

# Understanding Shushkakshipaka in the Digital Era: An Ayurvedic Review with Reference to Computer Vision Syndrome

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## ABSTRACT

**Background** Prolonged digital screen use has increased the global burden of Computer Vision Syndrome, a condition marked by dryness, burning, and visual discomfort. Ayurveda describes a similar clinical entity named *Shushkakshipaka*, explained as a *Vata-Pitta*-predominant disorder of the ocular surface. Understanding this correlation offers meaningful integrative insights for prevention and management.

**Aim-** To review the Ayurvedic concept of *Shushkakshipaka* and correlate it with the modern condition of Computer Vision Syndrome, focusing on clinical features, causes, and therapeutic approaches.

**Objectives-** To study the classical descriptions, causes, and symptoms of *Shushkakshipaka*. To describe the modern understanding of Computer Vision Syndrome and its ocular changes. To identify similarities between *Shushkakshipaka* and digital eye strain. To review Ayurvedic treatments such as *Tarpana*, *Nasya*, *Anjana*, and supportive measures. To highlight preventive strategies combining Ayurveda and modern ergonomics.

**Methods** This review is based on classical Ayurvedic texts including *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*, supported by commentaries and modern literature. Research databases and peer-reviewed journals on digital eye strain, dry eye disease, ergonomics, and ocular physiology were assessed to establish clinical connections.

**Results** The features of *Shushkakshipaka* such as *Rukshata*, *Daha*, eye fatigue, and mucosal irritation closely resemble symptoms reported in Computer Vision Syndrome. Factors like excessive screen exposure, reduced blinking, blue-light strain, and environmental dryness correspond with *Vata* aggravation and depletion of ocular lubrication. Ayurvedic therapies such as *Tarpana*, *Nasya*, *Anjana*, *Netra-Seka*, along with lifestyle modifications, show potential to reduce ocular dryness, improve tear stability, and enhance visual comfort.

**Conclusion** There is a strong conceptual and clinical overlap between *Shushkakshipaka* and Computer Vision Syndrome. Integrating Ayurvedic ocular therapies with digital ergonomics may offer a comprehensive approach to prevention and symptom relief. This review supports further interdisciplinary research and potential development of Ayurvedic protocols for digital-related eye disorders.

**Keywords:** Shushkakshipaka, Computer Vision Syndrome, Vata, Pitta, Tarpana, Digital Eye Strain

## INTRODUCTION

Digital technology has become an inseparable part of daily life, and screen-based activities now occupy several hours of a person's routine. This shift has led to a rapid rise in visual complaints collectively known as Computer Vision Syndrome. People who work on computers, use smartphones for long durations, or frequently engage with digital devices often experience dryness, burning, eye strain, blurred vision, and headaches. These symptoms reflect strain on the ocular surface, reduced blinking, and excessive exposure to artificial light sources.<sup>1</sup>

Ayurveda offers a rich understanding of eye health, with detailed descriptions of ocular structures, functions, and disease mechanisms. Among the many *Netra Roga* described in classical texts, *Shushkakshipaka* closely resembles the presentation of dry, fatigued, and irritated eyes seen in heavy screen users. This condition is attributed to the aggravation of *Vata* and *Pitta*, leading to dryness, roughness, and reduced ocular lubrication. The classical texts emphasize the role of lifestyle, environmental factors, and improper visual habits in triggering such disorders, which aligns well with modern digital lifestyle patterns.<sup>2</sup>

The physiology of the eye according to Ayurveda highlights the importance of adequate *Sneha*, balanced *Doshas*, and proper nourishment of ocular tissues. With increasing screen time, the natural tear film becomes unstable, mirroring the *Ruksha* and *Alpa-Sneha* state described in *Shushkakshipaka*. Reduced blinking during continuous digital work further worsens dryness and discomfort. These parallels create a foundation for interpreting Computer Vision Syndrome through the lens of Ayurvedic principles.<sup>3</sup>

Modern research on digital eye strain recognizes the impact of prolonged near work, glare, blue-light exposure, and poor ergonomics. These factors contribute to ocular surface inflammation, tear evaporation, and muscular fatigue. Ayurveda similarly acknowledges the harmful effects of excessive visual strain, improper lighting, and forceful, continuous use of the eyes. The agreement between ancient descriptions and contemporary findings suggests that classical preventive strategies may hold value even today.<sup>4</sup>

Given this strong correlation, integrating Ayurvedic therapies such as *Tarpana*, *Nasya*, *Anjana*, and *Netra-Seka* with modern ergonomic measures can provide a comprehensive approach to eye care in the digital era. Understanding *Shushkakshipaka* offers not only clinical relevance but also preventive guidance for growing screen-related visual disorders. This review aims to bridge classical concepts with current scientific insights, highlighting the potential of Ayurveda in addressing the emerging challenge of Computer Vision Syndrome.<sup>5</sup>

## AIM AND OBJECTIVES

### Aim

To review the Ayurvedic concept of *Shushkakshipaka* and correlate it with the modern condition of Computer Vision Syndrome, focusing on clinical features, causes, and therapeutic approaches.

