Effect of Pranayama and Eye Exercises on Visual Acuity of Medical Students: A Case Control Study

Nitin Gosewade¹, Amol Drugkar², Vinod Shende³

ABSTRACT

Introduction: In current century of information technology, use of electronic gadgets has increased and also the no of ocular complaints also increased. Regular practice of relaxation techniques like pranayama and certain eye exercises are found to be useful in relieving these systems and also improving the visual acuity as such. Aim to study the effect of pranayama and eye exercises on visual acuity.

Material and Methods: This study was done on 60 medical students, divided into study and control groups equally. Study group subjects performed kapalabhati pranayama and eye exercises regularly for eight weeks while control group participants did not participate in any kind of exercise. Snellen’s chart was used to test the visual acuity to test the effect of pranayama and eye exercises.

Results: There was significant improvement in visual acuity in subjects practicing pranayama and eye exercises. Visual acuity values in study group in right eye before and after intervention were 34.30 ± 20.28 and 30.70 ± 21.89 respectively. Values in left eye were 34.60 ± 20.08 and 30.46 ± 21.62 respectively. In control group the values were 32.60 ± 20.37 and 32.30 ± 20.44 for right eye respectively and 31.10 ± 19.22 and 30.90 ± 19.15 for left eye respectively.

Conclusion: The present study suggests that pranayama along with eye exercises can be used as potential non-pharmacological measure for visual acuity improvement.

Keywords: Visual acuity, pranayama, eye exercises, Snellen’s chart

INTRODUCTION

In the current century, information technology has become the boon for the overall development of a person. But it has got certain disadvantages also if used excessively. Excessive television watching, spending lot of time on social networking sites on mobile and computer has increased the eye complaints. Most of the people visit ophthalmologist with common ocular complaints like itching, redness, burning, tearing of the eyes, headache, double vision, eye strain and blurred vision. In India, the major symptoms related to the computer use reported by the ophthalmologists are headache, eyestrain, tiredness and burning sensation, watering and redness. Depth perception is the function of binocular vision which gives us an idea regarding size and distance of the objects to enable us move around them. Both of our eyes and its connections to brain and extra ocular muscles work in coordination to produce complicated visual images and messages. All of us in our routine activities often need to respond immediately to different simple as well as complex conditions like the simple responses to the doorbell in home to the traffic signals on the road. These muscles can get fatigued. Thus it is necessary for us to do regular exercise in order to keep these muscles healthy, like any other muscle in the body. Yoga is an ancient Indian technique which includes practice of specific postures, cleansing practices, regulated breathing exercise and meditation. A combination of yoga practices along with other eye relaxation techniques reduced symptoms of visual strain reflecting in betterment of visual acuity. Yogic exercises are supposed to strengthen all the extraocular muscles and help in preventing eye strain. Yoga has been shown to improve ocular symptoms in people who use computers for prolonged hours. Even a short program of yogic exercises of six weeks was found to be effective in enhancing emotional well-being and handling of stress among employees of a workplace. It has been reported that one month yoga training resulted in improvement in mirror tracing tasks. In 1900, Dr. William H. Bates, a Newyork ophthalmologist noted how much his own eyes ached. It reminded him how often his patient complains of eyestrain and headaches even after they had responded well to medical treatment. In his office, he rested his elbow on his desk and cupped his palms over his eyes. After ten minutes his eyes stopped aching and he felt mentally refreshed. Uncupping his eyes, he found that objects in his room seemed much clearer and brighter. His observation led him to evolve his ‘method of eyesight training’ described in his bestselling book of 1919, Better Eyesight without Glasses. Various websites mentioned simplified eye exercises and their usefulness on eyes including claims like improvement in vision. But definitive studies in this regard are lacking. We planned this study with the objective to study the effect of pranayama along with Bates eye exercises on visual acuity.

