



## COMPARATIVE STUDY OF EFFICACY OF SHATAVARI GHRUTA ANJANA AND ERANDA TAILA ANJANA IN THE MANAGEMENT OF VISUAL DISPLAY TERMINAL SYNDROME

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## ABSTRACT

This study was conducted to evaluate the efficacy of *Shatavari ghutra Anjana* and *Eranda taila anjana* in the management of the visual display syndrome. For this work patients attending the *netraroga* (ophthalmology) OPD at the hospital attached to Tilak Ayurveda Mahavidyalaya, Pune (Maharashtra) was selected based on the inclusion and exclusion criteria of the study. Ethical clearance was accredited by the institutional ethical committee of the institute and written consent from all the selected patients was taken before the treatment. The selected patients were randomly divided into two groups. Group A was given *Shatavari ghruta anjana* in each eye one time a day for one month and group B was given *Eranda taila anjana* in each eye one time a day for one month. The clinical data collected and compiled from this clinical trial was sorted out processed by implying various statistical methods and it was found that Group A showed comparatively better results in redness of eyes and eye irritation.

**Keywords:** *Shatavari ghruta anjana*, *Eranda taila anjana*, visual display syndrome.

## INTRODUCTION

Vocational and non-vocational use of computers and digital electronic devices has increased with development in the electronic industry and easy availability of devices. Due to long working hours in front of the computer and other short screens, related vision and other ophthalmic symptoms like eye strain, dry eye, eye irritation, blurred vision, headache, and redness may develop. These have been collectively called Computer Vision Display Terminal Syndrome (VDTS) or Computer Vision Syndrome (CVS). Images on computer screen contrast are not sharp; edges of characters are not well defined, so eyes have difficulty in focusing causing strain on ciliary muscles of an eye leading to symptoms of VDTS. Prolong maintenance of the same posture and even wrong posture puts strain on neck muscles and cervical spine leading to neck pain and headache. According to the National Institute of Safety and health, CVS affects about 90% of the population who spent three or more hours a day on the computer and digital devices<sup>1</sup>. Asthenopic symptoms in the eyes are responsible for much of the morbidity in CVS. In modern medical science, artificial tear drops are usually recommended but they give only temporary and symptomatic relief. The present study was conducted on patients reporting in *netraro-ga* OPD of Tilak Ayurveda Mahavidyalaya, Pune (Maharashtra). Ethical clearance was accredited by the institutional ethical committee of the institute (Ref no. RSTH/PG/IEC/1269/2019). The selected patients were randomly divided into two groups. Group A (n=30) was given *Shatavari ghruta anjana* in each eye

one time a day for one month and group B (n=30) was given *Eranda taila anjana* in each eye one time a day for one month. The drugs were prepared in the pharmacy of the institution for which a standardization certificate was obtained from Savitribai Phule Pune University

## MATERIALS AND METHOD-

The selected patients were randomly divided into 2 groups with the following drug schedule-

- Group A (n=30)- *Shtavari ghruta anjana* in each eye one time a day for one month.
- Group A (n=30)- *Eranda taila anjana* in each eye one time a day for one month.

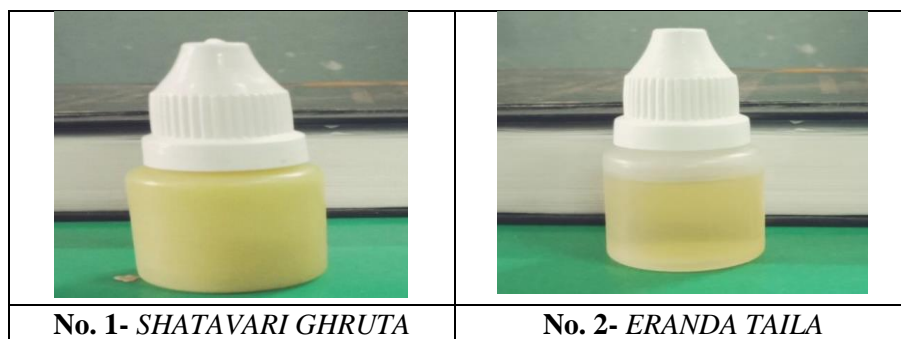
## PROCEDURE FOR APPLYING ANJANA<sup>2</sup>

- *Vartma* (eyelid) should be held firmly with the left hand so that the patient cannot blink.
- Hold the *adhovartma* and apply the *anjana* from *Kaneenaka* (inner canthus) to *Apanga pradesha* (outer canthus) with a finger.
- After application of *anjana* the eyes should remain close, and the patient is asked to mildly rotate the eyeball inside the lids.
- Eyes should not be opened and close.
- Eyes should not be washed immediately after the application of *anjana*.

