

**COMPUTER VISION SYNDROME: AN INTEGRATIVE REVIEW
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ABSTRACT

Computer Vision Syndrome (CVS), also known as Digital Eye Strain (DES), is a common occupational and lifestyle-related disorder resulting from prolonged use of digital devices such as computers, laptops, tablets, and smartphones. The rapid expansion of digital technology in education, healthcare, and professional settings has led to a significant increase in the prevalence of CVS worldwide. The condition is characterized by ocular symptoms including eye strain, dryness, burning sensation, redness, blurred vision, and visual fatigue, along with extraocular complaints such as headache, neck pain, and shoulder discomfort. These symptoms adversely affect work performance, academic productivity, and overall quality of life. The pathogenesis of CVS is multifactorial and includes prolonged accommodative effort, reduced blink rate, tear film instability, poor ergonomics, improper lighting, and uncorrected refractive errors. Contemporary management focuses on patient

education, ergonomic modifications, scheduled visual breaks, appropriate optical correction, and the use of ocular lubricants. Although Computer Vision Syndrome is not explicitly described in the Ayurvedic classics, its clinical features show close similarity to Shushkakshipaka, Netrashrama, and Vata–Pittaja Netraroga. Ayurvedic principles such as

Nidana Parivarjana, Dinacharya, Netra Kriyakalpa, Rasayana Chikitsa, and appropriate Pathya–Apathya may help maintain ocular health and reduce digital eye strain. This review presents an integrative overview of the epidemiology, etiopathogenesis, clinical features, diagnosis, prevention, and management of CVS from both modern and Ayurvedic perspectives. It also highlights the potential role of Ayurveda as a complementary approach in the prevention and supportive management of this increasingly prevalent condition while emphasizing the need for well-designed clinical studies to establish stronger scientific evidence.

KEYWORDS: Computer Vision Syndrome, Digital Eye Strain, Ayurveda, Shushkakshipaka, Netrashrama, Netra Kriyakalpa, Dry Eye Disease.

INTRODUCTION

The digital revolution has transformed almost every aspect of daily life. Computers, smartphones, tablets, and other electronic devices have become indispensable tools for communication, education, healthcare, commerce, and entertainment. Following the COVID-19 pandemic, online education, remote working, telemedicine, and virtual meetings substantially increased screen exposure among people of all age groups. Consequently, prolonged digital screen use has emerged as a major occupational and lifestyle-related health concern.^[1]

One of the most common consequences of excessive screen exposure is **Computer Vision Syndrome (CVS)**, also known as **Digital Eye Strain (DES)**. The American Optometric Association defines CVS as a complex of eye and vision problems related to activities involving prolonged use of computers, tablets, e-readers, and smartphones.^[2] Unlike reading printed material, digital screens present unique visual challenges due to reduced contrast, glare, pixel structure, screen brightness, and continuous focusing demands.

Computer Vision Syndrome includes a wide range of ocular and musculoskeletal symptoms. Frequently reported ocular complaints include eye fatigue, burning sensation, itching, redness, watering, dryness, blurred vision, diplopia, and photophobia. Extraocular manifestations such as headache, neck pain, shoulder pain, and upper back pain are also common because of poor posture and prolonged sitting.^[3]

The development of CVS is multifactorial. Reduced blink rate during screen viewing

increases tear film evaporation, leading to ocular surface dryness. Continuous accommodation and convergence place excessive stress on the ciliary muscles, resulting in accommodative fatigue and blurred vision. Improper workstation design, poor illumination, glare, improper viewing distance, uncorrected refractive errors, and prolonged uninterrupted screen use further aggravate symptoms.^[4]

The prevalence of Computer Vision Syndrome has increased dramatically over the last decade. Various epidemiological studies report that approximately 50–90% of regular computer users experience at least one symptom of CVS during their lifetime.^[3,8] Healthcare professionals, software engineers, office employees, students, teachers, and individuals involved in prolonged digital work are particularly vulnerable.

