


Original Research Article

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

Mohanakrishna Meka *

Assistant Professor, Department of Surgery, Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar, Telangana, India

*Corresponding author email: vanisu1990@gmail.com

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Abstract

Background: This study was to show the advantage of Honey dressing over conventional saline dressing in the management of chronic non healing ulcer.

Materials and methods: This was an open study comparing conventional normal saline dressing and honey dressing in the management of chronic non healing ulcers done during July 2014 to June 2015 in general surgical wards of government TD medical college, Alappuzha.

Results: Factors assessed include average hospital stay, culture sterility pre and post dressing, their outcome plan (discharged, amputated or grafted), whether diabetes and vascular compromise has altered the results in two groups etc. As in evidence with ancient literature and studies in modern literature it was proved that irrespective of age, sex, distribution of diabetes and vascular compromise in Doppler; honey dressing was significantly advantageous over conventional normal saline dressing in terms of culture sterility, better outcome plan as well as less stay in hospital.

Conclusion: The honey dressing is a better alternative to conventional normal saline dressing which can also pave way for decrease in antibiotic resistance.

Key words

Normal Saline dressing, Honey dressing, Ulcers.

Introduction

A chronic non healing ulcer is one of the most common cause of admission in the surgical ward, most common causes being Diabetes mellitus, POVD, Traumatic 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 go for amputation. Once patient is amputated chance of developing ulcer in the opposite extremity increases.

Even if the limb is saved, 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 to day which add to the cost of the treatment. Still the line of management of chronic non healing ulcer is in most of our hospital is repeated wound debridement, saline washing, dry to moist gauze dressing and antibiotics.

Wagner Grading System for Diabetic Foot Infections

0 – Intact Skin

1- Superficial ulcer of skin or subcutaneous tissue

2- Ulcers extend into tendon, bone, or capsule

3 - Deep ulcer with osteomyelitis, or abscess

4 - Gangrene of toes or forefoot

5 - Midfoot or hindfoot gangrene

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 MRSA, vancomycin-resistant enterococci and

Burkholderia cepacia to the list of susceptible bacteria [1].

Aim and objectives

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

Materials and methods

Study was conducted among patients admitted with chronic non healing ulcers in male and female general surgical wards of Govt. T.D Medical College, Alappuzha which is a tertiary care centre for one year extending from July 2014 to June 2015.

Patients who meet the inclusion criteria was selected during the study period. For the first 6 months of study Saline dressing was given. For the next 6 months of study Honey dressing was given.

Inclusion criteria

All Patients of age group 13-80 years included in this study are classified according to the grade of ulcer by Wagner classification and EPUAP classification for pressure sores

- All grades included except those in which gangrene has already occurred.
- Diabetic ulcer
- Traumatic ulcer
- Venous ulcer
- Ulcer due to POVD

Exclusion criteria

- Fistulas to organs or cavities
- Discharging sinus from bone
- Malignancy
- Exposed blood vessels
- Tuberculous ulcer

Study procedure

Due clearance was obtained from the research and ethical committee and informed written consent from the patients after explaining to them about the procedure and purpose of this study. On admission Pus C&S was taken for both groups and Arterial Doppler study to assess the vascularity of the limb was done in both groups. X ray of the affected region was taken to rule out osteomyelitis. Wound debridement was done in both study groups.

For first 6 months, patients were given conventional saline dressing i.e. 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. Alternate day cleaning and dressing was done. Oral or parenteral antibiotics were also given. Next 6 month selected patients were given Honey dressing. Honey poured 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. Antibiotics were also given orally or parenterally and alternate day dressing was given. Honey (government supply bottled honey) used in this study is sterilized by heating at 65⁰ Celsius for 5 mins. It was obtained from College of Agriculture, Vellayani.

Outcome was assessed at the end of 1st week in both groups and factors assessed include Pus c & s (for presence or absence of organism), Nature of discharge (whether purulent or serous), Appearance of healthy granulation tissue.

The factors used in comparison of saline dressing and honey dressing include:

- Pus culture before and after dressing.
- Outcome plan-whether patient was discharged, amputated or grafted. 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.

- Duration of hospital stay.
- Whether there is any difference of outcome in different distribution of grades of ulcer.
- Whether there is any difference of outcome in patients with vascular compromise which is found out by Doppler ultrasound.
- Whether there is any difference of outcome in patients with diabetes mellitus.

