

## Normal Saline versus Honey Dressing in the Preparation for Skin Grafting

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**Objective:** To compare the continuously wet normal saline and honey gauze dressings in terms of days required for wound preparation for skin grafting and graft take. **Material and Methods:** The present study was a Quasi-experimental which was conducted in the Department of General Surgery, GEMS, Ragolu, Srikakulam Andhra Pradesh from January to November 2019. **Methodology:** Eighty wounds with small patches of slough and pale granulation tissue requiring preparation for skin grafting were included and divided into two groups by simple random sampling. Wounds requiring mechanical debridement or grossly infected wounds, diabetics, and patients with age > 60 years, Hb <10 g/dl, and serum albumin level ≤ 3 g/dl were excluded. Time for wound preparation in days was noted. Split thickness skin grafts meshed to 1-1.5 were applied. The largest area of graft loss in both wounds was measured in the two largest dimensions and noted in cm<sup>2</sup>. This was the endpoint of the study. **Results:** Average time for preparation in the saline group was 10 days whereas the average time in the honey group was 27 days. The average area of graft loss in the saline group and honey group was 2 cm<sup>2</sup> and 3 cm<sup>2</sup> respectively. **Conclusion:** Normal saline dressing is a hyperosmolar physiological dressing and prepares the wound faster than honey dressing at a low cost with quite satisfactory graft take.

**Keywords:** Normal saline, Honey, Dressing

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M Sanjay Kumar, Associate Professor, Department of General Surgery, Great Eastern Medical School and Hospital, Srikakulam, Andhra Pradesh, India. Email: <a href="mailto:drdhariprasad@gmail.com">drdhariprasad@gmail.com</a>	Rao DH, Kumar MS. Normal Saline versus Honey Dressing in the Preparation for Skin Grafting. Surgical Rev Int J Surg Trauma Orthoped. 2020;6(4):232-236. Available From <a href="https://surgical.medresearch.in/index.php/ijoso/article/view/201">https://surgical.medresearch.in/index.php/ijoso/article/view/201</a>	

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## Introduction

Wounds and their management are fundamental to the practice of plastic surgery. Skin grafting is still the most viable option for the wounds that cannot be closed primarily. Many skin graft failures can be attributed to inadequate recipient site preparation. For the successful take of the graft, a bed should have healthy granulation tissue free of slough and infection. If these conditions have not been met, it may be prudent to delay skin grafting until the wound is better prepared [1]. A pseudo eschar or slough is essentially a provisional matrix formed from exudated serum components at the wound air interface. Slough plays a role in prolonging the inflammatory stage of wound healing thus delaying the formation of healthy granulation tissue [2]. An effective way to deal with the slough is through autolytic debridement with the proper use of moist interactive dressing [3] Thus nature of the dressing for a wound while in preparation for grafting is very important. The dressing should be inert, physiological, and cheap- providing moist relatively low oxygen tension milieu. A moist wound environment physiologically favors cell migration and matrix formation while accelerating the healing of wounds [4]. Search for an effective, cheap, and easily available dressing continues [5].

To keep the pathogens count low various dressings ranging from naturally available products like honey, banana leaves, papaya, amniotic membranes to bactericidal chemo-therapeutic applications like silver sulphadiazine, chlorhexidine, etc are used with variable results. The use of bactericidal chemotherapeutic agents like silver sulphadiazine on wounds in preparation for grafting is to be condemned [6-8]. The advent of newer dressings like hydrocolloids, hydrogels, and alginates has given new dimensions to wound management. These modern dressings are costly, not easily available locally, and have yet to prove their superiority over traditional gauze dressings [4].

