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NETRA SHARIR OF AYURVEDA IN THE MODERN PERSPECTIVE: A REVIEW ARTICLE

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ABSTRACT

The Indian system of Ayurvedic medicine has described three basic physiological constituents of human body, viz., dosha, dhatu and mala. Acharya Sushruta was a great surgeon in ancient India known today as the “Father of Shalya Tantra (Surgery)” for inventing and developing surgical procedures. Acharya Sushruta has elaborately described the defining characteristic of Shalakyatantra. It comprises of the disease of shalakyatantra as narrated by king of Videha (the author of Nimi Tantra). Acharya Sushruta first ever has described the anatomy of eye in relation to their shape, size of various anatomical components. Acharya Sushruta has also described the Netra rog in a very systematic manner. In the Uttaratantram, Sushruta recites an elaborated classification of eye disease complete with signs, symptoms, prognosis and medically surgical interventions. In the foetus, the parts of eye are originated from akasha, vayu, agni, apa and prithvimahabhuta. Acharya Sushruta has described all anatomical structures of the eye in terms of madala, patala, sandhi, peshi, marma, sira and Drishti. Sushruta delineated fine anatomical divisions mandala of eye. Different Acharyas have their own view in the utpatti (origin) of Netra during garbhawastha kala. Increased demand of Ayurveda science in the present society is required to understand the depth of Ayurvedic principle in an easy mode. Hence an effort has been made to ascertain and establish the knowledge regarding anatomical structure of Netra sharir.

Keywords: Ayurveda, Netra, Field of vision, Mandala, Patala, Sandhi

INTRODUCTION

Acharya Susruta has described durdhva-jatrugataroga elaborately which deals with the causes, diagnosis and curative procedures of the diseases pertaining to the body above the clavicles, i.e., ear, eye, mouth, nose. Acharya Susrutahas described gross ocular anatomy in first chapter of uttara-tantra. In this article we intended to identify the anatomical considerations of the eye are described in many topics like Netrautpatti (embryology development of the eye), Netra-sharir(anatomical considerations of the eye), Panchbhautika concept of embryogenesis of the eye, Measurements and appearance of the eyeball, Sources of origin of its constituents the eyeball, Colors of eye and Effect of Tejodhatuon eye, Mandala, Sandhi (junctional area), Patala (layer of eyeball), concept of Dristiand Akshi Bandhana (contents of orbit that binds the eyeball). So, there is a need of proper understanding the anatomy in modern prospective. It cannot be characterized by a single entity at all the time because Ayurveda is the science based on the concept of structure and functional understanding. For this study, the basic materials have been collected from the Ayurvedic classics with the available commentaries, as well as text books of modern science have been referred for better understanding of the concept and its comparison with modern science.

Field of Vision

According to Astang-Hridaya Samhita the eyes of kaphajprakriti people are red at the angle, unctuous, wide, long with well-designed white and black spheres (sclera and cornea) with more eyelashes. AcharyaSusruta has mentioned the eyes of kaphajprakriti people are red at the angle, white eyes. In the classical text of Ayurveda it has been mentioned there are different types of eyes based on the dominance of dosha in the prakriti like small eye, big eye, round eye, elongated eye, sunken eye, rough eye, steady gaze eye, unsteady gaze eye, normal and healthy eye and these are the factors which can influence the field of vision. The field of vision is the visual area seen by an eye at a given instant. Visual field testing is a common procedure in almost every eye practice. The visual field is a three-dimensional area of a subject's surroundings that can be seen at any one time around an object of fixation. The visual field can be divided into well as text

books of modern science have been referred for better understanding of the concept and its comparison with modern science. Field of Vision According to Astang-Hridaya Samhita the eyes of kaphajprakriti people are red at the angle, unctuous, wide, long with well-designed white and black spheres (sclera and cornea) with more eyelashes. AcharyaSusruta has mentioned the eyes of kaphajprakriti people are red at the angle, white eyes. In the classical text of Ayurveda it has been mentioned there are different types of eyes based on the dominance of dosha in the prakriti like small eye, big eye, round eye, elongated eye, sunken eye, rough eye, steady gaze eye, unsteady gaze eye, normal and healthy eye and these are the factors which can influence the field of vision. The field of vision is the visual area seen by an eye at a given instant. Visual field testing is a common procedure in almost every eye practice. The visual field is a three-dimensional area of a subject's surroundings that can be seen at any one time around an object of fixation.

