



Review Article

MANAGEMENT OF DRY EYE SYNDROME THROUGH AYURVEDIC INTERVENTIONS: AN IN-DEPTH ANALYSIS

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ABSTRACT

Dry eye syndrome (DES) is a chronic ocular condition characterized by reduced tear production or increased tear evaporation, leading to discomfort, visual disturbances, and potential damage to the ocular surface. Conventional treatments like artificial tears provide temporary relief without addressing the underlying causes. This article explores the potential of Ayurvedic interventions in managing DES by drawing parallels with "Shushkashipaka," an Ayurvedic ocular surface disease with similar manifestations. Ayurveda offers various Kriyakalpa procedures such as Tarpana, Putpaka, Parisheka, Ashchyotana, Nasya, and Anjana, which can help address the multifactorial nature of DES. These personalized and comprehensive approaches provide alternative and complementary therapeutic options for managing DES. Further research and clinical studies are needed to validate the efficacy and safety of Ayurvedic interventions in managing DES. However, the principles and therapeutic procedures described in Ayurvedic texts hold promise in addressing this prevalent eye condition.

INTRODUCTION

Dry eye syndrome (DES) is a chronic multifactorial condition of the ocular surface characterized by either reduced tear production (aqueous deficient) or increased evaporation of the tear film (hyper evaporative type) resulting in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface. It is accompanied by loss of homeostasis and increased osmolarity of the tear film, inflammation of the ocular surface, and also with neurosensory abnormalities [1].

The prevalence of DES is higher among women than men and increases with age and chronic illness comorbidities [2]. One recent population-based study found a prevalence of 11.3% among all adults greater than 50 years of age and as high as 22.8% among women greater than 75 years of age [3]. The burden of DES on affected patients is significant, with effects on visual function, activities of daily living, professional work, and quality of life.

Direct costs from doctor's visits, medications, and procedures and indirect costs from decreased productivity reduced quality of life, and general impairment in functioning make DES a substantial economic burden, as well [4].

The management of DES is highly complicated because of its multifactorial etiology associated with many mechanisms [5]. Artificial tears are a common first-line medicinal therapy for DES that aims to supplement the tear film but they are of short-duration action and do not address the underlying causes of DES. Also, a proportion of patients have been found to show limited or no improvement with artificial tears [6].

Ayurveda, the ancient Indian system of medicine describes a similar ocular surface disease condition "Shushkashipaka" which correlates with dry eye syndrome (DES) based on similar manifestations. In Shushkashipaka eyelids become stiff (Daruna) and dry (Ruksha) and at the same time the vision becomes blurred (Avila darsana). Other associated symptoms include difficulty in opening and closing the eyelids (Krichronmilana nimilana), foreign body sensation (Gharsha), pricking sensation (Toda), splitting pain (Bheda), and discharge (Upadeha) [7].

Ayurvedic drugs have been in use for centuries and have the potential to be effective on multifactorial interlinked complex pathology. Ayurveda describes

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several medical formulations and topical therapeutic procedures (*Kriyakalpa*) to treat *Shushkashipaka* efficiently. This article aims to discuss the correlation between *Shushkashipaka* disease and dry eye while exploring the treatment options available in Ayurveda to address this condition.

Shushkashipaka

The *Sushruta Samhita* describes *Shushkashipaka* as a *Vataja* disease^[8] and mentioned it in the *Sarvagata roga* (diseases affecting all parts of the eye) chapter^[9] as a *Sadhya vyadhi* (*Ashastrakrit* - diseases which can be treated with medicines)^[10]. It is described as a *Vata-pitta* vitiated condition by Vagbhata^[11] and Sarangadhara considered it as *Vata-raktaja*^[12]. Although the *Shushkashipaka* mentioned in the *Sushruta Samhita* is a brief description of the disease, the Vagbhata had described it as a well-established advanced disease with a preponderance of *Paka* (inflammation)^[11].