High osmolarity has been considered a valuable tool in desloughing the wounds and lowering the pathogen count. Both of these factors encourage healing and promote the formation of healthy red granulation tissue [9]. Normal saline dressing functions in part as an osmotic dressing [10]. Application of simple normal saline-soaked gauze dressing is cost-effective, easily available, and has no known cytotoxic side effects. Continuously moist saline gauze dressings are as effective for autolytic

Debridement as other types of moist dressings in terms of healing rate and have the additional benefits of easy application and regular wound examination [9]. With the evaporation of water, the dressing becomes hypertonic. The hyperosmolarity of the normal saline dressing provides an osmotic gradient for the absorption of wound fluid and desloughing, contributing to its effectiveness as moist wound dressing promoting granulation and epithelialization [10].

Honey has been an integral part of the medicinal culture in different parts of the world. It is one of the earliest known dressings for the wound acting as an osmotic dressing with the added benefit of its antibacterial properties. It has been observed that inflammation, swelling, and pain are decreased with the use of honey, and healing is enhanced [11-13].

In clinical practice, both normal saline and honey gauze dressings are used in preparing the wounds with patches of slough and pale granulation tissue. Thus, the objective of this study was to compare the normal saline and honey dressing in terms of cost of treatment, days required for wound preparation for skin grafting, and graft take.

## Material and Methods

**Study design and study conduct:** It was an experimental study conducted at Department of General surgery unit, GEMS hospital, Ragolu from January to November 2019.

### Inclusion criteria

Eighty wounds with small patches of slough and/ or pale granulation tissue not ready for grafting and not requiring surgical debridement were included in the study and divided into two groups by simple random sampling using the random table.

### Exclusion criteria

Grossly infected wounds, and patients with diabetes, age < 60 years, Hb < 10g/dl, and serum albumin ≤ 3 g/dl were excluded from the study.

Informed consent explaining the use of two dressings was taken from all the inclusive patients. The area of the wounds to be dressed was measured in the two largest dimensions and noted in cm<sup>2</sup>. Sterile gauzes soaked in a commercially available tube packed honey and normal saline available as intravenous drips were applied over the wounds. Both wet dressings were covered with sterile cotton and crepe bandage [12,13,14]. Both

Dressings were changed daily for wound examination and decision regarding grafting was made on clinical grounds by looking for red/pink granulation tissue and noting down epithelialization of margins [1,15]. Wound swabs for culture and sensitivity were sent before grafting. Wounds with a positive culture of group A streptococcus pyogenes were also excluded from the study [16].

## Result

A single dose of the first-generation cephalosporin was given at the time of induction. Split Of the eighty patients studied, 48 were males and 32 were females. The age range was 12 years to 54 years. The etiology of wounds is shown in Table 1.

**Table-1: The etiology of wounds in two groups.**

Etiology	Normal saline	Honey group
	Group (n=40)	(n=40)
Burn wound	28	26
Post infective wounds	12	14

Wound dimensions in the saline group varied from 18 cm<sup>2</sup> to 46 cm<sup>2</sup> whereas dimension in honey group varied from 14cm<sup>2</sup> to 44 cm<sup>2</sup> Time from start of dressing to decision for grafting in days and average area of graft loss in cm<sup>2</sup> in two groups is shown in Table 2.

**Table 2: Comparison of Normal Saline and Honey dressings on wounds.**

Variables	Normal saline	Honey group
	Group (n=40)	(n=40)
Duration of wound	12	26
Preparation (average days)	1.8	3.2

## Discussion

Successful preparation of a wound before skin grafting is very important. The dressing used for preparing a wound for grafting should not do any harm to cells involved in healing the dressing should be "sterile" and should provide a moist environment to the wound there is a dearth of good evidence about topical wound agents from systematic reviews of randomized trials. An exception is the subject of dressings and topical agents for chronic wounds, which has been the subject of systematic evidence collecting [17,18]. Perhaps because of a perceived confusion about what is best in a different area, complementary and alternative therapies are increasingly seen as better than conventional. The lack of evidence about either enhances this [11].

