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## Ayurvedic Management of Myopia in Children: A Case Series

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### ABSTRACT

**Introduction:** Myopia is one of the leading causes of visual impairment in schoolchildren. The most common management option, prescription of corrective spectacles, neither correct nor prevent progression of the error. The cardinal symptom of myopia, the inability to see distant objects, may be compared with *Timira* (blurring of vision) in Ayurveda.

**Case Series:** The cases of three children who presented to Sreedhareeyam Ayurvedic Eye Hospital with the blurring of vision and who were diagnosed with myopia are presented here.

**Intervention:** The children underwent specially tailored Ayurvedic treatment protocols, which included oral medicines, *Netra Kriyakalpa* (ocular therapeutics), and treatments for the head.

**Results:** Improvement in visual acuity and refraction was observed at the end of the treatments. Multiple follow-ups demonstrated either improvement or maintenance of visual acuity.

**Conclusion:** The main challenge for the patients was maintaining and improving vision. The results of the series indicate the potential of Ayurvedic treatments to both manage myopia and to maintain, and improve in some cases, vision in children.

**Key Words:** *Ayurveda*, Case report, *Timira*, *Kriyakalpa*, Complementary and alternative medicine, Refractive error

### INTRODUCTION

Vision 2020: The Right to Sight contends that uncorrected refractive errors are among the top causes of visual impairment and blindness.<sup>1</sup> Myopia is the leading cause of visual impairment in children among the three types of refractive error, with a rapid increase in prevalence.<sup>2</sup> Myopia presents a significant impact on an individual's quality of life as well as the economy.<sup>3</sup> Research on causal factors, possible treatments, and efforts at prevention have been spurred in light of the increasing incidence and prevalence of myopia.<sup>4</sup> The aetiology of myopia is multifactorial as per the Consortium for Refractive Error and Myopia (CREAM) study, which demonstrated 24 genomes with a 10-fold increase in myopia.<sup>5</sup> Conventional management options for myopia have either short-term benefits or significant side effects.<sup>6</sup> Although significant strides have been made in the field of surgical correction, they might not always be effective in the tender

and delicate eyes of children. In light of the above, treatment options in contemporary and alternative medicine (CAM), including *Ayurveda*, may be sought.

### METHODOLOGY

The cases of three children diagnosed with myopia and who underwent *Ayurvedic* eye treatments are presented in this series. Points regarding their history were given by their legal guardians. The CARE guidelines were adhered to for ensuring transparency and effectiveness in reporting.<sup>7</sup> Written informed consent was obtained from the parents. Institutional ethics committee clearance was not required to prepare this series.

#### Case 1

A 9-year-old male patient presented with a complaint of defective distant vision for 7 months. His parents reported

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watching TV very closely and his inability to read small letters on the chalkboard from a distance. He was diagnosed with myopia by an ophthalmologist and was prescribed corrective spectacles, which he never used. In September 2017, he started *Ayurvedic* medication from Sreedhareeyam Hospital, which provided better clarity in vision. Hence, he came for further management. His history was negative for significant illnesses. His mother had a full-term normal delivery and he achieved all cardinal milestones on time. His immediate family members do not present with similar complaints, and his history readings were normal. A review of systems showed normal cardiovascular, gastrointestinal and neurological functions, and vital signs were all normal.

Unaided distant visual acuity (DVA) was LogMAR 0.602 in his right eye (OD – oculus dexter) and LogMAR 1 in his left eye (OS – oculus sinister), and near visual acuity (NVA) was N6 in both eyes (OU – oculus uterque). Pinhole acuity was not determined. Manual refraction showed that a -0.50 diopter (D) lens with -3.00D cylinder and 10° axis corrected the DVA OD to LogMAR 0.176, and a -1.50D lens with -3.00D cylinder and 160° axis corrected the DVA OS to LogMAR 0.477. Anterior segment examination OU showed normal lids and sclera, normal cornea, deep anterior chamber, and a normal lens. Direct and consensual pupillary reflexes were normal OU. Posterior segment examination OU showed normal media, optic disc, background, and blood vessels. Corneal topography OU demonstrated with-the-rule astigmatism. The patient was admitted for a 15-day course of inpatient *Ayurvedic* treatment.

Unaided DVA at discharge showed improvement to LogMAR 0.778 OS, while DVA OD was maintained. Manual refraction demonstrated the same readings as found on admission.

