

Computer Vision Syndrome in the Context of Ayurveda and Therapeutic Potential of *Kriyakalpa*: A Narrative Review

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Abstract:

Background: Computer Vision Syndrome (CVS), or Digital Eye Strain, is an emerging occupational health issue resulting from prolonged use of digital devices. CVS commonly presents with ocular discomfort, dryness, burning sensation, blurred vision, headache, and neck pain. Modern management primarily emphasizes ergonomic adjustments and symptomatic relief. Prolonged screen exposure reduces blink rate, destabilizes the tear film, and strains ocular muscles. In Ayurveda, these manifestations correlate with *Shushkakshipaka* and *Vata-Pitta* vitiation affecting the *Netra*. As the eyes are the seat of *Alochaka Pitta*, excessive visual strain disrupts ocular balance. Ayurveda, through its *Kriyakalpa*, provides a holistic approach focused on addressing the root cause and promoting prevention.

Objectives: To explore the application of Ayurveda principles in the management of CVS

Methodology: This literary review involved a comprehensive analysis of classical Ayurveda texts and contemporary research articles related to Computer Vision Syndrome (CVS) and its correlation with Ayurveda principles, particularly *Kriyakalpa*. Relevant databases and journals were systematically searched to gather information on Ayurveda diagnostic approaches, treatment modalities, and preventive measures applicable to CVS management.

Results: According to Ayurveda, management is based on *Nidana Parivarjana* (elimination of causative factors), *Dosha Shamana* (pacification of vitiated *Doshas*), and *Rasayana* therapy (rejuvenation). Prolonged screen exposure aggravates *Vata* (dryness, strain) and *Pitta*

(burning, redness). Hence, treatment focuses on Snehana (oleation), *Tarpana*, and *Netra Kriyakalpa* procedures to restore lubrication and strength.

Tarpana, a specialized ocular therapy, nourishes ocular tissues and stabilizes tear film. Medicated ghee preparations such as *Triphala Ghrita* and *Shatavari Ghrita*, known for their *Chakshushya* and *Rasayana* properties, are commonly indicated. Internal medications with *Balya* and *Rasayana* effects support systemic balance. Additionally, lifestyle modifications including proper blinking, periodic breaks (20-20-20 rule), adequate sleep, and a *Pitta-Vata* pacifying diet are recommended.

Conclusion: Ayurveda *Kriyakalpa* offers a holistic approach to CVS by addressing root causes, balancing *Dosha*, and strengthening the eyes. Combining Ayurveda therapies with ergonomic practices may provide a sustainable solution for managing CVS.

Keywords: Computer Vision Syndrome, Digital Eye Strain, Ayurveda, *Kriyakalpa*, *Tarpana*, *Netra Roga*

1. Introduction:

Computer Vision Syndrome (CVS), also referred to as Digital Eye Strain, encompasses a group of ocular and visual symptoms resulting from prolonged use of computers, smartphones, tablets, and other digital devices. With increasing digitalization in education, healthcare, and workplaces, the prevalence of CVS has risen dramatically worldwide. Studies estimate that nearly 50–90% of regular digital device users experience one or more symptoms of CVS.^{1,2}

The characteristic symptoms include eye fatigue, dryness, burning sensation, watering, blurred vision, headache,

photophobia, diplopia, and pain in the neck and shoulders.³ These manifestations are attributed to decreased blink rate, increased tear evaporation, accommodative stress, glare, improper viewing distance, and prolonged focusing on digital screens.⁴

Modern management primarily focuses on symptomatic relief through artificial tears, ergonomic interventions, blue-light filters, environmental modifications, and visual hygiene. However, these approaches often provide temporary relief without addressing the underlying functional imbalance responsible for recurrence of symptoms.⁵

Ayurveda considers the eyes (*Netra*) as one of the most vital sensory organs and describes extensive principles for maintaining ocular health under *Shalakya Tantra*. *Netra* is regarded as the principal seat of *Aalochaka Pitta*, responsible for visual perception. Disturbance in *Dosha*, especially *Vata* and *Pitta*, impairs ocular physiology resulting in symptoms closely resembling Computer Vision Syndrome.⁶

