

An Ayurvedic Perspective of Dry Eye

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Abstract: *Dry eye is a multifactorial disorder due to inflammation of the ocular surface, neurotrophic deficiency and meibomian gland dysfunction. Dry eye is generally compared to shushkakshipaka. But if the symptoms of dry eye are analysed deeply, two terminologies in Ayurvedic classics have much resemblance in correlating the condition. Initial stage where vata prakopa over the surface structures of eye due to the lack of snigdha bhava either in the form of abnormal aqueous or lipid component of tearfilm which in turn create difficulty in opening the lids, pricking pain and gritty feeling is termed as Krichronmeela explained in the context of vartma roga (disease of lid) by Vagbhata acharya. In the later stage, pitha get involved in the pathogenesis and the samprapthy deepens into the dhatus over the surface structures of eye like conjunctiva and cornea, giving the appearance of sarvakshi disease Shushkakshipaka.*

1. INTRODUCTION

Changing lifestyle is invariably cause metabolic changes that influence the functioning of eye, resulting in diseased state. Major eye complaints associated with lifestyle disorders are – Cataract, Macular degeneration, Diabetic Retinopathy, Dry Eye and Refractive Errors¹. Dry eye disease is a common yet frequently un-recognized clinical condition in which the etiology and management challenge clinicians and researchers alike². Dry Eye is a multifactorial disorder due to inflammation of the ocular surface and lacrimal gland, neurotrophic deficiency and meibomian gland dysfunction. A variety of drugs and treatment modalities have been tried over the years but none has succeeded in providing a complete cure. This is mainly because of a lack of holistic approach.

It's a matter of proud that even in this era of sophisticated instruments for accuracy in diagnosis we have our own parameters for diagnosis and more over terminologies mentioned in the context of eye diseases are sufficient enough to diagnose all pathological lesions of eye. On those old days our acharyas shared very comprehensive idea of dry eye, and the treatment strategy prescribed for dry eye having much impact even today in relieving the symptoms related to dry eye. When symptoms of dry eye are analysed, two of the disease that have striking similarity to dry eye are Krichronmeela mentioned by Vagbhata in Vartmaroga³ and Shushkakshipaka described by Vagbhata and Susrtha in Sarvakshi Roga⁴. Krichronmeela is the initial stage of dry eye when the disease pathology create some subjective discomforts like gritty feeling, pricking pain, difficulty in opening after waking from sleep and the eye looks normal in appearance. When the vitiation of doshas intensifies, in addition to lid the signs and symptoms now scattered to cornea and conjunctiva and present as Shushkakshipaka, a sarvakshigata roga. Identification and intervention at the stage of Krichronmeela will help in reducing the burden of dry eye in the society. 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. Absence of preservatives and cost effectiveness is an added advantage of ayurvedic treatment of dry eye.

2. PRESENT SCENARIO

Dry eye occurs when there is inadequate tear volume due to an unstable tear film and resulted in ocular surface disease. Concept of mechanism of dry eye has changed over recent years. Until lately, the condition was thought to be merely due to aqueous tear insufficiency. Today, it is understood that dry eye is a multifactorial disorder. Latest definition as per 2007 report of International Dry Eye Workshop is Dry eye is a multifactorial disease of the tears and ocular surface that results in

symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface. Tear film stability, a hallmark of the normal eye, is threatened when the interactions between stabilizing tear film constituents are compromised by decreased tear secretion, delayed clearance, and altered tear composition. Ocular surface inflammation is a secondary consequence. Reflex tear secretion in response to ocular irritation is envisioned as the initial compensatory mechanism, but, with time, inflammation accompanying chronic secretory dysfunction and a decrease in corneal sensation eventually compromises the reflex response and results in even greater tear film instability.

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 the signs and symptoms of mild to moderate disease and, 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 allergenic, worsening the clinical markers of the disease. While preservative-free solutions do not worsen corneal barrier function, however they have not been found to normalize it either. The surgical options include temporarily or reversible, long term or permanent occlusion of puncta but potential problems are created by this like extrusion, granuloma formation and canaliculitis, fragmentation and distal migration causing inflammation.

