



Review Article

A REVIEW OF TREATMENT ASPECTS OF COMPUTER VISION SYNDROME (CVS) THROUGH AYURVEDA

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KEYWORDS: Computer Vision Syndrome, Dry eye, *Ayurveda*, *Shalaky Tantra*, *Shushkakshipaka*, *Kriyakalpas*.

ABSTRACT

Computers have become a critical component of our life. In many situations, everyone indispensably needs to use a computer. Different careers depend purely on computer use since the arrival of games, different software programs, etc. The utility of computers has been extended to such a proportion that people use a computer for more than 8 hours a day. Though inevitable, it damages the eye and circumjacent muscles as the computer causes strain on eyes. Most of these symptoms are due to the dryness of eyes and reduced blinking. *Shalaky Tantra* shares the maintenance of healthy eyesight through diversified *Kriyakalpas*. *Kriyakalpas* include *Tarpana*, *Putapaka*, *Ashchotana*, *Anjana*, *Vidalaka*, *Lepa*, etc. All these *Kriyakalpas* are utilized for the maintenance of a healthy eye. When an imbalance of *Tridosha* occurs in different *Mandalas* and *Patalas*, these *Kriyakalpas* are used to restore equilibrium in the status of *Doshas* and result in *Samprapti-vighatana*. Computer Vision Syndrome is not mentioned directly in Ayurvedic classics but it can be compared with symptoms of *Shushkakshipaka* of *Sarvaksiroga*. Acharya Vagbhata has mentioned cooling and rejuvenating therapies for eyes affected by bright light, high-voltage electric spark and heat exposure. Frequent eye examinations and appropriate viewing habits help to prevent the development of the symptoms of CVS. *Nasya* is highly effective in CVS if it is performed systematically. Thus, Ayurveda is an effective medical system that is crucial to keep your eyes healthy.

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INTRODUCTION

The knowledge bank of present life has emerged as a profession causing vision-related discomfort, ocular fatigue, and systemic consequence. Computer Vision Syndrome is the modern nomenclature to optical and systemic symptoms arising due to a long period and inappropriate working on a computer and is emerging as a pandemic in the 21st century. The increased application of computers in the workplace has brought around the development of several health concerns. Many individuals who work at a computer describe an exalted level of job-related complaints and symptoms, including ocular distress, muscular strain, and stress. The level of

discomfort seems to grow with the workload and has become an indispensable part of life for IT professionals. In these professions, the person's job demands the use of the computer for more than 8 hours a day. Since the computer is involved with vision and eyes, it has a certain consequence on the eye and circumjacent muscles. Most of these symptoms are due to Dryness of eyes which are created and reduced blinking. In this review article, an effort is made to discuss the role of Ayurveda.

Computer Vision Syndrome ensues in visual and ocular symptoms arising due to extensive and inappropriate working on the computer and is emerging as a greater health concern. The increased

use of computers in the workplace has brought around the development of several health concerns. Many individuals who work at a computer describe high-level related complaints and symptoms, including discomfort, muscular strain, and stress. The level of discomfort seems to grow with the amount of computer use. [1] Visual discomfort and related symptoms occurring in computer workers must be recognized as an increasing (premonitory) health problem. Such a complex of eye and vision problems related to near work experienced during computer use has been termed "computer vision syndrome". Many individuals who work at a computer experience eye-related discomfort and/or visual problems.[2] However, based on current evidence it is the use of computers that causes permanent changes or damage to the eyesore visual system. CVS is becoming a major public health issue. Around 64% to 90% computer users suffer from CVS.[3] Since the computer is involved with vision and eyes, it has some effect on the eye and surrounding muscles. Most of these symptoms are due to the aridity of eyes which is created by the monitor light. The vision problems related to near work experienced during computer use has been termed "computer vision syndrome". Many individuals working on a computer suffer from eye-related discomfort and/or problems in vision. It is not clear whether prolonged computer use causes permanent changes or damage to the eye. This report will review the factors relating to eye and vision problems associated with computer work and provide recommendations for preventing or reducing the symptoms. Working adults aren't the only ones affected. Kids who gaze at tablets or use computers during the day at school can have issues, too particularly if the lighting and their position are less than ideal. Instead of being one precise problem, it includes different types of eye strain and pain. Dry eye is a cardinal symptom which is tackled in the treatment of CVS. Dry eyes are not a very dangerous issue but can cause serious problems if not get the attention at the time. CVS also gets worse the longer you continue the activity. In many cases, the symptoms seem after several hours of work and not immediately. Nearly 60 million people suffer from CVS globally, and million new cases of CVS occur each year. [4] A pilot survey conducted in the metropolitan cities of India revealed the incidence of CVS in as much as 70% of computer users. [5]

