Research Article

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A CLINICAL STUDY OF THE EFFECT OF TILA TAILA PADABHYANGA ON EYE STRAIN

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ABSTRACT

Due to changed lifestyle we are giving more strain to our eyes. For serving this, Ayurveda emphasized on Padabhyanga. The Acharyas have told that Padabhyanga helps to improve our vision. In further context they have mentioned a link between Pada and Netra as two poles of our body. This study had tried to explore the role of Padabhyanga in Dinacharya and the effect of Tila Taila Padabhyanga in Eye Strain. A total of 60 diagnosed patients of eye strain were registered and randomly divided into two groups. In Group A, daily Tila Taila Padabhyanga and 500 mg Yashtimadhu choorna capsule with lukewarm water at night was given while in Group B only 500 mg Yashtimadhu choorna capsule with lukewarm water at night was given for 60 days. Assessment of efficacy in symptoms weakness and heaviness of eyes was done at 15 days interval. t test and χ^2 test were applied. Results showed that in Group A 70% showed improvement in weakness while in Group B 33.33% improved. Improvement in heaviness was observed in 33.33% Group A while 23.33% Group B patients. There was highly significant ($p < 0.01$ unpaired t test, $p < 0.001$ χ^2 test) improvement in weakness of eyes in Group A but there was no significant difference between two therapies ($p < 0.2$ unpaired t test, $p \geq 0.5$ χ^2 test) in heaviness of eyes. Thus regular practicing Tila Taila Padabhyanga is very beneficial for reducing Eye Strain. The Nityabhyasa of Padabhyanga may prevent its symptoms.

Keywords: Padabhyanga, Foot Massage, Eye Strain, Tila Taila.

INTRODUCTION

Ayurveda is not just for helping sick people to become well, it is all about maintaining health and keeping the body in the best possible correlation¹. Eye is a special sense organ with which we are able to enjoy this beautiful nature. It is a source of direct knowledge and also 90% of what we learn about the world around us comes through the eyes, as per our National policy – “One of the basic human rights is the right to sight.”² We are giving more and more strain to our eyes through pollution, computer radiation, some occupations like night shifts and so many. Due to these factors we are suffering from many eye problems like Eye Strain, congestion, refractive error, etc. While referring old Samhitas, we came across a special Upakrama (procedure) under Dinacharya (daily regime) i.e. Padabhyanga (foot massage). In benefits of Padabhyanga, the Acharyas have told that it helps to improve our vision³⁻⁸. In further context they have mentioned a link between Pada (foot) and Netra (Eye). Pada and Netra are like two poles of our body. And still drug instilled from one pole i.e. Pada can reach to other pole i.e. Netra^{9, 10}. The feet are the most overworked parts of the body. They bear the full burden of our weight day after day. We often enclose them in restrictive gear such as socks and sneakers or stockings and high heels. At the end of a long day, our feet deserve a little special treatment for the many ways they have been good to us. Foot massage is the best way to relax your mind and muscles and revive your feet.

Eye Strain (sometimes called as Asthenopia) means weakness or heaviness of eyes due to over work or improper work¹¹. The likely mechanism is that poor viewing conditions cause contraction of the orbital portion of the orbicularis oculi muscle

which causes eye lid squint in an attempt to improve vision. This has been shown to result in secondary reduction in eye lid blink, thereby resulting in weakness or heaviness of eyes¹². Though ‘Eye Strain’ is the disease of 21st century, Ayurvedic treatment described in Dinacharya of ancient texts can definitely be tried on this condition¹³. Since main symptoms of Eye Strain show Vata vitiation; Padabhyanga with Tila Taila (sesame oil) can be helpful in it. Tila Taila is a well-known ancient medicine and it is also the most superior for Snehan (oleation) and Vata (air) vitiation¹⁴⁻¹⁹. So, this clinical research had tried to explore the effect of Tila Taila Padabhyanga in Eye Strain.

Aims and objectives

To study the role of Padabhyanga as an Upakrama in Dinacharya.

To study the effect of Tila Taila Padabhyanga in Eye Strain.

MATERIALS AND METHODS

Tila Taila and Yashtimadhu Choorna^{20, 21}
(*Glyceriza glabra* Linn).