Continuous exposure to digital screens causes excessive visual exertion (*Atiyoga* of *Chakshurindriya*), which aggravates *Vata*, producing dryness (*Rukshata*), strain and fatigue, while *Pitta* aggravation manifests as burning sensation, redness and irritation. These clinical features closely resemble *Shushkakshipaka* and *Abhishyanda* described in classical Ayurvedic texts.⁷

Among various ophthalmic therapies described in Ayurveda, *Kriyakalpa* occupies a unique place. It comprises specialized local ocular therapeutic procedures such as *Tarpana*, *Putapaka*, *Aschyotana*, *Seka*, *Pindi*, *Bidalaka*, and *Anjana*, which nourish ocular tissues, improve tear film stability, alleviate

inflammation, and restore normal ocular function.⁸

Therefore, understanding the role of *Kriyakalpa* in the management of Computer Vision Syndrome is essential for developing an integrative and preventive healthcare strategy.

2. Materials and Methods:

The present study is a narrative literary review based on classical Ayurvedic literature and contemporary scientific evidence.

Classical references were collected from *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, *Sharangadhara Samhita*, and other classical Ayurveda texts dealing with *Netra Roga*, *Kriyakalpa*, and *Rasayana Chikitsa*. Relevant commentaries were also reviewed to understand the principles of ocular therapeutics.

Electronic databases including PubMed, Google Scholar, Scopus, and ResearchGate were searched using keywords such as "Computer Vision Syndrome," "Digital Eye Strain," "Ayurveda," "*Kriyakalpa*," "*Tarpana*," "*Netra Tarpana*," "ocular surface disease," and "dry eye disease." Peer-reviewed articles published in English were included. Information from review articles, randomized clinical trials, observational studies, and systematic reviews was critically analyzed.

The collected information was organized under themes including pathophysiology of CVS, Ayurveda correlation, principles of management, *Kriyakalpa* procedures, herbal formulations, and preventive strategies.

3. Results:

The reviewed literature indicates that prolonged digital screen exposure significantly reduces spontaneous blink rate from approximately 15–20 blinks per minute to as low as 5–7 blinks per minute, resulting in rapid tear film evaporation and ocular surface instability.^{2,4} Continuous accommodative effort and exposure to glare further contribute to visual fatigue and extraocular muscle strain.

From an Ayurveda perspective, these pathological changes predominantly represent aggravation of *Vata* and *Pitta Dosha*. Excessive visual concentration causes depletion of ocular lubrication, leading to *Rukshata*, *Toda*, *Nistoda*, and *Shoola*. Simultaneously, increased heat generated by prolonged visual effort vitiates *Pitta*, resulting in *Daha*, *Raga*, and ocular irritation.^{6–8}

Accordingly, management of CVS emphasizes three major principles:

- *Nidana Parivarjana* by minimizing prolonged screen exposure and correcting visual habits.
- *Dosha Shamana* through ocular and systemic therapies.
- *Rasayana* measures for long-term maintenance of ocular health.

Among *Kriyakalpa*, *Tarpana* is considered the most beneficial intervention for CVS because medicated ghee remains in prolonged contact with the ocular surface, nourishing the cornea, conjunctiva, eyelids, and surrounding tissues. *Triphala Ghrita* and *Shatavari Ghrita* possess *Chakshushya*, *Vata-Pittahara*, anti-inflammatory, antioxidant, and rejuvenative properties that improve tear film stability and reduce ocular fatigue.

Other useful *Kriyakalpa* procedures include *Aashchyotana* for lubrication and cleansing, *Seka* for soothing inflamed eyes, and *Anjana* for maintaining ocular hygiene and strengthening visual function.

