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DRISHTI IN AYURVEDA: ACRITICAL REVIEW OF ITS ANATOMICAL PHYSIOLOGICAL AND CLINICAL CORELATIONS WITH MODERN OPHTHALMOLOGY

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ABSTRACT

Background: The concept of Drishti occupies an important position in Ayurvedic ophthalmology, particularly in the classical descriptions of Netra Sharira and Drishtigata Rogas. Although the term is frequently used in Ayurvedic literature, its precise anatomical and physiological interpretation remains a subject of scholarly discussion. Depending on the context, Drishti has been described as a structural component of the eye, the functional basis of vision, or an integrated entity involving both. **Objective:** To critically analyse the concept of Drishti as described in classical Ayurvedic literature and explore its possible anatomical, physiological and clinical correlations with contemporary ophthalmology. **Materials and Methods:** A conceptual literary review was undertaken using classical Ayurvedic texts, including Sushruta Samhita, Charaka Samhita and Ashtanga Hridaya, along with their available commentaries. Relevant modern ophthalmological literature and previously published review articles were also examined. The collected information was analysed thematically under anatomical, physiological and clinical domains. **Results:** Classical descriptions suggest that Drishti cannot be restricted to a single anatomical structure. References concerning its morphology, dimensions, appearance and protection indicate a structural interpretation, whereas descriptions involving visual impairment,

perception and restoration of visual function indicate a physiological interpretation. Modern ophthalmology identifies several structures essential for vision, including the cornea, aqueous humour, pupil, crystalline lens, vitreous body, retina, optic nerve and central visual pathways. These structures collectively contribute to the formation, transmission and interpretation of visual information. **Conclusion:** Drishti may be interpreted as a comprehensive concept encompassing the anatomical components involved in vision and their integrated physiological functioning. Contextual interpretation of the term is essential for understanding Ayurvedic descriptions of ocular diseases and developing meaningful interdisciplinary research.

KEYWORDS: Drishti, Netra Sharira, Drishtigata Roga, Shalakya Tantra, Chakshu, Visual Pathway, Ophthalmology, Ayurveda.

1. INTRODUCTION

Ayurveda describes the human body as an integrated system in which structural integrity, physiological activities and sensory perception function in coordination. Among the eight branches of Ayurveda, Shalakya Tantra is particularly concerned with diseases and disorders affecting the organs situated above the clavicular region, including the eyes, ears, nose, oral cavity, throat and head.

Among these sensory organs, the eye occupies a particularly significant position because of its role in visual perception and interaction with the external environment. Classical Ayurvedic literature has extensively described the anatomy, physiology, pathological conditions and therapeutic approaches associated with the eye.[1]

Acharya Sushruta has provided a systematic description of Netra Sharira, including the five Mandalas, six Sandhis and six Patalas.[2] Within this anatomical framework, Drishti Mandala has been given considerable importance. Several ocular disorders have also been classified under Drishtigata Rogas, indicating the importance of Drishti in understanding visual disturbances and their clinical manifestations.

However, the term Drishti has been used in different contexts throughout Ayurvedic literature. In certain descriptions, it appears to indicate a definite anatomical component of the eyeball, while in others it represents the functional ability to perceive objects. Some references suggest that both structural and functional aspects are involved.

Modern ophthalmology explains vision as a complex process involving optical media, retinal photoreceptors, neural transmission and cortical interpretation. The anatomical structures responsible for these activities function together rather than independently.

Therefore, a critical examination of Drishti from both Ayurvedic and modern perspectives is necessary. Such an approach may provide a better understanding of classical ophthalmological terminology and its relevance to contemporary clinical practice.

2. AIM AND OBJECTIVES

Aim

To critically review the concept of Drishti according to classical Ayurvedic literature and explore its anatomical and physiological correlations with modern ophthalmology.

Objectives

1. To analyse the etymology and different interpretations of the term Drishti.
2. To study the description of Drishti in Sushruta Samhita, Charaka Samhita and Ashtanga Hridaya.
3. To understand the structural and functional characteristics attributed to Drishti.
4. To examine possible correlations between Drishti and anatomical structures involved in vision.
5. To explore the relevance of Drishti in understanding various Drishtigata Rogas.
6. To identify areas requiring further interdisciplinary research.

3. MATERIALS AND METHODS

The present work was designed as a conceptual literary review.

