World Journal of Pharmaceutical and Life Sciences
WJPLS
www.wjpls.org
SJIF Impact Factor: 6.129

ANTICIPATED MODE OF ACTION NETRA TARPANA

Dr. Arun Kumar Gupta*[1], Dr. Swati Garg[2] and Dr. Trupti Gupta[3]

[1]MD (Panchakarma), Assistant Professor Dept. of Panchakarma, L.N.Ayurveda College & Hospital Bhopal.
[2]MD (Rachanasharir), Assistant Professor Dept. of Rachanasharir, L.N.Ayurveda College & Hospital Bhopal.
[3]MD (Agadtantra), Assistant Professor Dept. of Agadtantra, Rajeev Gandhi Ayurveda College & Hospital Bhopal.

Corresponding Author: Dr. Arun Kumar Gupta
MD (Panchakarma), Assistant Professor Dept. of Panchakarma, L.N.Ayurveda College & Hospital Bhopal.

Article Received on 21/05/2020 **Article Revised on 11/06/2020** **Article Accepted on 01/07/2020**

ABSTRACT
The eyes are said to be most important than all other *Indriyas*. They are considered as the reflectors of the mind. Eyes are the most precisely developed portions of the brain seen outside the skull. *CharakSamhita* had mentioned few details as for as eye is concerned. The prevalence of myopia of adults aged over 30 years was 17% in Central India [1] and 19.4% in Indians with diabetes aged over 40 years[2].*Sushruta* the Father of ancient Indian surgery has recommended *'Kriyakalpa'* for the management of *Timira* and other netrarog along with other forms of treatment. The term *Kriyakalpa* refers to the treatment, which can be applied for almost all types of eye diseases; and it comprises of *Tarpana, Putapaka, Anjana, Aschyotana*and *Seka*.Netratarpan is the best modality of myopia and other eye disease. Administration of *Tarpana*in the Eye, Drug absorbthrough various layers of the eye and drugs spread in to the deeper tissues through *RupavahaSiras. Ghrita*is having *Rasayana, Balya*&*Chakshushya*properties. By the Activation*of Alochaka Pitta*it induces of *hakshuvaisheshika*& *BuddhivaisheshikaAlochaka Pitt. ChakshuvaisheshikaAlochaka Pitta* Increased power of *DrishtiNadi. BuddhivaisheshikaAlochaka Pitt*Activate of Visual center in Brain (Optic nerve). So Tarpan improve Visual status. Administration of *Tarpana*in the Eye, Fat soluble ingredients of Drugs absorbed through Cornea Transportation of drugs through Cornea and reach to deeper tissues Lipids (Phaspholipids - Glycerides) Amino acids and proteins, Vit A, D, E, K & Carotene increase Lubrication between lens fibers & increase Muscular power of ciliary muscles. Lipids functions as a lubricating substance between cornea & lens fibres and fat soluble fatty acids Act as an antioxidants. It Helps in anaerobic oxidation which prevent the cornea and Lens from oxidative injuries. So Tarpan is best treatment modality for Eyes Disease. It maintains the health of eye &cures the eye diseases.

INTRODUCTION

The eyes are said to be most important than all other *Indriyas*. They are considered as the reflectors of the mind. Eyes are the most precisely developed portions of the brain seen outside the skull.CharakSamhita had mentioned few details as for as eye is concerned. It had mentioned four types of NetraRoga in Sutrasthan and ninety six numbers of eye diseases indicated in Chikitsasthana and AcharyaShushruta described 76 types of Netrarog. The diseases of eye were classified by Sushruta, according to the site of lesion. Few references of eye diseases like vartmasankocha, Timir, Pilla rogaOne group of eye diseases, known as '*DrishtigataRogas'* are responsible for visual impairment, both partial and complete. *Timira*comes under this group of diseases. Sushruta considers *Timira, Kacha*and *Linganasha*as the progressive clinical stages of the disease *Linganasha*; where as*Vagbhata* enumerates six types of *Timira* as separate entities. The prevalence of myopia of adults aged over 30 years was 17% in Central India [1] and 19.4% in Indians with diabetes aged over 40 years[2].Now a days myopia is the most common disease of Eye disorders.*NetraTarpan* is one of the best treatment modality of Myopia We should take care of Eye, *Sushruta* the Father of ancient Indian surgery, has recommended *'Kriyakalpa'* for the management of *Timira* and other netrarog along with other forms of treatment. The term *Kriyakalpa* refers to the treatment, which can be applied for almost all types of eye diseases; and it comprises of *Tarpana, Putapaka, Anjana, Aschyotana*and *Seka. Netratarpan* is the best treatment modality of Eye diseases.*NetraTarpan*maintain the health of Eyes and also cure the eye diseases. In this article we will know about how to work *netratarpan* to maintain of health of eyes & cure the eye disease.

