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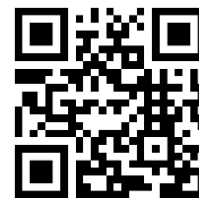


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Netra Vigyan in Ayurveda: Preventive Management of Eye Strain due to Increased Screen Time

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ABSTRACT:

Background: The rapid rise in digital device usage has led to an increased prevalence of digital eye strain (DES), a condition characterized by ocular discomfort, fatigue, dryness, and visual disturbances. Ayurveda describes the eye (*Netra*) as a vital sense organ governed primarily by *Alochaka Pitta*, supported by *Tarpaka Kapha*. Excessive screen exposure can disturb this balance, leading to *Netra Shram* and *Shushkakshipaka*. **Objective:** To explore the concept of Netra Vigyan in Ayurveda and evaluate its preventive role in managing eye strain associated with prolonged screen exposure. **Materials and Methods:** A narrative review was conducted using classical Ayurvedic texts including *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*, along with contemporary scientific literature on digital eye strain from indexed journals.

Results: Ayurveda attributes digital eye strain to *Ati Yoga of Chakshurendriya*, resulting in *Vata-Pitta Prakopa* and depletion of *Tarpaka Kapha*. Preventive strategies such as *Dinacharya*, *Netra Kriya Kalpa* (Tarpana, Aschyotana), *Rasayana* (Triphala, Amalaki), and dietary modifications show potential in alleviating symptoms and improving ocular health.

Conclusion: Ayurvedic preventive measures offer a holistic, cost-effective, and sustainable approach to managing digital eye strain. Integration of Ayurvedic principles with modern ergonomic practices can significantly reduce ocular morbidity.

KEYWORDS: Digital Eye Strain, Computer Vision Syndrome, Tarpana, Triphala, Preventive Ophthalmology

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1. INTRODUCTION:

The eye (*Netra*) is regarded in Ayurveda as one of the most vital *Jnanendriya* (sensory organs), playing a central role in *Darshana* (visual perception), which is essential for cognition, orientation, and interaction with the external environment. Classical Ayurvedic literature gives paramount importance to the preservation and protection of vision, emphasizing that “*Sarvendriyanam Nayanam Pradhanam*”—among all sense organs, the eyes hold supreme significance. The structural and functional integrity of the eye is primarily governed by *Alochaka Pitta*, while *Tarpaka Kapha* provides nourishment and lubrication, and *Vata Dosha* regulates neuromuscular coordination. The proper functioning of *Netra* thus depends on a delicate equilibrium of these *Doshas* along with the support of *Rakta Dhatu*.

Ayurvedic classics such as *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya* have elaborately described various preventive and therapeutic measures for maintaining ocular health under the domains of *Dinacharya* (daily regimen), *Ritucharya* (seasonal regimen), and specialized ocular therapies like *Netra Kriya Kalpa*. Practices such as *Netra Prakshalana* (eye washing), *Anjana* (collyrium application), and *Tarpana* (oleation therapy for eyes) are advocated to preserve visual acuity, prevent degenerative changes, and alleviate ocular fatigue. These measures highlight the preventive orientation of Ayurveda, focusing not merely on disease management but on the maintenance of optimal visual function.

In the contemporary digital era, there has been an unprecedented increase in the use of visual display terminals such as computers, smartphones, and tablets. This has led to a significant rise in a cluster of ocular and extraocular symptoms collectively termed as **Digital Eye Strain (DES)** or

Computer Vision Syndrome. DES has emerged as a major occupational and lifestyle-related health concern, affecting individuals across all age groups, particularly those engaged in prolonged screen-based activities.

Digital eye strain is clinically characterized by symptoms such as ocular dryness, irritation, burning sensation, blurred or double vision, headache, and ocular fatigue. These manifestations primarily result from prolonged visual focus, reduced blink rate, improper viewing distance, and continuous exposure to screen glare. The decreased frequency of blinking leads to instability of the tear film, causing dryness and discomfort, while sustained accommodative effort results in visual fatigue and headache.

