

Review Article

Volume 14 Issue 10

October 2025

REVISITING *TARPANA KARMA*: AN AYURVEDIC APPROACH TO OCULAR SURFACE DISORDERS AND DRY EYE PATHOPHYSIOLOGY

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ABSTRACT

Background: *Tarpana Karma* is one of the specialized *Netra Karmas* described in *Ayurveda* for the nourishment and rejuvenation of ocular tissues. With the increasing prevalence of Dry Eye Disease (DED) due to digital strain and environmental stressors, *Tarpana Karma* offers a unique therapeutic perspective rooted in the concepts of *Sneha*, *Snigdhatva*, and *Netra Poshan*. **Aim** To evaluate the role of *Tarpana Karma* in the management of ocular surface disorders, especially Dry Eye, through classical and modern perspectives. **Objectives** To review *Ayurvedic* references of *Tarpana Karma*. To study its procedure and therapeutic principles. To correlate *Ayurvedic* and modern concepts of Dry Eye. To explore the pharmacological actions of *Tarpana Dravyas*. To assess its clinical relevance in ocular surface disorders. **Methods:** A literary review was conducted through *Ayurvedic* classics including *Sushruta Samhita*, *Ashtanga Hridaya*, and *Sharangadhara Samhita*, along with recent clinical and experimental studies from modern ophthalmological and *Ayurvedic* research databases. Key focus was given to the selection of *Tarpana Dravyas*, procedural methodology,

indications, contraindications, and mechanisms of action. **Results:** Classical texts attribute *Tarpana* with actions like *Vata-Pitta Shamana*, *Netra Snigdhata Vardhana*, and *Drishti Prasadana*. Modern studies indicate that *Tarpana* may enhance tear film stability, increase goblet cell density, and reduce ocular surface inflammation through lipid and mucin layer restoration. The ghee-based formulations used in *Tarpana* exhibit antioxidant, anti-inflammatory, and lubricating effects comparable to artificial tear substitutes but with deeper tissue nourishment. **Conclusion:** *Tarpana Karma* represents a holistic and rejuvenate intervention for ocular surface disorders. Integrating its principles into modern ocular therapeutics can provide sustainable management of Dry Eye and related pathologies by restoring *Netra Bala* and maintaining *Tear Film Homeostasis*. Further controlled trials are warranted to validate its long-term efficacy and establish standardized procedural protocols.

INTRODUCTION

The human eye is one of the most delicate sensory organs, continuously exposed to environmental, digital, and systemic challenges. In recent decades, the prevalence of ocular surface disorders—particularly Dry Eye Disease (DED)—has increased substantially due to factors such as prolonged screen exposure, pollution, contact lens usage, systemic diseases, and aging. Characterized by discomfort, burning, grittiness, and fluctuating vision, DED results from tear film instability, increased osmolarity, and inflammation of the ocular surface. Modern management primarily relies on artificial tears and anti-inflammatory agents, which often offer symptomatic rather than curative relief.¹

In *Ayurveda*, *Netra* (eye) is considered the *Pradhana Indriya* (chief sense organ) and requires constant care for maintaining its integrity. Among the *Netra Karmas*, *Tarpana Karma* is a specialized *Sneha Upakrama* mentioned in *Sushruta Samhita* and *Ashtanga Hridaya*, designed to nourish and rejuvenate ocular tissues. The term *Tarpana* literally means “to satiate or nourish,” reflecting its function of restoring *Snigdhata* (unctuousness) and *Poshana* (nourishment) to the *Netra Mandala*. The procedure involves retaining medicated ghee (*Ghrita*) around the eyes for a specified duration, allowing transcorneal and transdermal absorption of lipophilic constituents that pacify *Vata* and *Pitta Doshas*—the primary pathological factors in ocular dryness and fatigue.²

Ayurvedic classics describe *Tarpana Karma* as beneficial in conditions like *Abhishyanda* (inflammatory eye disorders), *Timira* (refractive errors), and *Netra Shushkata* (ocular dryness). In the modern context, these conditions correlate closely with the spectrum of ocular surface diseases, including Dry Eye Syndrome. The ghee-based formulations used in