AIMS AND OBJECTIVES

To know credible mode of Action of *Netratarpan.*

Development of Eye

The eyeball at birth is 16 mm in diameter and hence hypermetropic. The cornea is relatively large in size. The

sclera is thin and bluish in colour. The anterior chamber is rather shallow and the pupil small. The uveal tract has scarce pigments. The lens is round. The cones are short. The fovea is not properly developed structurally and functionally. It continues to develop till 4 - 6 weeks after birth and hence the frequent consequence of bilateral ocular nystagmus of congenital origin or lesions developing in both eyes soon after birth. The infant starts fixing objects by 6 weeks. He follows objects with both eyes by six months of age and develops full range of binocular vision by the age of 6 years. The eyeball as a whole is developed to full adult normal size by the age of 10 years.

Statistics of an emmetropic eye

(a) Antero - posterior length: 24 mm approx.
(b) Horizontal diameter: 23.5 mm approx.
(c) Vertical diameter: 23.00 mm approx.
(d) Volume of eyeball: 7.00 cc
(e) Weight of the eyeball: 6.8 gm.
(f) Circumference of the eyeball: 72 mm.
(g) Radius of curvature of posterior 5/6th (scleral shell): 12 mm.
(h) Radius of curvature of anterior 1/6th (cornea): 8 mm.
(i) Refractive index of cornea: 1.37
(j) Refractive index of Aqueous: 1.33
(k) Refractive index of Vitreous: 1.33
(l) Refractive index of lens cortex: 1.38
(m) Refractive index of lens nucleus: 1.40
(n) Refractive index of capsule: 1.35

The Embryology of eyes

The central nervous system is developed from the neural groove, which invigilates to form the neural tube running longitudinally down the dorsal surface of the embryo. At either side of the anterior portion of this structure a thickening appears at the early stage (the optic plate), which grows outwards towards the surface to form the primary optic vesicle. The two eyes develop from these optic vesicles and the ectoderm and mesoderm coming in contact with the optic vesicles. After it meets the surface ectoderm, the primary optic vesicle invaginates from below to form the optic cup. The line of invagination remains open for sometime as the embryonic fissure. The inner layer of the cup forms the main structure of the retina, from which the nerve fibres eventually grow backwards towards the brain. Its outer layer remains as a single layer of pigmentary epithelium; between the two lies a narrow potential space representing the original optic vesicle; and from its anterior border develop parts of the ciliary body and iris. The neural ectoderm secretes jelly like structure - the vitreous, which fills the cavity. The mesoderm around the cup differentiates to form the coats of eye, orbital structures, angle of anterior chamber and main structure of cornea. Meanwhile, the surface ectoderm invaginates and later separates to form the lens. The surface ectoderm remains as the corneal and conjunctivalepithelium. The mesoderm in front of the cornea grows in folds, unites and separates to form the lids.

Primordia of ocular structures

The eye originates from neural ectoderm, surface ectoderm and mesoderm.

Surface ectoderm	Mesoderm	Neural ectoderm
1.Conjunctival epithelium 2. Corneal epithelium 3. Crystalline lens 4. Eyelashes 5. Epithelium of - Meibomian glands - Glands of Moll - Glands of Zeis	1. Corneal stroma 2. Corneal endothelium and Descemet's membrane 3. Iris stroma 4. Choroids 5. Sclera 6. Vitreous	1. Sensory retina 2. Retinal pigment epithelium 3. Pigmental epithelium of iris 4. Sphincter pupillae 5. Dilator pupillae 6. Melanocytes 7. Neural part of optic nerve

1. Eyelids – They develop from both surface ectoderm and mesoderm.
2. Zonules – They develop from surface ectoderm and mesoderm.
3. Bruch's membrane – It develops from neural ectoderm and mesoderm.

Anatomy of the eye

The eye is the most highly specialised sense organ serving the most vital function of providing sight to living creatures. It is not generally understood that the eyeball only serves the purpose of condensing and directing the rays of light on a sensitive retina from which impulses are transmitted to the occipital lobe of brain. The eyeball, therefore, acts mainly as peripheral receptor and all the images formed on the retina are actually appreciated, interpreted, evaluated and analysed at the higher centers only. The eye is the organ of sight situated in the orbital cavity. It is almost spherical in shape and is about 2.5 cm. in diameter. Of its total surface area, only the anterior one sixth is exposed. The remainder is recessed and protected by the orbit into which it fits. The volume of an eyeball is approximately 7 cc. The space between the eye and the orbital cavity is occupied by fatty tissue. Structurally the two eyes are separate but they function as a pair. It is possible to see with only one eye, but three-dimensional vision is impaired when only one eye is used specially in relation to the judgment of distance. Anatomically, the wall of the eyeball can be divided into three layers: fibrous tunic, vascular tunic and nervous tunic.