Clinical data obtained from the study was analysed using SPSS software. Mean, median and mode was calculated for categorical data. The tests of significance used include students t test and chi square test. Level of significance is p value < 0.05.

Results and Discussion

Age distribution of patients included in study

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 (**Graph - 1**).

Total 50 patients were included in the study out of which 27 patients received honey dressing and 23 patients got normal saline dressing (**Graph - 2**).

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

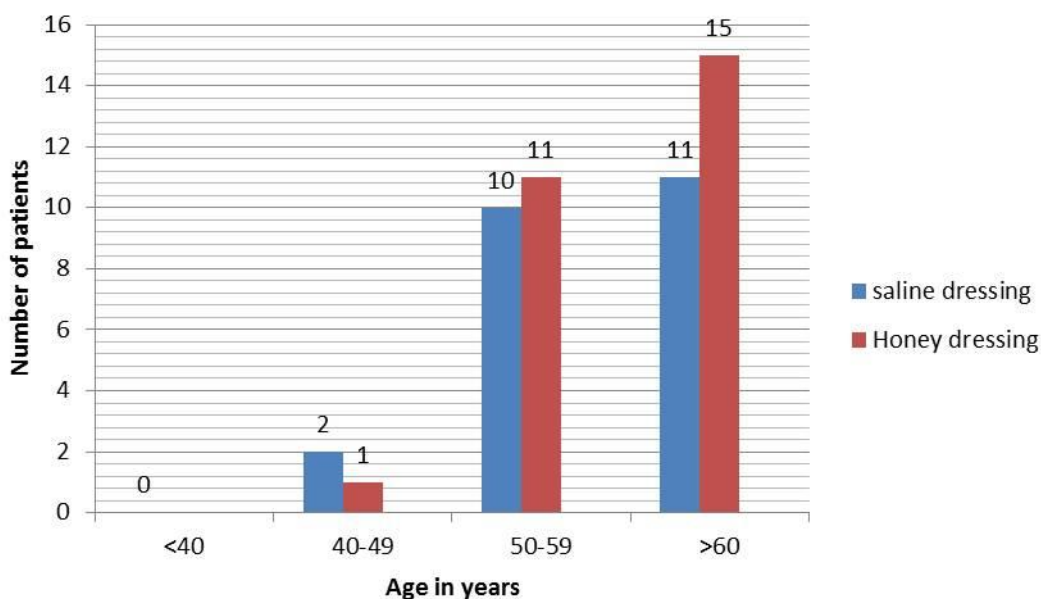
were given honey dressing included 15 males and 12 females. Normal saline group included 13 males and 10 females. Gender differences in both groups were also proven to be statistically insignificant with $p > 0.05$.

Culture sterility- pre and post honey dressing

Swab was taken from ulcer site and was sent for culture and sensitivity to our microbiology lab,

both before dressing and 7 days after dressing. It was observed that honey dressing turned 92% of cultures sterile. Chi square value was calculated as 35.9 and p value 0.0001. Hence the effect of honey dressing on turning unsterile cultures sterile was proved to be highly significant (Table – 1).

Graph - 1: Age distribution of patients included in study.



Graph - 2: Gender distribution of patients included in study.

