



Original Article

A Study of Topical Honey versus Povidone in Diabetic Wounds in a Medical College in Rural Area of Northern India

Authors

Rajinder Pal Singal¹, Muzzafer Zaman*²

¹Dept of Orthopaedic, Maharishi Markandeshwar Medical College and Hospital, Kumarhatti, Solan, HP,
Email: singalrikki@yahoo.com, Mb No: 9996184795

²Dept of Surgery, MMIMSR, Mullana Ambala, Haryana, India, Mb No - 9996640686

*Corresponding Author

Muzzafer Zaman

Dept of Surgery, MMIMSR, Mullana Ambala, Haryana, India. Mb No - 9996640686

Abstract

Objectives: *This study was done to compare outcomes with dressings of honey to povidone iodine in the management of diabetic foot ulcers.*

Materials and Methods: *The present study was carried out for a period of three years from may 2012 to august 2016 in a medical college of northern India. About 200 patients who presented with features of diabetic foot were selected randomly and included in this study and divided into two groups based upon the subsequent treatment of raw area with honey and povidone- iodine respectively.*

Results: *A total of 200 patients were studied. Group I consists of 100 patients out of which 58 were males and 42 females while in Group II there were 56 males and 44 females. The age range in group I was 46 to 75 years while the age range in group II was 48 to 82 years.*

In case of group I time of healing was 7- 75 days with median of 28 While in group II time of healing was 7- 60 days with median of 18 days. In case of group II time of healing was 7 – 60 days with median of 18 days, hospital stay was 7- 34 days with median of 12 days.

Conclusion: *In terms of hospital stay, time of healing, allergy to material and need for amputation honey was found to be better than povidone iodine solution for dressing of diabetic foot ulcers.*

Keywords: *Honey, diabetic foot, povidone iodine.*

Introduction

Diabetic foot is the most common complication of diabetes mellitus and is unavoidable but with positive and aggressive approach, morbidity and mortality due to diabetic foot problems can definitely be decreased. "Diabetic foot "literally means a lesion which needs surgical intervention in a diabetic patient⁽¹⁾. Abnormalities of various

factors contribute to defective wound healing in diabetes, like decreased growth factor production, angiogenic response, macrophage function⁽²⁾, collagen accumulation, epidermal barrier function, and keratinocyte and fibroblast migration and proliferation⁽³⁾. Wound dressings represent a part of the management of diabetic foot ulceration. Conventional dressings

were found ineffective in the management of these ulcers as they respond poorly thereby increasing hospital stay of the patient. Honey is a viscous, supersaturated sugar solution derived from nectar gathered by the honeybee⁽⁴⁾. It has high osmolarity and acidity, flavonoids⁽⁵⁾ beeswax, hydrogen peroxide, and inhibin. It has been shown to possess antibacterial action well in excess of that needed to halt the growth of clinically important organisms such as methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant *Escherichia coli*⁽⁶⁾.

Materials and Methods

The present study was carried out in the department of general surgery in maharishi markandeshwar medical college, solan (MMMSR) for a period of three years from May 2012 to august 2016. The primary aim of this study was to find out some dressing agent that is easily available, cheap and simple to use for poor population of that area who couldn't afford costly and complicated dressings. About 200 patients were included in this study, both genders were included. The patients presented to outpatient and emergency department of surgery with chief complaints of non healing wound of lower extremity. Patients were randomly allocated into two groups depending upon the dressing material used. After an informed consent had been obtained, surgical debridement of all the patients was done under spinal anaesthesia.

(Group I) (Povidone iodine group)- Wounds were debrided under aseptic technique followed by washing with povidone iodine, then packed with soaked gauze of the same solution and covered with occlusive or absorbent secondary dressings. Two times daily dressing changes were applied, then declined as the treatment progresses until healing was achieved. The indicators of healing were red to pink healthy granulation tissue with no slough and negative culture sensitivity report of swab.

(Group II) honey dressings- Debridement was done in a similar manner to group I and washed

with normal saline, then packed with natural honey impregnated gauze and occlusive or absorbent, secondary dressings were needed to prevent honey oozing out from the wound dressing. Two times daily dressing changes were applied, then decreased as the treatment progresses until healing was achieved, similar to group I.

Differences in healing, hospital stay and cost were analysed using T test.

Results

A total of 200 patients were studied and were randomly divided into two groups depending upon the type of agent used for dressings of wound. Group I consists of 100 patients out of which 58 were males and 42 females while in Group II there were 56 males and 44 females. The age range in group I was 46 to 75 years while the age range in group II was 48 to 82 years. All the patients underwent surgical debridement under spinal anaesthesia. In case of group I time of healing was 7- 75 days with median of 28 While in group II time of healing was 7- 60 days with median of 18 days and p value of <0.001 (significant). In case of group II time of healing was 7 – 60 days with median of 18 days, hospital stay was 7- 34 days with median of 12 days and p value was < 0.001 (significant).

