

## A THERAPEUTIC STUDY ON THE EFFICACY OF AMALAKI RASYANA AND TRATAKA KARMA IN COMPUTER VISION SYNDROME

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### ABSTRACT

*Acharya Vagbhata* quotes that loss of vision is a loss of life. With the change in time, our daily activities had also changed, and the use of eyes has too faced a drastic change. Due to this modern era disease like Computer Vision Syndrome (CVS) has come into existence. Approximately 60 million people suffer from Computer Vision Syndrome globally, which leads to a decrease in productivity at work and people's quality of life. Till today no permanent remedy has been prescribed for the cure of CVS only temporary cure is available, giving room to understand the diseases through *Ayurved* spectacles as a science of life. The present research trial is a randomized parallel-group study consisting of 45 patients in total and 15 patients in each group on a random basis. In Group-A patients were advised to practice *Trataka karma* once a day & two capsules of *Amalaki Rasayan* twice in a day with lukewarm water. In Group B patients were given two capsules of *Amalaki Rasayan* twice a day with lukewarm water. In Group C patients were advised to practice *Trataka karma* once a day. After the enrollment of patients, signs and symptoms were assessed both subjectively and objectively before and after treatment. The study verified the hypothesis that CVS in *Ayurvedic* perspective is a *Vata-Pitta Phradhan Tridosaja Netra Roga* affecting mainly the eyes and body as a whole and needs a systemic and *yogic* intervention for the cure of patients.

**Keywords:** Computer Vision Syndrome, *Trataka karma*, *Amalaki Rasayan* & *Vata-Pitta Pradhan Tridosaja Netra Roga*, systemic and *yogic* intervention.

## INTRODUCTION

Acharya Vagbhat quotes that loss of vision is a loss of life<sup>1</sup>. Vision is our primary connection with this world. Eyes can sense about 10 million gradations of light and nearly 7 million different shades. The shifting in our daily needs from paper to the computer has created much pressure on our visual apparatus. Due to this modern era disease like Computer Vision Syndrome has come into existence. Computer Vision Syndrome is a visual ocular and systemic symptom due to improper and prolonged use of working on video display terminals (VDT). Approximately 60 million people suffer from Computer Vision Syndrome globally, which leads to a decrease in productivity at work and people's quality of life<sup>2</sup>.

A recent survey indicates that eye strain is the complaint of more than 80% of people who work for long hours on computers. One survey on Computer Vision Syndrome was held in Jamnagar (India), in which 485 out of 1205 computer professionals were having CVS symptoms, which means 40.24% of the total surveyed population has shown the occurrence of CVS in Jamnagar<sup>3</sup>. A pilot survey conducted in India's metropolitan cities reveals a 70% incidence of Computer Vision Syndrome among computer users<sup>4</sup>. Till today no permanent remedy has been prescribed for the cure of CVS, giving room to understand the diseases through *Ayurved* spectacles as a science of life. So, to find a better solution to this burning problem, this study was designed.

In the present clinical studies, *Amalaki Rasayana* has been used as a medication *Amalaki* being a *Chaksusya drvya* will significantly affect the eyes, and when it is used in form of *rasayana*, its potency increases several folds<sup>5</sup>. *Trataka kriya* has been described by *Acharyas* as "*divyadrashiti prajayate*" so it strengthens the ocular muscles and will provide relief from the symptoms of CVS. By keeping this concept in mind, to evaluate the role of this therapy in Computer Vision Syndrome, a study was planned with the following aims and objectives.

### AIM & OBJECTIVES

1. Hypothesize the *samprapti ghataka* (Pathophysiology) of computer vision syndrome according to

*Ayurved* classics.

2. To collect all the references of computer vision syndrome and its related diseases in *Ayurved* classics.
3. To evaluate the efficacy of *Amalaki Rasayan* and *Trataka karma* in reliving the sign and symptoms of computer vision syndrome.

### Sign & Symptoms of Computer Vision Syndrome

Red eyes, burning eyes, Itching eyes, Eye Strain, Blurred near and distant vision, Difficulty in focusing, Double vision, Squint, Headache, Neck pain /Shoulder pain/back pain, Fatigue, Dryness in eyes

### MATERIALS & METHODS

#### Study design -

The present research trial is a randomized parallel-group study consisting of 45 patients in total irrespective of their sex, religion, gender, caste, and occupation. It consists of three groups with 15 patients in each group.

