

Clinical Study of EUSOL and Acetic Acid Dressing over the Infected Diabetic Ulcers for Slough Removal

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Abstract

Management of Infected Diabetic wounds is fundamental in surgical practice. Diabetic ulcers have variable infective etiology and many dressing agents are used for local application. EUSOL and Acetic Acid are commonly used for slough removal over infected ulcers.

Aim of the study is to determine the efficacy of EUSOL and Acetic Acid in removal of slough over Diabetic ulcers infected with Proteus, Pseudomonas and other Bacterial growth.

This study was conducted in the Department of General Surgery at PES institute of medical science & research, Kuppam, Chittoor District, Andhra Pradesh in the period between September 2017 to March 2018 over a study population of 30 patients. 15 patients with Pseudomonas culture positive ulcers and remaining 15 with other bacterial growth positive ulcers and dressings done with Acetic acid and EUSOL respectively and findings noted in terms of slough removal and formation of granulation tissue.

By this study We recommend the selection of suitable solution (Acetic acid for Pseudomonas and EUSOL for other bacterial growth) that helps in quick slough removal and wound healing.

Aim

To determine the efficacy of EUSOL and Acetic Acid in removal of slough over Diabetic ulcers infected with Proteus, Pseudomonas and other Bacterial growth.

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Introduction

The Management of Infected Diabetic wounds are most important in the practice of surgery to prevent further complications of gangrene & amputations in limbs.

Slough is a mass or layer of dead tissue that consists leucocytes, bacteria, proteinaceous material, and serous exudates, separated from underlying tissue. Slough is commonly found on diabetic foot wounds. The clinician must consider the presence of slough to be clinically significant, and seek to remove slough to prepare the wound for healing [5].

Wound healing has a multifactorial etiology. Various treatment modalities have been discovered over the years in forms of different types of wound dressings. Some commonly used dressing agents are Povidone Iodine (Betadine), EUSOL, Acetic Acid, Silver Sulfadiazine, Honey etc for local application. For Infected wounds EUSOL and Acetic Acid are commonly used for slough removal in a Diabetic foot.

Edinburgh University Solution Of Lime (EUSOL) is a standard dressing material used to remove slough and kill bacteria except Pseudomonas, an essential component of wound healing.

EUSOL is a solution of Calcium Hypochlorite containing not less than 0.25% w/v of available Chlorine buffered with Boric Acid (1:1) to a pH of 7.5 - 8.5. Hypochlorite solutions have been known for over two hundred years [2].

Mechanism of Action

EUSOL acts by Inhibiting the production of bacterial cell wall by the release of Nascent Chlorine.

Pseudomonas is a classic opportunistic pathogen with innate resistance to many antibiotics and disinfectants. *P. aeruginosa* has acquired significance as an important

cause of nosocomial infections because of its ability to survive in the hospital environment and to develop resistance to antimicrobial agents. It is the most frequently isolated nonfermentative bacillus from various clinical specimens. 0.5-5% Acetic Acid is used against *Pseudomonas* infected burn wounds, ulcers, skin and soft tissue infections. Philips et al. was first to report use of acetic acid as a topical agent for the treatment of superficial wounds infected by *P. aeruginosa*.

We used 2% Acetic Acid over the infected Diabetic Ulcers, Acts as a bactericidal against *Pseudomonas*.

As wounds are a great burden on the Healthcare system, hence need for the study.

Materials and Methods

Hospital based study is conducted in the Department of General Surgery, PESIMSR, Kuppam.

A total of 30 patients with Infected Diabetic Ulcers were studied.

Out of 30 patients, Infected ulcers of 15 were *Pseudomonas* culture positive and other 15 were *Proteus* and Other Bacterial culture positive.

EUSOL dressing was applied twice daily in 15 patients with *Proteus* and other bacterial growth and Acetic Acid dressing applied twice daily in 15 patients with *Pseudomonas* growth.

Removal of Slough, Formation of Granulation tissue was estimated on Day 3 and Day 7. Findings noted and Conclusions were drawn.

Discussion

This study was conducted in patients with infected



Image 1: Infected Diabetic ulcer with Slough tissue (Culture- *Proteus*)



Image 2: Formation of Granulation tissue



Image 2: Infected Diabetic ulcer with *Pseudomonas*

Diabetic ulcers and on application of EUSOL dressing in wounds of 15 patients with culture positive for *Proteus* and other bacterial growth (Since because EUSOL is not effective against *Pseudomonas*), we found significant removal of slough by day 7 with formation of granulation tissue and repeat culture that was sent showed negative growth.

Similarly in 15 patients with Diabetic ulcers infected with *Pseudomonas*, Acetic acid dressing was applied twice daily and good response was observed in terms of Slough removal and formation of granulation tissue. Culture turned out to be negative on repeat.

Conclusion

By this study, We recommend the use of 2% Acetic Acid for *Pseudomonas* Infected Diabetic Ulcers and EUSOL for removal of slough over infected Diabetic ulcers with *Proteus* and other bacterial growth. So the selection of suitable solution (Acetic acid and EUSOL) according to the bacterial growth helps in quick slough removal and wound healing.

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