specific interventions included in the review
For inclusion in the review, the studies were required to have investigated the use of honey as a wound care intervention. The comparators were polyurethane film, amniotic membrane, potato peel and silver sulphadiazine.

Participants included in the review
Patients with burns or wounds. The review included studies of patients with post-operative wounds, with moderate to severe burns and with partial thickness or superficial burns.

Outcomes assessed in the review
For inclusion in the review, the studies were required to report clinical or microbiological outcomes, e.g. wound healing time and infection rate.

How were decisions on the relevance of primary studies made?
Each report that could be described as an RCT was read independently by three of the authors. The authors were not blinded to the identity of the primary researchers, owing to their familiarity with the subject area.

Assessment of study quality
The validity of the included studies was assessed using a 5-point quality scale (see Other Publications of Related Interest no.1) and a 16-point validity scale (see Other Publications of Related Interest no.2). Three authors independently applied the quality and validity scales.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.

The following data were extracted from each trial: the trial design; details of the honey and control interventions; outcome measures; statistical analysis; and the geographic location of the trial. Data were also extracted on the proportion of wounds healed at 7 and 21 days, and the number of wounds initially with bacterial growth that were rendered sterile by treatment at 7 and 21 days.
The analyses of healing and infection resolution were based on the numbers of patients randomised and who had infected wounds initially, respectively.

**Methods of synthesis**

How were the studies combined?

A narrative synthesis was undertaken. A point estimate was calculated, along with confidence intervals (CIs), for the relative benefit of honey from those studies reporting homogeneous outcome measures. A fixed-effect model was used to calculate the relative benefit ratios. The number-needed-to-treat (NNT) was calculated, along with 95% CIs, using the method of Cook and Sackett (see Other Publications of Related Interest no.3).

The authors state that publication bias was not assessed using funnel plots as these tests have been shown to be unhelpful (see Other Publications of Related Interest nos.4-5).

How were differences between studies investigated?

The authors do not state a method for assessing differences between the studies. The authors state that heterogeneity was not assessed since heterogeneity tests have been shown to be unhelpful (see Other Publications of Related Interest no.6).

**Results of the review**

Seven RCTs with a total of 510 patients were located. All but one study were led by the same investigator. One study (n=50) investigated the use of honey in post-operative wound care (Caesarean section or hysterectomy), one study (n=50) investigated the use of honey in the treatment of moderate to severe burns, and 5 studies (n=410) investigated the use of honey in the treatment of partial thickness or superficial burns.

Seven trials were located and all but one were conducted by the same investigators.

One study (n=50), performed in the United Arab Emirates, investigated gynaecological or obstetric patients with infected post-operative wounds. This study compared the use of honey with antiseptics plus systemic antibiotics. Honey was significantly better (p<0.05) for all of the outcomes, with much shorter times being obtained for healing, eradication of infection, use of antibiotics and hospital stay. Compared with antiseptic, the NNT with honey for good wound healing was 2.9 (95% CI: 1.7, 9.7).

One study (n=50) from India investigated patients with moderate or severe burns, and compared the use of honey with tangential excision. Half of the total number of patients had full thickness burns, and half of those treated with honey eventually needed skin grafts. For all of the outcomes, tangential excision followed by grafting by 6 days' post-burn was significantly better than initial treatment with honey followed by grafting where necessary. For example, in those patients randomised to initial grafting, the graft took better (p<0.05), fewer infections were reported (p<0.05), fewer antibiotics were needed (p<0.001), a smaller volume of transfused blood was required (p<0.01), hospital stay was shorter (p<0.001), and the appearance of the wound was better (p<0.01).

Five studies (n=410, range: 50 to 104) investigated patients with partial thickness or superficial burns involving less than 40% of the body surface. At 7 days, 97 of the 167 patients (58%) were healed with honey and 29 of the 151 patients (19%) were healed with other treatments. Compared with any other treatment, the NNT with honey for 7 days to produce one patient with a healed burn was 2.6 (95% CI: 2.1, 3.4). By 21 days, 165 of the 167 patients (99%) were healed with honey and 113 of the 151 patients (75%) were healed with other treatments. Compared with any other treatment, the NNT with honey for 21 days to produce one patient with a healed burn was 4.2 (95% CI: 3.3, 6.0).

**Authors' conclusions**

There is little confidence in a conclusion that suggests honey is a useful treatment for superficial wounds or burns, even though it is biologically plausible.

**CRD commentary**
The research question was clearly stated in terms of the participants, intervention, comparators and outcomes.

No information was given on the search terms used in the search strategy; the provision of this data would have strengthened the report. It might also have been beneficial to have contacted the authors for additional data and/or additional trials. In a situation where the work of one research group dominates the published literature, attempts to trace unpublished material and/or to assess the likelihood of publication bias would seem advisable. However, they were omitted in this instance.

The authors assessed the quality and validity of the studies using accepted standardised tools, but did not use the subsequent results to give extra weight to particular pieces of evidence.

The review, with its supplementary data, appeared to present the appropriate information from the studies. The report might have been improved by including details of the data extraction process.

The authors opted not to examine the possibility of heterogeneity statistically, and cited evidence to support their course of action (see Other Publications of Related Interest no.6). It should be noted that the cited evidence was reported by three authors, two of which were authors of this report.

The conclusion of the review on the relative effectiveness of honey and other interventions (aseptic techniques, polyurethane film, amniotic membrane, potato peel and silver sulphadiazine) appear to follow from the evidence presented. In addition, the implications of the review are clearly stated. However, the authors did not stress the findings of the study comparing honey with grafting (when required), with immediate tangential resection and grafting. In this study, all of the outcomes were significantly better with excision and grafting than with honey dressings and salvage grafting. The review may have benefited from a more in-depth exploration of this finding.

**Implications of the review for practice and research**

Practice: The authors state that honey is a natural product, and those characteristics associated with wound healing may be affected by the species of bee, geographical location and botanical origin, as well as the processing and storage conditions. The generalisability of the results to other regions is uncertain, as six of the seven studies were conducted in India and the remaining study was conducted in the United Arab Emirates.

Research: The authors state that the nature of the current evidence is such that caution still needs to be exercised. This review should be of help in designing new, large, randomised studies with blinded assessment of useful clinical outcomes. Future trials should compare the use of honey with standard wound treatments for burns, post-operative wounds and venous ulcers.

**Bibliographic details**


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http://www.biomedcentral.com/1472-6882/1/2

**Other publications of related interest**


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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.