IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

"Conceptual Resemblance Between *Timira* And Age-Related Physiological Insufficiency Of Accommodation: Ayurvedic And Modern Perspectives."

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ABSTRACT

The eye is the most highly specialized sensory organ, serving the vital function of vision, which is considered the most important of the five senses. As vision plays a crucial role in the quality of life and interaction with the environment, it becomes essential to protect ocular health throughout one's lifespan. In *Ayurveda*, *Timira* is a disease that encompasses a broad spectrum of visual disturbances, ranging from mild blurring to complete vision loss. Age related physiological insufficiency of accommodation is not merely a refractive error but a condition of physiological insufficiency of accommodation, resulting in a gradual decline in near vision with age. The phenomenon of age-related physiological insufficiency of accommodation closely parallels the *Ayurvedic* concept of *Timira* as described in the context of *Drishtigata Roga*. Both conditions are characterized by a gradual decline in near vision, typically occurring with advancing age, and share underlying features of tissue degeneration and functional impairment of the visual apparatus. This article attempts to explore the correlation between *Timira* and age-related physiological insufficiency of accommodation, with the aim of enhancing understanding through an integrative perspective rooted in both classical *Ayurvedic* principles and modern ophthalmic science.

Key Words – *Timira* , age-related physiological insufficiency of accommodation , Presbyopia, *Drishtigata Roga*.

INTRODUCTION

The eyes (*Netra*) are regarded as the most vital of all the sensory organs (*Indriyas*) in the field of *Shalakya Tantra*. The classical texts emphasize the importance of vision by stating, "One who desires a long and healthy life must take proper care of their eyes, there is no difference between day and night for a blind person." Regardless of a person's wealth, the loss of vision renders them unable to fully experience and enjoy the pleasures of life. As vision loss leads to significant impairment, the preservation and protection of eyesight hold paramount importance in *Shalakya Tantra*.

Acharya Sushruta classified *Timira* as one of the Twelve *Drishtigata Rogas*[1] (diseases of the eye affecting vision), while Acharya *Vagbhata* also included *Timira* in his enumeration of twenty-seven *Drishtigata Rogas*[2]. *Acharya Sushruta* described *Timira* as a disease that affects all four *Patalas* (layers) of the eye, leading to its classification into *Prathama, Dwitiya, Tritiy*a, and *Chaturtha Patalagata Timira*, based on the progressive involvement of each layer.

***Timira*:** The term *Timira* is derived from root 'Tim' (meaning the increase of watery substance in the eye or loss of light perception) with 'Unadi' suffix 'Kirach' to form the *Timira*[3]. Timira has been mentioned in *Uttartantra,* in terms of involvement of successive *Patalas.*

In *Amarakosha*, the meaning of *Timira* is given as darkness. *Acharya Sushruta* have described that diseases *Timira* inflicts four *Patalas* causing *Prathama, Dwitiya, Tritiya* and *Chaturtha Patalagata Timira*. According to Dosha involvement six types of Timira i.e. *Vataja, Pittaja, Kaphaja, Raktaja, Sannipataja* and *Parimalayi*[4].

According to *Sushruta ,*

1-"यत्नवानपि चात्यर्थं सूचीपाशं न पश्यति"((सु.उ6/10) --- Difficulty in threading needle

2-"दृष्टिर्भृशं विह्वलति द्वितीयं पटलं गते"(सु.उ6/8) --- Difficulty in near vision

3-"समीपस्थानि दूरे च दृष्टेर्गोचरविभ्रमात"((सु.उ6/10)--- Keeping near object at a greater distance than usual for better visibility

4-"अव्यक्तानि स रुपाणि सर्वाण्येव प्रपश्यति"(सु.उ6/7) --- Blurring of vision

These symptoms are quite similiar to the Age related physiological insufficiency of accommodation that leading to a progressive fall in near vision

According to *Acharya Hrudaya*, when the ***Doshas*** reach the ***Patala*** the person begins to see ***Abhuta***—non-existent visual phenomena such as flies, mosquitoes, or strands of hair. In contrast, ***Bhuta***, or real nearby objects, are seen with difficulty.

