AN AYURVEDIC APPROACH TO COMPUTER VISION SYNDROME (CVS)

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ABSTRACT:
With the advent of new technologies, occupational challenges, environment etc., has led to the manifestation of new disorders. CVS is one among such diseases affecting 90% of adults and kids due to excess use of computer, television, portable video games and mobile games. CVS is a group of symptoms like eye pain, strain, dry eyes, irritation, tiredness, blurred vision, double vision & in some cases headache, neck pain & giddiness. In modern medicine no remedial measures except usingocular surface lubricants, computer glasses, and counseling for judicious computer use. These symptoms are similar to the symptoms of Netrarogas. So the line of treatment is of Netragataroga Chikitsa- Aschotana, Seka, Pindi, Bidalaka, Prakshalana followed by Nasya & Tarpana with Vatapittahara Dravyas & Shirodhara can also be given. Yogic eye exercises relax eye muscles to reduce eyestrain and increases stamina of eye muscles. This article gives an idea about Ayurvedic & Yogic as therapeutic approach for CVS.

Keywords: Computer vision syndrome, Ayurvedic therapies, Yoga

INTRODUCTION:
Computer Vision Syndrome (CVS) is occurring in 90% computer professionals characterized by complex eye and vision problems related to near work which are experienced during working with computers involving both ocular and non-ocular symptoms. It is not only affecting the computer professionals, even kids are suffering from CVS due to excess use of computer games, portable video games, mobile games and videos. Symptoms of CVS include headaches, blurred vision, neck pain, fatigue, eye strain, dry eyes, irritated eyes, double vision, vertigo/dizziness, polypia, and difficulty refocusing the eyes. Some people also suffer from headache, neck pain & giddiness. This group of symptoms is called Astenopia. These symptoms can be further aggravated by improper lighting conditions1. Mechanism of CVS is something like carpal tunnel syndrome which occurs by carrying out the same motion again and again. Just like other stress injuries which worsen later on, CVS also get worse the longer you continue the activity. Here the mechanism is overworking or over straining of eye muscle, which is responsible for focusing. In many cases the symptoms appear after several hours of work and not immediately2.

Understanding CVS with Ayurvedic Siddhantas:3 We shall understand this syndrome with the Ayurvedic perspective of Hetu, Asatmendriyartha Samyoga, Purvaroopa, Roopa of Netrarogas(Doshik involvement), Samprapti to find out a suitable Chikitsa for treating CVS.

1. Hetu:
a. The external factors causing Dosha Prakopa are Bahya Hetus. Working with computers and watching television, playing with video games and mobile games for longer duration, looking at fast moving images and Bhasvara Vasthu Darshana and multiple colours very frequently, improper lighting arrangement, improper seating position, etc acts as a Bahya Hetu in causing Computer Vision Syndrome\(^4\).

b. The internal factors causing Prakupita Tridosha due to various Nidanas are Abhyantara Hetus. Along with existing eye diseases like Presbyopia, Myopia, Asthenopia, Dry Eyes, Glaucoma which further aggravates the severity acts as Abhyantara Hetu.

2. AsatmendriyarthaSamyoga:
The Asatmendriyartha Samyoga of Chakshurendriya is as follows:
a. **AtiYoga** - AtiDarshanam i.e., seeing very bright light or objects for long periods of time. And doing the same action again and again.
b. **Mithya Yoga** - Seeing for a long time those objects which are very near or very far, which are very minute, which are very bright and sparkling. In CVS we can say that:
   - Watching computer from very near
   - Working with computer and watching TV in darkness or dim light or improper lighting.
   - Reading small font and watching flickering images
   - Sitting in an improper position while working with computers are MithyaYogas.

c. **Prajanaparadha** Manasika Prajanaparadha can also be found in the patients of Computer Vision Syndrome as most of them are stressed from the nature of the job especially those working in software companies and call centre.

d. **Parinama** – Due to exposure to cold in air conditioned atmosphere by a CVS patient would further aggravate Vatadi Dosha and increases the dryness in eyes as it’s not a natural atmosphere. The duration of work can also be considered under Kala i.e., more the duration the patient is exposed to computer work he is more prone to develop Computer Vision Syndrome.