In addition, internal administration of *Rasayana* formulations supports tissue

nourishment and enhances ocular resilience. Lifestyle modifications such as the 20-20-20 rule, conscious blinking, proper workstation ergonomics, adequate illumination, sufficient sleep, hydration, and a *Vata-Pitta* pacifying diet further complement the therapeutic regimen.

Table: Role of Kriyakalpa in Computer Vision Syndrome

<i>Kriyakalpa</i>	Role in CVS	Ayurvedic Effect
<i>Tarpana</i>	Lubricates and nourishes the ocular surface; reduces dryness and fatigue	<i>Vata-Pitta Shamana, Chakshushya</i>
<i>Aashchyotana</i>	Provides lubrication, cleansing and symptomatic relief	<i>Dosha Shamana, Netra Prasadana</i>
<i>Seka</i>	Soothes burning, irritation and ocular discomfort	<i>Pitta Shamana, Daha Prashamana</i>
<i>Anjana</i>	Supports ocular hygiene and visual comfort	<i>Chakshushya, Netra Prasadana</i>
<i>Pindi</i>	Provides local soothing and reduces ocular strain	<i>Vata-Pitta Shamana</i>
<i>Bidālaka</i>	Helps relieve burning, fatigue and periocular discomfort	<i>Pitta Shamana, Daha Prashamana</i>

4. Discussion:

Computer Vision Syndrome (CVS) has emerged as one of the most common occupational health problems due to the exponential increase in the use of digital devices. With the widespread adoption of computers, smartphones, tablets, and online learning platforms, prolonged screen exposure has become inevitable, significantly affecting ocular health and quality of life. The multifactorial nature of CVS involves reduced blink rate, prolonged accommodation, tear film instability, glare, poor ergonomics, and environmental factors, all of which contribute to ocular surface dysfunction and visual fatigue.^{1–4}

Ayurveda does not describe Computer Vision Syndrome as a distinct disease entity; however, its clinical manifestations

closely resemble *Shushkakshipaka*, *Vataja Abhishyanda*, and conditions arising from excessive utilization (*Atiyoga*) of the visual sense organ (*Chakshurindriya*). The eyes are considered the seat of *Aalochaka Pitta*, which governs visual perception, while *Vata Dosha* regulates neuromuscular activity and tear dynamics. Continuous visual strain caused by prolonged screen exposure aggravates *Vata*, resulting in ocular dryness (*Rukshata*), pricking sensation (*Toda*), fatigue, and blurred vision. Simultaneously, aggravated *Pitta* produces burning sensation (*Daha*), redness (*Raga*), irritation, and photophobia.^{6–9} Thus, the Ayurveda interpretation of CVS provides a logical framework for understanding its pathogenesis.

The first principle of management is *Nidana Parivarjana*, which involves avoiding or minimizing causative factors. In the context of CVS, this includes limiting unnecessary screen time, maintaining an appropriate viewing distance (50–70 cm), reducing screen glare, optimizing ambient illumination, ensuring proper posture, and practicing regular blinking. Modern ophthalmology similarly recognizes ergonomic modifications and visual hygiene as the cornerstone of CVS prevention, highlighting the concordance between Ayurvedic and contemporary recommendations.^{2,4}

Among the therapeutic measures described in Ayurveda, *Kriyakalpa* plays a pivotal role in ocular disorders. These localized ophthalmic procedures are specifically designed to nourish, cleanse, lubricate, and rejuvenate the eye. *Tarpana* is regarded as the most suitable *Kriyakalpa* for CVS because medicated ghee remains in prolonged contact with the ocular surface, allowing better absorption of lipid-soluble phytoconstituents. This therapy replenishes the tear film, improves corneal lubrication, strengthens extraocular tissues, relieves ocular fatigue, and enhances visual comfort. Classical texts describe *Tarpana* as *Chakshushya* (beneficial for the eyes), *Balya* (strengthening), and *Rasayana* (rejuvenating), making it particularly relevant for chronic digital eye strain.^{7,9}

