INDIGENOUS DRUGS FOR EYE DISORDERS IN SHATKALPA ADHYAY OF KASHYAPA SAMHITA

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ABSTRACT

The eye is one of the sense organs with the most important function of vision. Though of prime importance, it is a very delicate and sensitive part of the body and is exposed to the environment. Through ages, different herbs are being used in indian traditional medicine for treating eye disorders. These drugs are termed *chakshushyadravyas* in ayurveda texts, *bruhattrayi* as well as *laghutrayi*. Kashyapasamhita, a text on ayurveda pediatrics contributes a special chapter on six drugs for treating eye disorders in children. The present article reviews indigenous drugs mentioned in the sixth chapter of *kalpa*sthan of kashyapa samhita in the management of eye disorders. Indigenous drugs for eye disorders in *shatkalpaadhyay* of kashyapasamhita: a review. Out of the six drugs stated by kashyapa for treating eye diseases some are common with other textbooks and well known. They have been traditionally used by local people with good results for years but there is a need to re-establish the use of these drugs in prophylaxis and management of eye conditions in a scientific way including standardization and aseptic use of these drugs.

KEYWORDS: Kashyapa, Chakshushya, eye disorders.

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INTRODUCTION

Eye disorders are a very common manifestation in children as well as adults. Ayurveda has included eye disorders under *ShalakyaTantra*, one of its eight branches. There are references to many single herbs and formulations in Ayurveda texts for the management of eye disorders. Those, beneficial for eyes have been termed as *Chakshushya*.⁽¹⁾ These may be useful in prophylactic as well as therapeutic ways for eye health.

Kashyapa Samhita, a specialised book for Ayurveda paediatrics, contains a separate chapter on six drugs for management of eye disorders in children. These are as follows⁽²⁾–1) *Chakshushya*, 2) *Pushpak*, 3) *Mata*, 4) *Rochana*, 5) *Rasanjana and* 6)*Katak*.

Kashyapa advises the application of these six items the eyes along with breast milk in postnatal period up to 4/5/6 months. (3) He further prescribes single or combination of these items for specific eye conditions. Kashyapa has stated three combinations of each drug with either milk/honey/Rasanjan. Only exception is *Katak* (*nirmaliBeej*) which can be used with water also. (4)

Table 1 shows there are many different herbs and formulations mentioned for treating eye disorders in Charak, Sushruta and Vagbhatsamhita along with Madhav Nidan, Bhavprakash, and Sharangdharsamhita. Different Nighantu texts also mention such herbs. The six drugs that are prescribed for the treatment of eye disorders of children in Kashyapa Samhita have been reviewed here.

Table 1: The names of six drugs as mentioned in verses by Kashyapaare as under.

| Drug name | Synonym |
|-------------|--|
| Chakshushya | Kulathi (Cassia absus) |
| Pushpak | Chemically an oxide of Zinc |
| Mata | Haritaki (Terminalia chebula) |
| Rochana | Gorochan (stone or bezoar found from cow) |
| Rasanjan | Semisolid extract of decoction of Berberis |
| | aristrata |
| Katak | Clearing nut (Strychnospotatorum) |

Aim

The review aims to know the Indigenous drugs prescribed for management of ophthalmic conditions by Kashyapa.

Objectives

To understand the use of the drugs in eye disorders To establish the importance and relevance of the use of these drugs

Review of Drugs

Chakshushya

The literal meaning of the name is "good for improving sight." In Ayurveda, the word is used in two meanings -1) To indicate a property of improving eye health. 2) To indicate the herb.

The drug is mentioned under ChakshushyaRasayana which is a category of herbs useful for eye health and treating eye disorders. It is commonly known as Kulathi. Ayurveda classifies this drug under Shimbi Kul. The latin name of the plant is *Cassia absus* and it belongs to family *fabaceae* with recorded Ayurvedic ethnomedical uses. It is applied as collyrium to the eyes.

Synonyms: Chakusya, Aranyakullithaka, vanyaKulattha, Kulali(Sanskrit), Chaksu (Hindi), Chimed (Gujarati), Ivala, Rankulith, Ranhulge (Marathi), Bankulthi, Bankukirtikalay (Bengali), ChanubalaVittulu (Telugu), Karum (Tamil), Jasmeejaz (English), and) Kannkutakinbij, Kadhulig (Kannada).

