

A REVIEW OF DRISHTI

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ABSTRACT: *Ayurveda is a wide and deep science which itself is full of knowledge and many scientific facts. With time these facts have been established by the great pioneers of Ayurveda. Their contributions for establishing various concepts create milestone in the history of Ayurveda. Innumerable researches and experiments are going on in the field of Ayurveda but some controversies are still remaining. Drishti is one of the controversial terminologies in Shalakyia Tantra and there are many concepts which have been given time to time and are still evolving. At some places Drishti is taken as a functional entity and at other places as a structural unit. It also appears to have both structural and functional properties in few contexts. In the present study attempts are made to clarify the concepts regarding properties of Drishti on the basis of Ayurvedic texts and modern ophthalmology and conclusions have been drawn accordingly.*

Key Words: Drishti, Controversy, Functional entity, Structural unit, Ayurveda

INTRODUCTION: Ayurveda is an ancient medical science which envisages complete regimen for both healthy as well as diseased one, guarding health at all ages. It is divided into eight branches and Shalakyia Tantra is one of them dealing with diseases of supraclavicular region including eyes, ear, nose, throat, head and neck. Out of these; eyes have been given prime importance because of dealing with vision. Acharya Sushruta has first given the detailed description of Netra Sharira (eye anatomy), well organized classification of eye diseases and their management both by medical and surgical means.1 Netra Sharira deals with three major portions of eye-Mandala, Sandhi and Patala.2 Among five Mandala Drishti Mandala is one which is situated in the innermost aspect of eyeball and in context with this all Drishtigata rogas have been described. Drishti is an important part of eye and in classics it is interpreted in various aspects. It is considered as a controversial entity in Ayurveda till today and debates are going on over its structural and functional properties. In the present study attempts are made to elaborate Drishti and its relation in different aspects according to Ayurvedic and modern sciences.

Aim and Objective: To understand the concept of Drishti in different aspects according to Ayurvedic and modern classics.

MATERIALS AND METHODS: Various texts including Ayurvedic literature, Sanskrit literature and other modern literatures were studied and all the related points have been elaborated in this study. Literary Review Ayurvedic Review Etymology of Drishti Different types of etymology for Drishti are given in Indian classical texts and these can be summarised as follows: Drish-to see + KtinKarane means source or tool with which one sees. Drishbhava + Ktin mean seeing, viewing, intellect 3. References for Drishti in Ayurveda Drishti in Anatomical Point of view According to Ayurveda the vitiated doshas travel through siras and reach the eye then get localized in the vartmapradesha, sita-asitamandala, sarvakshi or drishti and different diseases of eye are manifested. It is described in Sushruta Samhita that Drishti as a structure itself is covered externally with outer coat (Avrataam bahayen patalen akshi). It has also been told by Acharya Sushruta that while doing Agnikarma (thermal cauterization) on vartma (lids), Drishti should be covered with wet gauze (Drishti

achchhadana). 4 According to Acharya Charaka also there is indication for Mridusweda (mild fomentation) for Drishti by covering it with padma, utpalapatra (leaves of lotus) (Drishti swedayeta mridu naiv va).5 Here Drishti can be considered as an anatomical entity. Appearance of Drishti has been described as glow like a lightning bug or that of minute particle of fire (Khadhyota visfulingabha). Structure of Drishti has been explained as a hole or aperture (Vivarakriti).6 The measurement (pramana) of Drishti is described as 1/7th of Krishnamandala, 1/9th of Taraka, Masoordala matra (size equivalent to the cotyledon of Lentil) in Ayurvedic classics.7,8,9 Drishtyantaratarm has been used to measure distance between two Drishti (inter pupillary distance) as four angulas is narrated.10 Drishti Mandala is said to be derived from both paternal and maternal factors in Ayurveda.11 Formation of Drishti occurs with sara of Panchamahabhuta- akasha, vayu, agni, jala and prithvi (Panchabhuta prasada jam) as explained in Sushtuta Uttaratantra. According to Ayurveda Drishti never increases in size during whole lifetime.12 Daily use of Anjana and Ashchyotana are said to be beneficial for eyes making Drishti as clear as a moon appears in the sky.13 While explaining prognosis and treatment of many diseases, term Drishti has been used as an anatomical entity. When Savrana shukla affects Drishti, its prognosis becomes poor.14 Acharya Vagbhata explained Shukla roopata (whitish discoloration) on involving Krishna mandala as well as Drishti as an asadhya (incurable) lakshana of Shukra.15 When Arma reaches upto Drishti, chedana karma (excision) is advised as a treatment by Acharyas.16 While explaining Lingnasha changes in colour of Drishti are given according to involvement of Doshas by Acharya Sushruta and Acharya Vagbhata.17,18 According to Acharyas colour of Drishti changes when Doshas affect Tritya Patala, finally Doshas further progress to Chaturtha Patala and completely block the vision. 19 Drishti gets shrunken in Gambhirika due to constriction of Sira by Vata. 20 All the above references indicate towards Drishti being an anatomical entity. Drishti In Physiological Point of View Properties of Drishti- It performs better in shade and cold atmosphere (Sheet satmya). Drishti as knowledge- Drishti visharada is a term used for persons having extreme knowledge. Drishti as Vision- In Ayurvedic classics there are several references which indicate that Drishti term is used for vision. Few textual references are as following:

