A study on literature review of dry eye syndrome in *Ayurveda* w. s. r. to *Shushkakshipaka*

Nidhi Pandya^{*1}, Nutan Radaye²

P. G. Scholar^{*1}, Professor HOD and Guide²

Dept. of Shalakya Tantra and Netra Rog, G. D. Pol foundation' s

YMT Ayurved College, Kharghar, Navi Mumabai, Maharashtra

*Corresponding author: nppandya93@gmail.com

Abstract:

Dry eye is a common ocular disease with a wide variety of symptoms due to multi-factorial and elusive etiology. With a global prevalence ranging from 20 to 50%, dry eye disease (DED) is a significantly growing health problem worldwide. When symptoms of dry eye are analyzed, the disease that have striking similarity to dry eye, is *Shushkakshipaka* described by *Acharyas Vagbhata* and *Sushruta* in *Sarvagat Netraroga*. The commonest ocular symptoms are feeling of dryness, grittiness, foreign body sensation, itching, redness, photophobia, burning and pricking pain which gradually worsen over the course of day. Stringy discharge, transient blurring vision and crusting of lids are also common. Eventually symptoms worsen the condition of ocular surface and causes erosion and inflammation of lids, conjunctiva and

cornea. Symptoms are timely relieved with the help of lubricating eye drops. In Ayurveda local treatment therapies like *Ashchyotan*, *Parishek*, *Tarpan* etc are performed. If not treated timely, there may be vision threatening complications, epithelial breakdown, ulceration, bacterial keratitis, trichiasis, keratinization, symblepheron, corneal perforation and melting. In recent times focus on treating the underlying cause of dry eye instead of conventional local treatments for symptomatic relief is highly considered by researchers studying *xero-dacryology*. In light of above knowledge, the present article focuses on evaluation of risk factors contributing to dry eye, pathophysiology and management of dry eye syndrome in terms of ayurveda.

Keywords: Dry eye syndrome, *Shushkakshipaka*, *Netraroga*, *xerodacryology*

Introduction

Dry eye is one of the most frequently encountered ocular morbidities encountered by ophthalmologists which are many times missed. With a global prevalence ranging from 20 to 50%, dry eye disease (DED) is a significantly growing health problem worldwide. Dry eye is a cause of discomfort, visual disturbance, pain discomfort and irritation which ultimately results in inability of an individual to perform daily work like reading, driving etc. Latest worldwide accepted definition by a panel of experts in the field at the Tear Film and Ocular Surface Dry Eye Workshop (TFOSDEWS) II in 2017: “Dry eye is a multifactorial disease of the ocular surface characterized by a loss of homeostasis of the tear film, and accompanied by ocular symptoms, in which tear film instability and hyperosmolarity, ocular surface inflammation and damage, and neurosensory abnormalities play etiological roles”.¹ When symptoms of dry eye are analysed, the disease that have striking similarity to dry eye is *Shushkakshipaka* described by *Acharyas Vagbhata* and *Sushruta* in *Sarvagat Netra Roga* (which involves more than one structures of eye during the pathological process). Vitiating of *Vata* and *Pitta Doshas* as prime cause.^{2,3}

The treatment of dry eye syndrome has relied predominantly on artificial tears and lubricants that require frequent instillation as they have short duration of action. This palliative approach generally has been

successful at relieving symptomatically, in rare cases, has slowed the progressive damage to the cornea and conjunctiva that occur over time with dry eye. Nevertheless, these products do not address the underlying disease process and in some cases can be toxic and allergic, worsening the clinical markers of the disease.

When most of the contemporary treatment options available are intended just to relieve local dryness, ayurvedic treatment is designed to relieve *Dosha* vitiation leading to dry eye, thereby treating the disease at its root cause.

Methodology:

Literature research method

A systematic literature review was performed using ancient literature, pubmed databases, Scopus, and articles in two steps irrespective of date and place of published study.

The first step was oriented to articles published for dry eye.

The second step focused on risk factors, correlating factors and etiopathogenic conditions that were found to positively contribute to dry eye and course of disease.

A manual literature search on ocular surface disorders and dry eye from authentic books and journals was also undertaken.

Discussion

Dry eye ayurvedic perspective

Nidana

Dry eye is caused by *Vata* vitiating *Nidanas*. Later on, *Pita* vitiating factors also contribute to the disease pathology. There are two types of *Nidanas* to be considered. One is the general *Vata/Pitta* vitiating factors and *Vishesha Achakshushya Nidanas* that affects *Netra Avayava* specifically.

