

UNDERSTANDING OF GLAUCOMA IN GENERAL PERSPECTIVE: A REVIEW ARTICLE WITH SPECIAL REFERENCE TO ADHIMANTHA

Dr. Shivani Prajapati^{1*}, Prof. Shamsa Fiaz²

¹P. G. Scholar Department of Shalakya Tantra, National Institute of Ayurveda, Jaipur.

²Professor and HOD Department of Shalakya Tantra, National Institute of Ayurveda, Jaipur.

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*Corresponding Author

Dr. Shivani Prajapati

P. G. Scholar Department of
Shalakya Tantra, National Institute
of Ayurveda, Jaipur.



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ABSTRACT

Glaucoma is a chronic, progressive optic neuropathy characterized by structural damage to the optic nerve head and corresponding visual field defects, often associated with raised intraocular pressure (IOP). It is one of the leading causes of irreversible blindness worldwide and frequently remains asymptomatic until advanced stages, especially in primary open-angle glaucoma (POAG). Modern ophthalmology recognizes glaucoma as a multifactorial disease in which IOP is the most important modifiable risk factor, although vascular, biomechanical, and neurodegenerative mechanisms also contribute to optic nerve damage. In *Ayurveda*, severe ocular diseases are described under *Netra Roga*, among which *Adhimantha* is considered a grave and potentially blinding disorder. Classical descriptions present *Adhimantha* as a severe

disease associated with intense ocular pain, visual disturbance, and deeper involvement of ocular structures, often developing as a complication of neglected or improperly managed *Abhishyanda*. Although glaucoma and *Adhimantha* are not identical disease entities, certain clinical features—particularly progressive visual disturbance, ocular heaviness, and chronic deterioration seen in *Kaphaja Adhimantha*—permit a meaningful comparative discussion with glaucomatous disorders, especially POAG. The present review article aims to provide a general understanding of glaucoma from both modern and *Ayurvedic* perspectives, with special emphasis on the concept of *Adhimantha*, its etiopathogenesis, types, symptomatology, diagnosis, and management. The review also attempts to discuss the possible correlation of

glaucomatous pathology with different forms of *Adhimantha* and to highlight the relevance of an integrative perspective in preserving vision and preventing blindness.

KEYWORDS: Glaucoma, *Adhimantha*, *Kaphaja Adhimantha*, Primary Open Angle Glaucoma, Intraocular Pressure, Optic Neuropathy, *Ayurveda*, *Netra Roga*.

1. INTRODUCTION

Glaucoma is a heterogeneous group of ocular disorders that share a common endpoint: progressive optic neuropathy associated with retinal ganglion cell loss, characteristic optic disc changes, and corresponding visual field defects.^[1] Because visual loss in glaucoma is irreversible and the disease may remain asymptomatic until substantial damage has already occurred, it represents a major public health concern. In primary open-angle glaucoma, peripheral visual field loss often develops slowly and silently, which is why glaucoma is commonly called the “silent thief of sight”.^[2,3]

Ayurveda, particularly through *Shalakya Tantra*, describes a wide spectrum of ocular diseases under *Netra Roga*. Acharya *Susruta* has mentioned 76 *Netra rogas* among them *Sarvagata rogas* are 17 in numbers, *Adhimantha* is one of them.^[4] *Adhimantha* is regarded as a severe and vision-threatening disorder due to its intense pain, progressive course, and potential to cause blindness if untreated. It is often described as a complication or advanced stage of *Abhishyanda* when the earlier disease is neglected or improperly managed.^[5,6]

From a comparative clinical viewpoint, some of the symptom complexes described under *Adhimantha*—such as visual blurring, heaviness, pain, and progressive visual impairment—invite discussion in relation to glaucoma. While it is not correct to correlate glaucoma and *Adhimantha* as exact synonyms, the *Ayurvedic* framework of *Adhimantha*, particularly *Kaphaja Adhimantha*, may offer a useful interpretive model for understanding chronic glaucomatous pathology.^[7] In *Kaphaja adhimantha* the eye is swollen, not very congested. attended with lacrimation, itching, coldness, heaviness, sliminess, dirt and horripilation. The patient with dirty eyes as if filled with dust sees objects with difficulty and suffers from blowing of nose and headache.^[8]

2. AIM

To review glaucoma in a general perspective and to understand its possible Ayurvedic correlation with **Adhimantha**, with special reference to the clinical significance of **Kaphaja Adhimantha**.

