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A CLINICAL STUDY TO EVALUATE THE EFFECT OF *GHRITKUMARYADI ASCHYOTAN* WITH GLYCERINE (EYE DROPS) IN THE MANAGEMENT OF COMPUTER VISION SYNDROME

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ABSTRACT

Computer Vision Syndrome (CVS) is an emerging occupational health disorder resulting from prolonged use of digital devices, characterized by ocular symptoms such as eye strain, dryness, burning sensation, redness, headache, and blurred vision. In Ayurveda, these features can be correlated with *Shushkakshipaka* and *Vata-Pittaja Netra Vikara*. *Aschyotana* is described as the first line of treatment among *Kriya-Kalpa* procedures for ocular disorders. *Ghritkumaryadi Aschyotana*, owing to its *Snigdha, Sheeta, Ropana and Chakshushya* properties, along with glycerine which enhances lubrication and tear film stability, was selected for the present study. **Material and Methods:** A total 44 patients of age group of 10-60 years presenting with sign and symptoms of computer vision syndrome were selected randomly from OPD of the department of *Shalakya Tantra Netra Roga*. 22 patients of study group were managed from *Ghritkumaryadi Aschyotan* with Glycerine (eye drops) and 22 patients of Control group were managed from *Ghritkumaryadi Aschyotan* (eye drops) only. **Results:** *Ghritkumaryadi aschyotan* with glycerine is more effective as compared to *Ghritkumaryadi Aschyotan* without glycerine. No adverse drug reaction were reported during the study period. **Conclusion:** *Ghritkumaryadi Aschyotana* with glycerine is safe and effective in reducing the signs and symptoms of Computer Vision Syndrome. Its *Vata-Pitta shamaka, Snigdha, and Chakshushya* properties help in restoring ocular comfort and tear film stability, making it a beneficial therapeutic modality for Computer Vision Syndrome management.

KEYWORDS: Computer Vision Syndrome, *Ghritkumaryadi Aschyotan*, Digital eye strain.

INTRODUCTION

Eyes are on of the most advanced sensory organs in the human body, with a significantly larger portion of the brain dedicated to vision compared to other senses like hearing, taste, touch or smell.

चक्षुरक्षायाम् सर्वकालम् मनुष्यैर्यत्नः कर्तव्यो जीविते यावदिच्छा। व्यर्थो लोकोऽयं तुल्य रात्रिन्दिवानाम् पुंसामन्धानाम् विद्यमानोऽपिवित्ते ।।[1]

(A.H.-13/98)

The modern digital era, the extensive and prolonged use of digital screens—computers, smartphones, tablets—has led to a significant increase in visual health complaints, collectively termed Computer Vision Syndrome (CVS) also known as Digital Eye Strain.

According to the American Optometric Association, more than 50% of computer users experience some form of visual discomfort, making Computer Vision Syndrome an increasingly common public health concern,

especially among students, professionals, and individuals engaged in continuous near work.

In Ayurveda, there are many comparable conditions that resembles Computer Vision Syndrome, which are thoroughly discussed in conceptual study.

The eye, being a *Pitta*-predominant organ, is highly sensitive to stress, dryness, and fatigue.

Ghritkumaryadi Aschyotan, a classical Ayurvedic formulation containing *Ghritkumari* (Aloe vera), *Daruharidra* (Berberis aristata), *Madhu* (Honey), and Glycerine, is known for its *Netrya, Shothahara, Ropana, Vrihan, Tridosha-shamaka etc* properties. The combination provides lubrication, anti-inflammatory, antimicrobial, and rejuvenating effects on the ocular tissues. Glycerine, due to its hygroscopic nature, enhances the moistening and soothing properties of the formulation, offering relief in conditions of ocular dryness and strain.

The present clinical study aims to evaluate the therapeutic efficacy of *Ghritkumaryadi Aschyotan* with Glycerine in the management of Computer Vision Syndrome, with an emphasis on subjective and objective parameters. Through this study, an effort is made to bridge traditional Ayurvedic wisdom with modern clinical challenges, offering a safe and effective solution for a lifestyle-induced ocular disorder.