Vagbhata had said that when *Vata* and *Pitta* are increased, they will produce pricking (*Toda*) and cutting (*Bheda*) type of pain along with discharge (*Updehavat*). The eyelids become dry and hard, making it difficult to open and close the eyes. There will be acute pain of suppuration (*Shoolpakvat*) and a craving for cold applications (*Sheetechchha*)^[11].

Karala Tantra has identified an excessive burning sensation (*Daha*) in *Shushkashipaka* and defined it as a *Vataja* eye disease producing closure (*Kunita*) and roughness (*Khara*) in eyelids, associated with difficulty in lid movement, blurred vision, and burning sensation^[13].

The basic pathological factors as per the Ayurvedic aspect were thought to be an imbalance of *Pitta dosha* which led to deranged *Dhatwagni* (metabolism) which ultimately led to malformation and hypo formations of body elements, resulting in *Vata* dominance and *Kapha* depletion.

The signs and symptoms of *Shushkashipaka* bear a striking resemblance to those of dry eye syndrome.

Treatment of Shushkashipaka in Ayurveda

Treatment for Dry Eye Syndrome (DES) typically involves various approaches such as adding tears, retaining tears, stimulating tear production, using biological tear substitutes, employing anti-inflammatory therapy, incorporating essential fatty acids, and adopting environmental strategies. However, prolonged use of preservatives found in artificial tear supplements may lead to adverse effects, including reduced effectiveness, allergic reactions, and toxicity. Additionally, managing DES requires lifelong treatment as there is no curative remedy available in conventional medicine, only palliative measures.

The objective of treatment for *Shushkashipaka* is to alleviate the imbalanced *Doshas*, specifically *Vata* and *Pitta*, which affect the essential body tissues (*Rasa* and *Rakta dhatu*), tears (*Ashru*), and lubricating fluids in the eyes (*Akshi sneha*). The treatment approach should focus on pacifying *Vata* and *Pitta*, while also nourishing the *Rasa* and *Rakta dhatus*, and enhancing the lubricating fluids.

Ayurveda effectively treats *Shushkashipaka* through a variety of *Kriyakalpa* procedures, including *Tarpana*, *Putpaka*, *Seka*, *Ashchyotana*, *Nasya*, *Anjana*, and other measures, which will be explored in detail in the subsequent sections.

Tarpana

In Ayurvedic texts, various *Acharyas* have mentioned *Tarpana* as a treatment for *Shushkashipaka*. *Tarpana* is one among *Netra Kriyakalpa* which is a technique that aims to rejuvenate and satisfy all sense organs. It has a high potential and effect on the management of eye diseases. Usually, *Snigdha dravyas* (the drugs having oleation property) especially medicated *Ghrita* are used for *Tarpana*^[14]. It prevents friction damage to the ocular surfaces secondary to lid movement or extraocular movements. *Tarpana* also prompts the lacrimal glands to enhance tear production. Furthermore, when compared to artificial tear products, substances like *Triphala ghrita* or *Goghrita*, due to their higher lipid content, exhibit mucoadhesive properties. This leads to an extended period of contact with the ocular surface. As a result, the effectiveness of *Tarpana* treatment is enhanced. The mucin layer within the tear film facilitates the even distribution of *Ghrita* across the ocular surface. This holistic approach offers sustained relief for patients experiencing moderate-to-severe symptoms of dry eyes.

Sushruta suggested that for the *Tarpana* procedure, a combination of *Chatur sneha* except for *Taila* (*Ghrita*, *Vasa*, and *Majja*) along with a decoction made from *Vatshamaka* drugs would be a good choice^[15]. On the other hand, Vagbhata recommended the use of medicated *Ghrita* prepared from *Jivniya gana* for *Tarpana*^[16]. These drugs used in *Tarpana karma* possess lubricating and anti-inflammatory properties. Additionally, they exhibit *Vatshamaka*, *Snehana*, and *Chakshushya* (ability to improve eyesight) properties, which help in pacifying vitiated *Vata dosha* and relieving eye dryness, both of which contribute to the development of *Shushkashipaka*^[17]. Some of the commonly utilized *Tarpana* drugs include *Godugdha*, *Jivantyadi ghrita*, *Shatviryadi ghrita*, *Triphala ghrita*, *Goghrita manda*, and *Shatavari ghrita*^[18].