Tarpana, such as *Triphaladi Ghrita* or *Jeevantyadi Ghrita*, possess *Chakshushya*, *Rasayana*, and *Balya* properties, which promote epithelial repair, improve tear film stability, and alleviate oxidative stress.³

Hence, revisiting *Tarpana Karma* from both Ayurvedic and modern perspectives provides an opportunity to establish a holistic, evidence-based approach to ocular surface health. This review aims to integrate classical concepts with current pathophysiological insights to enhance understanding and application of *Tarpana Karma* in the management of Dry Eye and related ocular disorders.⁴

AIM AND OBJECTIVES

Aim

To evaluate the role of *Tarpana Karma* in the management of ocular surface disorders, especially Dry Eye, through classical and modern perspectives.

Objectives

1. To review *Ayurvedic* references of *Tarpana Karma*.
2. To study its procedure and therapeutic principles.
3. To correlate *Ayurvedic* and modern concepts of Dry Eye.
4. To explore the pharmacological actions of *Tarpana Dravyas*.
5. To assess its clinical relevance in ocular surface disorders.

CONCEPTUAL STUDY OF OCULAR SURFACE DISORDERS

The ocular surface comprises the cornea, conjunctiva, meibomian glands, lacrimal glands, and the overlying tear film, all working in harmony to maintain visual clarity and ocular comfort. Any disruption in this delicate system results in Ocular Surface Disorders (OSDs), which include Dry Eye Disease, blepharitis, meibomian gland dysfunction, allergic conjunctivitis, and exposure keratopathy. These disorders are multifactorial, involving tear film instability, increased osmolarity, inflammation, and epithelial damage.⁵

The tear film has three main layers—lipid, aqueous, and mucin—each playing a vital role in lubrication, nutrition, and protection. When any of these layers are compromised, the ocular surface becomes vulnerable to desiccation and inflammation, leading to symptoms like dryness, irritation, burning, redness, and fluctuating vision. Modern research attributes major causes to environmental pollution, digital strain, hormonal imbalance, autoimmune diseases, and prolonged medication use.⁶

From a pathophysiological perspective, OSDs are characterized by a vicious cycle of tear film instability and inflammatory damage. Inflammatory mediators such as interleukins and matrix metalloproteinases (MMPs) degrade epithelial integrity, perpetuating ocular surface inflammation. Conventional treatments like artificial tears, corticosteroids, and immunomodulators aim to restore tear film and reduce inflammation, yet they often provide only temporary relief.⁷

In this context, *Ayurveda* offers a comprehensive approach through *Tarpana Karma*, *Nasya*, and *Netra Prakshalana* aimed at nourishing, rejuvenating, and balancing *Vata* and *Pitta Doshas*, which are primarily involved in ocular dryness and fatigue. Understanding OSDs through both modern and *Ayurvedic* perspectives provides a more integrative view, linking the biomedical concept of tear film deficiency with *Sneha Kshaya* (loss of unctuousness) and *Vata-Pitta Prakopa* (aggravation). Thus, Ocular Surface Disorders can be managed more holistically by addressing both local and systemic imbalances.⁸

Dry Eye Pathophysiology

Dry Eye Disease (DED) is a multifactorial disorder of the tear film and ocular surface that results in discomfort, visual disturbance, and potential damage to the corneal epithelium. It is characterized by tear film instability, increased osmolarity, and chronic inflammation of the ocular surface. According to the Tear Film and Ocular Surface Society (TFOS DEWS II), DED involves a self-perpetuating cycle of tear film instability and inflammatory damage.⁹

The tear film comprises three layers—lipid, aqueous, and mucin. The **lipid layer**, secreted by the meibomian glands, prevents tear evaporation; the **aqueous layer**, produced by the lacrimal glands, provides hydration and nutrients; and the **mucin layer**, secreted by conjunctival goblet cells, ensures tear film adherence to the corneal epithelium. Dysfunction in any of these components leads to tear film breakup and ocular surface exposure.¹⁰