Why *Aschyotan Karma?*

सर्वेषामक्षिरोगाणामादावाश्च्योतनं हितम् ।
रूक्तोदकण्डूघर्षाश्रुदाहरोगनिबर्हणम् ।।[2]

(A.H.Su.-23/1)

a). *Aschyotan* is beneficial at the initial stage of all types of eye disorders. Especially effective in relieving *raktpitta, kandu, gharsha, ashru, daha. Aschyotan* is a crucial procedure among all *Kriya Kalpa* treatments.
Acharya Vagbhatta mentions it as an initial therapy *(Aadya Upakrama)* for all eye diseases. (A. S. Su. 32/5)[3]

b). It can be performed at any time, including emergency situations. It also serves as a treatment method for complications arising from other *Kriya Kalpas* and in severe conditions like *Nayanabhigghata.*

Aschyotan is one of the unique procedure done for the eye disorders. *Aschyotan* is cost effective, safe and easy procedure which can be done by the patient himself/herself in their own homes & it is one of the local therapeutic procedure where exact amount, dosage schedule, frequency have already been mentioned by ancient acharyas.

Therefore, *Aschyotan* is taken as the main treatment approach for a Computer Vision Syndrome.

AIMS AND OBJECTIVES

a). To evaluate the effect of *Aschyotan Kriyakalpa* with *Ghritkumaryadi Aschyotan* (Eye Drops) on computer vision syndrome.
b). To compare the efficacy of *Ghritkumaryadi Aschyotan* with and without glycerine in the management of Computer Vision Syndrome.
C). To study the untoward effects of drugs if any.

Ethical Clearance

The Institutional Ethics Committee was given with an overview of the proposed clinical investigation. Following the chairman of the ethics committee's approval, the clinical trial was started.

MATERIALS AND METHODS

Selection of the patients

Total 44 Patients were selected from the O.P.D of Department of *Shalakya Tantra* (*Netra*). R.G.G.P.G. Ayu. Hospital Paprola, Distt. Kangra Himachal Pradesh. Patients of Computer vision syndrome who attended O.P.D. during this study period were selected for the present study irrespective of age, caste, Gender, race and religion.

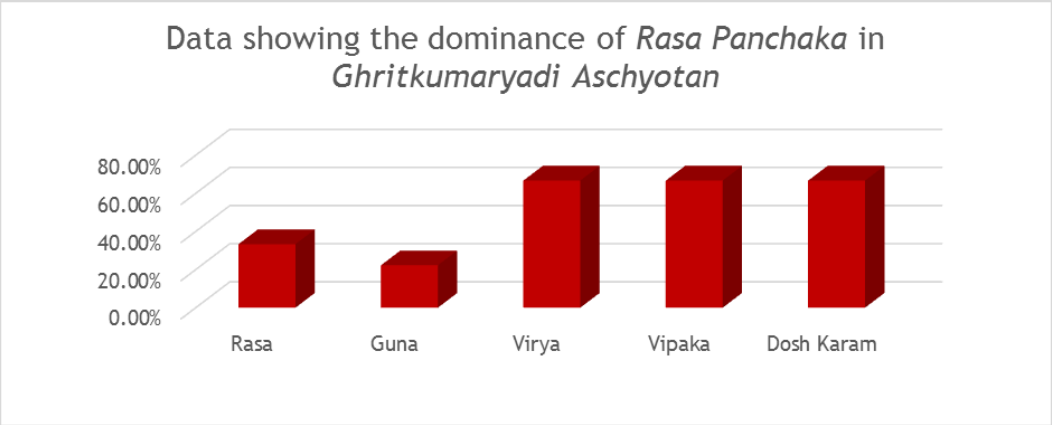
Drug Review

Ingredients of *Ghritkumaryadi Aschyotan* with Glycerine

Sr. No.	Name of the Drug	Botanical name	Family	Part Used	Proportion
1	*Ghritkumari*[4]	*Aloe vera (Linn.)* Burm f.	Liliaceae	*Patra Majja*	10% w/v A.E.
2	*Daruharidra*[5]	*Berberis lycium*	Berberidaceae	Root	0.5% w/v A.E.
3	*Madhu*[6]	Honey			3% w/v
4	Glycerine				1% w/v
5.	Sterile aqueous base (Distilled water)				Q.S.

Data Showing the dominance of *Rasa- Panchaka* in *Ghritkumaryadi Aschyotan*

Rasa	*Madhura, Tikta, Kashya*	33.33%
Guna	*Laghu, Ruksha, Picchil*	22.22%
Virya	*Sheeta*	66.66%
Vipaka	*Madhura*	66.66%
Dosha Karma	*Tridosha Shamaka*	66.66%



Interpretation of *Rasa Panchaka* in *Ghritkumaryadi Aschyotan*

The analysis of *Rasa Panchaka* (i.e., *Rasa, Guna, Veerya, Vipaka,* and *Dosha Karma*) in *Ghritkumaryadi Aschyotan* reveals the following dominant characteristics:

- ***Rasa***

Tikta, Madhura, Kashya Rasa are the dominant *Rasa*, observed in 33.33 % of the ingredients. This indicates a strong potential for anti-inflammatory, cooling, lubrication, nurushing, *Pitta* pacifing and cleansing actions of these *Rasa*.

