AYURVEDIC OCULAR THERAPEUTICS
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INTRODUCTION
The importance of the eyes was underscored in Ayurveda by quoting eye as the most important of all organs: “Sarvendriyanam Nayanam Pradhanam” i.e. eyes hold special status among all the sense organs. Eyes are the most precious gift of the God to the living beings. Good vision is crucial for social and intellectual development of a person. Ayurveda, the fountain head of Indian medicine was conceived as a science and preached in the country some thousands of years ago, long before the other countries could dream of systematizing the concept of remedies for human ailments. Shalakya Tantra is one among 8 specialties of Ashhtanga Ayurveda, which deals with the diseases occurring above the clavicle. So it mainly deals with the sense organs; diseases affecting them and their management.

Acharya Nimi is considered as the exponent of this branch of Ayurveda. His view point on the subject of Shalakya is presented in first 26 chapters in Uttar Tantra of Sushruta Samhita wherein 19 chapters hold the Anatomy, Classification, Pathophysiology of diseases and their treatment, which reflects the importance of ophthalmology since ancient time. Eye is perhaps the only organ in the body whose anatomy, diseases and their treatment are detailed vividly and systematically in Ayurvedic literature.

NETRA KRIYAKALPA- As the Panch-karma is the bases of Kayachikitsha, Kriyakalpa is the main therapeutic process for Ophthalmology in Shalakya tantra. The word Kriyakalp built from two words: Kriya and Kalpa. Kriya means therapeutic procedures used to cure the disease and

ABSTRACT
Tremendous advancement made in ophthalmic medicine in recent years has begun a new era in the history of ophthalmology. Modern ophthalmologists and scientists have been able to convince the new generation about the significance of eye care and the right procedures to follow in order to ensure healthy vision. At the same time, there are various challenging problems, arising before modern ophthalmologists compelling them to tread the virgin fields of medical knowledge hidden in ancient medical manuscripts. Many are aware of various eye ailments and remedies. But the impact of Ayurvedic treatments for these ailments is yet to be recognised by both medical fraternity and the public in general. One such Ayurvedic ocular therapeutic is Kriyakalpa. Different types of Kriyakalpa, their indications and probable mode of action will be discussed in present review article.
Keywords: Kriyakalpa, Ocular pharmacology
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. Acharya Susruta mention Tarpan, Putapaka, Seka, Aschyotanam and Anjanam under the heading of Kriyakalpa. Acharya Vaghbata and Sarangdhara add Pindi and Vidalaka in them. Acharya Charaka had also told about Vidalaka.

INDICATIONS OF KRIYAKALPA- In Ayurvedic classics, different types of indications are given for different Kriyakalpas. These are as follows-

TARPANA- Tarpana is indicated especially in Vata-Pita dominating personalities suffering from eye disease.

PUTAPAKA- 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.

SEKA- Indicated in severe eye affections i.e. in acute condition of eye diseases.

ASCHYOTANA- It is indicated as a first procedure in all eye disease.

ANJAN- It is applied when the doshas are located only in the eyes and when the symptoms and signs get started according the involvement of doshas. It is indicated in Pakwaawastha of eye disorders. It is indicated not only in diseased eye but also in the normal eyes to maintain the visual power properly. It is effective in Lakshanas like Vedana, Ragata, Daha, and Shotha. It has direct action on the ocular tissues especially on conjunctiva, so it is useful in conjunctival disorders. It flushes out debris and unwanted tissue due to its Lekhan property.

PINDI- It is also called Kawalika. Indicated in abhisyandha and oedema, itching and ocular pain.

VIDALAKA- It is also indicated in the early stage of disease.

CLINICAL FEATURES OF AAMA-AWASTHA OF NETRA- Severe pain, redness, oedema, Foreign body sensation, pricking type pain and watering.

CLINICAL FEATURES OF NIRAAN-AWASTHA OF NETRA- Severity of pain, itching, oedema and watering reduces and colour of eye become clear.

OCULAR PHARMACOLOGY- Modern ophthalmology has reached a stage, where medical, surgical, laser and cryotherapy are playing an almost equal role in the management of eye diseases. Basic principal of ocular pharmacology is described here in breif.

MODES OF ADMINISTRATION-

TOPICAL INSTILLATION INTO CONJUNCTIVAL SAC / EXTRA OCULAR

Drops, ointment, Gels, and Ocuserts

PERIOCULAR ROUTE: Subconjunctival injections, Sub-Tenon injections, Retrobulbar injections, Peribulbar injections

INTRAOCULAR ROUTE: Intraocular injections

SYSTEMIC ROUTE: As in Ayurveda, we are applying ophthalmic therapeutic either in the form of local therapy i.e. Kriyakalpa or in the form of systemic use i.e. oral Chakshushya dravyas. So here we will focus only on topical route.