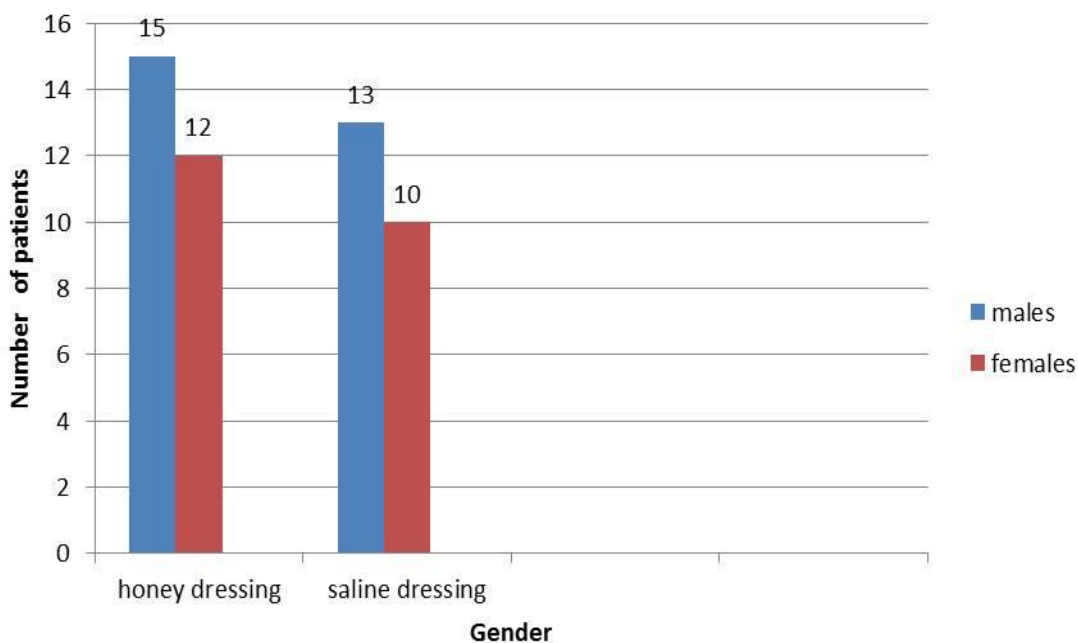


Table - 1: Culture Sterility Pre-Post-Dressing in Honey Dressing Group.

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

Table - 2: Analysis of outcome of honey and saline dressing.

Outcome	Normal saline	Honey dressing	Total
Discharge	13	6	19
Split skin graft	4	17	21
Amputation	6	4	10
Total	23	27	50

- (chi square=10.77,p value=0.004)

Table - 3: Comparison of duration of hospital stay.

Duration of hospital stay (in days)	Normal saline group	Honey dressing group	Total
7 to 13	0	1	1
14 to 21	2	3	5
22 to 28	5	16	21
29 to 35	9	6	15
36 to 50	7	1	8
Total	23	27	50

Table - 4: Distribution of different grades of ulcer in study population.

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

Table - 5: Doppler findings in study population.

Doppler finding	Saline dressing	Honey dressing	Total
Normal	11	17	28
Vascular compromise present	12	10	22
Total	23	27	50

Table - 6: Distribution of diabetes mellitus in study population.

	Saline dressing	Honey dressing	Total
DM+	12	11	20
DM-	11	16	30
Total	23	27	50

Analysis of outcome of honey and saline dressing (Table - 2)

Patients were categorized under the three probable outcomes:

- Discharged and asked to review later
- Split skin grafting done during their hospital stay
- Those who ended up in amputation.

63% of patients who were dressed with honey could be grafted during their hospital stay where as 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=10.77), thus confirming that honey dressing helps in early grafting of the patient and hence superior to conventional saline dressing.

Analysis with regard to duration of hospital stay (Table - 3)

Average duration of hospital stay in those dressed using normal saline was found to be 31.3 with standard deviation 6.5 and median being 30 and mean duration in those dressed with honey was found to be 25.77 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

- 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).

Distribution of different grades of ulcer in study population (Table – 4)

In saline dressing group, Only 1 out of the total 23 belonged to grade 1 ulcer, 10 patients grade 2, another 10 patients grade 3 and 2 among them had grade 4 ulcer. In honey dressing group 2 out of the total 27 patients had a grade 1 ulcer; 11 patients were grade 2; 8 patients had grade 3 ulcer and 6 patients grade 4. Majority of the patients belonged to grade 2 and 3 ulcer in both study groups. This difference in distribution of grades of ulcer in both groups were proven to be statistically insignificant with a p value >0.05. (Chi square=2.29, p value=0.512).

This confirms that better outcome in honey dressing like less mean duration of hospital stay and possibility of early grafting is not affected by the grade of ulcer. Thus superiority of honey dressing over conventional saline dressing is proved irrespective of grade of ulcer.

Doppler findings in study population (Table – 5)

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). This proves that honey dressing is superior to saline dressing irrespective of the factor that they are vascular compromised or not.

Distribution of diabetes mellitus in study population (Table – 6)

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 .

Honey has been proven to have significant antibacterial properties and is a useful constituent in wound and burn care [2]. 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 peroxide [3]. 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 tissues [4].

Efem (1988) [5], Dunford and Hanano (2004) [6], Khan Fasal [7] are among a few who have done trials with honey and all have reported the positive benefits of honey in pain reduction, odour control and general patient satisfaction. Honey was also proven to be superior to silver sulfadiazine in burns dressing by Subrahmanyam [8].

In our study also we got comparable results which were statistically significant thus proving that honey can be a good alternative to conventional saline dressing.

Conclusion

We conclude that 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 minimises scarring.

The honey dressing is a better alternative to conventional normal saline dressing which can also pave way for decrease in antibiotic resistance.

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