



ISSN 2456-3110

Vol 2 · Issue 5

Sep-Oct 2017

Journal of
**Ayurveda and Integrated
Medical Sciences**

www.jaims.in

JAIMS



Charaka
Publications

Indexed

A Scientific Metaphorical Study of *Savrana Shukla* to corneal ulcer with special reference to *Keratitis* of Infective origin

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ABSTRACT

Cornea being most anterior part of the eyeball, contributes 65-75 percent of the eyes total focusing power. Since Cornea acts as barrier against dirt, germs and other particles that can harm the eye they are prone to get infected easily as it comes in direct contact with external environment. In any inflammatory pathology in cornea affecting the deeper layers will give a permanent scar or removal of globe when complications occurs. Our *Acharyas* have narrated such conditions under *Krishna Mandala Rogas* with management, which helps to avoid complications and recurrences. The explanation of the diseases along with treatment principles are similar in the Modern Ophthalmology even today. Among the vast classification of inflammatory conditions of cornea, the primary type is mainly due to various type of infection. Thus in this area of topic *Savrana Sukra* in correlation to Inflammatory conditions of Cornea will be confined, aiming for the Ayurveda understanding, review of management principles which can be an effective and safer approach to the conditions which are sight threatening, non-healing and high recurrent rates.

Key words: *Krishna Mandala, Sukra, Vrana, Keratitis, Ulcer.*

INTRODUCTION

Diseases of cornea leading to blindness is 4th among the list of major causes of blindness in India as per NPCB. In the world corneal vision loss is the 1st cause for blindness as per WHO. At present there are about 6.8 million people in India whose vision is less than 6/60 and expected to increase.^[1] Any infectious

inflammatory pathology in cornea affecting the deeper layers will give a permanent scar or removal of globe when a complication occurs. Our *Acharyas* have narrated such conditions under *Krishna Mandala Rogas* with management, which helps to avoid complications and recurrences.^[2] The explanation of the diseases along with treatment principles are similar in the Modern Ophthalmology even today.

Understanding *Savrana Sukra* in Compendia

Savrana Sukra is one among 4 types of *Krishnagata Rogas* according to *Sushruta* and 5 types according to *Vagbhata*. *Acharya Vagbhata* has termed this as *Kshata Shukla*. The main causative *Doshas* are *Rakta (Su)*, *Pitta (Va)* and this condition is said to be *Asadhya*.

Sanskrit word *Savrana Sukra* means an ulcer of white colour.

- The word *Kshata* mean discontinuity.
- Causative *Doshas*: *Rakta (Su)*, *Pitta (Va)*.^{[3],[4]}

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Submission Date : 07/10/2017 Accepted Date: 28/10/2017

Access this article online

Quick Response Code



Website: www.jaims.in

DOI: 10.21760/jaims.v2i05.10258

OBJECTIVES

1. To establish the clinical correlation between *Savranasukra* explained under *Krishnagata Rogas* to corneal ulcer explained under inflammatory conditions of Cornea, specific to ineffective origin.
2. Ayurveda understanding, review of management principles which can be an effective and safer approach to the conditions which are sight threatening, non-healing and high recurrent rates which has simulation in compendia even at present.

METHODOLOGY

Extensive literary review of various texts of Ayurveda was done in order to carve out a possible comparison of *Savranasukra* with corneal ulcer of infective origin with modern counterpart. During this endeavor a seminar as a departmental activity on the same and review of other articles was also done, so that with a through discussion to a finesse correlation can be explored in order to attain a compatible behavior of these comparisons can be elucidated.

DISCUSSION**Congruence features of Krishna Mandala and Cornea**

While describing about *Mandalas*, *Acharyas* have explained *Krishna Mandala* which holds the 1/3rd among *Netra Ayama*^[5] and 1/7th of *Krishna Mandala* is *Taraka*. The possible correlation for *Taraka* can be Pupil and whole *Krishna Mandala* can be Cornea with Iris considering the dimensions.