From an Ayurvedic perspective, this condition closely resembles *Netra Shram* (ocular fatigue), which occurs due to *Ati Yoga* (overutilization) of *Chakshurendriya*. Continuous and excessive use of the eyes, particularly in unnatural conditions such as prolonged screen viewing, leads to *Vata-Pitta Prakopa*. The increased *Vata* contributes to dryness and fatigue, while aggravated *Pitta* results in burning sensation and irritation. Simultaneously, there is depletion of *Tarpaka Kapha*, which is responsible for lubrication and stability of ocular structures, thereby further exacerbating symptoms like dryness and visual discomfort.

Thus, digital eye strain can be understood as a modern manifestation of classical Ayurvedic concepts, where improper and excessive sensory usage disrupts the physiological balance of *Doshas*, leading to functional impairment of vision. This conceptual correlation provides a strong foundation for applying Ayurvedic preventive principles in the management of screen-induced ocular disorders.

2. Rationale of the Study

In recent decades, the rapid expansion of digital technology has significantly altered lifestyle patterns, leading to a substantial increase in screen exposure across all age groups. This shift has resulted in a marked rise in the prevalence of digital eye strain (DES), which is now recognized as a common occupational and lifestyle-related disorder. The widespread use of computers, smartphones, and other visual display devices for professional, educational, and recreational purposes has made prolonged visual engagement almost unavoidable.

Despite the growing burden of digital eye strain, contemporary management strategies remain largely symptomatic, focusing on temporary relief through artificial tears, ergonomic adjustments, and visual aids. These approaches, although effective to some extent, often lack sustainability and do not adequately address the underlying functional imbalance caused by excessive visual strain. As a result, there is an increasing need for preventive and holistic strategies that can provide long-term ocular health benefits.

In this context, there is a growing global interest in integrative healthcare systems that emphasize prevention, lifestyle modification, and individualized care. Ayurveda, with its well-established principles of *Swasthavritta* (maintenance of health) and *Dinacharya* (daily regimen), offers a comprehensive framework for the preservation and promotion of ocular health. The classical Ayurvedic texts provide detailed descriptions of eye care practices, etiological factors of ocular disorders, and therapeutic interventions aimed at maintaining the functional integrity of the visual system. Therefore, the present study is conceptualized to bridge classical Ayurvedic knowledge with modern clinical understanding of digital eye strain. By

correlating traditional concepts with contemporary pathology, this study aims to propose effective preventive strategies rooted in Ayurveda for the management of screen-induced ocular disorders.

3. Ayurvedic Aspect

Netra Sharir and Dosha Involvement

In Ayurveda, the eye (*Netra*) is considered a highly specialized organ with predominance of *Teja Mahabhuta*, reflecting its functional association with light perception and vision. The physiological functioning of the eye is primarily governed by *Alochaka Pitta*, which is responsible for visual cognition and processing of visual stimuli. Alongside this, *Tarpaka Kapha* plays a crucial supportive role by providing nourishment, lubrication, and stability to the ocular structures, thereby maintaining clarity and comfort of vision. The integrity of the eye is further sustained by *Rakta Dhatu*, which ensures proper vascular supply and metabolic support. The coordinated functioning of these components ensures normal vision. Any disturbance in their equilibrium leads to impairment of visual function and the manifestation of ocular disorders.

Nidana (Etiological Factors)

Ayurveda emphasizes that diseases arise due to improper utilization of sensory organs (*Asatmya Indriyatha Samyoga*), among which *Ati Yoga* (excessive use) is particularly relevant in the context of digital eye strain. Prolonged and continuous use of visual display devices constitutes *Ati Yoga of Chakshurendriya*, resulting in excessive strain on the visual apparatus.

Additionally, lifestyle factors such as *Ratri Jagarana* (night awakening), which is increasingly common due to late-night screen usage, contribute to the aggravation of *Vata* and *Pitta Dosha*. Environmental factors such as improper lighting, screen

glare, incorrect viewing distance, and poor visual ergonomics further exacerbate ocular strain. These factors collectively disturb the natural physiological balance of the eye and predispose individuals to visual fatigue and discomfort.