SAMPRAPTI OF *TIMIRA*

Aharaja Nidana *Viharaja Nidan*

↓

Tridosha Prakopa

↓

Srotavarodha / Srotosanga

↓

Khavagunya

↓

Doshadushya Samurchana

↓

Vimmarg-gamana of Prakupita Doshas through sira

↓

Effect of Prakupitta Doshas (in 1st Patala, 2nd Patala)

↓

Timira Roga

Age related physiological insufficiency of accommodation

Age related physiological insufficiency of accommodation is popularly known as PRESBYOPIA . Age related physiological insufficiency of accommodation becomes noticeable by the time a person reaches the early or mid 40s.[5] Whereas uncorrected hypermetropia , excessive use of smart phones , smoking , alcohol intake, menopause , diabetes , anaemia are certain risk factors which may cause premature age related physiological insufficiency of accommodation [6]. Age related physiological insufficiency of accommodation leads difficulty in day -to-day activities like reading, writing, threading needle, using mobile phone, blurred near vision and difficulty in using navigation[7]

In 2015 it was estimated that 1.8 billion people globally had age related physiological insufficiency of accommodation is expected to peak at approximately 2.1 billion in 2030[8]. Several studies have revealed that presbyopia is undercorrected in developing countries. A systematic review done by Dr. Shethu Sheela devi et al in 2019 observed the prevalence of uncorrected presbyopia in india to be 33% among adults aged more than or equal to 30 yrs in india

The American Optometric Association defines age-related physiological insufficiency of accommodation as an age-related visual impairment. It is a common refractive condition that typically occurs between the ages of 35 and 40. This condition results from a gradual decrease in the eye's ability to accommodate.

Accommodation is the process by which the eye adjusts to clearly focus on near objects. When focusing on a near object, the ciliary muscles contract, causing the crystalline lens to change shape so that light from the

object focuses precisely on the retina, rather than behind it. For distant objects, accommodation is not necessary because light naturally focuses on the retina in people without refractive errors.

After the age of 40, the crystalline lens becomes less flexible, reducing its ability to change shape and accommodate near vision effectively.

Theories of accommodation-

Helmholtz : The classical theory of accommodation, proposed by Helmholtz over 150 years ago, states that the lens is held relatively flat under resting tension when viewing distant objects. During accommodation, the ciliary muscle contracts and moves both forward and inward. This reduces the tension on the zonular fibers, allowing the elastic lens to increase in curvature, thereby enhancing its focusing power for near vision. According to Helmholtz, with age, the lens tissue gradually hardens, leading to reduced elasticity. As a result, the lens becomes less able to change shape during accommodation, which causes a decline in near focusing ability**.**

Coleman : Also known as the catenary theory, Coleman proposed that the zonular fibers function like the support pylons of a suspension bridge, helping to determine the natural curvature of the lens. This curvature is further influenced by the opposing pressures in the anterior and posterior chambers of the eye. When the ciliary muscle contracts during accommodation, the curvature of the lens becomes steeper. At the same time, a pressure gradient develops between the two chambers, causing the central part of the lens to curve more while the peripheral regions flatten slightly.

CONCLUSION

Timira, as described in classical Ayurvedic texts, aligns closely with the clinical features of age-related physiological insufficiency of accommodation(Presbyopia**)**. The symptoms detailed by *Acharya Sushruta* and other *Acharyas*—such as blurring of near vision, difficulty threading a needle, and the need to hold objects at a distance for better clarity—resonate with the modern understanding of presbyopic changes in the eye.

In Ayurveda, the pathological process involves the vitiation of *Tridoshas* and their migration to the *Patala*, where they impair the functional integrity of the ocular structures responsible for accommodation. This Ayurvedic perspective finds correlation in the anatomical and physiological changes noted in modern science, particularly the loss of elasticity of the crystalline lens and the diminished contractile efficiency of the ciliary muscles with age, as explained by the Helmholtz and Coleman theories.

Thus, recognizing *Timira* as a classical correlate of Age related physiological insufficiency of accommodation (Presbyopia) .

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