

The use of honey in wound care and the Mesitran product range

Honey has been used as a topical treatment for infection throughout history. Honey also appears to be effective in wound deodorising and debridement, and it has an anti-inflammatory effect and can stimulate new tissue growth. The Mesitran range is an example of a modern wound care product that uses the healing properties of honey. It offers a useful range of medical grade honey dressings to manage a variety of chronic wounds in a wide range of stages of the healing process.

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KEY WORDS

Hydrogels
Incontinence-associated
skin damage
Debridement

Honey consists of a mixture of bee saliva and nectar (Acton, 2008). Bees produce honey as a food store for the hive during winter and it consists of 20% water and 80% sugar (Molan, 2005). The use of honey in the management of wounds was first documented by the ancient Egyptians 4,000 years ago (Dunford et al, 2000).

There has recently been a substantial resurgence of interest in using honey in the treatment of wounds, particularly where conventional agents are deemed to have failed (Flanagan, 2000). There is evidence that honey can promote autolytic debridement, maintain a moist wound environment, promote wound healing, protect wounds from bacterial growth and cross-infection and deodorise wounds. Molan (1999) also describes the attributes of honey as antimicrobial, deodorising, debriding, anti-inflammatory and able to stimulate new tissue growth.

Wound debridement

The debriding action of honey has not yet been explained (Molan, 1999). Like many other moist wound dressings, honey can promote a moist environment and can therefore encourage autolysis and the removal of slough and necrotic tissue (Layflurrie, 2008). It is also believed that the ability of honey to promote rapid debridement is linked to the hydrogen peroxide that is produced when the honey is diluted; a process that is not yet fully understood (Lusby et al, 2002). Molan (2005) also explains that the most likely explanation of the debriding action of honey is that it promotes conversion of inactive plasminogen in the wound matrix to the active form, plasmin. This is the enzyme that breaks down fibrin clots, which attach slough and eschar to the wound bed. Honey also promotes the formation of granulation and epithelial tissue within the wound following debridement, by encouraging the creation of collagen (Young, 2005).

Honey's strong osmotic actions may create a moist environment by drawing lymph fluid from the wound tissues (White, 2005). This osmotic action provides a constantly replenished supply of proteases at the interface of the wound bed and the overlying necrotic tissue, which may in part explain the rapid debridement seen when using honey (Stephen-Haynes, 2005).

Promotion of wound healing

Honey is able to start the healing process in non-healing wounds in a number of ways (Molan, 2005). It promotes a warm moist healing environment without encouraging microbial growth or maceration (Molan, 2005). In animal models, honey has been shown to stimulate angiogenesis (Gupta et al, 1992) and to stimulate the growth of epithelium over the wound.

Studies using wounds in animals have shown that honey has an anti-inflammatory influence even when there is no infection present (Molan, 1999). This has been seen as a reduction in the number of inflammatory cells infiltrating the wound tissue. So far the component of the honey that has the anti-inflammatory effect has not been identified (Young, 2005) but the anti-inflammatory influence may be associated with the antioxidant content of honey.

Acute inflammation is a necessary part of the healing process; however, chronic prolonged inflammation can produce an unhealthy imbalance in the wound bed and eventually cause further tissue destruction (Young, 2005). Honey may stop this prolonged inflammation and start the healing process in a non-healing wound.

Antibacterial properties of honey

The development of antibiotics during the 20th century marked the decline of many former remedies, but the

emergence of antibiotic-resistant strains of pathogens has led to the need to find alternative treatments (Cooper, 2004) such as honey. The evidence of the antibacterial activity of honey is extensive, with more than 70 microbial species reported to be susceptible (Molan, 1992). The mechanisms of microbial inhibition and the cellular target sites have not been fully investigated, but multiple, non-specific sites are likely (Cooper, 2004).

The antibacterial properties of honey is thought to be due to the release of hydrogen peroxide with some honeys having additional phytochemical antibacterial components (Molan, 2001). Honeys differ in the amount of hydrogen peroxide they contain and its potency. However, certain honeys are antimicrobial despite an absence of hydrogen peroxide (Young, 2005). This is because a variety of properties of honey may be responsible for its antimicrobial effect. Another reason may be that the application of honey to the wound bed results in an acidic environment, which prevents the multiplication of bacteria (Young, 2005).

Cooper and Molan (1999) demonstrated that honeys with an average level of antibacterial activity can be expected to be effective in preventing the growth of pseudomonas on the surface of a wound. Gethin and Cowman (2008) demonstrated in their prospective randomised controlled trial involving 108 patients — 35 men and 73 women — that Manuka honey was effective in eradicating methicillin-resistant *Staphylococcus aureus* from 70% of sloughy chronic venous leg ulcers.

Wound odour

Honey has the ability to reduce and neutralise wound odour. This may in part be because of its debriding action and the removal of dead and devitalised tissue and also its antimicrobial actions on the bacteria that cause odour (Molan, 1999; Lay-flurrie, 2008).

The metabolism of the glucose in the wound environment would result in the production of lactic acid instead of malodorous compounds such as

ammonia, amines and sulphur derivatives, which result from metabolism of amino acids which are produced when infecting bacteria metabolise amino acids from proteins in the serum of necrotic tissue in the wound (Molan, 1999).

