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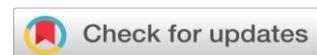
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ABSTRACT

Shalaky Tantra is the main branch of *Astanga Ayurveda*, it deals with the etiology, diagnosis, prognosis, prevention and treatment of disease which are located above the clavicle region in which the eye is a highly specialized sense organ that primarily serves the function of vision. *Drushti* or vision is the most important *Indriya*/sense of human body according to *Ayurveda*. Visual disturbances are described in *Ayurveda* under the terms *Timir*, *Kacha*, and *Linganasha* and progresses to total vision loss. *Timir* is one of the '*Drushtigataroga*', if it is not treated then it may lead into complete blindness. The symptoms of *Patalgat Timir* can be correlated with refractive error. Globally it is estimated that approximately 1.3 billion people live with some form of vision impairment. There is no medicinal treatment available for refractive error in modern science and available therapies have some complications like dry eye, corneal ulceration etc. While in Ayurvedic text *Timir* is said to be '*Ayushdhisadhya*' if treated in early stages. So, Ayurvedic science can be explored to find a better alternative to manage this condition. In *Ayurveda* there are number of preventive and curative modalities explained to treat *Timir* in the form of *Pathykarahaar-vihar*, *Ra-sayana yoga*, *Chakshusya* drugs, *Netrakarma*, *Kriyakalpa*, *Panchkarma* etc. Use of these therapies helps us to prevent vision loss and to maintain vision.

Keywords: *Timir*, Refractive error, *Patalgat Doshdushti*, Myopia, Cataract, *Pathykarahaar-Vihar*, *Rasayana Yoga*.

INTRODUCTION

Swasthata or well-being of a person, ultimate aim or goal of *Ayurveda*¹ can be referred briefly by normal functioning of all body constituents. Normalcy in physiological function and anatomical structure of *in-driyas*, that is sensory and functional organs is one of the important criteria of this well-being². According to *Ashtanga Hridaya*, every individual should make sincere attempts to retain his or her eyesight until the last breath of life, because for a blind person, day and night are the same, and this beautiful world is of no value to him, even if he is wealthy³. The term *Timir* is formed from the root 'Ti' (meaning the increase of watery substance in the eye or loss of light perception) with 'Un-adi' suffix 'Kirach' to form the *Timir*⁴. Simple Myopia closely resembles *Timir* in terms of symptoms, anatomical structures involved and the pathogenesis of the disease. In *Shalaky tantra Acharya Sushruta* has explained 76 *Netragata rogas*, among them vision related disorders are studied under the broad heading of "*Drushtigatarogas*". There are 12 *Drushtigataroga* explained by *Acharya Sushruta* and 27 by *Acharya Vagbhata*^{5,6}. *Timir* is one of them which occurred due to affliction of the 4 *Abhyantarpatalas*. It is said to be "*Param darun vyadhi*" since it is progressive, irreversible and may lead to total or partial blindness if left untreated⁷. The symptom of *Timir* is "*Avyktani saroopani sarvanevya prapashyat*" which means blurring of vision, which is cardinal symptom of refractive error⁸. Myopia is the refractive condition of the eye, in which distant objects are not seen clearly. Various surveys in India have found the simple Myopia prevalence ranging from 6.9% to 19.7%. Furthermore, its prevalence may be increasing over time as suggested by some studies in various countries including Singapore, Australia, and the United States. Simple Myopia progression is irreversible and there is no cure. Myopia is caused by genetic factors acting in many biochemical ways; a weak or deteriorated sclera and cornea are important contributions in the development of Myopia. According to one recent study, students who do a lot of 'near work' are more likely to acquire Myopia.

Stress is thought to play a role in the development of myopia. Nutritional variables also play important in the development of Myopia⁹. Treatment of simple Myopia leads to many complications such as corneal infections due to the usage of contact lens, corneal scarring and persistent corneal haze due to surgery. But refractive surgeries are costly and not suitable for children, and they also do not change axial elongation, which is the commonest cause for simple Myopia. Hence, Ayurvedic science can be explored to find a better alternative to manage this condition. Regarding the management of *Timir Acharya Sushruta* has recommended a number of the treatment modalities including *Langhna*, *Snehana*, *Snehpana* (internal use of oil, ghee), *Raktamokshna* (bloodletting), *Virechana*, *Nasya*, *Basti* etc¹⁰.

AIM

1. To study the conceptual resemblance between *Patalgat Timir* and refractive error.
2. To find out and discuss the preventive and curative measures mentioned in *Ayurvedic* text for *Timir* (vision disorder).

Review of Refractive error

- Refractive error is a problem with focusing light accurately into the retina due to the change in the shape of eye. The most common refractive errors are myopia, hypermetropia, astigmatism and presbyopia. Myopia results in faraway objects being blurry, hypermetropia and presbyopia results in close objects becoming blurry and astigmatism causes objects to appear stretched out and blurry. Other symptoms may include diplopia, floaters, night blindness, glare or halos around light, squinting, headaches, or eye strain etc.
- Myopia is a type of refractive error in which parallel rays of light coming from infinity are focused in front of the retina when accommodation is at rest. It is commonly referred as shortsightedness. Myopia is mainly of 2 types:

- 1) Simple or Physiological myopia

2) Pathological/ Progressive or Degenerative myopia¹¹.