MATERIAL AND METHODS

Study Design

Present study was carried out in Physiology Department at reputed Medical College of Mumbai. Total 60 healthy subjects (both male and female) who were in the first year MBBS, in the age group of 18–30 years belonging to simil-

¹Associate Professor, Department of Physiology, ²Associate Professor, Department of Anatomy, Chandulal Chandrakar Memorial Medical College, Kachandur, Durg, Kachandur, Chhattisgarh, ³Assistant Professor, Department of Physiology, MGIMS, Sevagram, Wardha, Maharashtra, India

Corresponding author: Dr Vinod Shende, Assistant Professor, Department of Physiology, MGIMS, Sevagram, Wardha, Maharashtra, India

How to cite this article: Nitin Gosewade, Amol Drugkar, Vinod Shende. Effect of pranayama and eye exercises on visual acuity of medical students: a case control study. International Journal of Contemporary Medical Research 2016;3(4):1133-1136.
ilar socio–economic status were recruited in the study. All the study participants were staying in college hostel having similar eating and sleeping patterns. The study subjects were selected according to following preset inclusion and exclusion criteria.

**Inclusion Criteria**
1. Indian subjects with or without refractive error
2. Both male and female subjects.
3. Subjects in 18-30 years of age.

**Exclusion Criteria**
1. Subjects with colour blindness.
2. Subjects with organic diseases like glaucoma, eye infections, eye injury, malignancy, post surgery for refractive errors, squint.
3. Subjects suffering from medical conditions known to impact cognitive functioning like neurological disorders, head injuries, cardiovascular diseases and diabetes.
4. Subjects not willing to give written consent.

All the participants were briefed in detail regarding the nature of study and written informed consent was obtained from each of them. Study was approved by the Institutional ethics committee.

Two groups were created viz: study and control group. Subjects were divided randomly into two groups; containing 30 subjects (18 male and 12 female) each. Visual acuity values were recorded from all the study participants before starting the study. Participants of study group were taught eye exercises and pranabhati pranayama. They performed eye exercises and pranabhati 2 times a day for (total one hour) 8 weeks regularly under supervision. Participants from control group were busy with their daily activities without exercise. Visual acuity was recorded from all the participants at the end of 8 weeks to see the effect exercises on vision.

**Outcome Measures**

**Acuity of vision**

It is the degree to which the details and contours of objects are perceived. We have measured the acuity of vision of all the subjects using Snellen’s chart.

**Snellen’s chart** – in 1875 Snellen created a new set of chart that used six meters as the standard measurement distance. It is a chart used for testing distant vision which is tested by the ability of the subject to recognize test letters on the chart. The test Block letters which are black on white background are of different sizes. Each line of letters has a figure of 60, 36, 24, 18, 12, 9, 6 and 5 meters noted beside it. The chart is so designed that each letter a normal individual can read at a required distance, subtends a visual angle of 5 minutes. The width of each stroke of the letter being 1 minute and the required distance, subtends a visual angle of 5 minutes.

The test Block letters which are black on white background are of different sizes. Each line of letters has a figure of 60, 36, 24, 18, 12, 9, 6 and 5 meters noted beside it. The chart is so designed that each letter a normal individual can read at a required distance, subtends a visual angle of 5 minutes. The width of each stroke of the letter being 1 minute and the lines in the letter are also separated by 1 minute of arc. Thus the ‘minimum separable’ in a normal individual corresponds to a visual angle of approx. 1 minute. If the subject, who stands at 6 meters (20 feet) distance reads the chart with one eye at a time and can read no further than the ‘24 meters’ line, his visual acuity is 6/24. It means a letter which can be read by a normal individual at 24 meters is being read at a distance of 6 meters only. Normal visual acuity is 6/6 or 6/5.10,11
Gosewade, et al. Effect of Pranayama and Eye Exercises on Visual Acuity

International Journal of Contemporary Medical Research  
ISSN (Online): 2393-915X; (Print): 2454-7379   | ICV: 50.43 | Volume 3 | Issue 4 | April 2016

### DISCUSSION

In the present study Snellen’s chart was used to check visual acuity in normal healthy subjects and to see the effects of pranayama and eye exercises on visual acuity. Results suggested that there was significant improvement in visual acuity in subjects practicing pranayama along with eye relaxation exercises as compared with control group.