(i) Fibrous Tunic

The wall of the eyeball is composed of a dense imperfectly elastic supporting membrane. The anterior part of the membrane is transparent- the cornea: the remainder is opaque – the sclera. The anterior part of the sclera is covered by mucous membrane, the conjunctiva, which is reflected from its surface on to the lids.Cornea is a clear, transparent and elliptical structure with a smooth shining surface. The average diameter of cornea is 11 – 12 mm. The thickness of the central part is 0.52 mm and the peripheral part is 0.67mm. The central 1/3 of the cornea is known as the optical zone. The refractive index is about 1.37 and Dioptric power of cornea is + 43 to + 45 D. The cornea consists of 5 layers namely:

1. The epithelium.
2. Bowman's membrane.
3. Substantiapropria or stroma.
4. Descemet's membrane
5. The endothelium.

Stratified squamous type of epithelium consists of three cell types namely the basal columnar cells, two or three layers of wing cells and surface cells. The Bowman's membrane, which is made up of collagen fibrils, does not regenerate when damaged. This results in the formation of permanent corneal opacity. Stromaconsists of keratocytes, regularly arranged collagen fibrils and ground substance. Descemets membrane is a thin but strong homogenous elastic membrane, which can regenerate. The endothelium is a single layer of flattened hexagonal cells. The cornea is an avascular structure. It derives nutrition from perilimbal blood vessels, aqueous humour and oxygen directly from atmospheric air. The nerve supply is purely sensory and it is derived from the ophthalmic division of the 5th cranial nerve through the nasociliary branch. The sclera is a strong, opaque, white fibrous layer, which forms 5/6 of the external tunic of the eye. It is relatively avascular, therefore infections rarely affect it. If they do occur, they are chronic and sluggish. It is blue and thin in childhood and in pathological conditions where uvea shines through it. It may be yellow in old age due to fat deposition. It is about 1 mm thick and is thinnest at theattachment of extra ocular muscles. The sclera gives shape to the eyeball, makes itmore rigid, and protects its inner parts. Its posterior surface is pierced by the optic foramen, which encircles the optic nerve. At the junction of sclera and cornea is an opening known as the scleral venous sinus or canal of Schlemm, through which the aqueous drains.

(ii) Vascular Tunic

The vascular tunic or the uveal tract consists of three parts, of which the two posterior, the choroid and ciliary body, line the sclera while the anterior forms a free circular diaphragm, the iris. The plane of the iris is approximately coronal: the aperture of the diaphragm is the pupil. The iris divides the anterior segment of the eye into anterior and posterior chambers, which contain aqueous humor secreted by the ciliary body. The measurement of the pupil is about 4 mm. and it regulates the amount of light rays reaching the retina. The pupillary margin slides to and fro upon the lens capsule. When the pupil is constricted, more of the posterior surface of the iris is in contact with the lens capsule. When pupil is fully dilated, the iris may not touch the lens. Anterior surface of the iris can be divided into two zones by a zigzagline called the collarets.

1. Ciliary zone.
2. Papillary zone.

The iris consists of three layers:

1. Endothelium.
2. Stroma.
3. Pigment epithelium.

The endothelium contains crypts or tissue spaces, which communicate freely with the anterior chamber. Stroma consists of loosely arranged connective tissue, blood vessels, nerves and two unstripped muscles – sphincter pupillae and dilator pupillae. Two layers of pigment epithelium are situated on the posterior surface of iris. The ciliary body in antero-posterior section is shaped roughly like an isosceles triangle, with the base forwards. The iris is attached about the middle of the base, so that a small portion of the ciliary body enters into the posterior boundary ofthe anterior chamber at the angle. Ciliary body has two parts namely,

(i) Pars plicata
(ii) Pars plana.

The pars plicata forms the anterior 1/3 rd of the ciliary body (about 2 mm.). The posterior 2/3 rd of the ciliary body (about 4 mm) is pars plana. It is relatively avascular therefore posterior segment of the eye is entered through the pars planaincision 3 – 5 mm behind the limbus. Pars plicata part of the ciliary body secretes aqueous humour. The ciliary body consists of four layers namely,
(i) Ciliary muscles (ii) Stroma (iii) Ciliary processes (iv) Epithelium

The ciliary muscles are flat bundles of non-striated muscle fibres which are helpful in accommodation of the lens. The stroma consists of loose connective tissue of collagen and fibroblasts, nerves, pigments and blood vessels. Macroscopically the ciliary processes are about 70 in number. Suspensory ligament or zonule of Zinn is attached to them and the equator of the lens. Each finger like process is lined by two layers of epithelial cells. The core of the ciliary processes contains bloodvessels and loose connective tissue. These processes are the main site of aqueousproduction. The epithelial layer consists of two layers of pigmented and nonpigmented epithelial cells. The ciliary body extends backward as far as the oraserrata, at which point the retina proper begins abruptly; the transition from ciliarybody to choroids, on the other hand, is gradual, although this line is conveniently accepted as the limit of the two structures. The ciliary body is richly supplied with sensory nerve fibres derived from the trigeminal nerve. The ciliary muscle is supplied with motor fibres from the

oculomotor and sympathetic nerves. The choroid is an extremely vascular membrane in contact everywhere with thesclera, although not firmly adherent to it so that there is a potential space betweenthe two structures – the epichoroidal space. The choroid is dark brown and extendsfrom the oraserrata up to the optic nerve aperture.The outer layers of retina aredependent for their nutrition upon the choroids. The inflammation of choroids always involves the retina. The choroids consists of three layers namely;

