



DRY EYE DISEASE (SUSKAKSIPAKA): AYURVEDIC PERSPECTIVE WITH SPECIAL REFERENCE TO ASCYOTANA KARMA

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Abstract: Dry Eye Disease (DED) is a multifactorial disorder of the ocular surface characterized by loss of tear-film homeostasis, tear-film instability and hyperosmolarity, ocular-surface inflammation and damage, and neurosensory abnormalities. Its clinical manifestations include dryness, burning, foreign-body sensation, grittiness, redness, photophobia, ocular fatigue and fluctuating or blurred vision. From the Ayurvedic perspective, Śuṣkāksipāka is a relevant clinical correlate because dryness, roughness of the eyelids, burning, ocular discomfort and difficulty in opening the eyes are prominent features, with predominant Vāta-Pitta involvement. Āścyotana Karma, the direct instillation of a medicated liquid into the eye, is described in classical Ayurvedic literature as an important initial ocular therapeutic procedure. This article reviews the modern concept, etiological factors, pathophysiology, clinical features and assessment of DED; the Ayurvedic concept, classical description, Nidāna, Samprāpti and management of Śuṣkāksipāka; and the role of Āścyotana Karma, including its procedure, Doṣa-specific application and conceptual correlation with modern topical ocular therapy. Godugdha is also discussed for its traditionally described Madhura Rasa, Śīta Vīrya, Snigdha qualities, Vāta-Pitta śāmaka action and nourishing properties. The article emphasizes that the Ayurvedic-modern relationship is a clinical and conceptual correlation and that further scientific studies are required to establish the efficacy, safety and mechanism of traditional Āścyotana preparations using standardized scientific parameters.

KEY WORDS: Dry Eye Disease; Śuṣkāksipāka; Āścyotana Karma; Godugdha; Vāta; Pitta; ocular surface; tear film.

AIM

To review Dry Eye Disease from an Ayurvedic perspective with special reference to Śuṣkāksipāka and to discuss the therapeutic relevance of Āścyotana Karma in relation to the modern concept of ocular-surface disease.

OBJECTIVES

- To review the modern concept, types, etiological factors, pathophysiology, clinical features and assessment of Dry Eye Disease.
- To describe the Ayurvedic concept, classical features, Nidāna and Samprāpti of Śuṣkāksipāka.
- To review the Ayurvedic management principles of Śuṣkāksipāka, including Nidāna Parivarjana and Kriyākalpa.
- To describe Āścyotana Karma, its classical rationale, procedure and Doṣa-specific application.

- To discuss the role of Godugdha in Ayurvedic ocular therapy and its conceptual relevance in dryness and irritation.
- To correlate Ayurvedic concepts with modern ocular-surface physiology and topical ocular therapy while distinguishing conceptual correlation from established equivalence.

Dry Eye Disease (DED) is one of the most commonly encountered disorders of the ocular surface and represents a major cause of ocular discomfort, fluctuating vision and reduced quality of life. It is a multifactorial disease involving abnormalities of the tear film, ocular surface, lacrimal functional unit, eyelids and ocular sensory innervation. The increasing use of digital devices, prolonged near-work, environmental pollution, air-conditioning, contact-lens use, ageing and various systemic and hormonal factors have contributed to the increasing clinical importance of dry eye.

According to the Tear Film and Ocular Surface Society Dry Eye Workshop II (TFOS DEWS II), dry eye is defined as a multifactorial disease of the ocular surface characterized by loss of homeostasis of the tear film and accompanied by ocular symptoms, in which tear-film instability and hyperosmolarity, ocular-surface inflammation and damage, and neurosensory abnormalities play etiological roles.

The tear film is essential for maintaining ocular-surface hydration, lubrication, protection and optical quality. The tear film contains lipids, proteins, mucins and electrolytes, all of which contribute to its integrity and stability. In DED, tear volume may decrease, tear evaporation may increase and tear-film breakup occurs more rapidly.

From an Ayurvedic perspective, several ocular disorders described under Netra Roga exhibit symptoms that closely resemble the clinical manifestations of dry eye. Among these, Śuṣkāṣipāka is particularly relevant because dryness, roughness of the eyelids, burning, ocular discomfort and difficulty in opening the eyes are prominent features. The condition is predominantly associated with Vāta and Pitta Doṣa.

1. MODERN CONCEPT OF DRY EYE DISEASE

The understanding of DED has evolved considerably. Earlier definitions primarily emphasized tear deficiency or excessive evaporation. The modern concept recognizes that DED is a complex disease involving the entire ocular-surface environment.

TFOS DEWS II places loss of tear-film homeostasis at the centre of the disease process. Tear-film instability, hyperosmolarity, inflammation, ocular-surface damage and neurosensory abnormalities interact with each other and perpetuate the disease.

