



Review Article

AN AYURVEDIC PERSPECTIVE ON GLAUCOMA

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Article info

Article History:

Received: 22-06-2023

Revised: 12-07-2023

Accepted: 30-07-2023

KEYWORDS:

*Adhimantha*,  
Glaucoma,  
*Virechana*,  
*Raktamokshana*,  
*Kriyakalpa*.

ABSTRACT

The word *Adhimantha* indicates excessive churning type of pain. *Adhimantha* is compared with glaucoma in modern science to some extent. Clinical features of this disease vary depending upon *Doshas* involvement 4 types of *Adhimantha* was mentioned by our *Acharyas*. Glaucoma affects 2-3% of people over the age of 40 years 50% may be undiagnosed. primary open angle glaucoma (POAG) is the most common form, the disease is insidious and usually asymptomatic until it has caused a significant loss of visual field hence it is called as “silent thief of sight”.

Glaucoma is a neurodegenerative condition that affects mainly nervous coat of eye and is associated with increased intraocular pressure when left untreated patients may gradually experience visual field loss and even lose their sight completely. It is the second leading cause of blindness around worldwide. It cannot be treated completely but it can be managed with Ayurvedic therapeutics to some extent by giving *Sodhana chikista* like *Virechana* and *Raktamokshana*, *Kriyakalpas* like *Akshitarpan*, *Seka*, *Anjana*, *Aschyotana*, *Pindi*, *Bidalaka*, *Chakshsuya* drugs and *Mutrala* drugs (diuretics) etc.

INTRODUCTION

“सर्वेन्द्रियानाम नयनं प्रधानं!!” i.e., eye is *Pradhana* among all sense organs to see and perceive knowledge [1] Sincere efforts should be made by every individual to protect the eyes throughout the life. Acharya Susruta has mentioned 76 *Netra rogas* among them *Adhimantha* comes under *Sarvagata rogas*[2]. As per all *Acharyas* *Abhisyanda* is the root cause of all types of *Netra rogas*. In which if *Abhisyanda* is not treated in time leads to many diseases, *Adhimantha* is one among them.

*Adhimantha* is compared with glaucoma in modern science. Severe pain (*Tivra Vedana*) in the eye is the common feature of all types of *Adhimantha*. Clinical feature of this disease vary depending upon *Dosha* involvement 4 types of *Adhimantha* was mentioned by our *Acharyas* i.e., *Vataja*, *Pittaja*, *Kaphaja* and *Raktaja* all these are *Vyadhana sadhya vyadhi*[3] considering *Hatadhimantha* as *Asadhya vyadhi*.

Glaucoma is second main cause of blindness. In India about 12 million people are affected and contribute to 12.8% of total blindness. It is a leading cause of irreversible blindness.

Definition

Glaucoma is characterized by a progressive optic neuropathy resulting in a characteristic appearance of optic disc and a specific pattern of irreversible visual field defects, raised IOP is the most common factor<sup>[4]</sup> (Normal IOP is 16-21mm of Hg).

Etiological Factors

Following are some of the causative factors which are responsible for Glaucoma

- 1) Age over 40 years
- 2) Myopic patients are more prone than the emmetropes
- 3) Family history (hereditary): three many types of genes are responsible for glaucoma are
  - Myocilin C (MYOC),
  - Optineurin (OPTN),
  - WD repeat domain 36 (WDR 36)
- 4) Diabetics, hypertension
- 5) Cigarette smoking

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<https://doi.org/10.47070/ijapr.v11i7.2881>

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**Pathophysiology of Glaucoma**

Raised intraocular pressure causes mechanical stretch on the lamina cribrosa leading to axonal deformation and ischaemia by altering capillary blood flow. As a result of this neurotrophins (growth factors) are not able to reach the retinal ganglion cell bodies, due to deficiency of this growth factors cause death of RGC associated with a loss of retinal nerve fibre. Loss of ganglion cells is related to the level of IOP but other factors may also play a role.

