


REVIEW ON THE IMPORTANCE OF KRIYAKALPAS IN NETRA ROGAS
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ABSTRACT

The promotion of the visual acuity was considered as one of the priorities in the branch of *Shalakya tantra* of *Ayurveda*. Many procedures and formulations have been described to cure the ophthalmic disorders. Present conventional system of medicine has topical and systemic administration of drugs to the eye which are highly inefficient and there is a need for controlled, sustained release, particularly for conditions that affect all parts of the eye. *Sushruta*, the father of ancient Indian surgery, advocated '*Kriyakalpa*' is the main therapeutic procedure for *Netra Rogas*, along with other forms of treatment. He has described this in a separate chapter in *Uttartantra* of *Sushruta Samhita*. Some of the proven principles of management procedures and medicaments include intake of purified medicated ghee (*Ghritapaana*), nourishing eye bath therapy (*Tarpana*), and processed liquid instillation through nostrils by drops or powders (*Nasya*), eye bath therapy (*Pariseka*), application of medicated paste on eye lids (*Bidalaka*) and collyrium (*Anjana*). These procedures improve the vision by strengthening of the ciliary muscles, maintaining unctuousness of the eye ball, proper accommodation of the lens, delays the senile opacity of the lens etc. On the other hand these procedures also helpful in dealing with inflammatory conditions like conjunctivitis, hordeolum, corneal ulcer, staphyloma, panophthalmitis etc. Thus *Kriyakalpa* can be done in healthy as well as diseased eye conditions to improve the ophthalmic health.

KEYWORDS: *Ayurveda, Netra rogas, Uttar tantra, Kriyakalpa, Eye diseases.*

INTRODUCTION

Kriyakalpa is the basis of the ophthalmic disorders, as *Panchkarma* is the basis of *Kayachikitsa*. When we refer to our classics for the therapeutic measures adopted in the management of eye diseases, we find that the management includes many of the topical treatments along with systemic ones. The reason might be that the drugs administered systematically may not cross the blood aqueous, blood-vitreous and blood-retinal barriers. Ancient seers have designed many unique routes of drug administration and also varied formulations to suit the anatomy, physiology and pathological status of all parts of the body and more importance is given to design eye medicaments. The eye being a very vital and sensitive part was of main focus while designing *Kriyakalpas*- *Charaka Samhita* deals with the diseases of the entire body on the medical lines without paying any special reference to the disorders of the eye, ear, nose and throat^[1]. However, some references are available regarding the eye ailments saying that eye disorders should be treated with the help of mentioned three *Kriya kalpa* in *Chikitsa Sthana* i.e. *Bidalaka*, *Aaschyotana* and *Anjana*^[2]. *Acharya Sushruta* mentioned five *Kriya kalpa* i.e., *Seka*, *Aaschyotana*, *Anjana*, *Tarpana* and *Putpaka*^[3]. *Acharya Sharangadhara* mentioned 7 *Kriya kalpa* five of them are same as *Sushruta* and added *Pindi* and *Bidalaka* to them^[4]. *Acharya Bhavamishra* has meant the same seven types of *Kriyakalpa* as that of *Sharangadhara Samhita* while *Chakradatta* has described complete chapter for *Netraroga* with many formulations and *Bahirgunthana Vidhi* for acute

eye condition^[5] which include *Seka* and *Aschyotana* (continuous pouring or instilling drops). Now all these topical measures came into play and these are called as '*Kriya Kalpas*'.

***Kriyakalpa*^[6]**

Kriyakalpa is the main therapeutic process for ophthalmology in *Shalakya tantra*, as the *Panchkarma* is the bases of *Kayachikitsa*. The word *Kriyakalpa* built from two words: *Kriya* and *Kalpa*. *Kriya* means therapeutic procedures for *Chikitsa* used to cure the disease and *Kalpa* means practicable, possible, manner of acting, a prescribed rule. So *Kriyakalpa* means specific formulation used for therapy in *Ayurvedic Ophthalmology*. It includes selection of specific procedure, preparation of special drug form and finally its proper application to the eyes. When we refer to our classics for the therapeutic measures adopted in the management of eye diseases, we find that the management includes many of the topical treatments along with systemic ones. The reason might be that the drugs administered systematically may not cross the blood aqueous, blood-vitreous and blood-retinal barriers. Now the topical measures came into play and these are called as '*Kriya Kalpas*'.

