The efficacy of aloe vera used for burn wound healing: a systematic review
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CRD summary
This review concluded that, although there is a paucity of evidence, there are data to suggest that topical aloe vera may be effective in healing first- and second-degree burns. Given the limited number of small and, overall, quite different poor-quality trials, the authors are right to suggest that their conclusions should be treated with caution.

Authors' objectives
To evaluate the effectiveness of topical aloe vera for the treatment of burn wounds.

Searching
MEDLINE, CINAHL, the Cochrane Database of Systematic Reviews, the Cochrane CENTRAL Register, DARE, HealthSTAR, Health Source: Nursing/Academic Edition, ACP Journal Club, Chinese Science and Technology Database, China Academic Database, Thai Theses Online, Thai Index Medicus Database, South-East Asia Index Medicus, Thai Medical Index and Medicinal Plant Database were searched up to 2004. The search terms were reported and no language restrictions were applied. In addition, the reference lists of retrieved articles were screened, and authors and experts in the field of burn therapy or herbal medicine were contacted for further studies.

Study selection

Study designs of evaluations included in the review
Controlled clinical trials were eligible for inclusion.

Specific interventions included in the review
Studies evaluating aloe vera for burn therapy were eligible for inclusion. The included studies evaluated fresh aloe vera mucilage, gauze with aloe gel or powder, and aloe cream. The interventions were compared with sulfadiazine cream, vaseline gauze or framycetin cream. The quantity of aloe vera in the preparations was not reported.

Participants included in the review
Inclusion criteria were not specified in terms of the participants. The severity of burn wounds varied, with some participants having first-, second- or third-degree burns. The percentage of body surface area with burns ranged from 2 to 40%. Some participants received concomitant treatments.

Outcomes assessed in the review
Studies assessing wound healing were eligible for inclusion. The analysis focused on the length of time required for burn wounds to heal. Other outcomes in the included studies were the percentage success rate for healing and the rate of epithelialisation on post-skin grafting days 5 and 8. The outcomes were assessed by physician clinical judgement, or objective definition using measuring tools.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The validity of randomised controlled trials (RCTs) was assessed and scored using the Jadad scale. The validity of non-RCTs was not assessed. The authors did not state how many reviewers performed the validity assessment.

Data extraction
Two reviewers independently extracted the data. Means and standard deviations for the time to healing were calculated. If standard deviations could not be obtained, equal variance and normal distribution of data were assumed and standard deviations were calculated on the basis of reported p-values. Study authors were contacted where possible for additional data.
Methods of synthesis
How were the studies combined?
Summary weighted mean differences (WMDs) and 95% confidence intervals (CIs) were calculated using a random-effects model (DerSimonian and Laird).

How were differences between studies investigated?
Statistical heterogeneity was assessed using the Cochran-Mantel-Haenszel method. Clinical heterogeneity was examined using a sensitivity analysis.

Results of the review
Four controlled clinical trials (n=371) were included. Two studies were RCTs, one study used a within-patient design, and one study was a controlled trial but with no information relating to randomisation.

Two studies were published in Thailand, one study in India and one in China. The two RCTs scored only 2 out of a maximum of 5 points on the Jadad scale. One study was reported as blinded.

The pooled WMD for healing time was significantly shorter for aloe vera compared with control (8.79 days, 95% CI: 2.51, 15.07, p=0.006) in one blinded RCT and one non-RCT of participants (n=138) with first- and second-degree burns. There was no significant statistical heterogeneity between the two studies. A third study reported a better success rate for first- or second-degree burns in the aloe vera group compared with the silver sulfadiazine group (95% versus 83%). The fourth study, which involved participants with second- or third-degree burns, reported that the epithelialisation rate measured by healing size was higher in the aloe vera plus vaseline gauze group than in the vaseline gauze alone group for post skin grafting on both day 5 (2.695 +/- 0.618 mm versus 1.294 +/- 0.169 mm) and day 8 (5.837 +/- 0.266 mm versus 3.953 +/- 0.326 mm).

Two studies (n=92) reported adverse effects. One study reported 40% irritation or itching in the aloe vera group and 44% in the sulfadiazine group. The second study reported discomfort and pain classified as mild (92.6%) or moderate (7.4%) in both groups, which was relieved by oral analgesic. No allergic reactions or eczema were reported in any of the included studies.

Authors’ conclusions
Differences between products and outcome measures make specific conclusions difficult. However, there is some evidence to suggest that aloe vera may be effective intervention in healing first- and second-degree burns.

CRD commentary
The review question was clear, but not specifically defined with respect to the participants. Several databases were searched, experts in the field were contacted for additional studies, and no language or publication restrictions were applied; this suggests that the risk of language and publication bias is minimal. The methods used to select the studies were not described, so it is not known whether any efforts were made to reduce reviewer error and bias. The authors did, however, take steps to reduce reviewer error and bias during the extraction of data. Study validity was only assessed for randomised trials, which makes it difficult to assess the reliability of the other data. The measurement of outcomes was subjective and clinicians were, in general, not blinded to intervention category, thereby introducing the possibility of measurement bias. The authors explored possible sources of variation, although the significance of these investigations was limited by the small numbers of patients and studies. Given the paucity of evidence from a limited number of small and, overall, quite different poor-quality trials, the authors are right to suggest that their conclusions should be treated with caution.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that further well-designed clinical trials specifying details of the types of aloe vera products used are required to determine the effectiveness of aloe vera for burn wound healing. In addition, there is a need to evaluate complete epithelialisation using at least two independent outcome assessors to minimise the potential
for bias.

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