Although Computer Vision Syndrome is not considered a sight-threatening disease, persistent symptoms significantly reduce work productivity, academic efficiency, and quality of life. Chronic ocular discomfort may also predispose susceptible individuals to dry eye disease and recurrent visual fatigue.^[4]

Ayurveda, the traditional system of medicine of India, considers vision (*Drishti*) one of the most precious sensory functions. The eye (*Netra*) is described as the foremost among the sense organs because it enables perception of the external world. Classical Ayurvedic texts emphasize preventive ophthalmology through daily regimens, seasonal practices, dietary regulations, and specialized ocular therapies. Excessive visual activity (*Atiyoga of Chakshurindriya*), exposure to bright light, inadequate sleep (*Ratri Jagarana*), mental stress, and improper dietary habits are regarded as important factors responsible for ocular disorders.^[5,6]

Although Computer Vision Syndrome is not specifically described in the Ayurvedic classics, many of its symptoms resemble **Shushkakshipaka**, characterized by ocular dryness, roughness, pricking pain, burning sensation, and difficulty in opening the eyes. Features of **Netrashrama** (ocular fatigue) and certain **Vata-Pittaja Netrarogas** also closely correlate with the symptomatology observed in CVS.^[6,7] This similarity provides a scientific basis for applying Ayurvedic preventive and therapeutic principles in managing digital eye strain.

An integrative approach combining evidence-based modern ophthalmic care with Ayurvedic preventive measures, ocular rejuvenation therapies, ergonomic interventions, and lifestyle

modifications may provide better long-term outcomes than symptomatic treatment alone. Such an approach is particularly relevant in the current era, where prolonged digital device use has become unavoidable.

EPIDEMIOLOGY

Computer Vision Syndrome has become one of the most common occupational health disorders associated with digital technology. The increasing availability of computers, smartphones, and tablets has substantially increased daily screen exposure worldwide. Office workers, students, healthcare professionals, software engineers, teachers, designers, and individuals working from home constitute the major at-risk population.

Several epidemiological studies indicate that between 50% and 90% of individuals who use digital devices for prolonged periods experience one or more symptoms of Computer Vision Syndrome.^[3,8] The prevalence is influenced by age, occupation, duration of screen exposure, environmental conditions, ergonomics, and pre-existing ocular disorders.

Following the COVID-19 pandemic, the incidence of Computer Vision Syndrome increased considerably because educational institutions and workplaces shifted to online platforms. School and college students reported longer daily screen time due to online classes, assignments, and recreational use of smartphones. Similar trends were observed among adults engaged in remote work.^[9]

Women appear to have a slightly higher prevalence of dry eye-related symptoms because of hormonal influences on the tear film, whereas elderly individuals often experience more severe manifestations due to age-related reduction in tear production.^[10] Contact lens users and patients with refractive errors are also at greater risk.

Major risk factors include

- Continuous screen use exceeding two hours without breaks.
- Reduced blink rate.
- Poor lighting and excessive glare.
- Incorrect viewing distance and screen position.
- Uncorrected refractive errors.
- Air-conditioned environments.
- Inadequate sleep.

- Psychological stress.
- Pre-existing dry eye disease.

Considering the rapid expansion of digital technology and increasing dependence on electronic devices, Computer Vision Syndrome is expected to remain an important public health challenge requiring multidisciplinary preventive strategies.

Etiology

Computer Vision Syndrome results from the combined influence of ocular, environmental, ergonomic, and behavioral factors rather than a single disease process.

The principal etiological factors include

1. Prolonged Digital Screen Exposure

Continuous focusing on digital displays places excessive demand on accommodation and convergence mechanisms. Unlike printed text, digital characters have blurred edges formed by pixels, requiring constant refocusing by the visual system.^[2]

2. Reduced Blink Rate

Normally, humans blink approximately 15–20 times per minute. During digital device use, the blink rate may reduce by nearly half, leading to increased tear evaporation and ocular surface dryness.^[4]

3. Tear Film Instability

Evaporation of tears disrupts the normal tear film, producing symptoms such as burning, foreign body sensation, redness, and fluctuating vision. Persistent tear film instability may contribute to dry eye disease.^[3]

4. Accommodation and Vergence Stress

Continuous near work results in prolonged contraction of the ciliary muscles and sustained convergence effort, leading to accommodative fatigue, blurred vision, headache, and eye strain.^[4]

5. Ergonomic Factors

Improper workstation design, inappropriate monitor height, poor posture, prolonged sitting, glare, reflections, and inadequate illumination contribute significantly to ocular and musculoskeletal symptoms.

6. Individual Risk Factors

Uncorrected refractive errors, contact lens wear, aging, systemic diseases affecting tear production, medications, poor nutrition, sleep deprivation, and psychological stress further increase susceptibility to Computer Vision Syndrome.

