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Case Report

A case study on Ayurvedic management of primary open angle glaucoma with special reference to Adhimantha

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Abstract

In the world, glaucoma ranks second in terms of causes of irreversible blindness, and third in India. In India, an estimated 11.2 million persons aged 40 and older have glaucoma, including 6.48 occurrences of POAG. The goal of the disease's management is to reduce intraocular pressure using existing medication like Carbonic anhydrase inhibitors, Beta blockers, and Prostaglandin analogues. Not every patient will benefit from these treatments. This case study concerns a 22-year-old male patient who came to Shalakyatantra OPD complaining of pain in his right eye, diminished vision in both eyes, redness in the Rt. eye, and a feeling of heavy eyes. The patient was diagnosed with primary open angle glaucoma and was taking eye drops Dorzalomide T. Upon examination, the patient's distant visual acuity was 1 meter finger count in the right eye and Hand Movement Positive in the left eye. Right eye intra ocular pressure measurements were 41 mmHg and Lt eye were 10 mmHg. In ayurveda, above symptoms can be correlated with *Adhimantha* mentioned in *Sarvagata roga.* Patient was treated with *Deepan, Pachana, Virechana and Vata- kapha shamak* internal medications along with therapeutical procedures like *Pindi, Jalaukacharana* for around 3 months. The right eye's visual acuity significantly improved both throughout and after the course of treatment. The intraocular pressure returned to its baseline. Every symptom from before had entirely subsided. Therefore, it can be said that the Ayurvedic method helps to provide a complementary treatment plan for POAG.

Keywords: *Adhimantha, POAG, Intra Ocular Pressure, Virechana.*

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Introduction

One of the leading causes for irreversible blindness in the world is glaucoma (1,2). With a 3:1 ratio, primary open angle glaucoma (POAG) affects more people worldwide than angle closure glaucoma (ACG) (1,2). About 11.2 million people aged > 40 years in India have glaucoma and among them 6.48 million people are afflicted with Primary Open Angle Glaucoma (POAG) (1,3). There are several types of glaucoma, including normal tension glaucoma, primary open angle glaucoma, primary angle closure glaucoma, secondary glaucoma, and congenital glaucoma (1,4). Among these, primary open-angle glaucoma, the most common subtype**,** progressing gradually and often without noticeable symptoms in its initial stages (2,4). The condition is marked by irreversible degeneration of retinal ganglion cells and their associated neurons, resulting in the characteristic cupping of the optic disc (2,4). Consequently, many affected individuals remain undiagnosed until significant visual field loss occurs, which can eventually lead to blindness. Presently, therapeutic interventions primarily aim to reduce intraocular pressure (IOP), as it is the only modifiable risk factor demonstrated to slow or prevent further disease progression (2,4,6). However, even after lowering Intra Ocular Pressure (IOP), neurotoxicity persists, which has prompted research into neuroprotective therapeutic approaches (5,6). With age, this condition grows more common and has a genetic component. The actual aetiology of the condition remains

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unknown. There is no known cure (4,5). The ideal anti-glaucoma medication should maintain intraocular pressure lower for longer, preserve vision fields, be side-effect free, and be consistent with current treatment regimens (5,6). The only drawback of anti-glaucoma medications is that they are lifetime medications without much benefit in preventing irreversible visual damage (5,6). Since there is no directly co-relating disease explained in the classics but symptoms of POAG can be correlated with *Adhimantha* (7). Aim and objectives of the study to evaluate the efficacy of ayurvedic treatment protocol for *Adhimantha* (POAG) (7).

Patient Information

A 22 yrs male patient, residing in Pune, Maharashtra (India) came to the Shalakya OPD, Dr. D. Y. Patil College of Ayurved and Research Centre, Pimpri, Pune-18, Maharashtra, with complaints of pain, feeling of heavy eyes, redness in Right eye, diminution of distance as well as near vision in both eyes in the last 3 months. No flashes/floaters but has headache and nausea. The patient was diagnosed with primary open angle glaucoma 3 years before and was operated for trabeculectomy of Left eye (3 years before). Since then, he was taking eye drops Dorzalomide T. But not got much relief so he came to Shalakyatantra OPD for further treatment on 28/05/24, on next day Ayurvedic treatment was started after detailed assessment of his visual functions and fundus examination. No any other significant family or personal history.