- *Ushnabhitaptasya Jalapraveshat*: Sudden dipping into or contact with cold water after being exposed in sun for long time interferes with natural cooling mechanism and may cause haemostatic imbalance. It causes vitiation of *Vata* and *Pitta Doshas*.
- *Durekshanat*: Looking at distant objects for long time low blink rate resulting in rapid evaporation of tears. It also causes eye strain and fatigue of eyes. This causes vitiation of *vata Dosh*.
- *Swapnaviparyaya*: Improper sleeping habits such as sleeping at day time and staying awake at night or excessive dreams or nocturnal lagophthalmos may cause eye strain. This causes vitiation of *Vata* and *Pitta Doshas*.
- *Prasaktasanrodanat*: excessive crying causes fatigue of eye structures and lacrimal apparatus. It causes vitiation of *Vata Dosh*.
- *Kopa, Shoka, Klesha*: Socio-pathological factors like anger, depression, stress, etc. results in insufficiency and excessive evaporation of tears. It causes

vitiation of *Vata, Rakta* and *Pitta Doshas*.

- *Abhighatat*: Ocular trauma. It causes vitiation of *Tridoshas*.
- *Atimaithunat*: Excessive sexual indulgence. This causes *Tridosh Dushti* and *Sarva Dhatu Kshaya* resulting in reduced tear production and unstable tear film.
- *Shuktarnalamlakulatthamasha Nishevanat*: Excessive consumption of Alcohol, *Kulattha*, *Masha* and sour food that are *guru* and *ushna*. This results in metabolic imbalance, lack of essential body fluids resulting in low tear production as well as unstable and abnormally formed tear film. This causes *Pitta* and *Rakta* vitiation.
- *Swedadayo*: excessive strenuous work causing excessive sweating resulting in faster evaporation of tears. It causes vitiation of *pitta*.
- *Dhoomnishevanacha*: excessive smoking or *Dhoompan* or exposure to dust, smokes, and sun and chemical fumes.
- *Chardevighatat Vamanatiyogat*: harmful effect of excessive vomiting in any pathology or *Vaman Atiyog*. It causes *Pitta* vitiation.
- *Bashpagrahat*: regression of tears. it causes vitiation of *vata*.
- *Sukshmanirikshanat*: looking at near objects for long period of time may result in low blink rate and rapid evaporation of tears. It also causes eyestrain. It causes vitiation of *Vata*.⁴
- Old age: *Dhatu Kshaya* and *Vata Vriddhi* in senile age can be

considered as a cause of *Shushkakshipaka*.

Modern lifestyle changes like excessive use of led screens, environment, lack of essential nutrition, low immunity, allergies, and systemic diseases also causes vitiation of *Doshas* that may lead to *Shushkakshipaka*.

Samprapti:

In dry eye, as the disease name suggests dryness or *Rukshata* is the basic cause of disease. *Nidanas* mainly *viharas* and environmental factors predominantly cause an increase of *Ruksha Guna* in *Netra*. This *Rukshata* is responsible for vitiation of *Vata*. Since tear film (may be correlated to *Tarpaka Kapha* as provides *Snigdhta* to eye, also nourishes ocular surface) is the most external part of *netra* and is directly exposed to *nidanas*, *Vata* vitiation happens over the ocular surface, which is very evident from the reduced quality of components of tear film, which in turn affects the normal movements of lids especially *unmeelana* (opening) in the beginning. The vitiated *Vata* penetrate deeper *Dhatus* of conjunctiva and cornea so that more inflammatory changes develop *Sarvakshigata Roga Shushkakshipaka*.

Vata Kopa causes *Stabdhata*. Tear film loses its *Snigdha* quality and this affects the movement of *Vartma*, causing *Varthmashabdhata*. For any action or movement there must be a factor responsible for stimulation as well as its transmission and also a factor responsible for performing the act. *Lacrimal Functional Unit* (LFU), is

an integrated system comprising the lacrimal glands, ocular surface (cornea, conjunctiva and meibomian glands) and lids, and the sensory and motor nerves that connect them. Increased *Vata* destabilizes the lacrimal functional unit, this results in reduced tear flow which causes difficulty in the opening and closing of lid.

Secretion of tears is based mainly on reflex component. Reflex occurs in response to corneal and conjunctival stimulation; tear break up and ocular inflammation.

