



Original Article

Current Evidence on Ayurvedic Topical Therapies in the Management of Diabetic Foot Ulcers: A Comprehensive Review

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Abstract:

Diabetic foot ulcer (DFU) is a serious complication of diabetes mellitus and a leading cause of infection, hospitalization, lower-limb amputation, and impaired quality of life. Despite advances in conventional wound care, delayed healing, recurrent infection, antimicrobial resistance, and high treatment costs continue to compromise clinical outcomes. Ayurveda describes chronic non-healing wounds under the concept of Dushtavrana and advocates topical therapies with Shodhana (wound cleansing), Ropana (wound healing), Krimighna (antimicrobial), and Shothahara (anti-inflammatory) properties. Increasing scientific interest in traditional wound management has prompted evaluation of these interventions using contemporary research methods.

Objective: To critically review and synthesize the available evidence on Ayurvedic topical therapies for the management of diabetic foot ulcers, with emphasis on their therapeutic efficacy, pharmacological actions, clinical applications, and existing research gaps.

Methods: A comprehensive literature search was performed using PubMed, Scopus, Google Scholar, Cochrane Library, AYUSH Research Portal, DHARA, and IndMED. Peer-reviewed clinical studies, randomized controlled trials, observational studies, case reports, experimental investigations, and relevant classical Ayurvedic literature pertaining to topical therapies for diabetic foot ulcers and chronic wounds were reviewed. The evidence was narratively synthesized to evaluate clinical outcomes, proposed mechanisms of action, and methodological quality.

Results: Current evidence indicates that several Ayurvedic topical formulations, including Jatyadi Taila, Madhu, Nimba (*Azadirachta indica*), Haridra (*Curcuma longa*), Yashtimadhu (*Glycyrrhiza glabra*), and other polyherbal preparations, exhibit antimicrobial, anti-inflammatory, antioxidant, angiogenic, and wound-healing properties. Clinical and experimental studies suggest beneficial effects on wound debridement, granulation tissue formation, infection control, epithelialization, and overall healing. However, the available evidence is constrained by small sample sizes, heterogeneity in formulations and study designs, inadequate standardization, and limited high-quality multicenter randomized controlled trials.

Conclusion: Ayurvedic topical therapies demonstrate promising potential as adjunctive interventions in the management of diabetic foot ulcers. Integration of standardized Ayurvedic formulations with evidence-based conventional wound



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care may enhance wound healing and improve patient outcomes. Well-designed randomized controlled trials, standardized pharmaceutical protocols, mechanistic investigations, and long-term safety evaluations are required to strengthen the evidence base and facilitate their integration into contemporary diabetic wound management.

Keywords: *Diabetic Foot Ulcer; Ayurveda; Dushtavrana; Madhumeha; Wound Healing; Topical Therapy; Integrative Medicine; Herbal Formulations.*

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Introduction:

Diabetes mellitus is a major global public health challenge, with its prevalence increasing rapidly due to population ageing, urbanization, and lifestyle changes. Among its chronic complications, diabetic foot ulcer (DFU) is one of the most serious, affecting approximately 15–25% of individuals with diabetes during their lifetime. It is a leading cause of hospitalization, lower-extremity amputation, disability, and increased healthcare costs. Delayed wound healing, peripheral neuropathy, peripheral arterial disease, infection, and impaired immune response contribute to the chronicity of DFUs and adversely affect patients' quality of life.

Conventional management of diabetic foot ulcers includes glycemic control, wound debridement, infection management, pressure off-loading, vascular intervention, and advanced wound dressings. Although these approaches have improved clinical outcomes, challenges such as prolonged healing time, recurrence, antimicrobial resistance, and high treatment costs remain significant.

Ayurveda describes chronic non-healing wounds under the concept of *Dushtavrana* and

emphasizes comprehensive wound management through *Shodhana* (wound cleansing) and *Ropana* (wound healing) therapies. Classical Ayurvedic texts describe several topical formulations, including medicated oils, ghee preparations, herbal pastes, and honey-based dressings, which possess antimicrobial, anti-inflammatory, antioxidant, and tissue regenerative properties. In recent years, these traditional therapies have gained increasing scientific attention for their potential role in the management of chronic wounds, including diabetic foot ulcers.

This review critically summarizes the current evidence on Ayurvedic topical therapies used in diabetic foot ulcer management, highlights their proposed mechanisms of action, evaluates available clinical and experimental evidence, and identifies existing research gaps and future directions for integrative wound care.

Literature Search Methodology:

This review was conducted to summarize the current evidence on Ayurvedic topical therapies used in the management of diabetic foot ulcers (DFUs).



