

Literature review: the use of honey in wound care



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The use of honey to treat infected wounds dates to many centuries ago before the discovery of the various types of bacteria that cause wound infection. In the recent times, honey has been found to cause inhibitory effect to many species of aerobic, anaerobic, gram-negative and gram-positive bacteria (Gethin, & Cowman, 2005, p. 7). Honey has also shown to have an antifungal effect on several types of yeasts and some species of *Aspergillus* and *Penicillium*. The use of honey has been shown to be effective in wound management in several ways; due to its antibacterial properties, honey clears the existing wound infection while at the same time guarding the wound against any further attacks by the bacteria, it covers the wounds and prevent formation of odors in the wounds, honey has anti-inflammatory effect which causes reduction of edema around the thus reducing the scar size and it finally enhances the growth and proliferation of granulation and epithelial cells (Mphande et al., 2007, p. 317). This enhances the speedy healing of the wounds. Honey has been shown to stimulate the production of human monocytes which causes the release of cytokines that are responsible for protecting the body against attack by pathogens. Honey has several properties that make it effective in wound healing; it has a very high sugar content and low moisture content which ensures the wound remains dry and protects it from bacterial invasion, it creates an acidic environment on the wound surface thus destroying all the bacteria that may be present and it also contains hydrogen peroxide which enhances its anti-microbial properties (Gethin, & Cowman, 2005, p. 6). Currently, many strains of bacteria have been shown to develop resistance to the commonly applied antibiotics. This has necessitated medical researchers to conduct more

studies on traditional methods of treatment to determine their efficacy in treatment and their usability in the modern world.

The severity of a wound on the body's surface depends on its depth and the extent of the body that is affected. Honey has been used in the treatment of burn wounds with promising clinical outcomes. In a study to investigate the use of topical honey in superficial burns and wounds, Moore et al. (2006, p. 234) demonstrates that the use of honey had superior effects on patient outcomes as compared with other forms of treatment. The researchers applied seven randomized clinical trials six of which were performed in India and one in the United Arab Emirates. They found out that honey produced more healing effects in a week's time as compared to the other drugs.

However, after a period of 21 days it was discovered that the healing rates for both honey and other drugs were comparatively similar. This study meets the standards required to draw a valid conclusion. The sample size and the methodologies if applied well would produce results with high specificity and validity rates. The study contained some bias which was not well controlled. There was no blinding and out of the seven clinical trials, six of them were conducted by the same researcher and this introduces the risk of manipulation of the results in order to match with the rest (Moore et al., 2006, p. 235). Despite all these efforts, there still lacks a definitive way of indicating that the use of honey has is significant in the modern day world. There is need to exercise caution in the use of unconventional methods of treatment. Studies are thus encouraged in developing high quality and scientific founded comparative evidence for the use of modern and traditional treatment options.

Although honey has been used for many years by the Egyptians and the Greeks for caring of wounds, Simon et al. (2006, p. 92) notes that only Medihoney has been licensed as medically fit for use by patients for wound management in Europe and Australia. In one particular case, the researchers observe that a patient who had been admitted to the hospital developed wounds which were infected with a strain of Staphylococcus bacteria which were resistant to methicillin which was commonly used for wound treatment. On evaluation, the patient was subjected to octenidin which is a local antiseptic for a period of 12 days. There was no recorded improvement on the patient's wounds and therefore the doctors decided to use Medihoney. It was noted that the bacteria cleared off the wound in 2 days. Honey is able to draw moisture from the wound and cause the dehydration of the bacteria that are on the wound. The sugar content of the honey is also very high to deter any growth of microbes in a wound. Honey has also been shown to reduce pain in the wounds. As a result of its anti-inflammatory effects, it inhibits the production of prostaglandins which sensitizes the nerve endings to cause pain. It also prevents edema on the wound localities which prevents pressure on the tissues that result into pain (Simon et al., 2006, p. 93). The use of honey has been shown to produce profound effects on wound management by many researches. The conclusion of this study tallies with others that have been conducted previously. However, there is need to establish the standards of the honey that is used under the different circumstances and the preferable quantities to be applied for effective results to be achieved.

