

COMPARISON OF EFFICACY OF EUSOL IN WOUND DRESSING VERSUS HONEY DRESSING

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DOI: <https://doi.org/10.5281/zenodo.18655201>

Keywords

Eusol Dressing, Honey Dressing, Necrotizing Fasciitis

Article History

Received: 16 July 2025

Accepted: 18 July 2025

Published: 20 July 2025

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Abstract

Objective: To compare the outcome of EUSOL in wound dressing versus Honey dressing for necrotizing fasciitis wounds.

Study Design: Randomized Controlled Trial

Place and duration of study: Department of Surgery, Ghurki Trust Teaching Hospital, Lahore from May 2025 till 15 July 2025

Methodology: After meeting selection criteria 62 patients were enrolled and were randomly divided into two groups. In group A, honey dressing was applied by covering the honey layer. In group B, EUSOL dressing was applied. Outcome in terms of granulation, wound healing and patient satisfaction were noted. All this data was recorded in proforma and analyzed on SPSS version 26.

Results: Complete epithelization was achieved in 17 (54.8%) cases in the Eusol group and 20 (64.5%) cases in the honey group ($p=0.437$). Patient satisfaction was observed in 25 (80.6%) patients in the Eusol group compared to 19 (61.3%) in the honey group ($p=0.093$). The mean duration to achieve healthy granulation was 6.48 ± 1.21 days in the Eusol group and 7.29 ± 1.04 days in the honey group ($p=0.007$). Mean healing time was significantly longer in the Eusol group (25.52 ± 3.08 days) than in the honey group (21.42 ± 3.12 days, $p<0.001$).

Conclusion: Complete epithelization and patient satisfaction were similar in both groups; however, honey dressing showed significantly faster healing, while Eusol dressing promoted earlier granulation. Overall, honey dressing appears more effective for wound management

INTRODUCTION:

Necrotizing fasciitis is a severe, sometimes lethal soft tissue infection that presents as a surgical emergency. It is identified by a rapidly spreading inflammation that results in extensive tissue destruction and necrosis¹. Muscle fascia and subcutaneous tissues necrotize as a result of necrotizing fasciitis, a subtype of severe skin and soft tissue infections. Usually, the infection follows the fascial plane, which has a weak blood

supply². Surrounding tissues remain untouched at first, which might postpone diagnosis and surgery. Infectious process can progress quickly, leading to secondary infections of the underlying and overlaying soft tissue, muscle, and fascia as well as perifascial planes^{3, 4}. In order to manage this uncommon and quickly developing illness, a prompt and effective surgical diagnosis is crucial. There have been reports of a high mortality rate of 12–20%, particularly in the absence of prompt

surgical surgery. A big open wound typically persists during wound debridement and systemic antibiotics based on bacterial culture^{5,6}.

The standard dry or wet gauze approach is used to treat the wound before a skin transplant, flap, or musculocutaneous flap is applied. When treating open wounds with traditional dressing procedures, there may be several morbidities⁷. EUSOL is solution commonly used for dressing of wounds⁸. Since the beginning of time, honey has been one of the most prized and cherished natural products that humans have ever encountered. It has long been utilized in Ayurveda for a variety of ailments, including wound and burn care. Its chemical makeup makes it the finest debriding agent, aids in wound healing, lowers inflammation, and inhibits the growth of microorganisms⁹.

Rationale of this research is to compare the outcome of EUSOL in wound dressing versus Honey dressing for necrotizing fasciitis wounds. Literature reported that honey dressing is better than EUSOL dressing. But patients' satisfaction was better with EUSOL. In literature, limited studies has been done as well as no local study conducted before in this regard, so there is a need to get evidence for local population. Therefore, we want to conduct this study, so that in future we can be able to implement findings of this research in local setting. This would help to improve our practice and knowledge and can modify the outcomes with better dressing and reduce the chances of complications. So, the objective of this resaearch was to compare the outcome of EUSOL in wound dressing versus Honey dressing for necrotizing fasciitis wounds.

METHODOLOGY

After taking approval from ethical review committee (ERC letter number with date), this randomized controlled trial was resulted out at Department of Surgery, Ghurki Trust Teaching Hospital, Lahore from May 2025 till 15 July 2025. Sample size was calculated using WHO sample size calculator. Total sample size was 62 cases in which 31 were from EUSOL in wound dressing and 31 were from honey dressing for necrotizing fasciitis wounds. For this calculation

80% power of test was used with 5% level of significance and percentage of complete epithelialization i.e. 86.9% with honey dressing and 55% with EUSOL dressing¹⁰. All the patients were enrolled by applying non-probability consecutive sampling technique.