Basal secretion of tears is inadequate and this results in drying of the eye. Meanwhile if a person keeps practicing *Vata Prakopa*, *Ahara* and *Vihara*, *Vata* get vitiated it reaches *Netra* where already the disease pathology is initiated because of local *Dhatu Dushti*. Increased *Ushna* and *Ruksha* qualities of *Nidanas* will initiate *Sthanika Pitta Prakopa* as well. *Vata-Pitta Kopa* will spread to different parts of eye like conjunctiva and cornea and results in a *Sarvakshigata Roga* named *Shushkakshipaka*. The word '*Sushkakshipaka*' means eye wherein *Ashru* has depleted or dried resulting in inflammation of the eye. In other word inflammation in the eye is due to decreased/depleted or dried *Ashru* in the eye. This can be considered as ocular inflammatory stage associated with dry eye. Clinical and basic research suggests that this inflammation plays a role in the pathogenesis of Kerato Conjunctivitis sicca mediated by T-cell lymphocytes. This has been supported by the studies investigating the role of anti-inflammatory therapies. Inflammation in the conjunctiva and

accessory glands is present in 80% of patients with KCS and may be the cause and consequence of dry eye, amplifying and perpetuating disease. *Shushkakshipaka* is a *Vata Pitta* predominant disease according to *Vagbhata* and *Vatika* according to *Susruta*. The symptoms exhibited like *Gharsha*, *Toda*, *Bheda Upadeha* are seen in association with *Prakopa* of *Vata*. Grittiness and dryness common in dry eye *Rookshata* of *Vartma* is a hall mark of *Shushkakshipaka* and feeling of dryness of eye in dry eye patients have also been explained in modern texts. Thus, we can conclude that dry eye syndrome can be called *Shushkakshipaka*. The symptoms of inflammation of KCS correlate to *Abhishyanda* which is a primary cause of *Sarva Akshi Roga* according to *Sushruta*.⁵

Rupa

The commonest ocular symptoms are feeling of dryness, grittiness, foreign body sensation, itching, redness, photophobia, burning and pricking pain which gradually worsen over the course of day. Stringy discharge, transient blurring vision and crusting of lids are also common. In rare cases there may be lack of emotional reflex tearing. The symptoms are frequently exacerbated on exposure to conditions that are associated with increased tear evaporation e.g. In low relative humidity areas like closed air-conditioned rooms, sunny, windy environment or central heating areas; or prolonged reading or video display unit use, when blink frequency is considerably reduced. After studying symptoms of *Shushkakshipaka*

and signs of dry eye we find the following matching criteria.

Signs

Matching criteria of *Shushkakshipaka* and dry eye syndrome

Ayurvedic Sushkakshipaka criteria	Matching criteria of dry eye
<i>Rukshata</i>	Dryness
<i>Vedana</i>	Pain And Discomfort
<i>Gharsha</i>	Foreign Body Sensation
<i>Raag</i>	Redness
<i>Shool, Toda, Bheda</i>	Pain
<i>Avil Darshan</i>	Blurred Vision
<i>Paak</i>	Inflammation

Matching criteria of *Vataj* and *Pittaj* *Abhishyanda* and Keratoconjunctivitis sicca (inflammatory)⁶

<i>Abhishyanda</i>	KCS
<i>Toda</i>	Pain
<i>Shofa</i>	Inflammation
<i>Shushkata</i>	Dryness
<i>Shushka Alpa Mala</i>	Mucus plaques
<i>Daha</i>	Burning sensation
<i>Raag</i>	Redness

Chikitsa

It is done according to predominant vitiated Dosha. In case of symptoms that are corresponding to vitiated *Vata* like *Toda*, *Rukshata*, etc, *Vatahara* local and systemic

treatment is given. In case of predominant, *Vata*, *Pitta* and *Rakta* like redness, *Daha*, etc, *Vata-Pitta Hara* treatment is used.

