



COMBATING REFRACTIVE ERRORS WITH AYURVEDA: NEED OF THE HOUR

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ABSTRACT

Worldwide, uncorrected refractive errors (URE) are the leading cause of vision impairment and the second leading cause of blindness in developing countries. Visual impairment and blindness caused by URE in adults can have severe impact on social and economic well-being. Although there is ample availability of advanced technology in the form of different types of spectacles, contact lenses and refractive surgery, it is neither free from adverse effects nor cost effective and hence not suitable for people at large. Hence, there is an earnest need for a cost effective remedy of the disorder under discussion, which should be free from any untoward effect. Ayurveda, an ancient healing science may do this job, since this describes a group of remedial procedures and regimen fulfilling these criteria. This article is for the description of the same. Here, several clinical studies carried out on refractive errors at different Ayurvedic Institutes of India have also been presented. Symptoms of refractive errors are comparable with those of Timira described in Ayurveda and can be successfully alleviated by Kriyakalpa (specific ocular therapeutic procedures), Nasya (nasal administration of medicine) coupled with eye friendly diet and regimen.

KEYWORDS: Refractive errors, Ayurveda, Timira, Kriyakalpa, Nasya.

INTRODUCTION

Refractive error (RE) is one of the most common ocular conditions affecting all age groups and a priority under the VISION 2020 initiative. Worldwide, URE is the leading cause of vision impairment and the second leading cause of blindness in developing countries, including India.^[1,2]

Visual impairment and blindness caused by URE in adults can have severe impact on social and economic well-being, including limiting the educational and employment opportunities of economically active persons.^[3] Estimated disability-adjusted life years and productivity loss indicate that uncorrected refractive error has a potentially greater impact on the global economy than all other preventable causes of moderate to severe vision impairment and blindness.^[1,4,5]

Even in this age of increasing popularity of contact lenses and refractive surgery^[6-8], the use of spectacles is the most popular method of correcting refractive errors.^[9] Although spectacles possess inherent merits like control over their use, spectacles do pose some significant challenges viz. lack of readily affordability, being a source of ocular discomfort especially when incorrectly prescribed, abuse of spectacles dispensing and

distribution by individuals having no professional experience in eye care or dispensing.^[10,11] Additionally, regulation of the cost of spectacles, availability of qualified eye care providers in sufficient numbers, education on spectacles wear etc. are also not easy to be ensured.

Whereas eye pain, blurred vision, red eyes, overgrowth of surrounding blood vessels etc. are some of the most common side effects of wearing contact lenses for extended periods, it can also bring about the risk of several serious conditions including eye infections and corneal ulcers. These conditions can develop very quickly and can be very serious. In worst cases, these conditions can cause blindness too. On the other hand, refractive surgery is neither free from adverse effects nor cost effective and hence not suitable for people at large.

In this way, there is an earnest need for a cost effective remedy of the disorder under discussion, which should be free from any untoward effect. Ayurveda, an ancient healing science may do this job, since this describes a group of remedial procedures and regimen fulfilling these criteria.

AIMS AND OBJECTIVES

Worldwide increasing prevalence, bad impact on quality and productivity of life and insufficient outcome of available Allopathic treatment modalities is necessitating the other health systems to provide a remedial treatment. The aims and objectives of the present article are.

- i. To justify the correlation of Refractive error with Timira described in Ayurveda.
- ii. To elucidate the role of Ayurveda in combating the Refractive error.

MATERIALS AND METHODS

Various books, journals, theses etc. available on Refractive error plus those on Timira were searched and referred along with internet to bring about the article in present form. The classical literature in Ayurveda and Allopathic medicine on these clinical conditions were also studied at fundamental level followed by its interpretation and logical analysis.

Refractive error vis-a-vis Timira

Refractive error can be well correlated with Timira of Ayurvedic Science, because both of these conditions elicit similar/comparative clinical features as evident from the table below.

Table: Comparative clinical features of Refractive error & Timira.

S.N.	Refractive error	Timira
i)	Blurred vision.	Avyakta Darshana (blurred vision)
ii)	Diplopia	Dwidha Darshana (Diplopia)
iii)	Headache	Shirobhitapa (Headache)
iv)	Eye strain	Netrayasa (Eye strain)
v)	Glare/halo	Vihwala Darshana (visualization of things like Mandala etc.)

Ayurvedic View

The approach of Ayurveda towards vision is evident from the saying "Human ought to always make endeavour to protect his precious vision till the late evening of life because the entire globe is worthless for a blind person even in the presence of large amount of wealth & possessions. A person is deprived of the sense of difference between the day and night who is deprived of vision".^[12]

Details of the etiology, prodromal symptoms, symptoms, diagnosis, prognosis, prevention and treatment of diseases that are located above the neck region, incorporating Eye, E.N.T., Head & Neck and orodental disorders are the purview of Shalakya Tantra, one of the eight branches of Ayurveda.^[13] The refractive errors may be correlated with Timira described in Ayurveda on the basis of similarities in symptoms of the two disease entities. A number of formulations are prescribed for the treatment of *Timira* in Ayurvedic classics. Here, specific

ocular therapeutic procedures (a group of special methods of drug administration) for the treatment for eye disorders has been delineated in the name of *kriyakalpa*.