Table I - Patients data

	Group I (POVIDONE N=100)	Group II (HONEY N=100)
Gender (male: female)	58:42	56:44
Age (years)	46-75	48-82
Debridement under spinal anaesthesia	100	100

Table No. II Healing of wound and hospital stay in days

	GROUP I	GROUP II	P VALUE
time of healing	7-75 DAYS	7- 60	P<0.001
median	28	18	
hospital stay	7- 40 DAYS	7- 34 DAYS	P<0.001
Median	18	12	

Out of 100 patients none had any irritant effect or allergy to honey while as 5 patients in group had allergy or local irritation to povidone iodine (p value <0.001). 15 cases of group I (toe amputation 10, below knee 3, above knee 2), compared to 6 in group II (3, 2, 1) respectively, so the percentage was reduced by almost 50% (P < 0.05).

Discussion

Complications as a result of diabetes mellitus are the most common cause of non traumatic lower extremity amputations in the developed world, the risk of lower extremity amputations is 15-46 times higher in diabetics than in non diabetics⁽⁷⁾. Honey has been used to treat infections and injuries in a wide range of wound types like burns, venous leg ulcers, diabetic foot ulcers, abscesses, pilonidal sinuses and necrotizing fasciitis⁽⁸⁾ as in our study it was primarily used for topical application of diabetic foot ulcers. The antibacterial agents in honey are predominantly hydrogen peroxide, of which the concentration is determined by relative levels of glucose oxidase, synthesized by the bee and catalase originating from flower pollen⁽⁹⁾. In our study, in case of group I (povidone iodine) time of healing was 7- 75 days with median of 28 while in group II (honey group) time of healing was 7- 60 days with median of 18 days and p value of <0.001 (significant). In case of group II time of healing was 7 – 60 days with median of 18 days, hospital stay was 7- 34 days with median of 12 days and p value was < 0.001 (significant). These results were comparable to the study carried out by Sahel K. Hammouri in 2004⁽¹⁰⁾.

Our study was carried out in a medical college located in a remote village of northern India catering mostly the poor population of that area and honey is an ideal first-aid dressing material especially for such patients in remote locations when there could be time for infection to have set in before and after Medical treatment is obtained, it is readily available cheap and simple to use. 15 cases of group I (toe amputation

10, below knee 3, above knee 2), compared to 6 in group II (3, 2, 1) respectively, so the percentage was reduced by almost 50% (P < 0.05) which is comparable to other studies in literature. Out of 100 patients none had any irritant effect or allergy to honey while as 5 patients in group I had allergy or local irritation to povidone iodine. There is also an economical advantage when using honey as a wound dressing especially in a remote area as ours. In our case more rapid healing rates were achieved. In addition there are the savings in the costs of surgery where sequential debridements becomes unnecessary when honey is use.

Conclusion

The management of diabetic foot wounds needs timely detection of complications and frequent assessment of the wound. In terms of hospital stay, time of healing, allergy to material and need for amputation honey was found to be better than povidone iodine solution.

References

1. David GA and Lawrence: Diabetic Foot Ulcers: Prevention, Diagnosis and Classification. Am Fam Physician.1998 Mar 15;57(6):1325-1332.
2. Maruyama K, Asai J, Ii M, Thorne T, Losordo DW, et al. Decreased macrophage number and activation lead to reduced lymphatic vessel formation and contribute to impaired diabetic wound healing. Am J Pathol. 2007;170:1178–1191. [PMC free article] [PubMed].
3. Falanga V. Wound healing and its impairment in the diabetic foot. Lancet. 2005;366:1736–1743.[PubMed].
4. Zalvaras CG, Marcus RE, Levib LS, Patzakis M (2007) Management of open fractures and subsequent complications J Bone j Surg 89(4):884-895.
5. Saunder WB, Principles of fractures. In Brinker MR (Ed) Basic Sciences (3rd edition) Philadelphia, USA p :8-18.

6. Gustilo RB, Anderson JT. Prevention of infection in the treatment of one thousand and twenty-five open fractures of long bones: retrospective and prospective analyses. *J Bone Joint Surg Am.* 1976 Jun;58(4):453-8.
7. Armstrong DG, Lavery LA. Diabetic foot ulcers: Prevention, diagnosis and classification. *Am Fam Physician* 1998; 57:1325-32.
8. Dunford C, Cooper R, Molan P. The use of honey in wound management. *White R, Nursing Standard,* 2000; 15(11): 63-68.
9. Weston RJ. The contribution of catalase and other natural products to the antibacterial activity of honey: a review. *Food Chemistry.* 2000;71:235–239.
10. Sahel K. Hammouri. The role of honey in the management of diabetic foot ulcers. *JRMS Dec* 2004; 11(2): 20-22.