1. Supra choroidal lamina.
2. Vascular layer or stroma.
3. Bruch's membrane.

The suprachoroidal lamina is a thin membrane of collagen fibres, melanocytes and fibroblasts. The stroma contains loose collagenous tissue, pigment cells, macrophages, mast cells and plasma cells. Its main bulk is formed by blood vessels, which are arranged in three layers,

(i) Layer of large vessels (Haller's layer).
(ii) Layer of medium vessels (Sattler's layer)
(iii) Layer of chorio - capillaries.

The inner side of the choroid is covered by a thin elastic membrane lamina vitrea or membrane of Bruch. Bruch's membrane lies in approximation with the pigment epithelium of the retina. The blood supply of the uveal tract is almost entirely derived from the posterior ciliary and anterior ciliary arteries.

(iii) Nervous Tunic

Nervous tunic or the retina is the innermost layer of the eye and is derived from neuroectoderm. Retina is a thin membrane extending from the optic disc to the ora serrata in front. It varies in thickness from 0.4 mm near the optic nerve to 0.15 mm anteriorly at the oraserrata. The retina consists of a number of layers formed by three strata of cells and their synapses – the visual cells (lying externally), a relay layer of bipolar cells (lying intermedially) and a layer of ganglion cells, the axons of which run into the central nervous system. The retina consists of 10 layers namely,

1. **Layer of pigment epithelium**: A single layer of hexagonal cells containing melanin pigment is situated on the outer aspect of retina.
2. **Later of rods and cones**: These are end organs for visual sensation.
3. **External limiting membrane**: It lies between rods and cones and outer nuclear layers.
4. **Outer nuclear layer**: It consists of nuclei of rods and cones.
5. **Outer plexiform layer**: It consists of arborisations of the axons of rods and cones nuclei with dendrites of the bipolar cells.
6. **Inner nuclear layer**: It consists of nuclei of bipolar cells.
7. **Inner plexiform layer**: It consists of synapses of the axons of the bipolar cells with the dendrites of ganglion cells.
8. **Layer of ganglion cells**: Large ganglion cells are present in this layer.
9. **Nerve fibre layer**: These are axons of the ganglion cells. These fibres are non-medullated and are continued as optic nerve fibres.
10. **Internal limiting membrane**: It separates the retina from vitreous.

Most externally, in contact with the pigment epithelium is the neural epithelium, the rods and cones, which are the end organs of vision. The microanatomy of rods and cones reveals the transductive region (outer segment), a region for the maintenance of cellular homoeostasis (inner segment), a nuclear region (outer nuclear layer) and a transmissive region (the outer plexiform or synaptic layer). The photoreceptors are specialised to transduce light rays into receptor potentials. The two types of photoreceptors are rods and cones, named for the differing shapes of their outer segments, which nestle among fingerlike extensions of the pigment epithelium cells. Each retina has about 6 million cones and 120 million rods. Rods are most important for black and white vision in dim light. They also allow us to discriminate between different shades of dark and light and permit us to see shapes and movement. Cones provide colour vision and high visual acuity in bright light. At the posterior pole of the eye, which is situated about 3 mm to the temporal side of the optic disc, a specially differentiated spot is found in the retina, the 'fovea centralis', a depression or pit, and here only cones are present in the neuroepithelial layer and the other layers are almost completely absent. The fovea is the most sensitive part of the retina, and it is surrounded by a small area, the macula lutea, or yellow spot, which although not so sensitive, is more so than other parts of the retina. There are no blood vessels in the retina at the macula, so that its nourishment is entirely dependent upon the choroid.

Optic nerve: The optic nerve extends from the lamina cribrosaupto the optic chiasma. The fibres of the optic nerve originate from the nerve fibre layer of the retina. All the retinal fibres converge to form the optic nerve about 5 mm to the nasal side of the macula lutea. The nerve pierces the lamina cribrosa to pass backwards and medially through the orbital cavity. It then passes through the optic foramen of the sphenoid bone, backwards and medially to meet the nerve from the other eye at the optic chiasma.The optic nerve is covered with the meningeal sheaths, i.e. the piamater, arachnoid mater and duramater after it pierces the lamina cribrosa. These meningeal spaces are continuous with those in the brain. The total length of the optic nerve is 5 cm. It can be divided into four parts:

Intraocular: 1 mm
Intra orbital: 25 mm
Intracanalicular: 4 – 10 mm
Intracranial: 10 mm