- ***Guna***

Laghu, Ruksha, Kashya Guna are dominant *Gunas* observed in 22.22 %, *Laghu guna* pacifies *Kapha* and mildly *Pitta*, Allivates eye heaviness caused by prolonged screen time.

Ruksha Guna Pacifies *Kapha*, absorbs moisture. Although *Ruksha guna* is having *Vata* aggravating properties but it is balanced with Glycerine (*Madhura Rasa*) which is added to the formulation.

Kashya guna pacifies *Vata*, provide lubrication, reduces dryness and burning, aids in rejuvenation, counters the *Ruksha and Laghu Guna*.

- ***Virya***

Sheeta (Cold) *Virya i*s dominant at 66.66%, suggesting cooling effects, which are especially helpful in reducing inflammation and irritation in eyes.

- ***Vipaka***

Madhura Vipaka is observed in 66.66% of the contents, it pacifies aggravated *Vata-Pitta*, nourishes and strengthens the ocular tissues, promotes lubrication and healing.

- ***Dosha Karma***

The formulation shows *Tridosha Shamaka* action in 66.66%, highlighting its utility in pacifying *Vata-Pitta-Kapha Doshas*, which are commonly vitiated in inflammatory and infectious eye conditions.

Selection Criteria

Inclusion Criteria

- Patients willing to undergo trial.
- Patients using computer for at least 2 hours per day presenting with the clinical features of computer vision syndrome will be taken into account.
- Age group above 10 years.

Exclusion criteria

- Patients not willing to undergo trial.
- Patients suffering from computer vision syndrome associated with other ocular disease (e.g. conjunctivitis, eyelid disorder, corneal ulcer, lagophthalmos, dacrocystitis and other infective, fungal and allergic conditions).
- Patient suffering from systemic/ metabolic disorders like diabetes, hypertension and cardio vascular disease.
- Patient suffering from moderate to severe anaemia.
- Age group above 60 Years

Sampling Technique

The selected patients were randomly divided into two groups:

Group I (Study Group): 22 Patients were managed by *Ghritkumaryadi Aschyotan* with Glycerine (Eye Drops).

Group II (Control Group): 22 Patients were managed by *Ghritkumaryadi Aschyotan* (Eye Drops).

Method of study

Clinical study accomplished in three phases

1) Diagnostic phase
2) Interventional phase
3) Assessment phase

1). Diagnostic phase

All the patients presenting with the clinical features of Computer Vision Syndrome were diagnosed on the basis of subjective and objective parameters.

Assessment Criteria

The therapeutic outcome was evaluated using both subjective and objective parameters:

A. Subjective Criteria

The clinical features of Computer Vision Syndrome were assessed under subjective criteria. Each symptom was graded or scored based on its severity to facilitate systematic evaluation and comparison.

B. Objective criteria / Investigational criteria

- General Eye examination
- Visual acuity.
- Slit lamp examination
- Schirmer's test.
- Fluorescein staining test.
- TBUT test
- Haematological - CBC, ESR, FBS

Total number of patients: 44

Group I- 22 Patients were given the trial drug *Ghritkumaryadi Aschyotan* with Glycerine(Eye Drops).

Group II - 22 Patients were given *Ghritkumaryadi Aschyotan* (Eye Drops)

Duration of Trial of both groups- 15 days

Dose of both groups-1-2 drops 4-6 times a day

Follow up of both groups – Follow up were done on 7th day, 15th day, and after 7 days of completion of trial.

Consent

A voluntary, signed, witnessed, informed consent /Assent were obtained from the patients.

2. Assessment Phase

Assessment of the clinical symptoms depending on the severity was done according to the scoring pattern given below:

a) Eye strain

It was scored on the basis of minimum time required for producing eyestrain after the computer work

Appears after more than 2 hours of computer work	0
Appears between 1-2 hours of computer work	1
Appear within 1 hours of computer work	2
Appear within 1/2 hours of computer work	3

b) Blurred Vision

Blurred vision was assessed on following grades.