Causes and Symptoms of Computer Vision Syndrome

Causes and symptoms of computer vision syndrome are distance and angle of eyes and

computer screen, less lightning in room, the glare of the screen, reduced blinking of eyes, increased tear evaporation and decreased tear production. It occurs because the visual demands of the task exceed the visual ability of the individual to comfortably perform them. At greater risk for developing computer vision syndrome are those persons who spent eight or more hours at the computer every day. Common symptoms are - Eyestrain, Headaches, Blurred vision, Difficulty in changing focuses between far and near objects, Dryness of eyes, Irritated eyes, Tired eyes, Redness, Contact lens discomfort.[6]

Ayurvedic Review

Computer Vision Syndrome is not mentioned directly in Ayurvedic classics but it can be compared with symptoms of *Shushkakshipaka* of *Sarvaksiroga*. An Ayurvedic approach can be given based on the fundamentals of Ayurveda. *Nidana* and *Samprapti* can be understood by *Trividhahetus* (*Astamyaindriyarthasamyoga, pradnyapradha, parinama*) related to *Chakshurendriya* (eye). The symptoms of CVS are related to *Vata-pitta pradhana tridosha* vitiation in *Chakshurendriya* leading to *Shushkakshipaka* is a disorder of the eye characterized by difficulty while closing the lids because of '*Daruna Rooksha Vartma Yat Kunitam*' (hardness and roughness of the eye lid), '*Avila Darshana*' (patient cannot see the objects clearly), '*Sudarunam Yat Pratibhodanam*' (difficulty in Opening / Closing the Eye). According to *Acharya Vagbhata* it is characterized by *Gharshna* (foreign body sensation), *Toda* (pricking Pain), *Upadeha* (loss of clear vision), '*Rooksha Daruna Vartma*' (Hardness and Roughness of the Eye Lids), '*Krichra Unmeela Nimeela*' (difficulty in closing and opening of eye lids), *Sushkata* (dryness) and *Shoola* (pain). [7]

In *Charaka Samhita*, clear guidelines for identification as well as treatment of the diseases which are not mentioned in the texts are given. [8] *Acharya Vagbhata* in their text mentioned cooling and revitalizing treatments for eyes affected by strong light, high-voltage sparks of lightning and exposure to heat. This reflects that our *Acharyas* might have seen some problems in eyes due to spark or light sources other than computers that is why they gave their treatment. Upon critical and systematic review of CVS, its etiopathogenesis because of the given guidelines regarding the new health problem seems to be a group of *Vata-Pitta* dominant ocular cum systemic symptoms. [9]

Acharya Charaka described *Asatmya indriyarthasamyog* (improper use of sense organs), i.e., *Atiyoga* (excessive use), *Heenayoga* (less use), and *Mithyayoga* (wrong use) as the foremost cause

of any disease. Here, excessive use of *Chakshuindriya* (eyes) - spending long hours on computers; less use of *Chakshuindriya* - working on computers without blinking; and wrong use of *Chakshuindriya* - seeing continuous changes in brightness of the screen, seeing small fonts, etc. All these factors together lead to the aggravation of *Vata-Pitta Doshas* that follow localization in the *Bahya Patala* (cornea and sclera) and produce symptoms of CVS.

