

Management Of Stargardt's Disease Through Ayurvedic Science

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Stargardt's disease is a hereditary disorder of the retina. There is a gradual loss of vision during childhood or adolescence and in a few cases, vision loss may be noticed in adulthood. Involvement of photoreceptor cells presents slow loss of central vision, distorted vision and reduced color vision. Mutations in ABCA4 gene following accumulation of lipofuscin within the retinal pigment epithelium is a causative factor of the disease. Beaten bronze reflex or Snail slime reflex from the macula is the typical clinical presentation.

Abstract

The signs & symptoms like Avila darshana (Blurred vision) and Vyavidha darshana (distorted vision) which are mentioned in Ayurvedic classics in the context of the disease Timira, can be correlated with the clinical manifestation of Stargardt's disease. Currently, there is no effective treatment in contemporary science for Stargardt's disease except for gene therapy and stem cell therapy. Hence, the present clinical study was undertaken in order to understand and manage the Stargardt's disease, with Ayurvedic treatment modalities like Virechana (Therapeutic purgative), Tarpana (Ocular therapy used to treat posterior segment disorders) and Nasya (Errhine therapy). A 25 years old male patient diagnosed with Stargardt's disease was advised to undergo Virechana with Trivrit lehyam (A linctus made of Operculina turpethum), Nasya with Ksheerabala taila (A medicated oil prepared from Sida cordifolia and sesame oil processed with medicinal herbs) and Tarpana with Mahatriphaladi ghrita (Medicated ghee prepared out of Emblica officinalis, Terminalia bellirica, Terminalia chebula and other medicated herbs) for a course of 26 days. There was marked improvement in vision after the treatment and the results proved to be significant on the basis of clinical assessment.

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Introduction

Stargardt's disease is the most common form of inherited juvenile macular degeneration¹ involving the macula - a small area in the center of the retina that is responsible for sharp, straight vision ahead like reading, watching television and looking at faces.² Researchers have estimated that 1 in 8000-10000 people will get this disease.³ Often, slow loss of central vision in both the eyes is seen and once visual acuity drops below 6/12, the disease progresses rapidly.⁴ Two types of photoreceptors cells i.e., rods and cones together sense light and convert it into an electrical signal which is then sent to the brain, this physiological mechanism is impaired in Stargardt's disease. Inside the photoreceptors, byproducts (lipofuscin) are formed as a result of Vitamin A metabolism which is removed by the protein synthesized by ABCA4 gene. Due to mutation in ABCA4 gene, there occurs accumulation of byproducts (lipofuscin) inside the photoreceptors, as a result of continued accumulation, there is death of rods and cones, this accumulated lipofuscin appears as yellowish flecks on fundoscopy.⁵

The concept of gene was explained long back by Ayurvedic scientist Acharya Charaka where he has categorized the whole genetics in three units - beeja, beejabhaga and beejabhaga avayava⁶, this Ayurvedic theory can be compared with modern genomic theory like beeja with sperm or ovum, beejabhaga with chromosome and beejabhaga avayava with gene for understanding. Dushti (mutation in gene) of these are responsible for manifestation of Adibalapravritta vyadhis⁷ (Hereditary disorders). In the present study, Beejabhaga avayavadushti (mutation) lead to vata, pitta

(fundamental units of body as per Ayurveda) vitiation which in turn produced lakshanas (signs and symptoms) like Avila darshana (blurred vision) and Vyavidha darshana (distorted vision) causing the disease. The Virechana (therapeutic purgative) and Nasya (Errhine therapy- where medicated oil is instilled in nostrils) adopted here mainly alleviate vata and pitta (Fundamental units of body as per Ayurveda) along with expulsion of morbid doshas (can be correlated with exudates) and Tarpana (ocular therapy used to treat posterior segment disorders where medicated ghee is kept over the eye for specific duration) strengthens ocular tissues and improves vision.

Aims and Objectives:

1. To understand Stargardt's disease through Ayurvedic perspective and manage accordingly.
2. To evaluate the efficacy of Virechana, Tarpana and Nasya in the management of Stargardt's disease.

Materials and Methods

Case history: A 25 year old male patient came to outpatient department of Shalaky Tantra, SKAMCH & RC, Vijayanagar, Bengaluru, Karnataka on 6th June 2017 who was referred from Retinal institute after diagnosing as having Stargardt's disease. He had blurred vision for distant objects since 2 years associated with headache on continuous reading. He also had difficulty in differentiating colors especially blue and black. On examination, visual acuity of both the eyes was 5/60. Eyeball movement was normal, conjunctiva was not congested, sclera, cornea, iris, pupil and anterior

were found to be normal. On fundoscopy yellow flakes at the macula were observed. On the basis of clinical symptoms, signs and investigations, the patient was diagnosed as Stargardt disease and advised to undergo Virechana (Therapeutic purgative), Tarpana (ocular therapy used to treat posterior segment disorders) and Nasya (Errhine therapy).

Observation & Result

After treatment, marked improvement in visual acuity was seen and headache was reduced.

