



ISSN 2456-3110

Vol 9 · Issue 6

June 2024

Journal of
**Ayurveda and Integrated
Medical Sciences**

www.jaims.in

JAIMS

An International Journal for Researches in Ayurveda and Allied Sciences



Maharshi Charaka
Ayurveda

Indexed

Understanding Corneal Opacity in *Ayurveda* perspectives

Pramila¹, Pratima Paudel², Shamsa Fiaz³

¹Post Graduate Scholar, Dept. of Shalaky Tantra, National Institute of Ayurveda, Deemed to be University, Jaipur, Rajasthan, India.

²Assistant Professor, Dept. of Shalaky Tantra, Patanjali Ayurveda Medical College and Research Centre, Dhulikhel, Nepal.

³Professor & HOD, Dept. of Shalaky Tantra, National Institute of Ayurveda, Deemed to be University, Jaipur, Rajasthan, India.

ABSTRACT

The cornea, also known as the *Krishna Mandala* in *Ayurveda*, is the transparent anterior one-sixth outer fibrous layer of the eyeball that resembles a watch glass. Corneal opacity is categorized as nebula, macula, or leucoma based on density. When a dense opacity covers the pupillary portion of the cornea, it can cause loss of vision (blocking the pathway of light rays) or blurred vision (owing to the astigmatic effect). The cornea also serves as a protective barrier, shielding the eye from potential harm such as dirt, germs, and other particles in the surrounding environment. Due to its direct exposure to the external environment, it is susceptible to infections. The transparency of the cornea is maintained by a number of factors, and any change in them affects the cornea by making it opaque. *Ayurveda* describes four types of corneal diseases under the heading of *Krishnagata Rogas*. Among them, *Savrana Shukra* can be correlated to corneal ulcers because of the similarities in their respective explanations. Corneal opacities can be correlated to *Avrana Shukra* based on its symptoms. Information on Corneal opacity was gathered from the *Laghutrayi*, the *Brihatrayi* and its commentaries, and other *Ayurvedic* and modern texts. Corneal opacities and *Avrana Shukra* are closely related. Although vitiated blood is said to be the origin of both of these disorders, *Savrana Shukra* is thought to be incurable while *Avrana Shukra* is said to be treatable. The *Ayurvedic* review of corneal opacity and its potential correlation with *Avrana Shukra Roga* is the primary focus of this paper.

Key words: Cornea, Corneal opacity, *Avrana Shukra*, *Savrana Shukra*

INTRODUCTION

The classical texts of *Ayurveda* have provided the concise explanation about anatomical and physiological aspects of eye before entering into the ocular disease proper. It includes the measurements of the eyeball and its functional units, nomenclature of different coats of eyeball and diseases involving each coats. In addition to this, *Acharya Sushruta* and *Vagbhata* have also given the precise explanation of

shape, size, structure, component and functional aspect of *Dristi Mandala* which represents the various parts of eye comprising the visual pathway. The cornea, also known as the *Krishna Mandala* in *Ayurveda*, the size of which is one third of *Netra Ayaama*^[1] (total circumference of eye) is the transparent anterior one-sixth outer fibrous layer of the eyeball that resembles a watch glass on the wrist. With reference to the diameter of *Krishna Mandala*, the diameter of the *Dristi Mandala* is mentioned as $1/7^{\text{th}}$ of *Krishna Mandala*^[2] Various factors; systemic or local contribute to corneal disorders, leading to loss of transparency and consecutively blurring or loss of vision. In classical *Ayurvedic* texts, the classifications of corneal diseases are presented as sequential and progressive, where one condition advances to the next stage. *Acharya Sushruta* mentioned 4 types of corneal diseases (*Krishnagata Roga* out of 76 total *Netra Roga*),^[3] while *Vagbhata* listed 5 types (out of 94 total *Netra Roga*).^[4]

Corneal diseases, resulting in blindness, rank fourth among the major causes of blindness in India according

Address for correspondence:

Dr. Pramila

Post Graduate Scholar, Dept. of Shalaky Tantra, National Institute of Ayurveda, Deemed to be University, Jaipur, Rajasthan, India.

