A new organic wound ointment for the healing of chronic wounds

Accepted 26th August, 2020

ABSTRACT

Despite the rapid development of pharmaceuticals, wound healing remains a challenging clinical problem often leading to complications that result in morbidity. The use of natural ingredients, also known as herbal medicine, for treatment still plays a significant role in society as health promotion and disease prevention as well as treatment. Honey, aloe vera and olive oil are commonly used to cure many ailments before the existence of modern medicine. When compared with standard conventional treatment, complementary and alternative medicine which was derived from natural ingredients is preferred, as it is cost-friendly, believed to have better safety profiles, and can be easily obtained even without a prescription. This study aimed to demonstrate the efficacy of a new organic wound ointment in wound healing. Study participants were selected by random from a pool of patients who were attending for their routine follow up visits in Wound Care Unit in Hospital Kuala Lumpur. Eight patients with chronic wounds of different aetiologies, that is, diabetic foot ulcer, chronic venous ulcer, non-healing ulcer, and carbuncle wounds. Wound assessment was done before cleansing using distilled water and followed by debridement if necessary. WoundKreme, a natural remedy ointment was used for this study. The ointment was applied to the wound using a tongue depressor and polyurethane foam was used as a secondary dressing. Patients were scheduled for twice a week dressing change and were followed up to 7 months. 2-layer compression bandage was applied for chronic venous ulcer subjects and diabetic foot ulcers were offloaded using paddings. There were 2 diabetic foot ulcers, 1 chronic venous ulcer, 3 non-healing ulcers, and 2 post-carbuncles wound. Three wounds, that is, 1 diabetic foot ulcers, 1 non-healing ulcer, and 1 chronic venous ulcer closed completely. Meanwhile, the other 4 ulcers showed wound area reduction of 75.0 to 97.5%. In conclusion, the results of this study affirm that organic wound ointment, such as WoundKreme, is effective in wound healing of different etiologies. There were no adverse reactions or allergies reported. However, a more robust trial with a larger sample size such as a randomized control trial will yield a better significant result.

Key words: Organic wound ointment, chronic wounds, wound healing.

INTRODUCTION

Despite the rapid development of pharmaceuticals, wound healing remains a challenging clinical problem often leading to complications that result in morbidity. The use of natural ingredients, also known as herbal medicine, for treatment still plays a significant role in the society as health promotion and disease prevention as well as treatment. Honey, aloe vera and olive oil are commonly used to cure many ailments before the existence of modern medicine. When compared with standard conventional treatment, complementary and alternative medicine which was
derived from natural ingredients is preferred as it is cost-friendly, believed to have better safety profiles, and can be easily obtained even without a prescription.

Honey was the most popular remedy since the ancient Egyptians (Ibrahim, 1981). Traditionally, honey has been used to treat burns, infected and non-healing wounds, and ulcers, boils, pilonidal sinus, venous and diabetic foot ulcers (Zumla and Lulat, 1989; Moore et al., 2001; Wijesinghe et al., 2009; Khan et al., 2007; Jull et al., 2013; Mohd Zohdi et al., 2012). Recent randomized controlled trial (Gethin and Cowman, 2009) and randomized study (Lund-Nielsen et al., 2011) affirm the efficacy of honey in treating venous ulcers and malignant wounds, respectively. Raw honey has anti-inflammatory (Molan, 1999; Ramirez-Arriaga et al., 2011; Beretta et al., 2010; Bansal et al., 2005; Yao et al., 2011), anti-bacterial (Molan, 1999; Molan, 2002; Rady and Guyer, 2015) as well as anti-oxidant properties (Molan, 1999; Ramirez-Arriaga et al., 2011; Beretta et al., 2010; Bansal et al., 2005; Yao et al., 2011). In an animal study, honey was reported to reduce the activities of cyclooxygenase-1 and cyclooxygenase-2, hence showing anti-inflammatory effects (Vallianou et al., 2014). Honey has demonstrated bacteriostatic and bacteriocidal (Brudzynski and Kim, 2011) effect on approximately 60 species of bacteria including aerobes and anaerobes, gram-positive and gram-negative bacteria (Molan, 2002) as well as antifungal activity against some yeasts and moulds (Molan, 2002; Rady and Guyer, 2015). The high viscosity combined with the high osmolarity of honey hinders the growth of bacteria (Osato et al., 1999; Khoo et al., 2010). Other anti-microbial property explanation includes honey acidity due to the presence of gluconic acid, low protein content, low redox potential because of high reducing sugars, high carbon-to-nitrogen ratio, hydrogen peroxides (a by-product of glucose oxidase) and other non-peroxide compounds such as lysozymes, phenolic acids, and flavonoids from floral sources (Osato et al., 1999; Snowdon and Cliver, 1996; Weston, 2000). Flavonoids and other polyphenol compounds found in unrefined honey act as anti-oxidants (Ramirez-Arriaga et al., 2011; Beretta et al., 2010).

