The Effect of Trataka Yoga Kriya on Visual Evoked Potential In Myopes

Sushma S[1], Uday K Dixit[2]

[1]Assistant Professor, Department of Physiology, [2]Third year MBBS Student, Bangalore Medical College and Research Institute, Fort, K.R. Road, Bangalore, Karnataka

Abstract

Aim of Study: To evaluate the effects of Trataka yoga on Visual Evoked Potential (VEP) in myopic subjects

Methodology: Out of 36 myopes recruited for the study, 25 subjects were considered for statistical analysis. Visual Evoked Potential was recorded before and after an intervention of Trataka yoga kriya for 3 weeks.

Results: The study showed that there was no significant statistical change in P100 latency pre and post intervention with mean readings of 95.25 and 95.79ms pre and post intervention respectively for the left eye and 95.15 and 96.4ms pre and post intervention respectively for right eye.

Conclusion: Our study concluded that Trataka yoga has no significant effect on VEP but better designed studies need to be done on a larger sample to confirm these findings and study the above association accurately.

Keywords*: Visual Evoked Potential, Myopes, Trataka Yoga Kriya*

Introduction

The prevalence of Myopia among the highest among pathology of the eye and is associated with comorbidities with an estimated 22.9% of the world population, being affected.[1]An additional 2.7% of people are estimated to have high myopia.[2] The economic impact of uncorrected refractive error is estimated to be a loss of $202 billion of global gross domestic product. In 2010, just over 28% of the world's population were affected by Myopia. This is predicted to rise to 34% by 2020 and nearly 50% by 2050.[3]

Visual evoked potential (VEP) is the graphic illustration of the cerebral electrical potentials generated by the electrical activity of the occipital cortex evoked by a defined visual stimulus, during the visual processing.[4] It is reported that the refractive errors distort the stimulus and cause defocus, which significantly changes the VEP (P100 latency and amplitude). There have been studies asserting that P100 wave latency of VEP is one of the major discriminators between normality and abnormality of visual Pathway and it is more sensitive to small refractive changes.[5]

Trataka Yoga Kriya is a form of Yoga said to improve eyesight and strengthen ocular muscles.

We hypothesized that impaired visual evoked response is associated with refractive error among myopic subjects. Furthermore, to date there is insufficient information available in connection with the above association in myopes after Trataka yoga kriya intervention. Similarly, no study has reported the impact of short term Trataka intervention on the VEP in different levels of refractive errors till date.

Hence, in the present study, an attempt is made to evaluate the possible association relating the visual

Corresponding Author:
Dr. Sushma S
Assistant Professor, Department of physiology
Bangalore Medical College and Research Institute,
Fort, K.R road, Bengaluru- 560002.
EMAIL: suvina76@gmail.com
Phone: 9916915194

evoked response in myopics aged 18 - 25 years following a non-pharmacological intervention of Trataka yoga kriya, which is easy to learn, implement, and adhere.

The present study may have significant potential for contributing to knowledge of the role of myopia on visual evoked response which may exert the pathophysiological assault, before and after an intervention program. Our data may provide an insight into the conflicting results of other studies and may suggest a rationale to select an appropriate evidence based non-pharmacological therapy tailored to the patient.

Aims and Objectives

To assess the influence of Trataka yoga kriya on Visual Evoked potential in myopes. Although several studies have reported the modulatory effects of refractive error on VEP among myopes, the possible role of a short period of Trataka practice was not well documented.

Material and Methods

Study design:

Pre and Post intervention study.

Study period:

August 2019 and October 2019

Place of study:

Dept of Physiology, BMCRI.

Study group:

The study was conducted on 36 subjects prediagnosed with myopia.

Sample size:

36 subjects prediagnosed with myopia

Inclusion Criteria:

1. Subjects in the age group of 18 and 25 years.
2. Subjects pre-diagnosed with Myopia.

Exclusion Criteria:

1. History of any ocular surgery
2. History of any ocular pathology
3. Subjects with colour blindness.
4. Subjects with history of seizures
5. History of neurological /psychiatric and other systemic diseases
6. Subjects who had received yoga training in the previous 3 months.

Methodology

Written informed consent was obtained from the recruited subjects after explaining the procedure in detail. The subjects were selected based on inclusion and exclusion criteria and their base line data was recorded.