The *Kriyakalpa* has witnessed some changes in its number in due course of time, which indicates the progressive nature of Ayurveda. Acharya Charaka, Acharya Sushruta, Acharya Vagbhata, Acharya Sharangdhara etc. are some of the pioneers of Ayurveda. It is due to their tireless efforts that this ancient science is standing in this modern era of advanced technology for the welfare of the masses.

Acharya Charak enumerated three *kriyakalpa* i.e. *Aschyotana*, *Anjana* & *Bidalaka* in his treated *Charaka Samhita*. On the other hand, Acharya Sushruta described five *kriyakalpas* i.e. *Tarpana*, *Putapaka*, *Seka*, *Aschyotana* & *Anjana*.^[14] Acharya Sharangdhara added two more *kriyakalpa* viz. *Pindi* & *Bidalaka* in that of Acharya Sushruta and made its number seven.^[15] A comprehensive description of *Kriyakalpa* is as follows.

1. Tarpana- This is one of the *Kriyakalpa* which brings about nourishing effect to the eyes to improve the visual acuity. In this procedure the unctuous substances i.e. medicated lipid (mostly *Ghrta Manda*) is kept in the eye for a specific period surrounded by a layer of wet flour of *pulse* (*Phaseolus radiatus*) or now a days by a *Tarpana* goggle.

2. Putapaka- *Putapaka* is the topical application of the extract in the eyes for a speculated time, which is performed after *Tarpana* therapy in order to restore the strength to eyes. The extract is prepared out of plant drugs, animal flesh, mineral drugs and fats by heating their mixture (paste) in a closed chamber.

3. Seka- This is the pouring of thin streams of medicated solution onto the closed eyes continuously from a height of four Angul for a specific period of time, as per the prevalence of *Dosha* (body humour). *Seka* is indicated in acute condition of eye diseases.

4. Aschyotana- Instillation of the drops of medicated solution into the open eyes from the height of two Angul is called as *Aschyotana*. *Aschyotana* is the first line of treatment in all eye diseases.

5. Anjana- Topical application of medicine to the internal surface of lid margin (conjunctival fornices) with an applicator (*Anjana Shalaka*) is called as *Anjana*.

6. Pindi- Here, heated medicine in cotton or *Doshghna* leaves is kept tightly over the eyelids. This is comparable to the *Poultice*. *Pindi* is capable of relieving the symptoms like oedema, itching and ocular pain.

7. Bidalaka- This is the application of medicated paste over the skin of lids and is useful in early stages of eye diseases especially for getting rid of burning, redness, watering, itching and swelling of eye.

Out of the above 7 *Kriyakalpa* procedures, the most effective in countering the refractive errors are *Tarpana*, *Anjana* and *Putapaka*. But the maximum benefit in vision improvement needs some more activities which may be presented in following manner.

- A. Snehapana (internal administration of lipid): Triphala Ghrita, Jeevanti Ghrita, Drakshadi Ghrita, Patoladi Ghrita etc.
- B. Virechana (Therapeutic purgation).
- C. Nasya (infusion of Ayurvedic medicine into the nostrils).
- D. Shirovasti (the pouring of medicated oils onto the head in a small leather vessel in the shape of a cap)
- E. Vasti (Therapeutic enema).
- F. Chakshushya Ahara-Vihara Sevana (Practice of eye friendly diet and regimen).

The role of the above mentioned Kriyakalpa, diet and regimen have also been substantiated by the clinical studies carried out at different Institutes/centres of Ayurveda. Some of these are presented below.

Clinical studies carried out on refractive errors at different Ayurvedic Institutes