_Aloe vera_ has been used since 1500 BC as a medicinal plant traditionally in many countries for various diseases and skin lesions (Shelton, 1991; Oliveira et al., 2010). Several studies have shown the positive effects of _Aloe vera_ to treat wounds such as psoriasis, mouth sores, ulcers, diabetes, herpes, bedsores, and burn wounds (Khadem Haghighian et al., 2012; Zahmatkesh and Rashidi, 2008; Elshenawie et al., 2013; Dat et al., 2012; Malek Hosseini et al., 2013; Sahu et al., 2013; Shaugh Nessy, 2000, Moghbel et al., 2007; Maenthaisong et al., 2007). Several studies conducted reported that _Aloe vera_ acts as anti-inflammatory (Shelton, 1991; Heck et al., 1981) by inhibiting IL-6 and IL-8, reducing leukocyte adhesion, increasing IL-10, and decreasing TNF-alpha levels (Mosayebi et al., 2009). _Aloe vera_ promotes wound healing by inhibiting thromboxane which is an inhibitor of wound healing (Shelton, 1991; Heck et al., 1981), and the presence of regenerative properties such as compound glucosmann which in turn increases the amount of collagen in wounds (Boudreau and Beland, 2006). Glucosmann affects fibroblast growth factor receptors and stimulates their activity and proliferation, which in turn increases the production of collagen. Magnesium lactate found in _Aloe vera_ prevents the production of histamine that causes itching and irritation of the skin (Bunyapraphatsara et al., 1996; Somboonwong et al., 2000).

Multiple studies have shown that the efficacy of topical administration of olive oil in the healing of diabetic foot ulcer (Khadem Haghighian et al., 2012; Zahmatkesh and Rashidi, 2008; Elshenawie et al., 2013; Aziza et al., 2011). Olive oil is composed of 98% triglycerides, including predominantly monounsaturated oleic acids, which their anti-inflammatory properties have been proven to be essential for skin maintenance, as such properties are similar to ibuprofen, which may accelerate the recovery and healing process of ulcers (Lucas et al., 2011; Cicerale et al., 2012). Despite the positive clinical evidence, the pathophysiological basis of live oil benefits on ulcer healing is not clear. Furthermore, owing to the high concentration of polyphenols, which are natural antioxidants, included in olive oil, its use mitigates the inflammatory process and increases blood flow, thus helps in ulcer healing (Cicerale et al., 2012; Rafehi et al., 2012).

**Objective**

To demonstrate the efficacy of a new organic wound ointment in wound healing.

**METHODOLOGY**

Study participants were selected by random from a pool of patients who were attending for their routine follow up visits in Wound Care Unit in Hospital Kuala Lumpur. Eight patients with chronic wounds of different aetiologies, that is, diabetic foot ulcer, chronic venous ulcer, non-healing ulcer, and carbuncle wounds. Wound assessment was done before cleansing using distilled water and followed by debridement if necessary. WoundKreme, a natural remedy ointment was used for this study. The ointment was applied to the wound using a tongue depressor, and polyurethane foam was used as a secondary dressing. Patients were scheduled for twice a week dressing change and were followed up to 7 months. 2-layer compression bandage was applied for chronic venous ulcer subjects and diabetic foot ulcers were offloaded using paddings.

The trial was conducted following the guidelines set in the Declaration of Helsinki and approved by the hospital review board. Informed consent and permission to use
Table 1: Cases of ulcers.

<table>
<thead>
<tr>
<th>Case</th>
<th>Diagnosis</th>
<th>Initial wound area cm²</th>
<th>Final wound area cm²</th>
<th>Percentage of wound reduction (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Diabetic Foot Ulcer</td>
<td>114.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>2</td>
<td>Non-Healing Ulcer</td>
<td>6.0</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>3</td>
<td>Chronic Venous Ulcer</td>
<td>1.5</td>
<td>0.0</td>
<td>100.0</td>
</tr>
<tr>
<td>4</td>
<td>Non-Healing Ulcer</td>
<td>162.5</td>
<td>4.0</td>
<td>97.5</td>
</tr>
<tr>
<td>5</td>
<td>Post-Carbuncle</td>
<td>67.5</td>
<td>2.0</td>
<td>97.0</td>
</tr>
<tr>
<td>6</td>
<td>Diabetic Foot Ulcer</td>
<td>57.0</td>
<td>6.0</td>
<td>89.5</td>
</tr>
<tr>
<td>7</td>
<td>Non-Healing Ulcer</td>
<td>10.0</td>
<td>2.5</td>
<td>75.0</td>
</tr>
</tbody>
</table>

Figure 1: A 56 years old, Chinese gentleman, with underlying type 2 diabetes mellitus.