Samprapti (Pathogenesis)

The pathogenesis of screen-induced ocular strain can be understood through the vitiation of *Vata* and *Pitta Dosha*. Excessive visual activity and continuous focusing lead to aggravation of *Vata*, resulting in symptoms such as dryness, fatigue, and instability of vision. Simultaneously, increased exposure to bright screens and prolonged concentration aggravate *Pitta*, causing burning sensation, irritation, and visual discomfort. A significant pathological event in this process is the depletion of *Tarpaka Kapha*, which is responsible for maintaining lubrication and moisture of the ocular surface. Its reduction leads to dryness and diminished protective function of the eye. Furthermore, the functional impairment of *Alochaka Pitta* results in reduced visual efficiency, manifesting as blurred vision and difficulty in focusing.

This chain of pathological events ultimately gives rise to clinical conditions that closely resemble *Netra Shram* (ocular fatigue) and *Shushkakshipaka* (a condition analogous to dry eye syndrome). Thus, the Ayurvedic understanding of pathogenesis provides a comprehensive explanation for the development of digital eye strain and forms the basis for its preventive and therapeutic management.

Preventive Management in Ayurveda

Ayurveda places a strong emphasis on *Nidana Parivarjana* (avoidance of causative factors) and *Swasthasya Swasthya Rakshanam* (maintenance of health) as the primary approach to disease prevention. In the context of increasing screen exposure and its

impact on ocular health, Ayurvedic preventive strategies provide a comprehensive and holistic framework aimed at preserving the functional integrity of *Netra*. These measures encompass daily regimens, specialized ocular therapies, dietary interventions, rejuvenative formulations, and behavioral modifications.

A. Dinacharya (Daily Regimen)

The concept of *Dinacharya* plays a pivotal role in maintaining ocular health by regulating physiological functions and preventing *Dosha* imbalance. Regular practice of simple daily measures can significantly reduce ocular strain and enhance visual comfort.

Netra Prakshalana (eye washing) with clean, cold water is recommended, particularly in the early morning. This practice helps in removing environmental irritants, reduces ocular fatigue, and provides a soothing effect by stabilizing aggravated *Pitta* and *Vata*. It also contributes to maintaining tear film integrity and ocular surface hygiene.

Adequate and timely sleep (*Nidra*) is essential for restoration and rejuvenation of ocular tissues. Sleep deprivation leads to *Vata-Pitta Prakopa*, resulting in symptoms such as dryness, heaviness, and visual fatigue. Therefore, ensuring proper sleep duration and quality is crucial in preventing eye strain.

Avoidance of *Ratri Jagarana* (late-night awakening), especially due to prolonged screen usage, is strongly advocated. Night awakening disturbs circadian rhythm and leads to depletion of *Tarpaka Kapha*, thereby impairing lubrication and nourishment of the eyes.

B. Netra Kriya Kalpa (Ocular Therapeutic Procedures)

Netra Kriya Kalpa comprises specialized therapeutic procedures designed

for the maintenance and restoration of ocular health. These interventions are particularly beneficial in conditions involving dryness, fatigue, and functional impairment.

Tarpana is a highly effective procedure in which medicated ghee is retained over the eyes for a specific duration. It provides deep nourishment, enhances lubrication, strengthens ocular tissues, and improves visual acuity. It is especially beneficial in conditions resembling dry eye and digital eye strain.

Putapaka is a rejuvenative therapy performed after *Tarpana*, involving the application of medicated extracts prepared through a specific heating process. It enhances the functional capacity of the eye and supports regeneration of ocular tissues. *Aschyotana* (instillation of medicated eye drops) serves as a cleansing and soothing therapy. It helps in relieving irritation, burning sensation, and mild inflammatory conditions, making it suitable for early-stage ocular discomfort associated with prolonged screen use.

Anjana (application of collyrium) is recommended for improving clarity of vision and removing accumulated impurities. It also helps in maintaining ocular hygiene and enhancing the functional efficiency of *Alochaka Pitta*.