Table 2: The properties according to Kashyap are⁽⁵⁾

| Rasa | Tikta, kashay |
|---------------------|---------------------|
| Guna | Sheeta |
| Veerya | Laghu, Ruksha |
| Vipak | Katu |
| Prabhav | Chakushya, |
| Effect on tridoshas | Kapha ,Pitta Shamak |
| Part used | Seeds |

I) Mata

It is a synonym of Haritaki i.e. Terminalia chebula. It is also known as black - or chebulic myrobalan. It is also known as "King of medicines."In Bruhattrayi, *Haritak*i has been indicated in *jvara*, *prameha*, *kushtha*, *unmada*, *apasmara*, *kramiroga*, *pandu*, *grahani*, *visha*, *madatyaya*, *and bhutabadha* etc. It has been mostly a drug indicated for Prameha.

Table 3: The properties according to Kashyapa are $^{(6)}$

| ruble 5. The properties according to Rushy apa are | | |
|--|-------------------------------------|--|
| Rasa | Tikta, madhura, Amla, Katu, Kashaya | |
| Guna | Laghu ,snigdha ,sheeta | |
| Veerya | Not mentioned | |
| Vipak | Madhura | |
| Prabhav | Vikasini | |
| Effect on tridoshas | Tridoshashamak | |
| Part used | Fruit | |

II) Rochana

Also known as *Gorochana*, it is a precious substance with medicinal properties in Ayurveda as well as Buddhist literature It refers to a stone or a bezoar obtained from cattle like bull, cow, ox, and yak. Preferably, the one obtained from a cow is considered to be precious and the best for medicinal use. *Gorochan a*acts as an antidote to poisons, promotes clear thoughts and alleviates fevers and contagious diseases. (7)

Table 4: According to Kashyapa the properties of Rochanaare as follows (8)

| Rasa | Tikta, Lavana |
|-----------|---|
| Guna | Ruksha ,ushna, Ghana, Pichchil |
| Veerya | Ushna |
| Vipak | Madhura |
| Prabhav | Mangal karak, Papnashak, Pakshmavardhan |
| Effect on | Vat nashak |
| tridoshas | |

III) Pushpak

Acharya Kashyapa has used this word frequently in the chapter. It seems to be similar to *Pushpanjan*. *Anjana* is a set of drugs counted in seventh place of the *Uprasa* group. ⁽⁹⁾ They are generally identified as *stibnite or antimonite* in English. They are five types out of which *Pushanjan* and *Rasanjan* are mentioned by Kashyapa. But these are not compounds of sulphide mineral. The first one is an oxide of Zinc whereas the second one is of plant origin.

Pushpanjan is prepared by melting Brass. When brass is melted, the zinc present in it reacts with atmospheric oxygen and gets converted into a white powder form like sugar. This powder is identified as *Pushpanjan* and chemically an oxide of zinc.⁽¹⁰⁾ Now a days it is artificially prepared in laboratories. Still some experts are doubtful about this compound.

Table 5: According to Kashypa the properties of Pushpak are (11)

| Rasa | |
|---------------------|-----------------------|
| Guna | Tikshna, ushna |
| Veerya | Sheeta |
| Vipak | - |
| Prabhav | Drushtiprasadan |
| Effect on tridoshas | Pitta and Kaphanashak |

IV) Rasanjan

It is of plant origin and is yellowish in colour. As the trees are more commonly found in North India, its production is more in this part. It is prepared from decoction of *Berberis aristata*or Indian berberis. The decoction of Indian berberis is mixed with an equal quantity of cow milk or goat milk and boiled till it becomes semisolid. This is said to be very beneficial for the eyes by the author of Aarogya prakash. (12) Charaka also indicates its use for tearing of eyes every fifth or

eighth day.⁽¹³⁾ It is stated that it is useful in diseases due to toxic substances. It also cures Shwas, Hikka, and oral diseases.⁽¹⁴⁾

Table 6: According to Kashypathe properties are (15)

| Rasa | Six rasa |
|---------------------|--------------------------|
| Guna | Ruksha |
| Veerya | Sheeta |
| Vipak | madhur |
| Prabhav | Shodhan and Pakshmajanan |
| Effect on tridoshas | Tridoshanashak |

V) Katak

Katak is called a clearing nut as it purifies water instantly. The latin name is *Strychnospotatorum*. It is widely used as a therapeutant in traditional and folk medicines. It belongs to family *Loganiaceae*.