When Tejo Dhatu does not reach Drishti, congenital blindness (Jatyandha) is developed.23

- ✓ If poison is given in Anjana form (Visha Samsrishta Anjana) then blurring of vision (Drishti vibhrama) occurs.24
- ✓ Controlling vega (natural urges) like Kshudha and Adhovaayu leads to defective vision.25,26
- ✓ If Adhimantha is not treated properly it leads to loss of vision (Drishtihanana).27
- ✓ Acharya Vagbhata used term Drishti Mushita darshanam for loss of vision in Aupsargika Lingnasha. 28 Acharya Sushruta used term Drishti runaddhi for loss of vision in Lingnasha.29
- ✓ Drishtiprada Varti is mentioned by Acharya Charaka in Trimarmiya adhyaya for treatment of Netrarogas and it is said to be potent enough to provide vision to even blind persons.30
- ✓ There are several references for Ahara sevana affecting Drishti (vision). Food prepared in ghrita, as well as intake of Mudga is said to be Drishti Prasadaka (helpful for vision).31,32 Food materials which are prepared in Taila are said to be Drishtighna (harmful for vision).33 Intake of Kalinda is said to be Drishti kshyakara (harmful for vision).34 Drishti Dushana (Vision impairment) occurs due to intake (sevana) of Viruddha dhanya.35
- ✓ Putapaka Kriyakalpa is considered as Drishti balartha parama by Acharya Sushruta whereas Acharya Vagbhata described Putapaka as Driga baladhana, both of which indicate

improvement in vision byputapaka.36,37Nasya procedure is also said to be Drishti prasadana. 38As a result of Mukhalepa, strengthening of vision (Drishtibala) occurs.39.

- ✓ Taila-abhyanga and Padabhyanga are also said to be helpful in improving vision (Drishti Prasada) according to both Acharya Vagbhata and Acharya Charaka respectively.40,41

All the above referenves denote that Drishti term has come mainly for functional outcome –vision. Drishti in Both Physiological and Anatomical View Ropana anjana is considered as Drishti Varnya and Bala Vardhanam that means eyes become clean externally along with improvement in vision.42

- ✓ In Pitta Vidagdha Drishti ,Kaphavidagdha Drishti and Nakulandhya structural and functional both deformities occur in Drishti.43
- ✓ In Abhigataja linganasha structural and functional both deformities occur (Drishti Vidiryate, sidati,hiyate)44
- ✓ In Animittaja Linganasha there is loss of vision (Drishtihanyate) but Drishti appearsclear (Vaidurya varna/Vimala varna) which shows vision is hampered in spite of intact structural integrity.45 Above are the references of Drishti indicating for anatomical as well as physiological aspect.

Modern Review46 In Modern Ophthalmology there are few structures related to vision which can be comparable to the description given in Ayurvedic texts for Drishti. Structures related to visual axis and vision are as following-

Cornea: Cornea is a clear, transparent and elliptical structure with a smooth shining surface. **Aqueous humor:** The aqueous humour is a clear watery fluid filling the anterior chamber (0.25 ml) and posterior chamber (0.06 ml) of the eyeball. It plays an important metabolic role by providing substrates and by removing metabolites from the avascular cornea and lens. It maintains optical transparency.