Etymology

Kriyakalpa is formed by two words as *Kriya* and *Kalpa*. Word *Kriya* refers here to therapeutic procedures, which cures the disease without causing any adverse effects while the word *Kalpa* indicates the specific

formulations adopted for the therapeutic procedures. Hence, the word *Kriyakalpa* literally means to perform proper treatment.

Definition of *Kriyakalpa*

No specific definition of *Kriyakalpa* has been given by the ancient scholars except the commentator *Dalhana*

who opines that *Kriyakalpa* includes various preparations like *Tarpana*, *Putapaka* etc. for the treatment of eye diseases, as a local measure.

Classification and Indication of *Kriyakalpa*

Astanga Hridaya indicated for *Tarpana Karma* in following symptoms and diseases

S.N.	Eye Symptoms [8]	S.N.	Eye Diseases [9]
1.	When a patient sees darkness / blackouts in front of eyes	1.	<i>Kricchroomeelana</i>
2.	In severe dryness of the eyes	2.	<i>Siraharsha</i>
3.	Roughness of the eyes	3.	<i>Sirotapata</i>
4.	Stiffness of the eyelids	4.	<i>Arjuna</i>
5.	Falling of eye lashes / Madrosis	5.	<i>Shukra</i>
6.	Dirtiness of the eyes	6.	<i>Timira</i>
7.	Deviated eye ball / Squint	7.	<i>Abhishyanda</i>
8.	In extreme aggravation of the diseases of the eye	8.	<i>Adhimantha</i>
9.	Injured eyes due to Abhighata	9.	<i>Anyatovata</i>
10.	Altered or lost lusture of ocular surface	10.	<i>Vataparyaya</i>
11.	Falling of eye sights	11.	<i>Vatika</i> and <i>Paitika</i> diseases of eyes

Tarpan Dravyas

- *Ghritha* prepared from *Kwatha of Kashmarya, Madhuk, Kumuda, Utpala, Urupaga, Kushtha, Brihati, Tamala, Mamsi, Sariva, Prapaundarika, Darbhama, and Kasheru* in milk. This *Ghritha* can be used.
- By using *Aja Yakrita, Agar, Priyangu, Nalada, and Devadaru* prepare *Ksheerapaka*. *Navaneeta* from the curd obtained from this *Ksheerapaka* is used for *Tarpana*.

Tarpana duration: a) According to *Dosha*- i. *Vata*- 1000 *Matra* ii. *Pitta*- 800 *Matra* iii. *Kapha*- 600 *Matra* b) According to *Adhithana*- i. *Vartma*- 100 *Matra* ii. *Sandhi*- 300 *Matra* iii. *Shukla*- 500 *Matra* iv. *Krisna*- 700 *Matra* v. *Drishti*- 800 *Matra* vi. *Sarvagata*- 1000 *Matra*. [10]

How Netra Tarpana Work: By virtue of its *Sanskaranuvartana* property, *Ghritha* attains the properties of ingredients without losing its own. *Ghritha* is supreme in *Jangama Sneha* and is *Balavardhaka, Ojovardhaka, Vayasthapana, Agni Deepana and Dhatuposhaka*. *Acharya Charaka* in *Sutrasthana Snehadhyaya* explained that, "*Snehoanilam Hanti*" which means that *Snehana* is the supreme treatment for *Vata Dosha*. He mentioned *Akshi - Tarpana* as one of the 24 *Snehapravicharana* in *Sutrasthana* 13th chapter. According to *Charaka*, *Ghritha* is effective in subsiding *Pittaja* and *Vataja* disorders; it improves *Dhatu*s and is overall booster for improving *Ojas*[11].