Our study results are comparable with that of Shirley Telles et al, they studied the visual discomfort in 291 professional computer users before and after yoga, their results suggested that the yoga practice reduce visual discomfort, while the group who had no yoga intervention showed an increase in discomfort at the end of sixty days. Rosemary Gaddum Gordon, D.B.O, M.A. published the article in 1995 in which he mentioned that: The extra ocular muscles need to be flexible and energized at a time. Study conducted by M Ashok Kumar et al on 30 medical students concluded that yoga eye exercises shown objective as well subjective improvement in ocular health of study participants after 6 weeks of exercise. The extra ocular muscles need to be flexible and energized to preserve clear and accurate focus. As we relax, muscles relax. This enables them to return to their natural state and move freely. Vision is a function of body as well as mind. Developmentally the eye is an extension of the brain, and it’s the mind that sees. As a result of this body-mind coordination the eyes only relax completely when the mind is relaxed. The mind relaxes when it is focused on just one thing at a time. STudy conducted by M Ashok Kumar et al on 30 medical students concluded that yoga eye exercises shown objective as well subjective improvement in ocular health of study participants after 6 weeks of exercise. The extra ocular muscles need to be flexible and energized to preserve clear and accurate focus. As we relax, muscles relax. This enables them to return to their natural state and move freely. Vision is a function of body as well as mind. Developmentally the eye is an extension of the brain, and it’s the mind that sees. As a result of this body-mind coordination the eyes only relax completely when the mind is relaxed. The mind relaxes when it is focused on just one thing at a time. Significant positive results of our study may be due to improvement in blood supply and nutrients to all the extraocular muscles which controls the movements of the eye. A regular exercise of extraocular muscles restores the normalcy of the eyeball in relation to size and shape which is the most important for normal vision.

### CONCLUSION

The results of the present study suggest that practice of pranayama along with eye exercises for 8 weeks improves the visual acuity. In contrast, the control group subjects who had not practiced pranayama do not show any improvement in the visual acuity. It suggests that pranayama along with eye exercises can be used as potential non-pharmacological measure for visual acuity improvement.

### REFERENCES


### TABLE-1: Visual Acuity findings in Study group

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Right Eye</th>
<th>Left Eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Exercise</td>
<td>Mean 34.30</td>
<td>Mean 34.60</td>
</tr>
<tr>
<td></td>
<td>Std Dev 20.28</td>
<td>Std Dev 20.08</td>
</tr>
<tr>
<td></td>
<td>SEM 2.61</td>
<td>SEM 3.66</td>
</tr>
<tr>
<td>After Exercise</td>
<td>Mean 30.70</td>
<td>Mean 30.46</td>
</tr>
<tr>
<td></td>
<td>Std Dev 21.89</td>
<td>SEM 21.62</td>
</tr>
<tr>
<td></td>
<td>SEM 2.82</td>
<td>SEM 3.94</td>
</tr>
</tbody>
</table>

**P value=0.00 (S)**

### TABLE-2: Visual Acuity findings in Control group

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Right Eye</th>
<th>Left Eye</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Exercise</td>
<td>Mean 32.60</td>
<td>Mean 31.10</td>
</tr>
<tr>
<td></td>
<td>Std Dev 20.37</td>
<td>SEM 19.22</td>
</tr>
<tr>
<td></td>
<td>SEM 3.71</td>
<td>SEM 3.51</td>
</tr>
<tr>
<td>After Exercise</td>
<td>Mean 32.30</td>
<td>Mean 30.90</td>
</tr>
<tr>
<td></td>
<td>Std Dev 20.44</td>
<td>SEM 19.15</td>
</tr>
<tr>
<td></td>
<td>SEM 3.73</td>
<td>SEM 3.49</td>
</tr>
</tbody>
</table>

**P value=0.55 (NS)**

P value=0.69 (NS)


Source of Support: Nil; Conflict of Interest: None
Submitted: 25-02-2016; Published online: 26-03-2016