No feeling of blurring of vision	0
Occasional blurring of images	1
Regular blurring of vision which disturbs computer work	2
Regular blurring of vision even without computer work	3

c) Headache

Headache was scored on the basis of frequency of attacks

No Headache	0
Occasional Headache	1
Irregular attacks of frequent Headache	2
Regular attacks of Headache	3

d) Redness

Redness was scored on the basis of frequency of attacks

No Redness	0
Occasional Redness	1
Irregular attack of redness	2
Permanent redness	3

e) Burning Sensation

Burning sensation was scored on the basis of frequency of attacks.

No Burning Sensation in eyes	0
Occasional Burning Sensation in eyes	1
Intermediate burning sensation.	2
Regular Burning Sensation in eyes	3

f) Dry eyes

It was scored on the basis of schirmer strip reading and Tear Break up time (T-BUT)

Shirmer - I reading more than 15mm BUT more than 15 seconds	0
Shirmer - I reading 10-15mm BUT more than 10 second but less than 15 seconds	1
Shirmer - I reading 5-10 mm BUT more than 5 seconds and less than 10 seconds	2
Shirmer - I reading less than 5mm BUT less than 5 second	3

g) Slow refocusing

It was scored on the basis of frequency of occurrence.

No Focusing problem	0
Occasional Slow refocusing	1
Regular slow refocusing without disturbing work	2
Regular slow refocusing which did not allow the work	3

h) Excessive fatigue

Pain was scored on the basis of frequency of attack

No Fatigue	0
Occasional fatigue/pain	1
Regular attack of pain without disturbing computer work	2
Regular attack of pain which did not allow the computer work	3

Statistical Analysis of the Results

The information regarding demographic data was given in percentages. The scoring of criteria of assessment was analyzed statistically in terms of mean values of B.T. (Before Treatment), A.T. (After treatment), S.D. (Standard Deviation) and S.E.(Standard Error). The effect of therapy was assessed by applying students paired t-tests for comparing the before treatment & after treatment scores of assessment criteria. Their significance was estimated by means of the 't' table on (n-1) degrees of freedom. 't' test was carried out at $p<0.05$, $p<0.01$, $p<0.001$. The obtained results were interpreted as:

Insignificant	$p>0.05$
Significant	$P<0.05$ and $p<0.01$
Highly significant	$P<0.001$

Overall effect of therapy

The assessment was done by adopting the following scoring pattern:

Cured	-	100%
Highly improved	-	76-99%
Markedly improved	-	51-75%
Mild improved	-	26-50%
Unimproved	-	<25%

RESULTS AND OBSERVATIONS

Age

Patient between the age group of 10-60 years were selected for the present clinical study. The table shows that majority of the patients 68.1% were reported in the age group of 10-30 years, followed by 25% in the age group of 31-50 years followed by 6.8% in the age group of 51-60 years.

Sex

In present study, majority of patients 63.6% were male followed by 36.3% females.

Above data shows more Prevelance in Males because:

a). Longer Screen Exposure – Males often spend more time on computers for gaming, work, or browsing.

b). More Involvement in Tech-related Jobs – Many males work in IT or screen-intensive professions.

These findings indicating that such conditions are more prevalent during young age because young people spend long hours on phones, computers and tablets for study, work and entertainment.

Religion

In present study, 100% patients were Hindu.

Predominance of Hindu population in the study is attributed to the geographical predominance of Hindu in the selected population. Religion don't have any significant relation to the disease.

Marital status

Present study shows that majority of patients 59% were unmarried followed by 40.9% were married. This is because majority of individuals they were students.

Education

Study shows that majority of patients 54.5% were graduates followed by 34% matriculates followed by 11.3% were post graduates.

Graduates often spend long hours on computer, tablets, phones etc for reading research papers and e-books, writing assignments and thesis, attending virtual classes and meetings, data analysis and programming.

Occupation

Present study shows that majority of patients 52.2% were students followed by 34.1% office employees followed by 13.6% were businessman.

Computer Vision Syndrome is More Prevalent in students because:
Excessive Screen Time – Students spend long hours on digital devices for studying, online classes, and assignments.

Habitat
Present study shows that maximum number of patients 63.6% were residents of rural areas followed by 36.6% were residents of urban area.
Reason being study was conducted in rural area.

Diet
It is observed from the present study that maximum number of patients 52.2% were from vegetarian dietary habits followed by 47.7% with mixed dietary habits.