The evidence supporting the use of honey in wound dressings

Moore et al (2001) investigated topical honey in superficial burns and wounds through a systematic review of randomised controlled trials (RCT). Seven such studies were found of which six were performed in India by the same author. These seven studies give information on 264 patients treated with honey. Moore et al (2001) reported that the studies were of limited quality. Six of the seven studies demonstrated that honey was superior for wound healing and the eradication of infection. The conclusion stated that there was a lack of high quality comparative evidence and that it is difficult to see how the 21st century can be upon us without such evidence being available.

Molan (2006) also reviewed the evidence supporting the use of honey as a wound dressing and suggested that some clinicians are under the impression that there is little or no evidence to support its use. Molan found that there are positive findings on honey in wound care from 17 RCTs involving 1,965 participants, and five clinical trials of other forms involving 97 participants treated with honey. He states that there is also a large amount of evidence in the form of case studies. Molan (2006) concludes that his review of the evidence amply demonstrates that honey, the oldest wound dressing material known to medicine, can give positive results where other modern products fail.

Mesitran honey

Mesitran is a range of hydroactive honey-enriched wound dressings that uses the healing properties of honey described above plus the benefits of added antioxidants in the ointments and the moisture balancing sheet-hydrogel dressings. It comprises three groups of dressings for all stages of wound healing: Mesitran ointment, Mesitran Mesh, and Mesitran and Mesitran Border (Table 1).

Table 1

The Mesitran range of dressings

Mesitran sheet hydrogel dressing
10 x 10cm, 17.5 x 10cm, 20 x 15cm

Mesitran Border sheet hydrogel with clear adhesive border
10 x 10cm (5.8 x 5.8cm)
15 x 13cm (10 x 8cm) sacral
15 x 15cm (10 x 10cm)

Mesitran Mesh
Hydrogel coated primary wound contact layer
10 x 10cm

Mesitran Ointment
15g and 50g tubes

Mesitran Ointment S
15g tube

Mesitran ointment

Mesitran ointment is indicated for debridement and for infected wounds and contains 48% honey. Mesitran S is for use with sensitive wounds and contains 40% honey. Mesitran S offers a gentler alternative because some patients can feel pain from the drawing sensation from the osmotic effect of the dressing. Mesitran ointment can also cleanse the wound and reduce malodour and can remain in place for two days. The other ingredients in Mesitran ointment are aloe vera, calendula, cod liver oil, sunflower oil, vitamins E and C, lanolin and zinc. Mesitran S contains only honey, polyethylene glycol (PEG) 4000, vitamins C and E and Medilan (medical grade lanolin) and is more suitable for those who may have more allergies to natural substances. Mesitran ointment is contraindicated in full-thickness burns and any known sensitivity to a component.

Mesitran Mesh

Mesitran Mesh is indicated to protect delicate wound beds and granulation tissue and contains 20% honey. It is a honey hydrogel-coated, open-weave polyester mesh, which can be used with the ointment and can stay in place for up to five days. It can be useful for all acute and chronic wounds including delicate

malignant wounds, pre-tibial lacerations, and other skin tears. The mesh is contraindicated in full-thickness burns, deep and/or narrow cavities and sinuses. The mesh should not be used on its own for heavily exuding wounds, but is ideal for use as a wound contact layer under a suitable secondary absorbent layer as the large open weave holes allow passage of exudate with less risk of getting blocked. This is especially useful if the exudate is particularly thick and could block the smaller holes in other wound contact layers. The hydrogel coating also means that it will not adhere to the wound.

Mesitran and Mesitran Border

Mesitran and Mesitran Border are indicated to maintain a moist healing environment in the later stages of healing during granulation and epithelialisation. They also can offer effective hydration to eschar and sloughy wounds to help loosen the wound debris and initiate autolytic debridement. They contain 30% honey and are formulated with honey, acrylic polymers and water. They are covered with a semi-permeable film, which has a moisture vapour transmission rate of 1,505–1,961 g/m²/24 hours. It can absorb seven times its own weight and can be left in place for up to five days.

The Mesitran range is indicated for low to moderately exuding wounds such as pressure ulcers, leg ulcers, diabetic foot ulcers, superficial wounds, superficial and partial-thickness burns, post-operative wounds, infected wounds and fungating wounds.

Vandeputte and Van Waeyenberge (2003) treated 89 patients with chronic wounds with Mesitran ointment in a non-randomised comparison study until complete wound closure. They concluded that the ointment had a quick debriding and antibacterial activity. They also concluded that Mesitran should be compared directly with high-tech dressings to quantify any difference in the effect on healing.

Conclusions

Honey wound dressings are currently enjoying a resurgence in use and there is now a growing number of companies

producing honey wound dressing ranges. Molan (2006) concludes that his review of the evidence amply demonstrates that honey can give positive results where other modern products are failing. The Mesitran range is an example of a modern wound care product that uses the healing properties of honey. It offers a useful range of medical grade honey dressings to manage a variety of chronic wounds in a wide range of stages of the healing process and is especially useful in debridement. **WUK**

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Key Points

- ▶ There has recently been a substantial resurgence in interest in using honey in the treatment of wounds.
- ▶ There is evidence that honey can promote autolytic debridement, maintain a moist wound environment, promote wound healing, protect wounds from bacterial growth and cross-infection and deodorise wounds.
- ▶ Mesitran is a range of hydroactive honey wound dressings.
- ▶ The Mesitran range is indicated for low to moderately exuding wounds such as pressure ulcers, leg ulcers, diabetic foot ulcers, superficial wounds, superficial and partial thickness burns, post-operative wounds, infected wounds and fungating wounds.

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