3.1 Classical Ayurvedic Literature

The following classical texts were considered:

- Sushruta Samhita, particularly Sharira Sthana and Uttara Tantra.
- Charaka Samhita, particularly Sutra Sthana and Chikitsa Sthana.
- Ashtanga Hridaya, particularly Sutra Sthana and Uttara Sthana.
- Relevant classical commentaries and Sanskrit terminological references.

3.2 Modern Literatur

Modern ophthalmological literature concerning ocular anatomy, optical media, retinal physiology, visual pathways, pupillary function and visual perception was reviewed.

3.3 Method of Analysis

Relevant descriptions were classified into three major categories.

1. Anatomical interpretation of Drishti.
2. Physiological interpretation of Drishti.
3. Combined anatomical and physiological interpretation.

The findings were compared with modern ophthalmological knowledge. The proposed correlations were interpreted conceptually, without assuming direct anatomical equivalence between classical Ayurvedic terminology and modern structures.

4. ETYMOLOGY AND CONCEPTUAL INTERPRETATION OF DRISHTI

The Sanskrit term Drishti is derived from the verbal root Drish, meaning to see, observe or perceive. With the appropriate grammatical formation, the term conveys the sense of seeing, vision, observation and visual perception.

In a broader philosophical and physiological context, Drishti may refer not only to the act of seeing but also to the faculty through which visual knowledge is obtained.[3]

The interpretation of Drishti can therefore be considered under the following aspects.

1. Structural aspect: The anatomical component or region of the eye associated with the visual axis.
2. Functional aspect: The capacity of the visual apparatus to receive and process visual information
3. Perceptual aspect: The process through which visual information is interpreted and recognised.

These interpretations suggest that Drishti is a context-dependent term rather than a strictly defined anatomical nomenclature.

5. DESCRIPTION OF DRISHTI IN AYURVEDIC CLASSICS

5.1 According to Acharya Sushruta

Acharya Sushruta has described the anatomy of the eyeball through five Mandalas, six Sandhis and six Patalas.

The five Mandalas are.

1. Pakshma Mandala
2. Vartma Mandala

3. Shweta Mandala
4. Krishna Mandala
5. Drishti Mandala

The six Sandhis represent the junctions between the different anatomical regions of the eye.
The six Patalas comprise two associated with the eyelids and four associated with the eyeball.

Drishti is described as an important component situated within the innermost region of the ocular structure. Drishti should be covered with **drishti achchhadana.**[4] Classical descriptions also provide measurements of Drishti in relation to Krishna Mandala and Taraka.

The measurement of Drishti is traditionally described as one-seventh of Krishna Mandala and one-ninth of Taraka in the relevant textual contexts.[5,6,7] Such measurements should be understood within the framework of classical anatomical descriptions rather than directly converted into modern biometric measurements.

Sushruta also describes the appearance of Drishti using the expression Khadyota-visphulingabha, suggesting an appearance comparable to the glow of a firefly or a small luminous spark.[8]

The term Vivarakriti has also been associated with its description, indicating an aperture-like appearance in certain interpretations.

These references provide evidence that Drishti was considered to possess identifiable morphological characteristics.

5.2 According to Acharya Charaka

Charaka Samhita contains several references indicating the importance of preserving ocular function.
Descriptions concerning mild fomentation with padma, utpalapatra[9], dietary practices and ocular health demonstrate the importance attributed to visual capacity.
The reference to Drishti in the context of visual function indicates that the term may represent the ability of the eye to perceive objects rather than merely an isolated anatomical structure.
Charaka's descriptions of ocular care and the maintenance of sensory functions further demonstrate the relationship between structural health and functional performance.[10,11]

5.3 According to Acharya Vagbhata

Ashtanga Hridaya also describes Drishti in different clinical and therapeutic contexts.

Procedures such as Putapaka, Nasya and other ocular and preventive measures are described in relation to the preservation or improvement of visual capacity.[12,13,14]

The expressions associated with Drishtibala and Drishtiprasadana suggest the importance of maintaining the functional efficiency of the visual apparatus.[15,16]

Thus, the descriptions of Sushruta, Charaka and Vagbhata collectively indicate that Drishti has both structural and functional dimensions.

6. ANATOMICAL INTERPRETATION OF DRISHTI

Several references in Ayurvedic literature support the interpretation of Drishti as an anatomical entity.

These descriptions include its location, appearance, dimensions and relationship with surrounding ocular structures.

6.1 Drishti as an Integral Ocular Structure

Sushruta describes Drishti as a specific region within the eyeball. Its relationship with Krishna Mandala and the description of its external covering suggest that it is considered part of the anatomical organisation of the eye.

