

## A CLINICAL STUDY TO EVALUATE THE EFFICACY OF *TRATAKA YOGA KRIYA* AND EYE EXERCICES (NON-PHARMACOLOGICAL METHODS) IN THE MANAGEMENT OF *TIMIRA* (AMMETROPIA AND PRESBYOPIA)

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### ABSTRACT

*Timira* is a disease that can be attributed to wide range of clinical conditions starting from mild blurring of vision and having potential risk of permanent vision loss. According to the involvement of *Dhatu*s (body elements) the condition can be grouped into two stages. The initial stage or *Uttana*, where the involvement of *Dhatu*s is limited to *Rasa*, *Rakta* (blood), and *Mamsa Dhatu* (muscle tissue). When the *Doshas* are localized in the first and second *Patala* refractive error do happen and in presbyopia more emphasis is given to *Mamsa Dhatu*. In this study only *Uttana* stage of *Timira* was considered. The clinical study was done on 66 patients of *Timira* in two groups of four sub groups each of myopia, hypermetropia, astigmatism, and presbyopia. Group A was subjected to eye exercises (Bates method) and Group B was subjected to *Trataka Yoga Kriya*. After the enrolment of patients for this study, signs and symptoms were assessed both subjectively and objectively before, during, and after treatment. The study indicates that subjectively there are significant results in both the groups but objectively there is not much improvement.

**Keywords:** Eye exercises, refractive errors, *Timira*, *Trataka Yoga Kriya*

### INTRODUCTION

Estimates of the number of people worldwide with refractive error range from 8 million to 2.3 billion.[1] But this figure seems to be subjective; because till today population-based study had not been carried out. Among this, majority of refractive errors are uncorrected. In 2006, refractive error program had been implemented in India. In 1990, papers published from India highlighted the fact that uncorrected refractive error was a significant cause of blindness and the major cause of impaired vision The fact became initiation for World Health Organization (WHO) to think about Vision 2020 global program – “The right to sight” –

Refractive error can no longer be ignored as a target for urgent action.[2] Hence the main motto of Vision 2020 (current global initiative program by WHO) mandate to correct refractive errors with little infrastructures. Throughout the global survey in developing as well as developed countries myopic group being the main culprit in refractive errors. Clinically asymptomatic retinal detachment is common in myopes, whereas asthenopic condition is more common among other refractive errors. Prevailing treatment modalities, that is, refractive surgeries are becoming popular option for reducing or eliminating refractive errors. Age factor, cost of the

treatment, complications like corneal dystrophies, dry eye, and prevalence of infection had limited its applications. Recent claims of genetic modulation therapy are under evaluation and its success rate is doubtful. While analyzing the etiology of refractive errors, today's life style, occupation, and unawareness of importance of eye have a great impact on ocular health.

Prevailing modality of treatment should be supplemented by some ocular strengthening therapy by which ocular health can be maintained and promoted search for such modality lead the investigators to Bates Eye exercise therapy, which is under-evaluated by modern science. However it is practiced in full pledged manner in many reputed institutes of India like School for perfect eyesight at Pondicherry and Moraji Desai institute of Yogic Science at New Delhi.

Meanwhile *Trataka Yoga Kriya* of our traditional system is practiced throughout India and believed to increase the eyesight. By keeping this concept in mind, to evaluate the role of this Nonpharmacological therapy in refractive error, a study was planned with following aims and objectives:

**AIMS AND OBJECTIVES:** To evaluate the role of eye exercises and *Trataka Yoga Kriya* on *Timira* w.s.r. to Ammetropia and Presbyopia.

#### **MATERIALS AND METHODS**

Patients attending the OPD and IPD of Department of Shalaky Tantra, Yashwant Ayurvedic College Post Graduation Training & Research Centre, Kodoli with signs and symptoms of *Timira*-Ammetropia and presbyopia were irrespective of their sex, religion, occupation, education, etc., A total of 64 patients (128 eyes) were recruited for the study. An elaborative case taking proforma

was specially designed for the purpose of incorporating all aspects of the disease on Ayurvedic and modern parlance.

**Sampling technique:** A total of 64 patients were registered under two main groups with four sub groups of refractive error like myopia, hypermetropia, astigmatism, and presbyopia, respectively, (Group A – 32 patients, Group B – 32 patients) by random sampling method.

