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ASSESSMENT OF ADD ON EFFECT OF YASHTIMADHU GHRIT TARPANA WITH TRIPHALA CHOORNA SEVANA IN THE MANAGEMENT OF SIMPLE MYOPIA

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ABSTRACT

Myopia, commonly referred as short sightedness, is the most common eye disease in the world with substantial social, educational and economic impact of affected one. It hampers day to day activities of a person if care is not taken properly. Simple myopia can be corrected with spectacles or contact lenses, whereas high myopia is often associated with potentially blinding conditions such as retinal detachment or macular degeneration. According to some Ayurvedic authors Simple Myopia can be correlated with 'Drushti gat Vyadhi' as explained in Ayurvedic Samhitas. In *ayurvedic* classics, we find the concept of *Chakshushya* and many therapeutic procedures explained, which are said to improve or enhance visual acuity as well as improve the health of the eye. We found some effective *Chakshushya* herbs in *Bhavprakash* and mentally satisfied with its *guna, karma* and *prabhavas*. Hence the drug selected here for study which is *Yashtimadhu Ghrita* and *Triphala Choorna* is on the basis of its *Chakshushya* property as well as easy availability.

KEYWORDS: Simple Myopia, Patalagata Vyadhi, Tarpana, Chakshushya Dravya.

INTRODUCTION

The diseases of the eye are much more important than any other physical disability as the loss of vision completely disables the patient. The world health organization has grouped Myopia and uncorrected refractive error with cataract, macular degeneration, infectious diseases and vitamin A deficiency among the leading causes of blindness and vision impairment in the

world. A good deal of care is required to be exercised in carrying out its proper diagnosis and treatment. Myopia is that dioptric condition of the eye, in which with the accommodation at rest, incident parallel rays come to focus anterior to photosensitive layer of retina. Myopia is mainly of two types.

1. Physiological or simple myopia
2. Pathological or degenerative myopia

In India, the prevalence of Myopia increases in school age and young adults, reach 25-30% in the mid to late teenage population. Although modern medical science has made tremendous remarkable progress and advances in the field of ophthalmology, the importance of ayurvedic treatment in the diseases of eyes can't be ignored owing to the above mentioned pitfalls of modern therapy.

In *Ayurveda*, clinical features related to visual disturbances are seen only in '*Drishtigat Rogas*'. Hence all cases of visual disturbances can be correlated under the broad heading of *Timira-Kacha-Linganasha* complex. The part of clinical feature of *Timira*, especially first and second *patala*, can be correlated with most important refractive error, Myopia. When the vitiated *doshas* invade first *patala*, the patient complains of difficulty in seeing objects distinctly. This is the common complaint of patients with refractive error. When the vitiated *doshas* are situated in the second *patala*, the patients complain of confused visual perception and appearance of bees, flies, hairs etc. These symptoms are present in high myopia also, where degenerative changes occur.

As far as the management of *Timira* is concerned, *Sushruta* have recommended the use of *Kriyakalpa*, which can be applied in almost all types of eye diseases but gives very good results in Myopia. Among the many contributions of Ayurveda in drug delivery system 'Kriyakalpa' has a very superior position as it is tissue targeted, fast acting, simple but innovative method of drug administration to various parts of eyes including the posterior segment, the optic centre and visual pathway too.

AIM

To assess add on effect of Yashtimadhu Ghrit Tarpana (*Glycyrrhiza glabra* (Linn.)) with Triphala Choorna Sevana in the management of simple myopia.

OBJECTIVE

To evaluate add on effect of *Yashtimadhu Ghrit Tarpana* as a topical medication in comparison with *Triphala Choorna Sevana* to prevent the progress of myopia.