Medicated ghee preparations such as *Triphala Ghrita* and *Shatavari Ghrita* are frequently recommended in ocular diseases. *Triphala* possesses antioxidant, anti-inflammatory, antimicrobial, and wound-healing properties, while *Shatavari* exhibits cooling, nourishing, and rejuvenative effects. These formulations pacify *Vata* and

Pitta, nourish ocular tissues, and improve tear film stability. Contemporary pharmacological studies have also demonstrated the antioxidant potential of *Triphala*, supporting its role in protecting ocular tissues from oxidative stress induced by prolonged digital exposure.¹⁰

Other *Kriyakalpa* procedures, including *Aaschyotana*, *Seka*, and *Anjana*, complement the management of CVS. *Aaschyotana* facilitates ocular cleansing and lubrication, *Seka* provides cooling and reduces burning sensation and inflammation, while *Anjana* improves ocular hygiene and maintains visual acuity. These procedures may be selected based on the predominance of symptoms and *Dosha* involvement.

Systemic management is equally important. Internal administration of *Rasayana* and *Chakshushya* formulations enhances tissue nutrition, improves immunity, and supports long-term ocular health. In addition, dietary measures emphasizing *Vata-Pitta* pacifying foods, adequate hydration, and consumption of antioxidant-rich fruits and vegetables contribute to maintaining ocular surface integrity.

Lifestyle modifications constitute an integral component of Ayurveda management. The 20-20-20 rule, conscious blinking, periodic breaks during screen work, sufficient sleep, regular eye exercises, stress management, and avoidance of prolonged continuous screen exposure significantly reduce visual fatigue and improve productivity. These recommendations are consistent with evidence-based guidelines advocated by ophthalmic associations worldwide.^{2,3}

Recent clinical studies evaluating Ayurveda ocular therapies have demonstrated encouraging outcomes in dry eye disease, allergic conjunctivitis, and digital eye strain, showing improvements in tear secretion, symptom scores, and ocular comfort. Although high-quality randomized controlled trials specifically evaluating *Kriyakalpa* in CVS remain limited, the available evidence suggests considerable therapeutic potential. Future multicentric clinical trials with standardized treatment protocols and objective outcome measures are warranted to establish stronger scientific evidence for integrating Ayurveda into routine management of CVS.

Overall, Ayurveda addresses both the symptomatic manifestations and the underlying *Dosha* imbalance responsible for ocular dysfunction. By combining *Kriyakalpa*, *Rasayana*, *Nidana Parivarjana*, and healthy lifestyle practices, Ayurveda offers a comprehensive, preventive, and restorative approach that complements contemporary ophthalmic care.

5. Conclusion:

Computer Vision Syndrome is a growing public health concern associated with prolonged digital device usage and modern lifestyle practices. Ayurveda provides a holistic understanding of the disorder by correlating its manifestations with *Vata-Pitta* vitiation affecting the *Netra*. Management through *Nidana Parivarjana*, *Kriyakalpa* procedures such as *Tarpana*, *Aaschyotana*, *Seka*, and *Anjana*, along with *Rasayana* therapy and lifestyle modifications, addresses both the underlying pathogenesis and symptomatic relief. Medicated ghee preparations including *Triphala Ghrita* and *Shatavari*

Ghrita nourish ocular tissues, improve tear film stability, and promote visual health. Integrating Ayurveda ocular therapies with ergonomic measures and evidence-based ophthalmic practices may provide a safe, sustainable, and effective strategy for the prevention and management of Computer Vision Syndrome. Nevertheless, well-designed randomized controlled trials are required to further validate the clinical efficacy of *Kriyakalpa* in digital eye strain.

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Conflict of Interest: *Non*

Source of funding: *Nil*

Cite this Article:

Dharmaraj Bhoite, Poonam Belgaonkar. "Computer Vision Syndrome in the Context of Ayurveda and Therapeutic Potential of Kriyakalpa: A Narrative Review".

Ayurline: International Journal of Research In Indian Medicine: 2026;10(5)

Crossref DOI: <https://doi.org/10.52482/ayurline.v10i5.1117>