Since dietary choices depend on personal preference, availability, and religious beliefs, there is no clear evidence that vegetarian individuals are more likely to suffer from Computer Vision Syndrome.

Addiction
In the present study, the maximum number of patients i.e 54.5% were having no addiction, 20.4% were addicted to tea/coffee, 13.6% were alcohol addict and 11.3% were addicted to smoking**.**

Addiction depends upon personal choices so, there is no direct relation between addiction and incidence of computer vision syndrome.

Appetite
In present study, it is observed that majority of patients i.e 70.4% were having normal appetite, however 29.5% of the patients were having reduced appetite.

Appetite depends on various factors like stress, lifestyle activities etc so, There is no direct relation between appetite and incidence of Computer Vision Syndrome.

Socio-economic Status
Study shows that majority of patients 81.8% belonged to middle class followed by 18.1% belonged to lower class.
Computer Vision Syndrome is more prevalant in middle-class families because they have greater access to digital devices (like smartphones, laptops, and tablets) and spend more time using them for work, education, and entertainment, whereas lower-class families may have limited screen exposure due to fewer resources.

Sleep
In present study, it is observed that maximum number of patients i.e 70.4% were having sound sleep followed by 29.5% were having disturbed sleep.

The quality of sleep is influenced by one's Prakriti, surrounding environment, and personal circumstances. Sleep disturbances may also be attributed to factors such as age and modern lifestyle habits. So, there is no direct relation of sleep with CVS.

Prakriti
Study shows that maximum number of patients i.e 52.2% were having Vata-Pitta prakriti followed by 31.8% were having Pitta-Kapha prakriti and 15.9% were having Vata-Kapha prakriti.

Accoprding to ancient ayurvedic texts, an imbalance or increase in Vata-Pitta doshas is the primary cause of Computer Vision Syndrome. While this study's limited sample size prevents a conclusive link between body constitution and the development of Computer Vision Syndrome, the result indicate that the condition appears more frequently in individuals with a Vata dominant Pitta imbalance.

Socio-economic Status
Patients were classified economically as follows: 81.8% belonged to the middle class, 18.1% belonged to lower class. Computer Vision Syndrome is more prevalant in middle-class families because they have greater access to digital devices (like smartphones, laptops, and tablets) and spend more time using them for work, education, and entertainment, whereas lower-class families may have limited screen exposure due to fewer resources.

Appetite
Normal appetite was reported by 70.4% of participants, whereas 29.5% experienced a decrease in appetite. Appetite depends on various factors like stress, lifestyle activities etc so, There is no direct relation between appetite and incidence of Computer Vision Syndrome.

Sleep
A majority of 70.4% of patients had normal sleep while 29.5% of patients had disturbed sleep. The quality of sleep is influenced by one's Prakriti, surrounding environment, and personal circumstances. Sleep disturbances may also be attributed to factors such as age and modern lifestyle habits. So, there is no direct relation of sleep with CVS.

Refractive error
In present study it is observed that majority of the patients i.e 70.4% were having no refractive error while 29.5% were having refractive error, because majority of patients taken for the study were young and had no refractive error.

Bowel Habit
Analysis shows that majority of patients i.e 75% had regular bowel habits while 25% of patients had irregular bowel habits. Bowel habits depends on dietary habits,

hydration, Stress level etc. so, there is no direct relation between bowel habits and incidence of Computer Vision Syndrome.

Time spent in front of Visual display units

Analysis shows that maximum number of patients i.e 63.6% spent 6-10 hrs in front of Visual Display Units followed by 22.7% spent 2-5 hrs in front of Visual Display Units followed by 13.6% spent more than 10 hrs in front of Visual Display Units.

The majority of people spend 6–10 hours daily on computers, phones, or tablets because of the growing dependence on digital technology for work, online education, social interaction, and entertainment. Office employees' jobs and students' online classes usually run from 9 AM to 5 PM, which is why they typically spend 6 to 10 hours in front of visual display units.

Signs and Symptoms

Symptomatology wise distribution reveals that 100% was of Eye strain, Headache and Dry eyes, 98.8% Blurred vision, 93.1% Burning sensation, 92% Redness, 90.9% of excessive fatigue and Slow refocusing.

Effect of therapy on clinical symptomatology in Group I

Clinical observations pertain to a total of 80 eyes from 40 patients who completed the full duration of the treatment.

Group 1 consists of 20 patients who completed the trial.
Group 2 consists of 20 patients who completed the trial.

