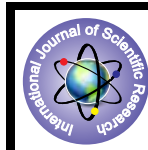


## STUDY OF UTILISATION OF EUSOL IN TREATMENT OF DIABETIC ULCERS



### Medical Science

**KEYWORDS :** Diabetic foot, ulcer, eusol solution

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### ABSTRACT

*Diabetic foot ulcer is a major and common complication of diabetes mellitus. In India the prevalence of foot ulcer is 2.1% to 12.4% among diabetics. Management of diabetic ulcers are challenging task to save the digits of the patient in cost effective manner. Various treatment options are been experimented and advocated. As the treatment duration is generally longer, a greater patient co-operation is essential particularly in a developing country. Thus the study was conducted at our institution to assess the effective of simple eusol solution in the management of diabetic ulcers. Eusol reduces morbidity, decreases the duration of hospitalization and helps in early development of granulation tissue and thereby faster wound healing.*

### Introduction:

Diabetes mellitus(DM) is one of the most important non communicable diseases rapidly increasing. Uncontrolled DM affects some of the important systems in the body like eyes, kidneys and nervous systems. As it affects the peripheral vascular and nervous system, diabetic ulcers are common problems. It is one of the important causes of morbidity. Management of diabetic ulcers are challenging task to save the digits of the patient in cost effective manner. Thus the study was conducted at our institution to assess the effective of eusol solution in the management of diabetic ulcers

### Materials and methods:

Thirty patients with diabetic foot ulcer treated at our institution were selected for the study. Inclusion criteria included ulcers of six to ten cms, controlled blood sugar levels, absence of vascular compromise and neuropathy and seronegativity for HIV and HBsAg. All patients with gangrene of the ulcer, ulcers of more than ten cms, uncontrolled blood sugar levels, neuropathy or vascular compromise which delays healing were excluded of the study. The patients were assessed for their blood sugar levels, HbA1c levels, HIV, HBsAg and blood leucocyte count. Sterile swabs were collected from ulcer and sent for culture sensitivity. Physician's reference was taken to all patients for strict control of blood sugar level. 19 patients were randomly selected and treated with eusol solution, were considered as group A. These patients were treated with EUSOL solution by dipping the ulcer in eusol solution for 30 minutes. Followed by wash with hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) and povidone iodine on the ulcer. This was followed with dressing of the ulcer with eusol soaked gauze. The dressing was done daily repeating the same

procedure. Group B had eleven patients. In patients with group B the wound was cleaned with only Hydrogen peroxide and povidone iodine, followed by dressing. The dressing was repeated daily repeating the procedure.

**Results:** The age distribution of patients in the study is as shown in table 1. There were 22 male and 8 female patients in the study. The culture report of the patients showed staphylococci in 16, E.coli in 7, streptococci in 6 and pseudomonas in one. Antibiotics were given according to culture sensitivity. Eusol solution was used in group A patients which is a antiseptic solution prepared from chlorinated lime and boric acid. Healthy granulation tissue was seen in 16 to 20 days in patients of group A. Patients in group B required 20 to 33 days for healthy granulation tissue. Split skin graft was done in 9 patients which included four patients in group A and five patients of group B. All four patients with skin graft in group A took the graft easily. One patient of group B had sloughing of the skin graft and repeated debride-

ment was required. No further complications were seen in both the groups.

### Discussion:

Diabetic foot ulcer is a major and common complication of diabetes mellitus, and probably the major component of the diabetic foot. It occurs in 15% of all patients with diabetes and precedes 84% of all diabetes-related lower-leg amputations.<sup>1</sup> In diabetic foot ulcers, availability of multi modality treatment with optimal blood sugar level control, antibiotic therapy, surgical intervention as in debridement, split skin grafting when available in combination with early recognition ensures rapid healing thereby minimizing morbidity and costs of hospitalization and treatment to the patients. It also eliminates the risk of amputation in the absence of ischemia and osteomyelitis. The various etiological factors contributing in diabetic ulcers can be easily identified by simple clinical tests. An early identification of which helps in prompt management of the ulcers.<sup>2</sup> The risk of lower extremity amputation is 15 to 46 times higher in diabetics and lower limb amputations are associated with diabetes in 40% to 90% of cases. In India the prevalence of foot ulcer is 2.1% to 12.4% among diabetics.<sup>3</sup>

The antibiotics given to the patients are based on culture results, with the aim of sterilization of the wound which is important for wound healing.<sup>4</sup> Debridement, of the wound which includes the removal of hyperkeratotic and devitalized tissue, foreign materials, and particulate matter from a wound, is often the key first step of effective wound care.<sup>5,6</sup> It helps reduce the rate of infection and provides an ideal healing environment.<sup>7</sup> Wound debridement helps reduce chronic inflammatory byproducts<sup>8,9</sup> and may be accomplished surgically, chemically, mechanically, biologically, or by autolysis.<sup>5</sup>

Following debridement we treated the patients with local antiseptic solutions along with systemic antibiotic therapy. The group of patients treated with eusol solution along with H<sub>2</sub>O<sub>2</sub> and povidone iodine showed quicker response with early appearance of healthy granulation tissue. Sodium hypochlorite in eusol solution reacts with hydrochloric acid to release chlorine gas. It reacts with other acids, such as acetic acid, to release hypochlorous acid. In reaction with hydrogen peroxide it gives off molecular oxygen. When dissolved in water it slowly decomposes, releasing sodium and chloride ions, and hydroxyl radicals. Those hydroxyl radicals can oxidize organic compounds or self-react to form water and oxygen. Many authors have utilized eusol solution in diabetic ulcers after debridement. Rodrigues 2011 suggests packing of the deep ulcers with Eusol and paraffin in 175 mm or 250 mm gauze wick to encourage healthy granulation tissue growth.<sup>10</sup> Khandelwal et al treated one group of patients

with eusol solution by dipping the ulcer for 30 minutes.<sup>3</sup>

#### Conclusion:

All though many advanced treatment techniques have been utilized like hyperbaric oxygen, several tissue growth factors which promotes healing, stem cell therapy, eusol is a simple, non expensive technique for faster healing which is also cost effective. It is particularly useful for a developing country as our, eusol which reduces morbidity, the duration of hospitalization helps in early development of granulation tissue and thereby faster wound healing.

**Table 1: Age distribution of the patients with diabetic ulcers in our study.**

AGE	NO OF PATIENTS
30-40	1
41-50	09
51-60	16
61-70	04

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