

**Research Paper**

Comparison of Conventional Normal Saline Dressing and Honey Dressing In the Management of Chronic Non-Healing Ulcers

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Email: drlatheef62@gmail.com, Mob: +919847152984**Abstract**

Background: The management of chronic wounds has been a considerable challenge since centuries. Non-standard treatment that is both medically and financially effective needs to be identified. Honey has been used for its healing properties for centuries and has been used to successfully heal chronic wounds including pressure-ulcers.

Methods: This is a study comparing conventional normal saline dressing and honey dressing in the management of chronic non healing ulcers carried out from July 2014 to June 2015. Factors assessed include average hospital stay, culture sterility before and after dressing, the outcome - discharged, amputated or grafted, whether diabetes and vascular compromise has altered the results in two groups.

Results: As in evidence with ancient literature and studies in modern literature it was proved that irrespective of age, gender, presence of co-morbidities like diabetes and vascular compromise; honey dressing was significantly advantageous over conventional normal saline dressing in terms of culture sterility, final limb outcome as well as less stay in hospital. This study turns to prove that honey dressing is a better alternative to conventional normal saline dressing which can also pave way for better antibiotic stewardship and decreased antibiotic resistance.

Keywords: Non healing ulcer, Honey dressing, diabetic foot.

INTRODUCTION

A chronic non healing ulcer is one the common conditions leading to in-patient care in surgical wards. Common causes being Diabetes mellitus, Peripheral occlusive vascular disease (POVD), Trauma and Venous ulcer. Most commonly the lower extremity is affected. Nearly 1% of the adult population is affected by this morbidity, of which 12% of chronic non healing ulcer foot

result in amputation. Once patient is amputated chance of developing ulcer in the opposite extremity increases. Even if the limb is salvaged; prolonged use of antibiotics, hospital stay, repeated wound debridement; add to the physical, mental and financial trauma of the patient. In addition, the emergence of antibiotic resistant strains are occurring day by day which add to the treatment cost. Nevertheless, the line of

management of chronic non healing ulcer in most hospitals is repeated wound debridement, saline washing, dry to moist gauze dressing and antibiotics.

Though honey has been mentioned to have a curative role in ancient literature, only recently it has been integrated into modern medical practice. The antibacterial property of honey was first recognized in 1892 by Van Ketel. In 1919 the antibacterial effect of honey was proven in laboratories. In vitro studies have shown that active honey is bactericidal against strains of antibiotic resistant bacteria isolated from infected wounds such as Methicillin resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *enterococci* and *Burkholderiacepacia*¹.

This study aims to demonstrate the benefit of Honey dressing over conventional saline dressing in the management of chronic non healing ulcer.

MATERIALS AND METHODS

Study was conducted among patients admitted with chronic non healing ulcers in male and female general surgical ward from July 2014 to June 2015.

Aim: To study the advantage of Honey dressing over conventional saline dressing in the management of chronic non healing ulcer.

Objectives: To prove that the duration with which a chronic non healing ulcer will become bacteriologically sterile and develop healthy granulation tissue is less with honey dressing compared to conventional saline dressing.

Inclusion Criteria: (1) Age group 13-80 years (2) Grade 1- 3 ulcers (3) Diabetic ulcer, Traumatic ulcer, Venous ulcer, Ulcer due to POVD (4) Patients consenting to the present study

Exclusion Criteria: (1) Fistulas to organs or cavities (2) Discharging sinus from bone (3) Malignancy (4) Exposed blood vessels (5) Tuberculous ulcer (6) Grad 4-5 ulcers.

Patients who satisfied the inclusion and exclusion criteria were selected for the study and were classified according to the grade of ulcer by Wagner classification and EPUAP classification

for pressure sores (Table 1). For the first 6 months of the study patient outcomes with saline dressing were studied; honey dressing was studied for the next 6 months.

