

Role of Honey as a Biological Dressing in Chronic Wounds

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Abstract

Introduction: Chronic wounds (leg ulcers, diabetic ulcers, and pressure ulcers), on the other hand, are caused mainly by an internal insult in the form of circulatory compromise. This study was conducted to evaluate the role of honey as a biological dressing.

Materials and Methods: In this study, 2500 male and female patients suffering from diabetes ulcer (56.76%), varicose veins (22.28%), trauma, and decubitus ulcers (20.96%) wound were treated with split skin graft (SSG) and conservatively with honey dressing and antibiotic. The bacteriological swabs were taken to determine causative organisms.

Results: In diabetic ulcers, 84% success was observed in those treated with SSG and a 100% success rate for patients treated with honey dressing and antibiotics. A graft success rate of 87% was found in venous ulcers and a success rate of 43.93% when treated with honey dressing and antibiotics. In addition, 100% wound healing was obtained in patients with traumatic ulcers suffering from HIV infection.

Conclusion: Honey dressing promotes rapid granulation tissue proliferation when compared to patients without honey dressing.

Key words: Decubitus ulcers, Diabetic ulcer, Honey dressing, Varicose vein

INTRODUCTION

A wound can result from either an external or an internal insult. Many acute wounds are caused by external insults, such as mechanical insults, thermal radiation, ultraviolet radiation, or radiation (gamma radiation) therapy. Chronic wounds (leg ulcers, diabetic ulcers, pressure ulcers), on the other hand, are caused mainly by an internal insult in the form of circulatory compromise. Inadequate circulation robs tissue of necessary nutrients and potentiates proinflammatory cytokines, leading to tissues necrosis.^[1,2]

Honey is derived from nectar gathered and modified by the honeybee, *Apis mellifera*. It is a carbohydrate-rich

symp derived from floral and other plants nectars and secretions. Since ancient times, honey has been used in folk medicine and has more recently been rediscovered by medical researchers for its use in dressing acute and chronic wounds. Traditionally, honey has been used to treat burns, infected and non-healing wounds, ulcers, boils, pilonidal sinus, venous, and diabetic foot ulcers.^[3-6] However, recent studies confirm the efficacy of honey in treating venous ulcers.^[7] In addition, in patients suffering from malignant wounds, improvement with respect to wound size and cleanliness was seen after treatment with honey-coated bandages.^[8]

Similarly, honey dressing quickened rates of healing in pressure wounds. Honey has also been used to lessen foul odors emanating from wounds which cause a social barrier for patients and may lead to isolation. There are also reports of using medihoney to reduce the symptoms of chronic ocular surface diseases.^[9,10] Unrefined honey has anti-inflammatory, antibacterial, and antioxidant properties.^[11] The antibacterial action is due to its acidity, hydrogen peroxide content, osmotic effects, nutritional

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and antioxidant content, stimulation of immunity, and unidentified compounds.^[12]

Honey is the oldest wound dressing material known to humans when some modern products fail in this area. Laboratory studies provide further evidence supporting its use in wound dressing due to its bioactivities. Honey stimulates leukocytes to release cytokines, which is what initiates the tissue repair process. It also stimulates the immune response to infection. The stimulation of other aspects of the immune system by honey is also evident (Proliferation of B- and T- lymphocytes and the action of phagocytes). In addition, honey stimulates the production of antibodies.^[13]

MATERIALS AND METHODS

Place of Study

IRT Perundurai Medical College and Research Institute, Perundurai, Tamil Nadu.

Sample Size

2500.

Period of Study

2000–2015.

Inclusion Criteria

- Male or female over 10-year-old who has provided his/her written informed consent
- Patients with diabetes mellitus, varicose veins, trauma, and decubitus ulcers.

Exclusion Criteria

- All patients under the age of 10 years
- Any patients with documented honey allergy
- Pregnant women
- Patients with a history of prior skin grafting
- Patients with documented coagulopathy.

All wounds were cleaned twice daily with hydrogen peroxide and povidone-iodine. Honey was then applied with a prepacked wooden spatula, using a fresh spatula for each application. The amounts applied depending on the size of the wound. All wounds were covered with Opsite to keep the agent in place.

