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Comparitive clinical study on the effect of *Mahatriphaladi Ghrita Tarpana* and *Jeevantyadi Ghrita Tarpana* in *Parathama Patalagata Timira* w.r.t. Keratoconus

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ABSTRACT

Keratonus is one of the important causes of progressive myopia and its incidence is 1 in 500 worldwide. Keratoconus is a degenerative disorder of the eye in which structural changes within the cornea cause it to thin and change to a more conical shape than the more normal gradual curve. Keratoconus typically starts at puberty as a progressive myopia causing substantial distortion of vision and marked astigmatism rapidly. This results in significant visual impairment leading to problems in doing routine works like driving and reading. Only temporary measures like Contact lenses and Surgery are available. In Ayurvedic terms, it can be correlated with *Prathama Patalagata Timira*. As Tarpana is considered to be supreme among all the *Kriyakalpas* in treating timira, it has been selected for the study. Giving due importance to the doshas and the site of pathology involved, Jeevantyadi Ghrita and Mahatriphaladi Ghrita are selected. Hence a clinical study has been done to compare the efficacies of Mahatriphaladi ghrita tarpana and Jeevantyadi Ghrita tarpana in Keratoconus.

Key words: Keratoconus, Mahatriphaladi ghrita, Jeevantyadi ghrita, Tarpana.

INTRODUCTION

Ayurveda has an outstanding role towards achieving the 'Right To Sight' of every individual. The branch of 'Shalaky Tantra' is one among Ashtanga Ayurveda, which specializes in the treatment of 'Jatrurdhwagata rogas'.

'Jatrurdhwa Pradesha', which is considered the 'Uttamanga', harbours all the five sense organs

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(jnanendriyas). Among these, 'Netra' (Eye) is of utmost importance and the quotation '*Sarvendriyanam Nayanam Pradhanam*' perfectly substantiates it.

"Vision" the ability to see, perceive, interpret, and enjoy the surroundings is one of the greatest assets a human being is blessed with. The joys and sorrows of a man, his state of health and disease, all are reflected in his eyes. Hence eyes can be regarded as the main link between man and his environment. Hence, it's aptly said "Eyes are the index of man's mind and nature".

The importance of eyes and vision is clearly depicted by Acharya Vagbhata in '*Ashtanga Hridayam*' (A. H. Uttarasthana 13/98) as: One must take keen interest in protecting one's eyes and vision all through his life.

Day and night seem to be the same for a blind man. Though endowed with all the wealth in the world he will still be considered a poor man, for having been deprived from the wealth of light.^[1] Blurred or

defective vision is one of the commonly faced problems nowadays and the cause of this can be majorly attributed to 'refractive errors'.

The disease 'Keratoconus' is an important cause of 'Curvatural Progressive Myopia'. Keratoconus is defined as a corneal disorder in which there is a progressive thinning of the central part leading to conical protrusion and there by uncorrected visual error, usually found in second or third decade.^[2]

The contemporary science advocates power glasses, contact lenses, corneal implants, corneal collagen cross linking with riboflavin (C3R), Laser assisted surgeries and keratoplasty in treating the keratoconus disease. These measures can temporarily combat the symptoms but no complete cure is available. Blurred vision or Avyakta Darshana or timira is mentioned as a symptom in 12 drushtigata vikaras, when there is doshic vitiation involving the prathamapatala of the eye.

Timira further leads to Kacha and Lingnasha as its complication. So it is better to intervene at the initial phase to arrest the progression of the condition, which may even lead to blindness. 'Brumhana' line of treatment can be best adopted considering Vatadosha Vruddhi in the pathology and Krishna mandala (Cornea) being formed by Vatadosha. Tarpana is one of the best 'Netrakriyakalpa' for brumhana purpose i.e. to nourish the eyes and to cure the vata-pittaja diseases. In addition, the Snehana, Chakshushya and Vata-pittahara action of the medicated ghee may be very much useful in the management of Keratoconus.