Electronic databases, including PubMed, Scopus, Google Scholar, Cochrane Library, AYUSH Research Portal, DHARA (Digital Helpline for Ayurveda Research Articles), and IndMED, were searched for articles published from January 2000 to June 2026. Additional relevant studies were identified by manually screening the reference lists of eligible articles and classical Ayurvedic texts.

Studies were included if they evaluated Ayurvedic topical interventions for diabetic foot ulcers or chronic wounds, including randomized controlled trials, non-randomized clinical studies, observational studies, case series, case reports, experimental animal studies, and in vitro investigations. Classical Ayurvedic literature describing topical wound management was also reviewed to provide a traditional perspective. Editorials, conference abstracts without full text, duplicate publications, non-English articles lacking reliable translation, and studies unrelated to topical Ayurvedic therapies were excluded.

Modern Perspective of DFU:

Diabetic foot ulcer (DFU) is a chronic, non-healing wound occurring in individuals with diabetes mellitus, primarily due to peripheral neuropathy, peripheral arterial disease, and infection. It represents one of the most serious complications of diabetes and is associated with prolonged hospitalization, lower-extremity amputation, increased mortality, and substantial healthcare costs.

The pathogenesis of DFU is multifactorial. Peripheral neuropathy leads to loss of protective sensation and foot deformities, making patients susceptible to repeated trauma. Peripheral arterial disease reduces tissue perfusion and oxygenation, impairing wound healing, while hyperglycaemia compromises immune function and promotes microbial infection. These factors collectively delay

tissue repair and increase the risk of chronic ulceration.

Diagnosis involves a comprehensive clinical assessment, including ulcer characteristics, vascular status, neurological examination, and evaluation for infection. The Wagner classification system is commonly used to grade ulcer severity and guide treatment.

Current management of DFU emphasizes a multidisciplinary approach, including optimal glycemic control, wound debridement, infection management, pressure off-loading, appropriate wound dressings, revascularization when indicated, and patient education. Although advances in wound care have improved healing outcomes, recurrence, antimicrobial resistance, delayed healing, and high treatment costs remain major clinical challenges. These limitations have stimulated growing interest in complementary therapies, including evidence-based Ayurvedic topical interventions, as adjuncts to conventional wound management.

Ayurvedic Perspective:

In Ayurveda, diabetic foot ulcer (DFU) can be correlated with *Dushtavrana* occurring in patients with *Madhumeha*, a subtype of *Prameha*. Chronic hyperglycemia leads to *Dhatu Kshaya*, *Ojakshaya*, and vitiation of Vata, Pitta, and Kapha, resulting in impaired tissue nutrition, delayed wound healing, and increased susceptibility to infection. The presence of slough, foul discharge, pain, swelling, and non-healing characteristics are classical features of *Dushtavrana*.

The management of *Dushtavrana* is based on the principles of *Vrana Shodhana* (wound cleansing) and *Vrana Ropana* (wound healing). Classical Ayurvedic texts recommend the use of topical therapies such as medicated oils (*Taila*), ghee-based formulations (*Ghrita*), herbal pastes (*Kalka*), honey (*Madhu*), and herbal ointments



possessing Shodhana, Ropana, Krimighna (antimicrobial), Shothahara (anti-inflammatory), and Vedanasthapana (analgesic) properties. These formulations promote debridement, control microbial growth, reduce inflammation, enhance granulation tissue formation, and accelerate epithelialization.

The holistic approach of Ayurveda, combining local wound care with systemic management of *Madhumeha*, dietary regulation (*Pathya*), and lifestyle modification, offers a comprehensive strategy for improving wound healing and reducing complications in patients with diabetic foot ulcers.

Ayurvedic Topical Therapies:

Ayurveda emphasizes Vrana Shodhana (wound cleansing) followed by Vrana Ropana (wound healing) for the management of *Dushtavrana*. Classical texts recommend topical formulations in the form of Taila (medicated oils), Ghrita (medicated ghee), Kalka (herbal paste), Churna (powder), Kwatha (decoction), and Madhu (honey) according to the stage and characteristics of the wound. These preparations aim to reduce microbial load, remove slough, control inflammation, promote granulation tissue formation, and accelerate epithelialization.

Jatyadi Taila is one of the most extensively studied Ayurvedic wound-healing formulations. It contains herbs with antimicrobial, anti-inflammatory, antioxidant, and tissue-regenerative properties. Experimental and clinical studies have demonstrated its effectiveness in reducing wound size, promoting granulation tissue, enhancing epithelialization, and improving healing in chronic wounds, including diabetic foot ulcers.