3. DRY EYE – AYURVEDIC PERSPECTIVE

3.1. Back Ground

Ayurvedic diagnosis of dry eye strictly depends on the complaints of the patient, Two diseases which exhibit symptoms similar to dry eye are Krichronmeela and Shushkakshipaka. Krichronmeela is a vatha predominant disease mentioned by Vagbhata in Ashtanga Hridaya⁵. Krichronmeela has not been mentioned by Susruta. Instead Susruta considers Shushkakshipaka as Vatha predominant disease⁶ whereas Vagbhata considers Shushkakshipaka as vatha pitha predominant condition⁷. This incongruity in Doshik attribution reflects that probably Acharyas have described different stages of the same disease pathology. Taking into consideration the pathology of dry eye, It can be assumed that Dry Eye changes are initiated by vatha vitiation and later pitha gets involved in the samprapthy.

Dry eye is generally compared only with shushkakshipaka. Reason for this is that Susruta acharya has not mentioned the term krichronmeela. In a similar context, Susruta samhitha provides elaborate description about various timiras but acharya Susruta didn't consider timira while counting the diseases pertained to drishti but it is awkward to call a simple vision problem as Linganasha (total blindness) only because of the above reason. Likewise, Shushkakshipaka being a disease described under the title of sarvakshi gata roga vignaneeya (which involves more than one structures of eye during the pathological process) is not the suitable choice for diagnosis when the eye looks normal in gross appearance and there is only subjective discomfort. So the opinion of Vagbhata acharya gathers importance from a diagnostic point of view. In the long run of disease pitta predominant symptoms like severe photophobia, burning sensation become more evident because of inflammatory changes of surface tissues transforming the initial stage into sushkakshi a sarvakshigataroga. It is really interesting that even in the early stage of dry eye where vata is more predominant acharya vagbhata consider pitta while fixing the treatment of krichronmeela. The fact is more clear when We analyse the treatment in addition to snigdha nasya, anjana instead of kevala vata samana sneha, purana ghrutha prepared with draksha added with sugar is suggested for snehapana

3.2. Nidana

Dry eye is caused by vatha vitiating nidanas. Later on, pitha vitiating factors also contribute to the disease pathology. There are two types of nidanas to be considered. One is the general vatha/pitha vitiating factors and vishesha achakshushya nidanas that affects netra avayava specifically.

3.3. Samanya Nidanas

Nidanas which can cause vitiation of vatha and pitha are

- Vegavinigraha or suppression of natural urges causes vatha vitiation⁸. Suppression of adhovata, mala, mutra and nidravega can initiate ocular pathology⁹

- Dhoomanishavana – direct exposure to smoke. Causes vitiation of pitha dosha by its ushna teekshna guna. Also vatha dosha is aggravated by its ruksha, laghu , sookshma¹⁰ . Smoking is an aetiological factor for dry eye¹¹
- Rajodhumanishavanath(Bhavamisra) – exposure to dust and smoke¹²
- Atisheegravyanath – traveling in vehicles
- Atisheetha sevanath- may be in the form of airconditioned environment. This leads to vatha prakopa . Scientists have found that colder outside temperatures drive down temperatures on the eye surface and eyelid. The meibum (the oily substance in the outermost layer of the tear film) becomes too thick and too stiff to spread evenly and protect the eye. The cold also can affect over-the-counter and prescription eye lubricants
- Hot , dry climate – Vatha Pitha kopa
- Older age – Vatha prakopa is common in older age. Old age has been recognised as a cause of dry eye²
- Intake of food predominantly katu, kashaya and tikta rasa , dried leafy vegetables, roasted meat (vallura) , pulses like mudga, masura, kalaya¹³

3.4. Vishesha Nidana

Nidana that are responsible for eye disease are mentioned in detail by Susruta¹⁴. Amongst these nidanas, those that lead to dry eye are