Putpaka

Putpaka is a procedure in which warm medicated juice (*Swarasa*) made with *Putpaka vidhi* is allowed to stand still in the eyes for a predetermined

amount of time with the aid of a prepared frame. The potency of the medication is transferred to the inner layers of the eyes during *Putapaka* due to the temperature, keeping them in contact with the epithelium. Through its therapeutic effects, it aids in clearing blockages in the eye's drainage channels, boosts circulation, revives up cell production, and clears the eyes of debris and dead skin cells.

Tarpana is an eye therapy that provides nourishment (*Santarpana*) to the eyes. In cases where the eyes have been excessively nourished or treated with oil (oleated) during *Tarpana*, *Putapaka* is used to restore the eyes to their normal pH levels. Consequently, *Putapaka* is always administered after *Tarpana karma* [19].

There are 3 types of *Putpaka*: *Snehana putpaka* (with fat), *Lekhana putpaka* (with drugs having a scraping effect), and *Prasadana putpaka* (with drugs having a soothing effect). *Snehana putpaka* is accomplished by using the fat, bone marrow, muscle fat, and juice from the meat of animals that live in marshy lands (*Anupa*), burrows (*Bhushaya*), or with drugs made from *Jivaneeya gana* macerated with milk. *Lekhana putpaka* is accomplished by using *Mastu* (whey), water of yoghurt macerated with the paste of animal and bird liver, pearl, iron, and copper ash, salt, *Srotanjana* (antimony sulphide), *Shankha* (ash of conch shell), *Phena* (sea foam), cuttlefish, and *Ala* (orpiment). *Prasadana putpaka* is performed using cow milk that has been macerated with animal and bird liver, marrow, muscle fat, intestine muscle, and sweet-tasting drugs in which ghee is also added [19].

The *Snehana putapaka* is recommended in cases marked by the extreme dryness of the eye and *Lekhana* (scraping) ones are efficacious in cases of excessive applications of the *Sneha* to the eye, while the eyesight is rejuvenated by the *Ropana* (healing) *Putapaka*, which restores the *Vata*, *Pitta* and the *Rakta* of the affected locality to their natural conditions. All three types of *Putpakas* can be used in treating *Shushkashipaka* according to the etiological factors and clinical features.

People who are not suitable for *Nasya* therapy should not be administered either *Tarpana* or *Putpaka*. *Dhumpana* (deep inhalation and swallowing of herbal smoke) is also indicated at the end of the *Snehana* and *Lekhana* types of *Putapaka* [19].

Parisheka

The *Kriyakalpa* practices that Acharya Sushruta mentions include one of the easiest and most effective procedures: *Parisheka* or *Seka*. *Parisheka* is a *Kriyakalpa* procedure in which a medicated liquid is continuously poured into the eye from a height of 4" for a predetermined amount of time in accordance with *Doshas*. It is a widely used technique in eye diseases that present with symptoms like

inflammation, pain, redness, and burning. *Doshas* are expelled from the *Urdhwajatrugata* (above clavicle) areas as well as the *Akshisandhistrotas* (junctions of the eye) when *Parisheka* is applied to the eye [20]. In Ayurveda classics, the *Parisheka* procedure has been recommended for *Sushkashipaka*. Additionally, *Yashtimadhu* (*Glycyrrhiza glabra* Linn.) is the typical medication recommended for *Parisheka* in a number of eye ailments. Some *Acharyas* had also mentioned the *Parisheka* composed of cold milk with the admixture of *Saindhava* salt or milk cooked with *Haldi* (*Curcuma longa* Linn.) and *Devadaru* (*Cedrus deodara* Roxb.) and mixed with a small quantity of *Saindhava* and said it is efficacious [14]. Due to the *Kandughna*, *Shothaghna*, *Ropana*, and *Rasayana* properties of *Yashtimadhu* (*Glycyrrhiza glabra* Linn.), its use in *Shushkashipaka* has an immediate and long-lasting relief.

