International Surgery Journal
Pal G et al. Int Surg J. 2017 Jun;4(6):1988-1991
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20172397

Original Research Article

Study of graft uptake in honey dressed wound: a 2 year experience

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Received: 21 March 2017
Accepted: 20 April 2017

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ABSTRACT

Background: Plenty of newer dressing material are available in market but mostly are not cost effective and not easily available especially in a rural set up. Honey being a traditional dressing material used from medieval time is cheap, readily available and can be applied easily by any person without any assistance. The objective was to study the effect of honey dressing on graft uptake.
Methods: It was a prospective study conducted at Acharya Vinobha Bhave Rural Hospital, Sawangi, Wardha, Maharashtra, India from July 2014 to August 2016. The study contains 117 patients with ulcers over various aetiology and at various sites, which were divided into two groups; one group contains 61 (52.13%) patient where the wound was dressed with honey dressing while in other group 56 (47.88%) patients were dressed with normal saline. Outcome measures were calculated in terms of proportion of acceptance of graft on day 5 and day 14 after the wound is grafted. Patients were followed-up for a maximum of 30 days post grafting.
Results: It was found that in 57 (93.44%) patients in honey group showed nearly 100% graft acceptance on day 5 while only 18 (32.14%) patients in saline group showed nearly 100% graft acceptance. On day 14 it was found that in honey group 45 (73.77%) patients showed nearly 100% graft acceptance while only 8 (14.29%) patients in saline group showed nearly 100% graft acceptance.
Conclusions: The present study concludes that wound dressed with honey shows greater graft acceptance as compared to wound dressed with normal saline.

Keywords: Graft acceptance, Honey, Saline

INTRODUCTION

Ever since the dawn of civilization wound and its management possess a greater challenge today also. From time to time there had been many dressing modality claiming to be most effective in wound healing.

However, split grafting till date is considered as a best modality in closing the large wound where primary closure is not possible. Split graft acceptance itself is a major problem in the process. Graft acceptance is enhanced when the wound bed is healthy that is in the absence of slough and presence of healthy granulation tissue. Preparing a wound bed for grafting is done by various dressing modality like saline, honey, silver sulphadiazine, hydrocolloids, hydrogel etc.

Plenty of newer dressing material are available in market but mostly are not cost effective and not easily available especially in a rural set up. Honey being a traditional dressing material used from medieval time is cheap.[1] It is readily available and can be applied easily by any person without any assistance. Honey causes significantly greater wound contraction than controls, and it promotes the formation of granulation tissue and epithelialisation of

wounds.[2] Honey also promotes tissue growth, increases synthesis of collagen, and helps in formation of new blood vessels in the bed of wounds.[3]

Honey also promotes autolytic debridement, stimulates growth of wound tissues promoting healing, starts the healing process in dormant wounds which are usually not healed for long after doing conventional dressing, stimulates anti-inflammatory activity which help in rapid reduction of pain, helps to reduce oedema and decreases exudates production.[4] Various studies had shown that honey dressing done over infected wounds renders the wound sterilized in 3-10 days.[5]

The accelerative effect of honey in the wound healing process has been shown to be related to its physical properties of hygroscopicity, hypertonicity, lower pH, and complex chemical composition. It has been assumed that the most of the antibacterial activity shown by honey is due to hydrogen peroxide.[6] High osmolarity present in honey helps in the treatment of infections because it prevents the growth of bacteria and encourages healing.[7] High osmolarity has been considered a valuable tool in desloughing the wounds and lowering the pathogen count. Both these factors encourage healing and promote the formation of healthy red granulation tissue.[8]

Normal saline dressing functions in part as an osmotic dressing. With evaporation of water the dressing becomes hypertonic. The hyperosmolarity of the normal saline dressing provides an osmotic gradient for absorption of wound fluid and desloughing, contributing to its effectiveness as moist wound dressing promoting granulation and epithelialisation.[9]

Being a rural health centre it is difficult for any patient to afford costly dressing material like hydrocolloid or hydrogel and honey being readily available and is cost effective thus honey dressing is compared with normal saline.

METHODS

This is experimental study conducted at Jawaharlal Nehru Medical College and Acharya Vinobha Bhave Rural Hospital Sawangi (Meghe), Wardha, Maharashtra, India from July 2014 to August 2016, after the approval from Ethical Committee. This study consists of 117 patients of various types of wounds.

Patients were randomly distributed in two groups where one group is of Honey dressing of 61 patients (52.13%) and the other group is of Saline dressing of 56 (47.86%) patients. The study is conducted among patients with any type of infected/traumatic wound/ raw area. Primary excised wounds or with diabetes mellitus or peripheral vascular disease, venous and neuropathic wounds were excluded from the study. In present study locally produced raw honey is used which is obtained by cultivating the *Apis dorsta* and *Apis cerana indica* honey bees found locally in Vidarbha region of Maharashtra, India. The honey used was unprocessed and was not sterilized by heat as heating honey causes inactivation of the glucose oxidase enzyme in honey which produces hydrogen peroxide, a major component of the antibacterial activity of honey.

Dressing was done by gauze piece soaked in honey or saline and was kept onto the wound which was then covered by dry gauze and bandage. As soon as the wound was ready for grafting, the wound was grafted and then the graft acceptance was assessed on day 5 and day 14.

Data analysis

Statistical analysis was done by using descriptive and inferential statistics using Chi-square test and software used in the analysis were SPSS17.0 version, Graph Pad Prism 5.0 and EPI-INFO and $p<0.05$ is considered as level of significance.