Optic disc: It represents the optic nerve head. It has only

nerve fibre layer so it does not excite any visual response so it is called as "blind spot". It is a pink, oval or circular disc of 1.5 mm diameter. There is a depression in its central part, which is known as the "physiological cup". It occupies the central 1/3 of the optic disc. Therefore the normal cup-disc ratio is 1:3 or 0.3

Interior of the eye

Crystalline Lens

The lens is a biconvex mass of peculiarly differentiated epithelium. It develops from an invagination of the epidermal epiblast of the fetus, so that what was originally the surface of the epithelium comes to lie in the centre of the lens, the peripheral cells corresponds to the basal cells of the epidermis. Just as the epidermis grows by the proliferation of the basal cells, the old superficial cells being cast off, so the lens grows by the proliferation of the peripheral cells. The old cells, however, cannot be cast off, but undergo changes (sclerosis) analogous to that in the stratum granulosum of the epidermis, and becomes massed together in the centre or nucleus. The lens is suspended by the suspensory ligament of the lens or zonule of Zinn, which is attached to the ciliary body and equator of the lens. The accommodative power varies with age, being 14 to 16 D (at birth), 7 to 8 D (at 25 years of age) and 1 to 2 D (at 50 years). The refractive index of the lens is 1.39 and thickness is about 4 mm. The radius of curvature on anterior surface is 10 mm approximately and 6 mm on posterior surface. It weighs 250 mg approximately.

The parts of the crystalline lens are:
(i) Lens capsule.
(ii) Cortex
(iii) Nucleus

The lens capsule is a smooth, homogenous acellular envelop, secreted by the underlying epithelial cells. It is thicker anteriorly and thinnest posteriorly. The cortex lies in between the lens capsule and the nucleus. It consists of lens fibres. The anterior cuboidal cells gradually become columnar and elongated towards the equator. Anterior and posterior Y shaped suture lines are formed at the junction of lens fibres. The lens has four nucleus, which are formed at different stages of life up to late adolescence namely embryonic nucleus (1 – 3 months of gestation), fetal nucleus (from 3 months of gestation till at birth), infantile nucleus (from birth to puberty) and adult nucleus (early adult life).

Aqueous Humour: The aqueous humour is a clear watery fluid filling the anterior chamber (0.25ml) and posterior chamber (0.06 ml) of the eyeball. In addition to its role in maintaining normal intra ocular pressure, it also plays an important role in providing nutrients and removing metabolites from the avascular cornea and lens. Aqueous humour is derived from the plasma within the capillary network of ciliaryprocesses. For many years Leber's theory of simple filtration from the blood was generally accepted. However, the chemical analysis of the aqueous humourindicated that ultra filtration and secretion are involved in the formation of the aqueous humour. The system of semi permeable membranes separating the blood from the ocular cavity is known as the blood – aqueous barrier.

The normal outflow of the aqueous humour takes place by two routes:
(i) Angle of anterior chamber (conventional route) – 80%.
(ii) Uveoscleral outflow (unconventional route) – 20 %

The conventional route of drainage is:
- The Trabecular meshwork
- Canal of Schlemm
- Aqueous vein
- Venous circulation
- The uveoscleral route of drainage is
- The ciliary body
- Suprachoroid space
- Venous circulation of ciliary body, choroids and schlera

Vitreous: The vitreous is an inert, avascular, transparent, jelly like structure, which serves only optical functions. It consists of a delicate framework of collagen and hyaluronic acid. It is a hydrophilic gel, which becomes fluid when its protein basis is coagulated due to advancing senile age, degenerations and chemical and mechanical trauma. The vitreous is attached anteriorly to the lens and ciliary epithelium in front of the oraserrata. It is known as the base of vitreous. Posteriorly, the vitreous is attached to the edge of the optic disc and macula lutea forming ring shaped structure around them. The vitreous undergoes significant physical and biochemical changes with ageing. At birth, the Cloquet's canal runs straight from the lens to the optic disc. It contains the primary vitreous. In young persons, the vitreous gel is homogenous but its fibres become coarse with the process of advancing age. In old age and in high myopes, the secondary vitreous liquefies (syneresis) and shrinks, producing a vitreous detachment, vitreous and retinalhaemorrhage and retinal break. The vitreous forms one of the refractive media of the eye. The vitreous does not have any blood vessels. It derives nutrition from the surrounding structures like choroid and ciliary body.

Extra ocular muscles

The eyeballs are moved by six extrinsic muscles, attached at one end to the eyeball and at the other to the walls of the orbital cavity. There are four straight and two oblique muscles. They consist of striated muscle fibres. Movement of the eyes to look in a particular direction is under voluntary control, but coordination of movement needed for convergence and accommodation to near or distant vision, is under autonomic control. The extra ocular muscles are:
(i) Medial rectus: Rotates the eyeball inwards.
(ii) Lateral rectus: Rotates the eyeball outwards
(iii) Superior rectus: Rotates the eyeball upwards

(iv) Inferior rectus: Rotates the eyeball downwards.
(v) Superior oblique: Rotates the eyeball so that the cornea turns in a downward and outward direction.
(vi) Inferior oblique: Rotates the eyeball so that the cornea turns upwards and outwards.