The *Parisheka* procedure indirectly provides frequent eye cleaning. The application of *Parisheka* as a liquid medication for a short duration is facilitated by heat and continuous exposure to the thin layer of skin on the eyelids, which results in a quick and effective mode of action. In certain eye conditions, sterile cotton fiber pads are now being utilized to deliver medication transdermally through the eyelids. The skin around the eyes is the thinnest in the human body, with a thickness of only 0.05cm. This technique directly impacts skin diffusion and increases skin temperature, leading to enhanced permeability of the stratum corneum (outermost layer of the skin) and accelerated penetration of the medicine. Moreover, the temperature rise also improves local blood flow, further enhancing the absorption of the medication through the skin. By applying the *Parisheka* drug to the eye for the appropriate duration, it facilitates effective medication absorption, and in turn, reduces localized inflammations and dryness symptoms. As a result, this method contributes to the successful treatment of dry eye conditions.

Aashchyotana

Aashchyotana is considered the first and foremost ocular therapeutic procedure for all types of eye diseases in Ayurveda. It involves instilling liquid medicine drop by drop into the opened eye at the inner canthus (*Kaninaka sandhi*) from a height of two *angulas* (approx 3-4cm)[20]. *Aashchyotana* is particularly indicated in certain eye conditions: *Ruk* (pain), *Toda* (pricking sensation), *Kandu* (itching), *Gharsha* (rubbing sensation), *Ashru* (tearing), *Daha* (burning sensation), *Raga* (redness). The method is specifically recommended in cases of *Aamavastha* of *Netrarogas*, which refers to acute inflammatory conditions of the eye having symptoms like pain, foreign body sensation, burning sensation, redness, itching, discharge, lacrimation, and swelling [21].

In the conjunctival sac, liquid medication is applied in the form of drops. Depending on the condition, 8 to 12 drops should be placed in the conjunctival sac [22]. The drug will have a route to enter the blood vessels of the conjunctiva here. It may be true that more than one drop won't stay on the conjunctiva, but when they are applied continuously for a longer period of time, at a slightly higher temperature, and from a slightly higher height, they will absorb more efficiently.

According to Ayurveda, various eye drops formulations with different properties are employed to treat different pathological conditions. In *Vataja* disorders (related to the *Vata dosha*), eye drops with *Tikta* (bitter) and *Snigdha* (unctuous) properties are recommended. These properties help to counteract the dryness and roughness associated with *Vata* imbalances. In *Pittaja* disorders (related to the *Pitta dosha*), eye drops with *Mridu* (mild) and *Sheeta* (cool) properties are used. This helps to soothe and pacify the heat and inflammation caused by *Pitta* imbalances. In *Kaphaja* disorders (related to the *Kapha dosha*), eye drops with *Tikta*, *Ushna* (warm), and *Rooksha* (dry) properties are employed. These properties aim to alleviate the excess heaviness and congestion associated with *Kapha* imbalances [21].

Ayurvedic texts have mentioned *Aashchyotana* with *Darvi kwatha*, *Prapaundarikadi kwatha*, *Punarnawadi kwatha*, *Manjishthadi kwatha*, *Mridweeka chandanadi kwatha* are beneficial in *Shushkashipaka* [14].