The tear film provides lubrication, protection from environmental insults, maintenance of optical quality, supply of nutrients and antimicrobial protection. It is maintained through interaction between the lacrimal glands, meibomian glands, conjunctival goblet cells, eyelids and ocular sensory nerves. Blinking spreads the tear film uniformly across the ocular surface.

When this equilibrium is disturbed, tear-film breakup and evaporation increase. The resulting hyperosmolarity can stimulate inflammatory pathways and produce epithelial damage. The resulting ocular-surface changes further destabilize the tear film, producing a vicious cycle of disease.

1.1 Types of Dry Eye Disease

Aqueous-deficient dry eye results primarily from inadequate aqueous tear secretion. It may occur with lacrimal-gland dysfunction, ageing, systemic autoimmune disease and other conditions affecting lacrimal secretion.

Evaporative dry eye occurs when tear evaporation from the ocular surface is excessive despite relatively preserved aqueous secretion. Meibomian gland dysfunction, altered blinking, environmental exposure and ocular-surface abnormalities may contribute.

These categories frequently overlap rather than occurring as completely separate entities. Therefore, DED is best understood as a multifactorial disorder rather than a single pathological entity.

2. ETIOLOGICAL FACTORS AND RISK FACTORS

Environmental factors include dust, smoke, air pollution, dry or low-humidity environments, air-conditioning, excessive wind and sunlight exposure.

Lifestyle factors include prolonged digital-screen exposure, reduced blink rate during screen use, prolonged reading, sleep deprivation, irregular daily routine and mental stress.

Ocular factors include contact-lens wear, meibomian gland dysfunction, blepharitis, previous ocular surgery and chronic use of certain topical medications.

Systemic factors include increasing age, hormonal changes, autoimmune disorders, nutritional deficiencies and certain systemic medications.

3. PATHOPHYSIOLOGY OF DRY EYE DISEASE

The pathophysiology of DED can be understood as a vicious cycle. Environmental or intrinsic factors initially disturb the tear film. Increased evaporation or reduced aqueous secretion produces tear-film instability and increased osmolarity. Hyperosmolarity and mechanical stress activate inflammatory pathways. Inflammation damages epithelial cells and goblet cells, further compromising tear-film stability.

Thus:

Risk factors → Tear-film instability → Increased evaporation → Hyperosmolarity → Inflammation → Ocular-surface damage → Further tear-film instability → Persistence of DED.

TFOS DEWS II describes DED as a self-perpetuating process in which desiccating stress and ocular-surface inflammation contribute to continuation of disease.

4. CLINICAL FEATURES OF DRY EYE DISEASE

Patients may present with dryness, burning sensation, foreign-body sensation, grittiness, itching, redness, watering, photophobia, ocular fatigue and fluctuating or blurred vision. Difficulty during prolonged reading and screen use is also common.

Paradoxically, excessive watering may occur in dry eye. Reflex lacrimation can be stimulated by ocular-surface irritation; however, such reflex tears may not adequately restore normal tear-film stability.

5. DIAGNOSIS AND ASSESSMENT

Diagnosis is based on history, symptoms and objective assessment of the ocular surface. Important investigations include Schirmer's test for assessment of aqueous tear production, Tear Film Break-Up Time (TBUT) for tear-film stability, Ocular Surface Disease Index (OSDI) for symptom assessment, ocular-surface staining for epithelial disruption, and meibomian gland evaluation in suspected evaporative disease.

6. AYURVEDIC CONCEPT OF SUSKAKSIPAKA

Ayurveda describes numerous diseases of the eye under Netra Roga. Among these, Śuṣkāṣipāka is particularly relevant when attempting to understand the Ayurvedic perspective of dry eye.

The term may be understood as Śuṣka (dry), Akṣi (eye) and Pāka (inflammatory or irritative process). The condition is predominantly related to Vāta and Pitta Doṣa, with the clinical picture reflecting both dryness and inflammatory manifestations.

7. CLASSICAL DESCRIPTION OF SUSKAKSIPAKA

A classical description of Śuṣkāṣipāka is available in Ayurvedic ophthalmological literature:

“यत्कृणितं दारुणरूक्षवर्त्म संदह्यते चाविलदर्शनं यत् ।
सुदारुणं यत्प्रतिबोधने च शुष्काक्षिपाकोपहतं तदक्षि ॥”

Meaning: The eye affected by Śuṣkāṣipāka becomes contracted or difficult to open; the eyelids become excessively rough and dry; burning sensation occurs and vision becomes indistinct or blurred. Opening the affected eye may be particularly difficult and painful.

The clinical features show close correspondence with modern ocular-surface symptoms. Śuṣkatā may be correlated clinically with ocular dryness, Rūkṣa Vartma with dry or rough eyelids, Daha with burning, Avila Darśana with blurred or fluctuating vision, Kṛcchra Unmīlana with difficulty opening the eyes, and Gharṣa or Toda with foreign-body or pricking sensation.