From an Ayurvedic viewpoint, these causative factors may be interpreted as **Atiyoga of Chakshurindriya, Ratri Jagarana, Manasika Nidana, and Vata-Pitta aggravating lifestyle practices**, ultimately disturbing normal ocular function and leading to symptoms comparable to **Shushkakshipaka** and **Netrashrama**.^[5-7]

Pathophysiology of Computer Vision Syndrome

Computer Vision Syndrome (CVS) is a multifactorial disorder resulting from prolonged exposure to digital screens. Unlike printed text, digital images are composed of pixels with blurred edges, making it difficult for the eyes to maintain a stable focus. Consequently, the accommodative system is continuously engaged, leading to visual fatigue and ocular discomfort.^[2,4]

The principal mechanisms involved in the development of CVS include accommodative stress, vergence dysfunction, tear film instability, reduced blink rate, and environmental factors.

Accommodative Stress

Accommodation is the physiological process by which the crystalline lens changes its curvature to focus on near objects. During prolonged computer work, continuous contraction of the ciliary muscles is required to maintain clear vision. Sustained accommodative effort eventually leads to muscle fatigue, producing symptoms such as blurred vision, difficulty in refocusing, headache, and eye strain.^[4,11]

Individuals with uncorrected refractive errors, presbyopia, or binocular vision abnormalities experience greater accommodative demand and are therefore more susceptible to CVS.

Vergence Dysfunction

Viewing digital screens also requires continuous convergence of both eyes. Prolonged convergence increases stress on the extraocular muscles and may produce diplopia, ocular discomfort, and frontal headache. Individuals with latent convergence insufficiency often experience worsening symptoms after extended screen use.^[11]

Tear Film Instability

The tear film consists of lipid, aqueous, and mucin layers that maintain lubrication and optical clarity of the ocular surface. During computer use, the blink rate decreases significantly while incomplete blinking becomes more frequent. This increases tear evaporation and destabilizes the tear film, resulting in dry eye symptoms such as burning sensation, foreign body sensation, redness, irritation, and fluctuating vision.^[3,12]

Persistent tear film instability may damage the ocular surface and contribute to chronic dry eye disease.

Reduced Blink Rate

Under normal conditions, humans blink approximately 15–20 times per minute. During digital device use, this may decrease to as low as 5–7 blinks per minute. In addition, many blinks are incomplete, preventing uniform tear distribution over the corneal surface.^[12] Reduced blinking is considered one of the most important contributors to digital eye strain.

Blue Light Exposure

Digital devices emit visible blue light (400–490 nm). Although current evidence indicates that the amount emitted by screens is insufficient to cause retinal damage during normal use, prolonged exposure may contribute to glare, visual discomfort, sleep disturbance, and circadian rhythm disruption, particularly when screens are used at night.^[13]

Musculoskeletal Factors

Computer Vision Syndrome is not limited to ocular manifestations. Improper sitting posture, inappropriate monitor height, prolonged static positioning, and repetitive movements produce neck pain, shoulder pain, upper back pain, and wrist discomfort. These musculoskeletal symptoms frequently coexist with visual complaints and contribute to reduced work productivity.^[14]

Clinical Features

The symptoms of Computer Vision Syndrome vary according to the duration of screen exposure, ergonomic conditions, environmental factors, and individual ocular status. Symptoms generally worsen with prolonged screen use and improve after adequate rest.

The clinical manifestations can be broadly classified into ocular, visual, and extraocular symptoms.

Ocular Symptoms

Common ocular complaints include:

- Eye strain (asthenopia)
- Dryness of eyes
- Burning sensation
- Foreign body sensation
- Itching
- Redness
- Watering due to reflex tearing
- Ocular irritation
- Heaviness of eyelids
- Difficulty keeping the eyes open

Among these, dryness and eye strain are the most frequently reported symptoms.^[3,12]

Visual Symptoms

Visual disturbances include:

- Blurred vision during or after computer work
- Intermittent diplopia
- Difficulty in refocusing from near to distant objects
- Fluctuating vision
- Increased sensitivity to light
- Reduced visual endurance

These symptoms result primarily from accommodative fatigue and tear film instability.^[11]

Extraocular Symptoms

Extraocular manifestations include:

- Frontal headache
- Neck pain
- Shoulder pain
- Upper back pain
- Fatigue
- Reduced concentration
- Decreased work efficiency

Poor workstation ergonomics and prolonged sitting posture contribute significantly to these

symptoms.^[14]

Risk Factors

Several occupational and personal factors increase the likelihood of developing Computer Vision Syndrome.