Anjana

Anjana refers to the application of medicated eye ointments or collyrium to the eyes. Ayurveda meticulously detailed *Dinacharya* (daily regimen) for a healthy life. One of the *Kriyakalpas* mentioned under *Dinacharya* for the prevention and treatment of various eye diseases is *Anjana*. *Anjana* formulations are prepared using various medicinal herbs, minerals, *Ghrita*, and other natural ingredients. Since the eyes have a predominance of *Pitta dosha* or *Teja mahabhuta* for their proper functioning or clarity of vision, various ancient *Acharyas* have described *Anjana* therapy as a daily regimen, especially *Sauviranjana* (antimony sulphide) mixed with honey. *Rasanjana* (made from concentrating the decoction of *berberis aristata*) mixed with honey is recommended once a week for purification and good eye health. *Sushruta Samhita* mentions three types of *Anjanas*: *Lekhana* (scraping), *Ropana* (healing), and *Prasadana* (reviving). *Lekhana anjana* is prepared using drugs with one or more tastes (*Amla*, *Lavana*, *Katu*, *Tikta*, *Kashaya*) except for the sweet (*Madhura*) taste. When applied, it helps in the secretion of accumulated *Doshas* from various areas around the eyes, nose, and eyelids. *Ropana anjana* is used for healing purposes and is prepared using drugs with bitter and astringent tastes. Its application has a

cooling effect due to the presence of *Sneha* (oil/ghee), restoring the eye's natural colour and vitality. *Prasadana anjana* is prepared with a sweet taste and a significant amount of *Sneha*. It enhances eyesight, tone, and vigor, making it suitable for soothing the eyes and related purposes [23].

The choice of *Anjana* and the timing of its application depend on the specific deranged bodily *Doshas* involved in each case, with morning, evening, or nighttime applications being recommended accordingly.

Various preparations of *Anjanas* are described in Ayurvedic classical texts for the treatment of *Shushkashipaka*. *Anjana* made up of powder of *Saindhava lavana*, *Daruharidra*, *sunthi* (*Zingiber officinale* Roscoe.) along with lemon juice and mixed with *Ghrita*, should be applied with breast milk and water. The *Ghrita* cooked with the drugs of the *Jivaniya* group and filling the cavity of the eye with the same, as well as snuffing with the *Anu taila* is also efficacious in *Sushkashipaka* cases [14]. *Sunthi* rubbed over a stone slab with clarified butter and breast milk is also recommended as *Anjana*. The *Vasa* (the essence of the flesh) of aquatic animals or of those which frequently habit swampy grounds, mixed with a small quantity of powdered *Sunthi* and *Saindhava* salt (and rubbed on a stone slab) should be applied to the eyes as an *Anjana* in a case of *Shushkashipaka* [15]. Various types of *Anjanas* can be used such as *Keshanjana* whose *Masi* should be obtained by burning the hairs dipped in *Ghrita* in the *Antardhuma* method. This *Masi* is mixed with *Ghrita* and kept in an iron vessel and used for *Anjana* [14]. *Churnjana* is prepared from *Manjistha* (*Rubia cordifolia* Linn.), *Triphala* (mixture of the dried fruits of the three plants: *Amalaki* (*Emblica officinalis* Linn.), *Haritaki* (*Terminalia chebula* Retz.) and *Vibhitaka* (*Terminalia bellarica* Roxb.), *Katankata* (*Kalanchoe pinnata* Lam.), *Loha bhasma*, and *Srotonjana* [24]. *Pinda anjana* is prepared by mixing an equal quantity of *Tamra raja*, *Sahachara Pushpa* (*Barleria prionitis* Linn.), *Pundarika* (*Nelumbo nucifera* Gaertn.), *Madhuka* (*Madhuca longifolia* J.Konig.), *Kalanusari* (*Trigonella foenum-graecum* Linn), and *Sariva* (*Hemidesmus indicus* Linn.), with goat's milk. *Sneha anjana* is prepared from *Anupa mamsa vasa*, with the powders of *Sunthi* (*Zingiber officinale* Roscoe.) and *Saindhava* (rock salt). *Gutikanjana* is prepared from *Suvarnagairik* (red ochre) one part, *Saindhav lavana* (rock salt) two parts, *Pippali* (*Piper longum* Linn.) four parts, *Shunthi* (*Zingiber Officinale* Roscoe.) eight parts grind and should be applied with goat's milk [14]. *Pathyadi varti* prepared from one part each of *Haritaki* (*Terminalia chebula* Retz.), *Yashtimadhu* (*Glycyrrhiza glabra* Linn.), and sixteen parts of *Maricha* (*Piper nigrum* Linn.) should be pounded and pasted together with cold water. It should then be made into