Clinical Features	N	Mean Score		D	% Relief	S.D.±	S.E.±	't'	P
		BT	AT						
Eye strain	20	1.9	0.4	1.8	94.7	0.48	0.10	15.0	p=<0.001
Blurred vision	19	1.3	0.2	1.1	84.6	0.41	0.09	12.5	p=<0.001
Headache	20	1.5	0.3	1.2	80	0.41	0.09	13.0	p=<0.001
Redness	16	0.8	0.1	0.7	87.5	0.25	0.06	15.0	p=<0.001
Burning sensation	17	0.9	0.1	0.8	88.8	0.50	0.12	8.24	p=<0.001
Dry eyes	20	1.5	0.1	1.4	93.3	0.48	0.10	12.33	p=<0.001
Slow refocusing	16	1.3	0.5	0.8	70.5	0.25	0.06	15.00	p=<0.001
Excessive fatigue	16	1.1	0.2	0.9	61.8	0.25	0.06	17.00	p=<0.001

Effect of therapy on clinical symptomatology in Group II

Clinical Features	N	Mean Score		D	% Relief	S.D.±	S.E.±	't'	P
		BT	AT						
Eye strain	20	1.8	0.3	1.5	83.3	0.41	0.09	13.07	p=<0.001
Blurred vision	20	1.3	0.5	0.8	61.5	0.36	0.08	10.37	p=<0.001
Headache	20	1.8	0.4	1.4	77.7	0.51	0.11	12.70	p=<0.001
Redness	17	0.9	0.2	0.7	77.7	0.39	0.09	8.64	p=<0.001
Burning sensation	17	0.9	0.1	0.8	88.0	0.20	0.20	8.74	p=<0.001
Dry eyes	20	1.5	0.4	1.1	63.3	0.44	0.10	11.00	p=<0.001
Slow refocusing	17	1.2	0.5	0.7	63.3	0.39	0.09	8.64	p=<0.001
Excessive fatigue	16	1.1	0.4	0.7	58.6	0.34	0.08	10.24	p=<0.001

Effect of therapy

Effect on Eye strain

The mean scores obtained before the trial in group I and group II were 1.90 and 0.41 and after trial the mean scores were reduced to 1.80 and 0.31 respectively.

• The percentage relief was 94.7% in group I which was highly significant (p<0.001) 't' 15.0, SE ± 0.10

• The percentage relief in group II was 83.3% which was also highly significant
(p<0.001), 't' 13.07, SE ± 0.09

This may be because of anti-inflammatory, lubricating and hydrating effect of the formulation.

Effect on Blurred vision

The mean scores obtained before the trials in group I and group II were 1.3 and 1.3 and after trial the mean score were reduced to 0.2 and 0.5 respectively.

• The percentage relief was 84.6% in group I which was highly significant (p<0.001), 't' 12.5, SE ± 0.09

• The percentage relief was 61.5% in group II which was significant (p<0.05), 't' 10.37, SE ± 0.08

This effect may be because it Nourishes and protects the eyes (*Netrya* & *Rasayana* properties), Clears ocular channels (*Srotoshodhana*), Stabilizes tear film and improves light refraction.

Effect on Headache

The mean scores obtained before the trials in group I and II were 1.50 and 1.85 and after trial the mean scores were reduced to 0.3 and 0.4 respectively.

• The percentage relief was 80% in group I which was statistically highly significant (p< 0.001), 't' 12.70, SE ± 0.11

This may be due to *Tridosha Shamana* (especially Vata-Pitta), *Netrya* and *Rasayana*, *Shothahara* and *Ropana* properties, Cooling & Soothing action of the formulation.

Effect on Redness

The mean scores obtained before the trials were 1.00 and 1.11 and after trial mean score were reduced to 0.1 and 0.2 respectively.

• The percentage relief was 87.5% in group I which was statistically highly significant ($p < 0.001$), 't' 15.0, SE ± 0.06

• The percentage relief in group II was 77.7% which was also statistically highly significant ($p < 0.001$), 't' 8.64, SE ± 0.09

This effect may be because of *Pitta-Rakta Shamana*, *Shothahara* & *Ropana*, Antibacterial & Cooling, Moisturizing properties of formulation.

Effect on Burning sensation

The mean scores obtained before the trial in group I and II were 1.11and 1.05 and after trial were reduced to 0.11 and 0.05 respectively.

• The percentage relief was 88.8% in group I which was statistically highly significant ($P < 0.001$), 't' 8.74, SE ± 0.20

This may be due to *Sheeta* (cooling), *Shothhara* (anti-inflammatory), *Snigdha* (lubricating), *Ropana*(healing) properties of this formulation.