	Without glasses				With glasses			
	BT	AV	AT	AN	BT	AV	AT	AN
Both eyes	5/60	6/18p	6/18	6/12	6/24	6/12p	6/12	6/9
Right eye	5/60	6/18p	6/18	6/12	6/24	6/18p	6/18	6/9p
Left eye	5/60	6/18p	6/18	6/12p	6/24	6/12p	6/12	6/9

BT- Before Treatment, AV- After Virechana,
AT- After Tarpana, AN- After Nasya

Discussion

Stargardt's disease, being a hereditary disorder, should be managed in time to restore the vision and to prevent further death of photoreceptor cells. Acharya Sushruta, the ancient Ayurvedic scientist, has mentioned that Virechana (Therapeutic purgative) imparts strength to Indriyas (sense organs) and is the best-preferred treatment for eye diseases.⁸ Because in the pathogenesis of eye disease, the role of pitta (2nd fundamental unit of body) and rakta (4th fundamental unit of the body according to ancient Ayurvedic scientist Sushruta) is inevitable considering vishesa sthana (i.e. eye is the seat of pitta and rakta having similar qualities of pitta, which together take part in the manifestation of eye disease). Virechana is the prime shodhana therapy for pitta and it also purifies rakta. It palliates vata and normalises its movements thus maintains its physiological function. Nasya (Errhine therapy) being a prime treatment modality for urdwa jatru gata rogas (Diseases above the clavicle region) expels morbid doshas⁹ (accumulated by-product) and Tarpana (Ocular therapy used to treat posterior segment disorders) a netra kriyakalpa provides strength to ocular tissues and improves vision.¹⁰ Hence the above mentioned treatment modalities are adopted in order to restore and improve the vision. The probable mode of action of these treatment principles are discussed below.

Virechana with Trivrit lehya

Virechana dravya properties:

Sukshma: By virtue of which the medicine enters even the minutest cells of the body and expels the morbid doshas (accumulated by-product).

Tikshna: By virtue of which compactness of the morbid doshas (by-products of vitamin A synthesis) get disintegrated.

Ushna: By virtue of which softening of abstracted morbid doshas (by-products of vitamin A synthesis) takes place.

Vikasi: By virtue of which medicine spreads all over the body and it breaks the morbid doshas into fragments.

Vyavayi: By virtue of which there will be quick absorption of the medicine through each cell of the body.

Drishti (Retinal layer) being pitta sthana (2nd fundamental unit of the body), Virechana (Therapeutic purgative) was advised. Virechana dravya passes quickly to the intestine, where while passing through, it produces mild inflammation in it, this in turn increases permeability of the capillaries in the intestine and facilitates quick absorption of the drug in the initial stage.¹¹ Because of vyavayi, vikasi and Sukshma properties it quickly reaches up to the cellular level where the toxins (by-products of Vitamin A synthesis) exists. Due to ushna guna of trivrit, dosha sanghata (compactness of the by-products) is softened and liquefied. Tikshana guna breaks down the by-products into a minute form and removes them out of photoreceptor cells. Thus, these removed by-products from the photoreceptor cells are brought to the intestine, where due to purgative action they are thrown out of the body preventing further photoreceptor degeneration.¹¹

Tarpana with Mahatriphaladi ghrita

Tarpana (Ocular therapy used to treat posterior segment disorders) with considerable quantity of Mahatriphaladi ghrita (medicated ghee) increases bioavailability due to higher concentration and prolonged tissue contact time. Higher concentration causes pooling of medicine which facilitates deeper permeation, this is achieved through corneal epithelium and endothelium which are lipophilic,¹² intraocular absorption of medicine into the anterior chamber, lens capsule, ciliary muscles and other tissues also takes place which reaches the target organ. Hence Tarpana with Mahatriphaladi ghrita strengthens ocular tissues and by virtue of its anti-oxidant property improves vision too.¹³

Nasya with Ksheerabala taila

Acharya Charaka and Acharya Vagbhata have mentioned nasa as dwara for shiras (Nose is route to head) and when medicine is instilled through the nostrils, it reaches shringataka marma (junction of vessels supplying sense organ as per Ayurveda) from there it spreads through the vessels of eyes, nose, throat, ears and so on to the head and expels the morbid doshas (accumulated byproducts). Ksheerabala taila being lipid soluble when administered undergoes rapid diffusion through nasal mucosa. The ingredients bala moola (sida cordifolia) tila taila (Sesame oil) and ksheera (Milk) constitutes sneha nasya which helps in pacifying vata and pitta. Acharya Vagbhata while explaining phalashruti (Benefits) of sneha nasya quotes 'Akshipatavam' (Physiological function of the eye) and Drudendriyam¹⁴ (Strengthens ocular tissues) due to its nourishing action. Hence ksheerabala taila nasya helps in improving vision.

Conclusion

Stargardt's disease, being a hereditary disorder of the retina needs a special attention and should be managed carefully as it is a main seat of visual perception and colour vision.

The accumulated lipofuscin should be cleared in order to prevent death of photoreceptors. As Virechana (Therapeutic purgative) is considered as best kaya shodhana (purification of body) it acts as drushti balapradha (nourishing retina), which is even explained under Virechana karma phala (Benefits of Virechana) and it helps in clearing the deposits. The nasal cavity, being easily accessible and due to its rich vascular plexus, permits direct entry of topically administered drugs (through Nasya) straight into the blood stream and helps in eliminating the morbid doshas which can be compared to the byproducts accumulated in photoreceptors. The lipophilic nature of Mahatriphaladi gritha (Medicated ghee) in Tarpana (Ocular therapy used to treat eye disorders) facilitates transportation of the drug to the target organ and finally reaches the cell; hence it disintegrates the pathogenesis of the disease and helps in Drusti Prasadana (nourishes the retina and improves vision).

Presently scientists are working to find new mutations in the ABCA4 gene, and in other genes, that might contribute to Stargardt disease.¹⁵

Hence the study showed significant relief in the patient's symptoms, also in visual acuity and color vision. Therefore, Virechana (Therapeutic purgative), Tarpana (Ocular therapy used to treat eye disorders) and Nasya (Errhine therapy) can be adopted as a line of treatment as per Ayurveda.

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