**Causes of raised IOP include**

- 1) Due to failure of aqueous outflow pump mechanism as a result of trabecular meshwork stiffening and apposition of schlem’s canal wall there will be decreased aqueous outflow
- 2) Thickening and sclerosis of trabecular meshwork with faulty collagen tissue
- 3) Narrowing of intertrabecular spaces
- 4) Deposition of toxic material in juxtacanalicular space

The retina and optic nerve share a peculiar mechanism of autoregulation of blood flow with rest of the central nervous system. Once the autoregulatory mechanisms are compromised, blood flow may not be adequate beyond some critical range of IOP

Progressive optic neuropathy occurs due to toxic factors such as glutamate (excitatory toxin), oxygen free radicals, or nitric oxide which are released when RGCs undergo death which results in characteristic optic disc appearance and visual field defects<sup>[5]</sup>

**Classification<sup>[6]</sup>**

**A. Congenital and Developmental Glaucoma**

1. Primary Congenital Glaucoma
2. Developmental Glaucoma

**B. Primary Adult Glaucoma**

1. Primary Open Angle Glaucoma (POAG)
2. Primary Angle Closure Glaucoma (PACG)

**C. Secondary Glaucoma**

The two main types of glaucoma

**Primary Open Angle Glaucoma**

It is characterized by slowly progressive raised intraocular pressure associated with optic disc cupping and visual field defects

Symptoms	Signs
Develops gradually with harmful effects but usually asymptomatic	Optic disc cupping (more than 0.4)
Mild headache and orbital pain	Visual field defects
Visual field defects noticed (occasionally)	Thinning of neuro retinal rim
Difficulty in reading and close work	

**Primary Angle Closure Glaucoma**

It is a type of Glaucoma in which rise in intraocular pressure occurs due to blockage of aqueous humour outflow by closure of a narrow angle of anterior chamber

Symptoms	Signs
Severe pain in eyes	Lids become inflamed
Impairment of vision	Conjunctiva-chemosed and congested
Redness and lacrimation	Cornea-cloudy, oedematous and insensitive
Photophobia	Anterior chamber-very shallow, flares present
Nausea, vomiting	IOP elevated between 40 and 70mm of Hg
	Optic disc is congested and inflamed

**Normal Tension Glaucoma**

It is characterised by progressive retinal ganglion cell death and glaucomatous visual field loss associated with an intraocular pressure constantly below 21mm of Hg

**Secondary Glaucoma**

It occurs as a result of another disease within the eye such as infections, inflammation, secondary cataract, tumour, hypertension, diabetes etc.

**Investigations<sup>[7]</sup>**

- 1) Visual acuity test
- 2) Diurnal variation test is especially useful in detection of early cases
- 3) Gonioscopy- To examine the angle of anterior chamber.
- 4) Tonometry- Measure IOP
- 5) Optical coherence test- To examine the thickness of retinal nerve fibre layer and ganglion’cell layer
- 6) Slit-lamp - examination of anterior segment
- 7) Perimetry- To detect the visual field defects
- 8) Nerve fibre layer analyzer (NFLA)
- 9) Ophthalmoscopy- To examine the optic disc
- 10) Pachymetry-It is used for measuring the thickness of cornea
- 11) Water drinking test

**Medical Management**

- Anti-glaucomatic drug like prostaglandin analogues, cholinergics agonist like pilocarpine, adrenergic agonist like brimonidine, carbonic anhydrase inhibitor, beta blockers etc.
- Surgical procedures like Iridectomy, Cyclocryo therapy, Goniotomy, Trabeculotomy, YAG laser etc.

## Ayurvedic Perspective

If *Abhisyanda* is not treated properly it leads to *Adhimantha*. In *Adhimantha* there is an intense feeling as if the eye is being extracted (out of socket) and is being churned up along with half of head in association with specific features of particular *Dosha* involved.

### Vataja Adhimantha

*Vataja Abhisyanda* if not treated properly it may lead to *Vataja Adhimantha* symptoms includes feeling as though eye is being plucked out, churned like *Arani*, blurring of vision, headache in one side, pricking, splitting, churning type of pain in eyeball, increased pressure<sup>[8]</sup>, ringing sound in the ears, giddiness<sup>[9]</sup>. In this condition *Rasa dhatu* gets decreased as a result of this occurs *Karnanada*, *Bhrama* etc.