Diagnosed patients who fulfilled the inclusion criteria were divided into the following groups.

**Group A** – Consist of 15 patients selected on a random basis, patients were advised to practice *Trataka karma* once a day & two capsules of *Amalaki Rasayan* twice in a day with lukewarm water.

**Group B** – Consist of 15 patients selected on a random basis, patients were given two capsules of *Amalaki Rasayan* twice a day with lukewarm water. (1 capsule is of 500 mg)

**Group C** – Consist of 15 patients selected on a random basis, patients were advised to practice *Trataka karma* once a day.

#### Selection of patients -

Patients were selected from the OPD of the Department of *Swasthavritta*, Room no 11 Hospital of University College of *Ayurved*, Karwar, Jodhpur.

**Collection of trial drug** – Trial drug *Amalaki Rasayan* was prepared in the Pharmacy of University College of *Ayurved*, Jodhpur. Video for eye exercise and *Bindu Trataka* was prepared by the research scholar under the guidance of a research guide.

**Inclusion Criteria**

- ❖ An adult person who has screen timing more than 3 hours per day shows any ocular or extraocular signs and symptoms related to Computer Vision Syndrome.
- ❖ People between ages 18 to 50 years.

**Exclusion Criteria**

- ❖ Persons below 18 years and above 50 years of age.
- ❖ A patient suffering from any systemic or metabolic disorders.
- ❖ Patients complicated with acute, chronic, infective conjunctivitis any specific eyelids disorders, corneal ulcers, dacryocystitis & lagophthalmos.
- ❖ A patient who has undergone any eye surgery.
- ❖ Using topical medium for a long time.

**Consent to participate in the study** - The patients were given necessary details about the present research work including merit and demerit of research work, about trial drug its duration, and route of administration. A detailed consent form was prepared and was signed by the patient, research scholar, and research guide before starting the trial.

**Follow up** –Three follow-ups of patients was scheduled after every 15 days and a detailed record of every visit of the patient is documented.

**Duration of trial**- The duration of the trial is of 45 days.

**Withdrawal criteria** –

- If any adverse effect occurs due to treatment.
- The occurrence of any acute or severe illness.

- The patient who doesn't visit in the subsequent follow-up.
- The patient is not willing to continue treatment.

**Method of study** –

**Diagnosis of the patient**

Computer vision syndrome has not had any clear-cut diagnostic criteria till now, so it has to be diagnosed mostly based on signs & symptoms. In the present study, some investigations were conducted to exclude other systemic and local eye pathology. Gradual changes in signs and symptoms were recorded in the Case report form prepared based on *Ayurved* and modern parameters.

The criteria adopted for the diagnostic purpose in the present study are as follows –

- a) Clinical features of Computer vision syndrome were assessed
- b) Schirmer, I test
- c) Visual acuity

**Medical intervention:** *Amalaki Rasayan* and *Trataka karma* were used as medical interventions in the present research work.

**Assessment**

Self-grading of all the symptoms of Computer vision Syndrome was done. Symptoms were assessed both before treatment and after treatment assessment of therapy was done on this basis.

0	Not present
1	After focusing on the screen for 3 hours or more
2	Focusing less than 3 hours
3	Present all time even without focusing the screen

2) Schirmer, I test was done before and after treatment to rule out the level of dryness in the eyes.

**Selection of Drug** - *Amalaki*, as we know have properties to strengthen the *indriyas*<sup>6</sup> hence it is considered one of the best remedies for ocular problems. It provides nourishment to the eyes and helps them to cope with the excessive stress due to prolonged work. *Amalaki* is used in the form of *Amalaki Rasayan* which is

prepared by giving 21 *bhavana* of *amalki swarasa* in *Amalaki churna*. *Amalaki* consists of *Chaksusya* properties and if we follow the procedure stated by *Acharya Charak*<sup>7</sup> it will lead to an increase in its efficacy several times which makes it more potent in the treatment of Computer Vision Syndrome. *Churana* of *Amalaki Rasayana* was sundried and pulverized into fine powder. The powder was packed in capsules of

500 mg each. A pack containing 60 capsules was packed.

### Trataka karma

Trataka Karma in the present study was performed in the following steps

- 1) Pre- Trataka karma
- 2) Trataka karma
- 3) Post-Trataka karma

Trataka karma is performed in the form of Bindu Trataka in the present research work. The procedure was provided in form of a video to the patients to make it convenient for the patients.

