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Insights into Dwitiya Patalagata Timira: Ayurvedic Concept and its Contemporary Correlation

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Abstract
Among the five sensory organs—eyes, ears, nose, tongue, and skin—Ayurveda accords the highest significance to the eyes, as nearly 90% of all knowledge is perceived through vision. Visual perception plays a vital role in daily human activities. Timira, a disorder of the Drishtimandala, encompasses a broad spectrum of visual impairments, ranging from mild blurring to complete loss of vision. Presbyopia is not merely a refractive error but a physiological decline in the accommodative power of the eye, resulting in a gradual deterioration of near vision. The Ayurvedic concept of Dwitiya Patalagata Timira closely corresponds to presbyopia described in modern ophthalmology. Therefore, this review aims to explore the correlation between Dwitiya Patalagata Timira and Presbyopia from both Ayurvedic and modern perspectives.

Keywords: Drishtigata Roga, Timira, Dwitiya Patalagata Timira, Presbyopia

INTRODUCTION

The eye is the most specialized organ of the human body, responsible for the essential function of vision. Among the five sensory organs, sight holds paramount importance, as it enables individuals to perceive and interact with the world. Therefore, lifelong care and protection of the eyes are indispensable. For a person deprived of vision, life becomes devoid of meaning—day and night appear the same, regardless of material wealth.[1]

Timira is one of the Drishtigata Rogas described comprehensively by Ayurvedic scholars. In the Sushruta Samhita (Uttara Tantra, Chapter 7), Timira Roga is categorized under Drishtigata Roga, and a total of twelve types of Drishtigata Roga are mentioned[2].

According to Acharya Sushruta and Acharya Vagbhata, the key symptoms of Timira (specifically Dwitiya Patalagata Timira) include Avyakta Darshana (blurring of vision), Suchipashyam Na Pashyati (inability to insert a thread through the eye of a needle), and Sukshma Cha Na Iksate (difficulty in seeing fine objects).[3]

In Netra Sharira (anatomy of the eye), the Patala represents one of the structural layers of the eye.

Ayurveda describes six Netra Patalas—two Bahya Vartmagata Patalas (external) and four Abhyantara Patalas (internal)[4]. When the vitiated Doshas ascend to the Dwitiya Patala, visual disturbance manifests as blurring of vision. The Patalas hold vital diagnostic and prognostic value since the progression and severity of Drishtigata Rogas, particularly Timira, depend on the depth of Patala involvement.

In modern ophthalmology, the American Optometric Association defines Presbyopia as an age-related refractive condition that typically develops between 35 and 40 years of age. It results from a gradual decline in the accommodative ability of the eye. Accommodation refers to the mechanism through which the eye adjusts its focus to clearly visualize near objects (within six meters). This adjustment occurs when the ciliary muscles contract, causing the crystalline lens to change its curvature, thereby ensuring that light rays converge precisely on the retina. In young individuals, accommodation allows clear vision at all distances. However, after the age of 40, the crystalline lens progressively loses elasticity, reducing its capacity to adjust focus for near objects and leading to presbyopia.

PRESBYOPIA

Presbyopia is not categorized as a refractive error but rather as a physiological condition characterized by a progressive decline in the eye's accommodative power. This occurs primarily due to age-related reduction in the elasticity of the lens capsule and lens substance. Along with lenticular changes, diminished functioning of the ciliary muscles also contributes to the development of presbyopia.[5]

This condition represents a gradual loss of the eye's ability to adjust focus for near objects. Although the exact underlying mechanisms are not yet fully elucidated, the most widely accepted explanation attributes it to the progressive hardening of the crystalline lens over time. Presbyopia is an inevitable part of the aging process, affecting all individuals regardless of prior refractive status.

Common early signs include difficulty in reading small print and the tendency to hold reading material farther away to see clearly. Typically, around the age of 40, the eyes begin to lose the ability to focus effectively within one to two meters, necessitating the use of corrective lenses for tasks such as reading or threading a needle. The term Presbyopia is derived from Greek, meaning "old man's eye" or "age-related vision."