Approval was obtained from the institutional research and ethical committee. Informed written consent was obtained from the patients after explaining to them, the procedure and purpose of this study. On admission, swabs were collected from the ulcers for bacterial culture and sensitivity and an arterial Doppler study was done to assess the vascularity of the limb. X-ray of the affected region was taken to rule out osteomyelitis. Wound debridement was done in both study groups. Saline dressing implied cleaning the ulcer with saline, debridement if abundant slough was present, covering the wound with sterile surgical pads after cleaning the surrounding skin with povidone iodine, on alternate days. Honey dressing was done by pouring sterilized Honey (College of Agriculture, Vellayani, Kerala) over the ulcer to fill three quarter of the depth. Gauze was placed over the ulcer, then dry sterile surgical pad was applied after cleaning the surrounding area with povidone iodine, on alternate days. Honey was sterilized by heating at 65 degree Celsius for 5 minutes. Oral or parenteral antibiotics were given in both groups. Outcome was assessed at the end of 1st week in both groups. Factors assessed include Presence or absence of organism (based on culture and sensitivity of swab collected from ulcer bases after dressing), nature of discharge (whether purulent or serous) and appearance of healthy granulation tissue.

Other factors used in comparison of saline dressing and honey dressing were: Outcome plan- whether patient was discharged, amputated or grafted, duration of hospital stay, outcomes based on Grade of ulcer at presentation and extent of vascular compromise. Grafting was done in patients with healthy granulation tissue and minimal serous discharge. In those patients whose wound culture was sterile but not fit for grafting were discharged for dressing in local hospital and asked to review later. Amputation was done in

those patients who had spreading infection with a nonviable limb.

Clinical data obtained from the study was analyzed using SPSS software. Mean, median and mode was calculated for categorical data. The tests of significance used include students test (paired and unpaired) and Chi square test. Level of significance was p value < 0.05 .

RESULTS

Total 50 patients were included in the study out of which 27 patients received honey dressing and 23 patients got normal saline dressing. People included in the study were categorized under 4 groups with regard to age i.e, those who are, < 40 years, 40-49 years, 50-59 years, > 60 years. 94% of patients were between the age group 40-59. In none of these groups the difference in number of patients between honey dressing and saline dressing were statistically significant (p value > 0.05). Mean age of patient included under honey dressing was 60.29 and Mean age of patient dressed with normal saline is 59.34. Among these 50 patients, 28 patients were male (56%) and 22 patients females (44%). Those who were given honey dressing included 15 males and 12 females. Normal saline group included 13 males and 10 females. Gender differences in both groups were also proven to be statistically insignificant with $p > 0.05$.

Both groups had comparable distribution of grades of ulcer (Table 3) (Chi square=2.29, p value=0.512).

In saline dressing group, Out of the total 23 patients, 11 had a normal Doppler study whereas 12 patients had evidence of vascular compromise. In honey dressing group, 17 among the 27 patients had normal Doppler scan whereas 10 had evidence of vascular compromise according to Doppler. 52% of saline dressing group and 37% of honey dressing group had evidence of vascular compromise in Doppler study. When tested using Chi square test, it was found that the difference in number of vascular compromised patients in both study groups was not statistically significant with

a p value > 0.05 (Chi square-1.15, p value-0.28). Thus, both groups were comparable with respect to extent of vascular compromise.

Among 50 patients included in the study, 20 patients were diabetic. 47.8% of patients in whom saline dressing was used and 59.2% of patients in whom honey dressing was used were non diabetic. This difference in distribution of number of diabetic patients were proved not significant with p value > 0.05 .

Swabs were taken from ulcer site on presentation and on day 7 after dressing, and were sent for culture and sensitivity. It was observed that honey dressing turned 92% of cultures sterile (Chi square value-35.9; p value 0.0001) (Table 2). Hence the difference in decolonization of ulcer bases among the groups was found to be highly significant.

Patients were categorized under the three probable outcomes: (1) Discharged and asked to review later (2) Split skin grafting done during their hospital stay (3) Amputation.