Literature Review

Simple Myopia

- The refractive status of the eye with simple myopia is dependent on the optical power of the cornea and the crystalline lens and the axial length. Poor vision for distance (short sightedness) is the main symptom of myopia.
- Symptoms of eyestrain develop due to dissociation between convergence and accommodation.
- Simple myopia or developmental myopia is the commonest variety.
- There will be no degenerative changes in the fundus of the patients with simple myopia.
- It is considered as a physiological error, not associated with any disease of the eye.
- Simple myopia is rarely present at birth. Most of such patients are rather born hypermetropic but during development the normal mark is overshooted and the child becomes myopic.
- Simple myopia usually begins between the ages of 7 to 10 years and may increase during the years of growth until stabilising around the mid teens usually at about –5 D or less and never exceeds –8D.

Ayurvedic review of Simple Myopia

Patala is one of the important structures described by *Sushruta* in *netrasharir*. Various authors have given their views on *patala* and its correlation yet no consensus has reached upon among them on this subject. Meaning of patala in Sanskrit-English dictionary by V.S.Apte is a film or coating over the eyes.

Timira is one such eye disease which starts from Avyakta darshana and ends in complete loss of vision i.e. Linganasha. The literally meaning of word Timira is Darkness. No separate etiological factors are explained in Ayurveda about vyadhi timira, hence general etiological factors given by acharyas are considered. Its clinical features are based on involvement of Patalas and vitiation of Doshas. So the treatment of the timira depends upon the stage and dominance of particular dosha.

Sushrutacharya has described the drishtidosha symptoms of four patalas and ayurvedic concept of Timira and linganasha along with their six subdivisions viz. vataja, pittaja, kaphaja, raktaja, sannipataja, parimlayi.

Samprapti Ghataka

Dosha- Tridosha

Dushya- Ashray of patalas which are ras, rakta, mamsa, meda, asthi

Srotas- roopvaha sira

Srotodushti- sang and vimarga gaman

Roop-(signs and symptoms)

The actual diagnosis of the disease is done on the basis of pradhan roop. In case of timira, the signs and symptoms are mentioned according to involvement of patalas and vitiation of doshas. The progress of disease timira through successive patalas and their correlation with the refractive errors may be done for the clinical condition. Simple Myopia can be correlated with 'Pratham Patalagata Dosha Dushti' as it reveals following symptoms.

All external objects appear dim and hazy when the deranged doshas passing through sira get carcerated within the first patala. Person with pratham patal gat timira cannot see the object distinctly. This condition can be correlated with lower degree of myopia, hypermetropia and astigmatism.

Tarpana

Sushrutacharya has mentioned the preparation and uses of therapeutic external ophthalmic preparations. Tarpana is highly modified procedure by which eye is nourished, toned up, strengthened and patient feels contentment.

Indications of Tarpana

The patient seeing darkness in front of eyes, fatigued and inactive eyes, dry eyes, hard lids with falling eyelashes, dirty eyes, squinting of eyes and highly diseased eyes are the conditions where eye gains energy from tarpana. (Su.ut.18/17).

Contraindications of Tarpana

Tarpana should not be used on a cloudy or very hot or cold days and it should not also be done in persons suffering from anxiety, tiredness, giddiness and in eyes where complications have not abated.

Tarpana vidhi

- Tarpana can be done either in early morning or evening; only after digestion of any food taken previously.
- The patient is asked to lie down on his back on a bed away from direct sunlight wind and dust and is given mild fomentation with cotton soaked in lukewarm water, then the eyes are encircled with firm, compact wall made up of paste of powdered mash pulse. The height of this wall should be 2 angula.
- As far as patient's convenience is concern, some modifications are made in this treatment. Instead of masha powder, swimming goggles are used with upper glass removed to pour medicine. This gives best results and more comfort to the patient in less time.
- The patient is asked to close the eyes and over the closed eyes, liquefied ghritamanda is poured very slowly till the entire eyelashes are under the liquefied ghrita.
- Patient is instructed to close and open the eyes for limited matra.
- After the procedures eyes are soothen with hot fomentation with pals and warm water.