RESULTS

In present study mean age in saline group was 27.17±25.98 while that in honey group was 27.88±26.88. There were 40 (71.43%) male and 16 (28.57%) female in saline group while in honey group there were 41 (67.21%) male and 20 (32.79%) female.

Table 1: Distribution of patients according to graft acceptance at day 5 and days 14.

	percentage of graft acceptance	Saline dressing	Honey dressing	χ^2-value	p-value
Day 5	91-100%	18 (32.14%)	57 (93.44%)	47.83	0.0001, S
	51-90%	34 (60.71%)	4 (6.56%)		
	<50%	4 (7.14%)	0 (0%)		
Day 14	91-100%	8 (14.29%)	45 (73.77%)	44.69	0.0001, S
	51-90%	33 (58.93%)	15 (24.59%)		
	<50%	15 (26.79%)	1 (1.64%)		

In present study all the wounds are grafted as soon as wound is ready for grafting. After the graft is place over the wound, its acceptance is noticed on day 5 and day 14 as 91-100%, 51-90% or <50% acceptance and the following observations are made (Table 1).

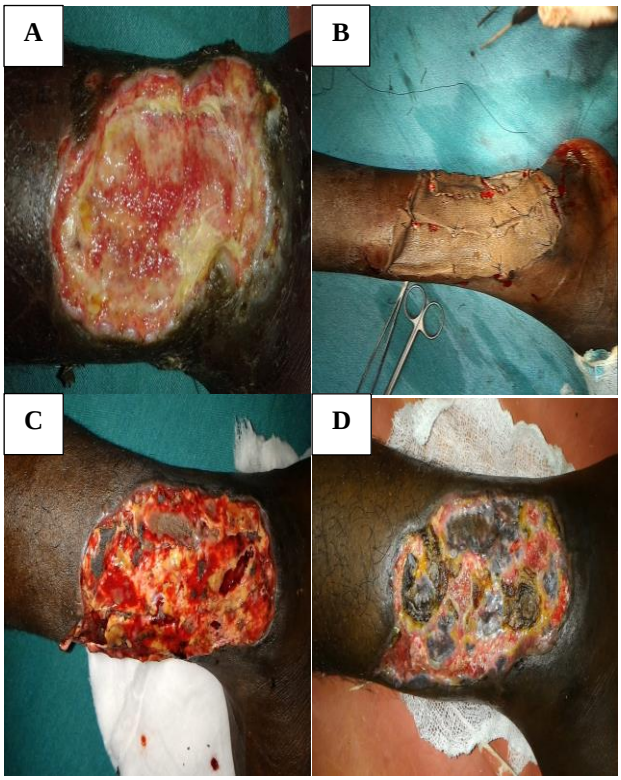

Figure 1: A) Wound over left leg (saline dressing); B) during grafting; C) 15 days post grafting; D) 22 days post grafting.

Figure 2: A) Wound over left leg (honey dressing); B) on grafting day; C) 15 days post grafting.

DISCUSSION

From above observation, it is concluded that graft acceptance is more in honey dressing group as compared to saline dressing group.

Graft acceptance not only depends upon the wound bed condition during grafting but also depends upon other factors like hematoma underneath the graft which hinders its acceptance, infection, excessive pressure on a fresh graft, fluid beneath the graft, gravitational dependency and movement of the area and surgeon error.

Other factors related to patients are anemia, hypoproteinemia, poor compliance of patient in maintaining immobilization. The general factors were present in both the group, still grafting was better in honey as compared to saline dressing group.

In a study by Simanjuntak CA comparing the honey dressing and amniochorionic membrane dressing in 40 patients divided equally in two groups found that 9 cases (45%) of honey dressing group and 5 cases (25%) of amniochorionic membrane dressing group need skin grafting.[10] The study showed >75% acceptance in all 9 patients in honey dressing group and 5 patients in amniochorionic membrane dressing group. However the study does not mention the observation time of graft acceptance and the follow up was not done to know any further loss of graft.

Bashir MM studied 60 patients with different etiology noticing graft acceptance. The author concluded that an average area of graft loss in saline group and honey group was 2 cm^2 and 3 cm^2 respectively (p-value=0.67).[11] Literature is full of evidences favoring superiority of honey over other agents like silver sulphadiazine, saline etc. in wound healing, however there are very few studies present which mention or study the effectiveness of honey in graft acceptance.

This study however shows effectiveness in graft acceptance when a wound is dressed with honey which could easily be explained by its antibiotic property, debriding property, neovascularisation properties, and early promotion of granulation tissue.

CONCLUSION

Honey a traditional agent used for dressing is a potent wound healing agent due to its high osmolarity, antibiotic, autolytic debridement property, neovascularisation property and neoepithelisation properties. Due to which it shows superiority in graft acceptance as the prepared wound bed is more suitable for grafting than the wound bed prepared by saline dressing. Honey is readily available and is cost effective and can be applied without any assistance by any person.

However this study does not included those ulcers with diabetes, PVD, or primarily incised wound, venous and neuropathic wounds, hence the efficacy of honey in graft acceptance in these wound cannot be commented upon and hence further study in these types of ulcer is needed.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

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Cite this article as: Pal G, Jain SC, Jajoo SN, Swarnkar M. Study of graft uptake in honey dressed wound: a 2 year experience. Int Surg J 2017;4:1988-91.