3. **Purvarupa** – The symptoms explained initially under CVS are seen to be explained under Purvarupa of Netrarogas by Acharya Sushruta are Avila, Samrambha, Ashru, Kandu, Upadeha, Guru, Oosh, Toda, Ragayuktam, Sashoolamvartma-kosheshu, Shukapurnabham\(^5\). Acharya Dalhana has commented Kandupoornopadehavat (excess Itching) is present instead of Ashrupoornopadehavat (excess lacrimation) and SaShoolam as Istat Shoolam i.e., mild pain are present in this stage.

4. **Rupa** - ShushkaakshiPaaka – The major symptom – Dryness of Eye & other symptoms that have been explained in CVS, it seems to be very near to the term Shushkaakshi Paaka explained under SarvagataRoga\(^6\).
### Table No. 1 CVS symptoms and their *Dosha* involvement (ShuskaakshiPaaka)

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Ayurvedic terms</th>
<th>Dosha vitiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry and irritated eyes</td>
<td>Visushka Netra / Rooksha Netra</td>
<td>Vata</td>
</tr>
<tr>
<td>Eye Strain</td>
<td>Netra Klama</td>
<td>Vata</td>
</tr>
<tr>
<td>Blurred vision</td>
<td>Avila Darshanam</td>
<td>Pitta</td>
</tr>
<tr>
<td>Red Eyes</td>
<td>Netra Raaga</td>
<td>Pitta</td>
</tr>
<tr>
<td>Burning Eyes</td>
<td>Netra Daha</td>
<td>Pitta</td>
</tr>
<tr>
<td>Excessive lacrimation</td>
<td>AshruBahulata</td>
<td>Vata</td>
</tr>
<tr>
<td>Double vision</td>
<td>Dwidhapashyati (Mithyadarshana)</td>
<td>Vata</td>
</tr>
<tr>
<td>Difficulty in focusing</td>
<td>Roopadarshanaasahyata</td>
<td>Vata</td>
</tr>
<tr>
<td>Change in colour perception</td>
<td>Vikrutavarnapatavam</td>
<td>Vata / Pitta</td>
</tr>
<tr>
<td>Photophobia</td>
<td>PrakashaAsahyatva</td>
<td>Vata / Pitta</td>
</tr>
<tr>
<td>Headache</td>
<td>Sirashoola</td>
<td>Vata / Pitta</td>
</tr>
<tr>
<td>Pain in shoulder, neck and back.</td>
<td>Greeva, Bahu , Kati Shoola</td>
<td>Vata</td>
</tr>
<tr>
<td>Contact lens discomfort</td>
<td>-----------------------------</td>
<td>-</td>
</tr>
<tr>
<td>Slowness in changing focus</td>
<td>Alpakriyalaghava of netra</td>
<td>Vata</td>
</tr>
</tbody>
</table>

### Table No.2 Netra RogaLakshana in comparision to CVS

<table>
<thead>
<tr>
<th>Vata</th>
<th>Lakshana</th>
<th>CVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alparaga</td>
<td>Redness</td>
<td>✓</td>
</tr>
<tr>
<td>Upadeha</td>
<td>Excessive secretions of eye / stickiness</td>
<td>✓</td>
</tr>
<tr>
<td>Toda</td>
<td>Mild pain (pricking)</td>
<td>✓</td>
</tr>
<tr>
<td>Bheda</td>
<td>Tearing pain</td>
<td>✓</td>
</tr>
<tr>
<td>Pitta</td>
<td>Lakshana</td>
<td></td>
</tr>
<tr>
<td>Daha</td>
<td>Burning sensation</td>
<td>✓</td>
</tr>
<tr>
<td>Atiruja</td>
<td>Excessive pain</td>
<td>✓</td>
</tr>
<tr>
<td>Raga</td>
<td>Redness</td>
<td>✓</td>
</tr>
<tr>
<td>Peetopadeha</td>
<td>Yellow discoloration</td>
<td>-</td>
</tr>
<tr>
<td>Kapha</td>
<td>Lakshana</td>
<td></td>
</tr>
<tr>
<td>Shuklopadeha</td>
<td>White discoloration</td>
<td>-</td>
</tr>
<tr>
<td>Bahupicchilaashru</td>
<td>Excess sticky secretions in eyes</td>
<td>-</td>
</tr>
<tr>
<td>Guruta</td>
<td>Heaviness</td>
<td>✓</td>
</tr>
<tr>
<td>Kandu</td>
<td>Itching</td>
<td>✓</td>
</tr>
</tbody>
</table>
5. Samprapti:

