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Review Article

CRITICAL REVIEW OF TARPANA

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ABSTRACT

Eyes are one of the most important sensory organs in human body. Despite amazing improvements and advancements in contemporary ophthalmology, there are limitations. The majority of inflammatory eye illnesses are effectively treated in the western medical system. However, neurological eye illnesses and degenerative eye conditions are resistant to even the most advanced new generation methods. In India alone, thousands of patients suffer from neurological and degenerative eye problems. Even if contemporary medicine has made tremendous and astonishing advances in the field of ophthalmology in recent years, the significance of Ayurvedic treatment for eye illnesses cannot be overlooked. Ayurveda, an ancient medical system, provides valuable knowledge not just for treatment but also for prevention. *Tarpana* is one of the most well-known ocular remedies in Ayurveda, and it is recognized to provide a definitive solution to the problem of ocular illnesses. Thus, it is vital to investigate the mode of action of *Tarpana* and provide an exact pharmacodynamics image of the medication in order to explain its utility in a scientific manner. With this perspective, an effort was made to identify the scientific data that can validate *Ayurvedic* concepts.

KEY WORDS: *Tarpana, Kriyakalpa, Akshi, Ayurveda, Ghrita, Chikitsa.*

INTRODUCTION

The eye is the primary sense organ gifted to humans by God. The value of an eye has been highlighted by *Ayurveda* in the quotation "*Sarvendriyanam Nayanam Pradhanam.*"ⁱi.e., eye is the prime sense organ among the all sense organs. It is discussed in depth by *Sushruta*. In *Uttartantra*, *Sushruta* explained the medicinal, surgical, and preventative aspects of *Netra* in 19 chapters. *Netra (Akshi)* is a crucial organ for *Indriya Janya Gyana* (sensory knowledge), which is regarded as the origin of *Pratyaksha Gyana* (direct perception). *Netra* is the most essential of the five *Indriyas* (sensory organs), via which we obtain knowledge without a doubt.

According to ancient Indian philosophy, all materials, whether alive or non-living, are composed of five essential elements called *Panchamahabhutas*, and all body parts are also composed of the combination of these *Mahabhutas*. In the case of *Netra*, *Teja Mahabhuta* predominates.ⁱⁱ The *Netra* is perpetually threatened by *Kapha Dosh*, which possesses the exact opposite properties of *Teja Mahabhuta*. The location of *Alochaka Pitta* is the eye. According to *Ashtanga Hridaya*, every person should make conscientious attempts to keep his or her vision till the end of life, because for a blind person, day and night are the same, and this lovely world is of no use to him, even if he is wealthy.ⁱⁱⁱ All attempts should be made to strengthen the eyes by using *Nasya*, *Anjana*, *Tarpana*, and other remedies. Once vision is lost, the world's diversity will be melded into one, of uniform blackness.[4] Despite the fact that modern medical science has made significant and amazing advances in the field of ophthalmology in recent years, the value of *Ayurvedic* treatment in eye problems cannot be overstated.

Apart from *Samanya Chikitsa*, each wing of *Ayurveda* has produced *Visishta Chikitsa*. For example, *Basti Chikitsa* is the *Chikitsardha* in *Kayachikitsa*, *Rakthamokshana* is the *Chikitsardha* in *Shalyachikitsa*, and *Kriyakalpas* is the main mode of treatment in *Shalaky Tantra*. *Kriyakalpas* are the procedures done in *Shalaky Tantra* that have far-reaching consequences in the management of *Netra Vikaras*. *Kriyakalpas* are intended to relieve *Sthanika Khavaigunya* caused by vitiated *Doshas* and their impact on *Netra Avayavas*. *Kriya Kalpas* can also be employed as *Swasthya Sanrakshaka Prayoga* to keep the sense organs functional and overcome age-related ailments. *Kriya Kalpas* includes *Seka*, *Aschyothana*, *Tarpana*, *Putapaka*, *Anjana*, *Bidalaka*, and *Pindi*.^{iv} *Netra Tarpana* is the most commonly employed and important *Kriya Kalpa* for eye diseases.

Akshi Tarpana serves as both a preventive and curative therapy for preserving proper eye health. *Brimhana* is found in nature. The term *Akshitarpana* (also known as *Netrabasti*) comes from Sanskrit, where *Akshi* refers to the eye and *Tarpana* refers to the process of nutrition or satiation.

Akshi Tarpana is an *Ayurvedic* cleaning and rejuvenation treatment offered at *Ayurvedic* care facilities as part of the *Panchakarma* treatment. *Akshi Tarpana* is a method in which lukewarm medicinal ghee is made to remain stationary in the eyes for a predetermined amount of time in a specific constructed frame. The therapy

is extremely useful for eye relaxation and the treatment of numerous eye problems. It feeds the eyes while also improving and strengthening the *Drishti Shakti*. In *Vataja* and *Pittaja Vikaras*, it is a highly successful preventive and curative technique.