Effect on Dry eyes

The mean scores obtained before the trials were 1.50 & 1.50 and after the trial were reduced to 0.15 and 0.40 in groups I and II respectively.

• The percentage relief was 93.3% in group I which was statistically highly significant ($p < 0.001$), 't' 12.33, SE ± 0.10

• The percentage relief in group II was 73.3% which was also statistically highly significant ($p < 0.001$), 't' 11.00, SE ± 0.10.

This may be due to lubricating, mousterizing, healing, anti-inflammatory, properties of this formulation.

Effect on Slow refocusing

The mean scores obtained before the trials were 1.62 & 141 and after the trial were reduced to 0.68 and 0.58 in groups I and II respectively

• The percentage relief was 70.5% in group I which was statistically highly significant ($p < 0.001$), 't' 15.00, SE ± 0.09

• The percentage relief in group II was 63.3% which was statistically significant ($p < 0.005$), 't' 8.64, SE ± 0.06

This effect may be due to *Shothhara* (anti-inflammatory), *Rasayana* (rejuvenating), *Vata-pitta* pacification properties of the drug.

Effect on Excessive Fatigue

The mean scores obtained before the trials were 1.37& 1.37 and after the trial were reduced to 0.31 and 0.50 in groups I and II respectively.

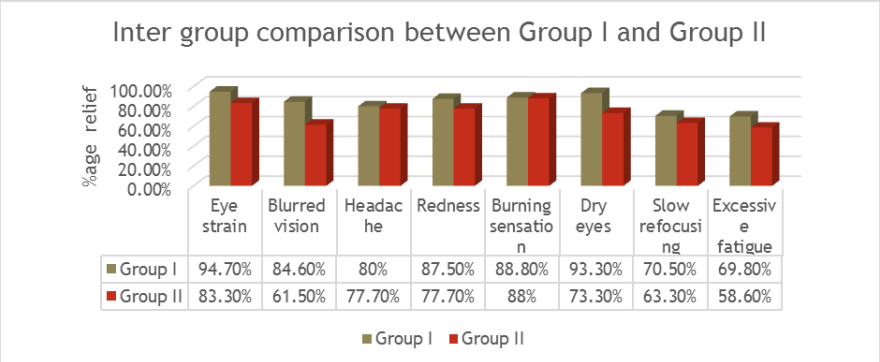
• The percentage relief was 61.8% in group I which was statistically significant ($p < 0.005$), 't' 17.00, SE ± 0.06

• The percentage relief in group II was 58.6%which was also statistically significant ($p < 0.005$), 't' 10.24, SE ± 0.08

This effect may be due to soothing, nourishing, cooling, anti-inflammatory action of the drug.

Inter group comparison between Group I and Group II.

Parameters	%age Relief		% of difference	S.D ±	S.E ±	t	P	Results
	Group I	Group II						
Eye strain	94.7 %	73.3%	11.4%	0.29	0.22	0.29	0.04	S.
Blurred vision	84.6 %	61.5 %	23.1%	0.28	0.18	0.58	0.01	S.
Headache	80 %	77.7 %	2.3%	0.52	0.20	-1.10	0.60	N.S.
Redness	87.5%	77.7%	9.8%	0.52	0.19	0.00	0.80	N.S.
Burning sensation	88.8%	88.0%	0.8%	0.53	0.20	0.00	1.00	N.S.
Dry eyes	93.3%	73.3%	20%	0.28	0.22	0.10	0.02	S.
Slow refocusing	70.5%	63.3%	7.2%	0.58	0.22	0.50	0.72	N.S.
Excessive fatigue	69.8%	58.6%	11.2%	0.57	0.24	1.2	0.41	N.S.