- Doorekshanata or looking at distant object for a long time. This results in infrequent blinking resulting in decreased secretion from meibomian glands. Prolonged visual efforts associated with decreased blink rate such as reading or watching TV
- Swapna viparyaya or altered sleep pattern. Night awakening cause vatha pitha prakopa
- Prasakta Samrodana or continuous weeping. It cause vatha vitiation. It leads to neurodeprivation resulting in less tear secretion
- Kopa and Shoka or excessive anger and grief also leads to pitha and vata vitiation respectively which affects the tear secretion
- Food like shuktha , amla, aranala have alcoholic properties , leads to vatha pitha aggravation.
- Kulatha is kashya rasa Ushna veeryaand amla vipakin¹⁵ .If taken for long time causes raktha and pitha disorders¹⁶
- Asatmendriyarthasamyoga especially athiyoga and mithya yoga of chakshur indriya¹⁷

3.5. Samprapthy

In case of dry eye, as the disease name suggests dryness or rookshatha is the basic cause of disease. Nidanas mainly viharas and environmental factors predominantly cause an increase of ruksha guna in netra. This rukshatha is responsible for chaya of vatha. Since tear film (may be considered as tharpaka kapha as provides snigdhtva to eye, also is invoved in the nourishment of cornea) is the most external part of netra and is directly exposed to nidanas, vata chaya 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 .Because of this reason it is considered as vartma roga by Acharya Vagbhata and named as Krichronmeela,gradually pitta get involved in the samprapti if the condition is not addressed properly. the samprapti penetrate deeper dhatus of conjctiva and cornea so that more inflammatory changes develop and now the possible diagnosis is strictly from the context of sarvakshigataroga vijñaneeya ie sushkakshipaka ..

Vatha kopa causes sthabdhatha¹⁸. Tear film loses its snigdha quality and this affects the movement of vartma, causing varthmashabdhatta. 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 vatha destabilises the lacrimal functional unit, This results in reduced tear flow which causes difficult 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. Secretion is reduced by sleep¹⁹.

Hence when the patient wakes from the sleep he experiences difficulty in movement of lids as movement, which is featured as an important lakshana of krichronmeela by vagbhatacharya .When he vigorously rubs the lid meibomian gland secretions flow in. Rubbing also helps in reflex flow of tears. and, patient is able to open his eyes .

Watering of eyes is rare but can occur paradoxically in a patient with “dryeyes.” Basal secretion of tears is inadequate and this results in drying of the eye. This gives rise to a reactive secretion of tears that causes epiphora. The patient may have a history of intermittent discomfort followed by watering of the eye.

Thus all the symptoms of Krichronmeela happens because of vatha kopa happening over the surface of eye ,as it affects the movement of lid it is considered as a vartma roga . Acharya Susrutha does not consider this pathology as disease manifestation may be because of the instability of condition just like timira and hence he does not address the disease in vartma roga.

Meanwhile if a person keeps practicing vatha prakopa , ahara and vihara, vatha get vitiated it reaches netra where already the disease pathology is initiated because of local dhatu dushti . Increased ushna and rooksha qualities of nidanas will initiate sthanika pitha kopa as well. Vathapitha kopa will spread to different parts of eye like conjunctiva and cornea and results in a sarvakshigatha roga named Shushkakshi paka. The word '*Sushkakshipaka*' means eye wherein *Ashru* has depleted or dried resulting in inflammation of the eye. In other words inflammation in the eye is due to decreased/depleted or dried *Ashru* in the eye²⁰. 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 finding has also 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 disease²¹ .

Shushkakshi paka is a vatha pitha predominant disease according to Vagbhata and vathika according to Susrutha. The symptoms exhibited like gharsha, thoda, bheda upadeha are seen in association with prakopa of vatha ²². Grittiness and stringy discharge are common in dry eye (Kansky) Rookshatha 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. ²³ Thus we can conclude that Krichronmeela is the initial stage of dry eye, where samprapthy is limited to tear film and involves vatha vitiation alone. When the disease pathology intensifies because of involvement of pitha, multiple structure in netra are effected and the disease then attains sarvakshi bhava. And at this stage , disease can be called shushkakshipaka.

3.6. Lakshana

Dry eye is now recognized as a symptom based disease. Because of the general repeatability of symptoms compared to that of diagnostic tests, dry eye has been considered a symptom-based disease. Information on DED is limited due to lack of uniformity in its definition and the inability of any single diagnostic test or set of diagnostic tests to confirm or rule out the condition. Thus, there has been a shift towards symptom-based assessment as the key component of clinical diagnosis 24-27. A recent international panel considered symptoms and signs to be of primary importance in diagnostic and treatment decisions, with diagnostic tests taking a secondary role. This was further validated by the DEWS report, which created a "global" consensus for dry eye diagnosis . Hence lakshanas should be given utmost importance.

