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A CLINICAL STUDY TO EVALUATE THE ROLE OF AKSHITARPANA, SHIRODHARA AND AN AYURVEDIC COMPOUND IN CHILDHOOD COMPUTER VISION SYNDROME

Singh Omendra Pal[1]*, Singh Laxmi[1], Kumar Abhimanyu[2]

[1]Major S.D. Singh Ayurvedic medical college Fatehgarh, Farrukhabad, Uttar Pradesh, India

[2]P.G. Department of Kaumarbhritya, National Institute of Ayurveda Jaipur, Rajasthan, India

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ABSTRACT

Computer vision syndrome is one among the lifestyle disorders in children. About 88% of people who use computers everyday suffer from this problem and children are no exception. Computer Vision Syndrome (CVS) is the complex of eye and vision problems related to near works which are experienced during the use of Video Display Terminals (TV and computers). Therefore, considering these prospects a randomized double blind placebo control study was conducted among 40 clinically diagnosed children (5-15 years age group) of computer Vision Syndrome to evaluate the role of akshitarpana, shirodhara and an ayurvedic compound in childhood computer vision syndrome.

KEYWORDS: Computer Vision Syndrome, Akshitarpana, Shirodhara.

***Address for Correspondence**

Lecturer, Department of Kaumarbhritya, Major S.D.Singh Ayurvedic medical college fatehgarh, Farrukhabad, Uttar Pradesh, India Email: omendrapalsingh@gmail.com

INTRODUCTION

In this 21st century the use of computers has increased tremendously. The computer plays a valuable role in increasing efficacy and accuracy of several works. But excessive use of computers has brought several health risks especially eye diseases. The children are not exception in this context. They have the nature of learning and adopting the things by what they see, therefore kids show equal interest in Video Display Terminals (TV and computers). Hence in the present scenario children are equally being affected with CVS (Computer vision syndrome) because of excessive exposure to VDTs. The American Optometric Association (AOA) has defined Computer Vision Syndrome as "The complex of eye and vision problems related to near work which are experienced during or related to computer use" CVS is a temporary condition resulting from focusing the eyes on a computer display for protracted, uninterrupted period of time.

The signs & symptoms of CVS may vary according to age but in children these include red eyes, burning eyes, dry eyes, teary eyes, itching eyes, eye strain blurred vision, difficulty in focusing, Double vision, Squinting for better vision, Headache, Pain Neck/ shoulder /back and Fatigue.

Computer Vision Syndrome and Ayurveda: Though 'Computer Vision Syndrome' has no direct reference in Ayurvedic classics, however an Ayurvedic approach can be given on the basis of the fundamentals of Ayurveda.The nidana and samprapti of Computer Vision Syndrome can be well understood by Trividha hetu[1](three types of etiological factors) viz. Asatmendriyartha samyoga(incompatible correlation of the senses with their objects), Prajnaparadha(intellectual error), Parinama(time/age) with respect to Chakshurendriya(visual objects). Asatmendriayrtha samyoga[2]**:** Among trividha hetu's it is the nearest or immediate cause in the disease manifestation. It includes the ati, mithya and heena yoga of the chakshunendriya. atiyoga (long exposure to screen), heenayoga (very small fonts, poorly illuminated room), mithyayoga (constantly staring, not blinking). Pragyaparadha[3]: Wrong understanding by the intellect and wrong actions accordingly is known as intellectual error that is committed by mind; it includes dhi vibhrama (unable to differentiate between good and bad i.e. continuous exposure to screen), dhrati vibhrama (child can't control, in spite of knowing its harmful effects), smriti vibhrama (forgets advice for evasion of unhealthy exposure) [4]. Parinama: It is an unavoidable cause.

In this way the child is excessively exposed to UV rays and glare, emitted from TV and computer monitors. These are vata-pittakara nidana as having speed and are the forms of energy leading to Vata - Pitta pradhana Tridosha vitiation at chakshurendriya then sthanasamshraya of these vitiated doshas occur in vahya and second patala of netra[5](external and second sheath of the eye, consists of tear film, conjunctiva and ciliary muscles of the eyes) producing the symptoms like dry eyes, eye strain, blurred vision (vataja) burning eyes (Pittaja), etc. the cardinal feature of computer vision syndrome.