Eye drops are the simplest and most convenient method of topical application. The forms of drug instilled in eyes are of two types: Aqueous solutions and Aqueous suspensions. In Solutions, drug is totally dissolved, therefore totally available. These are for immediate action but it is quickly diluted by tears and drain to
NLD. So tissue contact time is short. In suspensions, drug is present as small particles kept suspended in the Aqueous medium, particles do not leave the eye as quick as in Solutions. Therefore tissue contact time is increases.

Ointment and Gel increases the bioavailability of the drug by increase tissue contact time and by preventing dilution and quick absorption. Ocuserts form a system of drug delivery through a membrane. These can be placed in the upper or lower fornix up to a week and allow a drug to be released at a relatively constant rate. The systemic routes include oral intake and intramuscular and intravenous injections. The intraocular penetration of systemically administered drugs mainly depends upon the blood-aqueous barrier. The passage through blood-aqueous barrier in turn is influenced by the molecular weight and the lipid solubility of the drug. No passage is allowed to large-sized molecules such as Sb, As commonly present in major collyria formulation. Only low molecular weight drugs can cross this blood-aqueous barrier. The corneal epithelial tight junction i.e. zonula occludens and the lipid-water-lipid sandwich layer provides mechanical and chemical barrier for the drug absorption. The lipophilic and hydrophilic substances can be effectively delivered. The permeability across the sclera depends on the size and weight of molecules.

**KRIYAKALPA BASED ON OCULAR PHARMACOLOGY -**

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<thead>
<tr>
<th>KRIYA-KALP</th>
<th>USED FORMULATION</th>
<th>DRUG DELIVERY SYSTEM</th>
<th>REMARK</th>
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<tbody>
<tr>
<td><strong>TARPANA</strong></td>
<td>Simple Goghrita or Goghrita/oil prepared with medicine</td>
<td>Used preparation is in aqueous suspension form. So it will cross corneal epithelium barrier easily. ·Due to more tissue contact time, active components of drug will absorb more.</td>
<td>Mainly indicated in diseased conditions of Eyes.</td>
</tr>
<tr>
<td><strong>PU-TAPAKA</strong></td>
<td>Plant extracts after close chamber(ball wrapped by green leaves and layer of mud) combustion</td>
<td>·Used preparation is in aqueous solution form and active component concentration is high. ·Tissue contact time is very less.</td>
<td>Used after Tarpana to increase drasthibala and in mild eye affections</td>
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<tr>
<td><strong>SEKA</strong></td>
<td>Decoctions of raw drugs</td>
<td>·Used as aqueous extract i.e. in concentrate form, but used on closed eye. ·Medicine is absorbed through the skin of lids.</td>
<td>Indicated in severe eye affections.</td>
</tr>
<tr>
<td><strong>ASCHYOTHANA</strong></td>
<td>Decoctions of raw drugs</td>
<td>·The active principle is aqueous extract. ·Tissue contact time is</td>
<td>It is used as a first line of treatment in all eye disorders.</td>
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very less. It get diluted with tears and drained to NLD.

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<tr>
<th>ANJANA</th>
<th>Liniment of drugs</th>
<th>Bioavailability is more due to more tissue contact time.</th>
<th>Anjanas are mainly have lekhana properties which can gradually taper the thickness of the membrane and there by prevent the growth and also reduce the size.</th>
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<tbody>
<tr>
<td>PINDI /KAWLAKA</td>
<td>Poultice of different Medicine</td>
<td>Medicine is absorbed through the skin of lids. Due to heat of poultice, local temperature is increases resulting in local vasodilation. So the drainage of toxin occurs from lesion site.</td>
<td>Indicated in abhisyandha and oedema, itching and ocular pain.</td>
</tr>
<tr>
<td>VI-DALAKA</td>
<td>Medicated paste is applied over the skin of lids.</td>
<td>Medicine is absorbed through the skin of lids. Mechanical effect of pressure helps in reducing IOP by vasodilation and aqueous drainage.</td>
<td>Indicated in early stages of eye diseases especially for curing burning, watering, swelling and redness of eye.</td>
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**CONCLUSION**

The main aim of any pharmaco therapeutics 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 kriyakalp. 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. kriyakalp on the basis of modern pharmaco-therapeutic. Various drugs can be selected according to the stage and types of the disease and can be used in various Kriyakalp procedures according to need. In the light of above fundamentals of modern pharmacology, all the Ayurvedic ocular therapeutic procedures are relevant as such.

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