#### **Inclusion criteria**

- Sign and Symptoms showing *Prathama* (first) and *Dwitiya* (second) *Patalagata Timira*.
- Functional refractive errors in myopia, hypermetropia, astigmatism, and simple presbyopia.
- Patients with asthenopic symptoms like headache, watering, ocular pain, and fatigue.

**Exclusion criteria:** Patients having any lenticular or corneal opacity and any other known ocular pathology.

**Assessment criteria:** The criteria for assessment were based on signs and symptoms of disease *Timira* described in Ayurvedic as well as modern texts, that is, refractive errors and presbyopia. All the objective parameters like retinoscopy, autorefractometer, ascan, keratometer were adopted to study the role in detail.

#### **Grouping**

**Group A:** A total of 32 patients were registered in this group (myopia – 10, astigmatism – 10, hypermetropia – 06, and presbyopia – 06). Here patients were subjected to perform group of eye exercises once daily for 3 weeks.

**Group B:** A total of 32 patients were registered in this group (myopia – 09, astigmatism – 11, hypermetropia – 06, and presbyo-

pia – 06). Here patients were subjected to perform *Trataka Yoga Kriya* once daily (either in morning or in evening hours) for 3 weeks.

### Therapy

- I. Bates method[3] of eye exercises are as follows:
  1. Sunning, 2. Eye wash, 3. Palming,
  4. Candle light reading,
  5. Shifting and Swinging, 6. Playing with ball, 7. Vaporization, 8. Cold pad
- II. *Trataka Yoga Kriya*[4] *Trataka* – Method of fixing the eye on one object . The word *Trataka* means ‘to look’ or ‘to gaze’. It is last of the shat karmas. It acts as stepping stone between physically oriented practices and mental practices which lead to higher states of awareness. It is an external concentration practice in which one gazes steadily at some small object without blinking, while the eyelids are held slightly more open than usual. The practice is continued until the eyes strain and water. They should then be dosed and the eyes rolled gently a few times, followed by rinsing them carefully and gently with cold water. The purpose of this practice is to coordinate the impulses of the sensory and motor nerves, which assist in producing a state of calmness and tranquility necessary for concentration.

**Types of *Trataka*:** There are 3 kinds of *Trataka*

- *BahyaTrataka* (External)- Where one fixes their gaze on an external object.
- *AbhyantaraTrataka* (Internal)- where gaze is at the third eye (inward and upward). Or the inner celestial spaces such as *chidakash* or *hridayakasha*.

- *Madhaya Trataka*-where gaze is either at tip of nose or at mid – eye brow centre

***Bahya Trataka***- By placing a candle at eye level 2 to 3 feet away and sitting in a meditative posture, practicing *kaya – sthairyam* (steadiness of body) With the intention of being detached from all thoughts arising in the mind. Now begin gazing steadily without blinking at an object such as a still candle flame or symbol like ‘ohm’. If eyes become strained, imagine that the breath is through the mid – eye brow centre to *Ajna-chakra*. Then when the eyes are closed to rest, the subtle form is seen in the mental space, naturally leading to *Abhyantara Trataka*.

It is important to choose carefully what is the object for focus as a deep impression is made on the mind any many subtle energies and influences are aroused by the practice.

***Abhyantara Trataka***- One pointed concentrated focusing on an object seen within the inner celestial spaces of mind. The preparation is the similar to *Bahya Trataka*.

### Benefits of *Trataka*:

- 1. Physical:** It keeps away the eyestrain by strengthening the eye muscles and by giving deep relaxation to them. It makes the eyes clear, bright and radiant. It cleanses the tear glands and purifies the optical system.
- 2. Therapeutic**
  - It is known to correct refractive errors and beneficial in relieving nervous tension, anxiety, depression and lack of desire to sleep (Insomnia).
  - Many of the eye troubles are due to lack of proper blood circulation to the eyes and strains upon the muscles of the eyes. *Trataka* helps to relieve the strain of the eye muscles and improves blood circulation to the eyes.