Hetu

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

Samprapti

Nidanasevana (working with a computer for longer duration & following other *Dosha* aggravating factors). *Doshavruddhi* and *Doshadushti* (*Nidanasevana* continued further) *Dosha-prakopa* with the predominance of *Vata* and *Pitta Doshas*. The *Dosha* spreads in the body via all *Sira* and *Srotas*. The *Doshas* then enter into *Urdhwagata Sira*. *Prakupita Doshas* travel through *Urdhwagata Sira*. *Prakupita Doshas* then enter into the phase of *Sthana Samsraya* in various parts of the *Netra*. Initially, these *Doshas* produce *Poorvaroopalakshana*. Ultimately this results in manifestation of Computer Vision Syndrome. The *Asatmendriyarthasamyoga* of *Chakshurendriya* includes *Atidarshanam* i.e., seeing a very bright light or objects for long periods and watching the objects which are very near, very far, very minute, very bright and sparkling in nature. In CVS we can say that; Sitting in an improper position while working with computers is *Mithya Yoga* and doing the same action again and again. *Manasika Prajnaparadha* can also be found in the patients of Computer Vision Syndrome as most of them are stressed by the nature of the job especially those working in software companies and call centers. Due to exposure to cold in the air-conditioned atmosphere by a CVS patient would further aggravate *Vatadi Doshas* 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.

Management of Computer Vision Syndrome

The goals of Ayurveda treatment for Dry Eyes include correcting the vitiation of *Vatadosha* in the body and the eyes also relieving the symptoms of CVS and correcting the digestive fire and encourage lubrication in the body. The main concept of the treatment of *Netraroga* is *Nidanparivarjan* and *Vatadidoshanashak*. *Nidana Parivarjana* is the first and foremost *Chikitsa* in CVS. *Vaatadi Doshashama* includes *Sthanika* and *Sarvadehika* treatment procedures like *Shamana* and *Shodhana* which include *Rasayana*, *Aushadha*, *Kriyakalpa*, and *Panchkarma*. *Tarpan*, *Seka*, *Netradhara*, *Netra-prakshalan* etc. used as *Sthanaika* (local) treatment while *Nasya* used as *Shodhana* treatment for *Sarvadehika* purpose.

Nasya Karma

Nasya is one of the 5 *Karma* (Ayurvedic detoxification therapies) techniques. It is a procedure where medicines are administered through inserting into the nasal cavity through nostrils. This treatment eliminates the dryness that occurs at the root of many respiratory and allergic conditions. It helps in providing all the nourishment and lubrication to the eyes. According to *Doshaj* symptom *Acharya Vagbhatta* while explaining the type of *Nasya* as-

- *Pratimarsha Nasya* has mentioned *Klama Nasha* i.e. it reduces 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 it can be useful in relieving the pain in the neck and shoulder also.
- *Shaman Nasya* helps in treating the redness of the eyes, has it reduces the linear congestion.
- *Sneha Nasya* acts as revitalizing treatment. It strengthens functions of all sense organs & improves the vision.

Probable mode of action of Nasya

In Ayurveda, it is said that '*Nasahi Shirasodwaram*' i.e. nasal cavity leads to the structures of the head. Medicines administered through such route spreads to the eyes through the nasolacrimal duct, middle ear through the Eustachian tube and intracranial spaces through the middle ear. The *Nasyadravya* acts by reaching '*Shringatakarma*'. *Shringataka* is a main vital point situated on the surface of the brain corresponding to the nerve centers. It is a

composite structure consisting of four Shiras (arteries) in connection with four senses organs-viz. nose, eye, ear, and tongue. It is experimentally proved that wherever any type of irritation takes place in any part of the body, the local blood circulation is always increased. The same things happen when the provocation of *Doshas* takes place in *Shira* due to the irritating effects of an administered drug that increases the blood flow circulation of the brain. So extra accumulated morbid *Doshas* are to be expelled out from small blood vessels and ultimately these morbid *Doshas* are thrown away in the Nasal discharge, tears, and salivation. The nasal mucosa which comes into direct contact with the drugs applied directly included in *Nasya* therapy is supplied by many nerve ending, especially Trigeminal nerve. Direct counter-irritation or stimulation of those nerve terminals could cause distal changes in the Trigeminal ganglion itself and impulses are transmitted to the central nervous system. This stimulation of nerve terminals results in better circulation and nourishment of the organs and the disease will subside. Probably the *Nasyakarma* stimulates the trigeminal neurons which in turn may lead to alleviation of headache and other symptoms.