### OBSERVATIONS

It revealed that the incidence of CVS was higher i.e., 55.55% in the age group of 18 – 30 years, was 60.00%

in males and 86.67% in Hindus. The majority of the patients i.e., 46.67% were students, 51.11% were married, 57.76% belonged to a middle class, most of them i.e., 62.22% were vegetarian and 55.56% had good sleep and 44.45% had a good appetite, 66.67% had regular bowel habits. Most of them i.e., 46.67% were using a computer for 6 hrs - 8hrs/day & 73.33% were using computers in non-ideal placements, 80.00% were had is < 20cm distance from the screen to the user, 60.00% were working in non-uniform illumination. The majority of patients i.e., 51.11% were not using spectacles & 91.11% were right eye dominant. Majority of patients i.e., 51.11% had *sharir prakriti as Vata-Pitta prakriti* & 77.78% had *Mansik prakriti as Rajsika*.

### Clinical profile

**Table – 01:** Distribution based on chief complaints of the patient

S. No	Chief complaints	Total in %
1.	Red eyes	82.22%
2.	Burning eyes	73.33%
3.	Itching eyes	48.88%
4.	Eyestrain	95.55%
5.	Blurred vision	68.89%
6.	Difficulty in focusing	42.22%
7.	Double vision	22.22%
8.	Squinting	8.88%
9.	Headache	60.00%
10.	Neck/ Shoulder/Back pain	31.11%
11.	Fatigue	48.89%
12.	Dryness in eyes	100%
13.	Near vision	6.66%
14.	Far vision	71.11%

### Results –

Data collected in the present research work was subjected to statistical test and analyzed in the following way –

1. Subjective criteria – Wilcoxon matched-pair signed-rank test
2. Objective criteria - Student t-test

### Interpretation of Result –

- 1) On the basis of **P** value – Non – significant ( $p > 0.05$ ), Significant ( $p < 0.05$ ),

Highly – significant ( $p < 0.001$ )

- 2) Based on the percentage improvement in statistically analyzed data –

Completely Cured (100%), Marked improvement (76 % to 99%), Moderate improvement (51% to 75%), Mild improvement (26% to 50%), Unchanged (25% to no change)

### Effect of therapy –

45 patients were registered in the research work all patients completed the whole course of the treatment.

**Effect of therapy on the subjective (Non – parametric) data**

**Table – 02:** Effect of therapy on Group A –

Chief Complains	'n'	Mean score			% Difference	W value	P value	Result
		BT	AT	Diff.				
Red-eye	13	1.667	0.4000	1.267	76.00 %	78	0.0001	H. S
Burning eye	14	1.867	0.8000	1.067	57.15%	66	0.0005	H. S
Itching eye	7	1.000	0.6000	0.4000	40.00%	21	0.0313	S
Eyestrain	15	2.000	0.2000	1.800	90.00%	78	0.0005	H. S
Blurred vision	11	1.067	0.0666	1.000	78.00%	78	0.0002	H. S
Focusing difficulty	6	0.6000	0.0666	0.5333	88.88%	15	0.0313	S
Double vision	3	0.3333	0.2000	0.1333	39.99%	1	>0.999	N. S
Squint	0	-	-	-	-	-	-	-
Headache	13	1.467	0.2667	1.200	81.79%	45	0.0039	H. S
Neck/Back pain	3	0.333	0.1333	0.2000	60.06%	3	0.2500	N. S
Fatigue eye	6	0.800	0.266	0.5333	67.28%	15	0.0313	S

**Table – 03:** Effect of therapy on Group B –

Chief Complains	'n'	Mean score			% Difference	W value	P-value	Result
		BT	AT	Diff.				
Red-eye	13	1.400	0.333	1.067	76.21%	66	0.0005	H. S
Burning eye	11	1.200	0.400	0.800	66.66 %	36	0.0078	H. S
Itching eye	6	0.666	0.133	0.533	79.99%	21	0.0313	S
Eyestrain	14	1.467	1.067	0.400	27.26%	27	0.0273	S
Blurred vision	7	0.533	0.066	0.466	87.51%	21	0.0313	S
Focusing difficulty	6	0.666	0.400	0.266	40.00%	6	0.2500	N. S
Double vision	2	0.200	0.133	0.066	33.33%	1	0.5000	N. S
Squint	1	0.200	0.133	0.066	33.33%	1	0.5000	N. S
Headache	10	1.133	0.266	0.866	76.49%	36	0.0078	H. S
Neck/Back pain	4	0.400	0.200	0.200	50%	3	0.2500	N. S
Fatigue eye	6	0.733	0.533	0.200	27.27%	3	0.5000	N. S

