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Differential Diagnosis of Red Eye: An Integrative Approach from Ayurvedic and Modern Perspective

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ABSTRACT

Red eye is a prevalent clinical presentation in ophthalmology, encompassing a broad spectrum of underlying aetiologies. This abstract delineates the differential diagnosis of red eye based on distinct clinical features. This article explores the Ayurvedic perspective on bloodshot eyes, highlighting the intricate relationship between ocular health and the balance of *Doshas* (*Vata*, *Pitta*, *Kapha*) and *Rakta* (blood). Drawing from classical texts such as the *Sushruta Samhita*, various conditions associated with red eyes are examined, including *Shukalgata*, *Krishangata*, and *Sarvagata Rogas*. The differential diagnoses encompass conditions like *Prastari Arma*, *Lohita Arma*, and *Rakta Abhishyanda* and *Adhimanta* among others, detailing their unique presentations and implications. Furthermore, the modern understanding of red eye conditions is summarized, showcasing parallels with Ayurvedic diagnoses. By integrating both perspectives, this article emphasizes the need for a holistic approach in treating ocular ailments, where Ayurvedic principles can complement contemporary medical practices. This synthesis not only enriches the understanding of red eye etiology but also guides therapeutic strategies in clinical practice.

Key words: Red eye, *Shukalgata*, *Krishangata*, *Sarvagata Roga*, *Netra Roga*.

INTRODUCTION

Bloodshot eyes, characterized by redness and irritation, are a common concern that can arise from various underlying conditions. In Ayurveda, ocular health is closely linked to the balance of the three *Doshas* - *Vata*, *Pitta*, and *Kapha* - and the state of *Rakta* (blood). This ancient system of medicine provides a

comprehensive framework for understanding the etiology of red eye conditions, offering unique insights into their prevention and treatment. Ayurvedic texts, particularly the *Sushruta Samhita*, detail a range of disorders associated with red eyes, categorized into specific *Rogas* based on their characteristics and underlying imbalances. Each condition reflects not only the physical manifestations but also the broader implications of *Dosha* disturbances and blood dyscrasias.

In contrast, modern medicine categorizes red eye conditions through a clinical lens, addressing factors such as inflammation, infection, and trauma. This article aims to bridge the gap between these two perspectives, exploring the Ayurvedic classifications of red eye conditions alongside their modern equivalents. By doing so, it seeks to foster a holistic understanding of ocular health, promoting integrated approaches to diagnosis and treatment that consider both traditional wisdom and contemporary medical insights.

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THE PERSPECTIVE OF AYURVEDA

From the perspective of Ayurveda, bloodshot eyes can be attributed to various factors.

Predominantly red eye is found in Ayurvedic Literature (*Sushruta Samhita*) in the following Diseases/Conditions:

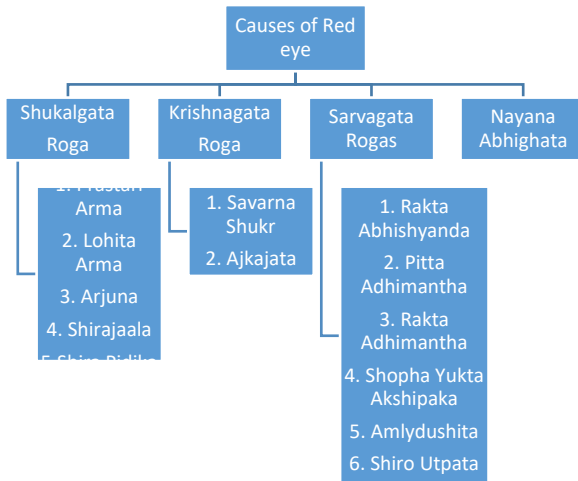


Figure 1: Causes of Red eye in Ayurveda

The differential diagnosis of red eye involves various conditions with distinct features:

A. Shukalgata Rogas causing red eye

- 1. Prastari Arma:** in the white part of the eye, if there is a spreading structure resembling a thin red line or a lump and in some cases a blue-coloured lump, it is called "Prastari-Arma."^[1]
- 2. Lohita Arma:** In the white part of the eye, an overgrowth of red tissue resembling a red lotus is called "Lohitarma."^[2]
- 3. Arjuna:** If a single spot on the white part of the eye shines like rabbit's blood, it is called "Arjuna."^[3]
- 4. Shirajaala:** If large, thick veins spread across the conjunctiva of the eye, forming a red, net-like pattern, it is called "Sirajal."^[4]
- 5. Shira Pidika:** If small nodules surrounded by veins appear near the iris, in the sclera of the eye, they are called "Sirajnapidika".^[5]

B. Krishnagata Rogas causing red eye

- 1. Svarna Shukra:** If there is an ulcer located deep in the black part (iris) of the eye, barely visible or difficult to see, resembling a puncture wound

made by a needle, from which warm tears flow and causes intense pain, it is called 'Svarna Shukra'.^[6]