Table 7: According to Kashypathe properties are (16)

| · recording to reasily puttle propertie | | |
|---|------------------|--|
| Rasa | Kashay, Madhur | |
| Guna | Sheeta ,snigdha | |
| Veerya | Sheeta | |
| Vipak | Madhur | |
| Prabhav | Pleasant ,vikasi | |
| Effect on tridoshas | Pitta shamak | |

Synonyms:

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Ambuprasadanaphala, Ambuprasadani, ToyaprasadanaChakshushya, , Kata, Kataka, Katakarenu, Kattha, Khataka, Lekhanatmaka, Payaprasadi, Ruchishya, Ruchya, Rushya, Chhedaniya, Guchhaphala ,Shlakshna, Shodanatmaka, Tiktamaricha, Tiktaphala, (Sanskrit):Neimal, Nelmal, Nirmali (Hindi)Chilbing, Chilhara, Gajara, Nirwali (Marathi) ;Nirmali(Bengal) Katakam, Tetta, Tettamparap, Titramparala(Malayalam) Niemali(Punjabi) Akkolam, Ilalam, Kadali, Sillam, Tatta, Tettankottai, Teru (Tamil) Nirmali (Urdu)

DISCUSSION

References of 105 single herbal drugs, 36 single mineral drugs, and 97 AhariyaDravyas (dietary substances) which are considered to be Chakshushyaare found in various Ayurveda texts. ChakshushyaDarvyas mentioned in Ayurveda has a wide spectrum of actions which includes drugs having preventive or therapeutic or nutritive or rejuvenating properties.⁽¹⁷⁾

Chakshushya (here name of the drug) i.e. Cassia absus is said to be useful in eye disorders. Scientific studies suggest that the drug has high potential as anti-bacterial, anti-hypertensive, antioxidant, antifertility, antifungal, anti-inflammatory, anti-hyperglycemic and anti-glycation activity. Local application of seeds is traditionally used for skin diseases, leukoderma, and eye diseases. Thus for establishing its role in the management of eye disorders strong scientific in-vitro and in-vivo experiments are required before making any confirmatory decisions on pharmacological activities of C. absus, and animal studies are also recommended for these activities.

Anjana is a modality for the topical type of ocular drug administration adopted by Ayurveda. Pushpanjan is sheeta and snigdha in nature and mitigates vitiated Pitta. Its external use cures Netrabhishyanda and reduces the burning of the eyes. It is also useful for external use in Vicharchika and other skin disorders. (20) In classics, we find the reference of this compound as good medicine for Hikka roga. (21)

Pushpanjan is said to be an oxide of zinc. Nanoparticles of Zinc oxide are widely used in cosmetics like sunscreen lotions, foot care ointments, and over-the-counter topical products and coatings (e.g., ultraviolet protection, fungicide in paints), electronic devices, and catalysts.

Kim et al. reported that an animal study with 500 mg/kg/day dose of ZnO nanoparticles for 90 days in rats showed increased retinopathy with local distribution of nanoparticles in ocular lesions. (22) But this was not a local application and the doses were high with longer duration. Ayurveda recommends its application as Churna Anjan in powder form. (23) Synthesis of ZnO nanoparticles using various methods may affect the size, shape, and structure of nanoparticles. The method of preparation of *Pushpanjan* in Ayurveda may make it different than labprepared ZnO.

Children are especially vulnerable to UVR because of their larger pupils and more transparent ocular media. Exposure of the eye to ultraviolet rays has been related with cataract formation and retinal degeneration. Therefore UV protective sunglasses are recommended for eyes. ZnO nano particles absorb UV radiations. Also, the presence of zinc helps restore Vitamin A in the retina. Thus the role of Zinc oxide nano particles in protecting eyes seems to be understood by ancient scholars very well and is still relevant. Kashyapa, being the father of Ayurveda paediatrics seems to have given due importance to child eye health in ancient times, too.