Dashavidha pareeksha

His *Prakriti* was *Vatakapha*. *Vikriti* was *Vata pradhana Tridosha* with involvement of *Prana* and *Vyana Vayu*, *Alochaka Pitta* and *Tarpaka Kapha*. He was in *Tarunavastha* (~young age). His *Satwa* (~psyche), *Sara* (~excellence of tissues), *Samhanana* (~Compactness of organs), *Ahara shakti* (~power of food intake and digestion), *Satmya* (~suitability) and *Pramana* (~measurements of body organs) were of *Madhyama* (~moderate) level. His *Vyayama shakti* (~power of performing exercises) was *avara* (poor).

Ashtavidha pareeksha

His *Nadi* (~pulse) was *druta* (fastly pulsating), *Mutra* (urine) was of *prakrita varna* (normal colour) *Mala* (stool) was *rooksha* and *baddha* (Hard and constipated), *Jiwha* (tongue) had *upalepa* (coated), *Shabda* (voice) was *spashta* (clear), *Sparsha* (Touch) *Anushna sheeta* (~normal temperature), *Akrithi* (body built) was *Madhyama* (~moderate) and *Drik* (vision) was *Heena* (reduced).

Stroto pareeksha

Rasavaha, raktavaha, mamsavaha and medovaha strotas (~blood circulating and supporting channels of aqueous pathway and microvasculature of optic nerve) are involved.

Ocular examination

· Distant visual acuity by Snellen's chart was 1 meter finger count (1MFC) in Right Eye (OD) and Hand movement positive (HM+ve) in Left eye (OS). Best corrected visual acuity is 6/36 in right eye with spherical concave lens. There was no improvement in vision of left eye.

· Anterior chamber was deep (Grade 4 by Van Herick method using Slit lamp). Pupils were of normal size and normal reaction. Intra Ocular Pressure (IOP) by Schiotz Tonometry was 41 mm Hg in Rt. Eye and 10 mm Hg in Left eye. Direct Ophthalmoscopy revealed Advanced POAG in both eyes with cup-disc ratio of 0.6:1 in right eye and optic atrophy in left eye. Colour vision test and Amsler grid was normal.

Treatment Protocol

Considering *Samprapti* of the disease, *Prakriti* of patient, he was treated with *deepana*, *pachana, virechana, vata-kapha shamaka* internal medications along with therapeutic procedures like *Pindi, Jalaukacharana* for around 3 months following *chakshushya rasayana* for next 3 months. Goal for the treatment of patient was to control the intraocular pressure (IOP), to reduce redness, Pain in Rt. eye and to stop progression of the glaucomatous changes in right eye.

Table 1: Treatment Protocol

Sr. No.	Procedure	Yoga	Duration	Posology	Rationale/Outcome
1	*Deepana, Pachana*	*Dhanyakadi Yoga (Dhamasa, Dhanyak, Jeerak, Musta, Punarnava, Triphala)*	Day 1 to Day 90	2.5 gm of combined powder twice a day with lukewarm water	*Strotoshodhana* at cellular level, causing reduction in intra ocular pressure by increasing the aqueous outflow
2	*Shamana yoga*	*Chandraprabhavati*	Day 1 to Day 90	250 mg tablet twice a day with lukewarm water.	It improves tissue metabolism and microcirculation including ocular tissues
		Gokshuradi Guggul	Day 1 to Day 90	250 mg tablet twice a day with lukewarm water.	It balances *vata- kapha doshas*. Reduces *Kapha-meda* accumulation which can obstruct normal ocular channel.
		Tb. Laghumalini Vasant	Day 1 to Day 90	125 mg twice a day with lukewarm water.	It clears *strotas* around aqueous outflow pathway, aiding in intraocular pressure (IOP) control.
		Pathyadi Kashaya	Day 1 to Day 90	1 Tsp twice a day with 40 ml water	It purifies blood, reducing microvascular congestion and improving retinal and optic nerve circulation.
3	*Pindi (Application of paste over eyes)*	*Erandmuladi Pindi*	Day 1 to Day 7		The transdermal absorption of antioxidant and anti-inflammatory herbs improve microvascular flow in the optic nerve head.
4	*Jalaukacharana (Leech application)*		Once a week for 3 months		It helps to neutralise the intra ocular pressure, reduces pain and improve blood circulation by decreasing *strotovarodha.*

Table 2: *Rasayana Yoga* for next 3 months

Sr. No.	Yoga	Scientific/ Botanical Name	Duration	Posology	Rationale/ Outcome
1	*Suvarna Makshika*	Chalcopyrite	12 weeks to 24 weeks	60 mg twice a day with Honey	It showed improvement in subjective visual function, showed changes in visual field indices.
2	*Abhraka Bhasma*	Calcined/ incinerated biotite Mica	12 weeks to 24 weeks	60 mg twice a day with Honey	
3	*Saptamruta Lauha*	*Lauha* Formulation	12 weeks to 24 weeks	250 mg twice a day with Ghee-Honey	
4	*Rasayana churna (Guduchi, Gokshura, Amalaki)*	*Tinospora cordifolia, Tribulus terrestris, Phyllanthus emblica*	12 weeks to 24 weeks	Each 500 mg twice a day with warm water	