Occupational Factors

- Daily screen exposure exceeding two hours
- Continuous work without breaks
- Poor workstation ergonomics
- Improper monitor distance
- Incorrect monitor height
- Excessive screen glare
- Inadequate ambient lighting
- Air-conditioned work environments

Personal Factors

- Dry eye disease
- Contact lens wear
- Uncorrected refractive errors
- Presbyopia
- Binocular vision anomalies
- Inadequate sleep
- Stress and anxiety
- Increasing age
- Female gender (particularly for dry eye symptoms)

The risk increases proportionately with the duration of uninterrupted screen exposure.^[9,10]

Diagnosis

Computer Vision Syndrome is primarily diagnosed based on a detailed history and comprehensive ophthalmic examination.

History Taking

The clinician should obtain information regarding:

- Duration of daily screen use

- Type of digital devices used
- Nature of occupation
- Working distance
- Frequency of breaks
- Presence of ocular symptoms
- Previous ocular diseases
- Use of spectacles or contact lenses
- Systemic illnesses
- Current medications

A detailed occupational history is particularly important because many symptoms are directly related to workplace ergonomics.

Ophthalmic Examination

Evaluation includes:

- Visual acuity assessment
- Refraction
- Binocular vision testing
- Accommodation assessment
- Ocular motility examination
- Slit-lamp examination
- Tear film evaluation
- Intraocular pressure measurement
- Fundus examination when indicated

Dry Eye Assessment

The following investigations may be performed:

- Tear Break-Up Time (TBUT)
- Schirmer's test
- Ocular surface staining with fluorescein
- Tear osmolarity (where available)
- Meibomian gland evaluation

Several validated questionnaires, including the Computer Vision Syndrome Questionnaire (CVS-Q) and Ocular Surface Disease Index (OSDI), are useful for assessing symptom severity.^[15]

Modern Management

Management of Computer Vision Syndrome aims to reduce symptoms, improve visual comfort, and prevent recurrence. Most patients respond well to conservative measures.

Patient Education

Patient education is the cornerstone of management. Individuals should understand that prolonged uninterrupted screen use is the major precipitating factor and that simple behavioral modifications can substantially reduce symptoms.^[2]

Ergonomic Modifications

Proper workstation design is essential.

Recommendations include

- Maintain a viewing distance of approximately 50–70 cm.
- Position the monitor slightly below eye level.
- Reduce screen glare using anti-glare filters if necessary.
- Adjust screen brightness according to ambient lighting.
- Use chairs with adequate lumbar support.
- Keep feet flat on the floor.
- Maintain relaxed shoulders and elbows.

Correct ergonomics reduces both ocular and musculoskeletal complaints.^[14]

The 20-20-20 Rule

One of the most effective preventive strategies is the **20-20-20 rule**.

Every 20 minutes, the user should look at an object approximately 20 feet away for at least 20 seconds. This allows relaxation of accommodation and reduces visual fatigue.^[2]

Conscious Blinking

Patients should be encouraged to blink consciously during computer work to maintain tear film integrity and reduce evaporation. Complete blinking helps distribute tears evenly across the ocular surface.^[12]

Artificial Tears

Lubricating eye drops remain the first-line treatment for patients with dry eye symptoms. Preservative-free artificial tears are preferred in individuals requiring frequent instillation because they minimize ocular surface toxicity.^[3]

Optical Correction

Appropriate correction of refractive errors significantly improves symptoms. Dedicated computer spectacles may benefit individuals engaged in prolonged near work.

Environmental Modifications

Environmental adjustments include:

- Increasing room humidity
- Reducing direct airflow from fans or air conditioners
- Optimizing workplace illumination
- Minimizing screen reflections
- Using larger font sizes
- Increasing screen contrast

Lifestyle Measures

Adequate sleep, regular physical activity, balanced nutrition, hydration, and limiting unnecessary recreational screen time contribute to better ocular health. Digital detox periods during leisure hours may further reduce symptom recurrence.^[9]

Prognosis

Computer Vision Syndrome generally has an excellent prognosis. Most symptoms are reversible and improve with appropriate ergonomic correction, regular visual breaks, lubrication, and healthy digital habits. However, failure to modify risk factors may lead to recurrent symptoms and chronic ocular discomfort, emphasizing the importance of preventive strategies and early intervention.^[2–4]

Transition to Ayurvedic Perspective

Although modern management effectively relieves symptoms, many individuals continue to experience recurrent episodes due to unavoidable digital device use. Ayurveda offers a preventive and holistic approach that emphasizes preservation of ocular health through proper diet, lifestyle, daily regimens, and specialized ophthalmic therapies. The following section explores Computer Vision Syndrome from the Ayurvedic perspective, including its correlation with **Shushkakshipaka**, **Netrashrama**, **Vata-Pittaja Netraroga**, and the principles of Ayurvedic management.