**Table – 04:** Effect of therapy on Group C –

Chief Complains	'n'	Mean score			% Difference	W value	P value	Result
		BT	AT	Diff.				
Red-eye	11	1.333	1.067	0.266	20.00%	10	0.0625	N. S
Burning eye	8	0.800	0.600	0.200	52.50%	1	0.9999	N. S
Itching eye	9	0.933	0.466	0.466	50.00%	28	0.0078	S
Eyestrain	14	1.667	1.467	0.200	11.99%	6	0.1250	N. S
Blurred vision	13	1.200	0.733	0.466	38.89%	28	0.0156	H. S
Focusing difficulty	7	1.000	0.400	0.600	60.00%	21	0.0313	S
Double vision	5	0.600	0.333	0.266	44.45%	3	0.5000	N. S
Squint	3	0.333	0.200	0.133	40.03%	3	0.2500	N. S
Headache	4	0.533	0.400	0.133	24.99%	3	0.5000	N. S
Neck/Back pain	7	0.733	0.600	0.133	18.17%	3	0.2500	N. S
Fatigue eye	10	1.067	1.000	0.066	6.24%	1	0.5000	N. S

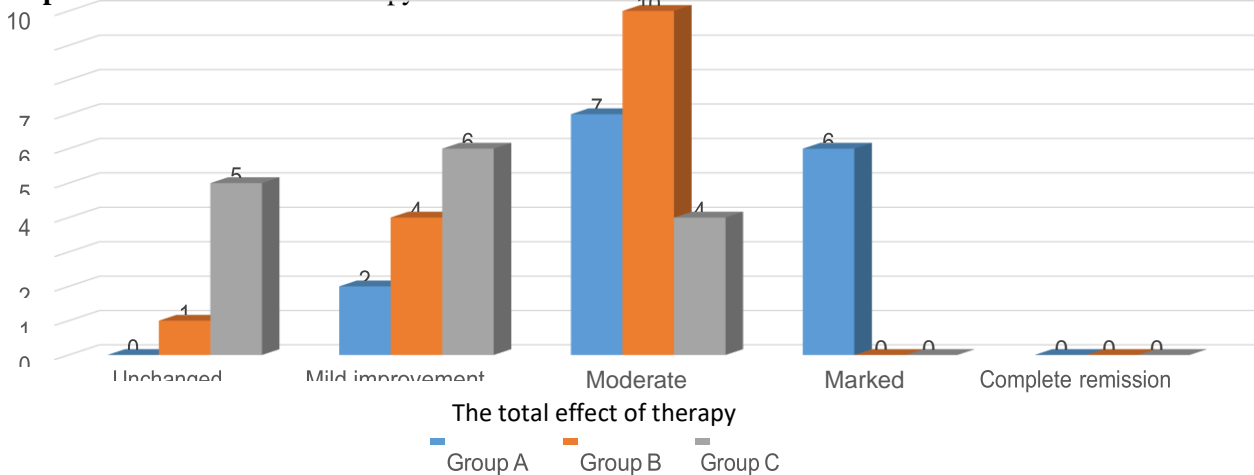
**Table – 05:** Effect of therapy on objective (parametric) data –

Group	'n'	Mean Score			% difference	S. D	S. E	t value	P value	Result
		B. T	A. T	Diff.						
A	15	1.800	0.400	1.400	77.77 %	0.5071	0.1309	10.693	<0.001	H. S
B	15	1.533	0.733	0.800	52.18 %	0.6761	0.1746	4.583	0.0002	H. S
C	15	1.933	1.400	0.533	27.58 %	0.5164	0.1333	4.000	0.0007	S

**Table – 06:** The total effect of therapy –

S.no	Category	Group A		Group B		Group C	
		No. of cases	Percentage	No. of cases	Percentage	No. of cases	Percentage
1.	Unchanged	00	00	01	6.66%	05	33.33%
2.	Mild improvement	02	13.33%	04	26.67 %	06	40.00 %
3.	Moderate improvement	07	46.67%	10	66.67%	04	26.67 %
4.	Marked improvement	06	40.00 %	00	00	00	00
5.	Complete remission	00	00	00	00	00	00