E-mail: drpramilamahala03@gmail.com

Submission Date: 11/04/2024 Accepted Date: 23/05/2024

Access this article online

Quick Response Code



Website: www.jaims.in

DOI: 10.21760/jaims.9.6.37

to the NPCB. Globally, corneal vision loss is identified as the leading cause of blindness by the WHO.^[5] Corneal diseases are divided into four basic categories: 1) Ulcerative diseases 2) Non – Ulcerative diseases 3) Disorders of Corneal Degenerations 4) Disorders of Corneal dystrophy. Corneal disorders can be correlated with *Ayurvedic* diseases such as *Savrana Shukra*, *Akshi Pakatyaya* to Ulcerative Keratitis; *Ajakajata* and *Siraja Shukra* to complications of Ulcerative Keratitis; and *Avrana Shukra* to non-ulcerative or Corneal Opacity. Acharya Sushruta states that *Avrana Shukra* can be as a consequence of *Abhishyanda* (Conjunctivitis), leading to a white spot developing in the cornea. This spot looks like a white cloud in the sky and is associated with no or minimum pain and lacrimation. *Acharya Sushruta* says that normally *Avrana Shukra* is curable yet the prognosis varies depending upon the depth, density and duration of onset. This ailment is difficult to cure when it is dense, indurated, and chronic.^[6] The primary focus of this paper is on the conceptualization of corneal opacity and its potential association with *Avrana Shukra*.

MATERIALS AND METHODS

Information about *Avrana Shukra Roga* and Corneal Opacity was taken from *Ayurvedic* literature, their commentaries, and textbooks of modern ophthalmology, in that order. The Google Scholar and PubMed databases were employed to assess previously published works in this field. Relevant information on specific topics has been collected from both indexed and non-indexed medical journals. The search strategy involved using keywords such as *Avrana Shukra* or *Krishangata Rogas*, as well as *Avarna Shukra* and *Krishanagata Rogas*, with a specific focus on *Ayurveda*.

RESULTS

Corneal opacity

Taken all the parts of visual pathway being healthy anatomically and functionally, cornea needs to be perfectly transparent for clear vision. Various factors are responsible for transparency of cornea including its avascularity, state of relative dehydration,

arrangement of stromal fibres, etc. Thus, any pathological changes like corneal edema, neovascularization, ulcer, scar or degenerative and dystrophic changes lead to loss of corneal transparency. Reduced vision in these cases can result from distorted images or scattering of light rays. Everything that has the potential to leave a scar can induce corneal opacities. Infections and eye injuries are the most frequent causes. One of the main causes of visual loss is corneal opacity. Corneal opacity can either be congenital (sclerocornea, tears in descemet's membrane, ulcer, peter's anomaly, endothelial dystrophy or dermoids) or acquired (due to trauma, infections, raised intraocular pressure). The main factors influencing healing of corneal opacity depends on pathophysiologic processes which had caused the opacity following injury and the depth of corneal damage.^[7]

Some risk factors for corneal opacity include:^[8]

- Vitamin A deficiency
- Measles - when measles results in scarring/infection of the eye
- Eye injury, from physical or chemical sources
- Herpes simplex virus - which can be transmitted to the eyes
- Other infections, including conjunctivitis
- Wearing contact lenses for a long period of time, especially overnight
- Keratoconus
- Stevens-Johnson syndrome
- Congenital corneal abnormalities