Treatment for *Shushkakshipaka*

1 *Snehapana*: it is ingestion of *Sneha*. *Vata-Pittahara*, *Drushtivardhan Aushadha Siddha Ghritas* are used for *Snehapana*.⁷

- a) *Goghrita*
- b) *Jivantyadi Ghrita*
- c) *Ghrita* processed in *Kulira swarasa* and milk
- d) *Ghrita* indicated for *Vatabhishyanda* (*Purana ghrita*)
- e) *Triphala Ghrita*
- f) *Yashtimadhusiddha Ghrita*
- g) *Mahatiktaghrita*

2. *Basti*: the technique is similar to enema. *Yashti Shatavari Siddha Ghrita* is used for *Vata- Pitta Shaman*

3. *Nasya*: it involves administration of medicine by nasal route. *Anutaila* is used as it is *Tridosha Shamak* and frequently used for treating *Urdhva Jatrugata Rogas*.⁸ Other *Dravya* used for *Nasya*

- a) *Jeevaniya Ghrita*
- b) *Siddha taila of Sariva, Vidarikand, Balamoola, Yashtimadhu, Kamal, Draksha, Jivak, Chandan, Jangal Mamsarasa, Ksheer.*
- c) *Goghrita*

4. *Ashchyotan*: Medicated liquid 10-12 drops is administered dropwise at inner canthus of eye. Various *Aschyotanayogas* used in *Suskakshipaka* are,

- a) *Yashtimadhu siddha Ghrita or Dughdha*

b) *Kashaya* prepared out of *Darvi* and *Prapoundarika*

c) *Manjishta, Yashtimadhu, Krishnasariva, Lodhra, Laksha and Prapoundarika Kwath* reduces inflammation and congestion.

d) Filtrate of *Kalka of Mrudvika and Rakta Chandana* in *Tandulodaka* along with honey reduces lacrimation and burning sensation.

e) *Lodhra* and *Korantaka Pushpa Kwath* reduces pain⁹

5. *Parishek*: Medicated liquid is administered in the form of *Dhara* at inner canthus of eye. Various preparations used for *Seka* are,

- a) *Ksheerapaka of Haridra and Daruharidra* with *Saindhava*
- b) *Dugdha Saindhava Parishek*.¹⁰

6. *Anjana*: medicine is applied at lower eye margin from inner to outer canthus and vice versa. It is done after proper *Kayasodhana* and *Sirosodhana*. Various *Anjanayogas* used in *Suskakshipaka* are,

a) *Saindhava, Devadaru and Sunti* pasted with *Matulunga swaras, Ghrita, Stanya* and *Jala*.

b) *Anjana of Shunti, Goghrita and Stanya*

c) *Snehanjana*: *Anjana of Anooopa Vasa* mixed with *Saindhava* and *Shunti* in minute quantity.

d) *Keshanjana*: *Anjana* prepared from human hairs smeared with ghee and rubbed on mirror and then in *Mallaka samputa for Mash*i preparation. This *Mashi* obtained is mixed with *Ghrita* and stored in a *Loha Patra*.

e) *Churnanjana*: Powder of *Loha* and *Srotanjana* are given *Bhavana* of *Kashaya* of *Manjishta, Triphala* and *Katankateri*.

This *Anjana* reduces pain, burning sensation and redness of eyes.

f) *Pindanjana*: *Tamra Bhasma*, *Sairyeka*, *Musta*, *Pundrahwa*, *Madhuka*, *Krishnasariva* are given *Bhavana* of goat milk and made into *Varti*.^{11, 12}

7. *Tarpana* and *Putpaka*: *Jivaniya Ghrita* and *Snighdha Putpaka* is used.^{13, 14}

Apart from above treatment, *Ashtang Sangraha* has also stated to use treatment given in *Vataj Abhishyanda* and *Pittaj Abhishyand* as *Shushkakshipaka* is a *Vata-Pitta* predominant disease.

Sadhyasadhyatva: *Sadhya Sarvagata Ashastrakrita Netra roga*.

Conclusion

Shushkakshipaka is initially correlates to dry eye disease, symptoms like dryness, grittiness, etc. which are of vitiated *Vata Dosha*. Along the course it leads to inflammatory changes showing symptoms of vitiated pitta which involves symptoms like *Daha*, redness of eyes, etc. that can be considered as dry eye syndrome.

In early stages Dry eye syndrome can be correlated to *Shushkakshipaka* in later stages where there is inflammation in stage of Keratoconjunctivitis sicca can be correlated to *Abhishyanda*.

The treatment and drugs should be used according to predominant vitiated *Doshas*.

Thus, *Shushkakshipaka* can be considered as dry eye disease in early stages and can be considered as a result of only vitiated

Vata. In later stages symptoms of both *vata* and *pitta Dushti* are seen and treatment should be done to alleviate *Vata* as well as *Pitta*.

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