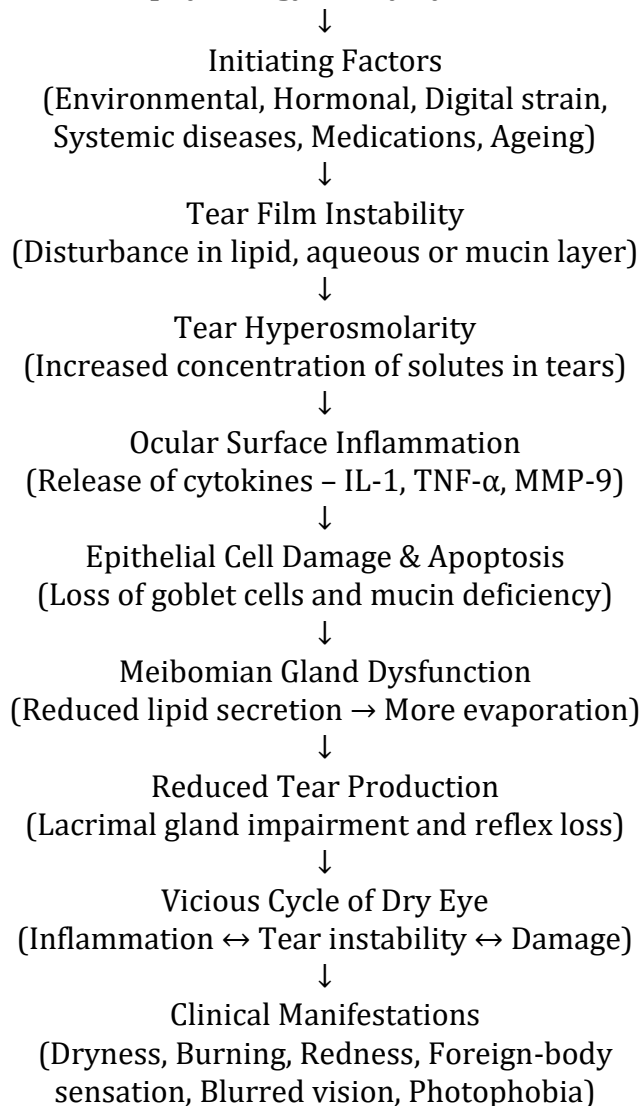
The core mechanism begins with **tear hyperosmolarity**, which stimulates epithelial cells to release inflammatory cytokines such as IL-1, TNF- α , and MMP-9. These mediators disrupt tight junctions, leading to epithelial apoptosis, goblet cell loss, and meibomian gland dysfunction. The resulting inflammatory cascade further reduces tear production and increases evaporation, reinforcing the cycle of ocular surface damage.¹¹

From an *Ayurvedic* perspective, the condition can be correlated with *Vata-Pittaja Netra Roga* and *Netra Shushkata*, arising from *Vata* aggravation and *Sneha Kshaya*. *Vata* causes dryness and instability, while *Pitta* induces inflammation and burning sensation. The depletion of

Sneha and *Rasa Dhatu* impairs ocular lubrication and nourishment, paralleling the tear deficiency and epithelial dysfunction described in modern pathology.¹²

Hence, the pathophysiology of Dry Eye reflects both structural and functional imbalance—where modern science explains it as tear film disruption and inflammation, while *Ayurveda* interprets it as *Vata-Pitta Dushti* leading to *Shushkata* (dryness) and *Balakshaya* (loss of ocular strength). This shared understanding bridges traditional and modern viewpoints, supporting the therapeutic relevance of *Tarpana Karma* in restoring tear film stability and ocular health.¹³

Pathophysiology of Dry Eye Disease



CONCEPT OF *TARPANA KARMA*

Tarpana Karma is one of the most important *Netra Karmas* described in *Ayurveda* for maintaining ocular health and treating various eye disorders, especially those associated with *Vata-Pitta Dushti* and *Netra Shushkata* (dryness of the eyes). The term *Tarpana* is

derived from the Sanskrit root “*Trup Santoshane*,” meaning “to nourish or to satiate.” It refers to the act of providing deep oleation and rejuvenation (*Poshana* and *Sneha*) to the ocular tissues through the retention of medicated *Ghrita* around the eyes.¹⁴

