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KRIYAKALPA – A GLIMPSE OF NETRAROGAS

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ABSTRACT

Kriyakalpas, the specialized ocular treatment modalities, affirms the absolute necessity of unique approach towards netrarogas, thus highlighting the gravitas of eye and eye diseases. 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 .These procedures improve the vision by strengthening of the cilliary 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 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. The probable mode of action and possible drug route of Kriyakalpas are yet to be explored

KEYWORDS, Netra rogas, Kriyakalpa, Eye diseases.

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INTRODUCTION

Shalakya Tantra, the branch Ayurveda which deals with the Urdhwajatrugata rogas, gives prime importance to eye disorders as eye is the most important sense organ. Kriyakalpas are the specialized ocular treatment modalities explained in Ayurveda. No other single-organ is ascribed with such specific and exclusive modality of treatments. Thus the importance of eye and eye disorders are highlighted in this science. The probable mode of action and route of drug delivery of Kriyakalpas are yet to be explored. Such an attempt is made in this article which helps in establishing the scientific credibility of Kriyakalpa.

Kriyakalpa is the basis of the ophthalmic disorders, as Panchakarma is the basis of Kayachikitsa. When we refer to our therapeutic measures classics for the 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

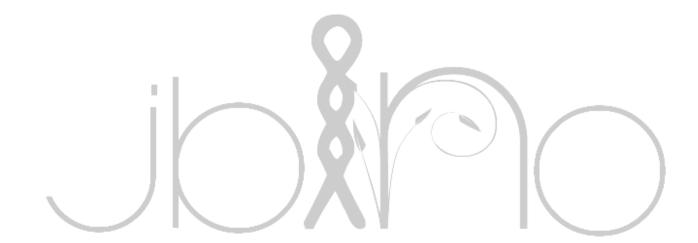
The word *Kriyakalpa* built from two words: *Kriya* and *Kalpa*. *Kriya* means therapeutic procedures for *Chikitsa* used to cure the disease and *Kalpa* means practicable, possible, manner of acting, a prescribed rule. So *Kriyakalpa* means

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.



Table – Kriyakalpa as per various Acharya [1,2,3,4]

Kriyakalpa	Charak	Sushruta	Sharangadhara	Bhavamishra	Chakradatta
Seka	-	+	+	+	+
Aaschyotana	+	+	+	+	+
Anjana	+	+	+	+	+
Tarpana	-	+	+	+	+
Putpaka	-	+	+	+	+
Pindi	-	-	+	+	+
Bidalaka	+	-	+	+	+



MATERIAL AND METHOD

Classification and Indication of Kriyakalpa [5,6,7,8]

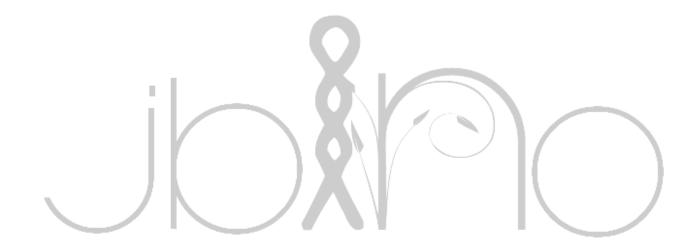
Kriyakalpa	Indication	Types	Duration	Mode of action
Tarpana	When a patient		i. <i>Vata-</i>	By virtue of its
	sees darkness/		1000 Matra	Sanskaranuvartana
	blackouts in		ii. <i>Pitta-</i>	property, <i>Ghrita</i>
	front of eyes In		800 <i>Matra</i>	attains the
	severe		iii. Kapha-	properties of
	dryness of the		600 <i>Matra</i>	ingredients without
	eyes Roughness		b) According	losing its own.
	of the eyes		to	Ghrita is supreme
	Stiffness of the		<i>Adhisthana-</i> i.	in <i>Jangama Sneha</i>
	eyelids		Vartma-100	and is
	Falling of eye		Matra ii.	Balavardhaka,
	lashes /		Sandhi-300	Ojovardhaka,
	Madrosis Injured		Matra iii.	Vayasthapana, Agni
	eyes due		Shukla-500	Deepana and
	to Abhighata,		Matra iv.	Dhatuposhaka.
	Siraharsha ,		Krisna-700	According to
	Arjuna ,		Matra v.	Charaka, Ghrita is
			Drishti-	effective in
				subsiding <i>Pittaja</i>

	Timira ,		800	Matra	and	Vataja
	Abhishyanda		vi.		disorders;	it
			Sarva	agata-	improves	Dhatus
			1000	Matra.	and is	overall
					booster	for
					improving (Ojas
Putpaka	Snehana	Snehana	200	Matra	Due to s	suspension
	Putapaka –	Putapaka	kala.		through	ghee
	<i>Rukshata</i> or				particles	do not
	Ruksha netra	Lekhaneeya			leave the	eye and
	<i>Vata</i> disorders	Putapaka	100	Matra	contact t	ime is
	of the eye.		kala		more an	id more
	Lekhaneeya	Ropaneeya			drugs	are
	Putapaka –	Putapaka			absorbed.	It will
	<i>Snigdhata</i> or		300	Matra	cross	corneal
	Snigdha netra		kala.		epithelium	barrier
	Ropaneeya		/		easily due	e to its
	Putapaka -				lipophilic pr	roperty
	<i>Pitta, Rakta</i> or					
	<i>Vata</i> or eyes					
	afflicted with					
	Vrana					