Madhu (Honey) has been traditionally used as a natural wound dressing because of its antimicrobial, osmotic, antioxidant, and anti-

inflammatory properties. It maintains a moist wound environment, facilitates autolytic debridement, reduces bacterial colonization, and promotes faster wound healing.

Panchavalkala Kwatha, commonly used for wound irrigation, possesses astringent, antimicrobial, and anti-inflammatory activities that help reduce wound exudate and prepare the wound bed for healing. Recent clinical studies have also evaluated Panchavalkala aerosol spray in combination with Jatyadi Taila for chronic ulcers, demonstrating healing outcomes comparable to conventional wound care.

Medicinal plants such as Nimba (*Azadirachta indica*), Haridra (*Curcuma longa*), Yashtimadhu (*Glycyrrhiza glabra*), Triphala, and Manjistha (*Rubia cordifolia*) are frequently incorporated into topical formulations because of their antimicrobial, antioxidant, anti-inflammatory, and collagen-promoting properties. These herbs contribute to infection control, angiogenesis, fibroblast proliferation, collagen synthesis, and re-epithelialization, thereby facilitating chronic wound healing.

Although available evidence indicates that Ayurvedic topical therapies are promising adjuncts in diabetic foot ulcer management, most published studies are limited by small sample sizes, heterogeneous formulations, and methodological limitations. Therefore, well-designed multicenter randomized controlled trials using standardized formulations are required to establish their efficacy and safety in routine clinical practice.

Yashtimadhu Ghrita is a medicated ghee preparation containing *Yashtimadhu* (*Glycyrrhiza glabra*) as the principal ingredient. It is traditionally indicated for *Vrana Ropana* (wound healing) because of its anti-inflammatory, antioxidant, antimicrobial, and epithelialization-promoting properties. Experimental studies have shown that



Yashtimadhu enhances fibroblast proliferation, collagen deposition, and angiogenesis, thereby accelerating wound contraction and tissue regeneration. Recent clinical reports have also demonstrated successful healing of diabetic foot ulcers when Yashtimadhu Ghrita was used as part of an integrative wound-care protocol. Although current evidence is encouraging, large randomized clinical trials are needed to establish its efficacy in diabetic foot ulcer management. [8–10]

Nimba Kalka and Yashtimadhu Taila:

Nimba Kalka (Azadirachta indica paste) combined with Yashtimadhu Taila has recently gained attention as an integrative topical therapy for chronic diabetic wounds. Nimba possesses broad-spectrum antimicrobial, anti-inflammatory, antioxidant, and immunomodulatory activities that help reduce wound bioburden and inflammation, while Yashtimadhu Taila promotes granulation tissue formation and epithelialization. Recent case reports have documented rapid reduction in wound discharge, healthy granulation tissue formation, and significant wound contraction within three weeks of treatment. These findings suggest that this combination may serve as a promising adjunctive therapy for infected diabetic foot ulcers. [11]

Jatyadi Ghrita:

Jatyadi Ghrita is a classical Ayurvedic polyherbal formulation widely used for the management of chronic wounds and burns. It contains herbs such as *Jati*, *Nimba*, *Haridra*, *Daruharidra*, *Manjistha*, and other wound-healing ingredients processed in ghee. Experimental studies have demonstrated that Jatyadi Ghrita enhances re-epithelialization, collagen synthesis, wound contraction, and moisture retention while reducing inflammation. Animal studies have reported significantly faster wound closure compared with

untreated controls. Its emollient nature maintains a moist wound environment, thereby facilitating tissue regeneration and reducing scar formation. The available evidence supports its potential role as an adjunctive topical therapy for diabetic foot ulcers, although robust multicenter clinical trials remain necessary. [12–13]

Discussion:

The present review indicates that Ayurvedic topical therapies have considerable potential as adjunctive interventions in DFU management. Classical formulations such as Jatyadi Taila, Jatyadi Ghrita, Madhu, Panchavalkala, Yashtimadhu Ghrita, and Nimba-based preparations possess antimicrobial, anti-inflammatory, antioxidant, angiogenic, and collagen-promoting activities that collectively facilitate wound healing. Experimental studies have demonstrated enhanced fibroblast proliferation, collagen synthesis, granulation tissue formation, and re-epithelialization, while clinical studies have reported improvements in wound contraction, reduction in wound discharge, infection control, and faster healing of chronic wounds.