Inter group comparison between Group I and Group II on various parameters

Eye strain

- Statistically comparative study between Group I and Group II was significant. (S.D. ± - 0.29, t- 0.29, p<0.05)

Blurred Vision

- Statistically comparative study between Group I and Group II was significant. (S.D. ± -0.28, t- 0.58, p <0.05)

Headache

- Statistically comparative study between Group I and Group II was not significant. (S.D. ± - 0.52, t- -1.1, p >0.05)

Redness

- Statistically comparative study between Group I and Group II was not significant. (S.D. ± - 0.52, t- 0.00, p >0.05)

Burning sensation

- Statistically comparative study between Group I and Group II was not significant. (S.D. ± - 0.53, t- 0.00, p >0.05)

Dry eyes

- Statistically comparative study between Group I and Group II was significant. (S.D. ± - 0.28, t- 0.22, p <0.05)

Slow refocusing

- Statistically comparative study between Group I and Group II was not significant. (S.D. ± - 0.58, t- 0.50, p >0.05)

Excessive fatigue

- Statistically comparative study between Group I and Group II was not significant. (S.D. ± - 0.57, t- 1.2, p >0.05)

Overall effect of Therapy

- No patient was cured in both group.
- 17 patients (85%) in Group I and 8 patients (40%) in Group II were markedly improved. The intergroup difference was 45% only.
- 3 patients (15%) in Group I and 12 patients (60%) in Group II were moderately improved. The intergroup difference was 45% only.

No patient was remained Unchanged in either groups.

Inference

- *Ghritkumaryadi Aschyotan* with Glycerine (Group I) was significantly more effective than the same formulation without Glycerine (Group II).
- 85% of patients in Group I showed marked improvement, compared to only 40% in Group II.
- Conversely, 60% of patients in Group II only showed moderate improvement, while only 15% in Group I fell in this category.
- No patients remained unchanged or fully cured in either group, suggesting the treatment is effective but not curative.

DISCUSSION

Probable Mode of Action Of *Ghritkumaryadi Aschyotan*

Ghritkumaryadi Aschyotan (eye drops) has got predominance of *Madhura, Kashaya, Tikta Rasa* (33.33%), *Laghu, Ruksha, Picchila Gunas* (22.22%), *Sheeta Virya* (66.66%) and *Madhura Vipaka* (66.66%). Hence it acts as *Tridoshashamaka*. It is a combination of three drugs with the properties mainly *Sheeta Virya, Chakshushya, Balya, Rasayana, Tridoshahara* etc.

The trial drug is
Vata Shamaka by (77.77%) by virtue of its *Rasa,Guna, Virya* and *Vipaka.*
Pitta Shamaka (100%) by virtue of its *Rasa, Guna,Virya* and *Vipaka*.
Kapha Shamaka (77.77%) because of its *Rasa, Guna, Virya* and *Vipaka*.

Thus the overall effect of the compound drug is *Tridosha Shamaka* and hence it disintegrates the pathology of the disease Computer Vision Syndrome, which is *Vata* dominant *Pitta Vyadhi* in its manifestation.

	Action	Role on Computer vision syndrome
Ghritkumari (Aloe vera)	*Sheetala, Tridoshaghna, Vrihana, Rasayana*	Soothes irritated eyes, reduces inflammation, and promotes tissue repair in tired eyes.
Daruharidra (Berberis aristata)	*Chakshushya, Krimighna, Raktashodhaka, Lekhana*	Reduces redness, fights infections or allergens, clears ocular discharge and supports eye health
Madhu (Honey)	*Yogavahi, Ropana, Lekhana, Tridoshaghna*	Acts as a carrier (*Yogavahi)* to enhance drug absorption, lubricates dry eyes, and promotes healing of ocular surface.
Glycerine (Modern adjuvant)	Humectant, Lubricant, Hydrating agent	Provides moisture to the eyes, helps in tear film stability, relieves dryness and irritation caused by screen exposure.

CONCLUSION

1. *Ghritkumaryadi Aschyotan*(eye drops) with Glycerine demonstrated effectiveness in alleviating several symptoms of Computer Vision Syndrome, including eye strain, blurred vision, headache, redness, burning sensation, dry eyes.
2. The response of the drug was relatively lower in treating symptoms such as slow refocusing and excessive fatigue when compared to its effectiveness on other signs, because slow refocusing and excessive fatigue have neuromuscular involvement, needing sustained *Rasayana*-like action which requires time to manifest clinically.

Future clinical trials should be conducted using *Ghritkumaryadi Aschyotan* with glycerine for a longer duration, so that its therapeutic effects on symptoms like slow refocusing and excessive fatigue can be properly evaluated. The current trial duration of 15 days was relatively short, which may not be sufficient to observe significant improvements in these deeper, neuromuscular symptoms

3. No adverse reactions were observed during or after the course of treatment, indicating its safety and tolerability.

In conclusion, the study's results indicate that *Ghritkumaryadi Aschyotan* (eye drops) with Glycerine is a promising and cost-efficient Ayurvedic remedy for managing Computer Vision Syndrome. It serves as a potential alternative to conventional treatments.

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