Seka	Itching in the	Lekhna	200 Matra	medicine is poured
SEKA		LEKIIIIa	200 Matra	
	eyes			on closed eye (on
	Watery eyes	Donana	600 Matra	eye lids)
	Conjunctivitis	Ropana	600 Matra	continuously from
	Burning eyes			four inches height
	Dry	Snehana	400 Matra-	fir a specific time
	Photophobia	Sileilaila	400 Malia-	according to
				<i>Dosha"</i> so the
				medicine is
				absorbed through
				skin of lids.
Aaschyotana	Pitta Dosha,	Lekhana	8 drops	
	eye condition			
	like mild pain,	Ropana	12 drops	
	redness,	Cnohana	10 duama	
	watering, foreign	Snehana	10 drops	
	body sensation,			1 ()
	itching, burning			
	sensation,			
	congestion of			
	vessels,			
	It is			
	contraindicated			
	in night.			
Anjana	When the	Lekhana	In Morning	
	patient has		it should be	
	undergone the	Ropana	kapha	
		1		

	Shodhana therapies of Vamana and Virechana and the Niraama Dosha are causing eye diseases, then Anjana should be done.	Prasadana	shaman Anjan In Evening pitta shaman Anjan	
Pindi	Acute stages of all eye diseases in general and Abhishyanda in particular	Adhimanth		It reduces inflammation produced due to trauma or wound. Mechanical effect of pressure helps in reducing IOP by dilatation of vessels & drainage of aqueous (PINDI).
Bidalaka	Acute stages of eye disorder, burning sensation, swelling, discharge, redness, pain,			Dermal absorption of medicines. • By vasodilatation - helps in relieving the inflammatory conditions, congestion, irritation etc.

foreign body	• Increases	s local
sensation etc.	temp	and
	facilitates of	drainage
	from the	site of
	lesion.	



DISCUSSION

THE OCULAR PHARMACOKINETICS [9, 10, 11]

The drug pharmacokinetics from the eye follows the following paths

- Trans-corneal permeation from the lacrimal fluid into the anterior chamber.
 Non-corneal drug permeation across the conjunctiva and sclera into the anterior uvea.
- Drug distribution from the blood stream via blood-aqueous barrier into the anterior chamber.
- Elimination of drug from the anterior chamber by the aqueous humor turnover to the trabecular meshwork and Schlemm's canal.
- Drug elimination from the aqueous humor into the systemic circulation across the blood-aqueous barrier.
- Drug distribution from the blood into the posterior eye across the blood-retina barrier.
- Intra-vitreal drug administration.
- Drug elimination from the vitreous via posterior route across the blood-retina barrier.
- Drug elimination from the vitreous via anterior route to the posterior chamber.

PROBABLE ROUTE OF ACTION

The probable mode of action of drug and its routes can be better explained in terms of the following anatomical structures:

CORNEA:

- The main route of drug entrance to the aqueous humor is trans-corneal permeation
- The drug absorption limits from the lacrimal fluid by corneal epithelium
- The hydrophilic drugs have lower permeability in the cornea than Lipophilic drugs.
- Among our medicinal preparations Ghritas, Vasa, Majja oil etc are lipophilic.

CONJUNCTIVA:

- Leaky epithelium
- Greater surface area.
- Permeable to the hydrophilic and large molecules (Swarasa, Kwatha, Arka).
 Dilution and excretion of the drug by tears also reduce the bio availability of topical ocular drugs (Aschyotana).
- Sustained release is more considerable (Anjana). SCLERA:
- More permeable than the cornea.
- it is Independent of drug lipophilicity.
- it is permeable to the large molecules of even protein size.
 Drug route: bulbar conjunctiva – sclera – choroid. VITREOUS:
- Lipophilic and Small molecules may diffuse rapidly into the vitreous (Ghrita, Vasa, Majja Oil).
- Free diffusion is present between the vitreous and the posterior chamber in the anterior region of the vitreous.

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• In conditions if Blood Retinal Barrier is disrupted, drug delivery with sustained release from the vitreous to the choroid maybe possible.

INTRA-VITREAL DRUG ELIMINATION:

- Anterior route: vitreous- posterior chamber- aqueous turn overuveal blood flow.
- Posterior route: (lipophilic) active and passive transport across posterior BRB.

CHOROID AND RETINA:

- Choroid has leaky walls and extensive blood flow.
 Small lipophilic drugs maybe more permeable
- The drug reaches the choroid and then across into the retina if BRB is disrupted through corneal and noncorneal route

CONCLUSION

Kriyakalpas are specialized treatment modalities which facilitates the ocular drugs to reach and act on the desired sites.

- Seka, Aschyotana, Pindi, Bidalaka are for the anterior segment of eye.
- Tarpana, Putapaka, Anjana are for both the anterior & posterior segments of eye.
- The medicaments, duration and dosage of kriyakalpas facilitate the bio availability of drugs e.g. Anjana is for sustained release.
- Putapaka is combination of lipo hydrophilic drugs.

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