



# "A CONCEPTUAL ANALYSIS OF COMPUTER VISION SYNDROME IN AYURVEDA AND ITS MANAGEMENT WITH ASCHYOTHANA"

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## ABSTRACT

In the present era of prolong and rampant computer usage, there has been rapid upsurge in computer related health problems. People are spending more and more time on screens. Prolonged exposure to VDTs has been the cause of a visual and ergonomic disorder called "Computer Vision Syndrome" (CVS). Computer vision syndrome (CVS) is a condition resulting from focusing the eyes on a Video Display Terminal (VDT) like Computer, Tablet, Smart phones etc. for protracted, uninterrupted periods of time. Symptoms of Computer Vision Syndrome include Headache, Blurred vision, Burning sensation, Fatigue, Dry eyes, Irritated eyes, Double vision, and

Difficulty refocusing the eyes. These symptoms can be further aggravated by improper lighting conditions and air moving fast the eyes. Dry eye is a major symptom that is targeted in the therapy of computer vision syndrome. So, these symptoms are related to vata- pitta pradhana vyadhi of Shushkakshipaka. Shushkakshipaka is one among "Sarvagata Netra Rogas" mentioned by Sushruta as well as Vagbhata under Sadhya Vyadhis. This paper aims to review multi facets of Ayurvedic management of CVS which is common lifestyle disease among youngsters worldwide. Acharya susruta mentioned Tarpanam, Putapakam, Sekam, Acshyothanam, Anjana, the kriya kalpas for netra rogas.<sup>[1]</sup> In Ashtanga hridaya, "Sarvesham akshi rogaanaammadou aschyothanam hitham...." For all eye diseases acshyothana is mentioned as treatment.<sup>[2]</sup> Hence the procedure of aschyothana can be done in Computer vision syndrome.

**KEYWORDS:** Computer Vision Syndrome(CVS), Sushkakshipaka, Video Display Terminal(VDT), Aschyothana.

## INTRODUCTION

A group of ocular symptoms produced due to working with computer monitors are collectively known as computer vision syndrome. The ocular symptoms includes Decreased vision, Burning, Red eyes, Stinging and photophobia<sup>[3]</sup>

Computer vision syndrome (CVS) is a condition resulting from focusing the eyes on a Video Display Terminal (VDT) like Computer, Tablet, Smart phones etc. for protracted, uninterrupted periods of time. Symptoms of Computer Vision Syndrome include Headache, Blurred vision, Burning sensation, Fatigue, Dry eyes, Irritated eyes, Double vision, and Difficulty refocusing the eyes. These symptoms can be further aggravated by improper lighting conditions and air moving fast the eyes. Dry eye is a major symptom that is targeted in the therapy of computer vision syndrome<sup>[4]</sup>

According to the study of National Institute of Occupational Safety and Health, the computer vision syndrome (CVS) affects some 90% of the people who spent 3 hours or more at day on a Video Display Terminals (VDT).<sup>[5]</sup>

In the opinion of American Optometric Association the treatment modalities followed for the management of Computer Vision Syndrome include Analgesics, Topical NSAIDs, Topical Steroids, Topical Cycloplegics, Topical Anesthetics, and Sedatives. The treatment adopted in modern medicine is for symptomatic relief and no definite cure is promised<sup>[6]</sup> If left untreated computer vision syndrome may leads to many serious complications like corneal opacity and corneal ulceration resulting to blindness.

## DISEASE REVIEW

The American Optometrist Association (AOA) defines CVS as “A complex of eye and vision problems related to near work which are experienced during or related to computer use.”<sup>[7]</sup> Most commonly reported symptoms of prolonged users of VDT’s comprise dry and irritated eyes, eye strain/fatigue, blurred vision, red eyes and burning sensation. Ergonomic problems associated with computer use include muscular stiffness, cervical pain, headache, numbness of the fingers<sup>[8]</sup> The prevalence of eye symptoms among computer users ranges from 25-93% as reported by various investigators. These symptoms of CVS are due to ocular (ocular-surface abnormalities or accommodative spasms) and/or extra ocular (ergonomic) aetiologies.

## SIGNS AND SYMPTOMS OF CVS

The signs & symptoms of CVS can vary but mostly include Eye Irritation (Dry Eyes, Itchy Eyes, Irritated Eyes), Red Eyes, Blurred Vision (Distance or Near), Headaches, Blurred vision, Double Vision, Headache, Asthenopia, Redness of eyes, Watering of eyes, Dry eyes.