63% of patients who were dressed with honey could be grafted during their hospital stay whereas only 17% of normal saline dressing group could be grafted. This difference was proven to be statistically significant with a p value of 0.004 (Chi square value - 10.77), thus confirming that honey dressing helps in early grafting of the patient and hence superior to conventional saline dressing.

Average duration of hospital stay in those dressed using normal saline was found to be 31.3 days with standard deviation 6.5 and median being 30 and mean duration in those dressed with honey was found to be 25.77 days with standard deviation 5.27, median being 26. Difference in average duration of hospital stay in both groups was proven to be highly statistically significant with a p value of 0.000934. (t value=3.29)

Duration of hospital stay was further divided into groups: 7-13 days, 14-21 days, 22-28 days, 29-35 days, > 35 days. Among these groups 21 of total 50 (42%) belonged to 22-28 days group. Another observation was that only 1 among the honey dressing group stayed for more than 35 days; whereas 7 among the normal saline group stayed

in hospital for more than 35 days. This difference in both groups was studied using Chi square test and was found to be statistically significant with a p value of 0.018.(Chi square value-11.8).

It was found that, honey dressing are associated with less duration of hospital stay, possibility of early grafting and significant ability to decolonize ulcer bases.

1. Wagner Grading system for Diabetic foot infections

0	Intact skin
1	Superficial ulcer of skin or subcutaneous tissue
2	Ulcer extend into tendon, bone or capsule
3	Deep ulcer with osteomyelitis, or abscess
4	Gangrene of toe or forefoot
5	Midfoot or hindfoot gangrene

2. Ulcer base de-colonization; pre-dressing and post-dressing - Honey dressing group

Culture sterility in honey dressing group	Pre dressing	Post dressing
Sterile	3	25
Unsterile	24	2
Total	27	27

3. Distribution of patients in both groups based on grade of ulcers.

Grade of ulcer	Saline dressing	Honey dressing	Total
Grade 1	1	2	3
Grade 2	10	11	21
Grade 3	10	8	18
Grade 4	2	6	8
Total	23	27	50

DISCUSSION AND CONCLUSION

Honey has been proven to have significant antibacterial properties and is a useful constituent in wound and burn care². It contains diastase, invertase and glucose oxidase. The antibacterial properties arise from the presence of glucose oxidase which converts glucose to gluconolactone, which in turn yields gluconic acid and hydrogen peroxide³. Numerous laboratory studies and clinical trials have shown that honey is an effective broad-spectrum antibacterial agent that has no known adverse effects on wound tissues⁴. Clinically, topical honey treatment has

been shown to have many key actions: antibacterial and antimicrobial, autolytic debridement, deodorises wounds, stimulates growth of wound tissues to hasten healing and to start the healing process in dormant wounds; anti-inflammatory activity rapidly reduces pain, oedema, and exudate and minimizes scarring;

Efem (1988), Dunford and Hanano (2004), Khan Fasal are among a few who have done trials with honey and all have reported the positive benefits of honey in pain reduction, odor control and general patient satisfaction⁵. Honey was also proven to be superior to silver sulfadiazine in burns dressing by Subrahmanyam⁶. In our study also we got comparable results which was statistically significant thus proving that honey can be a good alternative to conventional saline dressing.

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REFERENCES

1. Cooper. Evidence of use of topical agents in wound care.2004;58:46-48
2. Crane, E. "A Book of Honey." Charles Scribner's Sons, New York. Journal of Apicultural Research .1980;27(4):244.
3. Sibel Babacan and Arthur G. Rand. Characterization of Honey Amylase Journal of Food Science.2007; Vol. 72:50-55.
4. S. Babacan, L.F. Pivarnik, and A.G. Rand. Honey Amylase Activity and Food Starch Degradation. Journal of Food Science. 2002; Vol. 67: 1625-1630.
5. Efem S. Clinical observations on the wound healing properties of honey. British Journal of Nursing. 1988;75(11): 679-681.
6. Subrahmanyam. Topical application of honey in treatment of burns. British Journal of Nursing. 1991 ;78 (4): 497-498.