Commercial dressings for burns versus sweet ancient remedy

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The methodologist’s point of view

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In the heart of your house, one foggy evening, you are cooking what all the world should repute as a memorable dinner; you invited some new colleagues from the hospital, which makes you feel slightly nervous. While thinking about the last table decorations you look into the oven at the big pan. Food needs your attention. You take a spoon and start to stir the ingredients but… inadvertently you burn yourself. There are few minutes before the guests will start to ring your door. What you should do?

There are two options: the first deals with the home remedy, a natural cure, and it requires you to open your cupboard (looking for honey); the second deals with modern marketed drugs and it requires you to go to the nearest pharmacy to buy a dressing. The solution deals with the comparative efficacy of these medicines. Which should be better?

The latest issue of the Cochrane Database of Systematic Reviews offers two topical reviews dealing with this subject. In the first study, honey is evaluated for wound healing [1], and in the other, different dressings are studied for their healing properties [2]. Doctors and consumers are increasingly demanding more separation between marketing campaign to sustain products, superstition, myth remedies and evidence. In other words, the community is calling for disentanglement of evidence and folkloristic practice: these disentanglements regard both conventional medicines and nature’s drugs. The results of these disentanglements sometimes are surprising.

The sweet evidence revealed

Jull et al. found that honey may improve healing times in mild to moderate superficial and partial thickness burns compared with some conventional dressings [1]. This Cochrane systematic review included nine trials that evaluated honey as a treatment for superficial, partial and mixed depth (partial and full thickness) burns compared to conventional dressings, early excision, silver sulfadiazine and several unconventional dressings. However, with the exception of one trial, all the reports of burn trials were single-author trials, and all the reports originated from a single study centre, which may have impact on study quality, replicability and confidence, eventually [3, 4].
When compared to conventional dressings for the treatment of partial thickness burns, where the outcome were mean days to healing, weighted mean difference (WMD) was $-4.68$ days (95% CI $-5.09$ to $-4.28$ days) in favour of honey [5, 6]. One trial compared early tangential excision and skin grafting with honey dressings in seriously injured patients for the treatment of mixed partial and full thickness burns. Mean time to healing was 32 days in the honey-treated group and 18.4 days in the comparison group (WMD 13.6 days, 95% CI 10.02–17.18 days), significantly favouring early excision and skin grafting [7]. Honey compared with silver sulfadiazine did not reveal significant difference between these two interventions (WMD $-4.37$ days, 95% CI $-8.94$ to 0.19 days) [8].

Unconventional solutions

Three trials compared honey with natural dressing, the most unconventional being boiled potato peel dressing. After preliminary trials in year 1985 found that potato peel is suitable as a burn wound dressing in developing countries because of its promotion of epithelial growth and availability [9], more histological and clinical studies have been made that further supported its usefulness [10, 11]. In a trial included in the Cochrane review, 100 participants with partial thickness burns were recruited and compared honey to treatment with boiled potato peel [12]. The findings clearly favoured the honey: mean time to healing was 10.4 days in the honey-treated group and 16.2 days in the potato peel group (MD $-5.8$ days, 95% CI $-6.88$ to $-4.92$ days).

Both the remaining two trials recruited participants with partial thickness burns [13, 14]. In comparison with amniotic membranes, there was no significant mean difference (95% CI $-0.88$ to 4.68 days) between this intervention and honey [13]. The second trial compared honey with honey-plus (a derivative), which consists of unprocessed undiluted honey with added vitamins C and E, and polyethylene glycol. Significant mean difference of 1.9 days was found in favour of the honey-plus (1.9 days, 95% CI 0.59–3.21 days) [14].

Potato peel and honey are not the only edible interventions for pain described in the literature; in a trial unrelated to this Cochrane review, banana leaf dressing was found to be of equal efficacy to potato peel bandage in protecting the wounds and aiding healing [15]. Authors of this trial state that banana leaf dressing is 11 times cheaper than potato peel dressing; banana plants can be easily grown; the leaves are easily available throughout the year; the leaves of banana are large and thus offering larger surface area and the surface is nonadherent, waxy and cool. The banana leaf dressing can be prepared very easily with little training and it supposedly is the cheapest dressing available today [15]. So, we may see randomised controlled trials in the near future by comparing banana leaf dressing with honey as a treatment of burns.

Honey’s healing properties

Interest in honey as a wound management intervention has grown recently, largely due to the growing clinical problem of antibiotic-resistant bacteria and the combined difficulties for the practitioner in managing chronic wound types, such as burns, leg ulcers or surgical wounds, that may become infected, for example, with methicillin-resistant *Staphylococcus aureus* or *Pseudomonas*. The associated costs of treating such wounds are escalating as a result.

Although honey is hailed by the literature as a sound wound management intervention, modern medical practitioners may hesitate to apply honey for local treatment of wounds, because it sounds too alternative, or because of the suspicious messiness of such local application. Moreover, secondary infectious disease may be caused by contamination of honey with microorganisms [7, 16]. While the use of honey as a wound dressing has been recognised, at least since Egyptian times circa 2,000 BC, it is only more recently, due to the development and licensing of modern honey wound dressings, that such dressings have become more widely available and used in wound management [17, 18].