Honey has anti-inflammatory action increases the local blood flow, draws the lymph out of the wound, and lifts dirt/ dead tissue out of wound bed [12]. The high osmolarity of honey is considered the key to all the beneficial effects of honey. However, there is the biological plausibility, because inhibition of bacterial growth has been shown using impregnated honey discs or incorporating honey in agar plates. How much of this inhibition is due to inherent antimicrobial properties or its hyperosmolar nature is unknown [19-21]. There is corroborative evidence that high osmolarity achieved with simple sugar pastes is a valuable tool in the treatment of infections because it prevents the growth of bacteria and encourages healing [6]. Thus, part or all of the antimicrobial action of honey is due to hyperosmolarity [11].

High osmolarity can be safely achieved topically by the use of simple sugar paste, honey, and normal saline dressing. In normal saline dressing, as the fluid evaporates from the saline-soaked gauzes placed over the wound, the dressing becomes hyperosmolar and draws the fluid from the wound by osmosis. This movement of wound fluid into the gauze con-tributes to its effectiveness as a hyperosmolar dressing. Thus, the normal saline dressing can have anti-inflammatory action, increases the local blood flow by decreasing edema by drawing wound fluid out, and desloughs the wound [10]. Unlike the antiseptics and antibiotics, there is no impairment of the healing process with these physiological dressings. It is difficult to explain this in the presence of traditional beliefs regarding honey. The problem is solved when one looks at the variables associated with the commercially available honey. With honey, one needs to be aware that it is a natural product and that those characteristics associated with wound healing may be affected by species of bee, geographical location, and botanical origin, as well as processing and storage conditions [11]. Most importantly purity and sterility required for a product to be used for the medicinal purpose cannot be guaranteed with an item marketed as a food product. Thus, honey used in this study, and most of the published studies probably acted more like a sugar paste with purity not guaranteed and bacterial contamination of this impure honey can be a possibility. On the other hand, normal saline available as intravenous drips is sterile, free of pyrogens, and has standard concentration [22,23]. These limitations of impure honey may explain the delay in wound preparation with the use of honey.

Regarding the cost of treatment normal saline dressing is very cheap as compared to nonsterile commercially available honey. Expenditure of gamma radiation for sterilization of pure honey would add to the total cost of treatment [12]. New, large, randomized studies, with blinded assessment of useful clinical outcomes and compared with standard wound treatments need to be done with sterile and pure honey to show any superiority over the simple normal saline dressing and justify the cost of treatment. While these trials would be relevant to industrialized countries to compare honey with conventional treatments, it would be important to conduct them in the less developed world where cost and availability are the key issues [11].

## Conclusion

The normal saline dressing is a hyperosmolar physiological dressing and prepares the wound faster than honey dressing at a low cost with quite satisfactory graft take.

## What does the study add to the existing knowledge

In the current study, the comparison has been made between the two physiological dressings with similar mechanisms of action. It has been found that the wound is prepared much earlier with the use of normal saline in contrast to honey. This difference is statistically significant.