3. OBJECTIVES

1. To review the modern concept, epidemiology, classification, pathophysiology, and diagnosis of glaucoma.
2. To study the Ayurvedic concept of **Adhimantha** as described in classical and contemporary Ayurvedic literature.
3. To compare the symptomatology and progression of glaucoma with different forms of **Adhimantha**.
4. To discuss the relevance of **Kaphaja Adhimantha** in understanding chronic glaucomatous pathology.
5. To outline modern and Ayurvedic principles of management from an integrative perspective.

4. MATERIALS AND METHODS

The present review article is based on a narrative review of Ayurvedic and modern ophthalmic literature. Ayurvedic understanding was compiled from classical descriptions of **Adhimantha**, its relation with **Abhishyanda**, and contemporary review articles discussing its correlation with glaucoma. Modern understanding was based on standard glaucoma guidelines and ophthalmology literature dealing with primary open-angle glaucoma, optic neuropathy, intraocular pressure, diagnosis, and management. The material was critically arranged and interpreted under conceptual, clinical, and comparative headings.

5. Glaucoma: Modern General Perspective

5.1 Definition

Glaucoma is currently understood as a chronic, progressive optic neuropathy characterized by degeneration of retinal ganglion cells and their axons, resulting in characteristic optic nerve head changes and corresponding visual field loss. Although elevated intraocular pressure is the most important modifiable risk factor, but not the only risk factor for the development of Glaucoma.^[9] it is a multifactorial disease in which structural susceptibility of the optic nerve head, vascular factors, and neurodegenerative processes also play important roles.^[10]

5.2 Need of the Study

Glaucoma is one of the leading causes of irreversible blindness worldwide. Its burden is particularly significant because vision loss due to glaucoma is permanent and the disease often remains undiagnosed until late stages. Increasing life expectancy, population ageing, poor awareness, and delayed screening contribute to the growing burden of glaucoma-related visual disability, especially in developing countries.

5.3 Classification of Glaucoma

Glaucoma is commonly classified into **primary**, **secondary**, and **developmental/congenital** forms. Primary glaucomas include **Primary Open Angle Glaucoma (POAG)** and **Primary Angle Closure Glaucoma (PACG)**. Secondary glaucomas arise due to causes such as trauma, uveitis, lens-induced mechanisms, steroid use, pseudoexfoliation, pigment dispersion, or neovascularization. Congenital and developmental glaucomas are associated with abnormalities in the aqueous outflow system. This classification is clinically important because the mechanism, presentation, and management vary across subtypes.^[11]

5.4 Pathophysiology

Aqueous humour is produced by the ciliary body and drains predominantly through the trabecular meshwork and Schlemm's canal, with an additional uveoscleral pathway. When outflow becomes insufficient relative to production, intraocular pressure may rise. Persistent elevation of IOP can produce mechanical stress and vascular compromise at the optic nerve head, particularly at the lamina cribrosa, leading to retinal ganglion cell apoptosis, optic disc cupping, and progressive visual field loss. However, glaucoma may also occur in eyes with statistically normal IOP, indicating that vascular dysregulation, impaired ocular perfusion, mitochondrial dysfunction, and intrinsic susceptibility of the optic nerve head are also involved in disease progression.^[12]

5.5 Risk Factors

The risk of glaucoma increases with advancing age, positive family history, elevated IOP, thin central corneal thickness, myopia in some populations, diabetes mellitus, vascular dysregulation, and prolonged corticosteroid exposure. Recognition of these risk factors is important for identifying high-risk individuals and promoting early diagnosis.

6. Clinical Features of Glaucoma

6.1 Primary Open Angle Glaucoma

Primary open-angle glaucoma also known as chronic simple glaucoma.^[13] it is usually asymptomatic in its early stages. The disease progresses gradually, and central visual acuity often remains unaffected until late stages. Peripheral visual field loss develops slowly and may not be noticed by the patient for a long time. Because of this silent course, many patients present only after substantial optic nerve damage has occurred.