### Case 2

A 6-year-old male presented with a complaint of diminished distance vision for 8 months. His parents noticed difficulty in seeing distant objects and inability to read the letters off the chalkboard. He was diagnosed with myopia and was prescribed corrective spectacles, which he still uses but does not provide enough relief. Hence, he came here for better options. His history was negative for any significant illnesses. His mother had given birth to him after thirteen years of marriage, for which she had taken treatment for infertility. He was delivered by lower-segment Caesarean section, and he achieved all his milestones on time. His immediate family members do not complain of similar illnesses. His history readings are normal. A review of systems showed normal cardiovascular, gastrointestinal, and neurological functions, and vital signs were all normal.

Unaided DVA showed LogMAR 0.477 OD and LogMAR 0.176 OS, and NVA was N6 OU. Pinhole acuity and refraction

were not attempted. Anterior segment examination OU showed normal lids and sclera, normal cornea, deep anterior chamber, and a normal lens. Direct and consensual pupillary reflexes were normal OU. Posterior segment examination OU showed normal media, optic disc, background, and blood vessels. The patient was admitted for a 19-day course of treatment.

Unaided DVA has maintained OU at discharge.

### Case 3

A 9-year-old male complained of difficulty in the distant vision for 6 years. He noticed difficulty in reading the chalkboard from the back of the classroom. He was diagnosed with myopia and was prescribed corrective spectacles. He came to Sreedhareeyam seeking further options. His history is negative for any significant illnesses. His mother had a full-term normal delivery without postpartum complications. He attained all his milestones on time. His history readings are all normal. Review of systems showed normal cardiovascular, gastrointestinal, and neurological functions, and vital signs were all normal.

Unaided DVA was LogMAR 0.301 OU, aided DVA was LogMAR 0 OU, and NVA was N6 OU. Anterior segment examination OU showed normal lids and sclera, normal cornea, deep anterior chamber, and a normal lens. Direct and consensual pupillary reflexes were normal OU. Posterior segment examination OU showed normal media, optic disc, background, and blood vessels. The patient was admitted for a 10-day course of treatment. All diagnostic readings were maintained at discharge.

### Additional Information

Vulnerability assessment is done before treatment categorized the patients into the pediatric group with visual deficits. No history of disorientation, trauma, motility deficit and impaired judgment were elicited.

The patients' treatment protocols involved the administration of oral medicines (**Table 1**) and external ocular and head therapies (**Table 2**). *Pancakarma* (bio-purification) was not administered because the patients were under 10 years old.

All medicines, except *Netra Prabha* eye drops, were manufactured by Sreedhareeyam Farmherbs India, Pvt. Ltd., the hospital's GMP-certified drug manufacturing unit. *Netra Prabha* eye drops were manufactured by Jiwadaya Netraprabha Pharmaceuticals, Pvt., Ltd., based in Mumbai, Maharashtra, India.

### DISCUSSION

The patients' symptoms were compared with *Dvitiya Patalagata Dosha* (affliction of the second layer of the eye by

humors) as per the *Ayurvedic* classics. *Acharya Vagbhata* describes this condition as *Timira*. The feature of *Timira* that matches the symptoms of the patients is “*Durantikastham-Rupam ca* (patient is unable to perceive distant objects)”<sup>8</sup>. Invasion of the third *Patala* is described as *Timiraby AcharyaSusruta* and *Kacaby AcharyaVagbhata*.<sup>2</sup>

*Ayurveda* contends that the same medicines and treatments prescribed for adults may be prescribed to children in a lower dosage and intensity. *Mrdu* (mild), *Laghu* (light), *Madhura* (sweet), *Surabhi* (pleasant odour), *Samsamana* (pacifying), and *HetuViparita* (antagonistic to the cause) are the qualities of the medicines generally favoured for children as these should not greatly affect *Dhatus* and be both palatable and easy to assimilate. *Pancakarma*, usually advocated in the management of *DrishtigataRogas* (diseases of vision) including *Timira*, is contraindicated in children, especially those under the age of 10. Also, the medicines employed should not be too *Tikshna* (sharp). These are due to the *Saukumaryata* (tender and delicate body structure), *Alpakayata* (under-developed organs), *Vividha Anna Anupasevana* (unfit GIT to receive all types of food), *Aparipakva Dhatu* (tissues under progression of transformation), *AkleshaSahatva* (stress intolerance), and *AsampurnaBala* (poor immunity).<sup>5-8</sup>

The oral medicines were *Cakshushya* (good for eyes), *Brmhana* (nourishing), and *Vata Hara* (pacify *Vata*). In addition, *Mustarisha* and *Khadirarishta* are *Agni Dipana* and were prescribed to maintain normal digestion in the children.