From the ayurvedic point of view the symptoms of dry eye can be grouped in two stages . In the first stage the symptoms are a manifestation of vatha vitiation on the vartma (ocular surface) and in the second stage ocular inflammation due to pitha involvement is responsible for the symptoms

3.6.1. Stage 1²⁸

1. Pain and Difficulty to move lids after waking from sleep
2. Gritty sensation inside eye
3. Difficulty to open lids
4. Watering

5. Vigorous rubbing reduces symptoms – Vigorous rubbing helps in releasing secretions from the meibomian glands , thereby wetting the ocular surface

3.6.2.Stage 2²⁹

1. Grittiness
2. Pricking and cutting pain
3. Sticky feeling
4. Difficulty to open and close lids
5. Roughness and disease of lid
6. Dryness
7. Inclination for cold
8. Pain
9. Inflammation
10. Stiff and dry lids
11. Blurred vision
12. Opening of eye is difficult and painful

3.7.Chikitsa

Chikitsa is aimed at samprapthy vightana or interfering in the disease pathogenesis. In the first stage, when vatha is predominant, disease is limited to vartma , vatha hara treatment is done giving importance not to vitiate sthanika pitha. Hetuprathyaneeka chikitsa in the form of life style modification also plays a key role. In the second stage , when pitha and vatha are predominant , vatha pitha hara chikitsa is advised .

3.7.1.Stage 1³⁰

- Puranaghratha medicated with draksha kalka and sugar
- Nasya , dhoomapana, anjana – snigdha
- Purana ghrtha helps in alleviating vatha vitiation and addition of pithasamana drugs like draksha and sugar helps to protect the sthanika pitha. Snigdha nasya, dhoomapana and anjana are helpful in treating vatha vitiation

3.7.2.Stage 2³¹

- Ghrthapana with jeevaneeya gana
- Tharpana with jeevaneeya ghrtha
- Nasya with anutaila
- Seka with kosha milk with saindhava or milk with haridra and devadaru
- Anjana –
- Shundi macerated in breast milk
- Vasanjana mixed with shundi and saindhava
- Kesamashi

Jeevaneeya gana possess vathahara property. Nasya with anutaila, addition of shundi in preparation is aimed at protecting kapha which can vitiate because of snigdha, brimhana treatment.

Hetupratanika chikitsa plays a major role. Hence along with the treatment necessary lifestyle modifications has to be advised. Some of the required changes are:

- Avoid excessive air movement: windy conditions – outside or inside
- Avoid hot, dry environments and to add moisture to the air. Airconditioning is as bad as heaters for increasing the evaporation of tears.
- Wear glasses on windy days and goggles while swimming. The wraparound style of glasses may help reduce the effects of the wind. Goggles protect eyes from chemicals in poolwater that can dry the eyes.

- Take frequent breaks: While watching TV, reading or working at a computer.
- Position the computer screen below eye level: Computer screen below eye level keeps the eye open narrowly. This may help slow the evaporation of tears between eye blinks.
- Stop smoking and avoid passive smoking

3.8. Sadhyasadyatha

Both Krichronmeela and Shushkakshipaka are sadhya or curable diseases. But if not treated properly it can lead to a chronic condition called pilla³².

4. CONCLUSION

To our best knowledge this is the first article to incorporate krichronmeela in the diagnosis of dry eye. There is a general tendency to consider dry eye as shushkakshipaka alone. But in practice, we see that dry eye begins with the symptoms of krichronmeela. If the symptoms are analysed deeply, we find that dry eye has two stages. Initial stage is caused because of vathachaya in tear film leading to rukhatha of tear film. This stage is named Krichronmeela by Vagbhata acharya. In the later stage, pitha is involved in the pathology and samprapthy then involves other structures of eye, leading to a sarvakshi disease. This stage is stage of Shushkakshipaka. Treatment in the initial stage is aimed at relieving the vatha vitiation and in later stages vatha pitha treatment has to be administered.

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