Ayurvedic wound management differs from conventional treatment by adopting a holistic approach that combines local wound care with systemic management of Madhumeha, dietary regulation (*Pathya*), lifestyle modification, and measures to restore tissue health. This integrative approach may address both local and systemic factors contributing to delayed wound healing. The increasing scientific validation of medicinal plants such as *Azadirachta indica*, *Curcuma longa*, *Glycyrrhiza glabra*, and honey further supports the biological plausibility of Ayurvedic topical therapies.

Despite these promising findings, the current evidence base remains limited. Most published studies involve small sample sizes, single-center



designs, heterogeneous formulations, inadequate pharmaceutical standardization, and variable outcome measures, making direct comparison difficult. Furthermore, many studies lack long-term follow-up, allocation concealment, and blinded outcome assessment, thereby reducing the overall certainty of evidence. Consequently, robust multicenter randomized controlled trials using standardized formulations, validated wound assessment tools, and objective outcome measures are required before these therapies can be widely incorporated into evidence-based clinical guidelines.

Future research should focus on standardization of Ayurvedic formulations, pharmacological characterization, quality control, safety evaluation, and mechanistic studies using molecular biomarkers. Integrating modern wound-care principles with scientifically validated Ayurvedic topical therapies may provide a cost-effective, safe, and patient-centered approach for improving outcomes in diabetic foot ulcer management. Such evidence will strengthen the role of Ayurveda in integrative wound care and support its incorporation into contemporary clinical practice.

Conclusion:

Diabetic foot ulcer remains a significant clinical challenge due to its complex pathophysiology, prolonged healing time, high recurrence rate, and risk of lower-limb amputation. This review highlights that Ayurvedic topical therapies, including medicated oils, ghee-based formulations, herbal ointments, honey-based dressings, and polyherbal preparations, possess promising wound-healing properties supported by classical Ayurvedic principles and emerging scientific evidence. Their antimicrobial, anti-inflammatory, antioxidant, angiogenic, and tissue regenerative effects may contribute to improved

wound healing when used as adjuncts to conventional diabetic foot ulcer management.

However, the current evidence is limited by methodological heterogeneity, small sample sizes, lack of standardized formulations, and a shortage of high-quality randomized controlled trials. Therefore, the available evidence should be interpreted with caution, and these therapies should not be considered replacements for established evidence-based diabetic foot ulcer care.

Future research should prioritize standardized pharmaceutical preparation, rigorous preclinical evaluation, multicenter randomized controlled trials, long-term safety assessment, and mechanistic studies to establish the efficacy and safety of Ayurvedic topical therapies. Integrating validated Ayurvedic interventions with modern wound-care practices may offer a safe, cost-effective, and holistic approach to improving healing outcomes and quality of life in patients with diabetic foot ulcers.

References:

1. Sushruta. *Sushruta Samhita*, Chikitsa Sthana (Vrana Chikitsa Adhyaya).
2. Vagbhata. *Ashtanga Hridaya*, Uttara Tantra.
3. Review of grey literature on Ayurveda wound healing formulations and procedures: A systematic review. *J Ayurveda Integr Med*. 2023.
4. Current scenario of traditional medicines in management of diabetic foot ulcers: A review. *World J Diabetes*. 2023.
5. Traditional complementary and alternative medicine (TCAM) for diabetic foot ulcer management: A systematic review. *J Ayurveda Integr Med*. 2023.
6. Swathi K, et al. Antimicrobial and anti-inflammatory response by two formulations of



- Jatyadi Thailam in healing diabetic foot ulcers. 2022.
7. Wound healing activity of topical herbal aerosol sprays on diabetic and varicose ulcers: A randomized controlled multicentric trial.
8. Rayate AS, Nagoba BS, Mumbre S, et al. Current scenario of traditional medicines in management of diabetic foot ulcers: A review. *World J Diabetes*. 2023;14(1):1-16.
9. Review of grey literature on Ayurveda wound healing formulations and procedures: A systematic review. *J Ayurveda Integr Med*. 2023.
10. Ganatra R, Dudhamal TS. Integrative management of a post-debridement non-healing diabetic foot ulcer: A case report. *Asian J Case Rep Med Health*. 2025.
11. U B, Deeksha PC, Pradeepa MS, et al. Nimba Kalka and Yashtimadhu Taila in *Dushta Vrana Chikitsa*: A case of integrative wound management. *J Ayurveda Integr Med Sci*. 2026.
12. Rayate AS, Nagoba BS, Mumbre S, et al. Current scenario of traditional medicines in management of diabetic foot ulcers: A review. *World J Diabetes*. 2023;14(1):1-16.
13. Review of grey literature on Ayurveda wound healing formulations and procedures: A systematic review. *J Ayurveda Integr Med*. 2023.