Besides teaching Padabhyanga to the patients, pamphlets of important instructions and diagrammatic presentation of Padabhyanga were given with them. Padabhyanga procedure was taught for first day. Then patients were advised to do the same for period of two months.

Standard Operative Procedure (S.O.P.) – Before application of Tila Taila patients were asked to clean both feet with lukewarm water, dried well and then asked to massage both

planter surfaces of feet with Tila Taila by clean hands. Dose – 5 ml Tila Taila was used for both feet daily, but allowed to use more according to individual absorption requirement. Time of administration – Padabhyanga was suggested at night for at least 10 minutes for each foot with the steps - a) Stroking, b) Ankle Rotation, c) Pivoting, d) Kneading, e) Finger walking, f) Pulling and Squeezing, g) Sliding and h) Arch press.

For the present study Prospective, Open labeled, Randomized (Lottery Method), Single centric, controlled trial was designed to screen the effect of Padabhyanga in Eye Strain. Ethical clearance from the IEC was taken before initiating the clinical study. Written Informed consent was taken from each patient before starting the therapy.

Inclusion Criteria

Patients suffering from Eye Strain since one month due to computer work, watching television, constant reading, walking bare feet, constant standing, constant traveling on two wheeler and keeping awake at night.^{22, 23}

Age – Between 18 to 40 years.

Sex – Subjects of any sex were selected.

Exclusion Criteria²⁴

Those who were suffering from aggravation of Kapha.

Those who had (just) undergone Shodhana (purification therapies) like Vamana (emesis), Virechana (purgation),

Basti (enema), Raktamokshana (blood letting) and Nasya (nasal medication).

Those who were suffering from Ajirna (indigestion).

Age – Below 18 years and above 40 years.

Patients suffering from severe eye complaints like cataract, glaucoma, Pterygium, diabetic retinopathy, etc.

Any other major illness which causes ophthalmic complications such as diabetes, hypertension, etc.

Patients had undergone any eye surgery.

Withdrawal criteria

The patient who wished to discontinue and not ready for further participation was discontinued.

The patient who loose follow up for two consecutive visits was treated as discontinue.

The withdrawal patients were replaced by having fulfilling criteria of inclusion and followed up thereafter.

Dose Variation Study

Yashtimadhu is classified in the group of Vamanopag²⁵ (adjuvant in emetic therapy) drugs. So dose variation study was conducted for determination of suitable dose and it was 500 mg daily.

SAMPLE SIZE: 60 patients were selected for the clinical study. Two groups were prepared among them.

GROUPING

Table 1: Trial groups

Group	Treatment	Anupana	Kala (Time)
A (Study Group)	i. Tila Taila Padabhyanga daily ii. Yashtimadhu choorna 500 mg one capsule daily	---	At night
B (Control Group)	i. Yashtimadhu choorna 500 mg one capsule daily	Lukewarm water	At night

Assessment of efficacy

Efficacy of the therapy was assessed on the basis of reduced severity of Eye Strain. Clinical improvement of Eye Strain was based on individual symptoms.

1) Ex. = Excellent i.e. 3 grade reduction in severity score against initial score.

2) G. = Good i.e. 2 grade reduction in severity score against initial score.

3) En. = Encouraging i.e. 1 grade reduction in severity score against initial score.

4) CS = Clinically Stable i.e. severity score remain same as initial score.

5) CD = Clinically Deteriorated i.e. increase in severity score against initial score.

Parameters of assessment

Clinical

i) Gradation for Eye Strain was done on the basis of 'Visual Analogue Scale'. The VAS score was the distance from 'no strain' to the patient's mark. VAS was recorded before and after practicing Padabhyanga and during the follow up.

ii) Eye Strain was graded by using 5- point Likert Scale as follows

Table 2: Grading of Eye Strain using 5- point Likert Scale

0	Never	Grade I
1	Rarely	Grade II
2	Sometimes	Grade III
3	Often	Grade IV
4	Always	Grade V

Eye Strain grade scale number was recorded before and after practicing Padabhyanga and during the follow up.

● When Eye Strain was present, it was quoted according to frequency as 1, 2, 3 or 4 and when absent, quoted as 0.

● Paired 't' test and unpaired 't' test at 5% significant limit was applied to the observations and result was analyzed statistically.

