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A LITERATURE REVIEW OF TIMIR WITH SPECIAL REFERENCE TO MYOPIA

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INTRODUCTION

In Ayurvedic understanding, Timira's progression and severity are closely tied to the involvement of specific Patalas within the eye. These Patalas play a crucial role in the manifestation and evolution of Timira.

In total, the eye comprises six Patalas, divided into four Abhyantara Patalas (Internal layers) and two Bahya Vartmagata Patalas (External layers). These anatomical layers within the eye play vital roles in its structure and function. The Abhyantara Patalas, or internal layers, contribute to the intricate mechanisms of vision, while the Bahya Vartmagata Patalas, or external layers, serve as protective barriers and facilitate external interactions.

Science is not a sudden invention. It is a gradual evolution. Ayurveda, as, a science, is also not an exception to it. It is not just a curative medicine, but it also teaches the way to live long a healthy and happy life. The imperishable fundamentals of Ayurveda, which were laid down by the great sages of the golden days, are still applicable because of its eternal scientific background. Such fundamentals must be subjected to scientific research not only to prove its certainty but also to add something new to the existing knowledge. The remarkable strides achieved by man during the days of evolution and his phenomenal growth in unfolding the mysteries of nature relied greatly on his capacity to react to the environment. He succeeded in mastering entire animal world due to this fully evolved sence; among them, eye shares a greater role than the rest. Among five sense organs eye is most important by which we can experience the colourful life. Eye holds special status among all the senses. Although a blind person can see with the help of buddhi vaisheshik alochak pitta, but only eye can appreciate & perceive this beautiful world.

Myopia, commonly referred to as shortsightedness, is the most common eye disease in the world. People with myopia can be classified those with low to moderate myopia (referred to as "simple" or "school myopia", 0 to 6 Dioptres) and those with high or pathological myopia (Greater than -6 Dioptres). Simple myopia can be corrected with spectacles or contact lenses, whereas pathological myopia is often associated with potentially blinding conditions such as retinal detachment, macular degeneration and glaucoma.

Myopia is a measure cause of blindness. In modern medicine there is no specific treatment for myopia. Concave lenses contact lenses and surgery are used as an aid to the vision as prevalence of myopia is higher in urban population (693) in comparison to rural population (2.77%) in India oral medication is an important method of drug delivery. Shaman snehapan is also a important route of drug administration, which is also indicated and effective in timir roga.

Conceptual review

Myopia

The human eye is an extra ordinary optical instrument. The eye consists of a series of refraction media designed to focus rays of light upon a perception screen-the Retina. When the refractive condition of the eye is normal, the incident parallel rays from a distant object will fall on the retina exactly and there will be no refractive error. This condition is called emmetropia that is an eye in measure. The condition in which incident parallel rays of light from an object do not come to a focus upon the light sensitive layer of the retina is known as Ametropia that is an eye out of measure. For a proper eye sight, the cornea (The clear window in front of the eye) and the lens (Behind the pupil) must properly focus or refract light on to the retina (At the back of the eye). If the length or the shape of the eye is not ideal, the light may get focused too early or too late leaving a blurred image on the retina. The Ametropia includes myopia, hypermetropia and Astigmatism. This may be due to one or more of the following conditions.

A. **Axial ametropia:** Abnormal length of the globe.
B. **Curvature ametropia:** Abnormal curvature of the refractive surfaces of cornea or lens.
C. **Index ametropia:** Abnormal refractive indices of media.
D. Abnormal position of the lens.

Among all these factors, the axial length of the globe is most important approximately causing 90% of ametropia. While the axial length of most emmetropic eyes is approximately 24 mm, a larger eye can be emmetropic if its optical components are weaker and a smaller eye can be emmetropic if its optical components are stronger.

Etymology
The term Myopia is a Greek word, which means "I close the eye" introduced from the habit which short sighted people frequently have of half closing the lids while looking at distant objects so, that they may gain the advantage of stenopaeic opening (pinhole vision).
Synonyms: Nearsightedness, Shortsightedness.

Definition
Myopia is a type of refractive error in which parallel rays of light coming from infinity are focused in front of retina, when accommodation is at rest. Myopia or nearsightedness, is the ability to clearly see objects up close but not those at a distance. The first satisfactory definition of the condition was stated by Kepler in 1611 and Plempius in 1632, as they examined myopic eye anatomically and attributed the condition to a lengthening of its posterior part. Donder (1866 A.D.) established its pathological basis and detailed its clinical manifestations.

Epidemiology of myopia
The prevalence of Myopia varies with age and other factors. When examined without the aid of cycloplegic agents, a significant number of infants are found to have some degree of Myopia, their Myopia tend to decrease and most such infants reach emmetropia by 2-3 years of age.

The prevalence of Myopia is high in premature infants. Reviews of the extensive literature on Myopia identify some factors associated with prevalence. Some studies have found a slightly higher prevalence of Myopia in females than in males. The prevalence of Myopia increases with income level and education attainment and it is higher among persons who work in occupations requiring a great deal of near work.