6.2 Primary Angle Closure / Acute Congestive Glaucoma

Angle-closure glaucoma may present acutely with severe ocular pain, headache, redness, blurred vision, halos around lights, nausea, vomiting, and markedly elevated intraocular pressure. Unlike POAG, this presentation is dramatic and symptomatic and may lead to rapid visual loss if not treated urgently.^[14]

7. Diagnosis of Glaucoma

Diagnosis of glaucoma is based on the combined assessment of optic nerve structure, visual function, intraocular pressure, and anterior chamber angle status. **Tonometry** is used to measure IOP, **gonioscopy** evaluates the angle, **fundus examination** assesses optic disc cupping and neuroretinal rim changes, and **perimetry** detects visual field defects. Modern imaging such as **Optical Coherence Tomography (OCT)** helps quantify retinal nerve fiber layer loss and optic nerve head changes. Progressively decreasing RNFL thickness may reveal the presence of progressive glaucoma that, because of green labeling, can be missed by the clinician.^[15] Pachymetry and Van Herick grading may further support evaluation in selected patients.

Glaucoma diagnosis is not a single-event decision but a longitudinal process. Disease progression, target IOP, optic nerve status, and visual field change must be monitored over time, and management should be individualized according to severity and risk of progression.

8. Management of Glaucoma in Modern Ophthalmology

The principal aim of glaucoma treatment is preservation of visual function and quality of life by slowing or halting the progression of optic neuropathy, primarily through lowering IOP.^[16] Medical therapy includes prostaglandin analogues, beta blockers, carbonic anhydrase inhibitors, alpha agonists, and other agents as required. Laser procedures such as laser trabeculoplasty or peripheral iridotomy may be indicated depending on the mechanism.

Surgical procedures such as trabeculectomy, glaucoma drainage devices, and minimally invasive glaucoma surgery are considered when failure of medical therapy and unsuitable for ALT either due to lack of cooperation or inability to visualize the trabeculum.^[17]

A major limitation of glaucoma therapy is that already established optic nerve damage is generally irreversible. Therefore, early diagnosis, regular follow-up, adherence to treatment, and individualized target pressure are essential in preventing functional visual disability.^[18]

9. ADHIMANTHA IN AYURVEDIC PERSPECTIVE

9.1 *Adhimantha* among *Netra Rogas*

Ayurveda classifies ocular disorders under *Netra Roga*, and *Adhimantha* is described as a severe and potentially blinding disease among the *Sarvagata Netra Rogas*. It is not considered a superficial eye disorder; rather, it is regarded as a grave ocular condition involving deeper tissues and significant impairment of ocular function.^[19]

9.2 Relation with *Abhishyanda*

A well-accepted *Ayurvedic* concept is that *Abhishyanda*, if neglected or improperly treated, may progress into more severe ocular disorders including *Adhimantha*. This suggests a pathological continuum in which an initially *Dosha*-dominant inflammatory or congestive ocular condition deepens and becomes more destructive. Thus, *Adhimantha* is often understood as a more severe stage of ocular pathology than *Abhishyanda*.

9.3 Etymological and Clinical Understanding

The term *Adhimantha* is characterised by noise in the ears, giddiness and churning like pain in the forehead, eye brows etc.^[20] The condition is described with features such as pain, visual disturbance, discomfort, and progressive impairment of vision. Because of this severity and the risk of visual loss, *Adhimantha* has been explored in *Ayurvedic* literature as a possible correlate for certain serious modern ocular disorders, including glaucoma.

10. *Nidana* and *Samprapti* of *Adhimantha*

10.1 *Nidana*^[21]

The causative factors of *Adhimantha* can be understood as those that vitiate the *Doshas* and disturb ocular health. These include exposure to dust, smoke, excessive heat, wind, visual strain, irregular dietary habits, improper lifestyle, and neglect of earlier eye diseases such as

Abhishyanda. In *Kaphaja* conditions, *Kapha*-provoking diet and habits may contribute to heaviness, cloudiness, and obstructive pathology within ocular channels.

10.2 Samprapti

The above mentioned *nidana* aggravates *Doshas* and these *Doshas* start moving upward, through the *Siras* i.e. blood vessels and get lodged in the eye and give rise to various diseases, in different parts of eye. Thus after ascertaining the origin of eye disease one should take action for their treatment otherwise they might become severe.^[22] *Vata* contributes to pain and functional derangement, *Pitta* to burning and inflammatory changes, *Kapha* to heaviness, turbidity, stickiness, and obstruction, while *Rakta* intensifies congestion and inflammatory manifestations.