MATERIAL AND METHODS

Aim of the study

To evaluate the role of akshitarpana, shirosdhara and an ayurvedic compound in childhood computer vision syndrome"

Selection of the Cases

A randomized double blind placebo control study (except in shirodhara and akshitarpana group) was conducted in 40 children showing the signs and symptoms of Computer vision syndrome (CVS). The children of age group 5 – 15 years were screened from O.P.D. /I.P.D. of Balroga Department of National Institute of Ayurveda Jaipur, India. These were randomly categorized in 4 groups - Group A – Study drug, Group B – Akshitarpana(with Triphala Ghrita) and Study drug, Group C – Shirodhara (with cow milk) and Study drug, Group D – Placebo syrup. Ayurvedic counseling (satvavajaya chickitsa) was done in all groups.

Study drug: A Hypothetical ayurvedic compound (Syrup) containing 5 herbs viz. Amalaki, Haritaki, Bibhitaki, Ashwagandha and Yashtimadhu was prepared in pharmacy of National Institute of Ayurveda Jaipur.

Dose and duration: The study drug and placebo were administered according to the body weight of the child (1 ml/ kg / day) in 2 divided doses for 21 days. The Children were called for weekly follow up.

Akshitarpana was performed with Triphala Ghrita**;** 20-25 min daily for 5 days.

Shirodhara was carried out with cow milk**;** 30-40 minutes daily for 5 days.

Inclusion criteria

Children who spend more than two hours/day in front of screen (T.V. or computer).

Children who show minimum three symptoms of computer vision syndrome.

Exclusion Criteria

Children who were beyond the age group 5-15 years.

Children who suffer from any systemic disorder, physical disability or psychotic disorder were excluded from the clinical trial.

Assessment Criteria

Symptoms of CVS were graded and assessment on the basis of pre and post observations found on this scale was made.

CVS SYMPTOMS' GRADING

Red eyes

0: Absent
1: Present after sitting for more than 2 hours of continuous sitting in front of screen
2: Present in less than 2 hrs of continuous sitting in front of screen
3: Present all the time, even without facing screen

Burning eyes

0: Absent
1: Present after sitting for more than 2 hours of continuous sitting in front of screen
2: Present in less than 2 hrs of continuous sitting in front of screen
3: Present all the time, even without facing screen

Itching (eyes)

0: Absent
1: Present after sitting for more than 2 hours of continuous sitting in front of screen
2: Present in less than 2 hrs of continuous sitting in front of screen
3: Present all the time, even without facing screen

Eyes Strain (Non- Specific ocular discomfort)

0: Absent
1: Present after sitting for more than 2 hours of continuous sitting in front of screen
2: Present in less than 2 hrs of continuous sitting in front of screen
3: Present all the time, even without facing screen

Blurred Near and Distant Vision

0: Absent
1: Present after sitting for more than 2 hours of continuous sitting in front of screen
2: Present in less than 2 hrs of continuous sitting in front of screen
3: Present all the time, even without facing screen

Difficulty in focusing

0: Absent
1: Present after sitting for more than 2 hours of continuous sitting in front of screen
2: Present in less than 2 hrs of continuous sitting in front of screen
3: Present all the time, even without facing screen

Double vision

0: Absent
1: Present after sitting for more than 2 hours of continuous sitting in front of screen

2: Present in less than 2 hrs of continuous sitting in front of screen
3: Present all the time, even without facing screen

Squinting (for better vision)
0: Not needed
1: Needed after more than 1/2 hour of continuous sitting in front of screen
2: Needed After every 15 min. of continuous sitting in front of screen
3: Needed very frequently(less than 15 min. of sitting)

Headache
0: Absent
1: Slight headache, doesn't hamper his/her daily routine
2: moderate- can perform household works but can't work on Computer/watch TV
3: Severe headache hampering his/her routine work

Neck/Shoulder pain /Backache
0: Absent
1: mild pain, doesn't hamper his/her daily routine
2: moderate- can perform household works but can't work on Computer/watch TV
3: Severe pain hampering his/her routine work

Fatigue
0: Absent
1: Felt after more than 2 hours of continuous sitting in front of screen
2: Felt in less than 2 hrs
3: Feel Tiredness without doing any work

OBSERVATIONS

Age: The highest incidence of CVS was seen in the age group of 13-15years(50%) that shows the fact that CVS is most common in this pediatric age group because of the more use of computer in school and indulgence in watching TV at home. The lower age group has relatively less understanding of the computer functioning thus show less interest in it.

Sex: Male children (60%) incidence was more in clinical trial showing that this gender is more prone to CVS in children. The probable reason may be that girls usually obey more to parents and hesitate to avoid the instructions, boys becoming more stubborn to watch TV and computer.

