Do honey-impregnated dressings affect glycaemic control?

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In recent years, medical grade honey has been increasingly used in wound-care products. A range of therapeutic benefits have been attributed to honey, including increased rates of wound healing, antimicrobial properties and reductions in pain and malodour. Here, the authors present a retrospective study that investigates the impact on glycaemia of honey-impregnated dressings used to treat diabetic foot ulcers at a multidisciplinary diabetic foot clinic. The results suggest that honey dressings do not affect glycaemic control in people with diabetes treated with this modality.

Glycaemic control has been identified as an important factor in wound healing. The Department of Health's (DH's) audit standards for care of wounds has glycaemic control as an important criterion, with the aim of keeping blood glucose <11 mmol/L, or a stable HbA_{1c} level, during the period of ulceration (DH, 2005). This forms one of the aims of the high-impact interventions in promoting wound healing and preventing infection.

Medical grade honey is used in the treatment of diabetic foot ulcers and is thought by some to cause a deterioration in glycaemic control. In this retrospective study, the authors investigated whether glycaemic targets, as specified by the high-impact interventions care bundle (DH, 2005), were met by people with diabetic foot ulcers treated with honey-impregnated (honey) dressings, attending a multidisciplinary diabetic foot clinic.

Methods

To be eligible for inclusion, people with active diabetic foot ulceration must have been seen by the multidisciplinary diabetic foot clinic during the study period (18 November 2008 to 3 March 2009). Furthermore, two HbA_{1c} readings had to have been taken for each participant during the study period.

The primary objective was to determine whether a mean blood glucose <11 mmol/L was maintained by participants during the study period. The secondary aim was to assess the impact of honey dressings on glycaemic control.

Data collected were: age, sex, first HbA_{1c} reading, second HbA_{1c} reading, and the dressings used to treat the current episode of ulceration (distinguishing those participants who were treated with honey dressings, and those treated with all other dressing types). Data were extracted from electronic medical records.

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Diabetic foot ulcers were treated according to a standardised to protocol. This comprised:

- Washing the foot thoroughly before each treatment.
- Sharp debridement of necrotic tissue to promote healthy tissue granulation.
- Application of the appropriate dressing.

A case example of a complex diabetic foot ulcer treated successfully with honey dressings is shown in *Box 1*.

Results

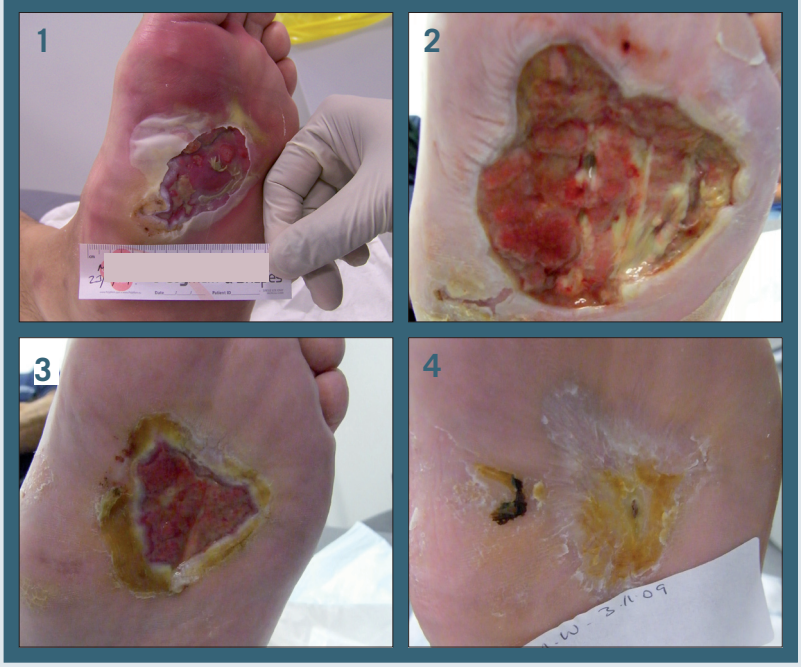
Records showed that 245 people attended the multidisciplinary diabetic foot clinic from 18 November 2008 to 3 March 2009. Of these, 62 people met the inclusion criteria.