Indications for *Tarpana Karma*'

1. *Avilekshana* (Blurred vision)
2. *Tamyati/Tama/Timira* (When a patient sees the darkness in front of eyes)
3. *Ati Vishushkatva* (Dryness of the eyes)
4. *Rukhsanetrata* (Roughness of the eyes)
5. *Ati Daruna netra* (Excessive crusting of eyelids)
6. *Shirnapakshma* (Falling of eyelashes)
7. *Avilaneetra* (Dirtiness of the eyes due to discharges)
8. *Jihmna netra* (Deviated eyeball or squint)
9. *Klishtaroga* (In extreme aggravation of the diseases of the eye)
10. *Netrabhighata* (Ocular trauma)
11. *Vata pittaja rogas*
12. *Kricchronmilana* (difficulty in opening eyes),
13. *Siraharsha* (conjunctival blood vessel congestion),
14. *Sirotpata* (episcleritis),
15. *Arjuna* (subconjunctival haemorrhage),
16. *Syanda* (conjunctivitis),
17. *Adhimantha* (glaucoma/uveitis),
18. *Anyatovata* (referred pain in the eye or sphenoidal sinusitis),
19. *Vataparyaya*
20. *Shukra roga – Savrana Shukla* (corneal opacity).

Contraindications for *Tarpana Karma*^{vi}

According to *Acharya Sushruta*, *Tarpana* is not indicated;

1. On a cloudy day.
2. Extreme hot or cold seasons.

3. In conditions of worries and anxiety.
4. In conditions of tiredness and giddiness of eyes.
5. In complications of eyes.
6. In the condition of acute pain.
7. inflammation, redness, etc.⁷

PROCEDURE^{vii}

Shodhana Karma is performed in accordance with standard protocol. Later *Sthanika Abhyanga* and *Mridu Swedana* is done.

Pradhana Karma

Ideally, *Akshi Tarpana* is performed in the early afternoon or late afternoon on an auspicious day, after the patient has digested his or her meal and after the entire patient has undergone appropriate purification treatments. An airy, well-lit, and dust-free room is provided for the patient to rest in supine position. *Masha* paste is then applied to the *Pali* (wall) around the eyes to create a solid, leak-proof barrier. *Pali* can expand to a height of two *Angulas* according to *Vagbhata*. It is advised that the patient closes his or her eyes and a solution of *Ghrita*, which has been processed with the correct medications and has been dissolved in lukewarm water is poured on top of his or her closed eyes. Intermittent and steady eye movement is requested from the patient.

Paschata Karma

After Emptying the *Ghrita* through a hole in the dough wall, near the outer canthus of the eye, the eye is irrigated with lukewarm water fomentation after the *Ghrita* has been retained for a specified period. *Shirovirechana* (*Nasya*) and fumigation (*Dhoompana*) with *Kapha*-suppressing medications should be used to eradicate *Kapha* that has already been aroused by *Ghrita*'s potency. Lights, wind, sky, mirrors, and illuminating bodies should be avoided at all costs by the patient.^{viii}

Snehadharanakala or period of retention of *Ghrita*^{ix,x,xi}

Snehadharanakala is instigated considering *Adhishtana* of diseases and severity of *Dosha Prakopa*.

<i>Adhithana</i>	<i>Su.Sa.</i>	<i>As.Hr.</i>	<i>Sh.Sa.</i>	<i>Bp</i>
<i>Sandhigata</i>	300	300	500	500
<i>Vartmagata</i>	100	100	100	100
<i>Shuklagata</i>	500	500	600	-

<i>Krishnagata</i>	700	700	700	700
<i>Drishtigata</i>	800/1000	800	800	800
<i>Sarvagatha</i>	1000	1000	1000	1000
<i>Su.Sa. -Susrutha Samhita, As.Hr.-Ashtanga Hrudaya, Sh.Sa. -Sharangadhara Samhita, BP-Bhavaprakasha.</i>				

Days of procedure or *Tarpana Avadhi*^{xii,xiii}

Without defining the condition of the eyes, *Acharya Sushruta* just requests that the treatment be performed for one day, three days, or five days, or until the *Samyaka Tarpita Lakshanas* are seen. According to *Acharya Jejjata*, *Tarpana* should be performed for one day for *Vataja* ailments, three days for *Pittaja* disorders, and five days for *Kaphaja* diseases. Depending on *Dosha* and *Teevratha* of *Vyadhi* as well as *Swasthya*, *Tarpana* can be performed every day, every other day, on alternate days, with a two-day or three-day respite, or with an interval of two days or three days. According to *Acharya Vagbhatta*, *Tarpana* should be performed daily in *Vata* vitiation, on alternate days in *Pitta*, with a two-day gap in *Kapha* and in *Swasthya* (healthy person), or until the eyes are completely sated.

