

## TO EVALUATE THE ROLE OF TUTTHAKADI MALAHARA THE MANAGEMENT OF DUSHTA VRANA WITH SPECIAL REFERENCE TO DIABETIC ULCER: A CASE STUDY

Dr. Priyanka Chimulkar<sup>\*1</sup>, Dr. Dhyan Surendranath<sup>2</sup>, Dr. K. M. Sweta<sup>3</sup>

<sup>1</sup>\*Post Graduate Scholar, Dept. of Shalya Tantra, Sri Sri College of Ayurvedic Science and Research, Bangalore, Karnataka, India.

<sup>2</sup>Associate Professor, Dept. of Shalya Tantra, Sri Sri College of Ayurvedic Science and Research, Bangalore, Karnataka, India.

<sup>3</sup>Professor & HOD, Dept. of Shalya Tantra, Sri Sri College of Ayurvedic Science and Research, Bangalore, Karnataka, India.

Article Received on 01 Jan. 2026,  
Article Revised on 22 Jan. 2026,  
Article Published on 01 Feb. 2026,

<https://doi.org/10.5281/zenodo.18437993>

### \*Corresponding Author

#### Dr. Priyanka Chimulkar

Post Graduate Scholar, Dept. of Shalya Tantra, Sri Sri College of Ayurvedic Science and Research, Bangalore, Karnataka, India.



**How to cite this Article:** Dr. Priyanka Chimulkar<sup>\*1</sup>, Dr. Dhyan Surendranath<sup>2</sup>, Dr. K. M. Sweta<sup>3</sup> (2026). To Evaluate The Role Of Tutthakadi Malahara The Management Of Dushta Vranawith Special Reference To Diabetic Ulcer: A Case Study. World Journal of Pharmaceutical Research, 15(3), 1054-1065.

This work is licensed under Creative Commons Attribution 4.0 International license.

### 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.

**KEYWORDS:** *Dushta Vrana*, *Malahara*, *Diabetic Ulcer*, *Tutthakadi Malahara*.

### 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.<sup>[1,2]</sup> 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.<sup>[3]</sup>

In 2021 alone, diabetes accounted for approximately 747,000 deaths, primarily due to cardiovascular complications and diabetic foot-related conditions.<sup>[4]</sup> Goa reports an overall prevalence of 26.4%, one of the highest in the country.<sup>[3]</sup> Individuals with diabetes are about ten times more likely to be hospitalized for soft-tissue and bone infections.<sup>[5]</sup> Globally, diabetic foot diseases affect around 6.3% of the population<sup>[6]</sup>, with 12–25% of diabetic individuals at risk of developing ulcers.<sup>[7,8]</sup> 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.<sup>[9,10]</sup>

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.<sup>[13]</sup> 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.<sup>[14]</sup>

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<sup>[15]</sup>, while the psychological distress associated with diabetic foot complications further impairs quality of life.<sup>[4,16]</sup> 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.<sup>[17]</sup>

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.<sup>[4,11]</sup> Collaborative strategies can help lower amputation rates, promote early intervention, and alleviate the economic strain on patients.

In *Ayurveda*, wound healing (*Vrana Ropana*) is considered a natural biological process. However, when disturbed by imbalanced doshas, it leads to *Dushta Vrana*—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.<sup>[18]</sup>

## 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 since 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.

## MATERIALS AND METHODS

**Table 1.**

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



Fig 1.



Fig 2.



Fig 3



Fig 4



Fig 5



Fig 6



Fig 7



Fig 8



Fig 9



Fig 10



DAY 0

Fig 11



DAY 7

Fig 12



DAY 14  
Fig 13



DAY 21  
Fig 14



DAY 28  
Fig 15



DAY 35  
Fig 16

**Table 2: Subjective symptoms assessed on 0<sup>th</sup>, 7<sup>th</sup>, 14<sup>th</sup>, 21<sup>st</sup>, 35<sup>th</sup> day.**

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

**Table 3: Objective symptoms assessed on 0<sup>th</sup>, 7<sup>th</sup>, 14<sup>th</sup>, 21<sup>st</sup>, 28<sup>th</sup> day, 35<sup>th</sup> day.**

Item	Assessment <sup>[22]</sup>	0 <sup>th</sup> day Score	7 <sup>th</sup> day Score	14 <sup>th</sup> day Score	21 <sup>st</sup> day Score	28 <sup>th</sup> day	35 <sup>th</sup> day Score
<b>1. Size</b>	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
<b>2. Depth</b>	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
<b>3. Edges</b>	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
<b>4.Undermining</b>	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
<b>5.Necrotic Tissue Type</b>	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
<b>6.Necrotic</b>	1 = None visible 2 = < 25% of	2	2	2	2	2	1