The visual field can be divided into central and peripheral field. The extent of normal visual field with a 5mm white color object is superiorly 50°, nasally 60°, inferiorly 70°, and temporally 90°. The field for blue and yellow is roughly 10° less and that for red and green color is about 20° less than that for white. The part of the external world visible to one eye when a person fixes his gaze on one point is called the field of vision for that eye. To diagnose blindness in specific portions of the retina, one charts the field of vision for each eye with an instrument called Lister perimetry. The process of charting the monocular field of vision is called Perimetry. It is employed for the diagnosis of various lesions of the visual pathways. All visual fields are designed to measure the entire peripheral vision. In fact, most commonly ordered visual fields only test the central portion of a patient's field of vision. The amount of the field tested depends on which test you perform.

NETRAUTPATTI (Embryology Development of the Eye)

In the foetus, the parts originated from akasha mahabhutaare-sound, auditory sensation, lightness, fineness and space; the parts from vayumahabhutaare –tangibility, sense of touch, roughness, impulsion, structuring of body tissues and maintaining

of movements of the body and dosha; the parts belonging to agni mahabhutaare visible form, vision, brightness, digestion and heat; those belonging to apamahabhutaare taste, sense of taste, coldness, softness, unctuousness and moisture; those belonging to Prithvi mahabhutaare odour, sensation of smell, heaviness, steadiness and material form. Acharya Sushruta has explained the subtle form of all the Indriya as is present during the formation of Garbha. Eleven indriya are originated from the vaikarika ahamkara with all its qualities with the help of taijasa ahamkara. These eleven indriyas are as follows: ear, skin, eye, tongue, nose, speech organ, hand, sex organ, rectum, feet and mind. The former five are the organ of perception the next five are effector organ and the mind are common to both.

The five tanmatras are created out of bhootadi ahamkara with all its qualities with the help of tejas ahamkara. These tanmatras are as follows; sabda, sparsha, rupa, rasa and gandha tanmatra. These tanmatras possess special qualities of sound, touch, vision, taste and odour. From these tanmatras the bhutas like akash, vayu, agni, jal and prithvi respectively are originated. Netras are agni predominant sense organ. All the indriyas become unambiguous during the third month. Charaka and Kashyap have opined the same that the genesis of all sense organs including eyes and organogenesis occurs in third month of intrauterine life. According to Janaka of Videha, sense organs exist; the seat of senses is first formed. After discussion with the various experts of Ayurveda on the topic of formation of embryo, detailing the manner in which the foetus is formed in the uterus of the mother and the mode of manifestation of its various organs, Punarvasu Atreya concluded that all the sense organs are developed simultaneously. Both Charaka and Sushruta consider Indriyas as Atmajabhava. The clearness of senses (Indriyaprasada) is attributed to Satmyabhava.

Mandala

Acharya Sushruta has enumerated the anatomical parts of the eye which consists of mandala are five in number and sandhi and patala are six in number.

1. Pakshma Mandala: This is the first and outermost mandala of the eye formed by the pakshma or eyelashes. Pakshma means chakshu aachadanaromani. Pakshma are situated

in lid margins called pakshmathaya or pakshmathasadana. Paksmathasa form of keshamandala is considered as upadhatu of majja and mala of asthi. It serves to heighten the protection of the eye from dust and foreign bodies.

2. Vartma Mandala: The Upper and Lower eyelids together form a circular structure in front of the eyeball called as vartma mandala. The eyelids are mobile tissues curtains placed in front of the eyeballs. Vartma Mandala is also known as Aksikosh considering its protective function. There are two tarunasthi in the eye lids. It is of elliptical space between the upper and lower eyelids. The eyelids feature a row of eyelashes along the eyelid margin. The two eyelids meet each other at medial and lateral angles (two sandhis askanika and apanga). The nimesha-unmesha function (blinking) is controlled by vyanavayu. The movement of the vartma (nimesha-unmesha) is regulated by motor nerves are facial (orbicularis muscle), oculomotor (levator palpebrae superioris muscle) and sympathetic fibers. Sensory nerve supply is derived from branches of trigeminal nerve such as lacrimal, supraorbital and supra ocular nerves for upper lid and infraorbital nerve with infra-trochlear branch for lower lid. Each eyelid consists (from anterior to posterior) of following many layers:

- i. The skin
- ii. The subcutaneous areolar tissue
- iii. The layer of striated muscle
- iv. Submuscular areolar tissue
- v. Fibrous layer
- vi. Layer of non-striated muscle fibres
- vii. Conjunctiva