Ayurvedic Perspective of Computer Vision Syndrome

Ayurvedic Perspective

Although **Computer Vision Syndrome (CVS)** is not specifically described in the classical Ayurvedic texts, its clinical manifestations closely resemble several ocular disorders (*Netrarogas*) described by Acharya Sushruta and Acharya Vagbhata. Ayurveda considers the eye (*Netra*) as one of the most vital sense organs (*Indriyas*), and preservation of vision (*Drishti Rakshana*) is regarded as an essential component of maintaining overall health.^[5-7]

The increasing use of digital devices has introduced a modern lifestyle factor that places continuous stress on the visual apparatus. From an Ayurvedic standpoint, prolonged concentration on digital screens can be interpreted as **Atiyoga (overuse) of Chakshurindriya**, leading to vitiation of **Vata** and **Pitta Dosha**. Continuous visual activity, inadequate blinking, excessive exposure to artificial light, disturbed sleep, mental stress, and irregular dietary habits gradually disturb the physiological balance of ocular tissues, resulting in symptoms that resemble **Shushkakshipaka**, **Netrashrama**, and **Vata-Pittaja Netrarogas**.

Ayurveda emphasizes prevention before disease develops. Therefore, daily eye care practices (*Netra Paricharya*), proper diet, adequate sleep, and healthy lifestyle habits become particularly relevant in the prevention and management of CVS.

Ayurvedic Anatomy and Physiology of the Eye

Ayurveda describes the eye as the principal organ responsible for perception of visual objects. According to **Sushruta Samhita**, the eye is predominantly associated with **Teja Mahabhuta**, while the proper functioning of vision depends upon the equilibrium of all five Mahabhutas and the three Doshas.

Role of Alochaka Pitta

Among the five subdivisions of Pitta, **Alochaka Pitta** is responsible for visual perception. It is situated in the eye and enables recognition of colour, form, shape, and brightness. Disturbance of Alochaka Pitta results in impairment of visual function.^[5]

Continuous exposure to bright digital screens, glare, and prolonged concentration may aggravate Alochaka Pitta, contributing to burning sensation, redness, photophobia, and visual fatigue.

Role of Vata Dosha

Vata governs movement, nerve conduction, blinking, tear distribution, and coordination of ocular muscles. Aggravation of Vata due to prolonged screen exposure, inadequate blinking, sleep deprivation, stress, and excessive mental work produces dryness, pricking pain, foreign body sensation, eye fatigue, and fluctuating vision.

Role of Kapha Dosha

Kapha maintains lubrication, nourishment, stability, and smooth functioning of ocular tissues. Depletion of Kapha results in reduced lubrication and tear film instability, thereby contributing to symptoms of ocular dryness.

Nidana (Etiological Factors)

Although digital screens were unknown during the classical Ayurvedic period, the causative factors described in Ayurvedic texts closely resemble the lifestyle practices responsible for Computer Vision Syndrome.

The probable Nidanas include

Atiyoga of Chakshurindriya

Excessive use of the visual sense organ is considered an important cause of ocular disorders. Continuous screen viewing without adequate rest represents a classical example of **Atiyoga**, leading to exhaustion of ocular structures.

Ratri Jagarana (Night Vigil)

Late-night use of smartphones, laptops, and tablets disturbs the natural sleep cycle. Ayurveda considers **Ratri Jagarana** a major cause of Vata and Pitta aggravation, producing dryness, burning sensation, fatigue, and diminished ocular strength.^[6]

Atiprakasha Darshana

Continuous exposure to bright illumination, LED screens, excessive screen brightness, and glare resembles excessive exposure to intense light (*Atiprakasha*), which aggravates Pitta and produces ocular discomfort.

Manasika Nidana

Psychological stress, anxiety, prolonged concentration, occupational pressure, and mental fatigue contribute to Dosha imbalance, especially Vata, thereby worsening ocular symptoms.

Aharaja Nidana

Improper dietary habits such as:

- Excessively spicy food
- Dry food
- Irregular meals
- Fast food
- Excessive caffeine
- Inadequate water intake

may aggravate Vata and Pitta while reducing ocular nourishment.

Dosha Involvement

Computer Vision Syndrome appears to be predominantly a **Vata-Pittaja disorder**.