Inclusion criteria: Cases of age 16-75 years, both genders, diagnosed with necrotizing fasciitis wounds were fall in inclusion criteria. Necrotizing fasciitis wounds was defined as presence of skin infection that can happen if a wound gets infected, also known as the "flesh-eating disease" i.e. transition of skin to erythematous, reddish-purple to bluish-gray hue, skin texture is indurated, swollen, shiny, and feel warm, palpable skin, painful and skin breakdown within 3-5 days with bullae and cutaneous gangrene when assessed clinically.

Exclusion criteria: Cases with diabetic wounds, traumatic wounds, and cases expired during postoperative period (on medical record), pregnancy were fall in exclusion criteria.

Informed consent from patients was taken after enrolment. Information regarding age, gender, BMI, sex, lateral side (left, right), history of hypertension (BP \geq 140/90mmHg), anemia (hb $<$ 10 g/dl), smoking ($>$ 5 pack years), cause of wound, duration of wound, wound size, was noted. Then cases were randomly divided in 2 groups by using lottery method. In group A, honey dressing were applied by covering the honey layer of 4ml per square inch, followed by dressing covered by Opsite, which were changed every 24 hours. In group B, EUSOL dressing was applied. Outcome was noted in both groups. In terms of outcome variables day required for healthy granulation was measured as the number of days required until development of healthy granulation tissues i.e. proliferation of fibroblasts, keratinocytes, endothelial cells, new capillaries, and pink color tissues on clinical examination. Wound healing time was measured in terms of days required for complete wound healing i.e. development of healthy granulation tissues and complete epithelization and pink skin color. If epithelialization achieves within 21 days i.e. a

process of covering denuded epithelial surface then it was labeled as complete epithelialization. Patients were managed and patient satisfaction was noted. All this data was noted in proforma. All the gathered data was entered and analyzed in SPSS version 26. Numeric variables like age, BMI, duration of wound, wound size, duration to achieve healthy granulation, hospital stay and wound healing, will be presented as mean & standard deviation. The categorical variable like lateral side, history of hypertension, anemia, smoking, cause of wound, epithelialized completely and patient satisfaction was presented as frequency and percentage. Both groups were compared for mean duration to achieve healthy granulation, hospital stay and wound healing, by using independent samples t-test and for epithelialized completely and patient satisfaction by using chi-square test. P-value ≤ 0.05 was taken as significant.

RESULTS:

In Eusol dressing group, mean age was 45.74 ± 10.71 years, while in the honey dressing group it was 46.51 ± 10.62 years. In the Eusol dressing group, 18 (58.1%) patients were male, which was the same in the honey dressing group. Mean BMI was 30.93 ± 2.42 kg/m² in the Eusol group and 31.64 ± 2.61 kg/m² in the honey group.

Hypertension was present in 21 (67.7%) cases in both groups. Anemia was observed in 15 (48.4%) cases in the Eusol group and 16 (51.6%) cases in the honey group. Smoking was reported in 13 (41.9%) cases in Eusol group compared to 17 (54.8%) in honey group. Left lateral side involvement was noted in 11 (35.5%) patients in Eusol group and 12 (38.7%) in honey group. Mean wound duration was 2.06 ± 0.81 days in the Eusol group compared to 2.16 ± 0.68 days in the honey group. The mean wound size was 144.71 ± 143.89 mm in the Eusol group and 200.32 ± 159.66 mm in the honey group. Table-I The mean hospital stay was significantly longer in Eusol group (9.09 ± 1.19 days) than in the honey group (5.06 ± 1.18 days, $p < 0.001$). The mean number of days to achieve healthy granulation was 6.48 ± 1.21 in Eusol group and 7.29 ± 1.04 in the honey group ($p = 0.007$). Mean healing time was 25.52 ± 3.08 days in Eusol group, whereas it was shorter in the honey group at 21.42 ± 3.12 days ($p < 0.001$). Regarding outcomes, complete epithelization occurred in 17 (54.8%) patients in the Eusol group and 20 (64.5%) in the honey group ($p = 0.437$). Patient satisfaction was reported in 25 (80.6%) cases in the Eusol group, compared to 19 (61.3%) in the honey group ($p = 0.093$). Table-II

Table-I: Basic demographics and history of individuals presented with necrotizing fasciitis wounds (n = 62)