- This practice makes the eyes clear and bright. It balances the nervous system by relieving nervous tension, anxiety, depression and insomnia. It helps to improve memory and strong will power.
- *Trataka*, which cures eye diseases and wards off sloth etc, should be valued and preserved with effort as one does a casket of gold.
- By constant practice of this, the *sambhavi mudra* is facilitated; diseases of the eyes are cured and acute vision is acquired.

**Follow-up** After completion of therapy, patients were followed-up for 1 month in order to observe any adverse effects of the therapy.

**Statistical test:** Based on observations, the data obtained were statistically analyzed in terms of mean, standard deviation, standard error, and unpaired 't' test was considered at the level of  $P < 0.001$  as highly significant,  $P < 0.01$  as significant, and  $P < 0.10$  as insignificant to assess the results.

#### Assessments of Overall Effect of Therapy

##### Subjective assessment

- Cured: Total 100% relief in signs and symptoms and no recurrence during follow up study were considered as cured.
- Marked improvement: More than 75% improvement in signs and symptoms was recorded as marked improvement.
- Moderate improvement: Around 51-75% improvement in signs and symptoms was considered as moderate improvement.
- Mild improvement: Around 26-50% improvement in signs and symptoms was considered as mild improvement.
- Unchanged: Up to 25% reduction in signs and symptoms was noted as unchanged.

##### Objective assessment

- Cured: Nearly 1D reduction in spherical or cylindrical dioptric power or complete remission.
- Marked improvement: Nearly 0.75D reduction in spherical or cylindrical dioptric power.
- Moderate improvement: Nearly 0.50D reduction in spherical or cylindrical dioptric power.
- Mild improvement: Nearly 0.25D reduction in spherical or cylindrical dioptric power.
- Unchanged: No reduction in spherical or cylindrical dioptric power.

##### Observations and Results

Out of 64 patients studied in this work, maximum patients (45.45%) were found in the age group of 16–30 years. Major numbers of patients were Hindus (86.36%). Maximum patients belonged to *Vata-Pitta Prakruti* (53.03%), showed sleep deprivation (71.21%) and were performing indoor activities (83.33%). Majority of patients were watching television (50%) and working on computers (59.09%) for 2-4 hours daily.

##### Affect of Therapy in Group A (Eye exercise group)

In myopic group, the percentage of relief in *Durastha Avyakta Darshana* (difficulty in distant vision) was 50% and *Netrayasa* (ocular fatigue) was relieved by 54%, which was statistically significant ( $P < 0.01$ ), and 40% insignificant relief ( $P < 0.05$ ) was observed in *Kadachit Vyaktobhava* (transient gain of clarity of vision). In astigmatic group, statistically insignificant 50% relief was observed in *Durastha Avyakta Darshana*, 62.5% in *Shirobhitapa* (brow headache), 60% in *Netrasrava* (watering), 54% in *Netrayasa*, and 75% in *Suchipasam*

Na Pasyathi (difficulty in seeing small objects). In hypermetropic group, statistically significant ( $P < 0.01$ ) relief of 88% in *Netradaha* (burning sensation), 72% in *Shirobhitapa*, 66% in *Netrasrava* was observed. The relief in *Durastha Avyakta Darshana* (37%), and *Vihwala Darshana* (27%) was statistically insignificant ( $P < 0.05$ ). In presbyopic group, the percentage of relief in *Netrayasa* (62.5%) and *Suchipasam Na Pasyathi* (12.5%) was statistically insignificant ( $P < 0.05$ ). The dioptric power was reduced by 25.95% in right eye and 22.15% in left eye, both the results being statistically insignificant ( $P < 0.05$ ). Keratometric reading was reduced by 25.65% in right eye and 24.25% in left eye, both the results being statistically insignificant ( $P < 0.05$ ). A scan reading was reduced by 12.65% in right eye and 12.15% in left eye, both the results were statistically insignificant ( $P < 0.05$ ). Retinoscopic reading was reduced by 16.55% in right eye and 15.15% in left eye, both the results being statistically insignificant ( $P < 0.05$ ).