OBJECTIVES OF THE STUDY

1. To evaluate the efficacy of Tarpana with Mahatriphaladi Ghrita in Keratoconus
2. To evaluate the efficacy of Tarpana with Jeevantyadi Ghrita in keratoconus
3. To compare the results obtained in 2 groups
4. To understand keratoconus disease in Ayurvedic perspective

MATERIALS AND METHODS

Source of data

The patients who were clinically diagnosed as keratokonous were randomly selected from the OPD and IPD of Shri Jayachamarajendra Institute of Medical College, Bangalore.

Methodology

40 patients presenting with the clinical features of Keratoconus were randomly selected and divided into 2 groups of 20 patients each. Totally 69 eyes were affected among 40 patients.

Group A is treated with Jeevantyadi ghrita tarpana for 5 days. Same procedure was repeated with a gap of 7 days for 4 sittings.

Group B is treated with Mahatriphaladi ghrita tarpana for 5 days and the procedure is repeated with a gap of 7 days for 4 sittings.

Both groups were assessed after a period of one month after completion of treatment. Patients were followed for 3 months.

Table 1:

Groups	Treatment	Methodology
Group A	Tarpana with Jeevantyadi Ghrita	Tarpana for 5 days with a gap of 7 days for 4 sittings
Group B	Tarpana with Mahatriphaladi Ghrita	Tarpana for 5 days with a gap of 7 days for 4 sittings

Method of preparation

Jeevantyadi Ghrita as per the classical method explained in Astanga Hridaya (A. H. Uttaratantra 13/2-3) and Mahatriphaladi Ghrita as per the classical method explained in Bhaishajya Ratnavali (B. R. 64/249-256) were prepared as in Rasashastra and Bhaishajya Kalpana practical hall.

Procedure

Prior to the Tarpana proper, Seka using warm Triphala quatha is performed as poorva karma.

Later a wall is constructed around the eyes at a height of 2 angulas and the luke warm Jeevantyadi Ghrita is poured into it, and retained for 700 matra kaala (Sa. Sam. U. 13/45-47). Later it is taken off through the hole created at the lower end of lateral side of the wall. As a paschat karma, Jatimukula are placed over the eye and Bandhana is done to prevent the exposure of eyes to bright light.

Criteria of Assessment

The results were assessed based on the relief found in the signs and symptoms of the disease. For accessing, the main clinical signs and symptoms were graded based on the severity as mild, moderate and severe.

Before treatment (BT) is the severity of the signs and symptoms before starting the treatment. After treatment (AT) is the severity of the signs and symptoms on 30th day after completion of four sittings of the scheduled therapy.

Statistical Analysis of the Result

Analysis of the result is determined by the values obtained before and after the treatment in both the groups, and is calculated by using Paired 't' test. The results are considered as significant only if the P value is '< 0.05' in this study.

RESULTS

Table 2: Group A

Parameters	Mean BT	Mean AT	% of Relief	SD	SE	T (df-19)	P value	Remarks
Blurred vision	1.5	0.65	56.6%	0.366	0.081	10.37	<0.001	HS
Headache	1.45	0.45	68.95%	0.64	0.145	6.89	<0.001	HS
Photophobia	1.5	0.65	56.6%	0.489	0.109	7.767	<0.001	HS
FB Sensation	0.95	0.35	63.15%	0.502	0.12	5.38	0.001	HS
Watering	0.7	0.2	66.6%	0.5	0.1	4.3	0.00	

g	5	5	%	12	14	58	016	HS
Eye strain	0.35	0.35	85.1%	0.45	0.102	19.49	<0.001	HS
Ghosting	1.35	0.55	59.25%	0.523	0.116	6.838	<0.001	HS
Itching	1.05	0.35	66.6%	0.571	0.127	5.48	0.001	S
Night vision defect	0.9	0.5	44.4%	0.598	0.133	2.99	0.0037	S

