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Case report

Honey based therapy for the management of a recalcitrant diabetic foot ulcer

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KEYWORDS
Diabetic foot ulcer;
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Abstract *Objective:* Diabetic foot ulcers are usually treated at hospital podiatry clinics and not at primary care level. We report an alternative approach using honey based therapy in the successful management of diabetic foot ulcer at primary health care level.
Methods: The case is discussed in relation to various modalities targeting diabetic foot ulceration in the literature.
Result: A 65 years old female-Egyptian diabetic patient presented with a neuropathic plantar ulcer of 10 × 5 cm post-thermal burn following the use of a hot water bottle.

The patient was treated with strict offloading using a pair of crutches, debridement of necrotic tissue using a sharp scalpel and commercial honey applied daily and covered with a glycerin based dressing. The honey dressing was changed daily along with strict offloading and by week 16 the ulcer completely healed.
Conclusion: Treatment of diabetic foot ulcer is possible at primary care level.

Key points

Natural honey is an effective wound dressing.
Natural honey is cost effective and aesthetically acceptable.
Natural honey is bactericidal, provides moisture and debrides wounds.

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A case report

Diabetes-related foot complications are a major burden for patients and society. Patients suffering from diabetic ulcers are at increased risk of hospitalization, lower limbs sepsis and amputation [1,2]. As a result patients suffer from decreased quality of life, decreased function and increased health care cost [3—6].

Worldwide, the majority of diabetic patients are being treated by family physicians thereby playing a pivotal role in the management of diabetes and its related complications.

Managing diabetic foot ulcer requires an integrated health care delivery utilizing multiple investigative and therapeutic modalities.

Although difficult to treat ulcers may require advanced biotechnologies including growth factors, the majority of ulcers may respond well to conventional therapies.

Honey has been used to treat wounds for millennia [7] and this is further supported by its effectiveness in promoting healing in animal and human studies.

Literature reviews, have been largely positive with regards to the antibacterial properties of honey especially against a wide variety of pathogens including *Pseudomonas* and methicillin-resistant *Staphylococcus aureus* (MRSA) [8—15].

Honey's antibacterial properties are related to many properties including its hyperosmolarity, containing less than 20% water, its acidity (pH 3.5—5.0), its release of hydrogen peroxide, flavonoids and phenolic acids making bacteria unlikely to survive in a honey based ulcer bed [16,17].

Honey's wound healing properties lie in its ability to provide moisture in the ulcer bed thereby aiding epidermal migration, providing trace nutrients and stimulating inflammatory cytokines (e.g., TN-α, IL-6, IL-1B) by macrophages [18—21].

Honey has been described in more than 500 reports in the literature and not a single complication with regards to clostridium spores wound infection has ever been reported [22].

Case history

A 65 years old female patient, with diabetes of 25 years, BMI = 23 kg/m^2, ex-smoker, who sustained a thermal burn to her right foot plantar surface following the application of a hot water bottle to treat the cold sensation felt in her leg secondary to diabetic peripheral neuropathy see Fig. 1.

She had her plantar ulcer treatment throughout her attendance at the main general hospital out patient clinic for six weeks and was not improving,

Figure 1 Plantar ulcer on presentation.

several conventional modalities were used including a non-adhesive foam dressing containing biotin, wet-to-moist dressing, Iodine based dressing & paraffin impregnated tulle and finally the patient had a dressing utilizing a silver containing alginate dressing (Sivercel-Systagenix).

All of which have failed to render desirable results. A holistic assessment of the patient by the attending consultant family physicians found her to have uncontrolled diabetes (HbA1C $>$ 10%), anemia (Hb = 10.0) and suffering from hypertension and chronic obstructive airway disease. She was commenced on insulin twice daily regimen, given iron supplement, anti-hypertensive medications were stepped up to control her blood pressure and tiotropium inhaler + a long acting salbutamol/fluticasone accuhaler were prescribed to control her chronic obstructive airway disease.

A wound assessment was carried out by the attending consultant family physicians with the following findings; the ulceration on initial presentation had the largest length of 10 cm $\times$ 5 cm being the largest perpendicular width (see Fig. 2). The peripheral pulses were manually palpable including dorsalis pedis & posterior tibial artery.

Figure 2 Plantar ulcer showing hard callus around the margin and necrotic areas in the center.