## DIAGNOSIS OF CVS

A comprehensive eye examination is to be done to diagnose CVS

- Patient history to determine any symptoms the patient is experiencing and the presence of any general health problems, medications taken, or environmental factors that may be contributing to the symptoms related to computer use.
- Visual acuity measurements to assess the extent to which vision may be affected.
- A refraction to determine the appropriate lens power needed to compensate for any refractive errors.
- Testing how the eyes focus, move and work together<sup>[9]</sup>

## AYURVEDIC CONCEPT

Direct reference of Computer Vision Syndrome is not found anywhere in Ayurveda Classics, but Acharya Charaka has advocated clear guidelines for identification and treatment for such maladies which are not mentioned in the texts<sup>[10]</sup> By analyzing the symptoms, it can be correlated with Shushkakshipaka which is a Sarvagata Netra Roga explained by both Sushruta and Vagbhata.

## HETU

Causes of CVS can be understood according to Ayurvedic concepts.

- Atiyoga of Darshanendriya (Excessive use of eye) : Continuous long working hours staring at VDT's
- Mithyayoga of Darshanendriya (Improper use of eyes): Abnormal working hours, continuously viewing screens of digital devices without blinking, Working in dimly lit room
- Sooksham nirikshnat : Viewing very small fonts against very bright illumination
- Ati Samipayat : Concentrating more on the near work without shifting gaze

## RUPA

The symptoms of CVS are related to vata-pitta pradhana tri-dosa vitiation at chakshurendriya leading to the sthanasamshraya (lodged) in netra (eyes). Shushkakshipaka is one among "Sarvagata Netra Rogas" mentioned by Sushruta as well as Vagbhata under Sadhya Vyadhis, caused by Vata and Pitta Doshas.

According to Vagbhata it is characterized by Gharshan (foreign body sensation), Toda (picking pain), Upadeha (Coating), Rooksha Daruna Vartma (Hardness and Roughness of eye lids), Sushkata (dryness) and Shoola (pain) and desire for cold comforts.<sup>[11]</sup> 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 Pratibodhanam (Difficulty in Opening/Closing the Eye).

## SAMPRAPTI

Dosha – Vata and Pitta,

Dushya – Rasa, Rakta, Mamsa, Medha, Srotas – Rasavaha Srotas,

Srotodrusti Prakara – Sanga, Rogamarga – Madhyama, Adhistana – Shiras,

Vyakta Stana – Nethra (all the Netra Mandalas).

## PREVENTIVE MEASURES

- The computer work-station should be ergonomically correct.
- Take breaks and blink your eyes every now and then and look out from the window to a distant object or to the sky. Follow 20-20-20 rule by giving break to eyes after every 20 minutes, focusing an object 20 feet away for 20 seconds.
- Appropriate glasses or contact lenses for correction of refractive errors, if any should be used Consider computer glasses – Computer glasses are prescription eyewear that are specifically designed for computer work. They allow to focus eyes on the distance of a computer screen, which is generally farther away than reading material. Computer glasses optimize eyesight when you one is looking at digital screens and help to reduce glare.

## MANAGEMENT

The management principles of Netra Roga in general consist of avoidance of etiological factors as the first line of management. The second principle is to counter act increased Vata and other Doshas in the poorvaroop stage itself, because if neglected these diseases progress rapidly and become incurable in later stages. Management of netra roga can be broadly classified into.<sup>[12]</sup>

### a) Nidana parivarjana

It is the first line of treatment of any disease and it is most important line of treatment for Netra roga also. It indicates that the root of Samprapti process is nidana and it must be avoided for best management of the disease. In netra roga the factors which are mentioned as Nidana of the disease should be avoided. Nidana parivarjanam includes avoiding by all means the etiological factors leading to aggravation of dosha, vyadhi and apathya.

### b) Vaatadi dosha shamanam (Curative measures)

Vaatadi dosha shamanam includes treating the aggravated doshas involved in causing Netra roga by shamana and shodhana.