Simultaneous pathology is always appreciated between Cornea and Iris, especially in extensive corneal diseases due to common nerve innervation, sharing qualities of nutrients through aqueous humor. This concept is well appreciated in modern ophthalmology.

Branches of the long ciliary nerve supplying the cornea contains one of the highest concentration of sensory nerve endings^[6] in the body and our *Acharyas* have emphasized *Krishna Mandala* is predominant of *Vata*.

Congruence features of 3 Patalas of Krishna Mandala and corneal layers

The *Patalas* wise clinical features of *Savranasukra* explained by *Vagbhata* prove to be reasonable with features of layer wise pathology where *Prathamapatala* can be considered to be Epithelium and Bowman's membrane, *Dwiteeyapatala* to Stroma and *Tritiyapatala* to Descemet's membrane and Endothelium.

Congruence features of Nidana of Savrana Sukra and aetiology of corneal ulcers

Cornea being exposed to air and dust always have a tendency to develop infection, some of which are also considered in *Ayurveda* under causative factors in general for Eye diseases. Even minor injuries which damages epithelium, dry up the tear film can also contribute as predisposing factors. Some of the important clinical features which can be emphasized are;

1. *Abhighaathaja* (Minor Trauma)
2. *Keetamakshika Sparshadibhi* (Invasion of bacterial, viral and protozoal organisms)
3. *Vata-rajo-dhooma Nishevanat* (Injury by vegetative material such as crop leaf, branch of a tree, decaying vegetative matter)
4. *Abhishyandha* (Conjunctivitis leading to Keratitis)
5. *Vyalakrutha* (Injury by Animal tail)
6. *Salilakridat* (Exposure to contaminated water like cleaning in tap water, using unhygienic hands)

Any factors that leads to corneal abrasion, microbes can adhere, clone and invade stromal lamellae and release toxins. It can be clearly established that our *Acharyas* were aware of risk factors of Corneal ulcer which are evident even today.

Congruence features of Savrana Sukra Lakshanas and clinical features of corneal ulcers of infective origin in common

1. *Nimagnaroopa* on *Krishnamanadala* - Saucer shaped deformity of ulcer as explained in bacterial origin.

2. *Suchyevaviddam* - Punctate epithelial erosions as seen in viral ulcers
3. *Ushnasrava* - Discharge
4. *Teevrraruk* - Acute pain
5. *Toda* (Pricking sensation)
6. *Raga* (conjunctival congestion)
7. *Pakwajambunibham*^[7] (severely congested eye / Ciliary congestion)

Painful red eye, photophobia, continuous discharge are the cardinal symptoms of corneal involvement of inflammatory process which are clearly defined by our ancient seers.

Congruence features of *Sadhya Lakshanas* and corneal ulcers of good prognosis

1. *Drishtisameepenabhavethu* - Ulceration away from central part of cornea viz. peripheral ulcer
2. *Na Cha Avaghadam* - Superficial ulcer (involving only the epithelial layer of cornea)
3. *Na Samsravedh* - Non discharging ulcer (Absence of secondary infection)
4. *Avedana* - Painless Ulcer
5. *Na Cha Yugma Sukram*^[8]- Solitary ulcer

Acharyas have described good prognosis of *Savranas Shukra* on the basis of location, type of ulcers, number of ulcers, and symptoms. The similar features are considered to be healing stage of ulcer without opacity as only epithelial layer are involved.

Congruence features of *Asadhya Lakshanas* and complications

1. *Vicchinnamadaya* - Perforation Of Corneal Ulcer, Corneal Fistula
2. *Pishitavruta* - Iris Polapse, Anterior Staphyloma, covered with granulation tissues
3. *Chala* - Toxic Iridocyclitis
4. *Sirasakta* - Neovascularization
5. *Lohitamantatascha* - Hemorrhage /hyphema
6. *Drushtikruchhra* - Centrally located

7. *Dvitwakgata* - Involvement of more layers
8. *Chirottitam* - Chronic
9. *Ushnashru* - Copious warm discharge
10. *Pidaka*^[9]- Descemetocoele, Phthisisbulbi

When the above said *Asadhya Lakshanas* are established it is labelled as incurable as it may lead to dense corneal opacity or other complicated conditions involving the structures of posterior segment finally resulting in Keratoplasty and Enucleation respectively.