▪ Grading of Myopia

American optometric Association (AOA) has defined three grades of myopia:

- a) Low myopia, when the error is $< -3D$.
 - b) Moderate myopia, when the error is between $-3D$ to $-6D$.
 - c) High myopia, when the error is $> -6D$.
- Simple myopia is considered as a physiological error not associated with any eye disease, usually it ranges from low to moderate that does not exceed $-6D$.
 - Pathological myopia starts in childhood at 5-10 years of age, progresses rapidly and results in high myopia during early adult life. High myopia includes myopic refractive error greater than 6.00 D or 8.00 D or an axial length greater than 26.5 mm. It is usually associated with degenerative changes in the eye like retinal tear and detachment, vitreous liquification, choroidal and myopic degeneration etc¹².
 - In astigmatism, light rays entering the eye can't converge to a point focus but form focal lines. Broadly there are 2 types of astigmatism depending upon etiology i.e regular and irregular.
 - Presbyopia is not an error of refraction but a condition of physiological insufficiency of accommodation lead to difficulty for near vision. This condition of falling near vision occurs due to age related decrease in amplitude of accommodation. Patient usually complaint of difficulty in reading along with Asthenopic symptoms i.e headache, eye strain etc.

Review of *Timir*

Acharya Sushruta has described 6 *patalas* i.e *Varmagat (Bahya)* and 4 *Akshitgatpatala (Aabhyntara)*.

1) Concept of *Patala*

Various authors have described the concept of *Patala* in their own way. V.S Aapte, in his Sanskrit- English dictionary describes the meaning of *patala* as film or coats of eyeball. According to Monier Williams, *patala* can be said to be a layer of eyewall¹³.

Etymology: *Pat+Klachpratyaya-* which means a layer, veil, membrane of eye, a film over eyes. So, it can be considered as coats of eyewall. There are 6 *patalas* explained by *Acharya Sushruta* such as: 2 *Vartma Patala* and 4 *Akshipatala*. *Timir* has been described in terms of involvement of respective 4 *Abhyntarpatala*. The outermost first *patala* is supported by *Tejas* and *jala*. 2nd *Patala* is nourished by *Mamsa*. 3rd *Patala* is supported by *Meda* and 4th *Patala* is supported by *Ashti*. The thickness of these four *Patalas* is about 1/5th of *Drushti*.

2) Concept of *Timir*

- Etymology of *Timir*: *Tim+Unadi* suffix '*Kirach*' (*Shabdikalpadrum*), it is derived as '*Timi Kledane Aardri Bhavahalti Yavatha*' which means- increase of watery substance in the eye¹⁴. The meaning of *Timir* according to *Amarkosha* is given as darkness¹⁵. According to *Acharya Sushruta*, when vitiated *Doshas* get lodged into first 3 *Patalas*, then bunch of symptoms known as '*Timir*'. When they occupy 4th *Patala* then they cause Vision loss, then known as '*Lingnasha*'. (*Ling* means *Darshanshakti* of *Chaksuyindriya*) (does not mean cataract). *Kacha* and *Lingnasha* are the successive stages of *Timir*.
- According to *Vagbhata Acharya*, when *doshas* gets lodges in first two *Patalasthan Timir* occurs when *Doshas* gets lodges in third *Patala* when it is known as '*Kacha*' and when it rests in fourth *Patala*, it is called as '*Lingnasha*'. But *Acharya Sushruta* does not mention '*Kach*' *Vyadhi*, while *Acharya Dalhan* has described *Kachas* '*Ragrapta Timir*'. The clinical features of *Timir* are based on vitiation of *Doshas* and involvement of *Patalas*.
- Intake of *Apthykar* and *Achaksusya Aahar- Vihar* leads to vitiation of *Doshas* with predominance of *Pitta Dosh*, which gets carried out through *Sirasupto Patalas* of *Drushti* that leads to *Timir* formation.
- *Timir* starts from blurring of vision i.e *Avyktadarshana* and if it's not treated during time it may lead to complete blindness i.e *Lingnash*. *Acharyas* has described 6 types of *Timir* i.e *Vataj, Pitajj,*

Kaphaj, Raktaj, Sannipatik and Parimlayi. The progress of the disease *Timir* has been mentioned in *Uttartantra* in terms of involvement of successive *Patalas*. The symptoms of *Timir* when it invades each *patala* are given in detail and critical analysis of these symptoms may establish an exact correlation for the clinical conditions seen in refractive error.

- When vitiated *Doshas* invade the first *Patala*, the patient complaints of blurry vision for distant objects.
- When vitiated *Doshas* gets lodge into 2nd *Patala*, patient complaint of increase in blurriness (*Vivhid darshanm*), distortion of vision (metamorphopsia), black spot in front of eyes (floaters), difficulty for near work (*Suchi pashamna pashyati*), seeing indistinct images (*Abhutmapipashyati*) like flies, hair webs, circles, clouds, rain etc.
- When vitiated *Doshas* gets lodge into 3rd *Patala*, then they will produce following symptoms such as, when *Doshas* gets lodge in upper part then those patients are unable to see far objects and if it occupy posterior part then those patients are unable to see the objects on his right or left side, if *Doshas* are localized in center, patient finds one object as two, two objects as three.
- At the end when *Doshas* gets lodged into 4th *Patala*, it leads to complete vision loss i.e *Lingnash*.

