



**COMPARATIVE STUDY OF *TUTTHAK* & EUSOL FOOT BATH AS *VRANA SHODHAN*  
& *VRANA ROPAN* IN *PRAMEHAJANYA DUSTAVRANA* (DIABETIC FOOT ULCER)**

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**ABSTRACT**

Present study aimed to find out comparative *Vranashodhan*, *Vranaropan* & microcirculation restoration effect of *Tutthak* foot bath & eusol solution in diabetic foot ulcer. Study was conducted on selected patients divided into two groups; experimental group (received *Tutthak* foot bath) and control group (received eusol solution). The findings of study revealed that *Tutthak* foot bath offers effective *Vrana Shodhan*, *Vrana Ropan*, *Urandoshnashaak*, *Shoolnashak* and antiseptic properties which helps to promotes wound healing process.

**KEYWORDS:** Ayurveda, *Tutthak*, Eusol, *Vranashodhan*, *Vranaropan*.

**INTRODUCTION**

Diabetic foot is a pathological condition involving deformity, infection, inflammation, pain and ulceration in the foot of diabetic patient. The diabetic foot often ends with amputation, while peripheral arterial disease, peripheral neuropathy and infection are the conditions accompanying diabetic foot.<sup>[1,2]</sup> The foot ulcer in case of diabetes mellitus often occurs at lower extremity and spread slowly. Trauma, high planter pressure, deformity and peripheral arterial diastase are major etiological factors responsible for diabetic foot.<sup>[3,4]</sup> The medical

science described various approaches for the management of diabetic foot including; use of anti-diabetic & antioxidant drugs, multivitamin, antibiotics and surgical treatment.<sup>[5]</sup>

As per traditional knowledge it is believed that *Tutthak* foot bath can play vital role in the management of ulcer/wound due to its *VranaShodhan*, *VranaRopan* & antiseptic properties.<sup>[6]</sup> Considering this fact present study was planned to measure efficacy of *Tutthak* foot bath in the management of diabetic foot.

**MATERIAL**

**Drug Review**

**Table 1: Properties and action of *Tutthak*.**<sup>[7,8,9]</sup>

<i>Rasa</i>	<i>Katu, Tikta.</i>
<i>Guna</i>	<i>Tikshna, Vishad, Laghu, Ruksha</i>
<i>Virya</i>	<i>Ushna</i>
<i>Vipaka</i>	<i>Katu</i>
<i>Doshghnata</i>	<i>Kaphahara, Vatahara</i>
<i>Karma</i>	<i>Twachya, Shoolnashak, Vranadoshnashak, Vranashodhak and Vranaropak.</i>

**Preparation of Formulation**<sup>[10-14]</sup>

*Tutthak Dravan* was prepared by standard method explained in *Samhitas*

Four *Gunja* i.e. 4x125=500 mg of *Tutthak* was diluted in 5 *Tole* i.e. 5x10=50 ml of water. One part of *Tutthak* was diluted in 100 parts of water, packed, stored & used with sterile precaution.

**Inclusion Criteria**

1. Patients b/w 16 to 70 yrs. of age.
2. Patients with normal bleeding and clotting time.
3. Patients with Diabetes Mellitus.
4. Patient having diabetic foot ulcer.
5. Both sex male & female.
6. HB more than 10 gm /dl.
7. Wound size 5x3x1 cm.

**Exclusion criteria –Exclusion Criteria**

Those patients possess following clinical features:

- Malignant ulcer
- Patient with Human immunodeficiency virus infection.
- Patient with Tuberculosis
- Patient with Hypertension
- Patient having Multiple ulcers
- Patients with multi organ failure
- Patients under malnutrition
- Patients with Ketoacidosis.
- Wound having wound size above 5 cm.

**Methods**

Total 60 patients were registered for study and divided into two equal groups; 30 patients in each groups. One group is experimental group (group A) and another one is control group (group B).

**Mode of Administration**

**The patients of experimental group treated with *Tutthak Dravan* as follows**

Groups	Experimental Group
Therapy	<i>Tutthak Dravan</i>
Dose ( <i>Matra</i> )	Depending upon size
Duration	30 min
Route of administration	Local
<i>Kala</i>	After meal

**Procedure**

- Diabetic ulcer was cleaned with normal saline.
- *Tutthak* in water mixed properly.