Blood supply to the eye
Arterial supply: The eye is supplied by the short (about 20 in number) and long ciliary (2 in number) arteries and the central retinal artery. These are the branches of the ophthalmic artery, one of the branches of the internal carotid artery.

Venous drainage: Venous drainage is done by the short ciliary veins, anterior ciliary veins, four vortex veins and the central retinal vein. These eventually empty into the cavernous sinus.

Nerve supply to the eye
The eye is supplied by three types of nerves,
1. The motor nerves.
2. The sensory nerves
3. The autonomic nerves.

1. The motor nerves
(i) The 3 rd cranial nerve (Oculomotor)
Levatorpalpebraesuperioris
Superior division Superior rectus
3 rd Nerve Medial rectus
Inferior division Inferior rectus
Inferior oblique
Branch to ciliary ganglion
Sphincter
pupillae
Ciliary muscle.

- The 4th cranial nerve (Trochlear): It supplies the superior oblique muscle.
- The 6th cranial nerve (Abducent): It supplies the lateral rectus muscle.
- The 7th cranial nerve (Facial): It supplies the orbcularis oculi muscle.

2. The sensory nerves: The 5th cranial nerve (Trigeminal): The ophthalmic division supplies the whole eye.

3. The autonomic nerves
(1) The sympathetic nerve supply is through the cervical sympathetic fibres to:
(i) Iris – Dilator pupillae muscle
(ii) Ciliary body
(iii) Muller's muscle in the lids
(iv) Lacrimal gland

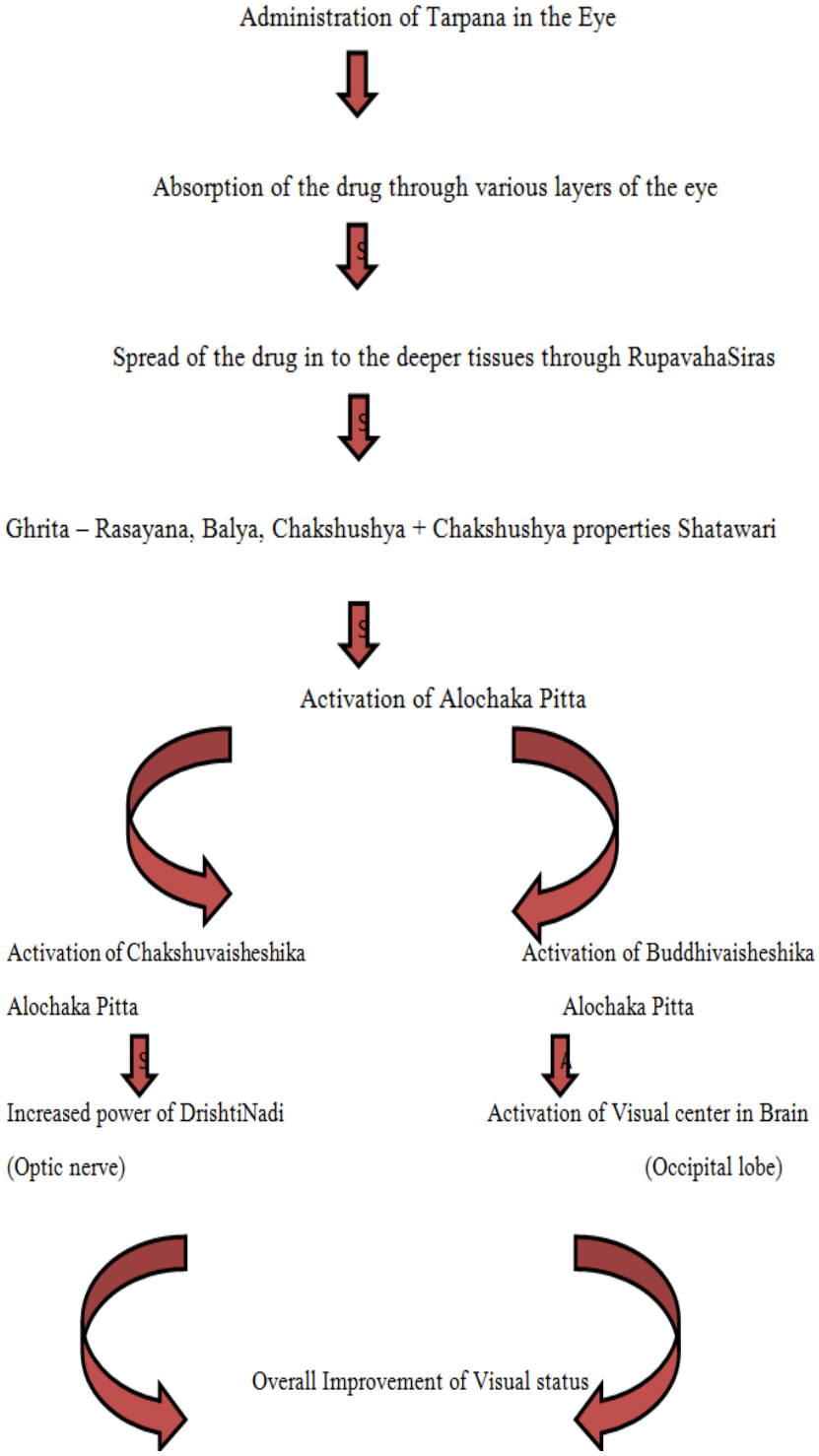
(2) The parasympathetic nerve supply originates from the nuclei in the mid brain.
It gives branches to:
i) Iris – Sphincter pupillae muscle
ii) Ciliary body
iii) Lacrimal gland