Krishnagata Roga

The assortment of corneal diseases in classical *Ayurvedic* texts follows a sequential and progressive pattern, where one condition advances to the next corresponding stage. *Acharya Sushruta* identified four types of corneal diseases, while *Vagbhata* enumerated five types. *Savrana Shukra* can be considered as the ulcerative condition of cornea which is present as circular, depressed corneal ulcer associated with

excessive discharge and pain.^[9] *Akshipakatyaya* is where the vitiated *Dosha* encroach to entire *Krishna Mandala* after affecting *Shukla Mandala* and as a consequence of *Akshikopa* (conjunctivitis and other inflammatory conditions)- fulminant keratitis.^[10] *Ajakajata* is the condition where *Krishna Mandala* appears like fecal matter of goat associated with severe pain, congestion and excessive discharge from eye, nearly perforating the *Krishna Mandala*- anterior staphyloma due to thinning of cornea.^[11] *Acharya Vagbhata* has added *Sirashukra* where *Krishna Mandala* is covered with multiple vessels associated with pain, lacrimation on and off of different character.^[12]

Avrana Shukra manifests in the cornea due to untreated *Abhisyanda* or sequela or due to any other causes, resulting in the appearance of whiteness in the black part of the eyes resembling cloud in the sky or conch shell. This condition is characterized by lack of eye pain or tearing in its early stages, and is easily treatable but when it becomes chronic and is situated in the deeper layers of the cornea, specifically the second and third layers it is considered to be *Asadhya*. *Avrana Shukra* is deemed challenging in the course of treatment. *Acharya Sushruta* has identified two categories of *Avrana Shukra*, namely *Achhaghana Anukari Shukra* (found in the superficial section of cornea) and *Bahala Shukra* (found in *Gambhir*, which is deeply placed and *Chirakari* i.e., of chronic onset).^[13]

The benign corneal ulceration resembles a white *Shankha* (Conch shell), with *Kapha Dosha* and minimal to no pain. Another well-known scholar, *Madhava*, detailed the characteristics of a benign corneal ulceration in his epic *Madhava Nidana*. He describes it as thin white clouds and shells, moons, and white lotuses. This condition is considered curable both by *Sushruta* and *Vagbhata*.^[14,15] While *Acharya Madhavakara* has detailed about the prognosis based upon the layer of *Krishnamandala* involved.^[16]

Signs and Symptoms^[17]

- *Sitam Yadaa Bhati Asita Pradeshe* - whiteness of the black of the eye i.e., cornea

- *Syandatmakam* - associated with *Abhisyanda*. Or secondary to different conditions of eye where main feature was oozing or discharge. (*Syanda* means flowing or oozing)
- *Na Ati Rujam* - no severe pain
- *Na Ati Ashru Yutam* - no excessive discharge of tears from the eye
- *Vihaya Siva Accha Ghana Anukari* - Resemble a white cloud in the sky.
- *Tad Avranam Sadhyatamam Vadanti* - This illness is of the *Avrana Shukla* variety, and it can be treatable.

Note: *Vagbhata* has not mentioned about *Abhisyanda* but says due to vitiated *Kapha* whitish colour appears over the *Krishna Mandala*.^[18]

Prognosis

Generally, *Avrana Shukra* is curable, particularly if it only affects the outer layer of the eye. However, it is believed to be more challenging to treat when it meets the following criteria:^[19]

- When it is located in the second and third layers of the eye
- When it is thicker in size
- When it has become chronic
- In addition to this, *Acharya Madhavakara* mentions few more conditions like;^[20]
- Where the periphery is elevated and centrally depressed
- With presence of new vessels
- Thick enough to obscure the vision completely

DISCUSSION

The cornea is more important in refraction since it is the eye's primary refractive medium. Non-ulcerative causes of corneal opacity can be infective and inflammatory conditions like conjunctivitis and uveitis or congenital conditions like endothelial dystrophies and degenerations or ecstasic conditions like keratoconus. The superficial opacities revert back after