- Foot was inserted in *Tutthak* solution prepared in water.
- Covered with cotton roller bandage.
- The same procedure of *Tutthak* footbath was repeated for the every patient of experimental group after 0, 3, 5, 7, 10, 12 and 15<sup>th</sup> day of protocol.

**The patients of control group treated as follows**

Groups	Control Group
Therapy	Eusol Solution
Dose ( <i>Matra</i> )	Depending upon size
Duration	30 min
Route of administration	Local
<i>Kala</i>	After meal

**Procedure**

- Diabetic ulcer was cleaned with normal saline.
- Eusol solution was prepared in water.
- Temperature was maintained at 25°C to 30°C.
- Foot was inserted into eusol solution for 30 min
- Covered with cotton roller bandage
- The same procedure of eusol solution was repeated for the every patient of control group after 0, 3, 5, 7, 10, 12 and 15<sup>th</sup> day of protocol.

**RESULTS**

Comparison between Group A and Group B was done using Mann Whitney U test. The **Table 2** depicted comparative results of both groups on different parameters. The *P* values for most of the parameters were measured as less than 0.05 significant level. The mean rank for different parameters was found to be more with Group A than Group B.

**Table 2: Statistical analysis between Group A and Group B.**

S. No.	Parameter	Group	N	Mean Rank	Sum of Rank	Mann Whitney U	<i>p</i> - value
1	<i>Vedana</i>	A	30	32.60	978	387	0.3523
		B	30	28.40	852		
		Total	60	-	-		
2	Tenderness	A	30	30.00	900	435	0.8243
		B	30	31.00	930		
		Total	60	-	-		
3	Oedema	A	30	32.28	968.5	396.5	0.4265
		B	30	28.72	861.5		
		Total	60	-	-		
4	Smell	A	30	30.50	915	450	0.9939
		B	30	30.50	915		
		Total	60	-	-		
5	Discharge	A	30	33.50	1005	360	0.1753
		B	30	27.50	825		
		Total	60	-	-		
6	Colour	A	30	30.98	929.5	435.5	0.8301
		B	30	30.02	900.5		
		Total	60	-	-		
7	Dimension	A	30	33.83	1015	350	0.1285
		B	30	27.17	815		
		Total	60	-	-		

In this clinical study it is seen that, clinical parameters like *Vedana*, tenderness, oedema, discharge, colour and dimension of ulcer relief significantly for experimental group as compared to control group. The overall effect of

therapy mentioned in **Table 3** and results revealed that therapy offers beneficial effects in case of diabetic foot ulcer. The healing effect of therapy depicted in **Figures 1A & 1B**.

**Table 3: Overall Effect of Therapy.**

Overall Improvement	Experimental group (A)		Control group (B)	
	No. of patients	%	No. of patients	%
Marked Improvement	29	96.67%	26	86.67%
Moderate Improvement	1	3.33%	4	13.33%
Mild Improvement	0	0.00%	0	0.00%
No Change	0	0.00%	0	0.00%
Total	30	100.00%	30	100.00%



**Figure 1A: Ulcer before treatment.**



**Figure 1B: Ulcer healing after treatment.**

## DISCUSSION

The various parameters selected for study changed in following manner.

### *Vedana*

*Vedana* after treatment reduced slightly for experimental group as compared to the control group.

### Tenderness

Tenderness after treatment reduced but not very significant.

### Oedema

Oedema after treatment with experimental group was reduced slightly more than that by treatment with control group.

### Smell

Smell after treatment with control group was reduced slightly more than that by treatment with trial group.

### Discharge

Discharge after treatment with experimental group was reduced slightly more than that by treatment with control group.

## Dimension

Dimension after treatment with experimental group was reduced slightly more than that by treatment with control group.

## Probable mode of action of the therapy

The properties of the drugs mentioned in **Table 1** offers *Vrana Ropana* and *Vrana Shodhana* effects thus boost healing process. The effect of therapy occurs in two stages first removal of local *Dhatu Dushti* followed by tissue regeneration and speed up of natural healing process.

## CONCLUSION

The *Tutthak* foot bath offers *VranaShodhan*, *VranaRopan*, *Urandoashnashaak*, *Bhedan*, *Shoalnashak* and antiseptic properties thus help to promote wound healing effectively. Study also proved that *Ayurvedic* treatment can be used as supportive modality with modern therapy in case of diabetic foot.

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