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A Critical Insight into Primary Open Angle Glaucoma as Jara Vyadhi and its Ayurvedic Interventions: A Single Case Study

Case Report

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Abstract

Deterioration of vision in elderly people is a major health issue. Currently, the rates of eye disease such as cataract, macular degeneration, diabetic retinopathy and glaucoma are highest in older group. Primary open angle glaucoma is an Insidious and chronic vision - threatening eye aliment due to neuro- retino -optic nerve degeneration, which may be due to raised intra ocular pressure (IOP) or older age or due to independent factors. Classic treatment can delay progression of glaucomatous optic neuropathy by lowering intra ocular pressure (IOP) medically or surgically, but it has its own limitations and interdisciplinary research will be necessary to advance understanding, diagnosis and treatment of this neurodegenerative disease. Main aim of this study is to evaluate the neuro-protective effect of *Ayurvedic* line of management in primary open angle glaucoma. A multidisciplinary approach from *Ayurvedic* line of medicine was employed for a diagnosed case of Primary open angle glaucoma (POAG) for 2months. It showed marked improvement in symptoms. This clinical study concludes that *Ayurvedic* treatment protocol along with Anti glaucoma eye drops are more effective in reducing the intra ocular pressure and control the progression. Hence early diagnosis & proper management can prevent, arrest, OR delay the progression of Primary open angle glaucoma (POAG).

Keywords: Primary open angle glaucoma; Neuro retino optic nerve degeneration; Intra ocular pressure; Glaucomatous optic neuropathy; Neuro protective adjuvant; Anti glaucoma eye drops.

Introduction

Aging of the eye affects all structures of the eye. Currently, the rates of eye disease such as cataract, macular degeneration, diabetic retinopathy and glaucoma are highest in older group (1). Age is an established major risk factor for glaucoma and is the second leading cause of irreversible blindness worldwide and third leading cause in India(2). This leading cause of blindness is becoming increasingly more prevalent in the aging population. Primary open angle glaucoma is a bilateral progressive, irreversible optic neuropathy of adult onset, for which the major risk factors are raised intraocular pressure and older age (3). Visual field loss is associated with the increase in optic cup size and other structural changes that occur at the optic nerve head. It is common condition, the incidence of which increases with age. Management of glaucoma is mainly concentrated on lowering intraocular pressure (IOP) that requires lifetime topical medications, different ocular medicaments for lowering of lowering intraocular pressure (IOP) and surgical interventions, but it has its own limitations to control the progression of Glaucomatous optic neuropathy (GON) and this is the reason behind the use of alternative neuro-protective adjuvant.

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Purpose

Main aim of this study is to evaluate the Neuro-protective effect of *Ayurvedic* line of management in Primary open angle glaucoma to promote the health of an elderly.

Method

Comparative study was done (within a group) between changes in field vision with tropical eye drops (beta-blockers)(figure1) and with Ayurvedic interventions along with tropical beta blockers(figure 2).

Presentation

A male patient aged 45 years visited *Shalakya Netra* OPD of GAMC Bangalore with a complaint of diminished vision for both distance and near since 1 year, with No H/o pain, floaters and flashes of light. He was a diagnosed case of POAG since 5 years and was on Ganfort & Brinolar eye drops. His medical history was not significant for DM and HTN without any significant family history. He was on spectacles 5years back.

Complaint

About 5 years back, he observed gradual Blurriness of vision for both distant and near objects and he was unable for any sort of identification. On

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consulting an ophthalmologist he was diagnosed to be suffering from primary open angle glaucoma in both eyes and was advice with topical beta-blockers. But He didn't find any improvement with the symptoms, hence approached our institution.

Treatment History

About 17years back he underwent Laser assisted in-situ keratomileusis (LASIK) surgery for both eyes.

Investigations

He underwent Fundoscopy, Perimetry and Tonometry prior to the treatment.

The fundoscopy showed 0.8 and 0.6 cupping in right and left eye respectively with thin Neuro Retinal Rim and torturous nasal shifted vessels.

Perimetry showed reduced field vision and

Tonometry showed 18mmhg and 21mmhg of ocular pressure in right and left eye respectively.