Pupil: Pupil is central opening in the iris and its size varies between 1 and 8 mm. Constriction of pupil regulates the entry of light inside the eye and allows the retina to adapt to the changes in the illumination.47

Lens: The lens is a biconvex and transparent structure. The lens has nodal point (optical centre of lens) on its posterior part through which rays of light passes to retina. **Retina:** It is the innermost tunic of the eyeball and the most highly-developed tissue and consists of 10 layers. Grossly it is divided into two distinct regions: Posterior Pole and Peripheral Retina separated retinal equator. Posterior pole refers to the area of the retina posterior to the retinal equator. The posterior pole of the retina includes two distinct areas: the optic disc and macula lutea. **Optic disc:** It is a circular area of 1.5-mm diameter. At the optic disc all the retinal layers terminate except the nerve fibres, which pass through the lamina cribrosa to run into the optic nerve. **Physiological cup** is a depression seen in the disc. **Macula lutea:** It is about 5.5 mm in diameter. **Fovea centralis** is the central depressed part of the macula. It is about 1.5 mm in diameter and is the most sensitive part of the retina. In its centre is a shining pit called **Foveola** (0.35-mm diameter) which is situated about 2 disc diameters (3 mm) away from the temporal margin of the disc and about 1 mm below the horizontal meridian. An area about 0.8 mm in diameter (including foveola and some surrounding area) does not contain any retinal capillaries and is called **foveal avascular zone (FAZ)**. Surrounding the fovea are the **parafoveal** and **perifoveal** areas. **Peripheral retina** refers to the area bounded posteriorly by the retinal equator and anteriorly by the ora serrata. **Areas of brain:** The visual cortex is the primary cortical region of the brain that receives, integrates, and processes visual information that is relayed from the retinas. It is

located in the occipital lobe of the primary cerebral cortex which is in the most posterior region of the brain. Visual Axis: Visual axis is the line joining the fixation point (O), nodal point (N), and the fovea (F). Figure 1 Visual axis (OF); fixation axis (OC) Visual pathway system: The visual pathway consists of: Optic Nerve, Optic Chiasma, Optic Tract, Lateral Geniculate Body, Optic Radiations and Visual Cortex.

DISCUSSION: All the Ayurvedic texts imply that Drishti can be taken as an anatomical entity (eyeball, central part of cornea, pupillary aperture, lens, retina or optic nerve) as well as a physiological outcome -vision. Discussion on Anatomical aspect of Drishti Drishti as Eyeball: There is description regarding protection of Drishti during Agnikarma and also while doing Mridusweda (mild fomentation) of Drishti, covering it with different leaves has been advised. Since all these objects can only be applied only externally to a body part and thus here Drishti can be considered as eyeball. Drishti as Cornea: While describing prognosis of Savranashukra it is said to be asadhya (incurable) when this disease involves Drishti. In modern texts similar type of condition is seen in corneal ulcer and corneal opacity where central as well as deeper layers of cornea are involved, it results into blurring of vision and in advanced cases it may lead to even blindness. Drishti is said to be covered by Bahayapatala. As per Ayurvedic classics Bahya patala is Tejo-jala ashrita which is further explained in Dalhana commentary that this patala is considered as Accha (clear) that helps in Roopa grahanam (vision) by Drishti⁴⁸. It indicates towards transparent structure which is helpful in vision also. In modern ophthalmology Cornea is explained as a clear and transparent structure through which light rays pass and reach upto retina. Any disturbance in its transparency causes defective vision. It is also a fact that all ocular structures related to vision are helpful in vision provided cornea is healthy. Hence here Drishti can be considered as cornea. Drishti as Pupil: Drishti is said to have glow-worm like appearance as per Ayurveda; it can be due to the fact that eyes reflect some amount of light and this is visualized in pupil. The feature of Vivarakriti implies a hollow structure as explained in Ayurveda as well as modern ophthalmology⁴⁹. According to modern ophthalmology pupil is a hollow aperture in the centre of the iris that allows light to pass into retina. Measurement of Drishti is given as 1/7 of Krishnamandala (cornea) and 1/9th of Taraka (iris) which can be clarified taking into consideration that pupil constrict or dilate according to the amount of light received and hence changes in size occur. It is also regarded as Masoordalaprmana which again signifies the same dilating or constricting actions of pupil. In the description of Kaphajalinganasha, constricting and dilating feature of Drishti to light and dark comes, which signifies the property of pupil as Drishti. In context to Arma, surgery (chedanakarma) is avoided if it is situated near Drishti. ⁵⁰Here Drishti can be considered for pupil and pupillary margins. All these points indicate towards close resemblance of Drishti to pupil. Drishti as Lens: Drishti plays an important role in pathogenesis and progression of Timira roga as there is wide description of this roga under the umbrella of Drishtigataroga. All three forms of this roga-Timira, Kaacha and Linganasha are found in different patalas of Drishti. All these features given for changes in colour of Drishti in Timira or kacha or linganasha can be depicted in modern texts and can be correlated with the disease of lens called as cataract. In cataract various colour changes along with different pattern of lens opacification are seen, these can be correlated with colour of Drishti in different types of Timira. Taking these facts into consideration, lens as an anatomical entity has a resemblance with Drishti. Drishti as Retina: Drishti has origin from sara of panch mahabhuta with predominance of tejomahabhuta which is considered as light media for eye. Roopa with the help of teja travels into chakshu and then reached to