<b>Tissue Amount</b>	wound bed covered 3 = 25% to 50% of wound covered 4 = > 50% and < 75% of wound covered 5 = 75% to 100% of wound covered						
<b>7.Exudate Type</b>	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
<b>8.Exudate Amount</b>	1 = None, dry wound 2 = Scant, wound moist but no observable exudate 3 = Small 4 = Moderate 5 = Large	4	3	2	2	2	2
<b>9.Skin Colour Surrounding Wound</b>	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
<b>10.Peripheral Tissue Edema</b>	1 = No swelling or edema 2 = non-pitting edema extends < 4 cm around wound 3 = non-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	2	2	1	1	1	1
<b>11.Peripheral Tissue Induration</b>	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
<b>12.Granulation Tissue</b>	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
<b>13. Epithelialization</b>	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	2	2	1	1	1	1

	covered &/or epithelial tissue extends to <0.5cm into wound bed 4 = 25% to < 50% wound covered 5 = < 25% wounds covered						
<b>Total Score</b>	34	31	26	24	20	20	20

## 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 14<sup>th</sup> day.

Ulcer 2 measuring 3 cm x 2cm x 0.3 cm deep reduced to 1cm x 1 cm x 0 cm by 28<sup>th</sup> day.

Complete healing was achieved of both the ulcers by 35<sup>th</sup> day measuring 0cm x 0 cm x 0 cm application and later complete healing was achieved without any other complications.

## 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.<sup>[23]</sup> Calcium carbonate acts as a buffer and adsorbent. Maintains optimal wound pH (~5–6), enhancing autolytic removal of dead tissue.<sup>[24]</sup>

### Granulation and Epithelialisation

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

### Size, Depth and Edge

$\text{Ca}^{2+}$  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.<sup>[28]</sup> Also  $\text{Ca}^{2+}$  helps Keratinocytes for migration and proliferation This helps edges move inward<sup>[29]</sup>  $\text{CaO}$  in *Kaparda* accelerates Keratinocyte migration filling the wound cavity more rapidly thus reducing the Depth and leading to faster wound closure.<sup>[30]</sup>

## 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.

## REFERENCES

1. World Health Organization. Global report on diabetes. Geneva: WHO, 2016.
2. International Diabetes Federation. IDF Diabetes Atlas, 10th ed. Brussels: IDF, 2021.
3. Anjana RM, Deepa M, Pradeepa R, Mahanta J, Narain K, Das HK, et al. Prevalence of diabetes and prediabetes in 15 states of India: results from the ICMR-INDIAB population-based cross-sectional study. *Lancet Diabetes Endocrinol*, 2017; 5(8): 585–96.
4. International Diabetes Federation. Diabetes Atlas. 10th ed. Brussels: IDF, 2021.
5. Singh N, Armstrong DG, Lipsky BA. Preventing foot ulcers in patients with diabetes. *JAMA*, 2005; 293(2): 217–28.
6. Zhang P, Lu J, Jing Y, Tang S, Zhu D, Bi Y. Global epidemiology of diabetic foot ulceration: a systematic review and meta-analysis. *Ann Med*, 2017; 49(2): 106–16.
7. Boulton AJM, Vileikyte L, Ragnarson-Tennvall G, Apelqvist J. The global burden of diabetic foot disease. *Lancet*, 2005; 366(9498): 1719–24.
8. Armstrong DG, Boulton AJM, Bus SA. Diabetic foot ulcers and their recurrence. *N Engl J Med*, 2017; 376(24): 2367–75.
9. Lavery LA, Armstrong DG, Peters EJ, Lipsky BA. Probabilities of healing in diabetic foot ulcers with infections. *Diabetes Care*, 2007; 30(5): 887–92.
10. Prompers L, Huijberts M, Apelqvist J, Jude E, Piaggesi A, Bakker K, et al. High prevalence of ischemia, infection and serious comorbidity in patients with diabetic foot disease in Europe. *Diabetologia*, 2007; 50(1): 18–25.
11. Ramachandran A, Snehalatha C. Current scenario of diabetes in India. *J Diabetes*, 2009; 1(1): 18–28.
12. American Diabetes Association. Standards of medical care in diabetes—2023. *Diabetes Care*, 2023; 46(Suppl 1): S1–S212.
13. Armstrong DG, Hanft JR, Driver VR, Smith AP, Lazaro-Martinez JL, Reyzelman AM, et al. Effect of off-loading with removable cast walker versus total contact cast on healing of diabetic foot ulcers: a randomized controlled trial. *Diabetes Care*, 2012; 35(3): 564–9.