*Netraraksha Kvatha*, prepared from ingredients such as *Cyperus rotundus* Linn., *Symplocos racemosus* Roxb., *Gmelina Arborea* Linn., *Aquilaria agallocha* Roxb., and *Emblica Officinalis* Gaertn., is indicated in *Netra Roga*. *Medhya Rasayana* is prepared from ingredients such as *Tinospora cordifolia* Miers., *Centella Asiatica* Linn., and *Glycyrrhiza glabra* Linn., and acts as a nerve tonic. *Hrasva* capsule, prepared from ingredients such as *Vitis vinifera* Linn., *Symplocos racemosus* Roxb., *Hemidesmus indicus* Linn., and *Zingiber officinale* Rosc., is indicated for all varieties of refractive error. *Saptamrta Ghrta* is prepared from *Bacopa monnieri* Linn., *Hemidesmus indicus* Linn., and *Holarrhena antidysentrica* Wall., is indicated in all eye diseases. *Vainateya Ghrta* prepared from *Glycyrrhiza glabra* Linn., and *Tinospora cordifolia* Miers., is also indicated in all eye diseases. *Jatavedha Ghrta* is prepared from *Terminalia chebula* Retz., *Terminalia bellerica* Linn., *Emblica Officinalis* Gaertn., and *Holostemma adakodien* R.Br., and is used for *Tarpana* in *Drishti Rogas*. *Ananta Ghrta* is prepared from *Cedrus deodara* Linn., and *Holostemma adakodien* R.Br., and is also used for *Tarpana* in *Drishti Rogas*. *Sunetra Junior* is prepared from *Nelumbo nucifera* Gaertn., *Ocimum sanctum* Linn., *Cinnamomum camphora* (L.) Presl., and is indicated in eye conditions of patients under 16 years of age. *Netra Prabha* is prepared from *Emblica Officinalis* Gaertn., *Argemone mexicana*

Linn., and *Cinnamomum Tamala* (Buch-Ham) T. Nees., and is indicated in most inflammatory conditions of the eye.<sup>3,4,5</sup>

*Anjana* was done in the manner of classical *Ascyotana*<sup>9</sup> at Sreedhareeyam in light of hygienic parameters. *Drishti Prasadana* and *Tarpana* was done to strengthen the nerves and to promote vision. The *Sneha* used for both procedures were *Vata Hara*. *Anna Lepa* was done for further pacification of *Vata*.<sup>8,9</sup>

## CONCLUSION

The main challenge in the patients was the improvement of vision; however, improvement was observed due to healthy *Dhatus* being formed by the treatments and the bodies of the children acclimatizing to the medicines and treatments. Usage of medicines that were *Brmhana*, *Samana*, *Mrdu*, and *Madhura*, facilitated the formation of a healthy physique as well as strengthening the nerves. The results of this series may be validated with large-scale sample trials and studies.

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### Authors' Contribution

- **Sreekanth P. Namboothiri** conceptualized, wrote, and edited the article.
- **Ratna Prava Misra** and **Jaya Sankar Mund** reviewed and edited the article, and offered constructive feedback on the same.

### Abbreviations:

DVA: distant visual acuity

NVA: near visual acuity

OD: oculus dexter

OS: oculus sinister

OU: oculus uterque

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Table 1: Oral Medicines

Medicine	Dose	Time	Anupama (post-prandial drink)	Case	Prescription	Duration
<b>NetrarakshaKvatha*</b>	40mL	Twice a day before food	<i>SukhoshnaJala</i>	1	Inpatient	14 days
				3	Inpatient	10 days
	5mL				Discharge	2 months
<b>SaptamrtaLauha</b>	1 tablet	Twice a day after food	<i>NetrarakshaKvatha</i> Honey	1	Inpatient	14 days
					Discharge	2 months
<b>MedhyaRasayanam*</b>	1 tablet	9:45am	<i>SukhoshnaJala</i>	1	Inpatient	14 days
		After break-fast	Honey		Discharge	2 months
<b>Hrsva Capsule*</b>	1 capsule	Twice a day after food	<i>SukhoshnaJala</i>	1	Discharge	2 months
<b>SaptamrtaGhrta*</b>	1 tablespoon	Twice a day after food	<i>SukhoshnaJala</i>	1	Discharge	2 months
<b>VainateyaGhrta*</b>	1 tablespoon	Twice a day after food	<i>SukhoshnaJala</i>	2	Inpatient	19 days
					Discharge	2 months
				3	Inpatient	10 days
<b>Mustarishta</b>	5mL	Twice a day after food	<i>Khadirarishta</i>	2	Inpatient	19 days
					Discharge	2 months
<b>Khadirarishta</b>	5mL		<i>Mustarishta</i>		Inpatient	19 days
					Discharge	2 months
<b>Gopicandanadi Gutika</b>	1 tablet	10 am	<i>Tulasi, Honey</i>	2	Inpatient	19 days
	1 tablet	Twice a day after food			Discharge	2 months