Observation and Results

Subjective parameters, including visual acuity, dark adaptation, and peripheral vision, demonstrated notable improvement following the intervention. The patient also reported a marked reduction in ocular symptoms such as redness (Figure 2), pain, and a sensation of heaviness in the right eye. Objective assessments corroborated these findings, with improvement in visual acuity and stabilization of the optic disc appearance, showing no further progression of optic nerve cupping on fundus examination. Intraocular pressure was effectively reduced and remained stable throughout the follow-up period. Additionally, visual field analysis revealed mild improvement with no evidence of further progression in the existing defects.

Table 3: Timeline of Vision and Intraocular Pressure (IOP) measurements

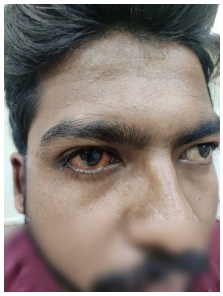
	28th May 2024		27th August 2024		26th Nov 2024	
	Right Eye	Left Eye	Right Eye	Left Eye	Right Eye	Left Eye
Vision (Unaided)	1 Meter finger count	Hand movement positive	6/60 P	Hand movement positive	6/24 P	Hand movement positive
Vision (aided)	6/36	Hand movement positive	6/12 P	Hand movement positive	6/9 P	Hand movement positive
Intraocular Pressure (IOP)	41 mm Hg		25 mm Hg		20 mm Hg	
Colour vision test	Normal					
Amsler grid	Normal Reading in both eyes in all quadrants					

Following three months of Ayurvedic treatment, the patient's intraocular pressure returned to baseline, and dorzolamide-t eyedrop was discontinued.

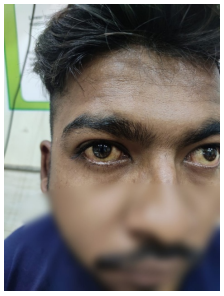
Figure 1: *Jalaukacharana* Procedure

Figure 2: Showing reduction in congestion/ Redness in Right Eye

28th May 2024



26th August 2024



Discussion

The aqueous outflow system and the optic nerve head and retina are the two levels at which the pathophysiology of POAG may be explained (9). According to the mechanical explanation, POAG patients experience compression of the lamina cribrosa, the supporting structure of the optic nerve, either as a result of elevated intraocular pressure or innate tissue weakness, which causes axon deformation and destruction (2). According to vascular hypothesis, the autoregulation of optic nerve vessels is compromised (2,3). The mechanical and vascular processes are interpreted by Ayurveda as *Prana* and *Vyana Vayu dushti*. *Prana Vayu dushti*-induced impaired autoregulation leads to vasospasm (*Samkocha* and *Vikasa*-abnormal constriction and dilatation), *Vyana Vayu dushti* (a factor for fluid transfer in the body), and ischaemia (6,7). This decrease in blood flow and nutrition leads to *dhatukshaya* (tissue loss) and *strotavarodha* at the *rasayanis* level (obstruction in microchannels supplying sustenance). One aspect of pathophysiology may be the impairment of *rasavaha strotodushti*, which results in *dhatukshaya* (degeneration), since it affects the circulation of *rasa-rakta*, the carrier of nutritional nutrients for *dhatus,* the structural components. Because *dhatwagni mandhya* causes *malasanchaya, strotorodha* also happens in aqueous outflow channels. *Ama* or *malasamchaya* refers to the accumulation of waste or undesired elements in bodily tissues, which upsets homeostasis and eventually causes structural and functional harm (7,10). The intraocular pressure is determined by the normal outflow of aqueous, which is dependent on the integrity of outflow structures, particularly in the Trabecular meshwork (TM). In POAG, cellular components of the ciliary body and TM exhibit increased extracellular matrix (ECM) deposition (*Malasanchaya)* due to reduced activity (*dhatwagnimandhya*). As a result, the fluid flowing through it (*Strotorodha*) is given resistance, which leads to *Margavarodhajanya Vata kopa* and therefore high intraocular pressure (6).

