

Comparison of Honey Dressing with Povidone-iodine dressing in Infected Surgical Wounds

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ABSTRACT

Background: Honey is a type of natural dressing with many mechanical, biochemical and antimicrobial properties.

Aim: To prove that Honey is better than conventional dressing with Povidone-Iodine (PVI) in terms of pain control and wound healing.

Methods: It is a randomized, single blind and multicentre experimental study, carried out in 2 hospitals i.e., Bhatti International Teaching Hospital situated in Kasur and Noor Hospital situated in Kot Radha Kishan from 04-05-18 to 10-01-19. 105 patients were included in the study while 2 patients left the follow up during study period. 2 parameters were studied i.e. Pain control and wound healing. Pain is assessed by visual analogue scale (VAS) and wound healing was assessed in terms of resolution of erythema and resolution of discharge from the wound.

Results: Mean age of patients in Honey dressing (HD) group was 42±12 years while mean age of patients in PVI dressing (PD) group was 40±13 years. 75% of patients from HD group were male while 25% were female. In PD group, 66% patients were male while 34% were female. Mean VAS in HD was 1.2±0.5 while it was 4.0±1.1 in PD group (p value=0.002). 86.5% (45 out of 52) of patients had successful outcome (resolution of erythema and discharge from wound and appearance of healthy granulation tissue) with the use of honey dressing while only 64.7% (33 out of 51) of patients had successful outcome with PVI dressing (2 sided sig.=0.01).

Conclusion: Honey dressing is better than conventional Povidone-Iodine dressing in terms of cost factor, pain control and early wound healing.

Key words: Honey, Povidone-Iodine, Dressing, Surgical wounds

INTRODUCTION

Wound infection is a common problem after surgery in our health care settings. It imparts a substantial economic and mental burden on patients and health care providers. Infected wounds are managed by surgical debridements, antibiotics and proper dressings. For a wound to heal properly a good dressing is mandatory, even after antibiotic therapy and debridement of wound. An ideal dressing should be cost effective, should provide physical protection to new developing tissues, absorb exudative fluid, stop hemorrhage and should provide a moist environment for early healing¹. A lot of dressings are available but none of them meet all the aforementioned criteria.

Surgical gauze soaked in Povidone-iodine (PVI) is globally used to dress the infected wounds because it is considered effective and inexpensive. PVI has been very effective against virulent organisms because of its property to cross bio films, its broad spectrum of antibacterial activity and its lack of establishment of bacterial resistance². Although PVI is effective in early stages of wound healing but in the long term due to its cytotoxicity to normal body cells and allergic reactions it delays wound healing². PVI soaked gauze dressings are uncomfortable and sticky that's why they cause severe pain during changing of

dressing. Much more sophisticated dressings are available commercially which are less painful and more absorbent but they are very expensive and patients don't afford it. Natural dressings like natural oils, sugar, vinegar and especially Honey are now in research process in many hospitals because they are easily available, cheap and soothing.

Honey is being used as a natural dressing of wound for many years³. A great amount of evidence and reasoning is available for the use of honey as a wound dressing⁴. Scientist have now discovered that honey is not merely a sugar syrup but it is a natural and bioactive wound dressing with many physical and biochemical properties that promotes the process of healing. Because of the ever increasing resistance of bacteria to the antibiotics, Honey has emerged as a main antibacterial agent⁵. It has been proved that honey is effective against a lot of virulent bacteria like Methicillin-resistant *Staphylococcus aureus* (MRSA), *Streptococcus pyogenes*, *E. coli*, *Proteus* and *P. aeruginosa*⁵. The physical properties of honey that inhibit bacterial growth are acidic pH and its hyperosmolarity.⁷

The purpose of this study is to assess the effectiveness of this natural dressing (Honey) with a conventional one (PVI) in terms of efficacy in wound healing.

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MATERIAL AND METHOD

This trial was a randomized, single blind and multicentre experimental study, carried out in 2 hospitals i.e. Bhatti International Teaching Hospital situated in Kasur and Noor Hospital situated in Kot Radha Kishan. Process of data collection was done from 04-05-18 to 10-01-19. Patients of all ages and both sex were included in the study. All patients who developed any kind of wound infection after surgery, ranging from mild erythema to frank discharge of pus, were included in the study. All patients admitted in these 2 hospitals after surgery as well as patients referred from other hospitals with wound infection were included. Patients having diabetes mellitus were included and their blood sugar was checked three times a day and was controlled by giving Insulin. Patients with a wound having dead necrotic tissue or gangrene were included in the study after surgical debridement. Patients on radiotherapy, chemotherapy, antibiotic therapy, steroids and immune-suppressive drugs were excluded from the study. Patients allergic to PVI or Honey were also excluded from the study.

Written and informed consent was taken from all the patients who were enrolled. Patients were segregated randomly in two groups with the use of numbered closed envelopes. Patients receiving Honey dressing were labeled as HD group and patients receiving PVI dressing were labeled as PD group. The authors declared no conflict of interest and no ethical issue as approved by Hospital ethical committee.

