

A successful combination- Teicoplanin and Manuka honey in the management of cellulitic wounds

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There is a plethora of literature throughout the centuries documenting the use of honey on infected wounds. According to Dioscorides in 50AD 'honey is good for all rotten and hollow ulcers' and later in 1892 van Ketel recognised the antibacterial property of honey. More recently Molan (1992) reports that honey has an inhibitory effect to around sixty species of bacteria including aerobes and anaerobes, gram-positive and gram-negative and some antifungal activity on *Aspergillus* and *Penicillium* species. In 2015, the National Institute for Health and Care Excellence (NICE) acknowledges that honey dressings can be used to treat infected wounds.

It was initially believed that the antibacterial property of honey was due to the osmotic effect of its high sugar content (Bose, 1982). However, dilution of honey by exudate reduces the osmolality to a level that ceases to control infection (Chirife et al, 1983). White et al (1963) found that honey contains an enzyme that produces hydrogen peroxide when diluted. This enzyme was referred to as 'inhibine' prior to its identification as hydrogen peroxide and the term 'inhibine number' is used to measure the relative antibacterial potency of different honeys, it being the number of steps by which a honey could be diluted and still inhibit bacterial growth (Molan, 2001).

There is much controversy about the use of hydrogen peroxide in wound care and the side effects caused by this acid being described as more damaging than the wound itself. This risk in honey dressings is negated by Molan (2001) who states that the hydrogen peroxide produced in honey activated by dilution is typically around 1mmol/l, about one thousand times less than

the 3% solution commonly used as an antiseptic yet the level of hydrogen peroxide is still effective as an antimicrobial agent.

Studies by Allen et al (1991) have also found that Manuka (*Leptospermum scoparium*) honey from New Zealand also has substantial levels of non-peroxide antibacterial activity associated with an unidentified phytochemical component making it therapeutic against bacteria. A further explanation of Manuka honey's effectiveness in infected wounds is that the honey has been found to be effective against bacteria in biofilms (Cooper, Jenkins and Rowlands, 2011).

Maddocks et al (2103) found that Manuka honey directly effects bacterial cells embedded within a biofilm and destroys not only *Staphylococcus aureus* but also *Streptococcus pyogenes*. Research by Lu et al (2014) agrees that Manuka type honeys at the concentration applied in wound dressings are highly effective in both preventing staph aureus biofilm formation and in their eradication.

Camplin and Maddocks (2014) state topical treatment of Manuka honey should be appropriately applied for a suitable length of time in combination with other antimicrobials where necessary to ensure that infection is resolved and the likelihood for resistance is minimised.

In serious skin and soft tissue infections, the use of intravenous Teicoplanin in combination with Manuka honey has healed infected wounds. Teicoplanin is a glycopeptide which is bactericidal by destroying the cell wall of gram positive

bacteria such as *Staphylococcus aureus* and *Streptococcus*, the most common bacteria that cause cellulitis and wound infections.

Delivering intravenous Teicoplanin in the community setting by highly trained community nurses enabled by the national OPAT (outpatient parenteral antimicrobial therapy) service has improved local care for patients in Dudley, West Midlands.

By treating the infected wound systemically and topically, wound healing has been rapid and effective. This has subsequently saved NHS resources, improved patient outcome and provided appropriate antimicrobial stewardship. The first example of accelerated wound healing and eradication of wound infection can be seen in this 86 year old gentleman who had a skin and soft tissue infection in his inner thigh. He had one week of failed oral antibiotics and was referred by his GP for intravenous antibiotic treatment. The wound healed with IV Teicoplanin and Manuka honey dressings in 12 days. This combination of treatments also prevented a hospital admission for incision and drainage of the infected area.



The second case study is of a 56 year old lady with infected lymphoedema. She also had failed oral antibiotic treatment and was referred by her GP for intravenous antibiotics. Her acute infection resolved with IV Teicoplanin within ten days and the wound was completely dry and healed after fourteen days of the combination of intravenous antibiotic and Manuka honey dressings.