Samyak Tarpita Lakshana^{xiv}

- ✓ *Sukhaswapana*-good (sound) sleep
- ✓ *Avbodhatva*-blissful awakening
- ✓ *Vaishadhya*-clearness of the eyes
- ✓ *Varnapatava*-discernment of individual colours
- ✓ *Nivriti*- feeling of comfort
- ✓ *Vyadhividhvansa*-cure of the disease
- ✓ *Kriyalaghvama*-easiness in closing and opening the eyes
- ✓ *Prakashkshamta*-ability to withstand bright light

*AtiTarpitaLakshanas*¹⁵

- ✓ *Netragaurava*-heaviness in eyes
- ✓ *Avilta*-indistinct vision
- ✓ *Atisnigdhatata*-excessive oiliness
- ✓ *AshruSrava*-lacrimation

- ✓ *Kandu*- itching
- ✓ *Upadeha*-stickiness
- ✓ *Dosha Samutklishta*-aggravation of *Dosha*

***Heena Tarpita Lakshana*¹⁵**

- ✓ *Netrarukshata*-dryness of eye
- ✓ *Avilta*-indistinct vision
- ✓ *Ashrusrava*- lacrimation
- ✓ *Asahyamroopdarshan*-difficulty in vision
- ✓ *Vyadhivridhi*-aggravation of disease

Treatment of inadequate and excessive *Tarpana*^{xv}

Dhoompana, Nasya, Anjana, Seka either *Ruksha* or *Snigdha* are to be done for treating both inadequate and excessive *Tarpana* conditions according to predominance of *Dosha*. *Snigdha Seka* in disease of *Vata* predominance, *Ruksha* in *Kapha* and *Sheeta Seka* in *Pitta* predominance *Dosha*.

Formulations used for *Tarpana*

Triphala Ghrita, Mahatriphla Ghrita, Patoladi Ghrita, Jeevantiyadi Ghrita.

Challenges in ocular drug delivery & *Tarpana*:

Tarpana can potentially be considered as a topical administration method for ocular medication delivery. For the majority of topically applied medications, the site of action is typically distinct layers of the cornea, conjunctiva, sclera, and other anterior segment tissues including the iris and ciliary body (anterior uvea). Precorneal variables and anatomical obstacles decrease the absorption of topical preparations upon application. Pre-corneal factors include:^{xvi}

- Solution drainage,
- blinking,
- tear film,
- tear turnover, and
- induced lacrimation

Due to its high turnover rate, tear film, whose composition and quantity determine a healthy ocular surface, is the first line of defense. Mucin in the tear film protects by generating a hydrophilic layer that glides across the glycocalyx of the ocular surface and clears it of debris and pathogens.^{xvii} However, tear film restoration time is only 2–3 minutes, and most topically administered treatments are washed away 15–30 seconds after