The classical description of protecting Drishti during certain therapeutic procedures also supports the interpretation of Drishti as a physical ocular structure.

6.2 Possible Correlation with the Cornea[17]

The cornea is the transparent anterior part of the eyeball and forms an important component of the refractive system.

It permits the passage of light into the eye and contributes significantly to optical focusing.

The classical references to transparent ocular structures and their relationship with visual perception may be conceptually compared with the optical role of the cornea.

However, the cornea cannot be considered an exact equivalent of Drishti because the classical descriptions also indicate deeper structures and functional components.

6.3 Possible Correlation with the Pupil

The pupil is the central aperture of the iris through which light enters the eye.

Its diameter changes according to illumination through the action of the pupillary muscles.

The classical descriptions of Drishti as an aperture-like structure and its relationship with light and visual perception provide a possible conceptual association with the pupil.

The pupil also plays an important role in regulating retinal illumination and maintaining appropriate visual performance under varying environmental conditions.[18]

6.4 Possible Correlation with the Crystalline Lens

The crystalline lens is a transparent, biconvex structure situated behind the iris.[19]

Its primary function is to refract light and focus images on the retina.

Accommodation allows the lens to alter its optical power for near and distant vision.

The descriptions of changes in the appearance of Drishti in certain ocular disorders have sometimes been compared with changes in lens transparency.

In particular, the clinical manifestations of Timira and Kacha have been discussed in relation to lens pathology.

Nevertheless, these descriptions should not be interpreted as establishing a direct equivalence between every Ayurvedic stage of Timira or Kacha and modern cataract.

6.5 Possible Correlation with the Retina

The retina is the innermost sensory layer of the eyeball. It contains specialised photoreceptor cells, namely rods and cones, which convert light energy into electrical signals.[20]

The macula is responsible for central vision[21], while the fovea provides the highest level of visual resolution.

Some interpretations of Drishti emphasise its central location and its importance in visual perception, suggesting a possible relationship with the macular region.

The comparison is particularly relevant because the retina serves as the principal sensory structure responsible for converting optical information into neural signals.

However, the available classical descriptions do not establish an exact correspondence with the modern histological organisation of the retina.

6.6 Possible Correlation with the Optic Nerve

The optic nerve transmits visual information from the retina towards the brain.[22]

Classical descriptions of impaired or diminished Drishti in certain disease conditions have been discussed in relation to optic nerve dysfunction.

Conditions involving optic nerve degeneration may produce severe visual impairment even when the anterior ocular structures appear relatively normal.

This provides a functional basis for comparing certain descriptions of Drishti with optic nerve pathology, although the comparison remains interpretative.

7. PHYSIOLOGICAL INTERPRETATION OF DRISHTI

The functional interpretation of Drishti is equally important.

Vision is not simply the result of the presence of an anatomically intact eyeball. It requires the coordinated activity of optical, sensory and neurological components.

7.1 Drishti as Visual Function

In several Ayurvedic references, Drishti is associated with the ability to see, recognise and perceive objects.

Descriptions of visual impairment in conditions such as Jatyandha, Linganasha and other Drishtigata Rogas indicate that the term is frequently used to represent loss or disturbance of visual function.[23,24]

Such references suggest that Drishti may be understood as the functional outcome of the complete visual apparatus.

7.2 Role of Alochaka Pitta[25]

Alochaka Pitta is an important Ayurvedic concept associated with visual perception.

It is generally described in relation to the ability of the eye to receive and recognise visual information.

In Ayurvedic interpretation, the predominance of Tejas Mahabhuta is associated with the visual faculty.

The two commonly described aspects of Alochaka Pitta are.

- Chakshur Vaisheshika: Associated with the visual activity of the eye.
- Buddhi Vaisheshika: Associated with the higher cognitive aspect of visual recognition and understanding.

These concepts may be discussed alongside the modern distinction between retinal phototransduction and central visual processing.

However, Alochaka Pitta should be understood as an Ayurvedic functional principle and should not be equated directly with a single modern biochemical or anatomical entity.

7.3 Visual Perception in Modern Ophthalmology

Modern visual physiology involves several sequential processes.[26]

1. Light enters through the cornea.
2. It passes through the aqueous humour and pupil.
3. The crystalline lens helps focus light on the retina.
4. Retinal photoreceptors convert light into electrical signals.
5. Signals are transmitted through retinal neural circuits and ganglion cell axons.
6. The optic nerve carries the signals towards the optic chiasma.
7. Visual information passes through the optic tract to the lateral geniculate nucleus.
8. Optic radiations carry the information to the primary visual cortex.
9. Higher cortical areas participate in visual interpretation, recognition and perception.