#### Effect of Therapy in Group B (Trataka Group)

In myopic group, 35% relief in *Durastha Avyakta Darshana*, 55% each in *Kadachit Vyaktobhavati* and *Netrasrava* and 62% relief in *Netrayasa* was observed which statistically insignificant ( $P < 0.05$ ) was. In astigmatic group, statistically insignificant ( $P < 0.05$ ) relief in *Durastha Avyakta Darshana* (37.5%), *Shirobhitapa* (62.5%), and *Netrasrava* (54%) is observed. In hypermetropic group, statistically significant ( $P < 0.01$ ) relief in *Shirobhitapa* (58%), *Netrasrava* (50%) was seen. The relief

in *Netrayasa* (57%), *Durastha Avyakta Darshana* (20%), and *Suchipasam Na Pasyathi* (16.6%) was statistically insignificant ( $P < 0.05$ ). In presbyopic group, the percentage of relief in *Netrayasa* (37.5%) and *Suchipasam Na Pasyathi* (12.5%) was statistically insignificant ( $P < 0.05$ ). The dioptric power was reduced by 23.95% in right eye and 21.16% in left eye, both the results being statistically insignificant ( $P < 0.05$ ). Keratometric reading was reduced by 27.85% in right eye and 25.35% in left eye, both the results which was statistically insignificant ( $P < 0.05$ ). A scan reading was reduced by 18.25% in right eye and 17.65% in left eye, both the results being statistically insignificant ( $P < 0.05$ ). Retinoscopic reading was reduced by 13.65% in right eye and 13.25% in left eye, both the results being statistically insignificant ( $P < 0.05$ ).

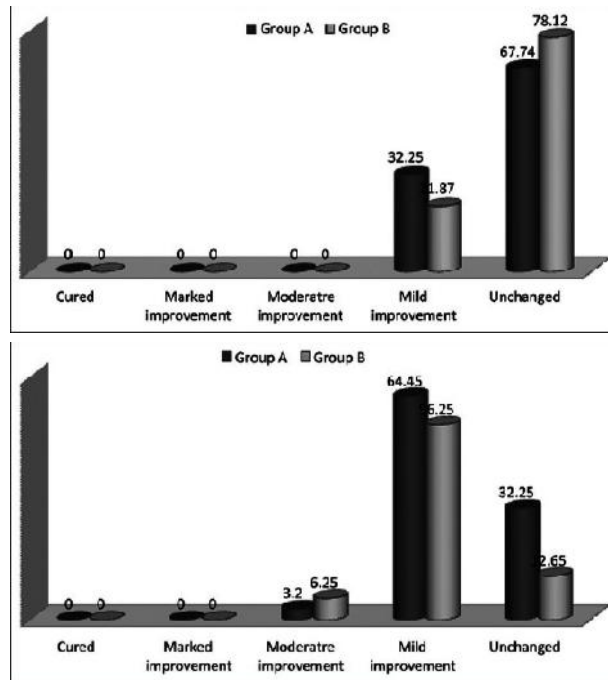
#### Total Effect of Therapy

The present study shows that none of the patients were cured and markedly improved in eye exercises group and in *Trataka* group. By eye exercises, moderate improvement was observed in one patient (3.20%), mild improvement was observed in 20 patients (64.45%), and no improvement was observed in 10 patients (32.25%) of *Timira*. Whereas by *Trataka*, moderate improvement was observed in two patients (6.25%), mild improvement was observed in 18 patients (56.25%) and no improvement was observed in 12 patients (37.5%) of *Timira*.

#### Overall effect of therapies on subjective parameters

In subjective parameters, mild improvement that is 3.20% in Group A and 6.25% in Group B was seen. Moderate improvement that is 64.45% in Group A and 56.25% in

Group B was observed. No change was observed in 32.25% patients of Group A and



37.5% patients of Group B [figure1].

Figure1: Overall effect of therapies on subjective parameters

**Overall effect of therapies on objective parameters:** Moderate improvement was seen in objective parameters in 32.25% patients of Group A and 21.87% patients of Group B. No change was observed in 67.74% patients in Group A and 78.12% in Group B [figure2].

Figure2: Overall effect on objective parameters: This depicts that no considerable improvement was found in objective parameters in both the groups. In contrast, moderate to mild improvement was noted and observed in many of the subjective parameters like *Shirobhitapa Netrasrava* and *Neytrayasa*.