**Graph -01:** Total Effect of Therapy



## DISCUSSION

### Demographical Discussion –

A higher incidence in the students of the age group of 16-35 years (*Taruna*) may be due to increased screen time in youngsters because due to pandemic all the academic activities have become online, and it has also headed to a sedentary lifestyle. Higher incidence in males indicates the unequal male and female ratio in the working class of the sample taken in the present study. The majority of Hindu patients of vegetarian dietary habits are due to the surrounding population of

the DSRRAU Hospital which has a more Hindu population. More ratio of middle economic class married people indicates the increased continuous use of VDUs i.e., approx. 6 to 8 hours per day among working-class people due to work from home conditions in the present time. Most of the patients had non-ideal placements of computers in their workplace which leads to worsening the symptoms of CVS and increasing the severity of symptoms day by day. Less distance of the screen increases fatigue and strain in eyes, bad illumination condition leads to blurred vision and glare in eyes which is a crucial reason behind CVS, use of a chair without hand and back support leads to pain in

neck and back of the patient. In the present research work majority of patients were having *vata pita* dominant *sharir prakriti* which reveals that CVS is a *vata pitta Pradhan tridoshaja* disorder and *vata pita prakriti* people are more prone to this disease. The predominance of *Rajasika Mansik prakriti* shows the tendency of attraction towards gadgets and this addiction worsens the symptoms.

#### Discussion on Clinical Features –

**1. Effect on the Red eye –** *Amalaki Rasyana* had a good impact in relieving the symptom of redness in the eyes as *Amalaki* contain vitamin A which helps to maintain conjunctival epithelium integrity and reduce redness in the eyes.

**2. Effect on the Burning eye-** This occurs due to *vata pita dosha*. *Amalaki Rasyana* contains *Amalaki* as its only ingredient which contains *amla rasa* that stabilizes the vitiated *vata* and due to *madhur rasa* and *shitha virya*<sup>8</sup> it stabilizes the vitiated *pitta* hence *Amalaki Rasyana* is a *vata pita ghana* and a very good *daha prashamak*.

**3. Effect on Itching eye –** *Amalaki Rasyan* contains Vitamin C which acts as the best anti-allergic drug and provides relief in the itching symptom. According to *Ayurved* itching is due to vitiation of *kapha dosha*, *Amalaki* due to *kashaya rasa* and *ruksha guna* it stabilizes the vitiated *kapha*<sup>9</sup> and provides relief in itching. *Trataka karma* promotes lacrimation in the eyes which neutralizes the dryness of the ocular surface and flushes out all the allergic causing particle from the ocular surface and pacify the itching of the eyes.

#### 4. Effect on Eye Strain –

It indicates that *Amalaki Rasyan* had a good impact in relieving the symptom of eye strain as *Amalaki* contain vitamin C and vitamin E and other antioxidants nourish sclera, cornea as well as intraocular contents, especially uveal tract and lenses.

#### 5. Effect on Blurred vision –

It indicates that *Amalaki Rasyan* is mentioned as means it provides strength to all *indriyas* including *Chaksu indriya*. According to *Ayurved*, it is due to *pitta dosha*, *Amalaki* contains *madhur rasa* and *shitha virya* it stabilizes the vitiated *pitta* hence *Amalaki Rasyana* works as *pita ghana* and helps in relief of the

above symptom<sup>10</sup>. *Trataka karma*<sup>11</sup> has been quoted as “*Divya Drushti prajayate*” which means it heals up all the eye-related problems and provides us “*Divya Drushti*.”

#### 6. Effect on Focusing difficulty –

It indicates that *Amalaki Rasyan* strengthens the first *patala* of eyes and ocular muscles in the second *patala* of eyes which are the most severely affected part in the eyes. According to *Ayurved*, it is due to *vata dosha*, *Amalaki* contains *amla rasa* that stabilizes the vitiated *vata* hence *Amalaki Rasayana* works as *vata ghana* and helps in relief of the above symptom<sup>12</sup>. *Trataka karma* helps in improving the tone of intraocular muscles which provides relief in focusing difficulty<sup>13</sup>.

#### 7. Effect on Double vision –

The present research work doesn't provide significant results in all three groups in this symptom. It may be due to fewer patients having such complaints.

#### 8. Effect on Squint –

The present research work doesn't provide significant results in all three groups in this symptom. It may be due to fewer patients having such complaints.

#### 9. Effect on Headache –

*Rasayana* is described as means that they play the same role for human beings as *amrita* plays for *devatas*<sup>14</sup>. *Rasayana* can make human beings free from all diseases and promotes the health and happiness of human beings<sup>15</sup>.