Socio economic status: The majority of cases registered for the current trial belonged to middle class patients (37.5 %) Now a days computer is in the reach of middle class people also so the cases of CVS are also getting more prevalent in this status.

Dominant rasa in diet: In clinical trial it was found that the patients of CVS like amla rasa the most i.e. 42.5 %. This observation is supported by the classical reference of netraroga nidana. In our classics also it is given that the excessive intake of sour taste dominating food items is having bad effect on eyes[6].

Family history of ophthalmic illness: Majority of the children (72.5%) were not having family history of any ophthalmic illness. This indicates that in case of CVS the present lifestyle (exposure to screen) is responsible and family history doesn't play any role.

Visual acuity: Maximum numbers of patients (29, 72.5%) were reported to have visual acuity 6/6 – 6/9.This shows CVS and refractive error were not significantly associated with each other in the patients of clinical trial. The refractive error may exaggerate CVS but later may exist independently.

Room (workplace) lighting: The clinical trial observations show that maximum number of children (47.5%) use computer in poorly illuminated room. This result is supported by the study of Bali J et.al. 2007; 55:289-93 that when person work on computer in dim light the glare and UV light emitted by VDTs produce more harmful effects on eye.

Angel/ level of gaze: Out of 40 patients of CVS, maximum number of children (67.5%) use computer at above the eye level. Taptagaporn S et.al. (1995) has recommended ergonomics that also suggests that the screen should be below the eye level; using TV or computers at above the eye level is one of the etiological factors of CVS.

RESULTS AND DISCUSSION

Overall it was observed that Akshitarpana procedure was highly effective in the complaint of CVS those were exclusively related to eyes viz. red eyes, burning eyes, dry eyes, teary eyes, itching eyes, eyestrain and also in headache. It had significant role in providing relief in complaints of blurred vision, difficulty in focusing and squinting for better vision.

The procedure of Shirodhara was found highly effective in complaints of headache and fatigue.

The Trial drug (syrup) did not show significant effect on any of the symptom of CVS in 21 days of trial. The reason behind may be the limited period of clinical trial in which the drug was not able to show significant effect on symptoms of CVS.

Probable mode of action of therapies

Akshitarpana

In the study Akshitarpana was performed with triphala ghrita. Triphala has proven effect in ocular diseases having Tridoshagna property so it also helps in reversing the disease by pacifying the aggrevating Vata-Pitta Doshas by virtue of its Rasa, Guna Vipaka Virya and Dosha Karmata, and by combination triphala acts as chakshushya.In our classics Ghrita is told one among the best rasayanas for eyes[7].It is having vata- pitta shamaka properties (by sheeta veerya and snighdha guna) which are the dominant doshas in samprapti ghataka of CVS.

Shirodhara

In the clinical trial shirodhara procedure has been found effective in complaints of headache and fatigue that are basically due to stress and workload on children using VDT. In the procedure of shirodhara, particular pressure and vibration is created over the forehead. The vibration is amplified by the hollow sinus present in the frontal bone. The vibration is then transmitted inwards through cerebrospinal fluid (CSF) of subarachnoid space of brain. This vibration along with little temperature may activate the functions of thalamus and the basal fore brain which then brings the amount of serotonin and catecholamine to the normal stage inducing the sleep that reduces the stressor hormones' secretions (cortisols) and thus in this way probably reduces the tension complaints like headache and fatigue. The cortisols level in blood comes to the lowest level at 3–5 hours after the onset of sleep.

Study drug- The study drug possesses five herbs (amalaki,haritaki,vibhitaki,ashwagandha yashtimadhu) that are predominance of Madhura (yashtimadhu,amalaki,haritaki), Kashaya rasa (triphala,ashwagandha), Guru Snigdha guna (Yashtimadhu), Sheeta virya(Amalaki,yashtimadhu), Madhura vipaka (all). Therefore by virtue of above properties the trial drug acts as Vatapitta Shamaka and chakshushya.

But The Trial drug has not shown significant effect in CVS symptoms. The reason behind may be the limited period of clinical trial. Drugs may show significant effect in longer duration of the treatment.