Anticipated way of action netratarpana
Netratarpanexplicated by Acharyashushruta, In this procedure we make frontier around eye orbital by *Masha* powder approx. height 1cm and fill by luke warm medicated *Snehadravya*for tarpana. Sneha absorbed by eyes & perform the Action. Sneha reach all Saptadhatu in *uttrottar*manner.Absorption is very high as drugs are lipid soluble; penetration of fat soluble substances is high regardless of molecular size. Highest and significant therapeutic deliberations are achieved. Ghrita is extreme in JangamaSneha and is Balavardhaka, Ojovardhaka, Vayasthapana, Agni deepana and Dhatuposhaka. By Acharya Charaka in Sutrasthana Snehadhyayadescribedthat, "SNEHOANILAM HANTI" which means that Shehana is the superlative treatment for VataDosha. He mentioned AkshiTarpana as one of the 24 Snehapravicharana in Sutrasthana 13th chapter. According to Charaka (Ch.Sam.Su. 13/14), Ghrita is operative in subsiding Pittaja and Vataja disorders, it ralliesDhatus and is overall booster for improving Ojas.

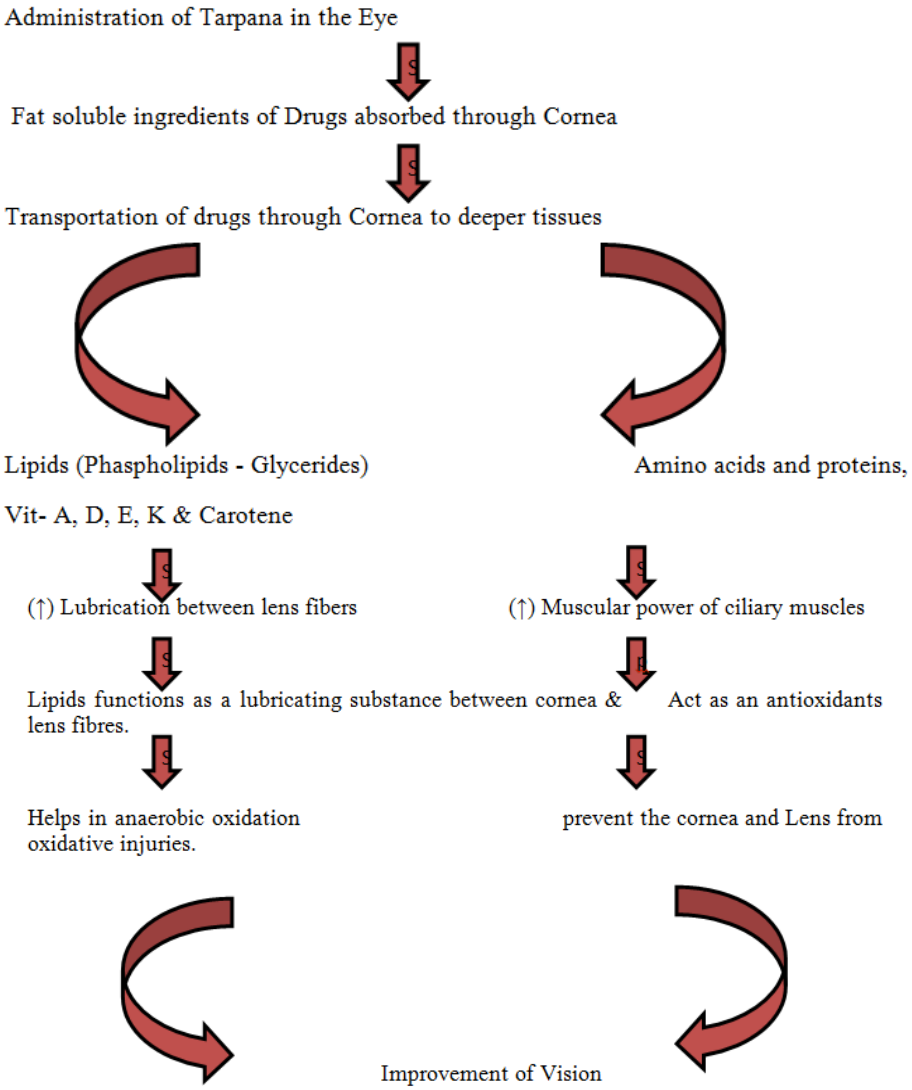
The Ghrita has the quality of infringing into minutest channels of the body. Hence when realistic in the eye, it enters into deeper layer of Dhatus and cleanses every minutest part of them. Moreover, Ghrita due to its Sansakaranuvartana quality easily gulps the properties of other drugs processed with it without leaving its own properties. Ghrita also comprehends properties like Balya, Brimhana and Rasayana, so it bounces strength to the overall tissues of the eyeball as well as to the nervous tissues. Ghritacomprehends vitamin A, D, E, K and carotene in it. Vitamin A and E are antioxidants and vitamin A also preserves the outer lining of the eyeball moist. Digestion, absorption and delivery to a target organ system are crucial in obtaining the maximum benefit from any formulation. This is facilitated by Ghrita, since active ingredients of drugs are mixed with Ghrita and they are easily absorbed. Lipophilic action of Ghritaexpedites transportation to the target organ and final delivery inside the cell, because cell membrane also contains lipid. This liphophilic nature of Ghrita facilitates entry of drug in eyeball through corneal surface since corneal epithelium is also permeable to lipid soluble substances and lipid soluble substances annoyed corneal epithelium irrespective of their molecular size. Moreover, Ghrita preparation used in Tarpana is in the form of suspension containing different particles of the drugs and the particles do not leave the eye as quick as solution. Tissue contact time and bio availability is more hence therapeutic concentration can be achieved. Myopia is a clinical condition in which the refractive error is present and this error may be due to changes in the axial length, refractive index or curvature of the cornea. The ShatawariGhrita used as Tarpana may have its action at the level of axis, index or corneal curvature. The fat soluble contents of the drugs absorbed through trans-corneal route may have action on the refractive media of the eye and eye as a whole. There may be peribulbar deposition of fat exerting pressure upon the sclera and this may be responsible for the