Follow up – Follow up was recorded after every 15 days for a period of two months.

OBSERVATIONS

Table 3: Hetu wise distribution of patients

Hetu (causes) ²⁶⁻²⁸	No. of patients (%)		Total	
	Group A	Group B	Cases	Percentage
Computer use	2 (3.33%)	2 (3.33%)	4	6.67
Computer use, Two wheeler riding.	7 (11.67%)	7 (11.67%)	14	23.33
Two wheeler riding	1 (1.67%)	2 (3.33%)	3	5.00
Constant Reading, Night Awaking	8 (13.33%)	9 (15.00%)	17	28.33
Computer use, Constant Reading, Night Awaking	1 (1.67%)	0 (0.00%)	1	1.67
Two wheeler riding, TV watching, Night Awaking	1 (1.67%)	0 (0.00%)	1	1.67
TV watching, Night Awaking	3 (5.00%)	3 (5.00%)	6	10.00
Constant Reading, Constant Standing	2 (3.33%)	0 (0.00%)	2	3.33
Computer use, TV watching	1 (1.67%)	0 (0.00%)	1	1.67
Night Awaking	2 (3.33%)	2 (3.33%)	4	6.67
Constant Reading, Constant Standing, Two wheeler riding	1 (1.67%)	0 (0.00%)	1	1.67
Two wheeler riding, TV watching	1 (1.67%)	1 (1.67%)	2	3.33
Constant Reading, Constant Standing, TV watching	0 (0.00%)	1 (1.67%)	1	1.67
Computer use, Night Awaking	0 (0.00%)	3 (5.00%)	3	5.00
Total	30	30	60	100.00

By statistical analysis $\chi^2_{cal} = 0.093$, $p > 0.05$ ($\chi^2_{tab} = 5.99$). So observations in both groups are at baseline level.

This table shows that the higher number of patients were found having combination of Hetu Constant Reading and Night Awaking 17 (i.e. 28.33%) and in decreasing number from Hetu Computer use-Two wheeler riding 14 (i.e. 23.33%), TV watching, -Night Awaking 6 (i.e. 10.00%), Computer use and

Night Awaking 4 (i.e. 6.67%) for each group. Constant Reading-Constant Standing and Two wheeler riding-TV watching 2 (i.e. 3.33%) and one patient having Hetu Computer Use-Constant Reading-Night Awaking, Two wheeler riding-TV watching-Night Awaking, Computer use-TV watching, and Constant Reading-Constant Standing-Two wheeler riding from each group (i.e. 1.67%).

Table 4: The response of therapy for the individual group after trial

Variable	Group	Ex	G	En	CS	CD	Total
Weakness	A	3 (10%)	4 (13.33%)	14 (46.67%)	9 (30%)	0 (0.00%)	30 (100%)
	B	0 (0.00%)	1 (3.33%)	9 (30.00%)	20 (66.67%)	0 (0.00%)	30 (100%)
Heaviness	A	0 (0.00%)	1 (3.33%)	9 (30.00%)	20 (66.67%)	0 (0.00%)	30 (100%)
	B	0 (0.00%)	1 (3.33%)	6 (20.00%)	23 (76.67%)	0 (0.00%)	30 (100%)

Ex = Excellent, G = Good, En = Encouraging, CS = Clinically Stable, CD = Clinically Deteriorated

Weakness

Group A – It was observed that 70% patients showed improvement and 30% remained clinically stable.

Group B - 33.33% patients showed improvement and 66.67% remained clinically stable.

Heaviness

Group A – 33.33% patients showed improvement and 66.67% remained clinically stable.

Group B – 23.33% patients showed improvement and 76.67% remained clinically stable.

Statistical Analysis

For statistical analysis paired 't' test, unpaired 't' test and Chi-square test were used.