2.) Putapaka:- In this process the oily (ghee) substance is kept in eye for a specific time by special arrangement. Simple ghee or oil is used as medicine which is the form of suspension. So its particles do not leave the eye and contact time is more and more drugs are absorbed. It will cross corneal epithelium barrier easily due to its lipophilic property. *Putapaka* can be done in all those conditions in which *Tarpana* is done. Those in whom *Nasya* (nasal instillation of medications), *Tarpana* and *Snehapana* (treatment in which medicated oils or ghee is given for

intake in metered doses either everyday or as a part of pre-treatment procedure for *Shodhana vis-à-vis* cleansing procedures) are contraindicated are not eligible to take *Putapaka*. *Putapaka* can be done for those eligible to take the treatment after the aggravation of *Dosha's* has been subsided.[12]

Indications: It is indicated when eye get fatigued after the *Tarpana*, i.e., for rejuvenation of eyes. *Putapaka* is used to give energy to the eyes to overcome from fatigued stage. *Putapaka yogas* are-

- *Putapaka* prepared from *Nimba Patra and Lodhra* with *Jala*.

- Juice of cooked *Aja Yakrita*, camel, Pig with *Pippali, Saindhava, Madhu* and *Ghritha* prepared as *Putapaka* method. This *Ghritha* can be used for *Tarpana*.

Types of Putapaka: *Putapaka* is of 3 types :[13]

i) Snehana Putapaka (*Putapaka* having or admixed with fats or prepared with unctuous or fat-rich drugs)- The below mentioned are used for *Snehana Putapaka*:- *Sneha* (ghee or oil), *Mamsa* (meat), *Vasa* (meat soup), *Majja* (bone marrow), *Meda* (fat) and *Madhura aushadha* (medicines or drugs having sweet taste)[14].

Indications:- It is preferred to be done in a person having *Rukshata* (excessive dryness in the body) or *Ruksha netra* (dryness in the eye), *Vata* disorders of the eye.

Duration- It is done for 200 *Matra kala*.

ii) Lekhaneeya Putapaka (*Putapaka* prepared using drugs having a scraping nature i.e. capacity to scrap off the *Kapha* and fat) The below mentioned drugs are mixed together and used for *Lekhaneeya Putapaka*:- *Jangala yakrit mamsa* (flesh or meat of the liver of animals and birds living in dry and desert regions), *Shunti* (Ginger), *Maricha* (Pepper), *Pippali* (Long pepper), *Krishna* or *Kanta loha bhasma* (Ash or calyx of magnetic iron), *Tamra bhasma* (Calyx or ash of Copper), *Shankha Bhasma* (Ash or

calyx of conch), *Pravala bhasma* (Calyx or ash of Coral), *Saindhava lavana* (Rock salt), *Dadhi* (curds etc).^[15]

Indications: It is preferred to be done in a person having *Snigdhatata* (oily body or excessive unctuousness of the body) or *Snigdha netra* (very unctuous eyes).

It is preferred to be done in *Kapha-Vata* conditions or *Kapha-Vata* disorders of the eye.

Duration: It is done for time duration of 100 *Matra kala*

iii) Ropaneeya Putapaka: Prepared by the Milk, *Madhu*, *Ghritha Jangala mansa* and *Tikta rasa dravyas*. It is preferred for bringing strength and luster in the eye or in eyes afflicted by morbid ^[16]

Indications: *Pitta*, *Rakta* or *Vata* or eyes afflicted with *Vrana* (ulcers). *Acharya Vagbhata* names it as *Prasadana Putapaka* (*Putapaka* prepared with nourishing drugs) and indicates its usage in *Drishti Roga's* (Vision related disorders).

Duration: It is done for time duration of 300 *Matra kala*.

3) Seka: *Seka* is defined medicated solution poured as stream from 4 *Angula* on closed eye continuously for specific time according to *Doshas*. It is more beneficial in those conditions which are strong and cannot cure with *Aschyotana*. In this process "medicine is poured on closed eye (on eye lids) continuously from four inches height for a specific time according to *Dosha*" so the medicine is absorbed through skin of lids.