Vartis and applied as *Anjana* in the case of *Shushkashipaka* [25].

Nasya

Nasya karma specifically involves administering medicated oils, herbal preparations, or powders through the nasal passages. The treatment is performed with the patient lying down with their head tilted back slightly. The therapist or practitioner instilled the medicated substances into the nostrils, and the patient is then asked to inhale the medicine deeply, allowing it to reach the sinuses and nasal cavity.

Nasya karma with *Anu taila* or *Sarivadi taila* is recommended in *Sushkashipaka* [14]. *Nasya* increases local circulation and due to this nourishment of the organ occurs and disease subsides. Drugs used for *Shirovirechana nasya* have *Katu*, *Ushna* and *Tikshna* properties. These properties lead to the liquefaction and penetration of *Vata* and other *Doshas* [20]. Vagbhata has recommended *Nasya karma* with *Anu taila*. *Anu taila* has *Tridosahara* characteristics. Since nostrils are the entrance way to *Shira*, the medication administered through the nostrils reaches *Shringataka* (a *Sira marma*) and spreads in the *Murdha* (brain) and *Marma* of *Netra* (eye), scratches the morbid *Doshas* in the supraclavicular region, and expel them from *Uttamanga* (head) [26].

Other Measures

In addition to *Kriyakalpa* procedures, several other measures in Ayurveda could be beneficial for DES.

Netraprakshalana (Eye wash)

Eyes should be washed daily with the decoction of *Lodhra* (*Symplocos racemosa* Roxb.) or *Yastimadhu* (*Glycyrrhiza glabra* Linn.) or with *Triphala* (mixture of the dried fruits of the three plants: *Amalaki* (*Emblca officinalis* Linn.), *Haritaki* (*Terminalia chebula* Retz.) and *Vibhitaka* (*Terminalia bellarica* Roxb.) *Swarasa* (juice) after getting up from bed in the morning [26]. Regular eyewash with the abovementioned herbs is efficient in preventing dry eye, eye strain due to long hours of screen time, and inflammatory conditions.

Swedana (Fomentation therapy)

Ayurveda recommends *Mridu swedana* for the eye [27]. *Triphala* powder is added to a glass of hot water and covered, once the powder has settled, then sterile eye pads are dipped into the clear liquid and applied to both eyes for 10 to 15 minutes.

Abhyanga (Massage)

It is also advantageous to gently massage (*Abhyanga*) *Triphala ghrta* over and around the eyes because eye skin is thin and permeable, it can absorb a remarkable amount of the herb. Acharya Gayadasa quoted in Dalhana commentary that *Triphala* and

Ghrta are *Chakshushya drugs*; these both give *Bala* (strength) to the eye. *Ghrta* has its lubricating action by *Snigdha* property and it is *Sanskaranuvarti* (takes the properties of the herbs into it, without leaving its inherent properties). It carries the properties of *Triphala* and acts as a good mediator. So, if *Snigdha* drugs especially *Ghrta* preparations are used, it penetrates the eye so the *Laghu* and *Ruksha properties* are counteracted [14].