Wound debridement was done in some patients. Split skin graft (SSG) and conservative treatment were used depending upon the severity of the wound. Bacteriological swabs were taken, and the presence of a common organism was determined.

RESULTS

In this study, 2500 patients were studied having a wound. In addition, 2000 male and 500 female patients were included with ages ranging from 10 to 80 years [Table 1]. In our study, male patients predominated with a male to female ratio of 4:1.

Patients were having diabetes (56.76%), varicose veins (22.28%), trauma, and decubitus ulcers (20.96%) as a disease pattern [Table 2].

From each patient bacteriological swab was taken and analyzed for the presence of common organisms. *Escherichia coli* and *Pseudomonas* were present as common organisms in wounds. In patients with diabetes, wound debridement was done in 65% of patients. In addition, the diabetes patients were undergoing treatment with insulin human mixtard 30/70 and oral hypoglycaemic agents. In addition, SSG was done for 900 patients out of 1419 with diabetes, and the success rate was 84%, while conservative treatment was done for 519 patients with diabetic ulcers <5 cm × 5 cm in size, which were treated at home.

Vascular Doppler studies were done in patients having varicose veins of lower limbs with a venous ulcer. Wound debridement was done for 20% of people with venous ulcers. Varicose vein surgery Trendelenburg's with perforator ligation and SSG was done in 250 patients and without SSG in 200 patients. A graft success rate of 87% was found in these patients. In addition, 107 patients who refused surgery were treated with honey and antibiotics. Among these wounds healed in 47 patients, 50 were lost for follow-ups, and 8 died from the remaining 10 neglecting the ulcers.

Table 1: Description and age distribution of study patients

Age	Male	Female
10–20	25	10
20–30	65	25
30–40	500	140
40–50	850	198
50–60	300	60
60–70	160	45
70–80	100	22
Total	2000	500

Table 2: Disease pattern in patients

Disease pattern	Male	Female	Total
Patients with diabetes	1025	394	1419
Patients with varicose veins	506	51	557
Patients with trauma and decubitus ulcers	469	55	524

Wounds in all patients suffering from trauma and decubitus were treated conservatively. Decubitus patients were all older adults and 234 patients died due to cardiovascular and neurological problems. In addition, 25 patients with HIV infection were treated with honey dressings for their traumatic ulcers, and 100% wound healing was obtained.

DISCUSSION

Honey has been in use as a wound dressing for thousands of years.^[14,15] In the past few decades, a large amount of clinical evidence has been accumulated that demonstrates the effectiveness of honey in this application.^[16,17] However, it is only in more recent times that the science behind the efficacy has become available. It is now understood that honey is not just sugar syrup with specific physical properties that make it suitable as a wound dressing material but a biologic wound dressing with multiple bioactive components that can expedite the healing process.

Honey is a biologic wound dressing with multiple bioactivities. Each healing-promoting activity can be found separately in pharmaceutical products, but in honey, they all present and work together synergistically to enhance the healing process. In addition, the added benefit from the physical properties of the honey creates a moist healing environment, one in which the antibacterial activity removes all likelihood of moist conditions favouring bacterial growth.^[18]

The most challenging aspects of chronic wounds are the prolonged healing times, risk of infection, deterioration of the patient's general health, and weakening of the immune system, which can increase morbidity and even result in death.^[19] This study revealed that the use of honey dressings decreased the length of hospital stay and would have, in turn, reduced hospital costs. Furthermore, in many cases, it avoided the need for grafting or a flap. In this study, 2500 patients suffering from wounds with various disease patterns were treated with SSG and conservatively with honey dressing and antibiotics.

In patients suffering from diabetic ulcers, 84% success was observed in those treated with SSG and 100% success rate for patients treated with honey dressing and antibiotics. Venous ulcers in patients with varicose veins and graft success rate of 87% were treated with surgery Trendelenburg's with perforator ligation (With or without SSG) and 43.93% when treated with honey dressing and

antibiotics. Finally, 100% wound healing was obtained in patients with traumatic ulcers suffering from HIV infection.

CONCLUSION

This study aimed to demonstrate that wound management with honey dressing is effective in treating chronic wounds. Evidence of honey promotes rapid granulation tissue proliferation when compared to patients without honey dressing.

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