8. NIDANA OF SUSKAKSIPAKA

Important causative factors include excessive exposure to smoke and dust, excessive sunlight, excessive visual strain, night awakening, mental stress, excessive crying, inadequate nutrition, Vāta-Pitta aggravating diet and irregular lifestyle practices.

These factors can be interpreted through Nidāna Parivarjana, the Ayurvedic principle of avoiding causative factors. Modern dry-eye management similarly recognizes environmental and behavioural risk-factor modification as important.

9. SAMPRATI OF SUSKAKSIPAKA

The pathogenesis may be understood predominantly through Vāta-Pitta aggravation.

Vāta possesses Rūkṣa and Laghu properties. Aggravation of Vāta may result in depletion of lubrication and dryness of ocular structures. Thus: Vāta prakopa → Rūkṣatā → reduction of ocular lubrication → discomfort → Śuṣkatā.

Pitta, because of its Uṣṇa and Tīkṣṇa qualities, may manifest as Daha, Rāga, irritation and inflammatory changes. Thus: Pitta prakopa → Uṣṇatā/Dāha → Rāga/Irritation → ocular discomfort.

Combined Vāta-Pitta involvement can therefore explain the coexistence of dryness with burning and irritation.

10. AYURVEDIC MANAGEMENT OF SUSKAKSIPAKA

Management should be individualized according to the involved Doṣa, stage of disease and strength of the patient.

Nidāna Parivarjana includes reduction of excessive screen exposure, adequate sleep, avoidance of smoke and dust, avoidance of excessive sunlight, adequate hydration, balanced diet and regulation of daily routine.

Internal management may include Triphalā preparations, Ghṛta formulations, Rasāyana drugs and Chakṣuṣya medicines according to the clinical condition.

External Kriyākalpa procedures include Āścyotana, Seka/Pariseka, Tarpana, Puṭapāka and Añjana.

11. ASCYOTANA KARMA

Āścyotana refers to instillation of a medicated liquid into the eye in the prescribed manner.

A classical statement from Aṣṭāṅga Hṛdaya, Sūtra Sthāna 23 states:

“सर्वेषामक्षिरोगाणामादावाश्चोतनंहितम्।
रुक्तोदकण्डूघर्षाश्रुदाहरागनिर्बर्हणम् ॥”

Meaning: Āścyotana is beneficial as the initial therapeutic procedure in ocular diseases. It helps alleviate ocular pain, pricking sensation, itching, foreign-body or rough sensation, excessive lacrimation, burning and redness.

This classical statement is particularly relevant to ocular-surface disorders because several of these symptoms are also major manifestations of DED.

12. PROCEDURE OF ASCHYOTANA Pūrvakarma: Examination of the patient, assessment of the ocular condition, selection of an appropriate medicine, preparation of the treatment area and ensuring a relatively wind-free environment.

Pradhāna Karma: The patient is positioned comfortably, generally in the supine position. The eyelids are gently opened and the medicated preparation is instilled into the eye from the prescribed height. Aṣṭāṅga Hṛdaya describes administration from approximately two aṅgula and mentions the use of an appropriate number of drops according to the procedure.

Paścāt Karma: Excess medicine may be gently removed. The patient should avoid bright light and exposure to dust and smoke, and adequate rest should be advised.

13. DOSA -SPECIFIC ASCYOTANA

Aṣṭāṅga Hṛdaya provides guidance regarding the thermal nature of Āścyotana according to Doṣa:

“उष्णं वाते, कफे कोष्णं, तच्छीतं रक्तपित्तयोः ।”

Meaning: In Vāta disorders a relatively warm preparation is indicated; in Kapha disorders it is lukewarm; while in Rakta-Pitta disorders it is cool.

This demonstrates that Āścyotana is selected according to the underlying Doṣa and clinical condition rather than being merely mechanical instillation of fluid.

14. ROLE OF ASCHYOTANA IN DRY EYE DISEASE

From the Ayurvedic perspective, direct application of an appropriately selected medicated liquid may counteract ocular dryness, reduce Daha and Rūkṣatā, relieve Gharṣa, improve ocular comfort, provide local nourishment and pacify aggravated Doṣa locally.

From the modern perspective, topical ocular preparations act directly on the ocular surface. Depending on formulation, they may improve lubrication, reduce friction, dilute inflammatory mediators, improve tear-film stability or provide symptomatic relief.

The principle of direct local application described by Āścyotana therefore has conceptual similarity with modern topical ocular therapy.

15. GODUGDHA IN AYURVEDIC OCULAR THERAPY

Godugdha is traditionally described as having Madhura Rasa, Śīta Vīrya, Snigdha qualities, Vāta-Pitta śāmaka action and nourishing properties. In ocular disorders characterized by dryness, the Snigdha and nourishing properties provide an Ayurvedic rationale for its consideration.