MATERIALS AND METHODOLOGY

For clinical study 'Assessment of add on effect of Yashtimadhu Ghrit Tarpana and Triphala Choorna sevana in the management of simple myopia' patient and drug are two important materials being used.

1. Patient

Total number of 50 patients of Simple Myopia fulfilling inclusion criteria selected from those attending the Netrarog O.P.D. An elaborative case proforma had been designed for including all aspects of the disease. It was done after taking proper written informed consent of the patient and explaining to him the whole work to be done, provided the information of the subject to be confidential.

Criteria of Assessment of Patients

Inclusion Criteria

- Patients willing for trial
- Patients having simple myopia (-0.25 to -3.00D spherical number) with normal ophthalmoscopic findings.
- Patients of age group between 16 to 25 years with signs and symptoms of simpe myopia as per Ayurveda and modern aspect

Exclusion Criteria

- Patients not willing for trial
- Patients having any other known ocular pathology.
- Patients up to 16yrs and above 25yrs of age will be excluded from study.

Clinical Study

A controlled, randomized, prospective study conducted for 50 patients. The study of the subject was totally based on the clinical ophthalmological examinations.

2. Drugs

The drugs used in this study are.

A) Yashtimadhu Ghrit

B) Triphala Choorna

The raw drug used for the study i.e. Yashtimadhu Bharad, Haritaki, Amalaki and Bibhitaki Choorna was obtained by Mankarnika Pharmacy, Pune. The standardization of raw drug is done at Poona University Botany department, Pune.

Methods of Drug Preparation

1. Yashtimadhu Ghrit

Yashtimadhu ghrit is prepared according to *sneha kalpana vidhi* mentioned by *Sharangdhara Samhita*. 1 part of *Yashtimadhu Kalka*, 4 parts of *goghrit* and 16 parts of water boiled together till all the water gets evaporated and only the ghrit remains behind. This suspension is then filtered properly which then ready for use.

Standardization of prepared drug is also done from Poona University Botany Department, Pune.

2. Triphala Choorna

According to *Sharangdhara* it is an absolutely dry form of drug which is finely powdered to get filtered by fine cloths.

METHODOLOGY

The selected patients were randomly divided into 2 groups with following drug schedule in a particular group.

Group A- 25 patients were given Yashtimadhu Ghrit Tarpana for alternate 7days in three settings along with 500mg Triphala Choorna Sevana with Ghrit and madhu for 60 days at bed time.

Group B- 25 patients were given 500mg Triphala Choorna with ghrit and madhu in unequal quantity at bed time for abhyantar sevana for 60 days.

Follow up of these patients were taken monthly for consecutive 6 months and these observations were subjected to analysis.

A. Subjective Criteria

1. Headache

0- No headache
1- Very occasional headache
2- Irregular attacks of frequent headache
3- Regular headache

2. Eyestrain.

0- After more than 6 hours of near work
1- After 4-6 hours of near work
2- After 2-4 hours of near work
3- Before 2 hours of near work

B. Objective Criteria

- Visual acuity
- Refraction
- Keratometry
- Axial length measurement

Among these keratometry and axial length measurement is done on first, third month and then on last follow up i.e. after 6 months.

Visual acuity percentage

Visual acuity was recorded on snellen's chart in numerical form and then converted into percentage as per the method of Kaith Lyle et al. 1985.

Snellen's chart reading percentage

6/6	100
6/9	90
6/12	80
6/18	60
6/24	50
6/36	40
6/60	20

Statistical Analysis

The information collected in the form of observations was subjected to appropriate statistical analysis. Medcalc software is used for statistical analysis for both qualitative and quantitative data obtained from the study. From the observations, result is noted.