Examination

Table No.1: Visual Acuity for Distant Vision and Near Vision

	Distant vision	Near vision
	Without glass	Without glass
OD	6/24p	N_{10p}
OS	6/6p	N_6

Macular Function Test:

With Amsler Grid – within normal limits.

Visual Field Analysis:

Confrontation method: showed glaucomatous field changes in both the eye which is more advanced in right eye than the left with central 30 degree and 60 degree respectively.

Table No. 2: External Ocular Examination:

Structure	Right eye	Left eye
Conjunctiva	No abnormalities	No abnormalities
Cornea	Sensitivity – diminished	Sensitivity – normal
Lens	No abnormalities	No abnormalities
Pupil	Pupil equally round reactive to light and accommodation (PERRLA)+	Pupil equally round reactive to light and accommodation (PERRLA)+
Angle of anterior chamber	Normal depth	Normal depth

Fundoscopic Examination:

Table No. 3: Schiozt's Tonometry

Right Eye	Left Eye
18mmhg	21mmhg

Table No. 3: Direct Ophthalmoscopy

	Right eye	Left eye
Media	Clear	Clear
Fundus	Pale fundus	Pale fundus
Vessels	Torturous Nasal shifted +	Torturous Nasally shifted +
Macula	Flat	Flat
Optic disc	Pale disc, thin Neuro retinal rim, 0.8 cupping	Pale disc, thin Neuro retinal rim, 0.6 cupping

Diagnosis:

By its manifestation this condition can be diagnosed as ***JARAJA TIMIRA*.**

Treatment Intervention:

Table 5: Treatment Intervention

Procedure	Drugs	Frequency	duration
Deepana – Pachana	*Vaishwanara choorna*	1 *karsha* (12gms) TID (in divided doses) before food	3 days
Nasya karma(9)	*Ksheera bala taila 101* nasal drops	8 *bindu* in each nostrils (*prate kala*)	7 days
Seka	*Triphala , guduchi, punarnava* (10) (*kashaya* of these drugs are prepared by adding equal quantity of each drug as classical method- filtered and used)	200 *matrakala (prate kala)*	7days
Bidalaka	*Triphala , patoladi grutha*(11) (*paste is prepared by adding fine powder of triphala with patoladi grutha)*	Remove after paste gets dried up (prate kala)	7days

Vataja timira(4) line of treatment is adopted here.

Patient is treated on outpatient bases for a period of 60 days.

Internally he was advised to take

Punarnavasava 15ml twice daily, after food with equal quantity of water.

Tab. *saptamruta loha* 1-0-1 after food

Haritaki choorna 1tsp 1-0-1 after food

Patoladi grutha 1tsp 1-0-1 with milk

Results after Treatment:

There was a marked improvement in visual acuity in both EYES.

There was a significant reduction in intraocular pressure.

Visual field analysis showed maintained field of vision without any deterioration.

Observations: (for 60 days)

Table No 6: Showing the observations after 60 days treatment

Assessment Criteria		BT(1st visit)		2nd visit		3rd visit		4th visit		5th visit		AT	
		OD	OS	OD	OS	OD	OS	OD	OS	OD	OS	OD	OS
Visual acuity	DV	6/24p	6/6p	6/24p	6/6p	6/18p	6/6p	6/18p	6/6p	6/18p	6/6p	6/18p	6/6p
	NV	N_{10} p	N_6	N_{10}	N_6	N_8P	N_6	N_8P	N_6	N_8P	N_6	N_8P	N_6
IOP (mmhg)		17.3	20.6	14.6	17.3	14.6	17.3	20.6	20.6	17.3	14.6	17.3	14.6

*OD- oculus dexter ; OS- oculus sinister; BT- before treatment; AT- after treatment; DV- distant vision; NV- near vision; IOP – intra ocular pressure.