	Dressing group	
	Honey dressing	Eusol dressing
n	31	31
Age (Years)	46.51 ± 10.62	45.74 ± 10.71
Gender		
Male	18(58.1%)	18(58.1%)
Female	13(41.9%)	13(41.9%)
BMI (Kg/m2)	31.64 ± 2.61	30.93 ± 2.42
History of		
Hypertension	21(67.7%)	21(67.7%)
Anemia	16(51.6%)	15(48.4%)
Smoker	17(54.8%)	13(41.9%)
Lateral side		
Left	12(38.7%)	11(35.5%)
Right	19(61.3%)	20(64.5%)

Duration of wound (Days)	2.16±0.68	2.06±0.81
Wound Size (mm)	200.32±159.66	144.71±143.89

Table-II: Comparison of outcomes observed in both trial groups (n = 62)

	Dressing group		p-value
	Honey dressing	Eusol dressing	
n	31	31	
Hospital Stay (Days)	5.06±1.18	9.09±1.19	<0.001
Healthy Granulation	7.29±1.04	6.48±1.21	0.007
Complete Epithelization achieved	20(64.5%)	17(54.8%)	0.437
Healing time (days)	21.42±3.12	25.52±3.08	<0.001
Patient Satisfaction	19(61.3%)	25(80.6%)	0.093

DISCUSSION:

Myositis and NF are examples of necrotizing soft tissue infections that have a high risk of morbidity and death. There are 0.3 to 0.5 cases of illness for every 100,000 people worldwide ¹¹. Although NF can affect any area of the body, it is most frequently observed in lower limbs, particularly in elderly people with a variety of comorbidities.^{12, 13}

In this study, complete epithelization was achieved in 17 (54.8%) cases in the Eusol group and 20 (64.5%) cases in honey group (p=0.437). Patient satisfaction was observed in 25 (80.6%) patients in Eusol group compared to 19 (61.3%) in honey group (p=0.093). Mean duration to achieve healthy granulation was 6.48 ± 1.21 days in Eusol group and 7.29 ± 1.04 days in honey group (p=0.007). Mean healing time was significantly longer in Eusol group (25.52 ± 3.08 days) than in the honey group (21.42 ± 3.12 days, p<0.001).

One trial found that percentage of complete epithelialization was 86.9% with honey dressing and 55% with EUSOL dressing ¹⁰. Another trial found that mean days required for healthy granulation was 7.39 ± 1.48 days with honey vs. 7.05 ± 1.45 days with EUSOL dressing, mean duration of hospital stay was 4.96 ± 1.31 days vs. 9.33 ± 1.45 days, mean wound healing was 20.23 ± 4.45 days vs. 28.38 ± 7.06 days (p<0.05). But patients satisfaction was 66.6% with honey dressing and 82.3% with EUSOL dressing (p<0.05) ⁸. One research showed that the EUSOL group achieves healthy granulation tissue

earlier than the honey group, which is consistent with the results of our investigation ¹⁴.

Partial thickness burns healed more quickly with honey than with traditional treatment, and infected postoperative wounds healed more quickly with honey than with gauze and antiseptics, according to a comprehensive evaluation of 26 studies including 3011 patients with acute and chronic wounds¹⁵. In their study, Shah AB et al. showed that the collagen granules group experienced decreased wound discharge, and at the end of the third and fourth weeks, this difference was statistically significant (P value <0.05). As early as the first week, the collagen granules group had reduced slough-covered floor area (P value <0.05). With the collagen granules group, healthy granulation tissue, the end result, and covering occurred earlier. P-value <0.05 at the conclusion of the second and third weeks¹⁶. According to a different research, necrotizing fasciitis is a soft tissue infection that spreads quickly and is lethal. To treat it, considerable tissue debridement and medicines are needed. Honey has antimicrobial properties and aids in tissue repair, making it a great debriding agent¹⁷. Additionally, Subodh P. Ugane et al. demonstrated that drinking and diabetes are risk factors for this illness. A new risk factor for Fournier's gangrene is HIV. Honey does wonders for treating Fournier's gangrene. It shortens hospital stays and slough clearing days¹⁸.

CONCLUSION:

On the basis of this study we may conclude that the rates of complete epithelization and patient satisfaction were comparable between the two groups, honey dressing demonstrated superior outcomes in terms of faster healing, with a significantly shorter healing time compared to Eusol dressing. However, Eusol dressing was associated with earlier granulation. Overall, honey dressing may be considered a more effective option for wound management due to its favorable impact on healing time.

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