Table 3: Group B

Parameters	Mean BT	Mean AT	% of Differ	SD	SE	T (df-19)	P value	Remarks
Blurred vision	1.3	0.45	65.3%	0.489	0.109	7.76	<0.001	HS
Headache	1.5	0.5	63.3%	0.825	0.184	5.146	0.002	HS
Photophobia	0.7	0.3	57.1%	0.59	0.133	2.99	0.0037	S
FB Sensation	0.65	0.35	46.15%	0.57	0.127	2.348	0.0149	S
Watering	1.1	0.4	63.6%	0.47	0.105	6.65	<0.001	HS
Eye strain	2.15	0.6	72.0%	0.604	0.135	11.46	<0.001	HS
Ghosting	1.15	0.4	65.2%	0.786	0.175	4.265	0.002	S
Itching	0.35	0.15	50%	0.366	0.081	1.83	0.0419	S
Night vision defect	0.8	0.2	75%	0.680	0.152	3.942	0.00043	S

Table 4: Comparison between Group A and Group B

Parameter	Group	Mean	% of differ	SD	SE	T-Value	P-Value	Remarks
Blurred vision	A	0.85	56.6%	0.366	0.081	7.321	<0.001	HS
	B	1.85	65.3%	0.489	0.109			

Headache	A	1	68.9 5	0.6 4	0.1 45	0.2 142	0.83 16	N.S
	B	0.9 5	63.3 3%	0.8 25	0.1 84			
Photophobia	A	0.8 5	56.6 %	0.4 89	0.1 09	2.6 262	0.01 24	S
	B	0.4	57.1 4%	0.5 9	0.1 33			
Foreign body sensation	A	0.6	63.1 5%	0.5 02	0.1 12	1.1 766	0.24 67	N.S
	B	0.3	46.1 5%	0.5 7	0.1 27			
Watering	A	0.5	66.6 %	0.5 12	0.1 14	1.2 86	0.20 59	N.S
	B	0.7	63.6 3%	0.4 7	0.1 05			
Eyestrain	A	0	85.1 %	0.4 5	0.1 02	9.2 031	<0.0 001	HS
	B	1.5 5	72.0 9%	0.6 04	0.1 35			
Ghosting	A	0.8	59.2 5%	0.5 23	0.1 16	0.2 368	0.81 4	N.S
	B	0.7 5	65.2 1%	0.7 86	0.1 75			
Itching	A	0.7	66.6 %	0.5 71	0.1 27	3.6 26	0.00 08	HS
	B	0.1 5	50%	0.3 66	0.0 81			
Night vision defect	A	0.4	44.4 %	0.5 98	0.1 33	0.9 877	0.32 95	N.S
	B	0.6	75%	0.6 80	0.1 52			

The result after statistical analysis suggests that Group A showed 67% whereas Group B showed 64% of overall result. During follow-up, there was 11% and 14 % of recurrence seen in the symptoms in Group A and Group B consecutively.

DISCUSSION

Majority of the patients in the study were male (55%). Though there is no much evidence about predominance of keratoconus in males, both sexes are considered equally affected according to various

studies. This observation might be due to professional compulsion of getting the condition treated in male population.

Around 67% patients had chronicity of more than 2 years. The reason might be the failed approach of treatment in contemporary medicine.

Only 20% of patients had a family history of similar complaints. The reason is increasing exposure of younger generation to heat, UV radiations and gadgets; hence hereditary history need not be there though the disease has a tendency for hereditary transmission to next generation.

Highest percentages i.e. 73% of the patients were in between the age group of 15 to 25years. This observation upholds the typical occurrence of the disease in adolescent young age.

Maximum patients were associated with 'Vernal Kerato-Conjunctivitis' (VKC) (36%). This observation might be due to the age related association of VKC.

Cornea is the first refractive media for the light rays to enter the eyeball. When the protruded and thinned out cornea scatters the entering light rays, there will be distorted image formed. The involvement of Vatadosha mainly is obvious in this pathology. Tarpana is a nourishing and oleating procedure, which acts exactly opposite to Vata and Pitta doshas, involved in the disease.

Tarpana forms an occlusive film over the surface of the eyeball and improves the composition of tear film by enhancing the mucin and aqueous layers. It prevents frictional damage to the ocular surfaces secondary to lid movement or extra ocular movements. It acts by retaining fluid and maintaining hydration of the ocular surface.