OBSERVATIONS AND RESULTS

First we will go with the qualitative data obtained which is-

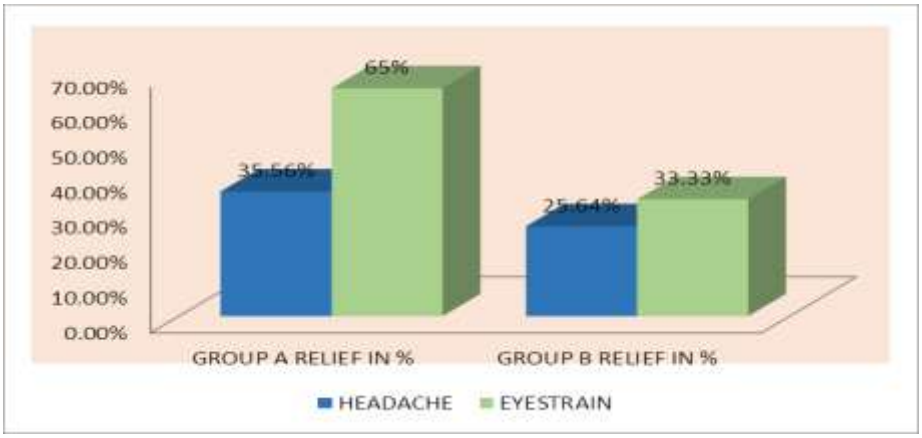
1. Headache
2. Eyestrain

Relief calculated in the percentage

Symptom	Group A Relief In %	Group B Relief In %
Headache	35.56%	25.64%
Eyestrain	65%	33.33%

From above table we can conclude that overall relief in percentage for the symptoms of simple myopia in both groups is seen as, there was 35.56% patients got relief for headache in group A while in group B 25.64% patients got relief for same complain. For eyestrain in group A 65% patients got relief while in group B for the same complain 33.33% patients got relief.

Graphical Representation Of Relief In Percentage In Both Groups-



Calculation of p value for each symptom in Group A

Statistical test used- **Wilcoxon rank sum test**

From Medcalc software

	Sum Of Positive Ranks	Sum Of Negative Ranks	No Of Pairs	Median	P Value	Test Significancy
Headache	0	13	25	2.000	0.0002	SIGNIFICANT
Eyestrain	0	21	25	1.000	0.0001	SIGNIFICANT

From above analysis, it is concluded that symptoms observed in Group A (headache and eyestrain) has effective relief with Yashtimadhu Ghrita Tarpana with Triphala choorna sevana as for both feature p value is <0.05 so it reveals that it has significant result.

Calculation of p value for each symptom in Group B

Statistical test used- **Wilcoxon rank sum test**

From Medcalc software

	Sum Of Positive Ranks	Sum Of Negative Ranks	No Of Pairs	Median	P Value	Test Significancy
Headache	0	10	25	2.000	0.0020	SIGNIFICANT
Eyestrain	0	11	25	1.000	0.0010	SIGNIFICANT

From above analysis, it is concluded that symptoms observed in Group B (headache and eyestrain) has effective relief with Triphala choorna sevana as for both feature p value is <0.05 so it reveals that it has significant result.

Statistical analysis for quantitative data obtained in the following form-

- Visual acuity (unaided vision)
- Lens power (Refraction)
- Values of A scan (K1, K2 And Axial length)

Medcalc software is used for statistical analysis. Statistics is drawn by using mean paired t test for above quantitative observations.

No.	Data	Mean	S.D.	T Value	P Value	Significance
1	Rt eye Vision Group A	23.5909	6.3287	-3.436	0.0025	Significant
2	Lt eye Vision Group A	26.3478	8.3138	-3.386	0.0027	Significant
3	Rt eye Vision Group B	21.9600	6.7082	-1.789	0.08	Insignificant
4	Lt eye Vision Group B	21.1200	4.9051	-1.346	0.1910	Insignificant
5	Rt eye Lens Power Group A	-1.67	0.1665	6.608	<0.0001	Significant