Properties of *Nasyadravya*

Many drugs mentioned for *Nasya* therapy are *Katu*, *Ushna* and *Teekshna*. These drugs produce *Dravekaranam* (liquefaction) and *Chedanam* (expulsion) of vitiated *Doshas*. The drugs having *Kashaya rasa* (Astringent) are known to produce astringent effect while on the other hand; the drugs having *Madhurarasa* (Sweet) produce freshening and nurturing effect. Sometimes systemic treatment also beneficial for other associated factors. *Netrarogas* are caused by specially *Vata-pitta dosha* dominance hence; following procedures are useful for the management of CVS. Some of these procedures are.

Eyewash (*Prakshalan*)

Eyewashes are very good for eye irritation and burning eyes. One has to pour cool water over his open eyes. It has a cooling effect which will make one's eyes feel fresh, happy and cheerful. If one teaspoonful of *Triphala* powder is added in a glass of water and kept overnight. The next day, one has to strain the water and wash his eyes with *Triphala* water at least 2-3 times in a day. *Triphala* is a very good herbal compound for eyes and this method can give very good results.

Netra Tarpana

It is an Ayurvedic treatment that helps relieve fatigue in eyes and improves vision. *Netra*

Tarpana acts as both preventive & curative therapy for maintaining the normal healthy condition of eyes. *Netra Tarpana* is a procedure where the lukewarm medicated ghee is made to stay stagnant in the eyes for a speculated time in a frame made out of black gram paste. *Ghrita* is *Madhura-Sheeta* and it is best for diseases due to *Vata-pitta* vitiation. Also, *Chakshurendriya* is *Majja Dhatu* predominant organ and *Ghrita* nourishes *Majja Dhatu*, so it is *Balya* for the eye. According to modern pharmacology, various drugs used in the form of eye drops or ointments enter the eyeball by passing through the cornea. This penetration depends upon the permeability of various layers of the cornea. Fat-soluble drugs readily penetrate these layers. *Tarpana* with *Ghrita* leads to maintain the lipid layer of the tear film which reduces the evaporation of the aqueous layer of the tear film. So it keeps the tear film in the normal state, maintaining the nutrition of eyes.

Shirodhara

This therapy includes the dropping of continuous stream of oil, milk or medicated buttermilk on the forehead for complete relaxation. *Shirodhara* is effective in treating dry eyes.

Netradhara is also beneficial in treating computer vision syndrome and dry eyes. It is effective in reducing the irritation caused to the eyes.

Snehapana (Ghritapana)

This therapy involves the consumption of a heavy dose of medicated *Ghrita*. *Snehapana* is given to the patient based on digestive fire. The intake of old *Ghrita* is very useful for the ocular tissues. After *Pana*, *Ghrita* gets absorbed into the systemic circulation. It has an affinity towards ocular tissues due to *Chakshushya* properties. Due to its lipid-soluble property, it crosses blood ocular barriers. By active and passive transport the ingredients of the *Ghrita* crosses the cell membranes and reaches the targeted tissues thereby correcting the abnormalities of ocular tissues, lubricating and rejuvenating it.

Virechana

After good lubrication of the body with *Ghrita*, *Sneha Virechana* is given to the patient to eliminate the toxins of the body. In this condition, the patient gets a loose motion for a day and thus, the desired detoxification of the whole body is attained.