The Ghrita has the quality of trespassing into minutest channels of the body. Absorption is very high as drugs are lipid soluble penetration is high irrespective of molecular size. In the description of the Drishti, Sushruta has mentioned that Sheeta dravyas are Satmya (wholesome) for Drishti. Ghrita also has Sheetavirya, hence the eye being the site of 'Alochaka pitta' can be effectively managed by constantly using

Ghee for Akshi Tarpana. Ghrita also possess properties like Balya, Brimhana and Rasayana, so it gives strength to the overall tissues of the eyeball as well as to the nervous tissues.

Jeevantyadi Ghrita has high levels of antioxidants^[3] which can reduce the oxidative stress and damage of thinned out cornea.^[4] Ghrita is one among the best Rasayana drugs and Jivanti is one among the best Chakshushya drugs, and most of the contents of Jeevantyadi Ghrita have Tridosha pacifying action. So Jivantyadi Ghrita having all the properties was selected for the study.

Mahatriphaladi Ghrita, indicated in Timira, has the ingredients like triphala, shatavari, guduchi, ajaksheera, draksha, yashtimadhu, ksheera kakoli, madhuparni, nidigdika, neelotpala, pippali and goghrita.^[6] Most of the drugs have 'Madhura Rasa', 'Sheeta Veerya', 'Madhura Vipaka' and are 'Chakshushya'. Majority contain antioxidants, which reduce the free radicals that cause oxidative damage to the eye.

Avyaktadarshana, the main symptom of 'timira' was found to be have significant improvement with P value <0.0001 in both the groups. This can be justified by Vata-pittahara property of the ingredients of Jeevantyadi Ghrita^[4] and Mahatriphaladi Ghrita.

Foreign body sensation can be explained as caused by follicles and papillary reaction caused by dryness. There was significant improvement in both the groups with p value < 0.0001. Tarpana increases corneal and conjunctival hydration levels and this might be the reason for improvement.

Headache and eyestrain are the asthenopic symptoms due to high degree of irregular astigmatism in Keratoconus. There was significant improvement in both the groups with p value < 0.0001. The basic cause of these symptoms is the increasing conicity of cornea. Tarpana is believed to have pressure effect over the cornea, thus shaping the extended conicity. There has been highly significant improvement in these symptoms in both the groups.

Ghosting is a symptom where the person finds clear image in one eye and multiple or spread image in the effected eye. The improvement found with p value < 0.0001 in group A and 0.0002 in group B, can be explained by the favorable changes in the protruded and thinned out cornea by Tarpana.

Night vision defect was moderately improved in both the groups. Group A showed better results than group B with p value 0.0004. This improvement can be understood by the changes caused by Tarpana in the curvature defect and thickness. The Chakshushya properties of the drugs is also a significant reason behind the improvement of vision.

Itching and watering are due to irritation caused by dryness and exposure of corneal nerves respectively. The vata-pittahara property of the drugs can be the reason behind the significant improvement observed.

The significant changes in cylindrical power indicates positive changes in the corneal curvature i.e. increased thickness. The attributes to the Vata-pittahara and brimhana properties of the drugs.

Blurred vision, Eyestrain and Itching have shown highly significant difference between two groups. The reason behind this might be properties of the individual Ghrilas. Jevantyadi Ghrita tackles eyestrain much better than Mahatriphaladi Ghrita. Whereas Blurred vision and itching is much more reduced with Mahatriphaladi ghrita tarpana because of presence of more Chakshushya dravyas and Kaphahara dravyas.

CONCLUSION

Keratoconus can be understood as Prathamapatalagata Timira based on the literature and observation. The historical analysis of the effect of Vatahara line of treatment also supports the involvement of Vata in Keartoconus. The demographic observations are supporting the incidence of age,^[7] association with VKC and Dry eyes and family history. The drugs selected for the study was dosha-pratyaneeka i.e. vata-pittahara in nature. The treatment plan was found effective in improving the corneal thickness and overall symptoms in both the groups. But Jeevantyadi Ghrita Tarpana yielded

slightly better results than with Mahatriphaladi Ghrita Tarpana. No patients had any adverse effects during the course of the trial. The contemporary measures like spectacles and surgery are ineffective in treating Keratoconus permanently. Classical 'Ayurvedic Eye therapies', when studied in a larger population and standardized as a best Alternative solution for such sight threatening diseases, it can serve to protect the "Right to sight" of every individual.

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