Honey works differently from antibiotics, which attack the bacteria’s cell wall or inhibit intracellular metabolic pathways. Honey is hygroscopic, meaning that it draws moisture out of the environment and thus dehydrates bacteria. Its sugar content is also high enough to hinder the growth of microbes, but the sugar content alone is not the sole reason for honey’s antibacterial properties. When honey is diluted with water, reducing its high sugar content, it still inhibits the growth of many different bacterial species that cause wound infections. Because of its high sugar content, honey also prevents pain on dressing changes, as it keeps the wound surface moist by mobilising the oedema from the surrounding tissues. Honey also has anti-inflammatory properties [18]. All this, together with evidence from the Cochrane review, makes honey a cheap and simple alternative to conventional dressings, which practitioners should be aware of.

Best among the commercial dressings

Another Cochrane review analysed a total of 26 randomised controlled trials that evaluated whether any type of dressing from the many now commercially available is more effective in promoting healing and minimising discomfort and infection for patients with superficial and partial thickness burns [2]. A number of dressings appear to
have some benefits over other products in burn management, and this benefit relates to time to wound healing, the number of dressing changes and the level of pain experienced. Although not all the included studies showed difference between compared interventions, the results indicate that burns dressed with hydrogels [19, 20], silicon-coated dressings [21, 22], biosynthetic dressings [23–26] and antimicrobial dressings [27–29] healed more rapidly than those dressed with silver sulphadiazine or chlorhexidine-impregnated gauze dressings.

The results for hydrocolloids and polyurethane dressings also suggest an improved rate of healing [30, 31]. There was no evidence that fibre dressings improve the rates of healing compared with silver sulphadiazine [32]. Also, there was no evidence of a difference in healing time between biosynthetic dressings and hydrocolloids [33].

Conclusion

In these two reviews, dressings and honey are very similar in terms of experiments, study quality and results. What is often different is the prejudice against grandma remedies. Evidence contrary to accepted wisdom regarding conventional and unconventional medicines equally. Existing evidence can guide practitioners in choosing alternatives to therapies that they usually prescribe for mild burns. Despite the increase in the types of commercially available dressings, since circa 2,000 BC, honey is still a valid remedy. Conventional dressings are relatively cheap, but in developing countries, every penny counts; so, efficacy and availability of honey should be key drivers of the decision-making process. Where price is not an issue, and practitioners can choose from a wide array of commercially available dressings for wounds, evidence should be consulted when considering a certain type of dressing for a patient.

Now, coming back to your dinner, before a colleague rings the calling bell near your door, what you should do? Honey or the nearest pharmacy?

A clinician’s point of view

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Honey, a sweet substance elaborated by honey bees, and coming from the nectar of flowers, has been considered as a curative remedy from time immemorial [34]. Primitive men collected honey for eating and therapeutic purposes, and the term “honey” is quoted more than fifty times in the King James version of the Holy Bible. However, only in recent times, the precise mechanisms accounting for the healing characteristics of honey have been, at least partially, elucidated. In the 1960s, evidence was provided regarding the fact that moist wounds healed more quickly, even if a moist milieu triggered the growth of bacteria [35]. An appropriate dressing preparation should therefore be antimicrobial too, and honey appeared to have antibacterial properties, as confirmed in the 1990s, when a number of anti-inflammatory and antimicrobial mechanisms have been hypothesised with reference to it. According to Wahdan, different antimicrobial substances are present in honey [36]. In particular, inhibines appear to play a relevant role, including hydrogen peroxide, flavonoids and phenolic acids. Flavonoids had already been extracted from honey before, while it was only in the late 1990s that caffeic acid and ferulic acid (phenolic acids) were extracted from honey for the first time [36].

On clinical grounds, the evaluation of honey for wound healing has constituted a topic of a recent Cochrane review, as discussed above [1]. In that review, Jull et al. concluded that honey might shorten healing times in superficial and also partial thickness burns, if compared with different standard dressings. Such a confirmation appears to be precious for physicians, since it represents a cheap, effective and easy-to-access alternative to available dressings. As in the case of many other substances, such as beverages including tea, coffee, wine and chocolate, popular beliefs regarding their putative preventive or therapeutic characteristics have been proved to be evidence-based, as confirmed by recent biomedical research and knowledge [37].

The importance of honey for human health, and not only concerning its dietary use, clearly emerged when its topical administration for burns treatment was analysed. The example of honey underlines the current relevance of past traditions regarding a number of “sweet” remedies, exactly when compared with modern scientific information. Therefore, and in conclusion, it is really true that one never learns enough from the past, and we believe that Archie Cochrane himself, the scientist after whom the Cochrane Collaboration and the Cochrane Review here discussed were named, would agree with that.

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References