Vata Dosha

Aggravated Vata produces:

- Dryness of eyes
- Foreign body sensation
- Eye strain
- Pain
- Blurred vision
- Difficulty in focusing
- Fatigue

Pitta Dosha

Aggravated Pitta causes:

- Burning sensation
- Redness
- Photophobia
- Increased lacrimation
- Irritation
- Heat sensation

Kapha Dosha

Kapha is usually depleted rather than aggravated in CVS. Loss of normal Kapha functions contributes to inadequate lubrication and instability of the tear film.

Dushya

The principal Dushyas involved include:

- **Rasa Dhatu** – impairment of nourishment and hydration
- **Rakta Dhatu** – redness and inflammatory manifestations
- **Mamsa Dhatu** – ocular muscular fatigue
- **Majja Dhatu** – neural fatigue associated with prolonged visual activity

Deficiency of Rasa Dhatu particularly contributes to ocular dryness.

Srotas Involvement

The important Srotas involved include:

- Rasavaha Srotas
- Raktavaha Srotas
- Majjavaha Srotas

Disturbance of these channels results in impaired nourishment, inflammation, neuromuscular fatigue, and defective ocular lubrication.

Adhithana

The primary site of disease manifestation is **Netra**, particularly the ocular surface, eyelids, tear film, conjunctiva, cornea, and accommodative apparatus.

Samprapti (Pathogenesis)

The probable Samprapti of Computer Vision Syndrome can be explained as follows:

Repeated and prolonged exposure to digital screens causes continuous stimulation of the visual apparatus. Excessive visual concentration (*Atiyoga of Chakshurindriya*), sleep deprivation (*Ratri Jagarana*), mental stress, improper diet, and exposure to bright light aggravate **Vata** and **Pitta Dosha**.

Aggravated Vata causes dryness (*Rukshata*), fatigue (*Shrama*), instability of ocular functions, and diminished blinking. Simultaneously, aggravated Pitta produces burning sensation, redness, irritation, and visual discomfort.

As the disease progresses, Rasa Dhatu depletion reduces ocular nourishment, resulting in inadequate lubrication. The disturbed Doshas localize in the eye (*Netra*) and produce symptoms resembling **Shushkakshipaka** and **Netrashrama**.

Thus, the disease may be summarized as:

Nidana → Vata-Pitta Prakopa → Rasa Kshaya → Netra Ashraya → Ocular Dryness + Fatigue + Burning + Blurred Vision → Computer Vision Syndrome

Correlation with Shushkakshipaka

Among all Ayurvedic ocular disorders, **Shushkakshipaka** demonstrates the closest resemblance to Computer Vision Syndrome.

According to **Sushruta Samhita**, Shushkakshipaka is characterized by:

- Dryness of eyes
- Roughness
- Pricking pain
- Burning sensation
- Difficulty opening the eyelids
- Foreign body sensation
- Ocular discomfort

These features closely correspond with modern symptoms of dry eye associated with prolonged computer use.^[5]

Although CVS also includes accommodative fatigue and musculoskeletal symptoms, the ocular manifestations show a strong clinical correlation with Shushkakshipaka.

Correlation with Netrashrama

Netrashrama refers to fatigue of the eyes caused by excessive visual activity.

Its characteristic features include:

- Eye fatigue
- Heaviness
- Watering
- Difficulty concentrating
- Temporary blurring
- Pain around the eyes

These symptoms closely resemble digital eye strain experienced after prolonged computer work.

Correlation with Vata-Pittaja Netraroga

Several features of Computer Vision Syndrome indicate simultaneous aggravation of Vata and Pitta.

CVS Symptom	Ayurvedic Interpretation
Dryness	Vata
Burning	Pitta
Redness	Pitta + Rakta
Eye strain	Vata
Headache	Vata
Blurred vision	Vata
Photophobia	Pitta
Irritation	Pitta

Therefore, CVS may be considered predominantly a **Vata-Pittaja Netraroga** with associated **Rasa Kshaya**.

Ayurvedic Diagnostic Approach

Diagnosis in Ayurveda is based upon **Trividha**, **Ashtavidha**, and **Dashavidha Pariksha**, along with detailed ophthalmic examination.