treating the cause but for the deeper ones, corneal graft either lamellar or penetrating keratoplasty is required. Similarly, while describing the prognosis of *Avrana Shukra* the involvements of various layers of *Krishna Mandala* are mentioned starting from *Prathama Patala* to *Tritiya Patala*. It involves the *Krishna Mandala* and progresses to intricate white spots or patches, either solitary or many, stationary or scattered. According to *Sushruta* and *Madhavakara*, *Avrana Shukra* is secondary to *Abhisyananda* while due to vitiated *Kapha* according to *Vagbhata*. This means corneal opacity is most of the time secondary to different infective and inflammatory conditions of cornea but not compulsorily. In fact, corneal opacity can be due to corneal degeneration and dystrophy or ecstacy. If the opacity only involves the outer layer, i.e. outer *Tvak/Patala*, is of recent onset then it is easily curable. Based on how dense the opacity is, it is mentioned if it is *Bahala* (thick or dense), then it is difficult to treat. Here, opacity being dense means, it has involved the corneal stroma and beneath, i.e., the leucomatous opacity or where the details of iris is obscured. Even in conventional science, once the opacity has involved stroma, it forms a scar and does not heal. The features added by Acharva Madhavakara, point towards corneal opacity secondary to keratoconus- *Vichhinna Madhya Pishitavrita* i.e., depressed at the centre and elevated periphery or towards neovascularization - *Sirasakta*. In case of keratoconus with corneal opacity only possible option is keratoplasty. Similarly, the vessels formed over cornea turn into ghost vessels and leave some traces of opacity behind. Therefore, these conditions are also considered as incurable conditions of corneal opacity. Visual disturbance is not explained directly as the feature of any *Krishna Mandalagata Roga*, but while explaining the prognosis, it is mentioned that if the *Shukra* is *Adristikrit*; i.e., obscuring vision then it is incurable. Otherwise, since cornea is the refractive media, it is obvious that any compromise to its transparency affects the vision based on the density.

CONCLUSION

Abhisyananda and other external conditions give rise to white opacities on the *Krishna Mandala*, also known as

Avrana Shukra or *Shuddha Shukla*. *Alpa Vedana* and *Ashrusrava* are its distinguishing features. Because *Lakshnas*, *Samprapti*, and the stages of the disease are similar, it can be linked to corneal opacity. Importantly, although both Ayurvedic and medical science have their own methods for treating corneal opacity or *Avrana Shukra*, the only thing separating them is how drugs are administered in the past and now. Further research is needed to determine whether giving the patient both sorts of medications would improve the outcome based on his *Prakruti* and chronicity.

REFERENCES

1. Shastri Ambikadutta, Sushruta Samhita of Sushruta, Edited with Ayurveda tattva sandipika hindi commentary, Uttar Tantra, Chapter no- 1/13, Chaukhambha Sanskrit Sansthan, Varanasi, Reprint 2016, Part-2, P. No.7
2. Shastri Ambikadutta, Sushruta Samhita of Sushruta, Edited with Ayurveda tattva sandipika hindi commentary, Uttar Tantra, Chapter no- 1/13, Chaukhambha Sanskrit Sansthan, Varanasi, Reprint 2016, Part-2, P. No.7
3. Shastri Ambikadutta, Sushruta Samhita of Sushruta, Edited with Ayurveda tattva sandipika hindi commentary, Uttar Tantra, Chapter no- 1/44, Chaukhambha Sanskrit Sansthan, Varanasi, Reprint 2016, Part-2, P. No.17
4. Brahmanand Tripathi, Astanga Hridayam of Vagbhata, Uttara Sthana Chapter no.- 10/22-28, Edited with Nirmala Hindi Commentary, Chaukhambha Sanskrit Pratishthan, Delhi, Edition: Reprint, 2019, P.No.- 951.
5. Gupta, N., Tandon, R., Gupta, S. K., Sreenivas, V., & Vashist, P. (2013). Burden of corneal blindness in India. Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine, 38(4), 198–206. <https://doi.org/10.4103/0970-0218.120153>
6. Shastri Ambikadutta, Sushruta Samhita of Sushruta, Edited with Ayurveda tattva sandipika hindi commentary, Uttar Tantra, Chapter no- 5/8, Chaukhambha Sanskrit Sansthan, Varanasi, Reprint 2016, Part-2, P. No.32.
7. Whitcher JP, Srinivasan M, Upadhyay MP. Corneal blindness: a global perspective. Bull World Health Organ. 2001; 79: 214–221.
8. <https://uvahealth.com/services/eye-care/corneal-opacity>
9. Shastri Ambikadutta, Sushruta Samhita of Sushruta, Edited with Ayurveda tattva sandipika hindi commentary, Uttar Tantra, Chapter no- 5/4, Chaukhambha Sanskrit Sansthan, Varanasi, Reprint 2016, Part-2, P. No.29