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Table 1: Showing the incidence of demographic profile

S.No.	Findings	Predominance	Percent
1.	**Age**	13-15 yr age group	50.00%
2.	**Sex**	Male	60.00%
3.	**Religion**	Muslim individuals	60.00%
4.	**Socio-economic status**	Middle class	37.50%
5.	**dietary habit**	Mixed	60.00%
6.	**Dominant rasa in diet**	Amla	42.50%
7.	**Sharirik Prakriti**	Vata-Pittaja Prakriti	62.50%
8.	**Mansik Prakriti**	Rajasika	60.00%
9.	**Satva**	Pravara	37.50%
10.	**Satmya**	Avar satmya	67.50%
11.	**Sara**	Madhyama	75.5%
12.	**Samhanana**	Madhyama	60.00%
13.	**Agni**	Vishama	53.50%
14.	**Koshta**	Krura	53.33%
15.	**F/H/O Ophthalmic illness**	No	72.50%
16.	**Visual acuity**	6/6 – 6/9	72.50%
17.	**Workplace lighting**	poor	47.50%
18.	**Angle of gaze**	Above eye level	67.50%

Results of therapeutic trial

HS= Highly Significant, S= Significant, NS= Not Significant, BT=Before Treatment
AT=After Treatment, SD= Standard deviation, SE=Standard error.

Table 2: Showing the pattern of clinical recovery of symptom of red eye in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD	SE	t	p	Results
	BT	AT			±	±			
A	1.7	1.1	0.6	35.29	0.69	0.22	2.71	<0.02	S
B	2.5	0.4	2.1	84.00	0.56	0.17	11.69	<0.001	HS
C	1.5	0.8	0.7	46.67	0.82	0.26	2.60	<0.02	S
D	1.4	1.2	0.2	14.28	0.42	0.13	1.5	<0.10	NS

Table 3: Showing the pattern of clinical recovery of symptom of burning eyes in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	p	Results
	BT	AT							
A	2.4	1.6	0.8	33.33	0.78	0.24	3.20	<0.01	S
B	2.3	0.2	2.1	91.30	0.31	0.10	21.00	<0.001	HS
C	2.3	1.9	0.4	17.39	0.51	0.16	2.44	<0.02	S
D	2.4	2.1	0.3	12.50	0.48	0.15	1.96	<0.05	NS

Table 4: Showing the pattern of clinical recovery of symptom of dry eyes in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	P	Results
	BT	AT							
A	0.9	0.6	0.3	33.33	0.48	0.15	1.96	<0.05	NS
B	2.1	0.2	1.9	90.47	0.87	0.27	6.86	<0.001	HS
C	1.0	0.6	0.4	40.00	0.51	0.16	2.44	<0.02	S
D	1.3	1.1	0.2	15.38	0.42	0.13	1.5	<0.10	NS

Table 5: Showing the pattern of clinical recovery of symptom of teary eyes in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	p	Results
	BT	AT							
A	1.5	1.0	0.5	33.33	0.70	0.22	2.23	<0.05	NS
B	2.0	0.1	1.9	95.00	0.99	0.31	6.04	<0.001	HS
C	1.1	0.6	0.5	45.45	0.70	0.22	2.23	<0.05	NS
D	2.0	1.8	0.2	10.00	0.42	0.13	1.5	<0.10	NS

Table 6: Showing the pattern of clinical recovery of symptom of itching eyes in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	p	Results
	BT	AT							
A	0.6	0.2	0.4	26.31	0.69	0.22	1.80	<0.10	NS
B	1.7	0.2	1.5	88.23	0.84	0.26	5.58	<0.001	HS
C	1.4	1.1	0.3	21.42	0.48	0.15	1.96	<0.05	NS
D	1.9	1.5	0.4	21.05	0.69	0.22	1.80	<0.10	NS

Table 7: Showing the pattern of clinical recovery of symptom of eye strain in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	p	Results
	BT	AT							
A	1.9	1.3	0.6	31.57	0.84	0.26	2.25	<0.05	NS
B	1.8	0.3	1.5	83.33	0.70	0.22	6.70	<0.001	HS
C	1.8	1.4	0.4	22.22	0.51	0.16	2.44	<0.02	S
D	2.2	1.9	0.3	13.63	0.67	0.22	1.40	<0.10	NS

Table 8: Showing the pattern of clinical recovery of symptom of blurred vision in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	p	Results
	BT	AT							
A	0.9	0.6	0.3	33.33	0.48	0.15	1.96	<0.05	NS
B	1.3	0.4	0.9	69.23	0.73	0.23	3.85	<0.001	HS
C	1.1	0.7	0.4	36.36	0.69	0.22	1.80	<0.10	NS
D	1.5	1.3	0.2	13.33	0.42	0.13	1.5	<0.10	NS

