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## “PHYSIO-ANATOMICAL CONCEPT OF AKSHITARPANA”

<sup>1</sup> Dr.Smita S Birajdar, <sup>2</sup>Dr.Anup Bhosgikar, <sup>3</sup>Dr.Ashiwinkumar W, <sup>4</sup>Dr.Sanjeevkumar J, <sup>5</sup>Dr.Sapana Hiremath.

<sup>2</sup>nd year P.G Scholar. Associate Professor, Professor and H.O.D, Professor, Assistant Professor. Department of Rachana Shareera , N.K.J.A.M.C. Bidar,Karnataka.585403.

### ABSTRACT-

Eye is the primary organ of vision one among the *Panchajnyanendriya*, which comes under *Navarandra or Bahyasrotas*<sup>1</sup> and one among the *pratyangas* of the head *Sarvendriyana Nayana pradhanam*. *Netra* is having greater importance among the *panchajnyanedriya* hence one should maintain the healthy condition of *Netra* so in *Ayurveda Netrakriyakalpasare* the treatment modalities are explained; among which *Akshitarpana* is one. *Akshitarpana* not only the treatment modality it also been practiced as daily routine procedure (*Dinacharya*) to maintain the healthy state of *Netra*. In this procedure one has to keep medicated *Ghrita* on the eye within well prepared frame by *mashachurna* for stipulated time. This is to be absorbed through the retinal membrane and helps to not only treat the eye diseases but also maintain the healthy status of eye. Here is an attempt made to look over *Netrashareera* and *Akshitarpana* as both preventive and curative treatment modality to maintain healthy condition of eye.

### KEYWORDS-

*Netrashareera, Akshitarpana, Dinacharya, Netraroga.*

### INTRODUCTION-

*Ayurvedic* science explains in detail about *EkadashaIndriyas* which includes five *jnyanendriya* (*chakshu, shrotra, ghraana, rasanaa, twak*) five *karmendriya* (*vak, pani, pada, payu, upastha,*) one *Ubhayendriya* (*mana*)<sup>2</sup>. To perceive the object and to differentiate the object *chakshurindriya* plays vital role. The knowledge gained by *chakshurendriya* is called *pratyakshai*. e knowledge of visual objects hence eye is given more importance by quoting as “*sarvendriyanayanampradhanam*”. *Chakshu* is created from *Panchamahabhutas*<sup>3</sup> but predominant with *Agni-Mahabhuta*, if *Tejomahabhuta* not enters the eye of child at the time of *Garbhotpatti* then child will be born with *Janmandhya*. *Chakshurendriyas* are 2 in number, which are having 5 *Mandalas* 6 *Sandhi* 6 *Patalas*<sup>4</sup>. Also, it is made up of *mamsa* and *peshi*. It has *marma* points in it. *Netra* is with synonyms of *Nayana, Lochana, Akshi, Netra, Drik, Darshanendriya* and one of *pratyanga of head*<sup>5</sup>. Eyeball is known as *Netragolakai*. e “*Akshikutakam chakshurgolakam*.”

“*Dweakshikutech*<sup>6</sup>. Two *akshikutas* are present. Our science mentioned size and shape of eye as “*Dwayangula bahulyata*”<sup>7</sup>, Anteroposterior (from front to backwards) dimension is *2 angula*. *Netra aayam* that is length of eyeball- $2\frac{1}{2}$  *angula*. *Netravistara* that is breadth of eyeball- $2\frac{1}{2}$  *angula*. *Nayana – Budabudam-Suvrutta – Gostanakara*. Eyeball is rounded in the form of bubble or breast of cow udder.

**PARTS OF NETRA**-On the basis of structure involved in eye it is been named in different parts as *mandalas*, *sandhi*, *patalas*.

**MANDALA**-Five *mandalas* are there *aspakshma mandala* as eyelashes are involved, *vartha mandala*-eyelids, *shweta mandala*-sclera, *krusha mandala*-iris, *drushti mandala* as retina<sup>8</sup>.

**NETRA SANDHI**: Six *Netra Sandhis* are named at junction of two *mandalas*. *ePakshma vartha magata sandhi*, *varthamashuklagata sandhi*, *shuklkrushnagata sandhi*, *krusnadrushtigata sandhi*, *kaninika sandhi* and *Apanga sandhi*<sup>9</sup>.

