To Evaluate the Role of Tutthakadi Malahara the Management of Dushta Vranawith Special Reference to Diabetic Ulcer: A Case Study

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***Abstract*—Diabetic ulcers are a debilitating complication of diabetes, affecting millions globally. The prevalence of diabetes continues to rise, leading to an increase in secondary complications such as chronic wounds, including *Dushta Vrana* (diabetic ulcers).**
These ulcers are challenging to treat due to impaired immune response, poor circulation, and delayed wound healing, often leading to infection, prolonged hospital stays, and even amputations.In Ayurveda, *Meha Vrana* (diabetic ulcers) require both *Shodhana* (wound cleansing) and *Ropana* (healing).*Tutthakadi Malahara*, with its combined properties of *Puyaghna* (pus-cleansing), *Vranasravahara* (discharge control), and *Vrana Ropana* (wound healing), offers a promising alternative.

***Index Terms*—Dushta Vrana, Malahara, Diabetic Ulcer, Tutthakadi Malahara**

I. INTRODUCTION

Diabetes mellitus is a chronic metabolic disorder that affects nearly every tissue and organ system of the body, including the skin. As the disease progresses, two major pathological processes—accelerated skin aging and persistent inflammation—contribute to the deterioration of skin function, particularly evident in diabetic ulcers. Chronic wounds such as diabetic ulcers have emerged as a major global health concern, ranking among the leading causes of morbidity and mortality. Despite ongoing global efforts to reduce mortality, diabetes continues to rise and is projected to become the eighth leading cause of death worldwide, with an estimated 57 million cases expected in India by 2025. [1,2] Alarmingly, around 51.2% of adults in India remain undiagnosed. The prevalence of diabetes has increased dramatically over the years, from 2.4% to 15% in urban regions and from 3.3% to 19% in rural areas between 1972 and 2019. [3]

In 2021 alone, diabetes accounted for approximately 747,000 deaths, primarily due to cardiovascular complications and diabetic foot–related conditions. [4] Goa reports an overall prevalence of 26.4%, one of the highest in the country. [3] Individuals with diabetes are about ten times more likely to be hospitalized for soft-tissue and bone infections. [5] Globally, diabetic foot diseases affect around 6.3% of the population [6], with 12–25% of diabetic individuals at risk of developing ulcers. [7,8] These ulcers commonly affect the lower extremities, significantly impairing daily activities and often resulting in recurrent infections and amputations despite preventive care. Studies indicate that 44–68% of hospitalized patients develop osteomyelitis, frequently necessitating amputation, and recurrence rates for diabetic ulcers remain high—ranging from 20–50% within one year and up to 70% within five years. [9,10]

The etiology of diabetic ulcers is multifactorial, involving internal metabolic disturbances, external trauma, and sociocultural factors such as the use of improper footwear and limited awareness of foot care practices in India. Effective management requires a comprehensive and multidisciplinary approach. According to the American Diabetes Association

(ADA), six essential interventions form the cornerstone of diabetic wound care: offloading, debridement, appropriate wound dressing, antibiotic therapy, revascularization, and limited amputation. [13] Additionally, maintaining foot hygiene and adequate hydration is crucial for ulcer prevention. Educating patients about diabetes management plays a key role in ensuring long-term self-care and reducing complications. [14]

Despite advances in medical treatment, diabetic ulcers continue to pose therapeutic challenges due to inadequate wound-cleansing methods and the growing threat of antibiotic resistance. Understanding the underlying pathophysiology and adopting innovative management strategies are vital for reducing recurrence and preventing amputations. Studies have shown that bacterial proliferation in glucose-rich tissues contributes to the chronicity of wounds [15], while the psychological distress associated with diabetic foot complications further impairs quality of life. [4,16] Managing such chronic ulcers demands a multidisciplinary approach that is often resource-intensive and financially burdensome. Although emerging modalities—such as bioengineered skin substitutes and growth factor therapies—show potential, their efficacy remains inconsistent, and ethical limitations restrict extensive human trials. [17]

Researchers caution that diabetic foot disorders may soon become a significant public health challenge. Hence, India urgently requires a coordinated, multidisciplinary healthcare framework to effectively address this epidemic and its complications. [4,11] Collaborative strategies can help lower amputation rates, promote early intervention, and alleviate the economic strain on patients.

In *Ayurveda*, wound healing *(Vraṇa Ropaṇa)* is considered a natural biological process. However, when disturbed by imbalanced doṣas, it leads to *Duṣhṭa Vraṇa*—a chronic, non-healing ulcer resembling diabetic ulcers. Such ulcers profoundly impact both physical and psychological well-being, making them difficult to manage through both modern and traditional approaches. Therefore, timely and effective intervention is essential to minimize chronic suffering and restore overall health. [18]

AIM AND OBJECTIVE

To evaluate the role of *Tutthakadi Malahara* in the management of *Dushta Vrana* with special reference to Diabetic Ulcer.