### Objectives

1. To study the classical descriptions, causes, and symptoms of *Shushkakshipaka*.
2. To describe the modern understanding of Computer Vision Syndrome and its ocular changes.
3. To identify similarities between *Shushkakshipaka* and digital eye strain.
4. To review Ayurvedic treatments such as *Tarpana*, *Nasya*, *Anjana*, and supportive measures.
5. To highlight preventive strategies combining Ayurveda and modern ergonomics.

## MATERIAL AND METHODS

This review was conducted using a narrative and analytical approach to understand *Shushkakshipaka* in relation to Computer Vision Syndrome. Classical Ayurvedic references were collected from *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, and other authoritative texts, including relevant commentaries. Additional information was gathered from *Nighantus* for detailed descriptions of ocular diseases and therapeutic procedures.

Modern scientific literature was reviewed using databases such as PubMed, Google Scholar, ScienceDirect, and WHO digital health reports. Keywords used included “Computer Vision Syndrome,” “digital eye strain,” “dry eye,” “ocular surface,” *Shushkakshipaka*, and “Ayurvedic eye disorders.” Only peer-reviewed articles, clinical guidelines, and standard ophthalmology textbooks were included. Studies discussing tear film physiology, blue-light exposure, blinking patterns, digital ergonomics, and ocular surface changes were screened to establish clinical parallels. Ayurvedic therapeutic procedures such as *Tarpana*, *Nasya*, *Anjana*, and *Netra-Seka* were included based on classical indications and modern evidence supporting their ocular benefits.

All collected data were compared, analysed, and synthesized to present conceptual correlations, clinical similarities, and integrated management strategies for *Shushkakshipaka* and Computer Vision Syndrome.

## CONCEPTUAL STUDY ON SHUSHKAKSHIPAKA

*Shushkakshipaka* is described in Ayurvedic ophthalmology as a disorder marked by dryness, burning, roughness, and irritation of the eyes. Classical texts mention it under *Netra Rogas* involving *Pitta* aggravation combined with *Vata*, leading to dryness of ocular tissues and discomfort during visual activity.<sup>6</sup>

### Nidana (Etiological Factors)

The causes of *Shushkakshipaka* revolve around activities that increase *Vata* and *Pitta*. These include excessive exposure to heat, wind, smoke, continuous viewing of fine objects, lack of sleep, and overuse of the eyes. These factors resemble modern triggers of digital eye strain, such as prolonged screen exposure and reduced blinking.<sup>7</sup>

### Samprapti (Pathogenesis)

The pathogenesis is mainly due to *Ruksha* and *Laghu* qualities of aggravated *Vata* and the irritative nature of *Pitta*. This combination reduces ocular moisture, disturbs tear film stability, and creates dryness, burning, and fatigue. The involvement of *Rasa* and *Rakta Dhatu* explains inflammation and sensitivity of the ocular surface.<sup>8</sup>

### Lakshana (Clinical Features)

Symptoms described include dryness, burning, gritty sensation, eye fatigue, mild pain, redness, and irritation. These directly match the features of Computer Vision Syndrome, such as reduced tear secretion, ocular fatigue, and discomfort during prolonged screen work.<sup>9</sup>

### Sadhya–Asadhyata (Prognosis)

*Shushkakshipaka* is considered *Sadhya* when addressed early through lubrication and lifestyle correction. Neglect may lead to chronic inflammatory changes, increasing the difficulty of management, like chronic dry eye syndrome in modern science.<sup>10</sup>

### Ocular Anatomy in Ayurveda Relevant to *Shushkakshipaka*

Ayurveda emphasizes structures like *Pakshma-mandala*, *Vartma*, *Krinna*, and *Snayu*, which play roles in ocular lubrication and blinking. Imbalance of these structures produces dryness and irritation. This aligns

with the modern understanding of meibomian gland function and blinking mechanisms.<sup>11</sup>

### **Role of *Dosha* and *Dhatu* in Disease Expression**

*Vata* causes dryness and fatigue, while *Pitta* contributes to burning and redness. *Rasa Dhatu* depletion reflects a reduction in tear volume, and *Rakta Dushti* mirrors ocular inflammation. These explanations help build a bridge between classical descriptions and modern ocular physiology.<sup>12</sup>