10.3 Prognosis of Adhimantha

Types of <i>adhimantha</i>	Acc to <i>Sushruta</i> ^[23]	Acc to <i>Vagbhata</i> ^[24]
<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 in 7 days
<i>Raktaja adhimantha</i>	Loss of vision in 5 days	Loss of vision in 3 days

11. Types of Adhimantha and Their Clinical Features

11.1 Vataja Adhimantha

Vataja Adhimantha is characterized predominantly by severe pricking, tearing, or throbbing pain, along with dryness, discomfort, and functional disturbance of vision. The *Vata*-dominant picture reflects instability, pain, and degeneration-oriented pathology.^[25]

11.2 Pittaja Adhimantha

Pittaja Adhimantha manifests with burning sensation, redness, heat, intolerance to light, and inflammatory features, often showing a more acute and aggressive course.^[26]

11.3 Kaphaja Adhimantha

Kaphaja Adhimantha is clinically associated with heaviness of the eye, itching, swelling, cloudiness, stickiness, blurring of vision, and relatively slow progression. *Kapha* predominance suggests *guru*, *manda*, *picchila*, and *srotorodhaka* qualities, which conceptually resemble a chronic, sluggish, obstructive ocular pathology. This form is particularly important when discussing possible *Ayurvedic* parallels to chronic glaucoma.^[27]

11.4 *Raktaja Adhimantha*

Raktaja Adhimantha is marked by intense redness, congestion, burning, and pain, reflecting significant *Rakta-Pitta* involvement and a more acute congestive pattern.^[28]

12. Correlation of Glaucoma with *Adhimantha*

12.1 Need for Careful Correlation

Glaucoma is a modern clinicopathological diagnosis defined by optic neuropathy, optic disc changes, and visual field defects, whereas *Adhimantha* is an Ayurvedic disease construct based on symptomatology, *Dosha* predominance, and ocular tissue involvement. Therefore, the two should not be considered exact equivalents. A more academically sound approach is to identify areas of clinical resemblance and use them for comparative interpretation.

12.2 Why *Adhimantha* is Discussed in Relation to Glaucoma

The comparison arises because both glaucoma and *Adhimantha* are serious ocular disorders that may lead to progressive visual loss and blindness if untreated. In addition, certain forms of *Adhimantha* involve ocular pain, heaviness, visual blurring, and progressive visual dysfunction, which can be clinically compared with glaucomatous disease patterns.

12.3 Correlation of POAG with *Kaphaja Adhimantha*

Among the four types, *Kaphaja Adhimantha* provides the most meaningful comparison with **Primary Open Angle Glaucoma**. POAG is generally chronic, insidious, and slowly progressive; similarly, *Kaphaja Adhimantha* is characterized by heaviness, cloudiness, blurred vision, sluggish progression, and an obstructive pathological pattern. From an Ayurvedic viewpoint, POAG may be interpreted as a condition involving **Kapha-induced srotorodha** in the ocular channels with subsequent **Vata involvement** leading to progressive degeneration and visual dysfunction.

12.4 Correlation of Acute Congestive Glaucoma with *Pittaja/Raktaja Adhimantha*

Acute congestive or angle-closure glaucomatous states present with severe pain, redness, blurred vision, and acute ocular distress. These features resemble *Pittaja* or *Raktaja Adhimantha* more closely than the chronic *Kaphaja* pattern. Thus, acute glaucomatous attacks may be discussed in relation to *Pittaja* or *Raktaja Adhimantha* on the basis of symptom similarity.

13. Ayurvedic Interpretation of Glaucomatous Pathology

When glaucoma is interpreted through an Ayurvedic framework, especially in relation to chronic open-angle disease, one possible explanation is **Kapha predominance causing srotorodha** in the ocular channels, thereby disturbing ocular homeostasis and function. Over time, **Vata** may become aggravated secondary to obstruction and tissue depletion, resulting in progressive visual dysfunction and degeneration. In more acute congestive states, **Pitta** and **Rakta** may also participate. This conceptual framework is especially useful in understanding POAG through the lens of **Kaphaja Adhimantha** with secondary **Vata** involvement.