instillation. Taking into account all precorneal variables, the contact time with the absorptive membranes is shorter, which is regarded as the fundamental reason why less than 5 percent of the applied dose reaches the intraocular tissues.^{xviii} In the case of *Tarpana*, the volume of drug retained over the ocular surface is significantly greater than that of eye drops; consequently, mucin may be diluted by *Ghrita* or any other *Tarpana* drug, thereby removing the hydrophilic layer barrier and increasing the amount of drug available for absorption. In addition, different layers of the cornea, conjunctiva, and sclera play a significant impact in drug permeation. The cornea, the anteriormost layer of the eye, is a mechanical barrier that prevents foreign substances from entering the eye and safeguards the ocular tissues. It is composed primarily of the epithelium, stroma, and endothelium. Each layer has a distinct polarity and a potential rate-limiting structure for drug diffusion. The lipoidal structure of the corneal epithelium, which includes 90 per cent of the cornea's total cells, confers great resistance to the absorption of topically administered hydrophilic medicines. In addition, the superficial corneal epithelial cells are connected by desmosomes and encircled by ribbon-like tight junctional complexes (zonula occludens)^{xix}. The presence of these tight junctional complexes inhibits paracellular drug absorption from the tear film into intercellular gaps of the epithelium and inner corneal layers. *Tarpana* is typically performed using lipophilic medications in the form of *Ghrita*, *Vasa*, etc., so it can be well absorbed via the lipoidal membrane and also nourish it to increase its function. In addition, *Tarpana* is administered in a lukewarm state, which may elongate the tight junctional complexes and permit paracellular drug absorption. The stroma, which accounts for 90 per cent of corneal thickness, is composed of an extracellular matrix and collagen fibrils arranged in a lamellar fashion. The nature of the stroma, which is highly hydrated, offers a formidable barrier to the passage of lipophilic medicinal molecules. The endothelium is a monolayer of hexagonal-shaped cells that forms the deepest layer of the body. Even though endothelium is a barrier between the stroma and aqueous humor, its selective carrier-mediated transport and secretory function aid in maintaining the aqueous humor and corneal clarity.^{xx} The presence of these tight junctional complexes inhibits paracellular drug absorption from the tear film into intercellular gaps of the epithelium and inner corneal layers. *Tarpana* is typically performed using lipophilic medications in the form of *Ghrita*, *Vasa*, etc., so it can be well absorbed via the lipoidal membrane and also nourish it, so enhancing its function. In addition, *Tarpana* is administered in a lukewarm state, which may dilate the tight junctional complexes and permit para-cellular drug permeability. The stroma, which comprises 90% of corneal thickness, is composed of an extracellular matrix and a lamellar arrangement of collagen fibrils. The highly hydrated nature of the stroma creates a formidable barrier to the passage of lipophilic medicinal molecules. Endothelium consists of a monolayer of hexagonal-shaped cells. Despite the fact that the endothelium is a barrier between the stroma and aqueous humor, its selective carrier-mediated transport and secretory function aid in maintaining the aqueous humor and corneal transparency.^{xxi} In contrast, in *Tarpana*, the drug is administered in a dose high enough to provide sufficient bioavailability even after the loss of systemic circulation; hence, it can operate both locally and systemically. The limbus is the origin of the sclera, which is continuous with

the cornea and continues posteriorly over the remainder of the globe. The sclera is predominantly composed of collagen fibers and proteoglycans encased in the extracellular matrix. It is believed that the permeability of the sclera is comparable to that of the corneal stroma. According to recent reports, the permeability of drug molecules through the sclera is inversely proportional to the molecular radius.^{xxii} When *Tarpana* is made with *Siddha Ghrita*, it has more small chain fatty acids with a small molecular radius than long-chain fatty acids. So, they might be easy to take in.

Pressure effect and refractive index: *Tarpana* increases the axial length of the lens by exerting extraocular pressure on it. Though this pressure impact is temporary, the oleation and hydration supplied by *Tarpana* may improve accommodation, allowing this pressure effect to last longer.

More contact time: *Ghrita* preparations used in *Akshi Tarpana* are in the form of suspensions containing various medication particles, which do not leave the eye as quickly as a solution. *Akshi Tarpana* can improve therapeutic concentration by increasing tissue contact duration and bioavailability.

Accommodation and visual acuity: The ability of the eye to modify the refractive power of the lens to automatically focus on objects at varying distances is referred to as accommodation. It is a complex constellation of sensory, neuromuscular, and biophysical events that cause the overall refracting power of the eye to rapidly vary in order to clearly depict things at varied viewing distances on the retina.^{xxiii} *Tarpana* may act over the accommodation capacity of the eye by providing nutrition not only to the cornea but also to the sphincter muscles and nerves innervating it.

Nutritional supplement from Tarpana drugs: *Ghrita* is used generally for *Tarpana* which contains mainly omega-3 & 6 fatty acids, Vit A, E & K & antioxidants.^{xxiv} Milk is also used for *Tarpana* which encompasses a variety of Vitamins, minerals, aminoacids etc.^{xxv}

Transient local vasodilatation of conjunctival vasculature (by *Sthanik Mridu Sweda* and *Sukhoshna*
lipophilic in nature *Ghrita*)



Epithelium-endothelium of cornea



Enhanced absorption of drugs in the deeper of layers



Absorption through cornea irrespective mol. Size



Intraocular drug absorption to anterior lens capsule, ciliary muscles, cornea and other tissue



Desired therapeutic action



Relief in symptoms

CONCLUSION:

The eye is the primary sense organ given to humans by God. For a blind person, day and night are the same, and even if he has a lot of wealth, this lovely world is useless to him, thus every individual should make earnest attempts to keep his or her vision until the last breath of life. Despite significant growth and breakthroughs in contemporary ophthalmology, there are certain limitations. *Ayurveda*, the ancient school of medicine, provides valuable instructions not only in terms of treatment but also in terms of prevention. *Akshi Tarpana Karma* is a local therapeutic method that, when administered swiftly, produces objective evidence of outstanding results.

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