- 2. Ajkajata:** If a structure resembling goat droppings, red in colour, painful, and associated with sticky red discharge, emerges by tearing through the black ring (iris) of the eye, it is called 'Ajakajat'.^[7]

C. Sarvagata Rogas causing red eye:

- 1. Rakta Abhishyanda:** The symptoms of *Rakta Abhishyanda* (conjunctivitis) are, discharge of copper-coloured tears, redness of the eyes, presence of red lines around the eyes, manifestation of other symptoms of aggravated *Pitta* (such as burning sensation, etc.)^[8]
- 2. Pitta Adhimantha:** The eye is suffused with red lines, there is discharge from the eye with a burning sensation and eyeball appears deep copper-coloured like a lump. A burning sensation is similar to that caused by an alkaline substance applied to a wound. The edge of the eye appears swollen and inflamed. The patient sweats, and everything appears yellow to the patient. Sometimes, fainting occurs. There is a burning sensation in the head.^[9]
- 3. Rakta Adhimantha:** The symptoms of *Rakta Adhimantha* (inflammation due to blood) are: the patient's eyes are as red as the *Japa* flower (hibiscus), the patient experiences anxiety, the eyes are painful to touch and there is discharge of blood or blood-coloured fluid from the eyes. The patient feels a pricking pain similar to a needle. The patient perceives all directions as burning with fire. The black part of the eye appears submerged in blood, resembling a lump of flesh. The eyes appear bright (as if burning), and there is redness around them.^[10]
- 4. Shopha Yukta Akshipaka:** Itching in the eyes, accumulation of discharge (mucus) in the eye and watering. The eye appears like a ripe fig fruit. Pricking pain is similar to a needle. Burning sensation in the eye. Coppery discoloration of the eye, swelling of the eye, frequent discharge of hot and cold, and sticky fluid. Irritation or restlessness in the eye with heaviness.^[11]

- 5. **Amladhyushita:** When *Pitta* is aggravated by the consumption of sour substances or irritating liquids, it makes the eyes red and blue and causes swelling in eye. This condition is called 'Amladhyushita'.^[12]
- 6. **Shiro-Utpata:** When a person's eye develops copper-colored lines, with or without pain, and these lines make the entire eye appear red over time, the condition is known as 'Sirotpata'.^[13]
- D. **Nayan Abhighata:** Due to causes such as injury from a stick or sharp instrument, people often suffer from eye injuries. These injuries lead to symptoms such as swelling (*Sarambha*), redness (*raga*), and severe pain in eye. In such conditions, a wise physician should administer treatments such as nasal drops (*Nasya*), topical applications (*Alepa*), eye washes (*Parishechana*), and soothing eye treatments (*Tarpana*). Additionally, treatments mentioned for conditions like *Rakta Abhishyanda* (conjunctivitis) and *Pitta Abhishyanda* should be employed. These treatments should be unctuous (*Snigdha*), sweet (*Madhura*), and cooling (*Shitala*), which bring comfort to the eyes. Similarly, for eyes injured by excessive sweating, fire contact, smoke exposure, fear, grief, or pain, the same type of treatment should be applied.^[14]

Modern Perspective

Red eyes are known by various names, including bloodshot eyes, scleral injection, and conjunctival injection. The primary cause of eye redness is usually the swelling or dilation of blood vessels. As a result, the surface of the eye appears red or bloodshot

Table 1: Causes of Red eye according to modern concept.

Adnexa/lids	Conjunctiva	Sclera and Cornea	Other Conditions
Blepharitis	Hyperaemia	Sclera:	Trauma
Floppy eyelid syndrome	Conjunctivitis	Episcleritis	Postoperative
Trichiasis,	Ophthalmia neonatorum	Scleritis	Dry eye syndrome

		Cornea	Endophthalmitis
Distichiasis	Subconjunctival haemorrhage	Infections or inflammatory keratitis	Anterior uveitis/iritis
Meibomitis, styte,	Pinguicula	Contact lens-related problems	Pharmacologic (prostaglandin analogues)
Canaliculitis	Superior limbic keratoconjunctivitis	Corneal FB	Angle-closure Glaucoma
Dacryocystitis	Giant papillary conjunctivitis	Recurrent corneal erosion	Carotid-cavernous fistula (corkscrew conjunctival vessels)
Lagophthalmos	Conjunctival FB	Pterygium	Cluster headache
Acne rosacea	Symblepharon etc	Neurotrophic keratopathy	Orbital cellulitis vs pre-septal cellulitis
Entropion or ectropion		Medicamentosa	
Sub-tarsal foreign body		Ultraviolet or chemical burn	