Thus, vision depends on the functional integrity of the entire visual pathway.

This provides a useful conceptual framework for understanding Drishti as a comprehensive visual faculty.

8. MODERN OPHTHALMOLOGICAL CORRELATION

The modern visual system can be broadly divided into optical, sensory and neurological components.

Modern structure| Principal function| Possible relevance to Drishti

Cornea| Initial refraction and transmission of light| Optical component

Aqueous humour| Maintains intraocular environment and optical transparency| Supporting optical medium Pupil| Regulates entry of light| Aperture-like interpretation

Crystalline lens| Refraction and accommodation| Image focusing

Vitreous body| Maintains ocular structure and permits light transmission| Internal optical medium

Retina| Phototransduction and initial neural processing| Sensory component

Optic nerve| Transmission of visual impulses| Neural component

Visual cortex| Interpretation of visual information| Higher perceptual component

The above comparison indicates that Drishti may be discussed as a functional-anatomical system rather than a single anatomical structure.

8.1 Visual Axis and Its Significance[27]

The visual axis is an important optical concept relating the fixation point to the foveal region through the nodal points of the eye.

The integrity of the structures involved in the passage and focusing of light is necessary for clear vision.

Any disturbance in corneal transparency, lens clarity, retinal function or neural transmission can result in impaired visual performance.

Therefore, the visual axis provides a useful modern framework for understanding the broader interpretation of Drishti.

8.2 Importance of Retinal Function

The retina plays a central role in visual perception because it converts incoming light into neural information.

Rod cells are particularly important for vision under dim illumination, whereas cone cells are responsible for colour discrimination and high-resolution vision.

The macular region is essential for central vision and detailed visual activities.

Retinal disorders such as age-related macular degeneration and retinitis pigmentosa demonstrate how damage to specific retinal components can produce characteristic visual disturbances.

8.3 Importance of the Central Visual Pathway

Visual perception continues beyond the eyeball.

The optic nerve, optic chiasma, optic tract, lateral geniculate body, optic radiations and visual cortex collectively participate in the transmission and interpretation of visual information.

Damage to these structures may result in characteristic visual field defects or reduced visual perception.

This demonstrates that normal visual function depends not only on the structural integrity of the eyeball but also on the proper functioning of the central nervous system.

9. CLINICAL INTERPRETATION IN DRISHTIGATA ROGAS

The clinical descriptions of Drishtigata Rogas provide an important basis for understanding the different dimensions of Drishti.

9.1 Timira and Kacha

Timira and Kacha are important conditions described in Ayurvedic ophthalmology.

Classical descriptions include progressive disturbances in visual perception, changes in the appearance of visual objects and impairment of vision.

Some of these manifestations may be compared with refractive, lenticular or other ocular disorders.

Cataract, for example, involves progressive loss of transparency of the crystalline lens and can produce blurred vision, glare and reduced visual acuity.

However, Timira and Kacha should not be automatically regarded as synonyms for cataract. Their interpretation requires consideration of the individual clinical features and classical descriptions.

9.2 Linganasha

Linganasha is described in Ayurveda in relation to severe loss of visual function.(28)

The term has been interpreted in different clinical contexts, and its manifestations may involve advanced ocular pathology.

In modern ophthalmology, profound visual loss can occur due to retinal degeneration, optic neuropathy, severe media opacity or damage to the central visual pathway.

Consequently, Linganasha may be discussed as a broad clinical concept of severe visual impairment, while specific modern diagnoses require appropriate ophthalmological examination.

9.3 Pittavidagdha Drishti and Kaphavidagdha Drishti[29]

Pittavidagdha Drishti and Kaphavidagdha Drishti are described in classical Ayurvedic ophthalmology with characteristic disturbances of visual function.

The clinical descriptions include variations in visual performance under different lighting conditions.

These manifestations have been compared by some researchers with disorders affecting retinal function.

Such comparisons may provide useful hypotheses for future research, but they should not be regarded as established diagnostic equivalences.

9.4 Nakulandhya

Nakulandhya is another condition described in the context of Drishtigata Rogas. Its clinical interpretation involves abnormalities of vision and visual adaptation. Modern retinal and neurological disorders may produce comparable patterns of visual dysfunction, but further clinical investigation is necessary before establishing any specific correlation.