Agnimandya, malasamchya, margavarodha, pranavaha and *rasavaha* and *Vyadhikshamatwahani* seems to play a significant role in glaucomatous damage. All these aspects should be kept in mind while selecting the therapeutic interventions. *srotodushti Deepana, Pachana* and *Anulomana* was done to relieve *agnimandhya* both at *Koshta* (gastrointestinal) and *Dhatu* (tissue) level and to bring *Vata doshanulomana* (homeostasis of Vata). Having *Samagni* is the base for being healthy and to have proper metabolism and absorption of the drug (11,12). Keeping this in mind, Leech application was preferred. Leech application helps to neutralize the intraocular pressure, reduces pain, and improves blood circulation by decreasing *srotovarodha* (13,14). *Amalaki,*

Haritaki, Bibhitak and *Dhamasa* are anti-atherosclerotic so reduce sclerosis and increase outflow of aqueous (16,19). This drugs also cause at *shrotoshodhana* at cellular level. This causes reduction in intraocular pressure by increasing the outflow. The ingredients were having immunomodulatory, adaptogenic, antioxidant and neuroprotective activities. *Musta, Punarnava, Dhanyak, Bibhitak* has hypotensive properties hence act as ocular hypotensive (16,19). The ingredients in *Pathyadi Kashaya*, including *Triphala, Nimba, Haridra, Guduchi*, and *Kirat*, exhibit *trishoshghna* properties (18). The decoction has qualities such as *amapachana, raktaprasadana, deepana*, and *shulaprashamana* (18). Additionally, these ingredients are known for their analgesic and anti-inflammatory effects, which help in pain relief. *Laghumalini Vasant* acts on *rasavah strotas*. It has *gamitva* at cellular level. It helps to reduce *Dhatvagnimandya* as it does *deepana* and *amapachana. Chandraprabha vati* and *gokshuradi guggulu* decreases *strotorodha* both at systemic and Trabecular meshwork (19). Both are having *Mutravirechaniya* properties so removes extra *kleda*/toxins via urine (19). Honey and ghee which also had *Chakshushya* properties was added to the combination for its targeted and synergistic action on ocular tissue. Overall effect of the therapy was removal of obstruction and improved nourishment of ocular tissues which resulted in reduction of intraocular pressure, improved retinal sensitivity and vision. Significant changes were observed in vision, intraocular pressure, symptoms like redness, pain and heaviness of eyes. This improves visual field. Ayurvedic Medications and immunity-enhancing Herbal formulations used in ayurveda, such as *Triphala, Saptamrita Lauha, and Saptamrita Rasa*, are believed to possess antioxidant and anti-inflammatory properties (15,21). These formulations have shown promising results in reducing oxidative stress and improving ocular blood flow (21).

In the following three months, *Rasayana Yoga* was administered to the patient as per the prescribed table no. 2. The *Chakshushya Rasayana* group of drugs, apart from having Rasayana properties, possess a special affinity to the visual apparatus, promoting vision, bringing homeostasis in the eye, rejuvenating the eye structurally and functionally, and protecting it from diseases. The selected drugs and treatment protocol exhibit antioxidant, neuroprotective, healing, adaptability, and immunity-enhancing properties (8). Swarna *Makshika Bhasma* by virtue of its Guru Snigdha Guna, Madhura Kashaya Tikta Rasa, Sheeta Veerya, Madhura Vipaka, and Jivaniya/Brimhaniya properties, it likely contributed to the observed improvements. Better control of intraocular pressure (IOP) with Chakshushya Rasayana therapy and its neuroenhancer effect might have significantly improved visual acuity.

Conclusion

This case study highlights the potential effectiveness of Ayurvedic management in Primary Open Angle Glaucoma (POAG). The treatment approach, based on the correction of Prana and *Vyana Vayu Dushti* through individualized herbal formulations and procedures such as *Jalaukavacharana* (leech application), demonstrated marked improvement in ocular health. A notable reduction in intraocular pressure (IOP), enhancement in visual function, and better retinal sensitivity were observed during the course of management. The therapy was well tolerated, with no adverse effects reported, indicating both safety and clinical feasibility of the Ayurvedic regimen. These findings suggest that Ayurveda can offer a holistic approach to the management of primary open angle glaucoma (POAG). However, further systematic and large-scale clinical studies are warranted to substantiate these preliminary observations and establish stronger evidence for its efficacy.

Informed written consent

The patient gave written informed consent prior to the documentation of his case facts.

Author Contribution

Each author has made equal contribution to the overall care of the patient, including treatment, documentation, and the preparation and development of the manuscript for publication.

Conflict of Interest

All authors declare, to the best of their knowledge, that could lead to a potential conflict of interest. No financial or personal interests have influenced the research or its outcomes.

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