Myopia of at least -0.50 D has a lower prevalence (less than 5%) in 5-year-old population than in any other age group. The prevalence of Myopia increases in school age and young adults cohorts, reaching 20-25% in mid to late teenage population and 25-35% in young adults in the United States and developed countries. The prevalence of Myopia declines somewhat in the population over age 45 years, reaching about 20% in 65 years old and decreasing to as low as 14% of persons in their seventies.

Ethnicity and Race
- The prevalence of Myopia has been reported as high as 78.5% in Asian countries, 30-40% in Europe and United States, and 10-20% in Africa.
- Myopia is less common in black, Nubians, and Sudanese people.
- In Americans between the age of 12 and 54, Myopia has been found to affect whites less than blacks.
- Asians had the highest prevalence (78.5%), followed by Hispanics (13.2%). Whites had the lowest prevalence of Myopia (4.4%), which was not significantly different from African Americans (6.6%). (www.wikipedia.org)

Education, Intelligence and Iq
A number of studies have shown that the prevalence of Myopia increases with level of education and many studies have shown a relationship between Myopia and IQ.
- According to Arthur Jensen, myopes are average 7-8 IQ points higher than non-myopes. The relationship also holds within families and siblings with a higher degree of refractive error have average higher IQ than siblings with less refractive error.
- Jensen believes that this indicates Myopia and IQ are pleiotropically related as they are caused or influenced by the same genes. The mechanism that has caused a relationship between Myopia and IQ is not yet known with certainty. (www.wikipedia.org)

Age of onset
- Congenital Myopia (present at birth and persisting through infancy).
- Youth-onset Myopia (40 years of age).
- Early adult-onset Myopia (20-40 years of age).
- Late adult-onset Myopia (>40 years of age).

Classification of myopia
Based on clinical entity
- Simple Myopia
- Nocturnal Myopia
- Pseudo Myopia
- Degenerative Myopia
- Induced Myopia

Based on degree
- Low Myopia (6.00 D)
- Medium Myopia (3.00 D-6.00 D)
- High Myopia (>6.00 D)

DISCUSSION
- **Simple myopia:** The refractive status of the eye with simple Myopia is dependent on the optical power of the cornea and the crystalline lens, and the axial length. Since the sharpest rise occurs at school

going age i.e., between 8 years to 12 years, so it is also called as School Myopia.

- **Nocturnal myopia:** Occurring only in dim illumination, nocturnal or night Myopia is due to primarily increased accommodative response associated with low levels of light. Because there is insufficient contrast for an adequate accommodative stimulus, the eye assumes the intermediate dark focus accommodative position rather than focusing for infinity.

- **Pseudo myopia:** pseudo Myopia is the result of an increase in ocular refractive power due to over stimulation of the eye's accommodative mechanism or ciliary spasm. The condition is so named because the patient only appears to have Myopia due to an inappropriate accommodative response.

- **Degenerative myopia:** A high degree of Myopia associated with degenerative changes in the posterior segment of the eye is known as degenerative or pathological Myopia. The degenerative changes can result in abnormal visual function, such as a decrease in best corrected visual acuity or changes in visual fields. Sequelae such as retinal detachment and glaucoma are relatively common.

- **Induced myopia:** Induced or acquired Myopia is the result of exposure to various pharmaceutical agents, variation in blood sugar levels, nuclear sclerosis of the crystalline lens, or other anomalous conditions. This Myopia is often temporary and reversible.

Etiology and Pathogenesis

- **Nocturnal myopia:** Significant levels of dark focus of accommodation.
- **Pseudo myopia:** Accommodative disorder, High exophoria and cholinergic agonist agents.
- **Degenerative myopia:** Inheritance, Retinopathy of prematurity Interruption of light passing through ocular media and unknown factors.
- **Induced myopia:** Age-related nuclear cataracts, Exposure to sulfonamides and other pharmaceutical agents, significant variability in blood sugar level.

Signs & Symptoms of myopia

The most common symptom associated with uncorrected Myopia is blurred distance vision.

- In Simple Myopia and degenerative Myopia, the distance blur is constant.
- In nocturnal Myopia, distance vision is blurred only in dim illumination or in dark conditions.
- In pseudo Myopia, the blurred distance vision may be constant or intermittent with greater distance blur occurring after near work.
- Blurred distance vision in induced Myopia can vary from transient (Lasting a few hours) to constant, depending upon the particular agent or condition causing it.
- If asthenopia is present in a patient with Myopia, it is usually due to some other cause, such as astigmatism, anisometropia, an accommodative dysfunction, or to a vergence disorder.
- The primary sign of Myopia is reduced unaided distance visual acuity, which can be corrected to standard or near-standard levels with the appropriate minus power optical correction.
- The uncorrected visual acuity level and the degree of uncorrected Myopia are highly correlated.
- In nocturnal Myopia, the results of Retinoscopy in a dark room may be shifted in the minus direction, compared with the standard manifest refraction. Patients who have nocturnal Myopia often complain of difficulty in driving at night and/or blurred distance vision at night.
- Patients with pseudo Myopia frequently have fluctuations in distance visual acuity that correspond to fluctuations in accommodation.
- These fluctuations in accommodation may be observed as variations in visual acuity and retinoscopic reflex and, sometimes, changes in pupil diameter.
- The definitive sign of pseudo Myopia is significantly more minus power on the manifest refraction than on the cycloplegic refraction. This additional minus power cannot be eliminated with the standard refraction procedures used to relax accommodation at distance.
- Degenerative or pathological Myopia is generally high Myopia that is congenital or of early onset. Corrected visual acuity may be reduced as a result of pathological changes in the posterior segment