Illustration Showing the Scheme of Samprapti of CVS

AchakshushyaNidanaSevana (Working with computer for longer duration & following other Dosha aggravating factors)

Dosha Vruddhi and Dosha Dushti (NidanaSevana continued further)

DoshaPrakopa with predominance of Vata and PittaDosha

Spreading of Dosha in the body through all Sira and Srotas

Entry of Doshas into UrdhwagataSira

Urdhwagati of PrakupitaDosha through the UrdhwagataSira

SthanaSamshraya of PrakupitaDosha in various parts of the Netra

PoorvaroopaLakshana

Manifestation of NetraRoga (Computer Vision Syndrome)

Understanding CVS with Modern concepts:

1. In Computer Vision Syndrome the sclera turns red which is called as the red eye due to excessive flow of blood to eye or inflammation or due to continuous work.

2. Muscles of eyes - Persons working with computer need to move their eyes frequently as to focus on the screen and on the nearby documents alternatively while entering various data which causes muscle strain resulting in eye strain, tiredness and pain in the eyes.

3. Lacrimal apparatus - Due to uninterrupted watching and reduced blink rate of eyes, the tear secretion by lacrimal glands decreases or tears quickly get evaporated and the eye is not properly moistened. This causes the sensation of dry eye and burning in the eyes.

4. Blink rate decreases to as low as 6–8 blinks/minute focusing on the computer screen. The normal blink rate is 16–20 per minute. It leads to early evaporation of tear film due to decreased blinking rate leading to dry eyes.

5. Function of Lipid layer is to prevent evaporation of aqueous layer & act as surfactant. Function of Aqueous layer is to supply oxygen to corneal epithelium & wash out debris & noxious irritants. Function of Mucus layer is to help in lubrication. Any type of impairment in any of these layers lead to dry eyes in further causing CVS.

ChikitsaSiddhanta

1. Ayurveda
Dosha – Vata and Pitta, Dushya – Rasa, Rakta, Mamsa, Medha, Srotas – Rasavaha Srotas, SrotodrustiPrakara – Sanga, Rogamarga – Madhyama, Adhistana – Shiras, Vyaktta Stana – Nethra (all the Netra Mandalas). Hence looking into the Ayurvedic treatment modalities, the drug should have Vatapitta property.

1. Nidana Parivarjana is the first and foremost Chikitsa in CVS.

2. Vaatadi Doshashama includes Sthanika and Sarvadheika treatment procedures like Shamana, Aushadha, Kriyakalpa, though the disease Computer Vision Syndrome is not mentioned in Ayurveda Samhitas based on the principles the following Chikitsa Siddhanta can be formulated.

3. In an Aganthu Karana Vyadhi like Computer Vision Syndrome Netra Prasadana Janana, Drushtiprasadanana drugs should be used which cause Dosha Shamana and SampraptiVighatana along with Vaatabhishyanda Chikitsa with Netrya and Snigdha Vatahara drugs are beneficial.

4. Different Kriya - Kalpas which are helpful in treating the CVS:
   a. NetraPrakshalana (Eye wash) – washing the eyes with medicated decoctions like Lodhra or Amalaki Swarasa after getting up from bed in the morning is a very good therapy for eyes.
   b. Anjana (collyrium) – applying Lekhananjana because of Theekshna property, eliminate the vitiated Doshas from the Siras pertaining to Varthma and eye.
   c. Abhyanga supress the Vatadosha confined to eye.