6	Lt eye Lens Power Group A	-1.53	0.1750	4.571	0.0001	Significant
7	Rt eye Lens Power Group B	-1.27	0.1250	2.000	0.0569	Insignificant
8	Lt eye Lens Power Group B	-1.15	0.1614	0.000	1.000	Insignificant
9	Rt eye K1 Group A	43.54	0.1137	0.440	0.6639	Insignificant
10	Lt eye K1 Group A	43.50	0.1187	1.693	0.1034	Insignificant
11	Rt eye K1 Group B	43.87	0.1429	0.700	0.4907	Insignificant
12	Lt eye K1 Group B	44.07	0.1871	2.138	0.0429	Significant
13	Rt eye K2 Group A	44.01	0.1146	3.055	0.0054	Significant
14	Lt eye K2 Group A	44.09	0.1190	3.361	0.0026	Significant
15	Rt eye K2 Group B	43.89	0.1250	2.00	0.0569	Insignificant
16	Lt eye K2 Group B	44.09	0.1233	0.811	0.4254	Insignificant
17	Rt eye Axl Group A	23.5248	0.1940	-0.639	0.5287	Insignificant
18	Lt eye Axl Group A	23.4312	0.1859	0.635	0.5316	Insignificant
19	Rt eye Axl Group B	23.3208	0.1040	-0.250	0.8047	Insignificant
20	Lt eye Axl Group B	23.1292	0.1082	1.886	0.0714	Insignificant

DISCUSSION

Because of its *madhur, sheeta, snigdha guna Yashtimadhu* acts on the vitiated *vata & pitta dosha* which are found to be aggravated in Timira vyadhi. Thus eyestrain, fatigue of eyes and feeling of grittiness in eyes is reduced. The *mamsa gamitva* activity of *yashtimadhu* helps the drug to act at the muscles and reduce the accommodative stress and strain. The *goghrit* plays vital role of rejuvenation of the cells and because of its '*yogavaahi' &' sukshma' guna* it acts as a vehicle for the drug delivery to the site of action. *Goghrit* is believed to be acting as a natural steroid i.e. anti-inflammatory and antiallergic but not as an immunosuppressive.

It has been observed that glycyrrhizic acid reduces the Reactive Oxygen Species (ROS) i.e. free radicals, the cytochrome and ROS inhibits the hyaluronidase enzyme (component in destruction of cell). Glycyrrhiza root has plenty of polyphenolic, isoflavones – glabridin & hispaglabridins like compounds as potential source of antioxidants. Licochalcones B & D inhibits the microsomal lipid peroxide & Licochalcone C attenuates inflammatory response by –

-influencing extracellular O2 production.

-modulating antioxidant network activity of superoxide dismutase.

-reducing production of superoxide radicals.

(Phytopharm Aug 2011-May 2012)

The antioxidant enzymes essential for maintaining the vitality of ocular tissues are Superoxide Dismutase (SOD) and catylase which are present in *Yashtimadhu*. These help in compensating the oxidative stress on the ocular surface, reducing the degenerative process. *Yashtimadhu ghrit* has been used for its efficacy on localized symptoms. Tarpana being the most feasible and competitive mode of administration of drug topically, it was chosen so tarpana was selected in the form of lipid solution as using the topical drug in the form of o/w solution makes the drug instantly available for topical action. The cell membrane is a lipid globular protein mosaic with lipid soluble portion or non-polar group towards interior of the membrane. Ionic water soluble or polar groups are oriented at the two surfaces of the membrane. Embedded within this phospholipid are globular proteins which are hydrophilic portion of the membrane; therefore the cell membrane has some sites for water soluble drugs. The absorption through cornea involves transformation of drug through its different layers. The corneal epithelium and endothelium have 100 times more lipid content than in the stroma and lipid soluble drugs readily penetrate the epithelium and the endothelium. However, only water soluble drugs can penetrate the stroma. Therefore, the drug should be amphipathic i.e. of both lipophilic and hydrophilic characters to penetrate properly. The main forms of drugs instilled into the eyes are aqueous solutions or aqueous suspensions. Each has different influence on drug bioavailability. In solutions the drug is totally dissolved but tissue contact time is short. In suspension the drug is present as small particles kept suspended in an aqueous medium by a dispersing agent (medicated *ghrit*). Particles do not leave the eye as quickly as solutions which increase the tissue contact time. Lipid soluble molecules pass through the phospholipid portion of the cell membrane by dissolving in it and diffusing through it, irrespective of molecular size and shape. Water soluble molecules on other hand are restricted to size 4Å and filter through pores in or around the globular protein molecules. Moreover the concentrated solutions are more readily absorbed. Only nonionized drugs can penetrate the lipid soluble layers, whereas ionized drugs readily traverse the water soluble stroma. Therefore, a drug should be able to exist in both ionized and nonionized form to penetrate the cornea. Substances which are exclusively electrolytes or non-electrolytes will not penetrate the cornea e.g. flourescein dye, a negatively charged ion will not penetrate the epithelium unless it is damaged.