1. A comparative study of Tarpana with eye exercises in the management of Timira with special reference to astigmatism (2010)-Rumana A.
2. Standardization of Akshi Tarpana and role of Jeevanti Ghrita in Timira w.s.r. to Myopia (2010)-Poonam.
3. A clinical study on Akshi Tarpana with and without Nasya on Timira w.s.r. to Myopia (2009)-Durgesh Prasad Gupta.
4. Management of Timira with Akshi Tarpana with Patoladi Ghrita Tarpana and eye exercises with special reference to simple myopia –A comparative study (2009)-Veena Shekar.
5. Management of Timiram (Progressive Myopia) with Akshi Tarpana by using Triphala Ghritam and Jivanti Ghrita (2008)- G. Mridula Rani.
6. A comparative study of Triphala Ghritapana & Virechan in the management of Prathama Patalagata Timira (Simple Myopia)-2008- Venkatesh A. Joshi.
7. A clinical study to evaluate the effect of Ushiradi Anjana on Timira (Refractive Errors and Presbyopia)-2008-Renu.
8. A clinical study on the efficacy of Tarpana and Shavaryaadi Choorna in the management of Timira w.s.r. to Myopia(2004)-Dr. Ashu Vinaik.
9. A clinical study on the effect of Chakshushya compound and Tarpana Kriyakalpa in Timira w. s. r. to myopia(2004)- Singh Hardev.
10. A comparative study on the efficacy of Tarpana and Triphalaadi drug compound in the management of Timira w.s.r. to Myopia (2002)-Dr.Manesh Kumar E.
11. Role of Putapaaka in Timira w.s.r. to Myopia (2001)-Dr. Kultar S. Dhiman.
12. A clinical study on effect of Timirahara Lauha in management of Timira w.s.r. to myopia (2001)-Jain Vinod.
13. A clinical study and management of Timira w.s.r. to myopia (2000)-Ravi H.K.
14. Study on Refractive Errors w.s.r to clinical evaluation of Myopia by Indigenous methods - Anjana, Tarpana, Eye exercise(1997)-Sarveshwarkar.
15. A study on presbyopia and its management w.s.r. to Navaneetanjana (1995)-Simla.
16. Management of Timira with Nasya with or without Saptamrita Lauha (1994)-Janardan Rao
17. Management of myopia with Siddha-Nagarjuna Varti Anjana (1993)-Chakravarthy D S. R.
18. Clinical evaluation of the effect of Tarpana in the management simple myopia w.s.r. to Sahadevi Ghrita(1991)-Mohan P. M.
19. Clinical evaluation of Nainamrita Anjana in Timira with or without Ghrita-Tarpana(1991)-Prasad Rao D.
20. Role of Indigenous drugs in eye diseases w.r.t. Myopia (1991)-Dr. K.S. Dhiman.
21. A Clinical study on the effect of Chakshushya drugs w.s.r. to Myopia(1990)-Uday Shankar.
22. Role of Triphala Ghrita in the management of Presbyopia (1990)-Nair N.P.
23. A study on the effect of Triphala Ghrita Akshi Tarpana in Timira Roga(1989).
24. Effect of Triphala Ghrita in cases of errors of refraction (1988)-Verma Anil Kumar.
25. Comparative evaluation of the effect of Saptamrita Lauha and Yashada Bhasma on refractive errors (1980)- Srinivasulu.

DISCUSSION

Non-surgical, non-invasive and cost-effective management of refractive error is possible with the adoption of Ayurvedic procedures (Kriyakalpa) coupled with that of eye friendly diet habit and regimen. Ancient medical scholars, the pioneers of Kriyakalpa were aware of the mechanism of blood aqueous barrier as well as ocular pharmacology. Kriyakalpa involves mucosal and cutaneous route of drug administration mainly.

Ghrita preparations used in Tarpana are in the form of suspension containing different particles of the drugs and the particles do not leave the eye as quick as solution. Tissue contact time and bio availability is more hence therapeutic concentration can be achieved by Tarpana. Tarpana is mostly done with lipophilic drugs in the form of ghee, lipid etc. thus it can be well absorbed through lipoidal membrane and also it can nourish this membrane so that its function gets improved. Accommodation is a complex constellation of sensory, neuromuscular and biophysical phenomena by which the overall refracting power of the eye changes rapidly to image objects at different viewing distances clearly on to the retina.^[16] Tarpana may act over accommodation capacity of eye by providing nutrition not only to the cornea but also to the sphincter muscles and nerves innervating it. This is also a fact that Ghrita, used widely for Tarpana contains nutrients like omega-3 & -6 fatty acids, Vitamin A, E & K & antioxidants etc.^[17] The mode of action of Putapaka should be assumed similar to that of Tarpana and it enhances the effect of Tarpana.

Anjana is an easy and effective modality of treatment for not only eye disorders but also for some systemic diseases. Probably it is capable of bringing about better ocular absorption via passive diffusion, carrier mediated transport (facilitated diffusion and active transport) and endocytosis as compared to the eye drops and solutions.

Nasal cavity structures have direct communication with the sensorineural structures of brain and this is a natural gateway to brain. Via this anatomical communication, the medicine of Nasya reaches to "Srīngataka Marma" (cavernous sinus) which is the seat of control of perception of vision, hearing, smell, and taste. In this way, role of Nasya in preservation and promotion cannot be overemphasized. The role of Snehapana, Virechana, Shirovasti, Vasti and Chakshushya Ahara-Vihara Sevana need not to be elaborated, since their validity had already been proved.

CONCLUSION

On the basis of above description it may be stated that Ayurveda is capable of playing a major role in combating refractive errors and subsequently in checking preventable blindness without imposing any adverse reaction/event/effect to the user. Masses must be educated and encouraged to adopt Ayurveda for not only getting rid of their refractive errors but also for the acquisition of healthy vision as well.

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