Definition

Tarpana is a procedure where medicated ghee (*Ghrita*) is retained over closed eyes for a specified period, allowing direct absorption through the corneal and periocular tissues. *Acharya Sushruta* and *Vagbhata* describe it as a *Brimhana* and *Rasayana* therapy for the eyes, which strengthens ocular structures and improves vision.¹⁵

Purpose

The main purpose of *Tarpana Karma* is to provide lubrication, nourishment, and rejuvenation to the eyes. It pacifies *Vata* and *Pitta Doshas*, replenishes the lost *Sneha*, and enhances *Netra Bala* (ocular strength). It is particularly indicated in conditions such as:

- *Netra Shushkata* (Dry Eye)
- *Abhishyanda* (Inflammatory conditions)
- *Akshigourava* (Heaviness of eyes)
- *Drishti Daurbalya* (Weak vision)
- *Timira* (Refractive errors)

Types of Tarpana

According to *Ayurvedic* texts, *Tarpana* is classified as:

- **Brimhana Tarpana** – Nourishing therapy for *Vataja* and *Ruksha* conditions.
- **Shodhana Tarpana** – Cleansing type for *Pittaja* and *Kaphaja* disorders.
- **Ropana Tarpana** – Healing type used in ulcerative and inflammatory eye conditions.

Procedure

A. Purva Karma (Pre-Procedure)

- *Snehan* and *Swedan* of face and around the eyes.
- Preparation of the *Tarpana* compound wall (made of *Masha* or *Godhuma* flour) around both eyes to hold the medicated *Ghrita*.
- Selection of suitable medicated *Ghrita* like *Triphaladi Ghrita*, *Jeevantyadi Ghrita*, or *Mahatriphala Ghrita*.

B. Pradhana Karma (Main Procedure)

- The patient is made to lie comfortably in *Supine* position.
- Lukewarm *Ghrita* is gently poured into the eye well until the level covers the eyelashes.
- The patient is instructed to keep the eyes closed initially and then to open and move them slowly in all directions.
- Duration varies based on the condition and strength of the patient (*Mild: 100 Matra, Moderate: 300 Matra, Strong: 600 Matra*).

C. Paschat Karma (Post-Procedure)

- The *Ghrita* is removed carefully.
- The eyes are wiped with soft cotton and washed with lukewarm water.
- *Anjana, Nasya, or Seka* may be performed as per indication.
- The patient is advised to avoid bright light, wind, smoke, and excessive reading immediately after the procedure.

Commonly Used Tarpana Dravyas

- *Triphala Ghrita* – For *Vata-Pitta* disorders, improves vision.
- *Jeevantyadi Ghrita* – Rejuvenates and strengthens ocular tissues.
- *Mahatriphala Ghrita* – For inflammatory and degenerative eye diseases.
- *Go Ghrita* – Has cooling, lubricating, and nourishing properties.

Mode of Action

- **Ayurvedic Perspective:** *Tarpana* restores *Sneha* and *Rasa Dhatu*, pacifies *Vata* and *Pitta*, and enhances *Drishti*. It acts as *Chakshushya* (eye tonic), *Rasayana* (rejuvenator), and *Vata-Pittahara* (dosha pacifier).¹⁶
- **Modern Perspective:** Medicated *Ghrita* forms a lipid layer over the cornea, reducing evaporation and improving tear film stability. The antioxidants and anti-inflammatory compounds in herbs help regenerate epithelial cells, increase goblet cell density, and decrease inflammatory cytokines, thus breaking the vicious cycle of Dry Eye.¹⁷

Therapeutic Significance

Tarpana Karma is a holistic approach addressing the root cause of ocular surface disorders by nourishing the eye tissues, restoring tear film balance, and strengthening ocular health. It provides both preventive and curative benefits, making it a valuable therapy in modern ophthalmic care, especially for chronic conditions like Dry Eye Syndrome.¹⁸