CASE STUDY

The following is a case study of a 67-year male patient who presented with the chief complains of ulcers measuring 3cm x 2 cm x 0.3 cm deep and 1cm x 1cm x 1 cm deep over plantar aspect of right foot for 2 months (K/C/O DM for last 8 years and under medication). He was being treated with oral medications and dressings. Study was done after obtaining an informed consent from the patient. He was treated with *Tutthakadi Malahara* for dressing daily and Septec 2 BD After food, *Kamadhuga* 2 BD after food as internal medication.

II. MATERIALS & METHODS

TABLE 1

Tutthakadi Malahara	
Materials	Tuttha-1/8 Part Raala-1/8 Part Khatika-1 Part Kaparda Bhasma-1 Part Tankana-1 Part Ghrita-2 Parts Water-QS Khalva Yantra Sterile Gloves Sterile pads Gauze pieces Normal Saline Roller bandage Micropore
Method of Preparation [19]	2 parts of Goghrita is melted and to it 1/8-part Raala Churna is added until it becomes uniform mixture. Then powdered 1/8 part Shodhita Tuttha, 1 part Khatika, 1 part Kapardika Bhasma and 1 part purified Tankana is added and triturated.Then water is added and trituration is done several times and excess was decanted. The resultant greyish white mixture is Tutthakadi Malahara. It was stored in air tight glass container
Procedure	Malahara was applied over the wound with sterile spatula after cleaning with NS and dressing with sterile gauze pieces and pads was done once daily
Study Duration	35 Days
Assessment	Assessment done on 0th ,7th 14th and 21st day Follow up on 28th and 35th day

Fig 1

Fig 2

Fig 3

Fig 4

Fig 5

Fig 6

Fig 7

Fig 8

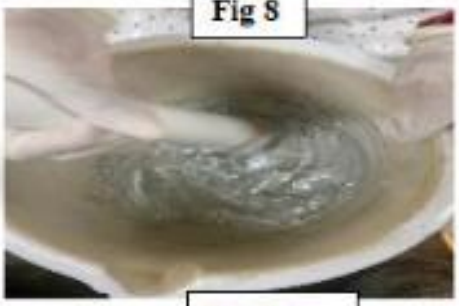

Fig 9

Fig 10

Fig 11

DAY 0

DAY 7

Fig 12

Fig 13

DAY 14

DAY 21

Fig 14

Fig 15

DAY 28

DAY 35

Fig 16

TABLE 2: SUBJECTIVE SYMPTOMS ASSESSED ON 0^{TH}, 7^{TH}, 14^{TH}, 21^{ST}, 35^{TH} DAY.

Pain Assessment [20]	0 No Pain	1-3 Mild pain	4-6 Moderate pain	7-10 Severe pain
0th day		+		
7th day		+		
14th day	+			
21st day	+			
28th day	+			
35th day	+			
Burning Sensation [21]	Grade 0 No burning	Grade 1 Mild burning	Grade 2 Moderate burning	Grade 3 Severe burning
0th day			+	
7th day		+		
14th day		+		
21st day	+			
28th day	+			
35th day	+			

TABLE 3: OBJECTIVE SYMPTOMS ASSESSED ON 0TH, 7TH, 14TH, 21ST, 28TH DAY, 35TH DAY.

Item	Assessment [22]	0th day Score	7th day Score	14th day Score	21st day Score	28th day Score	35th day Score
1. Size	1 = Length x width <4 sq. cm 2 = Length x width 4--<16 sq. cm 3 = Length x width 16.1--<36 sq. cm 4 = Length x width 36.1--<80 sq. cm 5 = Length x width >80 sq. cm	3	3	3	3	2	2
2. Depth	1 = non-blanchable erythema on intact skin 2 = Partial thickness skin loss involving epidermis &/or dermis 3 = Full thickness skin loss involving damage or necrosis of subcutaneous tissue; may extend down to but not through underlying fascia; &/or mixed partial & full thickness &/or tissue layers obscured by granulation tissue 4 = Obscured by necrosis 5 = Full thickness skin loss with extensive destruction, tissue necrosis or damage to muscle, bone or supporting structures	3	3	3	3	3	3
3. Edges	1 = Indistinct, diffuse, none clearly visible 2 = Distinct, outline clearly visible, attached, even with wound base 3 = Well-defined, not attached to wound base 4 = Well-defined, not attached to base, rolled under, thickened 5= Well-defined, fibrotic, scarred or hyperkeratotic	2	2	2	1	1	1
4.Undermining	1 = None present 2 = Undermining < 2 cm in any area 3 = Undermining 2-4 cm involving < 50% wound margins 4 = Undermining 2-4 cm involving > 50% wound margins 5 = Undermining > 4 cm or Tunnelling in any area	1	1	1	1	1	1
5.Necrotic Tissue Type	1 = None visible 2 = White/grey non-viable tissue &/or non-adherent yellow slough 3 = Loosely adherent yellow slough 4 = Adherent, soft, black eschar 5 = Firmly adherent, hard, black eschar	3	3	2	2	2	1
6.Necrotic Tissue Amount	1 = None visible 2 = < 25% of wound bed covered 3 = 25% to 50% of wound covered 4 = > 50% and < 75% of wound covered 5 = 75% to 100% of wound covered	2	2	2	2	2	1
7.Exudate Type	1 = None 2 = Bloody 3 = Serosanguineous: thin, watery, pale red/pink 4 = Serous: thin, watery, clear 5 = Purulent: thin or thick, opaque, tan/yellow, with or without odour	3	3	1	1	1	1
8.Exudate Amount	1 = None, dry wound 2 = Scant, wound moist but no observable exudate 3 = Small 4 = Moderate 5 = Large	4	3	2	2	2	2
9.Skin Colour Surrounding Wound	1 = Pink or normal for ethnic group 2 = Bright red &/or blanches to touch 3 = White or grey pallor or hypopigmented 4 = Dark red or purple &/or non-blanchable 5 = Black or hyperpigmented	1	1	1	1	1	1
10.Peripheral Tissue Edema	1 = No swelling or edema 2 = non-pitting edema extends < 4 cm around wound 3 = non-	2	2	1	1	1	1