Table 9: Showing the pattern of clinical recovery of symptom of difficulty in focusing in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	p	Results
	BT	AT							
A	1.1	0.2	0.9	81.81	0.99	0.31	2.86	<0.01	S
B	1.4	0.5	0.9	64.28	0.73	0.23	3.85	<0.001	HS
C	1.3	1.0	0.3	23.07	0.48	0.15	1.96	<0.05	NS
D	1.3	1.2	0.1	7.69	0.31	0.10	1.00	<0.10	NS

Table 10: Showing the pattern of clinical recovery of symptom of double vision in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	p	Results
	BT	AT							
A	0.8	0.6	0.2	25.00	0.63	0.20	1.00	<0.10	NS
B	1.4	0.5	0.9	64.28	0.99	0.31	2.86	<0.01	S
C	1.2	1.0	0.2	16.66	0.42	0.13	1.50	<0.10	NS
D	0.8	0.6	0.2	25.00	0.42	0.13	1.50	<0.10	NS

Table 11: Showing the pattern of clinical recovery of symptom of squinting for better vision in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	p	Results
	BT	AT							
A	0.8	0.5	0.3	37.50	0.67	0.21	1.40	<0.10	NS
B	1.4	0.1	1.3	92.85	0.94	0.30	4.33	<0.001	HS
C	0.6	0.5	0.1	16.66	0.31	0.10	1.00	<0.10	NS
D	1.2	1.1	0.1	8.33	0.31	0.10	1.00	<0.10	NS

Table 12: Showing the pattern of clinical recovery of symptom of headache in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	p	Results
	BT	AT							
A	2.1	1.4	0.7	33.33	0.82	0.26	2.68	<0.02	S
B	2.3	0.4	1.9	82.60	0.56	0.17	10.28	<0.001	HS
C	2.4	0.7	1.7	70.83	0.67	0.21	7.96	<0.001	HS
D	2.2	1.9	0.3	13.63	0.67	0.21	1.40	<0.10	NS

Table 13: Showing the pattern of clinical recovery of symptom of pain in neck/ shoulder /back in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	p	Results
	BT	AT							
A	1.2	0.6	0.6	50.00	0.69	0.22	2.71	<0.02	S
B	1.2	0.6	0.6	50.00	0.69	0.22	2.71	<0.02	S
C	1.1	0.7	0.4	36.36	0.51	0.16	2.44	<0.02	S
D	1.5	1.3	0.2	13.33	0.42	0.13	1.50	<0.10	NS

Table 14: Showing the pattern of clinical recovery of symptom of fatigue in 40 CVS patients (All 4 groups)

S.No.	Mean		Diff.	Relief %	SD ±	SE ±	t	p	Results
	BT	AT							
A	1.9	1.4	0.5	26.31	0.52	0.16	3.00	<0.01	S
B	1.0	0.4	0.6	60.00	0.69	0.22	2.71	<0.02	S
C	1.6	0.5	1.1	68.75	0.31	0.10	11.00	<0.001	HS
D	1.8	1.3	0.5	27.77	0.70	0.22	2.23	<0.05	NS

HS= Highly Significant, S= Significant, NS= Not Significant

Table 15: Showing Statistical status of inter-group differences of clinical improvement in patients of computer vision syndrome (Group C & D)

Clinical Features	N	SD	SE	t_{18}	p	Results
Red eyes	20	0.65	0.29	1.71	<0.10	NS
Burning Eyes	20	0.5	0.22	0.44	<0.10	NS
Dry Eyes	20	0.47	0.21	0.95	<0.10	NS
Teary Eyes	20	0.58	0.26	1.15	<0.10	NS
Itching eyes	20	0.60	0.27	- 0.37	<0.10	NS
Eyestrain	20	0.60	0.27	0.37	<0.10	NS
Blurred Distant Vision	20	0.57	0.26	0.77	<0.10	NS
Difficulty in focusing	20	0.40	0.18	1.09	<0.10	NS
Double vision	20	0.42	0.18	0.00	<0.10	NS
Squinting for better vision	20	0.32	0.14	0.00	<0.10	NS
Headache	20	0.67	0.30	4.63	<0.001	HS
Pain Neck/ shoulder /back	20	0.47	0.21	0.94	<0.10	NS
Fatigue	20	0.55	0.24	2.44	<0.02	S

Table 16: Showing Statistical status of inter-group differences of clinical improvement in patients of computer vision syndrome (Group A & D)