Figure No. 1:

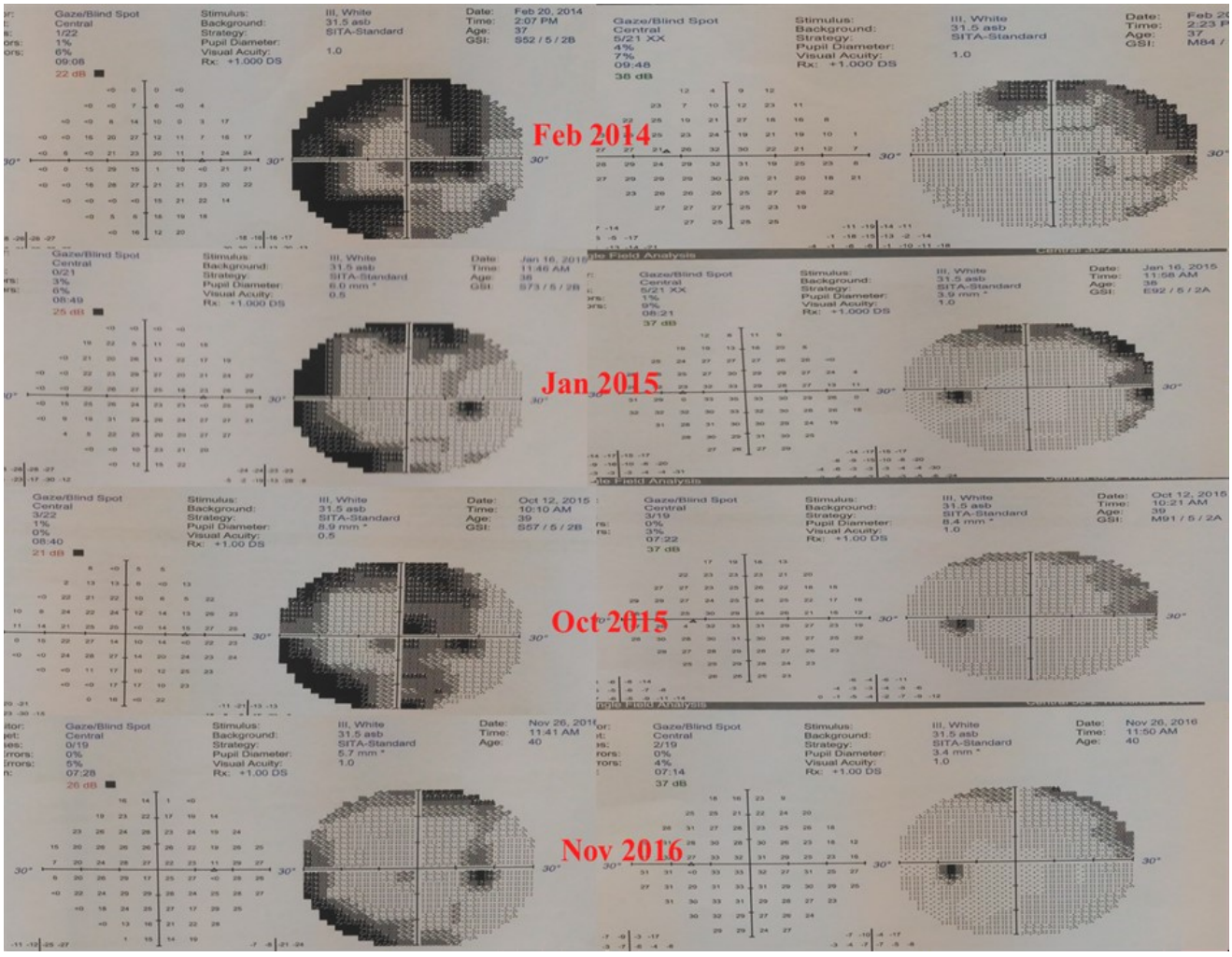

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Figure No. 2. A. Oculus dexter