Modern CVS develops due to prolonged screen exposure, artificial lighting, poor ergonomics, and decreased blinking. These factors match closely with classical *Nidana* of *Shushkakshipaka*. Reduced tear film, ocular fatigue, and digital strain reflect *Rukshata* and *Pitta* irritation described in Ayurveda. Ayurveda advises maintaining ocular lubrication, proper sleep, reduced strain, eye rest intervals, and protection from intense light or wind. These principles correspond with digital ergonomics such as the 20-20-20 rule, blink training, proper screen distance, and ambient light correction.<sup>13</sup>

The management of *Shushkakshipaka* focuses on *Sneha*, *Sheeta*, and *Rasayana* approaches. Therapies like *Tarpana*, *Nasya*, *Anjana*, and *Netra-Seka* restore tear film, nourish ocular tissues, and reduce inflammation. Internal *Rasayana* herbs help support long-term eye health.<sup>14</sup>

### **MODERN REVIEW**

Computer Vision Syndrome, commonly known as digital eye strain, has emerged as one of the most widespread visual complaints in today's technology-driven world. It refers to a group of eye and vision problems that arise from prolonged use of digital devices such as computers, smartphones, tablets, and LED screens. Unlike printed text, digital screens display pixelated images, fluctuating brightness, and varying contrast levels that place extra demands on the eye's focusing system. As screen dependence continues to rise, CVS has become a significant public health concern across all age groups.<sup>15</sup>

The primary causes of CVS include continuous near-work, reduced blinking, improper screen ergonomics, and environmental dryness. Normally, people blink 15 to 20 times per minute, but during screen use this rate drops to 5 to 7 blinks per minute. Reduced blinking leads to tear film evaporation, ocular dryness, and irritation. Bright screens, glare, blue-light exposure, poor posture, and long working hours further strain the eyes and surrounding muscles. Even minor uncorrected refractive errors such as myopia, hyperopia, or astigmatism can worsen digital eye strain because the eyes must work harder to maintain focus.<sup>16</sup>

The underlying mechanism of CVS involves continuous accommodation, convergence, and visual tracking, which overload the ciliary muscles responsible for focusing. This prolonged effort results in fatigue and blurred vision. At the same time, insufficient lubrication from reduced blinking destabilizes the tear film and exposes the surface of the eye to dryness and irritation. Exposure to blue light produces photo-stress, contributing to headaches and difficulty concentrating. Over time, repetitive strain can lead to chronic dryness and reduced visual performance.<sup>17</sup>

The symptoms of CVS include dryness, burning, gritty sensation, blurred vision, watery eyes, and redness. Many individuals have trouble shifting focus between near and distant objects after long hours of screen use. Headache, neck pain, shoulder stiffness, and upper-back discomfort are also common because of poor posture and continuous near-work. These visual and musculoskeletal symptoms often reduce work efficiency and overall comfort, leading to decreased productivity. In severe or neglected cases, digital eye strain may progress to chronic dry eye disease.<sup>18</sup>

Management of CVS requires a combination of ergonomic adjustments, visual hygiene, and supportive eye care. Simple measures such as the 20-20-20 rule, frequent blinking, maintaining an ideal viewing distance, and adjusting screen brightness help reduce strain. Using artificial tears, avoiding direct airflow

from fans or air conditioners, and treating uncorrected refractive errors provide additional relief. Anti-glare screens, appropriate lighting, and blue-light filters support long-term eye comfort. Preventive strategies are essential because timely intervention can stop CVS from progressing into chronic visual discomfort.<sup>19</sup>

Computer Vision Syndrome also aligns closely with the Ayurvedic description of *Shushkakshipaka*, which includes *Rukshata*, *Daha*, eye fatigue, and irritation. Excessive visual exertion, exposure to artificial light, and lack of adequate rest aggravate *Vata* and *Pitta*, leading to dryness and inflammation of ocular tissues. Ayurvedic therapies such as *Tarpana*, *Nasya*, *Anjana*, *Netra-Seka*, and internal *Rasayana* support lubrication, nourish the ocular system, and help restore visual comfort. Understanding CVS through both modern and Ayurvedic perspectives provides an integrated approach to maintaining eye health in the digital era.<sup>20</sup>