Clinical Features	N	SD	SE	t_{18}	p	Results
Red eyes	20	0.65	0.29	1.70	<0.10	NS
Burning Eyes	20	0.65	0.29	1.70	<0.10	NS
Dry Eyes	20	0.45	0.20	0.49	<0.10	NS
Teary Eyes	20	0.58	0.26	1.15	<0.10	NS
Itching eyes	20	0.69	0.31	0.00	<0.10	NS
Eyestrain	20	0.76	0.34	0.87	<0.10	NS
Blurred Distant Vision	20	0.42	0.19	0.00	<0.10	NS
Difficulty in focusing	20	0.41	0.18	1.09	<0.10	NS
Double vision	20	0.53	0.24	0.00	<0.10	NS
Squinting for better vision	20	0.52	0.23	0.84	<0.10	NS
Headache	20	0.69	0.31	0.65	<0.10	NS
Pain Neck/ shoulder /back	20	0.58	0.26	1.54	<0.10	NS
Fatigue	20	0.62	0.28	0.00	<0.10	NS

Table 17: Showing Statistical status of inter-group differences of clinical improvement in patients of computer vision syndrome (Group B & D)

Clinical Features	**N**	**SD**	**SE**	**t_{18}**	**p**	Results
Red eyes	20	0.68	0.30	5.53	<0.001	HS
Burning Eyes	20	0.40	0.18	9.85	<0.001	HS
Dry Eyes	20	0.68	0.30	5.53	<0.001	HS
Teary Eyes	20	0.76	0.34	4.97	<0.001	HS
Itching eyes	20	0.77	0.34	3.16	<0.001	HS
Eyestrain	20	0.70	0.30	3.88	<0.001	HS
Blurred Distant Vision	20	0.60	0.26	2.60	<0.01	S
Difficulty in focusing	20	0.56	0.25	3.15	<0.01	S
Double vision	20	0.76	0.34	2.04	<0.05	NS
Squinting for better vision	20	0.73	0.32	3.35	<0.01	S
Headache	20	0.75	0.33	4.15	<0.001	HS
Pain Neck/ shoulder /back	20	0.57	0.25	1.54	<0.10	NS
Fatigue	20	0.70	0.31	0.31	<0.10	NS

Table 18: Showing Statistical status of inter-group differences of clinical improvement in patients of computer vision syndrome (Group B & C)

Clinical Features	**N**	**SD**	**SE**	**t_{18}**	**p**	Results
Red eyes	20	0.84	0.38	3.15	<0.001	HS
Burning Eyes	20	0.42	0.19	8.87	<0.001	HS
Dry Eyes	20	0.71	0.32	4.66	<0.001	HS
Teary Eyes	20	0.86	0.38	3.62	<0.001	HS
Itching eyes	20	0.70	0.30	3.88	<0.001	HS
Eyestrain	20	0.61	0.27	3.97	<0.001	HS
Blurred Distant Vision	20	0.71	0.32	1.55	<0.10	NS
Difficulty in focusing	20	0.62	0.27	2.15	<0.02	S
Double vision	20	0.76	0.34	2.04	<0.05	NS
Squinting for better vision	20	0.70	0.31	3.79	<0.001	HS
Headache	20	0.75	0.33	0	<0.10	NS
Pain Neck/ shoulder /back	20	0.61	0.27	0.72	<0.10	NS
Fatigue	20	0.54	0.24	2.06	<0.05	NS

Table 19: Showing Statistical status of inter-group differences of clinical improvement in patients of computer vision syndrome (Group A & C)

Clinical Features	**N**	**SD**	**SE**	**t_{18}**	**p**	Results
Red eyes	20	0.76	0.34	- 0.29	<0.10	NS
Burning Eyes	20	0.66	0.30	1.34	<0.10	NS
Dry Eyes	20	0.5	0.22	- 0.44	<0.10	NS
Teary Eyes	20	0.70	0.31	0	<0.10	NS
Itching eyes	20	0.60	0.26	0.37	<0.10	NS
Eyestrain	20	0.70	0.31	0.63	<0.10	NS
Blurred Distant Vision	20	0.57	0.25	- 0.77	<0.10	NS
Difficulty in focusing	20	0.48	0.21	0	<0.10	NS
Double vision	20	0.53	0.24	0	<0.10	NS
Squinting for better vision	20	0.52	0.23	0.84	<0.10	NS
Headache	20	0.75	0.33	- 2.97	<0.01	S
Pain Neck/ shoulder /back	20	0.61	0.27	0.72	<0.10	NS
Fatigue	20	0.43	0.19	- 3.08	<0.01	S

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