Mode of action - Local Abhyanga over the eyes gives cooling effect & also relaxes the eye from strain and also strengthens the muscles of the eyes. ShiroAbhyanga helps the oil to reach up to the brain. The optic nerve which ends in the Drishtipatalam (retina) is the direct extension of brain stem. So daily application of oil, selected according to the Prakriti of the person helps in preventing eye diseases and also nourishes all sense organs and also helps in Drishtiprasadana.

d. Akshitarpana - Akshitarpana is a unique procedure where medicated Ghrita is retained over the eyes for a specific amount of time. Tarpana- As Ayurveda texts says, Tarpana gives strength to eyes i.e. it is Dristiprasadaka so used in various diseases. Tarpana is generally done with Ghrita which is Madhura- Sheetu so; it is best for Vatapitta vitiated diseases. Also Netrendriya is Majja Dhatu predominant organ and Ghrita nourishes Majja Dhatu, so it is Balya for eye.

Probable mode of action -According to modern pharmacology, various drugs used in the form of eye drops or eye ointments enters the eyeball by passing through the cornea. This penetration depends upon the permeability of various layers of cornea. The epithelium and endothelium is highly permeable for lipid content as compare to Stromal layer. Fat soluble drugs readily penetrate these layers. Tarpana with Ghrita leads to maintain the lipid layer of tear film which reduces the evaporation of aqueous layer of tear film. So it keeps the tear film in normal state, maintaining nutrition of eyes.
e. **Aschyotana** - Instillation of drops of medicines to the open eye from a height of two Angulas is called as Aschyotana. **Probable mode of action** After instillation of drops into the eye, it comes in contact with tear and due to blinking of eyelids the drugs get mixed with tear. After mixing with tear the drugs come in contact with conjunctiva and due to hydrophilic nature of conjunctiva the drugs get directly absorbed through conjunctival sac by the transcellular pathway and correcting the abnormalities caused due to insufficient formation of tear film on pre-corneal surface.

f. **Seka** - Pouring of thin streams of medicated solution to the eye continuously for stipulated period from a height of 4 Angulas. **Probable mode of action** As the medicine is poured slowly to eyes the tissue contact time is more than Aschyotana. The lipid soluble drugs are absorbed through corneal epithelium & endothelium; the water soluble drugs are absorbed through corneal stroma and conjunctiva both. Due to lipophilic nature of epithelium & endothelium of cornea, the lipid soluble drugs are absorbed by passive transport. The water soluble drugs are absorbed through stroma of cornea by trans-corneal pathway and helps in further reformation of the tear film on blinking.

g. **Bidalaka** - Application of drugs in the form of paste to the outer surface of the eyelids. The paste is left on site until it starts drying. **Probable mode of action** - Medicine applied on the lid is absorbed to a greater extent reaching to conjunctiva and reduces the local temperature there by relieves inflammation, imparting soothing effect and relieving other symptoms of dry eyes.

h. **Nasya** - is a procedure where medicines are administered through inserting into the nasal cavity through nostrils. **Probable mode of action** - In Ayurveda it is said that *Nasa hi Shirasodwaram*. i.e. nasal cavity leads to the structures of the head. So medicines administered through such route spreads to the following parts - Eyes through the nasolacrimal duct, Middle ear – through the Eustachiantube, Intra cranial spaces – through the middle ear. There is no digestion process of the medicine in this procedure so within no time delay the medicine is absorbed through the mucus lining of the structures. By cleaning all the Srotas the accumulation of vitiated Dosha in this pathway is treated.