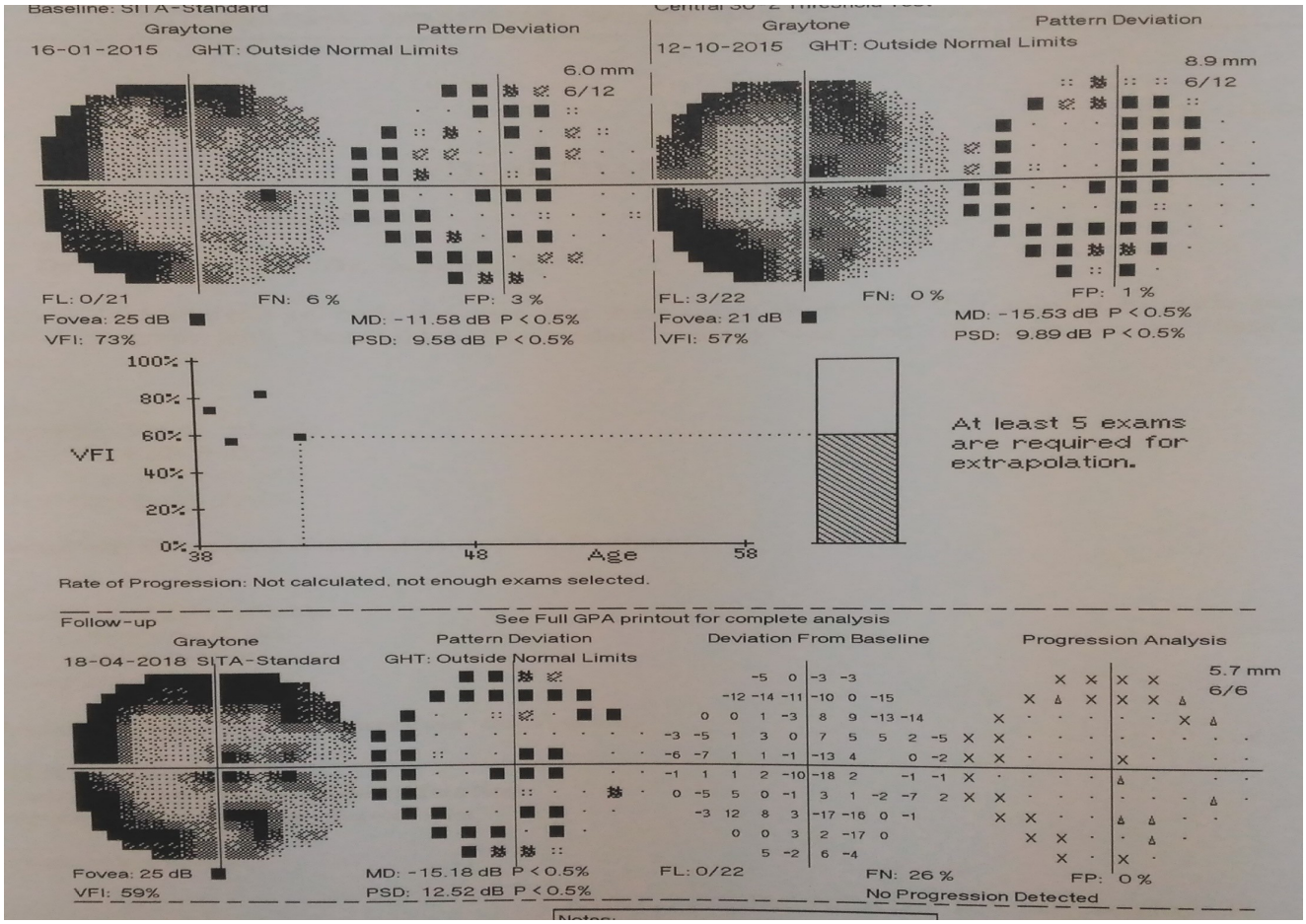
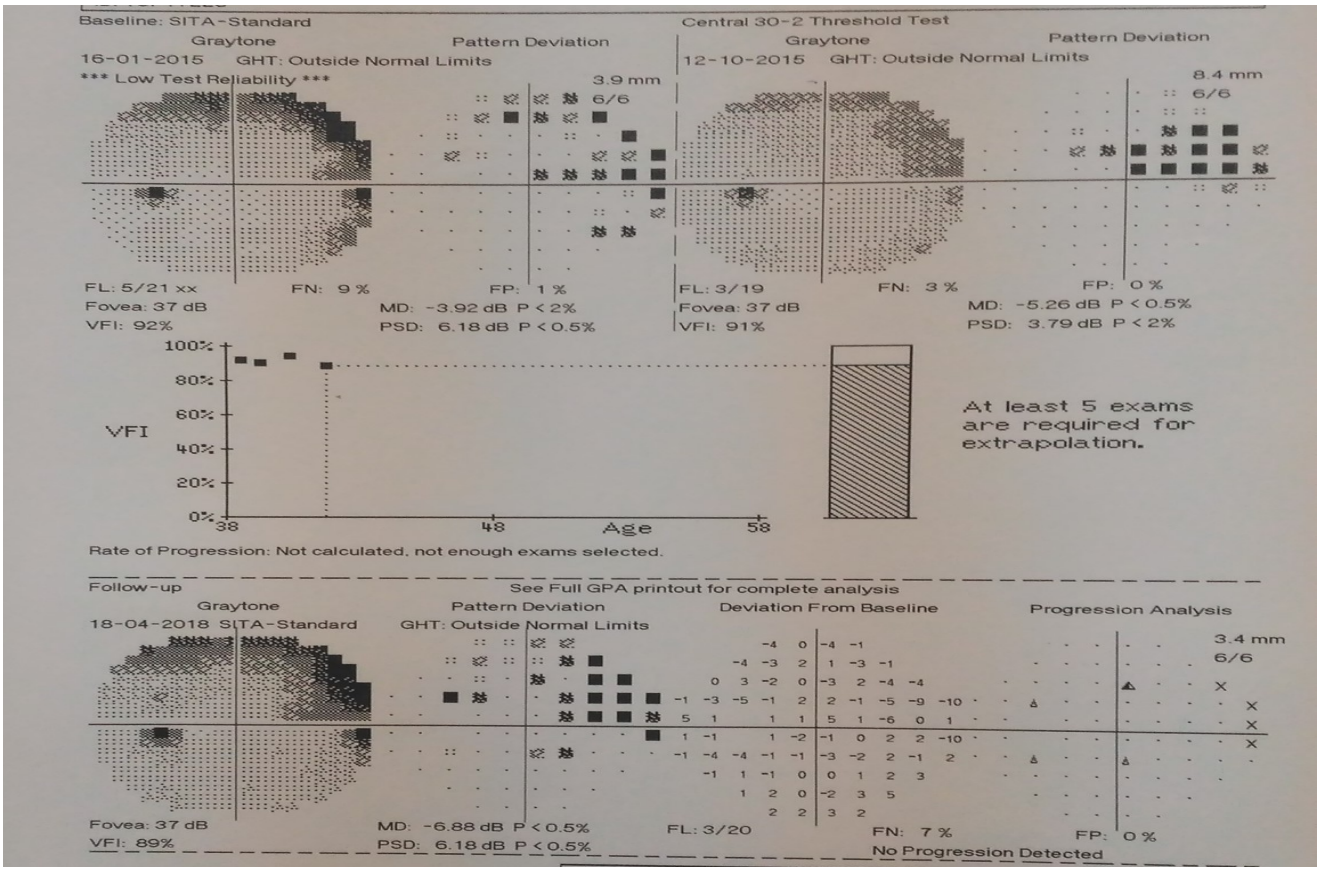