### Treatment

- 1) *Snehapana* with *Acha ghruta*, *Purana ghruta*<sup>[10]</sup>, *Mesasrunji ghruta*, *Triphala ghruta*, *Sahacharadi ghruta*.
- 2) *Swedana*- *Salvana Upanaha*, *Bashpa swedana*
- 3) *Basti*- *Sneha basti* in *Vata prakopa*
- 4) *Raktamokshana*- it is done in *Upanasika*, *Lalata* and *Apanga pradesha*
- 5) *Virechana*- *Sneha viechana* with *Tilwak ghruta*
- 6) *Anjana*<sup>[11]</sup>-
  - a) *Madhukanjana*: *Madhuka*, *Rajani*, *Pathya* and *Devadaru* are macerated with *Ajadugdha*.
  - b) *Gaireekanjana*: *Gairika*, *Saindhava*, *Krsna* and *Nagara* are macerated in water and used as collyrium.
- 7) *Nasya karma*- *Anutaila*
- 8) *Pariseka* : Decoction with *Vatahara* drugs
- 9) *Tarpana*- *Kashmarya*, *Madhuka*, *Kusta*, *Jatamansi*, *Sariva dashamoola*, *Kaseru* along with *Paya* (*Kasmaryadi kshirapaka*)
- 10) *Putapaka* - *Snehika* type of *Putapaka*
- 11) *Dhumpana*- *Snehika dhoompana*
- 12) *Aschyotana*- *Hrebera*, *Tagara*, *Manjistha*, bark of *Udumbara* along with *Aja ksheera*
- 13) *Ajadugdha* boiled with *Mula*, *Kanda* and *Patra* of *Eranda* used as eye drops<sup>[11]</sup>

### Pittaja Adhimantha

The symptoms includes eye ball looks like a liver with a full of red streaks as if burnt by fire, perspiration, yellowish appearance of all objects, lid margin becomes swollen and inflamed<sup>[12]</sup>

**Treatment:** It should be treated like *Pittaja abhisyanda*.

- 1) *Snehapana*- Ghee mixed with *Sarkara*<sup>[13]</sup>
- 2) *Raktamokshana*- *Siravyadha*
- 3) *Sramsana*- With the decoction of *Triphala*, *Trivrut*
- 4) *Pariseka*- Decoction of *Lodhra*, *Yasthimadhu*

- 5) *Aschyotana*- *Gambhari*, *Amalaki* and *Haritaki* mixed with water.
- 6) *Nasya karma*- *Gundradi ghrta*<sup>[14]</sup>
- 7) *Anjana*-
  - a. *Gulika anjana*
  - b. *Samudraphena* rubbed in *Stanya* and honey used as collyrium
  - c. *Sallaki* mixed with honey and sugar used as collyrium<sup>[14]</sup>
- 8) *Bidalaka/pindi*- *Dhatri* (*Amalaka*) or *Mahanimbhaphala*
- 9) *Tarpana*
- 10) *Putapaka*
- 11) Internally should be given like *Pittaja visarpa*<sup>[14]</sup> i.e., *Mahatiktaka ghruta*.<sup>[15]</sup>

**Kaphaja Adhimantha**- There will be a swelling associated with coldness, discharge, itching sensation, heaviness, sliminess and horripilation, seeing objects with a difficulty associated with pain, headache and blockage in the nose.<sup>[16]</sup>

### Treatment

- 1) *Apatarpana* (*Laghuahara* should be taken for 3 days) followed by intake of *Tikta ghruta*.
- 2) *Swedana*- Fomentation with the leaves of *Kupilu*, *Kapitha*, *Arka* etc.
- 3) *Sira mokshana*- *Siravyadhana*
- 4) *Avapidana nasya*- *Kaphahara* drugs
- 5) *Anjana*- *Haritaki*, *Haridra*, *Madhuyasti* and *Sauviranjana*<sup>[17]</sup>
- 6) *Dhumapana*- *Kapha hara* drugs should be taken.
- 7) *Pariseka*- *Kwatha* prepared with *Nimba*, *Patola*, *Jatipatra* made *Sukoshna* and poured over closed eyes.
- 8) *Bidalaka*
  - a. Paste of fine powders of *Kusta*, *Tagar*, *Daruharidra*, *Ela* applied over eyelid,
  - b. Paste of *Sunthi*, *Devadaru*, *Kustha* and *Balaka* should be applied.
  - c. Application of paste with *Barhista*, *Sunthi*, *Devadaru* and *Kustha*.<sup>[18]</sup>
- 9) *Aschyotana* - Eye drops made with *Nagara*, *Nimba*, *Triphala*, *Vasa* and *Rodhra* are used<sup>[19]</sup>
- 10) *Ruksha aschyotana*- Decoction prepared with *Gomutra tilwaka*, *Lodhra*, *Aragwadha mula twak* are used.
- 11) *Tarpana* - *Aja yakrit kshirapaka*
- 12) *Putapaka*- Prepared with *Yakrit of Chaga*, *Agaru*, *Priyangu*, *Devadaru*
- 13) *Kavalagraha* - *Teekshna dravyas*