Classification and doses ^[17]

- Lekhna* (200 *Matra*)- *Kapha Roga*
- Ropana* (600 *Matra*)- *Pitta and Rakta Roga*
- Snehana* (400 *Matra*)- *Vata Roga*

Indications

- Itching in the eyes
- Watery eyes
- Conjunctivitis
- Burning eyes
- Dry
- Photophobia

4) Aschyotana: It is indicated as first procedure in all eye diseases. Instilling medicated Ghee / Drops to eyes for specific frequency. This is useful in Dry eyes, myopia, and allergic and inflammatory eye disorders. *Aschyotana* is *Adya upakrama* in which medicated drops are instilled into open eye from do *Angula* (approximate 2") height at *Kanineeka Sandhi*. Most commonly used medicated drop for *Aschyotana* is *Triphala Kwath* containing *Amalaki* (*Emblia officinalis*), *Bibhitaki* (*Terminalia bellirica*) and *Haritaki* (*Terminalia chebula*).

Indications: Initial stage of eye disease when *Doshas* are not severely vitiated specially *Pitta Dosha*. It is used in eye condition like mild pain, redness, watering, foreign body sensation, itching, burning sensation, congestion of vessels etc. It is contraindicated in night.

Classification and Doses: ^[18] a. *Lekhana* (8 drops) - *Kapha Roga* b. *Ropana* (12 drops)- *Pitta and Rakta Roga* c. *Snehana* (10 drops)- *Vata Roga*.

5) Aanjan

The medication applied in the form of ointment to the eyes is termed as *Anjana*. When the patient has undergone the *Shodhana* therapies of *Vamana* and *Virechana* and the *Niraama Dosha* are causing eye diseases, then *Anjana* should be done.

Types: The *Anjana* are of three types, as we have to treat diseases developed by three different humours.^[19]

1) *Lekhana anjanas* mentioned for *Kapha* predominant conditions 2) *Ropana anjanas* for *Pitta* related diseases 3) *Prasadana anjanas* for *Vataja vikaras*.

Preparation of Anjana: The *Lekhana anjanas* are made of *Dravyas* having *Kashaya*, *Amla*, *Lavana* and *Katu in rasa*, *Ropananjanas* are with *Thiktha dravya* and *Prasadanjanas* with *Madhura seeta dravyas*.^[20]

Time of applications of Anjana ^[21]

There is different opinion regarding the timing of *Anjana*. During night due to sleep and in the day time because of the hot rays of sun the eye becomes weak, so it is advised to do *Anjana* both morning and evening. While applying in the morning time it should be *Kapha samana* in nature as there is chance of vitiation of the same in the morning while in the evening it is better if it is *Pitta samana* as it may make the eye fresh and cool which became weak due to the exposure to hot sun in this way the application of *Anjana* in morning and evening surely correct the daily vitiation of *Doshas* in a healthy eye. It is not applicable in pathological eye. The other opinion is regarding the application of *Theekshnanjana*, as it contains *Katu*, *Lavana*, *Amla dravyas* which of boutique combination of *Agni vayu* applying it in day time will again harm the eye as there is hot outside, but during night the coolness of the moon helps the eye to recover easily from the ill effects of *Theekshnanjana*. But according to some, application of *Anjana* in night should strictly avoided to them the *Seetha* in night it will cause *Stambhana* so the drug can't act properly. *Acharya Susruta* advises to do *Anjana* in morning for *Kapha* predominant eye diseases, during evening for *Vata* related eye diseases and in *Rakta pitta* diseases it is advised to do in night.

Mode of action: ^[22]

After deciding the type and dose of *Anjana* the desired amount of it can be applied in the eye Using the different *Salakas* mentioned for particular purpose i.e., If *Lekhana* is the aim of treatment the *Salaka* made of *Tamra* (copper) is the best option and for *Ropana* karma a *Kalalohaja* (iron) *salaka* is better and if *Prasadana* is the ultimate aim of treatment one can prefer a *Salaka* made of *Roopya* (silver) *Suvarna* (gold) and *Anguli* (finger) is also mentioned for the application of *Anjana* in the eye. After applying the *Anjana* patient is asked to move the eye ball after gently closing the eye, the patient is asked to move the eye so that *Anjana* may spread all over the surface of the eye, opening and closing of the eye spontaneously, rubbing of the lid forcefully and washing of eye should be avoided just after the application of *Anjana* karma. When the eye becomes free from the gritty feeling developed after the application of *Anjana netra prakshlana* should be the performed with suitable decoction. While preparing the decoction the factors like disease, *Dosha* and season

should be considered. After washing the eye, it should be cleaned with a piece of clean cloth. In conditions like severe vitiation of *Kapha*, *Dhoomapana* can be advised after *Anjana*. *Theekshnanjanas* are contraindicated for prolonged use, and *Prathyanjanas* are advised for correcting the complications if developed during application of *Theekshnanjanas*.^[23]