#### 10. Effect on Neck / Back pain –

The present research work doesn't provide significant results in all three groups in this symptom. It may be due to fewer patients having such complaints.

#### 11. Effect on Fatigue eye –

*Amalaki Rasayana* has antioxidant properties and increases the flow of blood in the visual apparatus which helps in relieve of fatigue symptoms.

#### 12. Effect on Dryness in Eyes –

In *Ayurvedic* texts, dry eye is explained as *Visushakbhava*, *visushaktav*, and *Sushakalpa* are *Vata pitta* dominating features. Thus, *Vata* and *Pitta* are responsible for dry eye symptoms. *Amalaki Rasayana* contains *Amalaki* as its only ingredient which contains *amla rasa* that stabilizes the vitiated *vata* and due to *madhur rasa* and *shitha virya* it stabilizes the vitiated

*pitta* hence *Amalaki Rasayana* is a *vata pita Ghana*. *Amalaki Rasayan* had a good impact on reliving as *Amalaki* contains vitamin C and vitamin E and other antioxidants nourish sclera, cornea as well as intraocular contents especially the uveal tract, and lense. *Trataka karma* promotes lacrimation in the eyes which neutralize the dryness of the ocular surface and keeps them moist which leads to reduction of dryness in the eyes<sup>16</sup>.

#### **Probable Mode of Action Amalki Rasyana –**

*Rasayana* act as immune modulators creates a stimulatory effect on tissue macrophages.

- Increase local blood circulation.
- Stimulates the neurotransmitters in sensory nerve endings.
- Work as an antioxidant

*Amalaki Rasayana* possess *Rasayana* properties it performs functions of *dhatuwardharan* and provides strength to *Chakshurindriya*<sup>17</sup>, it pacifies unbalanced *doshas*, and also promotes the functional integrity of visual apparatus. It strengthens the first and second *patala* of eyes and ocular muscles which are the most severely affected part of CVS. It enhances the reconstruction of the tear film. Vitamin C also known as Ascorbic acid is an antioxidant found in fruit and vegetables. Antioxidants help in maintaining healthy eyes they provide good vision by keeping eyes away from diseases.

#### **Probable Mode of Action Trataka karma –**

*Trataka* is a visual cleansing practice that increases visual perceptual sensitivity by decreasing optical illusion that leads to a reduction in anxiety<sup>18</sup> which is associated with a higher blinking rate<sup>19</sup>. Yoga practices increase physical as well as mental health benefits via downregulation of the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system<sup>20</sup>. Studies suggest that yoga eye exercises improve ocular motility and relieve symptoms of asthenopia and eye fatigue<sup>21</sup>. *Trataka* stimulates external ocular muscles to work more efficiently, it also increases the blink reflex and aqueous humour circulation, which encourages nourishment of the ocular tissues. *Trataka karma* can be considered as a non-pharmacologic and therapeutic

intervention for reducing symptoms as well as relieving the severity of computer vision syndrome<sup>22</sup>.

## **CONCLUSION**

Computer Vision Syndrome is a *vata – pitta pradhan tridoshaja netra roga*. *Asatameyaindriarthshayoga* and *Pragyapradha* are the two main causes behind the Computer Vision Syndrome according to *Ayurved*. Less distance of the screen from the user, non-uniform illumination, and reduced blinking rate can be coined as the other important causative factors. Red eye, burning eye, eye strain, dry eye, blurred vision, headache is observed as the main complaints of the patients. This disease is not related to the refractory error but the presence of this can increase the intensity of this disease. *Vata pita sharir prakriti* and *Rajsika Mansik prakriti* people are more prone to disease. *Taruna* aged people i.e., 18 to 50 years and students suffer most from CVS. Study Group A with intervention *Amalaki Rasyan & Trataka karma* performed better than the other Group B with intervention *Amalaki Rasyan* and Group C intervention as *Trataka karma*. Study drug *Amalaki Rasayan* is a very good *Rasyana yoga* that works very efficiently in strengthening *Chakshurindriya*. *Trataka* stimulates external ocular muscles to work more efficiently, it also increases the blink reflex and aqueous humour circulation, which encourages nourishment of the ocular tissues to provide relief in CVS. It is quoted as "*Divya Drushti prajayate*" in classical text. No adverse effect of the study drug and *yogic kriya* was observed during the trial duration.

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