Internal use of decoctions

Triphala (mixture of the dried fruits of the three plants; *Amalaki* (*Emblca officinalis* Linn.), *Haritaki* (*Terminalia chebula* Retz.), and *Vibhitaka* (*Terminalia bellarica* Roxb.), *Yastimadhu* (*Glycyrrhiza glabra* Linn.), and *Daruharidra* (*Berberis aristata* DC.) powder can be prepared as a general eye tonic by boiling it with water until it is reduced by one-fourth, straining, and adding one teaspoon of honey.

Less Screen Time

In Ayurveda, "*Asatmya Indriyarth Samyoga*" refers to the improper or excessive use of the senses, including the eyes. It suggests that when the senses are misused or overused, it can lead to various health issues. One specific modern-day concern that could be related to *Asatmya Indriyarth Samyoga* is the increased screen time (*Atiyoga*) [28], which is associated with DES. Extended periods of staring at screens, such as computers, smart phones, and tablets, can contribute to this condition and are often attributed to reduced blinking frequency while focusing on screens, which leads to inadequate tear distribution over the eye's surface. Ayurveda emphasizes maintaining a balance in all aspects of life, including the use of senses (*Satmya indriyarth samyoga*).

Eye exercise

DES occurs when the eyes do not produce enough tears or the tears evaporate too quickly, leading to discomfort and irritation. While eye exercises alone may not cure dry eye syndrome, they can be used in conjunction with other treatments to help alleviate symptoms and improve overall eye health. Eye exercises like *Trataka karma* [29] (a yogic gazing technique that involves staring at a single point of focus such as a candle flame for 5 minutes), blinking, palming, focus shifting, rolling of eyes, near-far focus, computer 20-20-20 rule are beneficial as adjuvant therapy for alleviating DES.

Hydration

Drinking an adequate amount of water helps in maintaining overall body hydration, including the eyes. In Ayurveda, this aligns with the principle of balancing the water element (*Jala*) in the body [30].

Eye-friendly Environment

Proper lighting and reduced glare in the workspace are recommended to minimize eye strain.

Ayurveda encourages creating a harmonious and balanced environment to promote overall well-being, including eye health.

Nutrition

Ayurveda recommends a balanced diet for overall health including eyes. Food rich in vitamins A, C, and E, as well as omega-3 fatty acids, are beneficial for eye health. Ayurveda recommends foods that balance the *Doshas* and support the health of specific organs, including the eyes. Spicy and oily foods (*Pitta vardhak aahar*) should be avoided [31].

Proper sleep

Sufficient and restful sleep is needed for eye health. Ayurveda emphasizes the importance of a regular sleep pattern and quality sleep for overall health, including the well-being of the eyes [32].

Avoid Smoke and Air pollution

Exposure to smoke and air pollutants can exacerbate dry eye symptoms. Ayurveda encourages avoiding environmental factors that can aggravate *Dosha* imbalances and negatively affect the eyes.

Stress Management

Stress-reduction techniques like meditation, yoga, or breathing exercises should be practiced. In Ayurveda, stress is considered a significant factor in disrupting overall health and can also impact eye health [33].

In addition to the medicinal treatment, some measures should be addressed for the management of DES including eating and drinking habits, lifestyle, and different types of addictions. Healthy foods, drinks, and habits should be introduced, while unhealthy addictions, junk food, and reckless behaviour should be eliminated.

DISCUSSION

Dry eye syndrome (DES) is a prevalent chronic ocular condition that affects a significant portion of the population, particularly women and individuals with comorbidities. The management of DES is challenging due to its multifactorial nature and the limitations of conventional treatments like artificial tears, which only provide temporary relief without addressing the underlying causes. In this article, we explored the potential of Ayurvedic interventions in managing DES by drawing parallels with the Ayurvedic concept of "*Shushkashipaka*," a condition that bears striking similarities to dry eye disease based on its clinical manifestations.

Ayurveda describes *Shushkashipaka* as a *Vata-pitta* vitiated condition, presenting symptoms of dryness, stiffness of eyelids, blurred vision, pain, stinging sensation, and discharge. Remarkably, these symptoms closely resemble those seen in dry eye syndrome. The parallelism between the two conditions

underscores the relevance of exploring Ayurvedic interventions for DES.