6) Pindi- Bandaging a medicated bolus over closed eye for a stipulated time period. Also known as *Kavalika* it is indicated in *Abhishyandha*, *Adhimanth*.^[24]

Indications- Acute stages of all eye diseases in general and *Abhishyanda* in particular. It reduces inflammation produced due to trauma or wound.

7) Bidalaka- Application of medicated paste over the eyelids for a stipulated time. It is application of medicated paste to eyelids externally except at eye lashes.^[25]

Indications- Acute stages of eye disorder, burning sensation, swelling, discharge, redness, pain, foreign body sensation etc.

OCULAR PHARMACOLOGY

Ocular pharmacotherapeutics can be delivered by four methods ^[26].

1. Topical instillation in to conjunctival sac as in the form of drops ointment gel and ocuserts.
2. Peri ocular injection – these include subconjunctival, subtenon, retro- bulbar and peri bulbar injection.
3. Intra ocular route-intracameral injection (into anterior chamber) intravitreal injection (into vitreous cavity)
4. Systemic administration –in the form of antibiotics and steroids. Eye drops are the simplest and most convenient method of topical application. It is instilled in two forms i.e aqueous solution and aqueous suspension.

In solution drugs are totally dissolved but it's quickly diluted by tears and drains in to NLD. So tissue contact time is less in suspension tissue contact time is higher than solution because the drug is presents as small particles and kept suspend in aqueous medium.

Ointments and gel increases bioavailability of drugs by increasing the tissue contact time and by preventing dilution and drainage of active ingredients. Ocuserts form a system of drug delivery through membrane. These can be placed in upper or lower fornix to a week. The corneal epithelial tight junction and lipid – water-lipid sandwich layer provides mechanical and chemical barrier for the drug absorption. The lipophilic and hydrophilic substance can be effectively delivered. Permeability across sclera depends on size and weight of molecules ^[27]. Depending upon this ocular pharmacology the therapeutic effect of *Kriyakalpa* can be understandable and conclusion of the effects can be drawn as follows.

CONCLUSION

As in Ayurveda, we are applying ophthalmic therapeutics either in the form of local therapy i.e. *Kriyakalpa* or in the form of systemic use i.e., oral *Chakshushya dravyas*. The main aim of any pharmacotherapeutics is the attainment of an effective concentration at the site of action for a sufficient period of time to elicit the response. In practice, therapeutic effect is found in all types of *Kriyakalpa*. It is up to the science to correlate the

observations with their scientific explanation. Here in present review article, it is tried to correlate the *Ayurvedic* ocular therapeutic i.e. *Kriyakalpa* on the basis of modern pharmacotherapeutic. Various drugs can be selected according to the stage and types of the disease and can be used in various *Kriyakalpa* procedures according to need. In the light of above fundamentals of modern pharmacology, all the *Ayurvedic* ocular therapeutic procedures are relevant as such.. Today current methods of drug delivery exhibit specific problems that scientists are attempting to address. For example, many drugs' potencies and therapeutic effects are limited or otherwise reduced because of the partial degradation that occurs before they reach a desired target in the body. If orally administered time-release medications deliver treatment continuously, rather than providing relief of symptoms and protection from adverse events solely when necessary. Present conventional system of medicine has topical and systemic administration of drugs to the eye which are highly inefficient and there is a need for controlled, sustained release, particularly for conditions that affect the posterior segment. Various non implantable and implantable drug delivery devices have been developed which are far from satisfactory and result in more adverse effects which is driving scientists to research more and more into safe, effective drug delivery methods for all parts of the eyes.

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