The mechanism under which honey works is still not well understood and various studies have been conducted with differing results. Among the mechanisms given include; stimulation of leukocytes to produce inflammatory effects on the wound. The initiation of inflammatory effects starts a cascade of cellular events which enhances the healing process. There is production of growth factors that function by controlling the proliferation of fibroblasts and epithelial cells on the surface of the wound. This process speeds up healing and prevents the formation of a scar on the wound's surface. In a recent study, Tonks et al. (2007, p. 1148) found a 5.8kDA component in the manuka honey which is in common use in New Zealand. This component in the honey causes the stimulation of TNF-alpha in the macrophages which enhances the phagocytosis of microbes in the wound. This process happens through the Toll-like receptor 4 in the cells. The second mechanism that has been observed to be effective in honey is in relation to the low pH of honey. The pH of honey ranges from 3.4-5.5 with a mean of 4.4. According to Rushton (2007, p. 70) and Schneider, Korber & Grabbe (2007, p. 415), bacteria colonies have been found in wound exudates having a pH value of > 7.3. This implies that with the low pH of honey, no bacteria invasion can occur in the wounds. The acidification of wounds has thus been demonstrated to increase the speed of wound healing. The low pH increases the release of oxygen from oxygen rich haemoglobin in the capillaries adjacent to the wounds. Rushton (2007, p. 71), also suggests that honey causes the suppression of protease activity in the wounds. This is through creation of an acidic atmosphere which is not supportive of protease activity that works at optimum levels at neutral pH. Honey is thus an anti-inflammatory agent and causes removal of invasive bacteria on the wound.

Additionally, honey has been demonstrated to have a debriding effect. This causes the removal of slough from the surface of the wound which are rich in bacteria colonies (Molan, 2005, p. 29).

The use of unconventional methods for treatment of diseases in the modern world has been faced by problems of acceptance. Many patients are knowledgeable on current medical procedures and would question the credibility of medical personnel applying traditional methods of treatment. In a study to determine the feasibility and acceptability of using Medihoney for leg ulcer patients, Dunford & Hanano (2005, p. 194) observed a high patient acceptance of honey treatment. The study intended to determine how effective honey was in relieving pain, in the control of odor and whether the patients felt satisfied by the procedures. A total of 40 patients were recruited to participate in the study. These were the patients whose wounds had not shown positive response to the 12 weeks compression therapy used to treat their ulcerous wounds. The patients received Medihoney dressing on their wounds concurrently with the other treatment for a period of 12 weeks. It was noted that the size of the ulcers diminished and the pain decreased significantly. In addition, the odors were eliminated as a result of increased healing. The patients were thus positive about the use of honey to treat their wounds. The results are however put into question by the fact that the patients who are in pain would give a nod to any procedure that tends to minimize their pain and suffering (Mphande et al., 2007, p. 317) Despite this, the study is instrumental in showing the knowledge gap that needs to be filled through further research.

The cost of medication is an important factor which determines how regular a certain procedure is used in comparison with another. Patients would tend to go for the lesser costly procedures which produces similar results. In a study carried out in South Africa, Ingel et al. (2006, p. 832) compared patients whose wounds were treated using honey to patients treated with IntraSite Gel. The patients treated using honey were mine workers with shallow wounds, skin grafting and burns of partial thickness. The researches found out that there was no appreciable difference in the time taken for healing between the two groups. However, in terms of cost the researcher found out that average cost of using honey for wound treatment was 4% the cost of using IntraSite. These results clearly indicated that use of honey is cheaper compared to some topical antibiotics in use today. The results are however constricted to one comparison as different antibiotics have different prices which also vary according to the country in use.

In summary, the use of honey has been found to be effective in enhancing wound healing. However, more studies are called for on the types of wounds that honey can be used to treat with maximum safety and efficacy.