C. Ahara (Dietary Measures)

Diet plays a crucial role in maintaining ocular health, as the nourishment of the eye is closely linked with *Rasa* and *Rakta Dhatu*. Ayurveda advocates the intake of *Chakshushya Ahara* (eye-beneficial foods) to support visual function and prevent degeneration.

Ghrita (clarified butter), particularly medicated formulations such as *Triphala Ghrita*, is considered highly beneficial due to its *Pitta-shamaka* and *Rasayana* properties. It

enhances lubrication, supports retinal health, and improves visual acuity.

Triphala, a combination of *Haritaki*, *Bibhitaki*, and *Amalaki*, is widely recognized for its antioxidant and rejuvenative effects. It helps in detoxification, improves microcirculation, and protects ocular tissues from oxidative stress.

Green leafy vegetables and fruits rich in vitamins, minerals, and antioxidants contribute to maintaining retinal health and preventing degenerative changes. These dietary components help in counteracting oxidative damage caused by prolonged screen exposure.

D. Rasayana (Rejuvenative Therapy)

Rasayana therapy aims at promoting longevity, enhancing tissue nourishment, and improving resistance against disease. In the context of ocular health, specific *Rasayana Dravya* play a significant role in maintaining visual function and preventing degeneration. *Triphala* acts as a potent ocular rejuvenator, improving vision and reducing strain through its antioxidant properties.

Amalaki (*Emblica officinalis*) is rich in Vitamin C and possesses strong *Rasayana* and *Pitta-shamaka* properties. It enhances tissue repair, supports ocular immunity, and prevents age-related degeneration.

Yashtimadhu (*Glycyrrhiza glabra*) exhibits anti-inflammatory and soothing properties, which help in reducing irritation and promoting ocular comfort.

E. Behavioral Modifications

Behavioral and lifestyle modifications form an essential component of preventive ophthalmology in Ayurveda. These measures aim to minimize strain on the visual apparatus and maintain functional balance. Limiting excessive screen exposure is fundamental in preventing *Ati Yoga of Chakshurendriya*. Periodic breaks during

prolonged screen use help in reducing accommodative stress and ocular fatigue. Maintaining proper posture, appropriate viewing distance, and adequate lighting conditions are crucial in preventing unnecessary strain on the eyes. Avoidance of glare and ensuring ergonomic alignment contribute to visual comfort.

Conscious blinking is an important yet often overlooked aspect. Prolonged screen use significantly reduces blink rate, leading to tear film instability and dryness. Awareness and voluntary blinking help in maintaining ocular lubrication and preventing dryness. Overall, these Ayurvedic preventive strategies provide a comprehensive, multi-dimensional approach to maintaining ocular health. By addressing lifestyle, diet, therapeutic interventions, and behavioral aspects, Ayurveda offers an effective and sustainable solution for preventing digital eye strain in the modern era.

5. DISCUSSION:

Ayurvedic descriptions of *Netra Shram* closely correlate with modern digital eye strain. The concept of *Vata-Pitta Prakopa* explains dryness and irritation, while *Tarpaka Kapha Kshaya* aligns with tear film deficiency. Modern medicine focuses primarily on symptomatic relief, whereas Ayurveda emphasizes prevention and root cause management. Interventions such as *Tarpana* and *Rasayana* provide nourishment and antioxidant benefits, addressing both functional and structural aspects of ocular health.

Integration of Ayurvedic principles with modern strategies such as the **20-20-20 rule**, ergonomic correction, and screen hygiene can provide a comprehensive approach to managing digital eye strain.

6. CONCLUSION:

Digital eye strain is an emerging lifestyle disorder driven by excessive screen exposure.

Ayurveda offers a preventive and holistic approach through *Dinacharya*, *Netra Chikitsa*, and *Rasayana* therapies. Adopting Ayurvedic preventive measures alongside modern ergonomic practices can effectively reduce ocular discomfort, enhance visual health, and improve overall quality of life. Thus, *Netra Vigyan* plays a crucial role in contemporary preventive ophthalmology.

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