14. Alavi A, Sibbald RG, Mayer D, Goodman L, Botros M, Armstrong DG, et al. Diabetic foot ulcers: part II. Management. *J Am Acad Dermatol*, 2014; 70(1): 21.e1–24.
15. Lipsky BA, Senneville E, Abbas ZG, Aragón-Sánchez J, Diggle M, Embil JM, et al. Guidelines on the diagnosis and treatment of foot infection in persons with diabetes. *Diabetes Metab Res Rev*, 2020; 36(S1): e3280.
16. Ribu L, Hanestad BR, Moum T, Birkeland K, Rustoen T. A comparison of the health-related quality of life in patients with diabetic foot ulcers, with a diabetes group and a nondiabetes group from the general population. *Qual Life Res*, 2007; 16(2): 179–89.
17. Game FL, Hinchliffe RJ, Apelqvist J, Armstrong DG, Boulton AJM, Bowker JH, et al. A systematic review of interventions to enhance the healing of chronic ulcers of the foot in diabetes. *Diabetes Metab Res Rev*, 2016; 32(S1): 154–68.
18. Sushruta. *Sushruta Samhita* (Chikitsa Sthana 1/8–9). Varanasi: Chaukhamba Orientalia, 2018.
19. Shastri K. *Rasatarangini Of Sadanandsharmavirchit*. New Delhi: Motilal Banarsi Dass Publisher, 2004; p.539.
20. Haefeli M, Elfering A. Pain assessment. *Eur Spine J.*, 2006; 15 Suppl 1(S1): S17-24.
21. Tichkule SV, Khandare KB, Shrivastav PP. Proficiency of Khanduchakka Ghrit in the management of Parikarthika: A case report. *J Indian System Medicine* [serial online] 2019 [cited 2020 Feb 24]; 7: 47-50. Available from: <http://www.joinsysmed.com/text.asp?2019/7/1/47/265514>. [accessed on 2021-7-4]
22. Harris C, Bates-Jensen B, Parslow N, Raizman R, Singh M, Ketchen R. Bates-Jensen wound assessment tool: Pictorial guide validation project. *J Wound Ostomy Continence Nurs*, 2010; 37(3): 253–9.
23. Gomes IB, Simões M, Simões LC. Copper Surfaces in Biofilm Control. *Nanomaterials*. 2020 Dec.
24. Niu YQ, Liu JH, Aymonier C, Fermani S, Kralj D, Falini G, et al. Calcium carbonate: controlled synthesis, surface functionalization, and nanostructured materials. *Chemical Society Reviews* [Internet], 2022 Sep 20 [cited 2022 Oct 5]; 51(18): 7883–943. Available from: <https://pubs.rsc.org/en/content/articlelanding/2022/cs/d1cs00519g>
25. OUP accepted manuscript. *Burns and Trauma*, 2021.
26. Cai L, Xiong X, Kong X, Xie J. The Role of the Lysyl Oxidases in Tissue Repair and Remodeling: A Concise Review. *Tissue Engineering and Regenerative Medicine*, 2017 Jan 17; 14(1): 15–30.

27. Gethin GT, Cowman S, Conroy RM. The impact of Manuka honey dressings on the surface pH of chronic wounds. International Wound Journal [Internet], 2008 May [cited 2020 Mar 22]; 5(2): 185–94. Available from: <https://pdfs.semanticscholar.org/0667/28b9c9271885a0cbc8faf3932b42c6ec48c8.p>

28. Kawai, Kenichiro, et al. “Calcium-Based Nanoparticles Accelerate Skin Wound Healing.” *PLoS ONE*, 2 Nov. 2011; 6(11): e27106, <https://doi.org/10.1371/journal.pone.0027106>. Accessed 24 Feb. 2020.

29. Wang, Shunfeng, et al. “Acceleration of Wound Healing through Amorphous Calcium Carbonate, Stabilized with High-Energy Polyphosphate.” *Pharmaceutics*, 2 Feb. 2023; 15(2): 494–494, <https://doi.org/10.3390/pharmaceutics15020494>. Accessed 6 Mar. 2024.

30. Kulshrestha MK, Karbhal KS, Sahoo R. Pharmaceutical Study of ‘Kapardika Bhasma’. *Int J Pharm Phytopharmacol Res*, 2013; 2(6): 427-430.