RESULT AND FINDINGS

- Marked reduction in ocular dryness, burning, redness, and foreign-body sensation after *Tarpana Karma*.
- Noticeable improvement in tear secretion and tear film stability.
- Decrease in ocular surface inflammation and congestion.
- Restoration of the lipid layer and improved ocular lubrication.
- Enhanced nourishment and tone of ocular tissues due to *Ghrita* and herbal constituents.
- Effective pacification of *Vata* and *Pitta Doshas*, correcting *Netra Shushkata*.
- Improvement in visual clarity and reduction in ocular fatigue.
- Sustained therapeutic effect during follow-up, showing long-term stability.
- No adverse effects or complications observed throughout therapy.
- Overall significant clinical improvement confirming *Tarpana Karma* as a safe and effective therapy for Dry Eye and ocular surface disorders.

DISCUSSION

The discussion on *Tarpana Karma* in the management of ocular surface disorders reveals a clear convergence between classical Ayurvedic wisdom and modern ophthalmic science. From an *Ayurvedic* standpoint, Dry Eye Disease can be understood as *Vata-Pittaja Netra Roga* characterized by *Shushkata* (dryness), *Toda* (pricking pain), *Daha* (burning), and *Aashru Kshaya* (tear deficiency). The primary pathological process involves *Vata Vriddhi* leading to *Sneha Kshaya* and *Pitta Dushti*, which disturbs the normal ocular *Snehana* and *Poshana*. *Tarpana Karma*, through the use of *Sneha Dravyas* like *Ghrita*, restores *Snigdhatva*, pacifies aggravated *Vata* and *Pitta*, and nourishes the ocular tissues by promoting *Rasa Dhatu* replenishment.¹⁹

Modern studies support this traditional understanding by showing that *Tarpana* helps in improving tear film stability, reducing inflammation, and increasing goblet cell density. The lipid-rich *Ghrita* formulations form a thin protective film over the corneal surface, preventing excessive evaporation and maintaining hydration. The bioactive compounds of *Triphala*, *Jeevanti*, and *Yashtimadhu* in medicated *Ghritas* provide antioxidant and anti-inflammatory effects, thereby reducing oxidative stress and epithelial damage. These pharmacological actions align well with the current biomedical management goals for Dry Eye, such as improving tear film integrity and breaking the inflammatory cycle.²⁰

The clinical findings indicate that patients undergoing *Tarpana Karma* experience substantial relief from symptoms like dryness, burning, and redness, along with measurable improvement in tear secretion and stability. This demonstrates that *Tarpana* not only provides symptomatic comfort but also addresses the underlying tissue-level pathology by rejuvenating ocular structures. Furthermore, its sustained effect suggests that the therapy enhances the natural lubricating mechanisms of the eye rather than merely providing external moisture as artificial tear substitutes do.²¹

Overall, *Tarpana Karma* bridges preventive, curative, and restorative aspects of ocular care. It integrates the Ayurvedic principles of *Sneha*, *Brimhana*, and *Rasayana* with modern pathophysiological understanding of the tear film system. Thus, it stands as a scientifically rational, safe, and holistic therapeutic procedure for Dry Eye and other ocular surface disorders. Further controlled trials and analytical studies on its pharmacodynamics can help establish *Tarpana* as a complementary modality in evidence-based ophthalmology.²²

CONCLUSION

Tarpana Karma proved to be an effective and holistic Ayurvedic procedure for managing ocular surface disorders, particularly Dry Eye Disease. It provided significant improvement in symptoms like dryness, burning, redness, and ocular fatigue by restoring *Snigdhata* and pacifying *Vata-Pitta Doshas*. The therapy enhanced tear film stability, reduced inflammation, and promoted ocular tissue nourishment through the combined effects of *Ghrita* and *Chakshushya Dravyas*. Unlike artificial tear substitutes, *Tarpana* offers deep rejuvenation and sustained relief by addressing the root cause—*Sneha Kshaya* and *Dosha Dushti*. Thus, it serves as a safe, natural, and scientifically supported approach that harmonizes traditional Ayurvedic principles with modern ocular science, emphasizing preventive and restorative eye care.

CONFLICT OF INTEREST-NIL

SOURCE OF SUPPORT –NONE

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