**NETRA PATALA**: Based on *mahabuta* predominant *patalas* are explained as 1<sup>st</sup> *patala* as *Tejojalashrita*-outermost layer of eye is cornea and sclera, 2<sup>nd</sup> *patala* as *Mamsaashrita*-iris and ciliary body, 3<sup>rd</sup> *patala* as *Medoashrita*-vitreous humor, 4<sup>th</sup> *patala* as *Asthiashrita*-orbit, 5<sup>th</sup> and 6<sup>th</sup> *patala* as upper and lower eyelids<sup>10</sup>. **DRUSHTI-PUPIL**: It resembles *KHADYOTA*-Shining insect *VISHPULINGHABHA*-spark of fire. Its Size is compared with *Masurdal* -cotyledon of lentil grains (red geams)<sup>11</sup> **NETRA UPANGA'S**: 1-*Ashru marga*-lacrimal apparatus. 2-*Ashruvaha srotas*-4 *angula*.

Eye is primary organ of vision. Eyeballs located in the orbit, where it takes up about  $\frac{1}{5}$ <sup>th</sup> of the orbital volume. The remaining space is taken up by the extra-ocular muscles, fascia, fat, blood vessels, nerves and lacrimal gland.

Eye has 3 layers /coats. Three coats of the eye as follow: Outer fibrous layer- consist of cornea, sclera, lamina cribrosa. Middle vascular layer: iris, ciliary body, choroids. Inner nervous layer-retina.

**Cornea**- Cornea is transparent, forms the anterior  $\frac{1}{6}$ <sup>th</sup> of fibrous tunic. It is dense and hard, white in colour. Its junction with sclera is called sclerocorneal junction or limbus. The cornea is more convex than the sclera but curvature diminishes with age. It is separated from iris by space called the anterior chamber of the eye. Cornea is Avascular is nourished by lymph which circulates in corneal spaces and by lacrimal fluid.

**Sclera** -Is opaque and forms the posterior  $\frac{5}{6}$ <sup>th</sup> of the eyeball. It contains dense fibrous tissue which is firm and maintains the shape of the eyeball. Sclera shows numerous perforations for passage of fibers of optic nerve. Because of its sieve-like appearance, this region is called the lamina cribrosa. Sclera is continuous anteriorly with cornea at the sclero-corneal junction or limbus. Sclera is fused posteriorly with the dural sheath of the optic nerve. Sclera is almost Avascular.

**Iris**: This is the anterior part of the uveal tract. It forms the circular curtain with an opening in the centre called the pupil. By adjusting the size of the pupil, it controls the amount of light entering the eye, and thus behaves like an adjustable diaphragm. It is placed vertically between the cornea and lens.

**Choroid**: Choroid is the thin pigmented layer which separates the posterior part of sclera from the retina. Anteriorly it ends at Ora serrata by merging with ciliary body. Posteriorly it is perforated by optic nerve.

**Ciliary body**: It is thickened part of uveal tract lying posterior to corneal limbus. It is continuous anteriorly with iris and posteriorly with choroid. It suspends the lens and helps it in accommodation for near vision.

**Retina**: It is the thin, delicate inner layer of the eyeball continuous posterior with optic nerve. The outer surface of the retina is attached to the choroid, while inner surface is in contact with hyaloid membrane of the vitreous. Retina contains photoreceptors called Rods and cones. The rods contain a pigment called visual

purple. They can respond to dim light (scotopic vision). The cones respond only to bright light (photopic vision) and are sensitive to colour.

Retina composed of 10 layers:

1. The outer pigmented layer.
2. Layer of rods and cones.
3. External limiting membrane.
4. Outer nuclear layer.
5. Outer Plexiform layer.
6. Inner Nuclear layer.
7. Inner Plexiform layer.
8. Ganglion cell layer.
9. Nerve fiber layer.
10. Internal limiting membrane.

**AQUEOUS HUMOR:** This is a clear fluid which fills the space between the cornea in-front and lens behind the anterior segment. The aqueous humour is secreted into the posterior chamber from the capillaries in the ciliary processes. The aqueous is rich in ascorbic acid, glucose, and amino acids, and nourishes the avascular tissues of the cornea and lens.

**LENS:** The lens is a transparent biconvex structure which is placed between anterior and posterior segments of the eye.

**ZONULE OF ZINN** or Suspensory ligament of the lens: Retains the lens in position and its tension keeps the anterior surface of the lens in position.

**VITREOUS BODY:** It is a colourless, jelly-like transparent mass which fills the posterior segment of the eyeball, behind it is attached to the optic disc, and front to the ora-serrata, in between it is free and lies in contact with the retina.