	pitting edema extends > 4 cm around wound 4 = Pitting edema extends < 4 cm around wound 5 = Crepitus and/or pitting edema extends >4 cm around wound						
11.Peripheral Tissue Induration	1 = None present 2 = Induration, < 2 cm around wound 3 = Induration 2-4 cm extending < 50% around wound 4 = Induration 2-4 cm extending > 50% around wound 5 = Induration > 4 cm in any area around wound	2	1	1	1	1	1
12.Granulation Tissue	1 = Skin intact or partial thickness wound 2 = Bright, beefy red; 75% to 100% of wound filled &/or tissue overgrowth 3 = Bright, beefy red; < 75% & > 25% of wound filled 4 = Pink, &/or dull, dusky red &/or fills < 25% of wound 5 = No granulation tissue present	3	2	2	2	2	2
13. Epithelialization	1 = 100% wound covered, surface intact 2 = 75% to <100% wound covered &/or epithelial tissue extends to > 0.5cm into wound bed 3 = 50% to <75% wound covered &/or epithelial tissue extends to <0.5cm into wound bed 4 = 25% to < 50% wound covered 5 = < 25% wounds covered	2	2	1	1	1	1
Total Score	34	31	26	24	20	20	20

III. RESULTS

Reduction of Symptoms of ulcer was achieved within 14-21 days of *Tutthakadi Malahara*

Ulcer 1 measuring 1cm x 1cm x 1cm deep reduced to 0.5 x 0.2 x 0.3 cm on 14th day

Ulcer 2 measuring 3 cm x 2cm x 0.3 cm deep reduced to 1cm x 1 cm x 0 cm by 28th day

Complete healing was achieved of both the ulcers by 35th day measuring 0cm x 0 cm x 0 cm

application and later complete healing were achieved without any other complications.

IV. DISCUSSION

EXUDATE AND NECROTIC TISSUE REDUCTION

Copper sulphate acts as a chemical debriding and antimicrobial agent- It destroys necrotic biofilm and inhibits microbial proliferation, thus preventing further tissue death. [23] Calcium carbonate acts as a buffer and adsorbent.Maintains optimal wound pH (~5–6), enhancing autolytic removal of dead tissue. [24]

GRANULATION AND EPITHELIALISATION

After slough removal, *Tuttha* stimulates Ropaṇa karma. Copper ions promote angiogenesis, fibroblast proliferation, and collagen cross-linking — all essential for granulation tissue. [25] Copper-dependent enzymes (like lysyl oxidase) help stabilize new tissue and accelerate re-epithelialisation. Hence, *Tuttha* is granulation-promoting agent. [26] Lowering wound pH can potentially reduce protease activity, increase fibroblast activity and increase oxygen release consequently aiding wound healing [27]

SIZE, DEPTH AND EDGE

Ca^{2+}helps activate contractile machinery (actin, myosin) and transforms fibroblasts into more contractile forms (myofibroblasts). This contraction helps pull the wound edges together reduces wound size. **[28]** Also Ca^{2+}helps Keratinocytes for migration and proliferation This helps edges move inward **[29]** CaO in *Kaparda* accelerates Keratinocyte migration filling the wound cavity more rapidly thus reducing the Depth and leading to faster wound closure **[30]**

V. CONCLUSION

Significant relief on symptoms of Dushta Vrana including Poothi Pooya, Srava, Athigandha etc was being observed in the course of treatment. There was better healing and sustained symptomatic relief in this patient with Tutthakadi Malahara application Due to

its easy and convenient mode of application it makes the procedure significant.

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