Table 5: Effect of therapy on Weakness of eyes

Follow up (Visit)	Mean of experimental group (A)	Mean of control group (B)
0	4.65	5.06
1	4.49	5.00
2	4.28	4.94
3	3.98	4.88
4	3.66	4.83
Difference in B.T and A.T	0.99	0.23

Table 6: Effect of therapy on Heaviness of eyes

Follow up (Visit)	Mean of experimental group (A)	Mean of control group (B)
0	2.51	3.06
1	2.47	3.00
2	2.37	2.96
3	2.34	2.98
4	2.28	2.95
Difference in B.T and A.T	0.23	0.11

RESULTS

Table 7: Statistical Analysis of Group A results

Variable	Grading on		Mean	Variance	SD	SE	T stat	P Value	Significance
Weakness	VAS	BT	4.6467	2.5640	1.6012	0.2923	3.745	0.001	Highly Significant
		AT	3.6600	2.7666	1.6633	0.3037			
	LK	BT	3.0667	0.6851	0.8277	0.1511	6.100	0.001	Highly Significant
		AT	2.0333	1.0678	1.0334	0.1887			
Heaviness	VAS	BT	2.5133	2.1633	1.4708	0.2685	2.856	0.01	Highly Significant
		AT	2.2867	2.0260	1.4234	0.2599			
	LK	BT	1.8333	1.2471	1.1167	0.2039	3.340	0.01	Highly Significant
		AT	1.5000	1.2241	1.1064	0.2020			

Statistical significance level (α) = 0.05

Table 8: Statistical Analysis of Group B results

Variable	Grading on		Mean	Variance	SD	SE	T stat	P Value	Significance
Weakness	VAS	BT	5.0633	2.2424	1.4975	0.2734	2.447	0.05	Significant
		AT	4.8333	2.8216	1.6798	0.3067			
	LK	BT	3.0333	0.7230	0.8503	0.1552	3.612	0.01	Highly Significant
		AT	2.6667	1.1264	1.0613	0.1938			
Heaviness	VAS	BT	3.0633	3.1445	1.7733	0.3238	2.007	0.10	Not Significant
		AT	2.9500	3.1095	1.7634	0.3219			
	LK	BT	2.0000	1.5172	1.2318	0.2249	2.804	0.01	Highly Significant
		AT	1.7333	1.3057	1.1427	0.2086			

Statistical significance level (α) = 0.05

Table 9: Statistical Analysis of Group A and Group B results

Variable	Grading on		Mean	Variance	SD	SE	T stat	P Value	Significance
Weakness	VAS	Gr. A	0.9867	2.0819	1.4429	0.2634	2.705	0.01	Highly Significant
		Gr. B	0.2300	0.2649	0.5147	0.0940			
	LK	Gr. A	1.0333	0.8609	0.9279	0.1694	3.376	0.01	Highly Significant
		Gr. B	0.3667	0.3092	0.5561	0.1015			
Heaviness	VAS	Gr. A	0.2267	0.1889	0.4346	0.0794	1.164	0.2	Not Significant
		Gr. B	0.1133	0.0957	0.3093	0.0565			
	LK	Gr. A	0.3333	0.2989	0.5467	0.0998	0.484	0.6	Not Significant
		Gr. B	0.2667	0.2713	0.5208	0.0951			

Statistical significance level (α) = 0.05

Table 10: Individual symptom of individual group before and after trial

Variable	Grading On	Group	Chi sq. Value	DF	Contingency Coefficient	P Value	Significance
Weakness	LK	Gr. A	17.160	3	0.472	0.001	Highly Significant
		Gr. B	5.696	3	0.294	0.5	Not Significant
Heaviness	LK	Gr. A	4.517	4	0.265	0.5	Not Significant
		Gr. B	3.163	4	0.224	> 0.5	Not Significant

VAS = Visual Analogue Scale, LK = 5-Point Likert Scale

Statistical significance level (α) = 0.05

DISCUSSION

Ayurveda aims towards giving priority for maintenance of health followed disease cure. For this purpose, Dincharya plays an important role. Padabhyanga is an Upakrama which balances both the facts i.e. guidelines given by Ayurveda and priorities of fast life.