10. Shastri Ambikadutta, Sushruta Samhita of Sushruta, Edited with Ayurveda tattva sandipika hindi commentary, Uttar Tantra, Chapter no- 5/9, Chaukhambha Sanskrit Sansthan, Varanasi, Reprint 2016, Part-2, P. No.32.
11. Shastri Ambikadutta, Sushruta Samhita of Sushruta, Edited with Ayurveda tattva sandipika hindi commentary, Uttar Tantra, Chapter no- 5/10, Chaukhambha Sanskrit Sansthan, Varanasi, Reprint 2016, Part-2, P. No.32.
12. Brahmanand Tripathi, Astanga Hridayam of Vagbhata, Uttara Sthana Chapter no.- 10/27, Edited with Nirmala Hindi Commentary, Chaukhambha Sanskrit Pratishthan, Delhi, Edition: Reprint, 2019, P.No.- 950-51
13. Shastri Ambikadutta, Sushruta Samhita of Sushruta, Edited with Ayurveda tattva sandipika hindi commentary, Uttar Tantra, Chapter no- 5/8, Chaukhambha Sanskrit Sansthan, Varanasi, Reprint 2016, Part-2, P. No.32.
14. Kaviraj Atridev Gupta, Ashtang Sangraha, Uttartantra 13/26 by Vagbhata, Varanasi, Choukhamba Krishandas Academy, 2005, P-234.
15. Vaidya Yadavji Trikamji and Narayan Ram Acharya, Sushruta Samhita Uttartantra 5/8, By Sushruta with Nibandhasnagraha Commentry of Shri Dalhanacharya, Varanasi, Choukhamba Surbharti Prakashan, 2012, P-602.
16. Madhav Nidanam of Shri Madhavakara, Madhukosha Sanskrit Commentary by Shrivijayarakshita and Shrikanthadatta with The Vidyotini hindi commentary and notes by Sri Sudarsana sashtri, revised & edited by prof. Yadunandana Upadhyaya, part II, Chapter 59/25, reprint edition, 2014. chaukhambha Prakashan, Varanasi, p.no.333-34.
17. Shastri Ambikadutta, Sushruta Samhita of Sushruta, Edited with Ayurveda tattva sandipika hindi commentary, Uttar Tantra, Chapter no- 5/8, Chaukhambha Sanskrit Sansthan, Varanasi, Reprint 2016, Part-2, P. No.32.
18. Brahmanand Tripathi, Astanga Hridayam of Vagbhata, Uttara Sthana Chapter no.- 10/25, Edited with Nirmala Hindi Commentary, Chaukhambha Sanskrit Pratishthan, Delhi, Edition: Reprint, 2019, P.No.- 950.
19. Shastri Ambikadutta, Sushruta Samhita of Sushruta, Edited with Ayurveda tattva sandipika hindi commentary, Uttar Tantra, Chapter no- 5/8, Chaukhambha Sanskrit Sansthan, Varanasi, Reprint 2016, Part-2, P. No.32.
20. Madhav Nidanam of Shri Madhavakara, Madhukosha Sanskrit Commentary by Shrivijayarakshita and Shrikanthadatta with The Vidyotini hindi commentary and notes by Sri Sudarsana sashtri, revised & edited by prof. Yadunandana Upadhyaya, part II, Chapter 59/25, reprint edition, 2014. chaukhambha Prakashan, Varanasi, p.no.333-34

How to cite this article: Pramila, Pratima Paudel, Shamsa Fiaz. Understanding Corneal Opacity in Ayurveda perspectives. J Ayurveda Integr Med Sci 2024;6:236-240.

<http://dx.doi.org/10.21760/jaims.9.6.37>

Source of Support: Nil, **Conflict of Interest:** None declared.