### Raktaja Adhimantha

Redness of eye resembling like *Bandhuka* flower, tenderness, bleeding, pricking type of pain,

visualises flames in all directions, cornea looks like as if dipped in blood.<sup>[20]</sup>

According to Bhavprakasha, *Krishna mandala* is compared with *Raktabija*.<sup>[21]</sup>

According to Arundatta Krishna, *Mandala* looks like a fire and neem immersed in blood<sup>[22]</sup>

### Treatment

It should be treated like *Pittaja abhisyanda* followed by *Sodhana chikistha* like *Sadyo virechana*

- 1) *Snehapana- Tikta ghruta pana (Purana ghruta)*
- 2) *Rakta mokshana – Jalouka*
- 3) *Anjana*
  - a) *Churna of Arjuna, Dhataki, Amalaki, Bilwa flowers, Patali* should be taken equal quantity mixed with honey and used as collyrium
  - b) *Candana, Kumuda, Kunkuma, Shilajatu, Tamrabhasma, Lohabhasma, Tuttha, Vanga, Kamsyamala, Sauviranjana* exudate of *Nimba* are pounded with honey and use as collyrium<sup>[23]</sup>

### Prognosis of Disease

The four types of *Adhimantha* are said to be *Sadhya* if treated in time if ignored leads to vision loss

Types	Sushruta <sup>[25]</sup>	Astanga Hrudaya <sup>[26]</sup>
<i>Vataja Adhimantha</i>	Loss of vision in 6 days	Loss of vision in 5 days
<i>Pittaja Adhimantha</i>	Loss of vision immediately	Loss of vision immediately
<i>Kaphaja Adhimantha</i>	Loss of vision in 7 days	Loss of vision immediately
<i>Raktaja Adhimantha</i>	Loss of vision in 5 days	Loss of vision in 3 days

### Correlation of Adhimantha to Glaucoma

*Adhimantha* is correlated with Glaucoma to some extent, like

- Vataja Adhimantha* ➔ Primary Angle Closure Glaucoma (PACG)
- Pittaja Adhimantha* ➔ Primary Angle closure Glaucoma (PCAG)
- Kaphaja Adhimantha* ➔ Primary Open Angle Glaucoma (POAG)
- Raktaja Adhimantha* ➔ Primary Angle Closure Glaucoma (PACG)
- Hata Adhimantha* ➔ Absolute Glaucoma

### Pathya-Apathya<sup>[27]</sup>

	Pathya (wholesome)	Apathya (Uwholesome)
Ahara	<i>Shaka Vargas, Shastika Sali, Yava, Godhuma, Mudga, Go Ghrutam, Saindhva Lavana, Madhu, Jangala Mamsa</i>	<i>Masha, Sura, Dadhi, Pinyaka, Hingu, Lavana, Panasa, Anoop Mamsa, Kantakari, Phanita</i>
Vihara	Eye exercises, <i>Pada Abyanga, Manasika Shanti, Padatradharana</i>	<i>Krodha, Atapa, Tejodarsana</i> (viewing bright light), <i>Divaswapnam, Ratri Jagarana, Sahasa, Madyapana, Tamboola Sevana</i>
Aushadi varga	<i>Shigru, Patola, Draksha, Kakamachi, Kadali, Varthaka, Haritaki, Vibhitaki, Amalaka, Puranaghrita</i>	