3. Shukla Mandala:

This mandala is present exactly inside of the vartamandala and beyond the krishnamandala. The Shukla mandala appears white in color. The Shukla mandala can be allied with the scleral part of the external fibrous coat of the eyeball. Sclera forms the posterior five-sixth opaque part of the exterior fibrous tunic of the eyeball. Its entire outer surface is covered by Tenon's capsule. In the anterior part it is also covered by bulbar conjunctiva. Thickness of sclera varies considerably in dissimilar

individuals and with the age of the person. It is normally thinner in children than the adults and in females than the males. Sclera is thickest posteriorly (1mm) and progressively becomes thin when traced anteriorly. Lamina cribrosa is a sieve-like sclera from which fibres of optic nerve pass. Sclera consists of following three layers:

I.Episcleral tissue

II.Sclera proper

III.Laminafusca

4.Krishna Mandala:

The krishana mandala of eye (cornea) is forms one-third of the transverse extent of the eyeball. In modern perspective, cornea is forms anterior one-sixth of the outer fibrous coat of the eyeball. The krishnamandala can be similar with the cornea; seems as blackish because of the iris. Cornea is a transparent, avascular, watch-glass like structure. The uveal tissue constitutes the middle vascular coat of eyeball. From anterior to posterior it can be separated into three parts, namely, iris, ciliary body and choroid. Iris is the anterior most part of uveal tract. Iris is a tenuos circular disc corresponding to the diaphragm of a camera. The definitive color of iris be contingent on the anterior limiting layer. In blue iris this layer is thin and contains few pigment cells. While in brown iris it is thick and compactly pigmented

DISCUSSION

In this literary study we collected various data from the Ayurvedic classics with the available commentaries, as well as text books of modern medical sciences, various articles for better understanding of the Netra sharer and its comparison with contemporary science. Acharyas have explained prakriti also influences eyes in terms of size, shape of eyes, appearance of eyes, dryness or roughness of eyes, color of eyes, lashes of eyes, movement of eyes and some specific features of eye. These relates to the constitutional variations of the individuals. Acharya Sushrutahas described "Sarvendriyaanam Nayanampradhanam". Acharya Sushruta first ever has described the anatomy of eye in relation to their shape, size of various anatomical components.

Sushruta has explained seventy-six different kinds of eye diseases and their treatment in Uttara Tantra. The Netra execute both physiological functions roopagrahana and buddhigrahana as it is the seat of Alochakapitta. It is predominant of tejomahabhuta so, there is always dread of kaphato eye.

The shape of Netra is like *suvrittam* means spherical from all sides and *gostanakara* means shaped like that teat of the cow (oval shape). Acharya Sushruta described the anatomical parts of the eye consists of *mandala* are five in number and *sandhi* and *patala* are six in number. *Sandhi* is the “Junctional Areas” between two *Mandalas*. The *Sandhi* are 6 in number. Acharya Sushruta has described the *patala* are most important structure of *netrasharir*. The first *patala* is the seat of *tejas* and *jala* and it can be taken as cornea and aqueous humour; the second *patala* is the seat of *mamsa* and it can be taken as iris and ciliary body. The third *patala* is the seat of *medo* and it can be taken as vitreous humour, it is a jelly like structure which resembles *medas*. The fourth *patala* is the seat of *asthi* and it can be taken as lens and retina, as it is the seat for *linganasha*. These are the parts where doshas get localized and produce various types of *netrarogas*. When doshas invade gradually deeper in the *patala* it causes *timira*, *Kacha* and *Linganasa*. Netra also consists of *Akshibandhana*, *sira*, *pesi*, *dhamani*, *marma*, *snayu* and other accessory parts. Thus, whole of *patala*, *Mandala*, *Sandhi*, *Akshibandhana*, *sira*, *pesi*, *dhamani*, *marma*, *snayu* completes the *netrasharira*. To conclude, we can say that *Patala* were described by Ancient Acharyas in order to show the severity of the diseases when they involve deeper tissues and no single structure can be correlated with specific *Patala* accurately. *Patala* can be taken as different structures in different contexts.

CONCLUSION

For the proper diagnosis of *netrarogas*, the detailed study of *netrasharira* is necessary. Vitiated Doshas when get accumulated in *netra* produce 76 types of *netrarogas* manifested as *Sandhigatarogas*, *Vartmagatarogas*, *Shuklagatarogas*, *Krishnagatarogas*, *Sarvagatarogas* and *Drustigatarogas*. When doshas invade gradually deeper in the *patala* it causes *timira*, *Kacha* and *Linganasa*. Netra also consists of *Akshibandhana*, *sira*, *pesi*, *dhamani*, *marma*,

snayu and other accessory parts. Thus, whole of patala Mandala, Sandhi, Akshibandhana, sira, pesi, dhamani, marma, snayu completes the netrasharira.

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