Recording of Visual Evoked Potential (VEP)

Visual evoked potentials were recorded using the using Nemus by EB Neuro according to the protocol proposed by the International Society for Clinical Electrophysiology of Vision (ISCEV).[6] VEP s were elicited by stimulation with a checkerboard pattern and were recorded from the occipital region in the midline and on either side of the scalp. The electric potentials that lead to an upward deflection were termed negative while those with a downward slope were termed Positive.[7] The two primary features to each deflection that can be described are-

a. The time elapsed since the stimulus (latency)

b. The magnitude of deflection from the base line (amplitude)

The component of major clinical importance is the P100 response, a positive peak having a latency of approximately 100ms.[8] The latency of P100 response is being considered in the present study. The recordings were evaluated using the "Queen Square" montage, which includes a midoccipital electrode placed 5cm above the inion, referenced to a mid-frontal electrode placed 12cm above the nasion (MO-MF). To complete the montage, leads were usually placed 5cm to the left (LO) and right (RO) of the MO lead. The results were then statistically evaluated.

Trataka Yoga Kriya And Related Eye Exercises

After measuring the baseline data, an intervention of Trataka yoga kriya[9] along with a set of eye exercises

was be given for a period of 3 weeks. It included gazing at the candle flame with focused attention for a period of 30 seconds followed by defocusing, breathing and chanting. Each session was repeated for 30 min duration and was conducted on everyday basis.

The preparatory Eye Exercises include

- Left and Right movements
- Up and Down movements
- Clockwise and anticlockwise Circular movements
- Simple Palming
- Simple and Intermittent Pressure application
- Palming with Brahmari

The form of Trataka which was practised is the Jyothi Trataka. The subjects were asked to sit 3 feet from a candle flame in a dimly lit room. They were asked to gaze and focus effortlessly and later intensively on the outer part and later the inner parts of the flame with intermittent chanting. In between the exercises simple palming was done to relax the eyes.

Statistical Analysis

Data was entered in Microsoft Excel and spss version 24.0 was used for statistical analysis. Data was analysed by descriptive statistics such as mean, median, standard deviation and interquartile range, percentage, tables and graphs wherever necessary. Student 't' test was used to determine significant difference in Visual Evoked Potential between pre and post intervention.

Observation and Results

Of the total 36 subjects, 25 subjects (with a mean power of left and right eyes being 2.29±1.92 and 2.52±1.97 respectively both male and female in the ratio of 17:8 with a mean age of 20 years) completed the intervention and were considered for the study. All 25 subjects had successfully completed 3 weeks of yoga intervention and were asked to continue the practice till the readings required for the study were completed.

Pre intervention tests showed a P100 latency of 95.15±4.08 and 95.25±5.97 in right and left eyes respectively. (Table-1)

Post intervention tests showed a P100 latency of 96.40±5.13 and 95.79±5.29 in right and left eyes respectively. (Table-1)

Paired sample tests show a mean increase of 0.055 and 0.497 post intervention in the P100 latency in right and left eyes respectively which is not significant. (Table-1)

Table-1: Pre and Post intervention Comparison

Parameters	Pre intervention	Post intervention	Sig (2 tailed)
P100 latency(L)(ms)	95.25±5.97	95.79±5.29	0.497
P100 latency(R)(ms)	95.15±4.08	96.40±5.13	0.055

Discussion

In the present study VEP was recorded in subjects prediagnosed with myopia before and after a yogic intervention and it was found that there is no statistically significant difference in the latency of P100 at the end of yoga training. A study by Anand et al has shown a strong negative correlation with P100 amplitude and strong positive correlation with P100 latency among myopes.[10] B J Winn has observed the positive correlative changes in latency and amplitude of P100 by artificially simulating refractive error.[11] A study has concluded that nonpharmacological approaches such as eye exercises and Trataka Yoga Kriya are not significant on myopia and VEP.[12]

Recording the refractive error using Autorefractometers could have been proved to show

valid and repeatable measures, which we could not precisely measure due to technical restraints. The use of standardized protocols for obtaining cognitive evaluations were followed by single researcher, to increase the test reliability. Though the Trataka intervention period was only for 3 weeks, still we could show significant improvement in cognitive functioning post intervention. This claim however needs to be tested in larger samples with long term intervention, which could have depicted significant changes. Further studies can be conducted to test the effect of Trataka on different neurological test batteries.

By observing the obtained results, the limitations would be lack of a larger sample size, short interventional protocol duration, the Trataka being tiresome for some of the participants to perform, as they were asked to perform the eye exercises in proper repetition.

Conclusion

The present study concludes that P100 latency in myopes did not show significant changes, postintervention of Trataka yoga kriya. For researchers, this study could provide a substantial base for conducting future trials to test the effect of Trataka in myopes. Also, more rigorously designed studies with a larger sample size are recommended to study the causal relationship between the VEP response at different levels of visual neuronal pathway, in combination with neuroimaging to assess the quality of Trataka yoga kriya, when applied over the myopic population.

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