- **Vagbhatacharya** while explaining *Pratimarsha Nasya* has mentioned *Klamanasha* i.e. it reduces the fatigue and eye strain. It improves the vision and hence can be useful in relieving the symptoms like blurred vision, difficulty in focusing, double vision, and eye strain. It also does the *Vatashamana*, hence can be useful in relieving the pain in the neck and shoulder. (As. Hri. Su.20/4)

- **Shaman Nasya** helps in treating the redness of the eyes, has it reduces the linear congestion (As. S. Su.20/ 29, As. Hri. Su. 20/6)

- **SnehaNasya** acts as rejuvenating therapy where it strengthens functions of sense organs & improves the vision capacity. (As. Hri. Su. 20/23)
i. **Gritapana** - Intake of old Ghrita is very useful for the ocular tissues. After Pana, the Ghrita gets absorbed into the systemic circulation. Due to Chakshushya properties, it has an affinity towards ocular tissues and due to its lipid soluble property crosses blood ocular barriers. By active and passive transport the ingredients of the Ghrita crosses the cell membranes and reach the targeted tissues thereby correcting the abnormalities of ocular tissues, lubricating and rejuvenating it.

2. **Yoga** Yogenic practices help to reduce eyestrain and also build up the stamina of eye muscles. Mainly ShatKriyas like Trataka & NetiKriya helps in improving the vision & maintain the eye health.

- **Gazing Exercise** - The preparatory eye practices of sideward, diagonal, circular, upward and downwards viewing are helpful. These included left and right gazing, upwards and downwards gazing, nose tip gazing and eyebrow center gazing. Blinking frequently and intentionally during the practices provide a good tear film for healthy eyes.

- **Trataka** - Trataka is practiced in two stages. In the first stage is gazing with concentration at a single object without blinking till the eye begins to water. The second stage is staring at a candle flame. The focusing exercises and Trataka improve the ability to make visual adjustments, the accommodation reflex and concentration, and help to stimulate as well as relax the eye muscles. The palming, blinking and splashing exercises relax the eye muscles.

3. **Other Treatments for Computer Vision Syndrome**

- **Location of computer screen** - Most people find it more comfortable to view a computer when the eyes are looking downward. Optimally, the computer screen should be 15 to 20 degrees below eye level (about 4 or 5 inches) as measured from the center of the screen and 20 to 28 inches from the eyes.

- **Reference materials** - These materials should be located above the keyboard and below the monitor. If this is not possible, a document holder can be used beside the monitor. The goal is to position the documents so you do not need to move your head to look from the document to the screen.

- **Lighting** - Position the computer screen to avoid glare, particularly from overhead lighting or windows. Use blinds or drapes on windows and replace the light bulbs in desk lamps with bulbs of lower wattage.

- **Anti-glare screens** - If there is no way to minimize glare from light sources, consider using a screen glare filter. These filters decrease the amount of light reflected from the screen.

- **Seating position** - Chairs should be comfortably padded and conform to the body. Chair height should be adjusted so your feet rest flat on the floor. If your chair has arms, they should be adjusted to provide arm support while you are typing. Your wrists shouldn't rest on the keyboard when typing.

- **Rest breaks** - To prevent eyestrain, try to rest your eyes when using the computer for long periods. Rest your eyes for 15 minutes after two hours of continuous computer use. Also, for every 20 minutes of computer viewing, look into the distance for
20 seconds to allow your eyes a chance to refocus (20-20-20 RULE- For every 20 minutes once, one should look at something kept 20ft away for 20 seconds)

- **Blinking** - To minimize your chances of developing dry eye when using a computer, make an effort to blink frequently. Blinking keeps the front surface of your eye moist.

- Regular eye examinations and proper viewing habits can help to prevent or reduce the development of the symptoms associated with Computer Vision Syndrome.

**CONCLUSION:**

Ayurveda Siddanthas are applied by centuries by observing, understanding diseases and by well testing. By above discussion it can be concluded that Ayurveda Siddanthas are eternal and can be applied in understanding newer diseases like Computer Vision Syndrome. Ayurveda Siddanthas help in understanding the disease in Poorvaroopavastha itself so that it doesn’t worsen the condition. Regular sittings can check further development of the disease. The Nidana mentioned under the CVS i.e. duration of Computer work is directly proportional to the severity of the symptoms in CVS. So Nidana Parivarjanameva Chikitsa can be well applied here. By above treatment modalities it can be said that CVS can be well managed with Ayurveda treatment, especially with Panchakarma.

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