## Author's contribution

**Dr. Dumpala Hariprasad Rao:** Manuscript preparation, Concept

**Dr. M. Sanjay Kumar:** Study design, manuscript

## Reference

01. Bohdan P, Tobias H, Elof E. Wound management In- Bahman G, Elof E, John AP, Plastic Surgery. 1st ed, Philadelphia- Saunders Elsevier. 2009; 29. [Crossref]
02. Robert DG, Thomas AM. Wound care In- Charles HT, Robert WB, Sherrell JA, Scott PB, Geoffrey CG, Scott LS; Grab and Smith's Plastic Surgery. 6th ed, Philadelphia- Lippincot William and Wilkins. 2007; 27. [Crossref]
03. Christian EP, Jeffrey JP, Peter R. Skin Grafts In- Stephen JM. Plastic Surgery General Principles. 2nd ed, Philadelphia- Saunders Elsevier. 2006; 299 [Crossref]
04. Bohdan P, Tobias H, Elof E. Wound management In- Bahman G, Elof E, John AP, Plastic Surgery. 1st ed, Philadelphia- Saunders Elsevier. 2009; 31. [Crossref]
05. Myers BA. Wound Management principles and practice. New Jersey (NJ)- Pearson Education Inc. 2004; 80-81. [Crossref]
06. Archer HG, Barnett S, Irving S, Middleton KR. Seal DV. A controlled model of moist wound healing- Com-parison between semipermeable film, antiseptics and sugar paste. J Exp Patho. 1990;71(2)155-170 [Crossref]
07. Gajiwala K, Gajiwala AL. Evaluation of Lypholized, gamma irradiated amnion as a biological dressing. Cell Tissue Bank. 2004;5(2)73-80. [Crossref]
08. Gore MA, Akolekar D. Evaluation of Banana leaf dres-sing for partial thickness burn wounds. Burns. 2003;29(25)487-492. [Crossref]
09. Ayodeji AS, Innocent OI, Olatunde OO. A comparison of the effect of chlorhexidine, Tap water and Normal saline on wound healing. Int J Morphol. 2006;24;673-676. [Crossref]
10. Lim JK, Saliba L, Smith MJ, McTavish J, Raine C, Curtain P. Normal Saline wound dressing— is it really normal. Br J Plast Surg. 2000;53(1)42-45. [Crossref]
11. Owen AM, Lesley AS, Fiona C, Kate S, Henery JM, Andrew RM. Systematic review of the use of honey as a wound dressing. BMC Complimentary and Alter-native Med. 2001;1(1)2. [Crossref]
12. Abdulrazzak M, Tahir SM, Imdad AK, Ghulam Ali M. Therapeutic effects of honey versus silver sulphadiazine in the management of burn injuries. J Liaquat Uni Med Health Sci. 2005;4;100-104. [Crossref]

13. Nagra ZM, Fayyaz GQ, Asim M. Honey dressings- Experience at department of plastic surgery and burns allied hospital, Faisalabad. *Prof Med J.* 2002;9(3)246-251.  
[Crossref]
14. Ovington LG. Hanging wet to dry dressing out to dry, *Advances in skin and wound care. J Prevent Healing.* 2002;15(2)79-84.  
[Crossref]
15. Alex S, Ian LV, Ernest KM. Grafts: In: Bahman G, Elof E, John AP. *Plastic Surgery.* 1st ed, Philadelphia- Saunders Elsevier. 2009;97 [Crossref]
16. Timothy G. *Plastic and reconstructive surgery* In- Nor-man SW, Christopher JKB, Ronan POC, Bailey and Love's *Short Practice of Surgery.* 25th ed, Arnold- London. 2008;401.  
[Crossref]
17. Svensio T, Pomahac F, Yao J. Accelerated healing of full thickness skin wounds in a wet environment. *Plast Recons Surg.* 2000;106(3)602-614.  
[Crossref]
18. Cooper RA, Molan P, Harding KG. Antibacterial activity of honey against strains of *Staphylococcus aureus* from infected wounds. *J Ray Soc Med.* 1999;92(6)283-285.  
[Crossref]
19. Cooper RA, Molan PC. The use of honey as an anti-septic in managing *Pseudomonas* infection. *J Wound Care.* 1999;8(4)161-164.  
[Crossref]
20. Karayil S, Deshpande SD, Koppikar GV. Effect of honey on multi-drug resistant organisms and its synergistic action with three common antibiotics. *J Postgrad Med.* 1998;44(4)93-96.  
[Crossref]
21. Sibbald R, Williamson GD, Orsted H, Campbell LK, Keast D, Krasner D, et al. Preparing the wound bed— debridement, bacterial balance and moisture balance. *Ostomy/Wound Manage.* 2000;46(11)14-35.  
[Crossref]
22. Whaley S. Tap water or normal saline for cleansing traumatic wounds. *British J Community Nurs.* 2004;9(11)471-478.  
[Crossref]
23. Bradley M, Cullum N, Nelson EA, Petticrew M, Sheldon T, Torgerson D. Systematic reviews of wound care management- Dressings and topical agents used in the healing of chronic wounds. *Health Technol Assess.* 1999;3;1-35.  
[Crossref]