The patient is a 56 years old, Chinese gentleman, with underlying type 2 diabetes mellitus. He was referred to the wound clinic due to infected left diabetic foot ulcer (Figure 1).

Clinical images and case details for publication/research purposes were obtained before the study.

RESULTS

There were 2 diabetic foot ulcers, 1 chronic venous ulcer, 3 non-healing ulcers, and 2 post-carbuncles wound. Three wounds, that is, 1 diabetic foot ulcers, 1 non-healing ulcer, and 1 chronic venous ulcer closed completely. Meanwhile, the other 4 ulcers showed wound area reduction of 75.0 to 97.5% (Table 1).

Case 2

The patient is a 51 years old, Malay lady, with no known medical illness. She was referred to the wound clinic for non-healing ulcer (Figure 2).

Case 3

The patient is a 65 years old, Malay gentleman, with underlying type 2 diabetes mellitus and hypertension. He was referred to the wound clinic due to bilateral chronic venous ulcer (Figure 3).

Case 4

The patient is a 63 years old, Malay gentleman, with
underlying type 2 diabetes mellitus, hypertension, and ischemic heart disease. He was presented with a non-healing ulcer, previously treated for right foot necrotizing fasciitis (Figure 4).
Figure 5: A 56 years old, Malay lady, with underlying type 2 diabetes mellitus and hypertension.

Figure 6: A 50 years old, Malay lady, with underlying type 2 diabetes mellitus and hypertension.

Case 5
The patient is a 56 years old, Malay lady, with underlying type 2 diabetes mellitus and hypertension. She was referred to the wound clinic for right arm carbuncle (Figure 5).

Case 6
The patient is a 50 years old, Malay lady, with underlying type 2 diabetes mellitus and hypertension. She was referred to the wound clinic for right diabetic foot ulcer (Figure 6).

Case 7
The patient is a 52 years old, Indian gentleman, with underlying type 2 diabetes mellitus, hypertension and end-stage renal failure on regular hemodialysis. He was referred to the wound clinic for non-healing ulcer (Figure 7).

DISCUSSION
WoundKreme, a natural remedy ointment was used for this study. It is rich in honey and active botanical ingredients, that is, aloe vera, olive oil, lanolin, glycerine, wheat germ oil, marshmallow root, wormwood, and beeswax, which was
curated to address all the different phases involved in wound healing to enhance and expedite healing. The unique action of each ingredient aids in wound debridement provides analgesic relief, and stimulates cellular re-epithelialization.

Honey contains multiple bioactivities and provides a moist healing environment that aids to rapidly clear infection, reduce inflammation, oedema, and exudation in the wound. It also increases the healing rate by stimulating angiogenesis, tissue granulation, and re-epithelialization. Honey is suitable for wound healing as it has anti-inflammatory, antibacterial as well as anti-oxidant properties. *In-vitro* studies show honey's ability to stimulate leukocytes which increases the production of cytokines and finally, stimulates the growth of cells.

*Aloe vera* plant extract helps to inhibit the growth of harmful bacteria and accelerates the healing process. Olive oil, which is rich in antioxidants, helps to improve inflammatory responses, acts as skin protection and lubricant. Lanolin and glycerine act as moisturizers to treat or prevent dry, rough, scaly, itchy, and minor skin irritations. Wheat germ oil, which is rich in vitamin A, D, and fatty acids, aids in skin repair and minimizing scar tissue. *Althaea officinalis*, also known as marshmallow root, is an active ingredient to treat inflammation and facilitate the removal of the dressing. *Artemisia absinthium* or wormwood is another active ingredient which hastens wound healing through its antibacterial and analgesic properties. Natural USP grade beeswax acts as antibacterial, antiviral, anti-inflammatory, and acts as a barrier to prevent fluid loss during the exudative phase of wound healing.

*WoundKreme* helps in wound healing and pain relief through its vast naturally derived ingredients while naturally debrides devitalized tissue in a physiologic manner. *WoundKreme* was formulated to accelerate the healing process and provides a more complete wound care dressing for patients and healthcare practitioners which is suitable for all types of cuts, burns, and wounds.

In conclusion, the results from this study show that organic wound ointment, such as *WoundKreme*, is effective in wound healing of different etiologies. There were no adverse reactions or allergies reported. However, a more robust trial with a larger sample size such as a randomized control trial will yield a better significant result.

**ACKNOWLEDGEMENT**

Feuille Organix Sdn Bhd sponsored the *WoundKreme* used for this study.

**REFERENCES**

Gethin G, Cowman S (2009). Manuka honey vs. hydrogel—a prospective, open label, multicentre, randomised controlled trial to compare...
Molan PC (1999). The role of honey in the management of wounds. J. Wound Care. 8(8): 415-8