Important points include

Rogi Pariksha

- Prakriti
- Vikriti
- Sara
- Satmya
- Ahara habits
- Sleep pattern
- Occupational history
- Daily screen exposure

Roga Pariksha

Evaluation includes:

- Nature of ocular discomfort
- Burning sensation
- Dryness
- Pain

- Watering
- Blurred vision
- Duration of symptoms
- Aggravating factors
- Relieving factors

Dosha Assessment

Most patients demonstrate features of:

- Vata predominance
- Pitta association
- Mild Kapha depletion

Differential Diagnosis

Computer Vision Syndrome should be differentiated from:

- Dry Eye Disease
- Allergic conjunctivitis
- Infective conjunctivitis
- Refractive errors
- Glaucoma
- Uveitis
- Migraine-associated visual symptoms
- Systemic diseases affecting the eye

Careful history and ophthalmic examination are essential to exclude organic ocular pathology before establishing the diagnosis of Computer Vision Syndrome.

Integrative Understanding

Modern medicine explains CVS primarily through accommodative stress, reduced blink rate, tear film instability, and poor ergonomics. Ayurveda interprets the same clinical condition through the concepts of **Atiyoga of Chakshurindriya**, **Vata-Pitta Prakopa**, **Rasa Kshaya**, and **Shushkakshipaka**. Although the explanatory frameworks differ, both systems recognize prolonged visual strain and environmental factors as key contributors. This conceptual overlap supports an integrative approach that combines evidence-based ophthalmic care with Ayurvedic preventive measures and ocular therapies to improve symptom control and quality of life.

Ayurvedic Management of Computer Vision Syndrome

The primary objective of Ayurvedic management in Computer Vision Syndrome (CVS) is to correct the underlying **Vata–Pitta imbalance**, restore ocular lubrication, improve visual endurance, and prevent recurrence. Since CVS is mainly a lifestyle-induced disorder, **Nidana Parivarjana (avoidance of causative factors)** forms the first principle of treatment. Ayurvedic management should be individualized according to the patient's **Prakriti, Dosha predominance**, severity of symptoms, and associated systemic conditions.

1. Nidana Parivarjana

Avoidance of etiological factors is considered the most effective preventive and therapeutic measure.

Patients are advised to:

- Limit prolonged continuous screen exposure.
- Follow the 20-20-20 rule.
- Maintain adequate blinking.
- Avoid excessive exposure to bright light and glare.
- Maintain proper posture while using digital devices.
- Ensure adequate sleep (7–8 hours).
- Reduce psychological stress.
- Consume a balanced and nutritious diet.
- Avoid excessive caffeine, smoking, and alcohol.

Netra Kriyakalpa

Netra Kriyakalpa comprises specialized local therapeutic procedures that nourish, protect, and rejuvenate ocular tissues. These procedures are particularly useful in patients with ocular dryness, burning sensation, eye fatigue, and digital eye strain. Reviews and clinical studies suggest that therapies such as **Tarpana, Anjana, Aschyotana**, and **Nasya** may improve ocular comfort when used appropriately alongside modern ergonomic measures.

Netra Tarpana

Netra Tarpana is one of the most important rejuvenative procedures described in Shalakyta Tantra.

In this procedure, medicated ghee is retained over the eyes within a boundary prepared using

black gram flour dough.

Commonly used preparations include

- Jeevaneeya Ghrita
- Triphala Ghrita
- Mahatriphala Ghrita
- Goghrita (when indicated)

Expected benefits include

- Lubrication of ocular surface
- Reduction in dryness
- Improvement in tear film stability
- Relief from eye fatigue
- Better visual comfort
- Nourishment of ocular tissues

Small clinical studies have reported symptomatic improvement in patients with CVS following Ayurvedic treatment protocols that included Tarpana, although larger controlled trials are still needed.

Aschyotana

Aschyotana (instillation of medicated eye drops) is useful during the early stages of ocular irritation.

Benefits include

- Cleansing of ocular surface
- Reduction of burning
- Relief from foreign body sensation
- Improvement in comfort

Seka

Seka involves gentle pouring of medicated liquid over closed eyes.

It is useful in

- Burning sensation
- Mild inflammation
- Eye fatigue

- Redness

Anjana

Application of medicated collyrium (Anjana) helps maintain ocular hygiene and may improve visual clarity in appropriately selected patients.

Bidalaka

Application of medicinal paste over closed eyelids helps reduce periocular inflammation and muscular fatigue.

Nasya Karma

Nasya is considered beneficial because the nose is regarded as the gateway to the head (*Nasa Hi Shiraso Dwaram*).

Medications commonly used include:

- Anu Taila
- Shadbindu Taila

Possible benefits include

- Nourishment of cranial structures
- Relief from headache
- Improvement in ocular fatigue
- Reduction of Vata aggravation

Internal Ayurvedic Medicines

Selection of medicines should always be individualized and supervised by a qualified Ayurvedic physician.