## DOSAGE AND DURATION (LOCAL APPLICATION OF ANJANA)

- Dosage : 0.04ml
- Time : Evening
- Duration : 1 Month

## STANDARDIZATION OF SHATAVARI GHRUTA AND ERANDA TAILA-



**TABLE 1: SHOWING ORGANOLEPTIC PROPERTIES OF SHATAVARI GHRUTA**

S.NO.	PARAMETERS	SHATAVARI GHRUTA
1	Colour	Whitish brown
2	Odour	Characteristic
3	Texture	Smooth, greasy
4	Taste	Characteristic

**TABLE 2: SHOWING PHYTOCHEMICAL EVALUATION OF SHATAVARI GHRUTA**

S.NO.	PARAMETERS	SHATAVARI GHRUTA
1	Ph value	6.95
2	Pugnacity	0.901g/ cm <sup>3</sup>
3	Refractive index	1.4532
4	Iodine value	32.560 mg/g
5	Saponification value	224/mg/g
6	Acid value	1.811 PaS

• **ERANDA TAILA**

**TABLE 3: SHOWING ORGANOLEPTIC PROPERTIES OF ERANDA TAILA**

S.NO.	PARAMETERS	ERANDA TAILA
1	Colour	Pale white
2	Odour	Characteristic
3	Texture	Viscous oily
4	Taste	Bland

**TABLE 4: SHOWING PHYTOCHEMICAL EVALUATION OF ERANDA TAILA**

S.No.	PARAMETERS	ERANDA TAILA
1	Ph	6.1
2	Viscosity at 300 K	0.652PaS
3	Refractive index	1.48
4	Saponification value	182.9 mg/g
5	Acid value	0.88 mg/g
6	Specific gravity	0.988mg/g
7	Iodine value	84.5 I <sub>2</sub> /100 g
8	Density	965 kg/ m <sup>3</sup>
9	Boiling point	312 <sup>0</sup> C

**SELECTION CRITERIA-**

**Inclusion criteria**

1. Patients willing for the trial.
2. Patients from the age group 18 to 70 years, both male and female.
3. Patients working on VDTS for at least 4 hours daily for a minimum of 2 years.
4. Patients suffering from at least 4 symptoms of the following – eye strain, dry eyes, eye irritation, blurred vision, headache, and redness of eyes.

**Exclusion criteria –**

1. Patients not willing for trial.
2. Patients below the age of 18 and above 70 years.
3. Patients having symptoms due to direct physiological effects or any general medical condition or systemic disorder.
4. Patients having abnormal ophthalmoscope findings.

Follow-up of these patients was taken weekly for consecutive 4 weeks and these observations were subjected to analysis. At the first visit, a routine ophthalmological examination was done. The patients were explained about the ergonomic considerations concerning their workplace and asked to do the required possible changes.