The one who consumes *Triphala choorna* with honey and ghee at night time is far away from ocular diseases. The contents of *Triphala – Haritaki, Bibhitaki & Amalaki* are known to be *Chakshushya* by its properties. *Triphala* acts as *vatanoolomaka & pittasaraka*

thus*ameliorating* the*vata-pitta prakopa*which helps in relieving eye strain and headache. *Triphala* because of its *Rasayana prabhava & chakshushya* property helps in maintaining the ocular health and quality of vision. *Triphala* by virtue of its *vatanoolomana* function prevents its adverse effects on the eye.

Triphala containing the berries of three myrobalans provides antioxidant effect, cytoprotective effect and protection to the gut bacteria. The symbiotic gut bacteria convert the prebiotics in the food into pro-biotics and improve the quality of nutrition thus making the essential components available for proper nourishment of ocular tissues.

Amalaki- cell damage management
Haritaki- provides sustainable cell life.
Bibhitaki- protects the symbiotic gut bacteria.

These activities can be said to be useful in relieving the asthenopic symptoms in simple myopia and providing the essential support for reducing the oxidative stress too. The vit. C in *amalaki* plays important role of an antioxidant.

In this study, total 50 patients were examined, 25 in each group A and group B for clinical trial of add on effect of Yashtimadhu Ghrita tarpana and Triphala choorna sevana in the management of simple myopia. The overall effect of therapy observed is.

In trial group A 4 patients out of 25 i.e. 16% did not have relief, 16 patients i.e. 64% had mild relief and 20% i.e. 5 patients had moderate relief.

In control group B, 14 patients out of 25 i.e. 56% had no relief while 11
Patients i.e. 44% had mild relief.

After applying statistical tests for result between two groups from the statistical calculations we can conclude that, p value is greater than 0.05 for headache hence there is no significant difference between Group A and Group B on Headache. P value is less than 0.05 for eyestrain hence there is significant difference between Group A and Group B on Eyestrain.

CONCLUSION

- The drug used was found to be cost effective and in convenient form without any distress to the subject.

- No any adverse effects of any of the drug were seen
- The incidence of the occurrence of Simple Myopia was found to be more in females than males.
- The affected individuals were more from the age group 24-25 yrs.
- The factors responsible for causing this disease were according to the *samanya netraroga hetu* mentioned in the texts of Ayurveda.
- The main component of the treatment of Simple Myopia lies in local strengthening of ocular tissues and the topical medicines play important role in arresting the symptoms to a better extent.
- *Yashtimadhu ghrit tarpana*is quite effective in management of symptoms seen in myopic patients i.e. headache, blurring of vision and eyestrain. *Triphala choorna* was found to be effective in relieving headache but not so for other symptoms.
- The combined effect of *Yashtimadhu ghrit* as topical medication *and Triphala choorna* as oral medication show comparatively better result than the single drug use.
- We can conclude that use of add on effect of *Yashtimadhu ghrit tarpana* as topical medication *with Triphala choorna* as oral medication can be effective in the management Simple Myopia.

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