## DISCUSSION

*Rajarishi Nimi* explains the clinical manifestation of *Timira* according to the *Dosha* localization in different *Patalas* (layers of eye), a transient phase of clear vision, that is, *Kadhachit Vyakto Bhavati* [5] when *Doshas* get localized in the outermost *Patala*. In this study this feature was observed in patients having refractive error between 0.25 and 0.75D. While analyzing the *Doshika* involvement, most of the patients were having *Kaphaja Timira Lakshana* especially in the Myopic and Hypermetropic group and *Vataja Timira lakshana* were seen in the Astigmatic and Presbyopic group. *Timira* being *Vataja Nanana-tamja* disorder; myopia and hypermetropia are grouped under *Vatakaphaja* and astigmatism and presbyopia are under pure *Vataja* categories. Eye exercise and *Trataka Yoga Kriya*, the basic concepts behind these are relaxation techniques. Re-

laxation of mind and eyes improves the vision. On analyzing the pathogenesis of vitiation of *Rasa* and *Raktavaha Srotas*, maximum concern was given to mental disturbance by ancient scholars. Similarly relaxation of mind was an essential prerequisite for the cure of the disease pertaining to the *Srotasas*.

### Mode of action of eye exercises

Eye exercises have a great role to play in asthenopic features. For better understanding, asthenopic features can be divided into extra ocular asthenopia and intraocular asthenopia. Extra ocular asthenopia is due to following factors like forcing the medial rectus muscle during convergence, lid squeezing to get stenopic effect, and strain causes fatigue, which in turn leads to brow headache, ocular pain, reflex lacrimation, and referred ophthalmoplegia. In the effort of clear vision, the blinking phenomenon also reduces, leading to non replacement of tear

film, which leads to blurring of vision. The fatigue of lid muscles also cause reflex irritation of conjunctiva, leading to burning sensation and thereby patient develops the habit of rubbing the eyes frequently to relieve the lid fatigue and irritation, which adds into the conjunctival hyperemia\chronic conjunctivitis. Whereas in case of intraocular asthenopia, ciliary spasm take place, which in turn leads to fatigue, ocular pain, and reflex features of lacrimation like burning sensation and watering.

#### **Mode of action of trataka**

- Alpha waves are often seen in a relaxed individual with eyes closed. Normally the alpha rhythm is blocked when the eyes are opened.
- During Trataka alpha activity was not only persisted but also increased slightly. The visual stimuli could not block the alpha rhythm as they became less sensitive to the external stimulation.
- The increase in alpha activity is an indication of pleasant mood, less mental disturbance, absorptive, high state of one pointed-ness and no fluctuation of ideas or thrusts in the mind of the practitioners. Also, in Trataka Yoga Kriya, imagination power increases; functionally efficiency of extra ocular and intraocular increases by forcing them to work and enhances the metabolism of rods and cones through the mechanism of dark and light adaptation. The sense organ, which is misused to the maximum extent is eye, that is, *Mithya* or *Atiyoga* of *Chaksurendriya*. In this era of changed life style and increased pace, it is the primary duty of Ayurvedic community to educate the society regarding the healthy use of this sense organ. A regular schedule in this regard for the prompt

relaxation of eye is not only beneficial to such refractive problems but also can prevent many degenerative conditions. A schedule of optimum exercise improves *Rasa, Rakta Samvahana* as well as improves the efficacy of sense organ in their perception. A mild derangement of these *Dhatus* can completely be cured with these exercises. If the vitiation is moderate to severe, this can very well act as suitable supportive therapy. Actually the agenda behind this particular study was to popularize these two simple techniques, which can contribute to mankind in prevention of many eye diseases and provide relief to too many visual problems/asthenopic symptoms.

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#### **CONCLUSION**

In Snellen's chart reading one line improvement was noted. There was moderate improvement in clarity of vision, contrast sensitivity, and fineness of objects. Though the degree of this improvement was almost similar in both the groups, a better relief was appreciated by patients of *Trataka Yoga Kriya group*. It is an encouraging finding that a non-pharmacological, low cost, relaxation technique can improve the quality of vision, by which it indirectly checks the progression of the disease condition. Both these techniques act as adjuvant therapy hence one should adopt pharmacological interventions (medical management), life style, and diet modifications to get a better result.

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*Source of support: Nil*  
*Conflict of interest: None Declared*