## RESULT AND FINDINGS

- The review shows a strong similarity between *Shushkakshipaka* and Computer Vision Syndrome, with both conditions presenting dryness, burning, irritation, and eye fatigue.
- Classical symptoms such as *Rukshata*, *Daha*, and reduced ocular comfort match the common complaints seen in people with digital eye strain.
- Excessive screen time, artificial light exposure, and continuous near work were found to be major causes of CVS, which aligns with Ayurvedic *Nidana* like overuse of eyes, heat exposure, and disturbed sleep.
- Modern studies reveal that blinking rate decreases during screen use, leading to tear film instability and dryness. This correlates with the Ayurvedic concept of reduced *Sneha* and *Vata* aggravation in *Shushkakshipaka*.
- Environmental factors such as air-conditioning, glare, and improper posture were found to worsen symptoms, supporting the classical view that wind, strain, and dryness aggravate *Vata* and *Pitta*.
- Ayurvedic treatments including *Tarpana*, *Nasya*, *Anjana*, and *Netra-Seka* were identified as effective in improving lubrication, reducing irritation, and restoring ocular comfort.
- Modern management practices like the 20-20-20 rule, blinking exercises, ergonomic corrections, and artificial tears complement Ayurvedic measures and help reduce digital strain.
- The overall findings indicate that an integrated approach combining Ayurveda and modern visual hygiene offers the most effective prevention and management of CVS.
- The review highlights that *Shushkakshipaka* and CVS share common pathophysiology, making Ayurvedic concepts highly relevant in understanding digital eye disorders.
- There is a need for more interdisciplinary research to develop standardized protocols that blend Ayurvedic therapies with modern eye-care practices for long-term ocular health.

## DISCUSSION

The findings of this review show that the classical condition *Shushkakshipaka* described in Ayurvedic texts closely resembles the modern entity known as Computer Vision Syndrome. Both conditions share dryness, burning, irritation, heaviness, and difficulty in sustained visual tasks. Ayurveda explains *Shushkakshipaka* as a disorder driven primarily by aggravated *Vata* and *Pitta*, resulting in reduced ocular lubrication and irritation of the eye tissues. Modern research reports identical mechanisms in digital device users, where decreased blinking, tear film instability, and continuous visual strain lead to dryness and

ocular fatigue. This conceptual overlap highlights that ancient descriptions remain highly relevant in the context of today's digital lifestyle.<sup>21</sup>

The discussion also reveals a strong alignment between classical *Nidana* and modern risk factors. Ayurveda describes excessive eye use, exposure to bright light, heat, wind, lack of sleep, and constant near vision work as important triggers for *Shushkakshipaka*. These are reflected in digital habits such as prolonged screen time, blue-light exposure, improper lighting, and long working hours without breaks. The reduction in blinking rate during screen use corresponds to *Vata*-related dryness, while the sensation of heat and burning mirrors *Pitta* aggravation. This shared understanding strengthens the bridge between traditional concepts and contemporary ocular physiology.<sup>22</sup>

From a pathophysiological perspective, the classical explanation of depleted *Sneha*, disturbed *Rasa Dhatu*, and irritation of ocular tissues provides a meaningful interpretation of changes seen in CVS patients. Tear evaporation, meibomian gland dysfunction, and ocular surface inflammation are well-known outcomes of digital strain. Ayurveda describes similar consequences as loss of ocular unctuousness, decreased nourishment, and heightened sensitivity. This harmony of descriptions allows modern clinicians and Ayurvedic scholars to interpret CVS through a unified lens.<sup>23</sup>

Management strategies discussed in this review highlight the value of combining Ayurvedic therapies with modern ergonomic practices. Classical procedures such as *Tarpana*, *Nasya*, *Anjana*, and *Netra-Seka* help restore lubrication, soothe irritation, and nourish ocular tissues. These benefits complement modern interventions like the 20-20-20 rule, blink training, artificial tears, and proper screen ergonomics. An integrative approach therefore offers a more complete framework for addressing the multifactorial nature of CVS. The preventive emphasis of Ayurveda, especially regular eye rest, protection from strain, and maintaining a balanced routine, holds significant practical value in the digital age.<sup>24</sup>

Overall, the discussion suggests that *Shushkakshipaka* can serve as an effective classical model for understanding and managing Computer Vision Syndrome. The shared symptom pattern, similar etiological base, and related pathophysiology create a natural ground for integration. Incorporating Ayurvedic perspectives not only enriches the understanding of CVS but also provides sustainable preventive and therapeutic measures. The present review supports further clinical studies to evaluate combined approaches and develop standardized protocols for managing digital eye strain.<sup>25</sup>

## CONCLUSION

This review shows that *Shushkakshipaka* described in Ayurveda and Computer Vision Syndrome in modern ophthalmology share a common pattern of dryness, burning, irritation, and visual fatigue, arising from similar causative factors such as excessive visual strain, reduced blinking, and environmental dryness. The classical explanation of aggravated *Vata* and *Pitta* leading to decreased ocular *Sneha* aligns closely with the tear film instability and ocular surface stress seen in digital device users. Ayurvedic therapies like *Tarpana*, *Nasya*, *Anjana*, and *Netra-Seka*, when combined with modern practices such as the 20-20-20 rule, ergonomic corrections, and regular blinking, offer a comprehensive and preventive approach to managing digital eye strain. Overall, the correlation between *Shushkakshipaka* and Computer Vision Syndrome provides a solid foundation for integrative eye care and encourages further clinical exploration to develop effective, blended management strategies.

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