chaksurendriya and then to chakshubudhhi where perception of the object occurs and finally perceived by atma which provide information of the object and all this can be considered as pathway for visual impulse received by eyes and thus enabling it to see. IndriyaArtha (object has form) IndriyaDravya (light media) IndriyaAdhithana (eyes) Indriya (photoreceptor cells of retina (rods and cones) IndriyaBuddhi (transmission of image via visual pathway) Atma (higher centre i.e. visual cortex) Flow Chart - Processing of vision according to Ayurveda The diseases explained in Drishtigataroga like Pittavidagdha Drishti, Kaphavidagdha Drishti, Nakulandhya or Hriswajadya have features of night blindness, day blindness, distorted vision and loss of vision. Here Drishti can be considered as retina because in all these diseases the retinal involvement is present which affects the visual outcome. Drishti as Optic Nerve: In a disease Hatadhimantha, which is a complication of Adhimantha, Drishti pratikshipan (shrinkage of Drishti) is found as a clinical feature. In Gambhirika roga also feature of shrunken eyeball is given by Acharyas which can be correlated with a condition of Pthisis bulbi according to modern science which is defined as shrunken, non-functional eye. Thus Drishti can be correlated with atrophy of optic nerve in modern ophthalmology. In a previous study it was concluded that Drishti should be referred as pupil in context of anatomy, intraocular lens in context to Kaach, Timira, Liganasha and it can be taken as optic nerve or retina as a whole in context to Pittavidaghdhadrishti, shleshmavidaghdhadrishti. 51 In an another study DrishtiKacha term was compared to Lens, DrishtiPatala to Retina, Drishtinadito Optic Nerve and DrishtiMarga to Visual Pathways System. 52 Discussion on Physiological aspect of Drishti Drishti as visual outcome: In some disease like Animittaja Liganasha and Aupsargikalinganasha there is no structural deformity but there is physiological dysfunction in eye (vision loss). It indicates that vision can be hampered even when eye appears quiet as seen in few conditions like retrobulbar neuritis in modern ophthalmology. Discussion on Anatomical as well as Physiological aspect of Drishti In Abhighatajalinganasha there is destruction of structure as well as loss of vision, which implies that Drishti can be taken as an anatomical and physiological unit both. In modern ophthalmology also it is seen that when there is any trauma occurs in eye, structural as well as physiological loss is seen.

CONCLUSION: In Ayurveda, Drishti is used as a broad terminology and is used accordingly in different aspects. From the present study it can be concluded that Drishti is not just a single entity but composed of many structures that can be correlated in modern ophthalmology. The structures which come across visual axis and their functional output in total can be taken as Drishti. In view of this definition the structures i.e. central part of Cornea, Pupil, Lens, Vitreous, Retina, Visual pathway all come under the broad view of Drishti along with functional outcome i.e. vision. For treating the diseases related with Drishti there should be proper knowledge of different terminologies and their practical implementation so that the basic aim of Ayurveda- to maintain the health of healthy person and to cure the unhealthy person can be achieved.

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