reduction in the antero-posterior diameter in myopic eye. Moreover, drugs placed over eyeball directly for long time may also act by directly exerting pressure upon the cornea and reducing its curvature. Among different routes employed for therapeutics in eye e.g. Seka, Aschyotana etc., in Tarpana there is contact of drug with eye for long time. This facilitates the action of drug by two ways – one by allowing more absorption of the drug by corneal surface and secondly by exerting direct pressure upon the cornea. There may be changes in the refractive index of the cornea causing less convergence of light rays. The action of Tarpana over axis, refractive index and corneal curvature needs further studies with large number of patients.

Flow chart 1- Anticipated mode of action netratarpana: (In Ayurveda context)



Flow chart -2 anticipated mode of action netratarpana: (InModern pharmacological context).



CONCLUSION

Now a daysMyopia is the most common disease in society, Netratarpan is the best modality of myopia and other eye disease. Administration of *Tarpana*in the Eye, Drug absorbthrough various layers of the eye and drugs spread in to the deeper tissues through *RupavahaSiras. Ghrita*is having *Rasayana*, *Balya* & *Chakshushya* properties. By the Activation*of Alochaka Pitta*it induces of *Chakshuvaisheshika* & *BuddhivaisheshikaAlochaka Pitt.*

ChakshuvaisheshikaAlochaka Pitta Increased power of *DrishtiNadi.*

*BuddhivaisheshikaAlochaka Pitt*Activate of Visual center in Brain (Optic nerve) . So Tarpan improve Visual status. Administration of *Tarpana*in the Eye, Fat soluble ingredients of Drugs absorbed through Cornea Transportation of drugs through Cornea and reach to deeper tissues Lipids (Phaspholipids - Glycerides) Amino acids and proteins, Vit A, D, E, K & Carotene increase Lubrication between lens fibers & increase Muscular power of ciliary muscles. Lipids functions as a lubricating substance between cornea & lens fibres and fat soluble fatty acids Act as an antioxidants. It Helps in anaerobic oxidation which prevent the cornea and Lens from oxidative injuries. So Tarpan is best treatment modality for Eyes Disease .It maintains the health of eye & cures the eye diseases.

REFERENCES

1. Nangia V Jonas JB Sinha A Matin A KulkarniM . Refractive error in central India: the Central India Eye and Medical Study. Ophthalmology, 2010; 117(4): 693-699. [CrossRef] [PubMed]
2. Rani PK Raman R Rachapalli SR Kulothungan V Kumaramanickavel G Sharma T. Prevalence of refractive errors and associated risk factors in subjects with type 2 diabetes mellitus SN-DREAMS, report 18. Ophthalmology, 2010; 117(6): 1155–1162. [CrossRef] [PubMed]