Presbyopia is generally classified into the following five stages:[6]

1. **Incipient Presbyopia** – This initial stage marks the earliest signs of reduced near vision performance. Individuals may experience mild difficulty in reading fine print or require additional effort for near tasks. Though clinical findings may reveal minimal visual impairment, patients often note the onset of visual strain during prolonged close work.
2. **Functional Presbyopia** – At this stage, a noticeable decline in accommodative amplitude affects near-vision tasks. Individuals begin to experience persistent visual discomfort or blurred vision during near work, which becomes evident upon clinical evaluation.
3. **Absolute Presbyopia** – This is the advanced stage where the loss of accommodation becomes complete, leaving the individual with virtually no ability to focus on near objects. The condition represents the culmination of the gradual physiological decline associated with aging.

Premature Presbyopia

4. Premature presbyopia refers to the early onset of reduced accommodative power, occurring sooner than the expected age range. It may result from various factors such as environmental strain, poor

nutrition, systemic illnesses, or prolonged use of certain medications. Individuals develop symptoms of near vision difficulty earlier than normal due to these contributory influences.

5. **Nocturnal Presbyopia**

Nocturnal presbyopia is a condition where visual difficulties for near tasks arise primarily under low-light conditions. In dim illumination, a decrease in accommodative amplitude occurs due to increased pupil size and reduced depth of focus, leading to blurring or strain during close work in such lighting environments.

Prevalence

The prevalence of presbyopia tends to be higher in countries with longer life expectancy and greater proportions of older populations. According to global estimates from 2005, over one billion people were affected by presbyopia, and this number continues to rise[7]. The condition is more commonly observed in urban areas of developed nations, where lifestyle and occupational demands increase reliance on near vision tasks.

Epidemiological data show regional variations: studies reported prevalence rates of 58% in Tanzania, 83% in Brazil, 93% in India, and 43% in Timor-Leste. In southern India specifically, presbyopia was observed in approximately 55% of individuals aged 35 years and above. Overall, several studies indicate a 62% prevalence of presbyopia, with incidence increasing steadily with age. Projections suggest that the global number of individuals with presbyopia will rise from approximately 1.4 billion in 2020 to 1.8 billion by the year 2050.

ETIOLOGY OF TIMIRA

Acharya Charaka classifies the causative factors of Timira under three categories—overuse, disuse, and misuse of the sense organs, particularly the eyes, in relation to their function and duration. These are collectively described as Pragyaparadha or "volitional transgressions."

- Excessive visual strain, such as continuously gazing at intensely bright objects, constitutes overuse of vision.
- Disuse refers to the failure to engage the eyes in normal visual activity, such as avoiding visual stimuli altogether.
- Misuse involves improper or abnormal visual habits, including frequently viewing objects that are excessively near or distant, frightening, unpleasant, deformed, or disturbing to the senses.

Such improper utilization of vision eventually leads to ocular disorders like Timira.

SAMPRAPTI OF DWITIYA PATALGATA TIMIRA

Nidana Sevana of Netra Roga

Aharaja(eg-excessive intake of Ushna, Kshara, Katurasa, etc.)

Viharaja (eg-Ushna Bhitasya Jale Prabeshada, Shukshma Nerekshnat etc.)

↓

Vatadi Dosha Prakopa

↓

Sira, Dhamani Ashrya of Doshas

↓

Doshas travel through Siras and Dhamani and get lodged in the Dwitiya Patal of Drishti

↓

DWITIYA PATALGATA TIMIRA ROGA

PATHOPHYSIOLOGY

Several key theories have been proposed to explain the mechanism of accommodation and its gradual decline with age.

Helmholtz's Theory:

The classical explanation of accommodation, introduced by Helmholtz more than 150 years ago, describes how the lens maintains a relatively flat shape under resting tension when focusing on distant objects. During accommodation for near vision, the ciliary muscle contracts and moves forward and inward, reducing the tension on the zonular fibers. This relaxation allows the elastic lens to become more convex, thereby increasing its refractive power. With advancing age, however, the lens substance becomes denser and less elastic, reducing its ability to change curvature effectively—a primary cause of presbyopia.

Coleman's (Catenary) Theory:

Coleman proposed that the zonular fibers act like the supporting cables of a suspension bridge, maintaining the natural curvature of the lens. This curvature is influenced by the balance of pressure between the anterior and posterior chambers of the eye. When the ciliary muscle contracts, the lens curvature increases centrally while relatively flattening at the periphery due to the pressure gradient created between these chambers.