## External Therapies

Treatment	Medicine	Case	Prescription	Duration	Procedure of Therapy
Netra Kriyakalpa(local ophthalmic therapies)					
Ascyotana	Ananta Ghrta*	1	Inpatient	8 days	The patient lay supine and one drop of the medicine was instilled into the sub-conjunctival sac. The patient was asked to slowly rotate the eyes after installation with the eyes closed.
	JatavedhaGhrta	3	Inpatient	6 days	
Anjana			Discharge	2 months	
	Sunetra Junior*	1	Discharge	2 months	
	Netra Sudha	2	Inpatient	17 days	
	Netra Prabha	2	Discharge	2 months	
	Netramrtam	3	Inpatient	6 days	
			Discharge	2 months	
Drishti Prasadana	Kshirabala 21 Avartana-Taila	2	Inpatient	5 days	The lukewarm medicine was taken and massaged over the forehead and the upper and lower eyelids from the inner canthus to the outer canthus; the inner aspect of the maxilla, outer canthus, inner canthus, supra-orbital margins, and eyebrows using the thumb and index fingers for 2-3 minutes each. Adequate pressure was applied to each of the points.
Eye Massage		1	Inpatient	9 days	2 drops of lukewarm oil were applied to the eyelids and massaged.
			Discharge	2 months	
Eye Picu	Ananta Ghrta	2		3 days	
Tarpana	JatavedhaGhrta* and KasyapaGhrta*	3	Inpatient	4 days	A circular fence was constructed around the orbits using Masha flour and water. The medicine, made lukewarm, was poured into the cavities. The patient was asked to blink frequently.
MahaTarpana^	JatavedhaGhrta* and Ananta Ghrta	1	Inpatient	6 days	
LaghuTarpana^	Ananta Ghrta	2		3 days	
Anna Lepa	SashtikaSali	1	Inpatient	6 days	A paste of SashtikaSali made warm was applied over the eyelids.
		2		5 days	
Treatments for the Head					
Talapoticchil	Bala, Vidari, Asvagandha, and KacchuradiCurna-mixed with Balasvagand-hadiTaila	1	Inpatient	7 days	A paste prepared from 30g of herbal powder and 60mL of herbal decoction was applied over a steamed plantain leaf. This leaf is then placed with the paste inwards over the patient's head and tied down using a Cora cloth.
Siroveshtana^	Powder of Balaand Vidarimixed with Kacchuradi-Curnaand Balasvagand-hadiTaila	1	Inpatient	5 days	A semisolid paste prepared by mixing 45g of all ingredients with the desired liquid medium was smeared over a Cora cloth and applied to the head (area with the paste facing inwards) in the following manner: One end of the cloth was anchored above the right ear. The cloth was wrapped over the forehead above the eyebrows and towards the left ear. From the left ear, the cloth was wrapped around the back of the head and brought upwards around the head while the vertex is avoided. The other end of the cloth was applied to the top of the head.

Treatment	Medicine	Case	Prescription	Duration	Procedure of Therapy
<b>Sirodhara</b>	<i>SasankaTaila</i>	<b>1</b>	Inpatient	3 days	The patient lay supine on the treatment table. A thin cloth band was tied around the forehead. A pot with an 8mm hole in the centre of the bottom was suspended above the patient's head with ropes. The lukewarm was poured into the pot and was allowed to drain through the hole onto the patient's head.
	<i>BalasvagandhadiTaila</i>	<b>2</b>		7 days	
<b>Siro Picu</b>	<i>SasankaTaila</i>	<b>3</b>	Inpatient	7 days	A piece of cotton gauze was dipped in lukewarm oil and placed over the bregma.