Frequently described formulations include:

- Triphala Churna
- Triphala Ghrita
- Saptamrita Lauha
- Yashtimadhu preparations
- Amalaki Rasayana
- Jeevaneeya Ghrita

These formulations are traditionally used for:

- Chakshushya (promotion of eye health)
- Rasayana action
- Reduction of oxidative stress
- Improvement of tissue nourishment

The evidence supporting these formulations for CVS is promising but remains limited, highlighting the need for well-designed clinical trials.

Pathya and Apathya

Pathya

Ayurveda places significant emphasis on dietary and lifestyle practices that promote ocular health.

Recommended measures include:

- Adequate sleep
- Regular blinking during screen use
- Consumption of green leafy vegetables
- Fresh fruits rich in Vitamin A and Vitamin C
- Cow's ghee in moderation
- Triphala preparations where appropriate
- Adequate hydration
- Yoga
- Meditation
- Pranayama
- Daily eye washing with clean water
- Regular outdoor activities

Apathya

Patients should avoid:

- Excessive screen exposure
- Night awakening
- Excessively spicy food
- Dry and processed foods
- Smoking
- Alcohol

- Mental stress
- Continuous near work without breaks
- Excessive exposure to bright light

Yoga and Eye Exercises

Yoga complements both modern and Ayurvedic management.

Recommended practices include:

- Palming
- Gentle blinking exercises
- Near–far focusing
- Eye rotation exercises
- Trataka (only in suitable individuals under guidance)
- Nadi Shodhana Pranayama
- Bhramari Pranayama
- Meditation

These practices may reduce visual fatigue and improve relaxation, although they should complement rather than replace evidence-based eye care.

Recent Research

Recent reviews consistently report a growing prevalence of Computer Vision Syndrome due to increasing digital device use across all age groups. Several publications have highlighted a conceptual overlap between CVS and **Shushkakshipaka**, supporting an integrative management approach that combines digital ergonomics with Ayurvedic preventive measures. However, current evidence for Ayurvedic interventions is based mainly on narrative reviews and small clinical studies. Larger randomized controlled trials are required before firm conclusions can be drawn regarding efficacy.

DISCUSSION

Computer Vision Syndrome has become one of the most common lifestyle-related ocular disorders in the digital era. Increased dependence on computers, smartphones, tablets, and online learning has substantially increased the burden of visual fatigue among students and professionals.

Modern ophthalmology attributes CVS primarily to accommodative stress, reduced blink rate, tear film instability, poor ergonomics, and prolonged near work. Treatment therefore

focuses on ergonomic modifications, scheduled visual breaks, correction of refractive errors, ocular lubricants, and patient education.

Ayurveda approaches the same condition from a broader perspective. The concepts of **Atiyoga of Chakshurindriya**, **Vata-Pitta Prakopa**, **Rasa Kshaya**, and **Shushkakshipaka** provide a theoretical framework for understanding the development of ocular dryness and fatigue. Preventive measures described in Ayurveda—including proper sleep, balanced diet, daily regimens, and ocular therapies—align well with modern recommendations that emphasize healthy digital habits.

An integrative strategy may therefore be beneficial. Modern ophthalmic evaluation is essential to diagnose refractive errors, dry eye disease, or other ocular pathology, while Ayurvedic lifestyle guidance and selected therapies may help improve patient comfort and quality of life. At present, stronger clinical evidence is needed to define standardized integrative treatment protocols.

CONCLUSION

Computer Vision Syndrome is an increasingly prevalent occupational and lifestyle disorder associated with prolonged use of digital devices. Although it rarely threatens vision permanently, it can significantly impair comfort, productivity, and quality of life.

Modern management focuses on ergonomic correction, visual hygiene, lubrication, and appropriate optical correction. Ayurveda offers additional preventive concepts through **Nidana Parivarjana**, **Dinacharya**, **Netra Kriyakalpa**, **Rasayana**, and lifestyle modification. The close resemblance between Computer Vision Syndrome and **Shushkakshipaka** suggests that Ayurvedic principles may have a supportive role within an integrative model of care.

Future multicenter randomized clinical trials with standardized outcome measures are necessary to establish the effectiveness of Ayurvedic therapies for Computer Vision Syndrome. Until such evidence becomes available, combining evidence-based ophthalmic care with safe Ayurvedic preventive practices appears to be a rational and patient-centered approach.

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