Figure No. 2. B Oculus sinister



Follow up

During the subsequent follow-ups vision acuity has improved and field of vision is maintained.

Discussion

It is well established that the incidence of Primary open angle glaucoma(POAG) increases with age and the pathogenesis of Primary open angle glaucoma(POAG) can be described at two level viz. at the level of aqueous outflow system and at the level of optic nerve head and retina. As per the mechanical theory, the supportive structure of optic nerve, lamina cribrosa gets compressed in primary open angle glaucoma (POAG) patients (5) either due to raised intra ocular pressure (IOP) or inherent weakness of the tissue and as age increases the drains for the fluid become narrow and the eye cannot drain the excess fluid quickly enough leading to distortion and damage to axons. This can also cause ischemia/ hypoxia by compressing the capillaries supplying these axons, thus disrupting normal axoplasmic flow and cell death. Vascular theory suggests impaired auto regulation of Optic nerve vessels.

According to *Aptopadesha (Acharya Susruta*), Aging is considered as a disease that may be manifested timely or untimely, characterised by degenerative changes (6). During this phase there is a predominance of *Vata dosha*, ultimately aging may result due to aggravation of *vata* and *pitta dosha*. Therefore excessive utilization of all the *nidhanas* which causes *vata- pitta* aggravation may lead to aging.