Lifestyle modifications

This is the last step of Ayurveda and *Panchkarma* treatment for dry eyes, which make some needed changes in lifestyle which start from

the "early to bed, early to rise" phenomenon. Eating habits, lifestyles and addiction are among the few things that change after having healthy food, drinks and habits. Too much salt in the diet or lack of vitamins can cause dry eyes. One can reduce the salt in their diet and drink approx. 12 ounces of water to stay hydrated. One can add omega-3s fatty acids (enhance the tear production) and Vitamin A to their diet which can be acquired by eating vegan foods i.e. Vegetables and fruits. One should do regular *yoga, Pranayama* and avoid using room heaters and air conditioners. One should say good-bye to smoking and alcohol to reduce the symptoms of dry eyes.^[10]

DISCUSSION

The computer vision syndrome name is not described in Ayurveda lexicons. Ayurveda *Siddhantas* are applied by centuries by understanding diseases and by well testing the

available treatment modalities. By the above discussion, it can be concluded that Ayurveda *Siddhantas* are eternal and can be applied in understanding newer diseases like Computer Vision Syndrome. Ayurveda *Siddhantas* help in understanding the disease in *Poorvaroopavastha* itself so that it doesn't worsen the condition. Decreased production of fluids from tear glands causes dry eyes. This prevents tears from performing their everyday functions and hamper vision. Dry eyes lead to constant irritation. 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* should be applied here. By the above treatment modalities, it can be said that CVS can be well managed with Ayurveda treatment, especially with *Panchakarma*.

	CVS In Modern	CVS In Ayurveda
<i>Nidana</i> (Causes)	Continue watching screen	<i>Atidarsanam</i>
	Watching very near & very far	<i>Durekshnata & Sukshmanireekshnata</i>
	Posture not suitable	<i>Swapnaviprariyata</i>
	Light is not proper	<i>Hinayoga of Chakshurendriya</i>
	Decrease blink rate or tear function	<i>Mansik dukkha</i>
	Glare and reflections from the monitor	<i>Bhasvara Roopa Darshana</i>
<i>Lakshana</i> (Symptoms)	Dry and irritated eyes	<i>Visushka Netra/ Rooksha Netra</i>
	Eye Strain	<i>Netra Klama</i>
	Burning Eyes	<i>Netra Daha</i>
	Blurred vision	<i>Avila Darshanam</i>
	Excessive lacrimation	<i>Ashru Bahulata</i>
	Difficulty in focusing / Blurred vision	<i>Roopadarshana-asahyata</i>
	Headache	<i>Shirahshoola</i>
	Double vision	<i>Dvidhapashyati</i>
	Change in colorperception	<i>Vikrutavarnapatavam</i>
	Photophobia	<i>PrakashaAsahyatva</i>
	Red Eyes	<i>Netra Raaga</i>
	Slowness in changing focus	<i>Alpakriyalaghava of Netra</i>
<i>Chikitsa</i> (Treatment)	Change the habit & avoid the use of social media apparatus	<i>Nidana-parivarjan</i>
	Medicine according to symptoms	<i>Doshapratyanikachikitsa/ Lakshananurupachikitsa</i>

CONCLUSION

With the advancement of new technologies, job-related challenges, environment, etc. have led to the manifestation of new disorders such as Computer Vision Syndrome. Ayurveda is an effective solution to treat several eye problem including cataract, glaucoma, dry eye syndrome and macular degeneration. Frequent eye examinations and appropriate viewing habits help to prevent the development of the symptoms of CVS. *Nasya* is highly effective in curing several diseases of the head (*Urdhwanga*) if it is performed systematically. There is no digestion process of the medicine in this procedure so within no time delay the medicine is absorbed through the mucous lining of the structures. Various *Kriyakalpas* help rejuvenate the eye and surrounding structures. *Netra Tarpana* acts as both preventive & curative therapy for maintaining the normal healthy condition of eyes. *Netradhara* is also beneficial in treating computer vision syndrome and dry eyes. It is effective in reducing the irritation caused to the eyes. *Prakshalana* is very good for eye irritation and burning eyes. Thus one can say that Ayurveda is one of the effective medical systems which are beneficial to keep your eyes healthy.

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Cite this article as:

N.A.Prasad, Varun Sawant, Ashu, Gagan Singh Dhakad, Akhlnath Parida. A Review of Treatment Aspects of Computer Vision Syndrome (CVS) Through Ayurveda. AYUSHDHARA, 2019;6(4): 2310-2315.

Source of support: Nil, Conflict of interest: None Declared

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