However, such *Ayurvedic* interpretation must always be correlated with modern ophthalmic diagnosis, because glaucoma is defined clinically by optic nerve damage, visual field loss, and IOP-related risk rather than by symptoms alone.

14. Principles of Management

14.1 Modern Management

Modern glaucoma management aims to reduce IOP to a level that minimizes further optic nerve damage. This may involve medical therapy, laser procedures, or surgery depending on the mechanism, severity, and progression of disease. Lifelong follow-up and treatment adherence are essential because glaucoma is a chronic condition with risk of progressive visual loss.

14.2 Ayurvedic Principles

1. *Ayurvedic* management of *Adhimantha* is based on *Dosha* predominance, chronicity, and patient strength. The general principles include *Nidana Parivarjana*, *Shamana*, and where appropriate *Shodhana*, together with local ocular procedures and internal medicines selected according to the clinical presentation. In *Kaphaja Adhimantha*, therapies like *Siramokshana*, *Swedana*, *Nasya*, *Anjana*, *Dhoompana*, *Seka*, *Lepa*, *Aschyotana*, *Putpaka* and *Snehapana* with *tikta ghritha*.^[29], has been mentioned having **Kapha-pacifying**, **Lekhana**, **Chakshushya**, and **Rasayana** properties may be considered conceptually relevant.

15. DISCUSSION

In *Ayurveda*, *Adhimantha* is closely related to Glaucoma. Glaucoma is defined as 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 risk factor.^[30] Similarly, *Adhimantha* is considered among the *Sarvagata netra rogas*. *Ayurveda*

interprets ocular disease through *Dosha*, *Dushya*, *Srotas*, and symptom complexes. Within this framework, *Adhimantha* represents a severe ocular disease with pain and progressive visual compromise, while *Kaphaja Adhimantha* specifically emphasizes heaviness, cloudiness, blurring, and obstructive pathology. These features make *Kaphaja Adhimantha* the most reasonable *Ayurvedic* correlate for chronic glaucoma, particularly POAG. Likewise, the acute painful congestive presentation of angle-closure glaucoma resembles *Pittaja* or *Raktaja Adhimantha* more closely than a chronic *Kaphaja* pattern.

The management of *Adhimantha* in *Ayurveda* considered same as *Abhishyanda* which emphasizes both *Samshodhana* and *Samshamana* therapies according to *doasha*. The therapeutic approach aims not only to alleviate acute symptoms like pain, redness, and swelling but also to prevent further progression of the disease toward “*Hatadhimantha*” an incurable disease leading to visual loss.^[31] In *Kaphaja Adhimantha* the therapies mainly focuses on to liquefying and eliminating kapha dosha, three days of fasting or light food with *Tikсна*(irritating) *nasya*, *dhoompana*, *kavala* are indicated to eliminate the excess *kapha dosha* and clear the blocked passage.

At the same time, scholarly caution is necessary. Glaucoma is defined by objective structural and functional abnormalities such as optic disc cupping, retinal nerve fiber layer loss, and visual field defects, whereas *Adhimantha* is a classical *Ayurvedic* disease category based on symptomatology and *Dosha*-based pathogenesis. Therefore, the most academically defensible conclusion is that ***Adhimantha*—especially *Kaphaja Adhimantha*—may be considered an *Ayurvedic* clinical correlate or interpretive model for glaucoma, rather than its exact synonym.**^[32]

16. CONCLUSION

Glaucomatous optic neuropathy can lead to irreversible blindness in chronic stage. The conventional management mainly focus on lowering intra ocular pressure (IOP). For effective management of glaucoma should include neuroprotective properties medications. *Ayurveda* introduces “*Rasayana*” concept which play an important role in degenerative disorders and other *shothahar* medications which can help to reduces the intra ocular pressure.

Thus, glaucoma may be interpreted in *Ayurveda* through the framework of *Adhimantha*—particularly *Kaphaja Adhimantha*—when supported by proper modern ophthalmic diagnosis.

Such a balanced perspective is useful for academic writing, integrative clinical thinking, and future research in *Ayurvedic* ophthalmology.

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