Samprapti Bhanga (Probable mode of action)

It is clear from Ayurvedic literature that Padabhyanga acts on both Sthanik Doshas (local sign and symptoms) and also on Sarvadehik Doshas (remote sign and symptoms or organ). Pada

and Netra are like two poles of our body. And still drug instilled from one pole i.e. Pada can reach to other pole i.e. Netra through Siras (vessels). These Siras, which are very minute, can be seen only by Yogachakshus and Gyanchakshus (extraordinary visual sense) but not by the ordinary eyes. Vagbhata in the references did not promise anything more than beneficial to the eyes.²⁹ The Sira means Strotas (channels)³⁰ and these two Strotas (Mamsavaha or Snayuvaha)³¹ from Pada go to eyes. These Siras may be the two Nadis, Gandhari (which connects left great toe to left eye) and Pusha (which connects right great toe to right eye) described in Yoga Shastra.³² Tila Tila applied for massage get absorbed percutaneously through the skin comparatively

easily because it is in lipid form³³. Thus this absorbed Taila through these Strotas, acting by its Snigdha (unctuous) and Ushna (hot in potency) properties pacifies Vata Dosha in the eyes aggravated by Atiyoga (over use) or Mitthyayoga (improper use) of Netra (i.e. Eye Strain).

Anatomically there exist no such vessels but can consider the Siras as neurovascular bundles because sole of foot has very rich nerve anastomosis. Stimulation of this neurovascular bundle benefits the body as a whole and eyes especially by nourishing eye muscles and reduces the Eye Strain. According to Samanyvishesha Siddhanta (co-inherence and distinction principle)³⁴, by pedal inunction ectodermal tissues of skin were nourished thereby nourishing its other derivatives in eye and improved the functions of the eye and reduced Eye Strain.³⁵

Also Ayurveda explain the same thing about the development of organs that Pada and Netra both have its origin from Vaikarik (modifying or modified source of creation) and Rajas Ahmaka (passionate source of creation)³⁶, also both develop at same month in intrauterine life³⁷. Thus by therapy on Pada we can have its effects on Netra because of their same origin. In pedal inunction the absorbed Taila, through Rasa (serum) in the skin and blood in the Siras gives nourishment to the eyes and reduces its weakness i. e. Eye Strain.³⁸

According to Physiology, by Padabhyanga the somatic sensory area in the cortex may get stimulation and as both feet and eyes are in the same area i. e. area II of cortex, its stimulant effect may go to the eyes and may act by improving the function of eyes and reducing the Eye Strain.³⁹ Also by Padabhyanga there might be nourishing or stimulation effect on eyes through the interpretative (association) areas of feet and eyes, as both meets at Wernicke's area and improving the function of eyes and reducing the Eye Strain.⁴⁰

Decrease in Eye Strain by Padabhyanga might be due to reflex action.⁴¹ According to the Spiritual energy massage, the points at the outer rim of the big toes are massaged to achieve the harmony of the Aghnya Chakra (or Inner Eye Chakra).⁴² According to the Acupuncture or Acupressure techniques, UB 62 Shenmai point, UB 67 Zhiyin point, K1 Yangquan point and GB 43 Xiaxi point situated at the sole of foot have indication for eye ailments and by practicing Padabhyanga through these points Eye Strain might have reduced.⁴³ Similarly Ayurveda believes the therapy by means of which we can have effects on distant area or organ.⁴⁴

The piezoelectricity derived from pressure of Abhyanga increases the conductivity of nerves and also due to increased amino acids in blood, parallelly it increases the neuron transmitter serotonin which helps to enhance pleasing effects on eyes.⁴⁵

While going through Ayurvedic literature for Sneha Dravya (oily preparation) it was found that Tila Taila is having superior qualities and it is the best for Abhyanga.⁴⁶ Also Eye Strain is the disease of Vata aggravation and Tila Taila is the best for Vata Shamana (mitigation).⁴⁷ The control drug Yashtimadhu was selected for Eye Strain, because by its properties Yashtimadhu acts as Chakshushya (pleasing to the eyes)^{48, 49}.

For Padabhyanga Tila Taila was used in a dose of 5 ml for each foot but relaxation for more doses was given according to individual absorption demand. For both the groups Yashtimadhu was used in a dose of 500 mg, one capsule at night. Yashtimadhu capsules were used to maintain exact dose administration and for patient convenience.

In old classics of Ayurveda Padabhyanga is mentioned in Dincharya before Snana (Bath), but in present study time of application of Padabhyanga was selected at night because the purpose of the study was to screen the effect of Padabhyanga in Eye Strain which was an Urdhwajatrugata (above collar bone)

disease and for Urdhwajatrugata disease, Swapnakala (night) is the best time for drug administration.⁵⁰ Also here patient convenience was taken into consideration.