Box 1: Case Study of Mr W

Mr W (52 years old, type 1 diabetes) stood on a sharp object and presented (*1*) with a plantar ulcer and was admitted to hospital. Surgical debridement was undertaken to expose the full extent of the wound, and topical negative pressure was used to promote granulation.

Three weeks after presentation, Mr W insisted he be discharged from hospital and it was at this time that honey-impregnated dressings were commenced (*2*). Mr W's ulcer, 6 weeks after discharge (*3*), showed good progress to healing and minimal callus formation at the wounds margins – indicating that Mr W was resting and offloading the foot as recommended.

At 18 weeks after presentation, Mr W's ulcer was close to achieving complete healing (4; note the dark yellow honey residue).



Of those 62 people, 36 received treatment with honey dressings. Of the honey dressings group, 22 were men, and mean age of the group was 53.2 years (range 26–75 years). The mean first HbA_{1c} reading in this group was 8.32% (standard deviation [SD] 1.49; 67.4 mmol/mol [SD 16.3]). The second HbA_{1c} reading was slightly lower at 8.19% (SD 1.37; 66.0 mmol/mol [SD 15.0]). There was no statistically significant difference between the first and second HbA_{1c} readings. Mean blood glucose, as determined by patient assessment of capillary blood glucose was, 10.6 mmol/L in the honey dressings group.

The remaining 26 people who satisfied the inclusion criteria were treated with other, non-honey dressings. This group was made up of a majority of men (16), and mean age of the group was 54.6 years. The mean first HbA_{1c} reading in the non-honey dressings group was 8.51% (SD 1.55; 69.5 mmol/mol [SD 16.9]). The second reading was slightly higher at 8.66% (SD 1.35; 71.1 mmol/mol [SD 14.8]). No statistically significant difference was observed between the first and second HbA_{1c} readings. Mean blood glucose, as determined by patient assessment of capillary blood glucose, was 10.8 mmol/L in the non-honey dressings group.

Discussion

NICE's "ideal" HbA_{1c} level for people with diabetes is 6.5% (48.0 mmol/mol; National Collaborating Centre for Chronic Conditions, 2008). The mean HbA_{1c} levels reported here, for both groups, are higher than this recommendation. However, when converted, the values reported are <11 mmol/L blood glucose – the target set by the DH's (2005) *Saving Lives: Reducing Infection, Delivering Clean and Safe Care* report. These figures were confirmed by patient assessment of capillary blood glucose.

"... the results presented here suggest that honey dressings do not impact upon glycaemic control in people with diabetes."

Among those with active diabetic foot ulcers treated with honey dressings, no significant difference between the first mean HbA_{1c} reading (8.32% [67.4 mmol/mol]) and the second (8.19% [66.0 mmol/mol]) was found. Glycaemia remained stable during the treatment period, suggesting that the honey dressings did not affect glycaemic control in this population. Similar results with regard to glycaemic control were seen in the non-honey dressings group (first mean HbA_{1c} 8.51% [69.5 mmol/mol], second 8.66% [71.1 mmol/mol]).

The findings reported here support those of Jeffery (2008) who found no significant difference in glycaemia in participants between pre- and post-honey dressings treatment of diabetic foot ulcers. While Jeffery's (2008) study was controlled, the sample size was small (n=17).

Other studies highlight the therapeutic benefits of using honey in the management of wounds. These include:

- Increased rate of wound healing (van der Weyden, 2005; Gethin and Cowman, 2009).
- Antimicrobial qualities (Chambers, 2006).
- Increased patient satisfaction associated with reductions in pain and malodour (Dunford and Hanano, 2004).

No protocol providing guidance on either the amount of honey to use on a wound, or its method of application, was identified in the literature. Some studies applied honey directly to the ulcers (Chambers, 2006; Abdelatif et al, 2008), while others used honey-impregnated dressings (Dunford and Hanano, 2004; Eddy and Gideonsen, 2005; van der Weyden, 2005; Mphande et al, 2007; Jeffery, 2008; Jull et al, 2008; Gethin and Cowman, 2009). Further research is needed to establish a clinical evidence base for the most effective use of medical grade honey in wound care regimens.

Conclusion

The findings of this retrospective study address concerns about the impact of honey dressings on glycaemic control when used to treat diabetic foot ulceration. Allowing for study design limitations, the results suggest that honey dressings do not impact glycaemic control in people with diabetes. However, more rigorously designed studies with larger sample sizes are needed to confirm these findings. ■

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