



## Wound healing with honey – a randomised controlled trial

**To the Editor:** We congratulate the authors on a well-designed study,<sup>1</sup> and state from the outset our support for the use of honey in wound healing. In particular, we believe that such treatments are entirely appropriate as sustainable low-cost solutions in primary health care in South Africa.

However, certain factors addressed by Ingle *et al.*, albeit obliquely, compel us to comment. We believe that three general questions need to be addressed regarding the use of honey for wound healing.

1. To what extent is honey generic in its wound-healing characteristics? The answer is, not at all. The antimicrobial activities of honey can vary 100-fold;<sup>2,3</sup> furthermore, different honeys are active against different bacteria or fungi. Not all honey is likely to have the same therapeutic effect, and only appropriately indicated honey should be used in wound healing. There is a need for standardisation in this regard.

2. What influence might the age, preparation, or handling of honey have on its efficacy as a wound healer? This goes to the nature of the antimicrobial action of honey. Here too there are three factors, which again need to be addressed independently.

- High osmolarity, owing to the high sugar content of honey, is the first cause of antimicrobial activity. This will not be affected by any treatments or handling of honey, such as pasteurisation, heating, sterilisation, irradiation or light.
- A high level of hydrogen peroxide, produced by the enzyme glucose oxidase, is the second cause of antimicrobial activity. It is well known that glucose oxidase activity is destroyed by heat and light,<sup>4,5</sup> and that many of the differences in the antimicrobial activity of honey are related to the processing of raw honey.<sup>3</sup> As such, the heating of honey, its sterilisation, or even keeping honey in the light, could reduce its value as a wound dressing. Enzyme activity might also be expected to decrease with the age of the honey.
- Phytochemical compounds in manuka (*Leptospermum scoparium*) honey have been shown to be largely involved in the unique antimicrobial activity of this honey. The nature and mode of action of these compounds have yet to be elucidated<sup>3</sup> but it does not seem unreasonable to believe that extreme treatment of honey, such as by sterilisation, might impact on the effectiveness of this antimicrobial action.

Hence, the preparation and handling of honey, as well as its age, might be expected to greatly determine its efficacy as a wound treatment. For maximum effect, unheated, untreated and fresh honey should be used.

3. Does honey need to be sterilised for safety reasons? There is theoretical evidence that because of the occurrence of clostridial spores in honey there may be a possibility of

contracting botulism. There are numerous cases of infantile botulism resulting from contaminated honey ingestion;<sup>6,7</sup> as a result certain countries have therefore taken to irradiating their medicinal honey. Molan,<sup>8</sup> however, argues that this is unnecessary as in more than 470 cases where honey was used on open wounds, it was never sterilised or irradiated, and it never resulted in infection. Molan<sup>8</sup> further observes that clostridia, being obligate anaerobes, would be unlikely to survive in the presence of hydrogen peroxide produced in honey wound dressings. However, as irradiation is known not to reduce enzyme activity<sup>9,10</sup> and hence would be unlikely to impact negatively on the antimicrobial value of honey, irradiation may be safely used if there is any concern about the threat of botulism. It should be noted that all honey imported into South Africa is irradiated as a matter of course, to prevent the introduction of the causative organism of the honeybee brood disease, American Foulbrood.

In conclusion, therefore, we would support the use of honey in wound and burn care, but with the prerequisite that the antimicrobial effect be standardised when used for medical purposes. The authors<sup>1</sup> used exclusively monofloral aloe honey, and the findings they report would therefore be exclusive to that type of honey and would certainly not necessarily apply to any honey found commercially in South Africa. It is also unknown at present whether the aloe honey used has high antimicrobial tendencies, and is appropriate as a wound-healing agent. Standardisation would be useful in providing honey with a consistently high antimicrobial activity; we are in the process of identifying the antimicrobial activity of South African honeys, and the effect on these honeys of treatments such as heat, irradiation, and sterilisation, in an effort to provide the basis for such standardisation.

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