The *Asadhya Lakshanas* explained are very well described in the texts of compendia which a corneal ulcer is complicated when they have the properties such as Central corneal perforation as the optical zone is hampered and disturbs vision, ulceration covered with granulation tissue as *Pishitavrutam*. Patients presenting with copious warm discharge is a sign of corneal abscess. There will be complete loss of vision in perforated corneal ulcers and toxic intra ocular contents. In the chronic history of corneal ulcers the ulcer can penetrate deep leading to perforation and toxic iridocyclitis. The sign *Sirasakta* can be understood as neovascularization seen in chronic corneal ulcer along with continuous discharge and *Lohitamantatascha* as intraocular haemorrhage / hyphaema when the complete ocular contents are involved.

Congruence features of *Chikitsasutra* explained in *Ayurveda* and treatment principles in allied science^[10-12]

1. *Gharshana* - (*Lekhanaanjana, Vaivarnaya Nashaka Anjana*). Removal of the epithelium (scraping of epithelium) is done in most the lesion of cornea preferably in fungal and viral keratitis which enhances penetration. Similarly a superficial keratectomy may help in de-bulk the lesion.
2. *Kriyakalpa* procedure (*Tarpana, Putapaka, Bidalaka, Sechanam, Aschyotana, Siravyadha, Jaloukaavacharana*) - Topical treatment (Antibiotic eye drops, Eye bandaging)

3. *Abhyantara Chikitsa* - (*Grithapana, Kashayas, Churna and Vati*), Oral antivirals, Anti bacterials, Anti fungals, Analgesics, along with combination of Systemic steroids.

The Ayurvedic treatments explained in different texts when analyzed are meant for minimization of *Shotha* (oedema), relieve *Shoola* (pain) and *Gharsha* (discomfort), reduce *Raga* (congestion), debridement, promote *Ropana* (epithelialisation). To benefit the patient a thorough understanding of *Nidana, Samprapti*, internal and external treatment with the probable objectives are indispensable. The successful treatment for recurrent and chronic inflammatory conditions can be achieved through suitable application of *Shodhana, Shamana* and *Kriyakalpas*. *Kriyakalpas* - the special set of *Sthanika Chikitsa* mentioned in our science definitely be able to reduce the squeal of the disease and complications.

CONCLUSION

Many congruent features can be justified between *Krishna Mandala* and Cornea, inflammatory disorders of Cornea of infection origin to *Savrana Shukra*. *Acharyas* have clearly explained the *Lakshanas* and *Chikitsa* of *Savrana Rogas* which are very apt to understand the different types of ulcerative keratitis due to infection existing at present. The cascade of complications has close proximity with Ayurvedic opinion of the diseases as a paradigm inference. The overall description available in Ayurvedic literature of *Savrana Sukra* can be systematically correlated with complicated corneal ulcer as per as outlined supra. The progression of the disease is rapid and hence requires immediate attention as explained by both the sciences. Many entities are such that the recurrence rates are very high in spite of treatment or will be non-responsive and ends up in therapeutic indication of Keratoplasty. In such diseases where immunity is aetiological factor, our science definitely has an upper hand in treatment. The successful treatment for recurrent and chronic inflammatory conditions can be achieved through suitable application of *Shodhana, Shamana* and *Kriyakalpas*.

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How to cite this article: Padmavathi Rathod, Nithyashree CT, Mamatha KV, Sujathamma K. A Scientific Metaphorical Study of Savrana Shukla to corneal ulcer with special reference to Keratitis of Infective origin. J Ayurveda Integr Med Sci 2017;5:77-81.

<http://dx.doi.org/10.21760/jaims.v2i05.10258>

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