### c) Aushadha

In Nayanabhighata pratishedha adhyaya Acharya Dalhana says that pittaabhishtyanda, raktaabhishtyanda and vataabhishtyanda chikitsa is to be followed in abhighataja netra rogas with drugs having drushti prasaadana properties, like Nasya, aalepa, snigdha dravya which are drushtiprasaadajanana should be used. Triphala is

said to be drug of choice in case of Netra Roga with various Anupana based on the involvement of Doṣās. This drug is Cakṣuṣya, Rasāyana along with Deepana, Pācana properties. A number of herbal and animal drugs like madhu, ghrita, yashtimadhu etc are mentioned as Chakshushya in the Samhitas and Nighantus where as many mineral drugs are described in the text books of Rasashastra, which can be used in treating various netra roga.

#### d) Kriyakalpa<sup>[13]</sup>

Sushruta has recommended „Kriyakalpa“ for the management of netra roga, along with other types of treatment. They can be advocated in almost all eye diseases and it comprises of tarpana, putapaka, anjana, aschyothana and seka. Later scholars like bhavaprakasha have advocated the use of Swarasa and Arka for local use in Netra roga.

#### ASCHOTANA<sup>[14]</sup>

Aschotana is the instillation of the drug in the form of drops into the eyes from a height of 2 angulas. It is the primary method of all ophthalmic medication employed in all eye diseases where doshik vitiation is minimal or roga is of Alpa bala.

#### MODE OF ACTION OF ASCHOTANA

##### Ayurvedic aspect

*Gathwa sandhi sitham ghraanam mukhasrotamsi bsheshajam Urdhwagannayane nyastham apatharpayathe malaan”*

The instilled medicine will penetrate into the sandhi (kaneenika sandhi) where

The medicine is instilled, then to the shukla mandala, then to ghraana, mukha and remove the mala present in urdhwa bhaaga.

Aschotana helps in reducing Ruk, Toda (painful conditions), Kandu (itching sensation), Gharsha (irritation or foreign body sensation), Asru (excessive watering), Daha (Burning Sensation), Raga (Congestion or redness of eyes) Paka, Sopha (features of inflammation).<sup>[15]</sup>

##### Modern aspect

The procedures and forms of the drug are modulated to ensure maximum Absorption. There are several methods of administering ocular drugs which includes Topical or extra ocular drug via either Conjunctival or Epi-scleral absorption (non-corneal) and trans-corneal absorption.

Intra ocular penetration of drug depends on the permeability of the drug across the cornea, anatomical and physiological influences of local environment including lacrimation, tear drainage and composition of per-corneal tear film.

Topical administration of drug into inferior fornix of the conjunctiva is the most common route of ocular drug delivery. Both lacrimation and blinking influence the residence time of the drug in the fornix. Therefore the efficacy of the drug depends on the anatomy and physiology of the lids, the pre corneal tear film, the conjunctiva, cornea and the lacrimal system.

The conjunctival sac has a capacity of approximately 15-20microlitre. Natural tear film volume is 7-8 microliter. Tear turnover is 16% per minute during a normal blink rate of 15-20 blinks per minute. Most solution applicators deliver 50-100 microliter per drop and thus substantial amount of drug is lost through overspill on administration. Turnover of the tears is also highly dependent on environmental conditions particularly dependant on environmental conditions particularly temperature and humidity. The epithelium of conjunctiva is continuous with that of cornea and epidermis of the lid. It contains goblet cells, which produce mucus and are integral part of tear film.

Hence drug absorption through conjunctiva requires transport basically through the epithelium. In sub-conjunctival stroma, which is highly vascular owing to the rich superficial venous plexus and lid margin vessels, drugs may absorb in significant concentration into circulation. After administration into inferior fornix, drugs drain directly through nasolacrimal duct into nose where measurable systemic absorption via nasal and nasopharyngeal mucosa occurs. By varying the form and potency of drug, more residence time in the fornix and more drug absorption is achieved.

## CONCLUSION

In light of the "digital revolution," we are spending more and more time looking at digital devices than ever before. We now have immediate and unlimited access to information and to one another. Sight is the most abused of our five senses as to most of us, computers have become an irreplaceable necessity in our lives at work and home. We need to protect our ocular health and thus prevent the epidemic of the 21st century. The Aschtothana and Ayurvedic therapeutic measures can provide long term relief from the symptoms and maintain our healthy eyesight, hence cost effective than using artificial lubricants for long term use which can even cause toxicity due to preservatives present in them.

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