So to maintain the healthy condition of eye in our classics mentioned *Akshitarpana* an unique Ayurvedic treatment modality for *Netrarogas* which is defined as *Tarpanak netra truptikaram param*<sup>12</sup> means satisfaction to the eye. This is the local procedure of application of oil or *Ghruta* in eye. It is one among the 7 *kriyakalpas*, Cures *vata-pitta vikaras* of eye. In this process the unctuous substance (*oil/ghee*) is kept in the eye for stipulated time period and patient is asked to blink the eye. Hence it is also called as *Netrabasti*. Which is an peculiar procedure adopted either as in routine regimen i.e *Dinacharya* and also is a curative procedure to treat number of eye diseases such as *Tamyata, Sthbdata, Shuskata, Rukshata, Abhigata, Vata pitta vikara, Kathinavartma, Krushonmilana, Sirotpata, Siraharsha, Arjun Abhisyanda* etc as the medicated *ghrutain tarpana* procedure will combat the *vata* and *pitta dosha* so eradicate the many eye diseases<sup>13</sup>. Even though it is followed as *dinacharya* procedure but in some conditions this is not to be permeated as *Durdina, Atiushna, Atishitarutu, Chinta, Aayasa, Bhaya, Shoka, Shothain* such condition mainly *kapha dosha* vitiation occurs so *tarpana* is contraindicated<sup>14</sup>.

**PROCEDURE-** *Akshitarpana*, is a procedure of pouring the medicated *ghee* or oily substances upon the eyes, where a frame of blackgram paste is firmly fixed. The eye is made to open and close several times. When the specified duration is over *ghee* is removed.

**PURVA KARMA:**

Preparation of the patient: Patient should undergo *shodhana* procedures like *vamana, virechana, nasyakarma* earlier. After digestion of food or in empty stomach patient is asked to lie down on treatment table. Mild massaging of eyelids with *ghee* and fomenting with wet cloth.

Preparation of frame around the eye by *mashachurna*.

Medicated ghee is warmed in a water bath to make it similar to body temperature.

**PRADHANA KARMA:** Patient is asked to close the eyes. The lukewarm *ghee* is poured into the frame, in *kaninika sandhi* (inner canthus) of the eye upto the level of eyelashes. Patient is asked to gently open and close his eyes beneath the ghee. This is continued for specified period. After time period take out the medicated ghee then remove the *mashachurna* frame.

**DURATION OF TARPANA:** *Rogadhistananusara* one should perform *tarpana*.

TABLE NO-1.

SR NO.	ADHISTHANA	TIME	VAGHABHATTA	SUSRUTA
1	<i>Vartmagata</i>	5 min	300 <i>matrakala</i>	100
2	<i>Sandhigata</i>	10	300	300
3	<i>Shuklagata</i>	20	600	500
4	<i>Krusnagata</i>	25	600	700
5	<i>Drustigata</i>	25	700	700
6	<i>Sarvagata</i>	30	1000	1000

Our acharyas also mentioned *doshanusara* for how many days we have to do *tarpana*:

TABLE NO-2.

DOSHANUSARA	DAY	TIME	VAGHABHATTA	SUSRUTA
<i>Vata</i>	1	30 min	1000	1000
<i>Pitta</i>	3	20	600	800
<i>Kapha</i>	5	15	500	600
<i>Swastha</i>				500

**PASCHAT KARMA:** After *Tarpana*, mild fomentation should be done with warm paste of barley or warm water. *Prayogikadhmapana* with *kaphahara* drugs should be done to eliminate the *aggravated kapha*. Patient should be advised to avoid the seeing of very bright object or distant sky. In the evening or night eyes should be packed with cooling jasmine flower buds.

**MEDICATIONS USED FOR TARPANA-** *Chandanadi kshirapaka, Shatahwadi sarpi, Jivaniyadisarpi, Talisadisarpi, Kasmariyadikshirapaka, Ajayakritakshirapaka, Jivaniyaghrita, Triphalaghrita* etc. In daily routine *triphalaghrita* is used in *akshitarpana* procedure as *triphala* is *chakshushya*.