Terminalia chebula (Haritaki) is credited with a number of medicinal activities due to the presence of a large number of different types of phytoconstituents. Haritaki is a component of Triphala, which is a well-known formulation for treating eye disorders. Recently, M. P. Gangammaet al reported marked improvement in symptoms of computer vision syndrome after topical application of Triphala eye drops. (25) Most of the clinical studies of Haritaki are found in combination with other herbs in the management of eye disorders. But use of Haritaki as a single drug applied to eyes, the way Kashyapa has described remains unexplored and holds great potential for research.

The role ofgorochan in ophthalmic studies is yet not established. Hence research is needed in this aspect before making any tall claims despite its traditional history of usage. *Rasanjan* is the most advocated drug for eye disorders. Clinical studies have also shown positive results. A clinical study on the application of *Rasanjan* in infective conjunctivitis showed improvement within a week. (26) Atul Bharadwaj et al reported that eye drops prepared from *Rasanjan* were found to be very effective in relieving all the clinical features. (27)

The ripe seeds of *Katak* (Nirmali Beej)are used for clearing muddy water. The clarification occurs due to the combined action of colloids and alkaloids present in the seeds. (28) There is a lack of clinical studies supporting the direct role of *Strychnospotatorum* in ophthalmology. This paves a new path of research in ophthalmology.

Considering, so much importance given to the six drugs by Kashyapa, the logic of their topical application must be ruled out. In this effort, modern concept of ocular drug administration and nerve growth factors come in picture. Nerve growth factor is a neurotrophic factor, known to play a critical protective role in the development and survival of sympathetic, sensory, and forebrain cholinergic neurons. Recently, the therapeutic role of NGF has been observed on human cutaneous and corneal ulcers, pressure ulcers, glaucoma, maculopathy and retinitis pigmentosa. (29) Trials on ocular administration of various nerve growth factors in rodents have been done and it was found that it promotes recovery of chemically injured cholinergic neurons in the forebrain of the mouse. (30)

Alessandro et al. suggested that eye NGF application can be an alternative route to prevent degeneration of NGF-receptive neurons involved in disorders such as Alzheimer and Parkinson. (31)

The mode of action of Anjan (application of drugs in the form of collyrium) may be in many ways. The clearing of eyes with the use of above said drugs may be in the form of metabolism, evaporation, binding to tear proteins, and washing out. Their absorption may be from cornea, conjunctiva, or systemic route. Whether the six drugs applied in the said way reach the anterior segment or posterior segment or they travel through this route to brain tissues is also not known. Bhutada assessed the effect of eye exercise, TriphalaKwath Eyewash, and Instillation of Distilled Water on Computer Vision Syndrome. (32) Muley et. al. reported the Case of Corneal Melting with Phthisis Bulbi with Uveal Tissue Prolapse in Left Eye. (33) Few studies on eye fatigue and transmission of infection through eye were reported. (34) Jaiswal et. al. reported about Peripapillary Retinal Nerve Fiber Layer Thickness in Patients with Iron-Deficiency Anemia. Needs for safe eye drops are evident in some systemic diseases like diabetes and after surgeries.

Thus, the ocular application of medicines in Ayurvedicway was probably targeted not only as ocular therapeutics but also as a brain protective prophylactic measure. Hence intensive research is needed on the activity of the six drugs in managing eye diseases and protecting eye health.

CONCLUSION

Out of the six drugs stated by Kashyapa for treating eye diseases some are common with other textbooks and well known. They have been traditionally used by local people with good results for years but there is a need to re-establish the use of these drugs in prophylaxis and management of eye conditions in a scientific way including standardization and aseptic use of these drugs. This urges further in-vitro and in-vivo research studies to understand the role of *Chakshushya*, *Mata*, *Pushpanjan*, *Gorochan*, *Rasanjan*, *and Katak* specifically in ophthalmic conditions.

CONFLICT OF INTEREST

Nil

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ETHICAL CLEARANCE

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