9.5 Abhighataja Linganasha[30]

Traumatic injury to the eye may produce both structural damage and functional visual impairment. Depending on the severity and location of injury, the cornea, lens, retina, optic

nerve or other ocular structures may be affected This provides a conceptual example in which structural integrity and visual function are simultaneously compromised. It supports the interpretation that Drishti may encompass both anatomical and physiological dimensions.

10. DISCUSSION

The concept of Drishti represents an important area of interpretation within Ayurvedic ophthalmology.

The available descriptions from Sushruta Samhita, Charaka Samhita and Ashtanga Hridaya demonstrate that the term has been employed in different contexts.

The anatomical interpretation is supported by references concerning its location, dimensions, appearance and protection during therapeutic procedures.

On the other hand, references concerning Drishtibala, Drishtiprasadana, visual impairment and restoration of visual capacity indicate a functional interpretation.[31,32,33]

Modern ophthalmology provides a comprehensive explanation of vision through the coordinated activity of optical media, retinal photoreceptors, neural pathways and cortical centres.

No single structure independently performs the complete process of vision.

The cornea and lens contribute to image formation, the pupil regulates light entry, the retina converts light into neural impulses, and the optic pathway transmits these impulses for further processing.

Therefore, the broad interpretation of Drishti as an integrated visual system appears conceptually appropriate.

Nevertheless, caution is necessary while comparing individual Ayurvedic structures with modern anatomical components.

The anatomical descriptions in classical texts were developed within a different scientific and terminological framework. Similarity in appearance, location or function does not necessarily establish anatomical identity.

For example, the interpretation of Drishti as the pupil may be supported by its aperture-like description, whereas its association with the central retinal region may be considered in the context of visual function and central visual perception.

These interpretations are not necessarily contradictory if the term is understood contextually.

Drishti should not be restricted to one specific anatomical structure and may represent the structures along the visual axis together with their functional integrity.

Thus, an integrated approach appears more appropriate than attempting to identify Drishti with only the pupil, lens, retina or optic nerve.

10.1 Clinical Significance

A clear understanding of Drishti is important for interpreting Drishtigata Rogas and their clinical manifestations.

It may assist Ayurvedic scholars and clinicians in understanding the relationship between structural changes and functional disturbances.

The concept also provides an opportunity for developing interdisciplinary research involving classical textual interpretation, ophthalmological examination and modern diagnostic investigations.

10.2 Research Perspectives

Future research should focus on.

1. Systematic textual analysis of Drishti references across major Ayurvedic Samhitas.
2. Comparative interpretation of Drishti Mandala and the visual axis.
3. Evaluation of classical descriptions of Drishti in relation to modern ocular anatomy.
4. Clinical correlation of selected Drishtigata Rogas with objective ophthalmological findings.
5. Development of standardised terminology for interdisciplinary Ayurvedic ophthalmology research.

Such studies may help establish a clearer conceptual framework without imposing modern anatomical terminology directly upon classical descriptions.

11. LIMITATIONS OF THE REVIEW

The present article is based primarily on literary and conceptual analysis. It does not include clinical investigations, experimental validation or direct anatomical examination.

Furthermore, the available interpretations of certain Ayurvedic terms vary among commentators and researchers.

The proposed modern correlations are therefore interpretative and should not be considered established anatomical equivalences.

Further studies involving textual analysis, clinical observations and modern diagnostic investigations are required to strengthen the understanding of Drishti.

12. CONCLUSION

Drishti is a multidimensional concept in Ayurvedic ophthalmology that cannot be adequately explained by assigning it to a single anatomical structure.

The classical descriptions of Sushruta, Charaka and Vagbhata indicate that Drishti has been used in both structural and functional contexts.

Its anatomical interpretation is supported by descriptions of location, dimensions, appearance and relationship with surrounding ocular structures. Its physiological interpretation is reflected in references concerning visual perception, visual strength and impairment of sight.

Modern ophthalmology demonstrates that vision is a coordinated process involving the cornea, aqueous humour, pupil, crystalline lens, vitreous body, retina, optic nerve, visual pathways and cerebral visual centres. Considering these observations, Drishti may be understood as a comprehensive functional anatomical concept involving the structures essential for vision and their integrated physiological activities.

A contextual interpretation of Drishti is therefore necessary for understanding the pathogenesis of Drishtigata Rogas and establishing meaningful correlations between Ayurvedic ophthalmology and contemporary scientific knowledge.

Further interdisciplinary research is required to explore these relationships and develop a more precise understanding of this important classical concept.

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