In the context of dry eye, Godugdha Āścyotana may theoretically help reduce dryness, burning and irritation while improving ocular comfort. However, when discussing its use in a clinical trial or thesis, Ayurvedic textual rationale should be distinguished from modern evidence regarding efficacy and safety.

16. MODERN CORRELATION OF ASCHYOTANA

A topical preparation placed on the ocular surface initially interacts with the tear film and ocular epithelium. The preparation spreads across the tear film, mixes with existing tears, alters the local tear-film environment depending upon its composition, and is subsequently diluted and cleared through blinking and the nasolacrimal system.

The direct ocular application described in Āścyotana therefore has an anatomical basis for producing a local effect. However, every Ayurvedic preparation should not automatically be considered equivalent to a modern artificial tear. Exact effects depend upon composition, concentration, sterility, pH, osmolality, stability and other physicochemical characteristics.

17. AYURVEDIC–MODERN CORRELATION

The relationship between Śuṣkāṁṣipāka and DED should be regarded as a clinical and conceptual correlation rather than an assertion that both entities are completely identical.

Ayurvedic Śuṣkatā corresponds clinically with ocular dryness and tear-film dysfunction; Rūkṣatā with ocular-surface dryness; Daha with burning; Gharṣa with foreign-body sensation; Toda with pricking discomfort; Avila Darśana with blurred or fluctuating vision; and Kṛcchra Unmīlana with difficulty opening the eyes.

Vāta aggravation can be conceptually correlated with dryness and loss of lubrication, while Pitta aggravation can be conceptually correlated with burning and inflammation. Āścyotana can be correlated with topical ocular therapy, and Nidāna Parivarjana with modern risk-factor modification.

18. DISCUSSION

Dry Eye Disease is increasingly recognized as a complex ocular-surface disease rather than simply a condition of inadequate tears. Modern ophthalmology recognizes multiple interacting mechanisms including tear-film instability, increased evaporation, hyperosmolality, inflammation, epithelial damage and neurosensory abnormalities.

The Ayurvedic description of Śuṣkāṁṣipāka provides a different but clinically meaningful framework. The prominence of dryness and roughness can be interpreted in relation to Vāta, whereas burning and inflammatory symptoms correspond conceptually with Pitta involvement.

An important strength of the Ayurvedic approach is its emphasis on Nidāna Parivarjana. Modern dry-eye management similarly recognizes modification of environmental and behavioural risk factors such as prolonged screen exposure, low humidity, smoke and abnormal visual habits.

The concept of Kriyākalpa provides a structured approach to local ocular treatment. Among these procedures, Āścyotana is particularly relevant because the medicine is directly applied to the ocular surface. Classical Ayurvedic literature specifically describes Āścyotana as beneficial at the beginning of ocular disease and attributes relief of pain, itching, foreign-body sensation, burning and redness to the procedure.

From the modern perspective, topical ocular preparations can modify the ocular-surface environment directly. Thus, there is a reasonable conceptual bridge between Āścyotana and contemporary topical ocular therapy. Nevertheless, the two should not be considered automatically equivalent because modern ophthalmic preparations are developed with strict attention to sterility, pH, osmolarity, preservatives, stability and pharmacokinetics.

The Ayurvedic concept of Godugdha as Madhura, Śīta, Snigdha and Vāta-Pitta śāmaka provides a theoretical basis for its consideration in dryness and burning conditions. Further scientific studies are required to determine its physicochemical properties, ocular-surface interaction, safety, tolerability and therapeutic efficacy when used as Āścyotana.

19. CONCLUSION

Dry Eye Disease is a multifactorial ocular-surface disorder characterized by disruption of tear-film homeostasis, ocular symptoms and varying degrees of tear-film instability, hyperosmolarity, inflammation and ocular-surface damage.

The Ayurvedic description of Śuṣkāṅṣipāka demonstrates considerable symptomatic similarity with modern DED, particularly with respect to dryness, roughness, burning, ocular discomfort, difficulty in opening the eyes and visual disturbance.

Ayurveda provides a comprehensive approach involving Nidāna Parivarjana, Doṣa-specific management, internal medicines and local Kriyākalpa procedures. Among these, Āścyotana occupies an important position because of its direct application to the ocular surface.

Godugdha, owing to its traditionally described Madhura Rasa, Śīta Vīrya, Snigdha and Vāta-Pitta śāmaka properties, provides an Ayurvedic rationale for its consideration in dryness and irritation of the eye.

Integration of Ayurvedic principles with modern ocular-surface assessment may provide a broader framework for understanding and managing dry-eye symptoms. However, further well-designed clinical and laboratory studies are necessary to establish the efficacy, safety and mechanism of traditional Āścyotana preparations using standardized modern scientific parameters.

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