### DISCUSSION

Glaucoma is the most common cause of irreversible blindness. Glaucoma is defined by the progressive loss of retinal ganglion cells and is associated with a characteristic optic neuropathy and

- 4) *Pindi - Fried Lodhra* mixed with *Kanjika*
- 5) *Aschyotana- Churna of Kaseru and Madhuka* are wrapped in cloth and soaked in rain water used as eye drops.
- 6) *Bidalaka- Nilotapala, Usira, Kantakari, Yasthimadhu, Musta, Lodhra, Padmaka* mixed with ghee applied around the eyes.<sup>[23]</sup>
- 7) *Nasyakarma*
- 8) Oral administration like - *Vasadi kasaya, Patoladi kasaya, Phala trikadi kasaya, Brihat kushmanda avaleha* and *Satavari paka* should be given.

### Hathadhimantha

When *Vataja Adhimantha* is neglected it leads to an *Hatadhimantha*, there will be severe pain associated with shrinking of eyes.<sup>[24]</sup>

### Treatment

It is incurable disease but general line of treatment like *Vataja Abhisyanda* and *Vataja Adhimantha* should be followed.

so as preventive and curative aspect Ayurvedic therapeutics are very much helpful. *Adhimantha* has a similar symptoms with that of glaucoma like blurring of vision, eye pain, half sided headache, nausea, vomiting etc *Shodhana chikista* like *Virechana*, *Nasyakarma*, *Raktamoksana* are explained in Ayurvedic texts. According to *Bhela samhita Alochaka pitta* is of 2 types. They are *Chakshur vaisheshika* and *Buddhi vaisheshika* mainly *Pitta* gets vitiated in eye diseases. Due to *Virechana karma* the vitiated *Dosas* and waste products of metabolism in the *Kosta* are eliminated. *Nasya* helps in removing all the vitiated *Doshas*, *Kriyakalpas* like *Ascyotana*, *Anjana*, *Akshitarpana*, *Putapaka* etc has more contact time and higher bioavailability so the drug absorption is more in topical route than the oral route. *Raktamokshana* like *Siravyadhana*, *Jaloukavacharan* etc are indicated in *Adhimanta*. *Jalouka* having an anticoagulant, vasodilation, analgesic, anti-cholinergic agents as it reduces the pain and pressure inside the eyeball. Acharya Charaka has mentioned *Mutra virechaniya dashemanis* and included *Gokshura*, *Vasuka (Punarnava)* etc has a *Sothahara* properties helps in reducing the oedema.<sup>[28]</sup> Internally administrating *Chakshusya ghrutas* like *Mahatriphala ghrutam*, *Jeevantiyadi ghrutam* etc. As these *Ghrutas* will reduce the sclerosis of trabecular meshwork with faulty collagen tissue. *Chakshuya dravyas* like *Triphala*, *Yasthimadhu*, *Bhrungaraja* etc are given for vision improvement as the drugs mostly contain anti-inflammatory, antioxidants, *Rasayana* (rejuvenating) properties and also prevent further damage of RGC.

## CONCLUSION

Glaucoma damages the optic nerve, which is responsible for transmitting visual information from the eye to the brain. This damage is often caused by increased intraocular pressure (IOP). In our classics it is mentioned that *Adhimantha* occurs due to the negligence of *Abhisyananda*. It is *Vyadhana* type of *Sadhya vyadhi*, churning type of pain is the main symptom of *Adhimantha* with the help of Ayurvedic principles explained for *Adhimantha* can be applied to Glaucoma and are helpful in restoring the deterioration of vision and ultimately blindness ensues. According to Ayurveda texts mentioned *Pathya ahara vihara*, *Rutucharya* and *Dincharya* can be followed and helps in prevention of progression of disease. These natural approaches, when combined with conventional medical treatments, may provide a holistic approach to promote healthy eye and support the management of glaucoma.

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**Cite this article as:**

P.Ramya Kumari, Ch.Ramadevi, K.Anasuya. An Ayurvedic Perspective on Glaucoma. International Journal of Ayurveda and Pharma Research. 2023;11(7):90-95.

<https://doi.org/10.47070/ijapr.v11i7.2881>

**Source of support: Nil, Conflict of interest: None Declared**

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