Schachar's Theory:

Schachar presented a contrasting explanation, emphasizing the role of equatorial zonular fibers. According to this concept, contraction of the ciliary muscle actually increases tension on the zonules and the lens capsule, resulting in the lens shape change necessary for accommodation. Over time, as the lens continues to grow equatorially while the scleral size remains constant after early adulthood, zonular tension gradually decreases. Consequently, the ciliary muscle becomes less effective in generating sufficient tension to alter lens configuration, leading to the development of presbyopia.

MANAGEMENT

Ayurvedic texts describe several therapeutic approaches for managing Dwitiya Patalagata Timira. These include internal and external ocular therapies such as Snehapana (internal oleation), Tarpana (retention of medicated ghee over the eyes), Putapaka (instillation of processed medicated extracts), Nasya (nasal administration of medicines), and Anjana (application of collyrium). Each of these therapies aims to nourish and strengthen ocular structures, restore Dosha balance, and improve vision.

Prognosis (Sadhya–Asadhya)

According to Ayurvedic principles, the prognosis of Timira varies depending on the depth of Patala involvement:[8]

- Prathama Patalagata Timira — Sadhya (curable)
- Dwitiya Patalagata Timira — Krichrasadhya (difficult to cure)
- Tritiya Patalagata Timira — Yapya (manageable but not completely curable)

DISCUSSION

Dwitiya Patalagata Timira as Presbyopia

- Timira is an ocular disorder in which the Patala—the subtle layers of the eye nourished by Teja, Jala, Mamsa, Meda, and Asthi dhatus—are affected. These layers are likely correlated with various intraocular structures responsible for accommodation and convergence.
- In modern terms, Presbyopia represents a physiological decline in the eye's accommodative ability, primarily caused by lens hardening and weakening of the ciliary muscles.
- In Ayurveda, the vitiation of Doshas affecting the Patala leads to different varieties of visual disturbances, including those resembling refractive or accommodative errors. Acharya Sushruta describes Dwitiya Patalagata Timira with clinical features that closely parallel the manifestations of presbyopia.
- Dalhana identifies the Dwitiya Patala as Medaashrita Patala, suggesting involvement of structures associated with nourishment and elasticity—similar to the tissues governing lens flexibility and ciliary function in modern physiology.
- The symptoms described, such as Vihwala Darshana (hazy, confusing, or unstable vision with perception of false images like flies, webs, or rings) and Gochara Vibhrama (optical distortion where distant objects appear close and near objects appear far away), indicate disturbed focusing ability.
- The classical feature Suchipasham Na Pashyati—the inability to see the eye of a needle despite effort—is a direct reflection of near-vision impairment, a hallmark sign of presbyopia.
- Hence, considering both the symptomatic resemblance and the involvement of visual accommodation mechanisms, Dwitiya Patalagata Timira described in Ayurveda can be meaningfully correlated with the modern condition of Presbyopia.

CONCLUSION

Presbyopia is a universal age-related condition observed in all primates, characterized by blurred near vision and difficulty in perceiving fine details at normal working distances. A comparative analysis of the clinical features of Dwitiya Patalagata Timira described by Acharya Sushruta and Acharya Vagbhata clearly indicates a strong resemblance to the features of presbyopia as understood in modern ophthalmology. Therefore, Dwitiya Patalagata Timira can be correlated with presbyopia under the category of Drishtigata Roga in Ayurveda.

Classical Ayurvedic literature outlines several effective ocular therapies (Kriyakalpas) such as Tarpana, Seka, Putapaka, Anjana, and Aschyotana, which aim to nourish ocular tissues, maintain ocular lubrication, and enhance visual function.

In addition, Ayurveda emphasizes specific eye exercises and lifestyle modifications that help preserve accommodative function and delay the progression of age-related visual decline.

Consequently, there is a significant need to thoroughly re-examine the anatomical and functional aspects of the Netra described in various Samhitas and establish their scientific correlation with modern ophthalmic anatomy and physiology to deepen understanding and broaden clinical applicability.

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