All the wounds were first washed with 0.9% saline and then active ingredients were applied which is either honey or 10% Povidone iodine (PVI) solution. The amount of active ingredient should be just sufficient to completely fill the wound. All the wounds were then covered with Opsite™ which is a Transparent Adhesive Film Dressing which retained the honey or PVI in the wound cavity. The wound is examined daily externally and the dressings were changed on alternate days for up to 2 weeks. Outcome of interest were pain control and wound healing. The pain was calculated using visual analog scale (VAS) while wound healing was assessed by resolution of erythema or pus discharge at 7th, 10th and 14th day. VAS is a scale from 0-10 ranging from no pain (score 0) to maximum unbearable pain (score 10). The results were considered successful if erythema, pain or discharge ended and granulation tissue appeared. The result was considered a failure if erythema, pain and discharge persisted or gangrene developed. No antibiotic is given during the study period of 2 weeks in both the groups.

The sample size of 105 patients was calculated with 95% confidence interval and 90% power of study. In HD group 52 patients were studied while in PD group 53 patients were studied. Mean±SD was calculated for quantitative variables while for categorical variables, frequencies and percentages were observed. Pearson Chi-Square test was applied to observe association between qualitative variables. All the assembled data was entered and assessed using SPSS version 21.

RESULTS

Mean age as well as frequency of male and female patients were similar in both the groups, depicting a good

randomization. Mean age of patients in HD was 42±12 years while mean age of patients in PD group was 40±13 years. As far as gender is concerned, 75% of patients from HD group were male while 25% were female. In PD group, 66% patients were male while 34% were female (Table 1).

Two patients out of 105 left against medical advice and didn't complete the treatment. Both the patients were from PD group leaving behind the subject count of 51 patients in this group. We studied the pain score (by VAS) in both the groups depicting the comfort level of the patients during dressings. There was a marked difference in pain score between the two groups. Dressing with honey was almost painless and was very soothing (mean VAS=1.2±0.5) while pain score was relatively high in PVI dressings (mean VAS=4.0±1.1). The difference was statistically significant (p value=0.002) (Table 2).

86.5% (45 out of 52) of patients had successful outcome (resolution of erythema and discharge from wound and appearance of healthy granulation tissue) with the use of honey dressing while only 64.7% (33 out of 51) of patients had successful outcome with PVI dressing (2 sided sig.=0.01) (Table 3).

Unsuccessful patients were those in which erythema or discharge persisted after 2 weeks of dressing. 7 patients (13.5%) from HD group and 18 patients (35.3%) from PD group had unsuccessful results. Cultures were taken from the wounds of these patients and antibiotics given. Wounds which are not healed even after antibiotic were then managed by surgical debridement.

Table 1: Demographic Data

Groups	HD group (n=52)	PD group (n=53)
Mean age (years)	42±12	40±13
Male	39(75%)	35(66%)
Female	13(25%)	18(34%)

Table 2: Pain score during dressing

Groups	HD group (n=52)	PD group (n=51)	P value
Mean VAS	1.2±0.5	4.0±1.1	0.002

Table 3: Resolution of infection

Outcome variables	HD group (n=52)		PD group (n=51)	
	No.	Successful	No.	Successful
Resolution of erythema	20	20(100%)	15	12(80%)
Resolution of fluid discharge	11	9(81.8%)	22	14(63.3%)
Resolution of purulent discharge	21	16(76.2%)	14	7(50%)
Total	52	45(86.5%)	51	33(64.7%)

DISCUSSION

Honey is a natural wound dressing having a lot of chemical and mechanical properties and because of its low cost, it has become a very famous dressing for chronic and infected wounds. Although honey is in use for a very long time, it is presently reintroduced as being a very effective therapeutic material⁸. Honey is anti-oxidant and anti-inflammatory in nature and a very effective anti-microbial agent⁹. Honey is particularly effective against proliferation

of Staph. aureus, Strept. pyogenes, Pseudomonas and Proteus¹⁰. The biochemical mechanisms by which honey aids in wound healing include the tissue growth factor induction and re-epithelialization¹¹.

The results of our study also showed that honey is a very effective dressing compared to a conventional dressing which is PVI. Our results were supported by another study done in India which also showed similar results¹². Not only PVI, but even when compared with other biochemical dressings like EUSOL (Edinburgh University solution of lime) and sugar, Honey has been proved to be a more efficient dressing^{13,14}. Many other studies done in different parts of the world showed that honey is superior to conventional dressings especially in diabetic and chronic wounds and pressure ulcers¹⁵⁻¹⁸.

The positive aspects of our study were that first of all we used a transparent dressing (Opsite) with which we could daily see the progress of the wound. Secondly, with the use of gauze dressing, instead of Opsite, ants were attracted to the wound and they cause damage to the wound. As Opsite is a sealant so there is no such issue. As honey absorbs most of the exudative fluid, it becomes diluted and creates a good environment for bacterial growth. In our study we made sure that dressing to be changed on every alternate day so that honey maintained its osmolarity. There were few limitations of our study as well. We followed the wounds for 2 weeks only and observed that a lot of wounds were still not healthy especially chronic wounds. These wounds require much longer period to heal so patients should have been followed up for 6 weeks.¹² Another problem we noticed was itching and patients frequently asked to remove the dressing, we counseled them but still 2 patients lost for follow up. The reason of itching was most likely that the active ingredient touched the normal skin.

CONCLUSION

Honey dressing is better than conventional Povidone-iodine dressing in terms of cost factor, pain control and early wound healing. Honey is effective in all types of chronic wounds, diabetic foot wounds and pressure area wounds without the use of antibiotics.

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