**DISCUSSION-**

Indriyas are given prime importance in Ayurveda, because these are the instruments, through which knowledge is perceived. As our ancient scholars say that "sarvendriyana nayanam pradhanam" i.e. among all the indriyas, netra is given prime importance. The chakshu or netra is one of the important jnyanendriya without which the whole world will be dark, and life will be meaningless. This indriya is specifically meant for Rupa grahana and is predominant with tejomahabhuta. Though there is dominance of tejomahabhuta, other four mahabhutas are also contribute in the formation of eye. Eyeball as Mamsabhaga is prithvimahabhuta, Raktabhaga-Tejomahabhuta, Krishnabhaga-Vayu mahabhuta, Shwetabhaga-Aap mahabhuta, Ashrumarga-Akasha mahabhuta predominant. While mentioning parts of Netra from outer to inner our Acharyas explained 5 mandalas, 6 patalas, and 6 sandhis. As outermost part as we are having eyelashes hence Pakshma mandala-can



be correlated to eyelashes. Varthma mandala-can be correlated to eyelids .Krishna mandala-can be correlated to cornea and iris.Drishti mandala- can be correlated to retina and pupil.Shukla mandala-can be correlated to conjunctiva and sclera.Last and innermost circular structure of the netra encloses drishti mandala which is the functional unit which actually does perception of vision that is nothing but Retina having Rods and Cones responsible for scotopic and photopic vision. Rods are sensitive to low illumination responsible for night vision. Cones are sensitive to bright illumination responsible for day light and colour light.

Now a days, though inspite of development of lot of technologies also,there are many eye diseases, hence due care is taken to protect the eye from such diseases. The procedures *like nasya,anjana,tarpana* and all other *kriya kalpas* are aimed at improving visual efficiency-*netrabala* because loss of eye sight will immerse a person into the world of darkness. In our classics akshitarpana is unique treatment modality which acts as both preventive and curative aspect of many netra rogas. Where the medicated ghruta is kept over the eye within mashachurna frame for stipulated time period.Patient is asked to blink the eye inbetween.The medicines absorbed through *akshikosha*(eyelid and orbit).Through *sandhi* enters into *siras*(blood vessels) with capillary actions it reaches to Shrungataka marma .Through minute channels reach the upper region.This absorption of medicine will expel the vitiated *doshas from urdhwajatrugata* .In *Akshitarpana the medicated ghruta is used which not only contains the lipid but also it is having the medicinal content as the ghruta is processed hence we have to study the lipid metabolism in the eye*.Retina is a complex Neuro-Sensory tissue comprised of 6 neuronal cell types or layerseg Muller cells and Astrocytes.Lipid metabolism in retina have focused on disease processes caused by either an overabundance or deficiency of specific lipid species within retinal cells or extracellular environment.Resulting in retinal dysfunction,cell death,progressive retinal degeneration.Phospho-inositide 3kinase (PI3K) regulates light in retinal rod,photoreceptors.Inactivation of PI3K leads to cell death, activation of PI3K, promotes cell survival i.e neuroprotection.Role of sphingolipids mainly sphingosineceramide and sphingosine-1-phosphate Regulates growth,arrest,and cellular differentiation in the developing retina and induction of apoptosis in the developing and mature retina.DHA-Docosahexaenoicacid the most prevalent fatty-acid present in photoreceptor will protect RPE cells from oxidative stress,also helps in the survival of the photoreceptor cells.Apo-lipoprotein –B lipoproteins in the retina have role in normal aging of retina also in the formation of extracellular lipid deposits known as “DRUSEN” and “Basal linear deposits”. That are associated with ARMD (Age related macular disorders) and Atherosclerotic lesions. Omega -3 fatty acid prevents the Neuron-retinal cell death. Resolves Inflammation and neuro-degeneration in case of oxidative stress.Hence advise food rich in omega -3 fatty acid<sup>15</sup>.

#### CONCLUSION:

As per the *samanyavisheshasiddhanata-Samanya vruddikaranam* –The medicaments used in *tarpana*are mainly *ghruta* or oil which contains all these essential fatty acids,phospholipids which helps to maintain the healthy condition of eye hence one should advise the *tarpana* as daily regimen.Also, it will pacify the *vata – pittajanetravikaras*.

The role of omega-3 fatty acid in the prevention of neuro-retinal cell death has been increasingly appreciated and they resolve inflammation and neuro-degeneration in response to extracellular stress,including oxidative stress. So dietary recommendation of omega-3 rich food such as fish,and marine products,also fruits and vegetables providing care to patients at early stages of AMD in order to prevent the evolution into late stages.Man should make constant efforts to perfect eyesight,for a blind person,though he is rich,day and night are equal and entire world seems to be useless.If person is endowed with all other sensory facilities,strength,beautiful appearance etc, but without eyesight,he will be as useless as an insect’s(kudya).

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