Ayurveda offers a range of therapeutic procedures (*Kriyakalpa*) for the treatment of *Shushkashipaka*, suggesting that these interventions may have efficacy in managing DES. Several *Kriyakalpa* procedures like *Tarpana*, *Putpaka*, *Parisheka*, *Aashchyotana*, *Nasya*, and *Anjana* are discussed in this article, each with its unique mode of action in addressing specific symptoms and imbalances associated with DES.

Tarpana, the practice of nourishing the eyes with medicated *Ghruta*, holds promise for DES management. The application of medicated *Ghruta* helps alleviate dryness and stiffness of the eyelids, and it stimulates the lacrimal glands, promoting tear production. The personalized selection of drugs based on *Doshic* imbalances allows for targeted treatment, making *Tarpana* an effective Ayurvedic approach for DES.

Putpaka, a technique where warm medicated juice is allowed to rest on the open eye, can be employed to restore the eye pH levels after *Tarpana*. This approach aids in clearing blockages in the eye's drainage channels, removing debris and dead skin cells from the eyes, and promoting circulation and cell production. The use of different types of *Putpaka*, such as *Snehana*, *Lekhana*, and *Ropana*, allows for individualized treatment based on the patient's specific symptoms and *Dosha* imbalances.

Parisheka, or continuous pouring of medicated liquid on open eyes, helps in reducing localized inflammation and dryness. The method enhances absorption through the thin skin around the eyes, leading to effective symptom relief. *Parisheka* can be particularly effective for *Shushkashipaka* cases presenting with pain, redness, and burning. It acts well in acute inflammatory conditions of the eye, characteristic of *Aamavastha* of the disease, and aligns with its potential benefits in DES management.

Aashchyotana, the instillation of medicated eye drops, is considered the primary therapeutic procedure for various eye diseases in Ayurveda. In *Shushkashipaka* cases, specific eye drops with properties to counteract *Vata*, *Pitta*, or *Kapha dosha* imbalances can be employed. This treatment may help alleviate inflammation, pain, redness, and burning associated with DES.

Anjana involves applying medicated eye ointments to the eyes, offering nourishment, purification, anti-inflammatory effects, and *Dosha* balancing. Various *Anjana* formulations can be used, each tailored to the specific *Dosha* imbalances and symptoms present in individual patients.

Nasya Karma, the administration of medicated oils or powders through the nasal passages, has been recommended with drugs having *Shirovirechana* properties for *Shushkashipaka*. The regular application of *Anu taila* is suggested for daily use in the form of *Pratimarsh nasya*. *Nasya* helps to expel *Doshas* from the head region and has the potential to improve eye health by nourishing the organs and reducing imbalances.

Other Measures for managing dry eye include an eye-friendly environment, eye exercises, hydration, nutrition, proper sleep, avoiding smoke and air pollution, and stress management are important for overall eye health and dry eye management.

CONCLUSION

Ayurveda offers a holistic and personalized approach to managing Dry eye syndrome (DES) through various *Kriyakalpa* procedures. By drawing parallels with the Ayurvedic concept of "*Shushkashipaka*," an ocular surface disease with similar manifestations, Ayurveda provides valuable insights into the management of DES. *Tarpana*, *Putpaka*, *Parisheka*, *Aashchyotana*, *Nasya*, and *Anjana* are among the therapeutic procedures that hold promise in addressing the multifactorial nature of DES. Ayurveda's personalized and comprehensive approach to addressing DES provides an alternative and complementary therapeutic option for individuals seeking effective and sustainable solutions for their ocular health. Further research and clinical studies are necessary to validate the efficacy and safety of Ayurvedic interventions in managing DES, but the principles and therapeutic procedures described in Ayurvedic texts hold promise in addressing this prevalent eye condition.

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