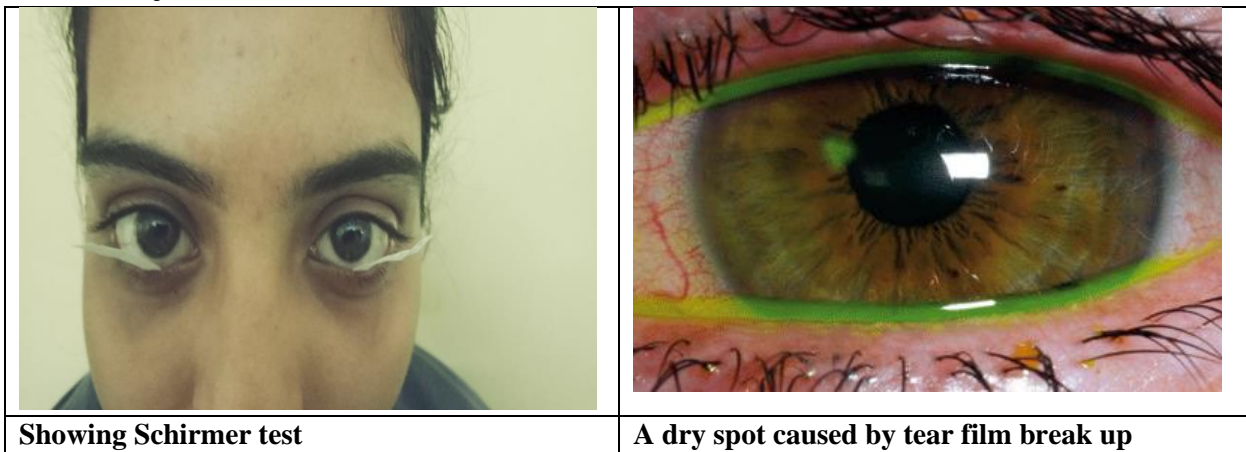
**The observations were recorded by gradation scale as per the Ocular Surface Disease Index (OSDI)<sup>3</sup> for the subjective criteria as follows: -**

For all 6 symptoms: -

- 0 – Symptom occurs after working on VDTS for 4 hrs.
- 1 – Symptom occurs after working on VDTS for 3 hrs.
- 2 – Symptom occurs after working on VDTS for 2 hrs.
- 3 – Symptom occurs after working on VDTS for 1 hrs.
- 4 – Symptom occurs after working on VDTS for 1/2 hrs.

Clinical examination of patients was done to evaluate the tear film by following tests<sup>4,5</sup>

1. Schirmer’s test
2. Tear film break uptime
3. Slit-lamp examination



**OBSERVATION AND RESULTS-**

The results obtained from the clinical study were compiled and evaluated by statistical analysis.

**DEMOGRAPHICAL DATA-**

**TABLE 5: AGE WISE DISTRIBUTION OF PATIENTS-**

AGE GROUP	Group A		Group B		Total	
	N	%	N	%	N	%
20-30 Years	25	83.3	24	80.0	49	81.7
30-40 Years	4	13.3	5	16.7	9	15.0
40-50 Years	1	3.3	1	3.3	2	3.3
<b>TOTAL</b>	30	100.0	30	100.0	60	100.0

**TABLE 6: GENDER WISE DISTRIBUTION OF PATIENTS-**

GENDER	Group A		Group B		Total	
	N	%	N	%	N	%
Male	23	76.7	17	56.7	40	66.7
Female	7	23.3	13	43.3	20	33.3
<b>TOTAL</b>	30	100.0	30	100.0	60	100.0

**TABLE 7: RELIGION WISE DISTRIBUTION OF PATIENTS-**

RELIGION	Group A		Group B		Total	
	N	%	N	%	N	%
Buddhist	2	6.7	2	6.7	4	6.7
Hindu	26	86.7	26	86.7	52	86.7
Muslim	2	6.7	2	6.7	4	6.7
<b>TOTAL</b>	30	100.0	30	100.0	60	100.0

**TABLE 8: OCCUPATION WISE DISTRIBUTION OF PATIENTS-**

OCCUPATION	Group A		Group B		Total	
	N	%	N	%	N	%
Business	0	0.0	1	3.3	1	1.7
Housewife	1	3.3	0	0.0	1	1.7
Job	2	6.7	2	6.7	4	6.7
Student	27	90.0	27	90.0	54	90.0
<b>TOTAL</b>	30	100.0	30	100.0	60	100.0

**TABLE 9: MARITAL STATUS WISE DISTRIBUTION OF PATIENTS-**

MARITAL STATUS	Group A		Group B		Total	
	N	%	N	%	N	%
Married	29	96.7	29	96.7	58	96.7
Unmarried	1	3.3	1	3.3	2	3.3
<b>TOTAL</b>	30	100.0	30	100.0	60	100.0