Complications of myopia

Abnormal or adverse ocular changes in degenerative Myopia can include:

- Vitreous liquefaction and posterior vitreous detachment.
- Peripapillary atrophy appearing as temporal choroidal or sclera crescents or rings around the optic disc.
- Lattice degeneration in the peripheral retina.
- Thinning of the retinal pigment epithelium with resulting atrophic appearance of the fundus.
- Ectasia of the sclera posteriorly (posterior staphyloma).
- Fuchs' spot in the macular area.
- Small choroidal crescents on the temporal side of the optic disc are often seen in simple Myopia.

Diagnosis of myopia

The evaluation of a patient with Myopia includes the elements of a comprehensive eye and vision examination with particular emphasis on the following areas.

A. Ocular examination

- **Visual acuity:** Both unaided distance and near visual acuities should be measured. Because of the correlation of unaided distance visual acuity with the degree of Myopia, visual acuity provides a means of checking the internal consistency of refractive findings, provided the reduced visual acuity is only a function of the Myopia, and not another ocular condition (e.g., high astigmatism). When the patient regularly wears an optical correction, aided visual acuity should be measured.

- **Refraction:** Retinoscopy provides an objective measure of refractive error and yields a good approximation of the subjective refraction. Use of an objective Auto refractometer may be substituted for Retinoscopy, although an auto refractometer will not give the qualitative information (e.g., clarity of the ocular media, optical quality of the retinoscopic reflex, and fluctuations in pupil size) that retinoscopy does. Retinoscopy in a completely darkened room may be useful in the diagnosis of nocturnal Myopia, although there is no proven procedure for the correction of nocturnal Myopia. Careful subjective refraction should be conducted to determine the lowest minus lens power that achieves best visual acuity. A cycloplegic refraction is required for the definitive diagnosis of pseudo Myopia. Additional procedures may include: Fundus photography and B-scan ultrasonography, Visual fields, Tests such as fasting blood sugar (e.g., to identify causes of induced Myopia).

Management of myopia

- **Optical correction:** Optical correction in the form of spectacles or contact lenses provides clear distance vision. Whether spectacles or contact lenses are preferable in a given case depends upon numerous factors, including patient age, motivation for wearing contact lenses, and compliance with contact lens care procedures, corneal physiology, and financial considerations.

Advantages of spectacles

- Spectacles may be more economical in many cases.
- Spectacles provide some eye safety, particularly when the lenses are of polycarbonate materials.
- Spectacles require less accommodation than contact lenses for Myopia, so that the likelihood of accommodative asthenopia or near point blur in patients approaching presbyopia may be less.
- Spectacles provide better correction for some types of astigmatism. Advantages of contact lenses:

Advantages of contact lenses

- Contact lenses provide a larger retinal image size and slightly better visual acuity in severe Myopia.
- Contact lenses reduce the problems of weight, visual field restrictions, and the possibility of induced prismatic imbalance from the tilt of the spectacle frame experienced by some spectacle lens wearers.
- Contact lenses (e.g., rigid gas-permeable lenses) may reduce the rate of Myopia progression due entirely or in part to corneal flattening.

Medical (Pharmaceutical)

Cycloplegic agents are sometimes used to reduce accommodative response as part of the treatment of pseudo Myopia. Some studies have reported that daily topical administration of atropine and cyclopentolate reduces Myopia progression rates in children with youth-onset Myopia. However, this benefit does not seem to outweigh the discomfort and risks associated with chronic cycloplegia.

Vision therapy

Unaided visual acuity can be improved in patients with Myopia using vision therapy, but Myopia does not appear to be reduced. Procedures have been proposed for reducing myopic progression rates, but no studies have tested their efficacy. Vision therapy to reduce accommodative response is often provided for pseudo Myopia. Auditory bio feedback has also been used successfully in the treatment of pseudo Myopia.

CONCLUSION

On the basis of review of literature, it can be concluded that the disease myopia can be co-related with Timir of first patal on the basis of similarities in symptoms, Involvement of anatomical structures, etiology, prognosis.

In Ayurvedic literature, Acharya have explained the diseases of eye with minute detail. Eyedisorders, which result into blurring of vision or either partial or complete loss of vision, have been described under the drushtigat rogas.

Myopia occurs irrespective of age.

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