As per the inclusion and exclusion criteria, the patients showing signs and symptoms of Eye Strain were included for study. The patients who suffer from Eye Strain due to computer use, constant reading, watching TV, constant traveling on two wheelers, and keeping awake at night were selected, because in these patients Eye Strain develops due to overuse or improper use of eyes. Also patients walking bare feet and constant standing were selected, because harassment of Pada is one of the causes of Netra Vikara (diseases).⁵¹

Age group 18-40 years was selected for study, because the onset of disease is at an average of 18 years of age due to many factors such as study, job, or two wheeler riding, etc., also patients aged more than 40 years generally have chance to develop presbyopia (ophthalmic health deteriorate due to age factor). Either sex was included because Eye Strain has no such prevalence about sex.

In age wise distribution maximum number of patients were found in age group 26-30 yrs. i.e. 31 cases (51.67%). It indicates prominent effect of fast lifestyle on youngsters. Excessive use of computer, two wheeler riding, night awaking, constant reading, watching television are causing Eye Strain in young age. In occupation wise distribution the higher incidence of patients was found in group of engineers i.e. in 20 cases (i.e. 33.33%). While in students it was 18 (i.e. 30%), this is again because of the fact that these persons make overuse or improper use of eyes and Sthanik (local) Vata Dosha gets aggravated in them. In Prakriti (constitution) wise distribution, the higher incidence of patients was found from Vatapradhana Prakriti i.e. Vata-Pitta (bile) 19 (31.66%) and Vata-Kapha (phlegm) 18 (30.00%), Vata plays an important role in Eye Strain; hence these patients suffer from Eye Strain in more numbers. This indicates that constant reading with night awaking and more computer use with two wheeler riding are the main Pradhyaparadhaja (intellectual insult) Hetu causing Eye Strain and finally it points towards the Nidanparivarjana (avoiding the cause) and importance of adopting proper Dincharya.

By statistical analysis, it was proved that, symptoms Weakness and Heaviness were improved in group A. Results were highly significant in group A with Visual Analogue Scale and 5-Point Likert Scale. In group B both Weakness and Heaviness were improved, result was highly significant with Likert Scale values. But with Visual Analogue Scale values for weakness result was just significant and for Heaviness it was not significant. This difference of result in group B occurs because Visual Analogue Scale measures the severity of symptoms and Likert Scale measures the frequency of the symptoms, means in group B the frequency of symptoms reduced but not the severity as compared to group A.

When unpaired 't' test was applied for above symptoms, it was highly significant for symptom Weakness which indicates that the trial therapy was more effective in Weakness than control therapy. It ascertained that the significant result obtained was due to extra effect of Padabhyanga.

Unpaired 't' test was insignificant for Heaviness indicates that the trial therapy and the control therapy, both are equally effective in Heaviness of eyes.

In experimental group 21 patients having symptom Weakness were cured, and 9 patients were not cured. In control group 10 patients having symptom Weakness were cured, and 20 patients were not cured. By applying χ^2 test to this, result was highly significant.

In experimental group 10 patients having symptom Heaviness were cured, and 20 patients were not cured. In control group 7 patients having symptom Heaviness were cured, and 23 patients

were not cured. By applying χ^2 test to this, result was not significant.

Finally summarizing that, the combination of Tila Taila Padabhyanga and Yashtimadhu choorna is more effective than only Yashtimadhu choorna for Weakness of eyes. And it is equally effective for Heaviness of eyes.

Thus the significant effect obtained was due to additional effect of Padabhyanga on Eye Strain.

The parameter of efficacy was Weakness of eyes and trial therapy shows good results in this symptom than control therapy. Also χ^2 test to this symptom comes significant. Hence the trial therapy Tila Taila Padabhyanga was effective and its role in Eye Strain proved.

CONCLUSION

Padabhyanga is an important Upakrama mentioned in Dincharya. It is the quickest, simplest, most pleasurable and inexpensive way to make someone healthier and happier. Regular practicing Tila Taila Padabhyanga is very beneficial for reducing Eye Strain. Overuse or improper use of eyes was the common causative factor for Eye Strain among all the patients. The Nityabhyasa (daily practice) of Padabhyanga prior to onset of Eye strain may prevent or postpone its symptoms.

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