**TABLE 10: FAMILY HISTORY WISE DISTRIBUTION OF PATIENTS-**

FAMILY HISTORY	Group A		Group B		Total	
	N	%	N	%	N	%
No	30	100.0	30	100.0	60	100.0
Yes	0	0.0	0	0.0	0	0.0
<b>TOTAL</b>	30	100.0	30	100.0	60	100.0

**TABLE 11: DIET WISE DISTRIBUTION OF PATIENTS-**

DIET	Group A		Group B		Total	
	N	%	N	%	N	%
Mixed	18	60.0	18	60.0	36	60.0
Veg	12	40.0	12	40.0	24	40.0
<b>TOTAL</b>	30	100.0	30	100.0	60	100.0

## SYMPTOMS WISE CHANGES-

Since observations are on an ordinal scale (gradations), we have used Wilcoxon Signed Rank Test to test efficacy in Group A and Group B.

### 1. EYES STRAIN-

**TABLE 12: EFFECT OF TREATMENT ON EYES STRAIN-**

EYES STRAIN	Median		Wilcoxon Signed-Rank W	P-Value	% Effect	Result
	BT	AT				
Group A	3	0	-4.824 <sup>a</sup>	0.000	87.9	Significant
Group B	3	0	-4.830 <sup>a</sup>	0.000	92.6	Significant

### 2. DRY EYES

**TABLE 13: EFFECT OF TREATMENT ON DRY EYES-**

DRY EYES	Median		Wilcoxon Signed-Rank W	P-Value	% Effect	Result
	BT	AT				
Group A	3	0	-4.814 <sup>a</sup>	0.000	91.3	Significant
Group B	3	0	-4.807 <sup>a</sup>	0.000	94.9	Significant

### 3. EYS IRRITATION

**TABLE 14: EFFECT OF TREATMENT ON EYE IRRITATION-**

EYE IRRITATION	Median		Wilcoxon Signed-Rank W	P-Value	% Effect	Result
	BT	AT				
Group A	3	0	-4.529 <sup>a</sup>	0.000	89.2	Significant
Group B	3	0	-4.638 <sup>a</sup>	0.000	90.9	Significant

### 4. BLURRED VISION

**TABLE 15: EFFECT OF TREATMENT ON BLURRED VISION-**

BLURRED VISION	Median		Wilcoxon Signed-Rank W	P-Value	% Effect	Result
	BT	AT				
Group A	3	0.5	-4.542 <sup>a</sup>	0.000	71.4	Significant
Group B	2	0	-4.497 <sup>a</sup>	0.000	81.3	Significant

### 5. HEADACHE

**TABLE 16: EFFECT OF TREATMENT ON HEADACHE-**

HEADACHE	Median		Wilcoxon Signed-Rank W	P-Value	% Effect	Result
	BT	AT				
Group A	2	0	-4.169 <sup>a</sup>	0.000	85.5	Significant
Group B	2.5	0	-4.573 <sup>a</sup>	0.000	90.9	Significant

### 6. REDNESS OF EYES

**TABLE 17: EFFECT OF TREATMENT REDNESS OF EYES-**

REDNESS	Median		Wilcoxon Signed-Rank W	P-Value	% Effect	Result
	BT	AT				
Group A	1	0	-3.573 <sup>a</sup>	0.000	85.3	Significant
Group B	2	0	-4.172 <sup>a</sup>	0.000	92.7	Significant

## 7. SHIRMER'S TEST-

**TABLE 18: EFFECT OF TREATMENT ON SCHIRMER'S TEST-**

SCHIRMER'S TEST		Mean	N	SD	SE	t-Value	P-Value	% Effect	Result
Group A	BT	9.04	30	2.40	0.44	6.687	0.000	41.59	Sig
	AT	12.80	30	2.10	0.38				
Group B	BT	9.20	30	2.80	0.51	5.707	0.000	30.22	Sig
	AT	11.98	30	2.40	0.44				

Since observations are quantitative, we have used paired t-test. From the above table, we can observe that P-Values for Group A and Group B are less than 0.05. Hence, we conclude that the effect observed in both groups is significant.