Table 2: Red eye classification according to Discharge and Pain

With Discharge	Without Discharge	
	Pain	Minimal or No Pain
<p>More common:</p> <p>Conjunctivitis, ophthalmia neonatorum, blepharitis</p> <p>Less common:</p> <p>Ac. allergic reaction, dacryocystitis, canaliculitis.</p>	<p>Typically, mild to moderate:</p> <p>Dry-eye syndrome, blepharitis, pingueculitis, inflamed pterygium, FB (corneal or conjunctival),</p> <p>corneal disorders (superficial punctate keratitis etc.), episcleritis, etc.</p> <p>Typically moderate to severe:</p>	<p>More common:</p> <p>Sub-conjunctival haemorrhage injected pterygium/pingueculum, blepharitis, dry-eye syndrome. Contact lens complications</p> <p>Less common:</p> <p>Conj. tumour</p>

	Corneal disorders (abrasion, erosion, infiltrate/ulcer), anterior uveitis, scleritis, acute angle closure glaucoma	
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Table 3: Differential diagnosis according to diseases

		Conjunctiva	Pupil	Cornea	Ant. chamber	IOP
1.	Subconjunctival Haemorrhage	Bright red	Normal	Normal	Normal	Normal
2.	Conjunctivitis	Injected vessels, fornices, Discharge	Normal	Normal	Normal	Normal
3.	Iritis	Injected around Cornea	Small, fixed, irregular	Normal KP's	Turgid, deep	Normal
4.	Acute Glaucoma	Entire eye red	Fixed, dilated, oval	Hazy	Shallow	High

Red eye due to trauma

- Subconjunctival haemorrhage.
- Corneal trauma - abrasion/laceration/edema
- Scleral rupture/laceration.
- Hyphema.
- Vitreous haemorrhage.
- Retinal tear/detachment.

DISCUSSION

In Ayurveda, the health of the eyes is closely related to the balance of the *Doshas (Vata, Pitta, Kapha)* and the state of Rakta (blood). Any imbalance can lead to various ocular conditions.

1. *Vata* Imbalance: Associated with dryness, strain, and nerve-related issues in the eyes. Conditions

like acute angle closure glaucoma and corneal ulcer may have *Vata* involvement due to the severe pain they cause.

2. *Pitta* Imbalance: Primarily linked to inflammation and redness. Conditions like conjunctivitis, scleritis, and iridocyclitis often involve *Pitta* due to the heat and inflammation they exhibit.
3. *Kapha* Imbalance: Can lead to congestion and fluid accumulation, although less frequently a primary cause in severe conditions, it may contribute to the watery discharge seen in viral conjunctivitis.
4. *Rakta Dushti*: Involvement of the blood, leading to conditions where there is significant inflammation, redness, and possible bleeding, such as scleritis and sub conjunctival haemorrhage.

Modern and Ayurvedic Co-relation

	Ayurvedic	Modern
1.	<i>Arma</i>	Pterygium
2.	<i>Arjuna</i>	Sub-Conjunctival haemorrhage
3.	<i>Shirajaala</i>	Scleritis and Episcleritis
4.	<i>Shira pidika</i>	Deep Scleritis or Phlyctenular conjunctivitis
5.	<i>Svarna shukr</i>	Corneal Ulcer
6.	<i>Ajkajata</i>	Adherent Leucoma /Ant. Staphyloma
7.	<i>Rakta Abhishyanda</i>	Conjunctivitis (Bacterial and Viral)
8.	<i>Pitta and Rakta Ahimantha</i>	Acute Angle Closure Glaucoma
9.	<i>Shopha yukta Akshipaka</i>	Endophthalmitis/panophthalmitis
10.	<i>Amladhyushita</i>	Chemosis
11.	<i>Shiro-utpata</i>	Scleritis
12.	<i>Nayana Abhighata</i>	Trauma to eye

Key findings include:

- Ayurvedic Diagnoses and Modern Equivalents: Conditions such as *Lohita Arma* and *Rakta Abhishyanda* show direct parallels to modern conjunctivitis and scleritis, highlighting the importance of recognizing traditional classifications in contemporary practice.
- Holistic Treatment Approaches: Ayurvedic therapies emphasize the use of herbal remedies, dietary modifications, and lifestyle interventions that can mitigate symptoms and restore balance. This is particularly beneficial for patients seeking natural treatment options alongside conventional therapies.
- Enhanced Understanding of Ocular Health: By examining the interplay between dosha imbalances and specific eye conditions, healthcare practitioners can develop more personalized treatment plans that address both the physical symptoms and the underlying imbalances in the patient's constitution.

CONCLUSION

The integration of Ayurvedic insights with modern medical understanding of red eye conditions provides a comprehensive framework for diagnosis and treatment. The identification of specific Ayurvedic terms correlating with modern conditions enhances the clinician's ability to approach ocular health from multiple angles. In conclusion, this discussion reinforces the importance of a holistic approach in managing red eye conditions, advocating for the integration of Ayurvedic wisdom into modern medical practice to enhance patient care and outcomes.

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