Prevention and treatment of *Timir*

Triphala Puranghrita, Yava, green gram *Shatavari, Aamlaki, Patol*, and other herbs, according to *Sushruta*, are beneficial in preventing of *Timir*. *Acharya Chakradatta* introduced *Padabhyanga* (oil massage in foot) to this. *Padabhyanga* is good for the eye, *Vagabhata* identifies 4 major nerves in the feet that connect to the eyes. These transmit the effect of the medicine applied over the feet in the form of massage¹⁶. *Timir* may be avoided by taking *Shatavari, Aamlaki, Triphaladi*, and *Yavadi Payas* (milk) on a daily basis. *Nasya, Tarpan, Pindi* are the preventive and treatment measurement of all eye disease.

According to *Acharya Chakradatta*, consuming *Triphala Kwath, Kalka* or *Churna* with *Ghrita, Madhu*

(Honey) on a regular basis helps to heal all sorts of *Timir*. All eye problems can be treated with *Netradhawan* (washing of eye) and *Triphala Kwath*. Aside from *Gandusha, Panital Gharshna* (rubbing of hands) after lunch is also beneficial in preventing visual problems¹⁷. *Timir* can also be deranged by using *Vachadi, Madhuk-Amalakadi*, and *Krishna Tila Kalka* on the head region before bathing¹⁸. Cooked vegetables of *Jeevanti, Changeri, Tanduliyak, Vastuk, Chilli, Mukapotika, Patol, Karwellak, Vartak, Jangal* and *Shakun Mamsa* etc. All these are beneficial for visual acuity. Regarding the treatment of *Timir Triphala* is said to be very useful. There is some different yoga which was explained as follow¹⁹:

1) *Vataj Timir = Triphala churna+ Til tail*

2) *Pittaj Timir = Triphala churna+ Ghrit*

3) *Kaphaj Timir = Triphala+ Madhu*

Acharya Vagbhata stated that, if *Timir* is not treated in early stages, it may cause complete blindness therefore, it is necessary to treat it as early as possible. For that he recommended *Snehana, Raktmokshna, Virechana, Nasya* and after that *Tarpan* etc therapies are advised²⁰. According to *Acharya Sushruta* in acute conditions of eye disease, body purification should be done with the help of *Langhana, Virechana, Nasya, Basti* and after that *Abhishndokatakriyakalpa* can be applied according to predominance of *Doshas*.

DISCUSSION

Acharya Sushruta has described *Timir* as a '*paramdarun Vyadhi*', which means that if it is not treated with time then it will eventually lead to blindness. *Patalgat Timir* symptoms have been linked to refractive error, which is a serious public health issue. Refractive error is a major public health problem that leads to vision disorders. In modern medical science there are not any medicinal treatments available for refractive error and the available treatment also has some complications. Hence Ayurvedic science can be explored to find a better alternative to manage this condition. While, in *Ayurveda Acharyas* has described number of treatment modalities in the form of *Pathykar Aahar- Vihar, Netrakarma, Kriyakalpa, Panchkarma, Chakshuya* drugs and *Rasayana* yoga etc. In case of acute

condition of eye problems, *Acharya Sushruta* has recommends doing *Langhna* (light diet), *Snehana* (Oleation), *Nasya* (Medication with nasal route), and *Virechana* (Purgation) for three days for *Dehashudhi* (Purification of body), followed by *Abhishyandokta Tarpan* etc *Kriyakalpa* (procedure). As we know, *Netra* is site for *Alochaka Pitta* which gets nourishment by *Pachaka Pitta*. Since *Koshtshudhi* is recommended firstly for 3 days to breakdown *Samprapti* of *Timir*. *Snehpanootar Virechana* followed by *Raktmokshna* is the main line of treatment of *Timir*. Before *Virechana*, *Snehana* and *Swedana* is advised, as it helps to breakdown of *Doshnghata*, *Strotoavrodha* (channels of the body) and open it, make it soften, dissolving *Shleshma*, causing vasodilation etc. All these help for flow of *Vatadi Dosha* in their normal form, Penetration of drugs upto cellular level, improve blood circulation, and helps for excretion of toxic products out of body. *Virechana* is not only effective for elimination of *Pitta dosha* but also effective for *Vata*, and *Kapha Dosha*. It helps to remove *Vata-Kapha Avarana* and helps open the channels of body.

CONCLUSION

Timir is a *Drushti Mandala* illness that begins with hazy vision and can progress to severe vision loss if it is not treated with timely.

- *Patalgat Timir* can be correlated with refractive error in symptoms point of view.
- Treatment modalities described in *Ayurvedic* text help to prevent vision disorder and to maintain visual acuity.

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