## 8. TEAR FILM BREAK UPTIME

**TABLE 19: EFFECT OF TREATMENT ON TEAR FILM BREAK UPTIME**

TFBUT		Mean	N	SD	SE	t-Value	P-Value	% Effect	Result
Group A	BT	8.43	30	2.40	0.44	6.327	0.000	24.79	Sig
	AT	10.52	30	2.10	0.38				
Group B	BT	8.22	30	2.80	0.51	5.438	0.000	20.80	Sig
	AT	9.93	30	2.40	0.44				

Since observations are quantitative, we have used paired t-test. From the above table, we can observe that P-Values for Group A and Group B are less than 0.05. Hence, we conclude that the effect observed in both groups is significant.

## DISCUSSION

From the above study, it is concluded that demographically prevalence of Computer Vision Terminal Syndrome is more prevalent in the age group of 20-30 years (81.7%), more prevalent in males as compared to females in both study groups (66.7%). Higher prevalence was seen in the Hindu population as understood due to the higher population group in the study. Occupation wise disease was more prevalent amongst students due to excessive use of electronic gadgets.

The symptoms of Computer Vision Display Terminal Syndrome (VDTS) are eyes strain, dryness of eyes, eye irritation, blurred vision, headache, and redness of eyes. On critical analysis of symptoms on Tridosha theory of Ayurveda, it seems to be *Vata-pitta* origin in nature.

In this study, it was statistically analysed that *Shatavari Ghruta* and *Eranda Taila* have a significant

effect on all the parameters in VDTS (P-Values for Group A and Group B are less than 0.05). *Shatavari ghruta* showed comparatively better results in redness of eyes and eye irritation, there was no significant difference between symptoms of eyes strain, dryness of eyes and blurred vision. *Shatavari* (*Asparagus racemosus*) is said to be *Chakshushya* (good for eyes), which pacifies *Vata-pitta* and *sheeta virya* in nature<sup>6</sup>. Cow's *ghruta* is also *Chakshushya*, which pacifies *Vata-pitta* and *sheeta virya*, *Balya* (strengthening properties)<sup>7</sup>. *Ghruta* possesses *sanskaranuvartanata* properties means when it is made into any formulation it retains its properties and also accepts the properties of other drug<sup>8</sup>. Here *shatavari* and *ghruta* both have *Chakshushya* and *vata-pittahara* properties showed symptomatically better results in redness of eyes and eye irritation as compared to *Eranda taila*. *Eranda taila* having *vata hara* properties and guru, Snigdha in nature showed better result in headache<sup>9</sup>.

According to the pathophysiology of CVS, the lipid layer of the tear film gets disturbed. Due to disturbed lipid layer, Tear Film Break up Time reduces remarkably. This disturbed tear film leads to dryness in the eye. Lipophilic action of *Shatavari ghruta* and *Eranda*

taila strengthens the lipid layer of the tear film. It increases Tear Film Break up Time and reduces Dryness. Both *Shatavari ghruta* and *Eranda taila* have lubricating properties which are very useful in reducing symptoms of Computer Vision Display Terminal Syndrome (VDTS).

## CONCLUSION

Computers, smartphones, and short screen gadgets are now an integral part of our day-to-day life. Computer and other short screen gadgets are like heat factories, so excessive use of them increases Vata- pitta dosha in the eyes leading to symptoms of VDTS. As per *Ayurveda* classics, *Shatavari ghruta* and *Eranda taila* have properties as *Snigdha* (oleation property), *Guru*, thus pacifying the *vata dosha*. Lipophilic action of *Shatavari ghruta* and *Eranda taila*, strengthens the lipid layer of the tear film by it increases Tear Film Break up Time. Both have lubricating properties which are very useful in reducing dryness. *Chakushya* property of *Shatavari Ghurta* and *Eranda taila* strengthens ocular muscles. It results in the development of pupillary reflex and a good convergence mechanism. Because of this, the patient gets relief from eye fatigue & headache. Because of these properties *Shatavari Ghurta* and *Eranda taila* have a significant effect on all the parameters in VDTS.

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