Though direct references are not available in our classics about primary open angle glaucoma, its manifestation and pathology can be interpreted as *Prana and vyana vayu dushti* (7).Impaired auto regulation occurs due to *Prana Vayu dushti* resulting in vasospasm (*Samkocha and Vikasa* abnormal constriction and dilatation) and causes *Vyana Vayu dushti* (factor for fluid transport in body) and ischemia. This reduction in blood circulation and nutrients indicates *srotavarodha* at the level of *rasayanis* (obstruction in micro channels providing nourishment) and results in *dhatu kshaya* (tissue loss).

Also the hypoxia at optic nerve head indicates *pranavaha srotodushti,* as age factor. As the circulation of *rasa-rakta* (the vehicle of nutritional factors for *dhatus*, the structural elements) is impaired, *rasavaha srotodushti* leading to *dhatu kshaya*(degeneration) can be considered as a component of pathogenesis. *Srotorodha* also occurs in aqueous outflow channels as a result of *dhatwagni mandhya* causing *malasanchaya,* which increases with age.

Ama or malasamchaya means deposition of unwanted or waste materials in the body tissues which disturbs the homeostasis, ultimately leading to functional and structural damage. Normal outflow of aqueous depends upon the integrity of outflow structures especially in the Trabecular meshwork (TM) and determines the intra ocular pressure (IOP). In primary open angle glaucoma (POAG), there is an inherent weakness of outflow structures due to age and increased extracellular matrix (ECM) deposition (*Malasanchaya*) in trabecular meshwork (TM) and cellular components of ciliary body caused by decreased activity (*dhatwagnimandhya*). This imparts resistance to the fluid passing through it (*Srotorodha*) causing *Margavarodhajanya Vata kopa* resulting in elevated intra ocular pressure (IOP).

The signalling mechanisms of immune system initiated by high intra oclar pressure (IOP), ischemia, and excessive excitatory amino acids can cause neuronal cell death. Auto antibodies against Glycosaminoglycans which maintain the structural and functional at optic nerve head (ONH) were found in eyes of primary open angle glaucoma (POAG) patients. A lack of cell-mediated immunity has been observed as leukocyte migration inhibition is found in primary open angle glaucoma (POAG) patients.

These all implies *Vyadhikshamatwahani* which is a prime factor in elderly, leading to progressive damage of optic nerve. Thus majority of the risk factors and pathological mechanisms involved in pathogenesis of glaucoma indicate the role *Vata* dysfunction which regulates the activities of other two *doshas* viz. *Pitta* and *Kapha*. In the later stages of glaucoma all three *doshas* turn abnormal while *Vata* continue to play a predominant role. This establishes primary open angle glaucoma (POAG) as *jara vyadhi (akalaja jara vyadhi)*.

Agnimandya, malasamchya, margavarodha, pranavaha and rasavaha srotodushti and Vyadhikshamatwahani also seems to play a significant role in glaucomatous damage. All these aspects should be kept in mind while selecting the therapeutic interventions.

Deepana, Pachana and Anulomana were 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. *Shiro santarpanarta Nasya karma* was done with *ksheera bala taila* owing to its properties of *Indriyasroto pravesa* i.e. permeating into minute channels and *margavishodhana* (removes obstruction). *Seka with tridoshahara dravya kashayas and bidalaka* were done owing to the property of *netra sthita harana* and *chakshushya rasayana*. *Punarnavasa* used also have *chakshushya* nature (8).

The ingredients were having immunomodulatory, adaptogenic, antioxidant and neuroprotective activities. *Ghee* which also had *Chakshushya, rasayana* 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 intra ocular pressure (IOP), improved retinal sensitivity and vision. Patient was advised to continue topical eye drops during the course of intervention. No adverse events were reported during the study and follow-up period. This indirectly reveals that the conventional and traditional drugs concomitantly used in this case are not interacting with each other.

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Conclusion

The larger optic cups and smaller Neuroretinal rims found in older subjects was taken to mean that there is loss of Neuroretinal tissue with age and this clinical study concludes that *Ayurvedic* treatment protocol along with anti glaucoma eye drops are more effective in reducing the intra ocular pressure and control the progression. Hence early diagnosis & proper management can prevent, arrest, OR delay the progression of primary open angle glaucoma (POAG).

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