

Effect of pranayama training on audio-visual reaction time

S B Jore¹, Prathamesh Kamble^{2*}, T B Bhutada³, M S Patwardhan⁴

¹Assistant Professor, ⁴Professor and HOD, Department of Physiology, Bharati Vidyapeeth Deemed University Medical College and Hospital, Sangli, Miraj, Maharashtra, INDIA.

²Assistant Professor, Department of Physiology, B. J. Medical College, Pune, Maharashtra, INDIA.

³Professor, Department of Physiology, Government Medical College, Miraj, Sangli, Maharashtra, INDIA.

Email: dr.prathamesh81@gmail.com

Abstract

Present study was conducted to observe effect of short duration pranayama on audio-visual reaction time. One sixty healthy 1st year M.B.B.S. students were participated in the study. Readings of height (meter), weight (kg.), auditory and visual reaction time taken just before starting and immediately after pranayama training. Pranayama training was given daily for 45 minutes duration 6 days/week for 12 weeks. Analysis was done by applying paired students t-test. After Pranayama training there was statistically significant decline in auditory and visual reaction time. Thus pranayama practice done for short duration also can improve concentration power and sensory motor performance.

Keywords: Alkaline Phosphatase; Gamma Glutamyl Transferase; HIV/AIDS.

*Address for Correspondence:

Dr. Prathamesh Kamble, Assistant Professor, Department of Physiology, Bharati Vidyapeeth Deemed University Medical College and Hospital, Sangli, Miraj, Maharashtra, INDIA.

Email: dr.prathamesh81@gmail.com

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INTRODUCTION

Yoga is philosophy and discipline applied to development of mind, body and spirit. Maharshi Patanjali, the father of yoga and great physician himself defines Yoga as "Complete mastery on mind and emotions."¹ Pranayama is 4th component of yoga which means controlled breathing. It is nowadays most popular stress relaxation technique. Definition of Pranayama in Yog-sutras of patanjali is "Tasmin sati swas praswasayor-gativicchedah pranayamah" i.e. "Regulation of incoming and outgoing breath with retention, which follows after securing steadiness of posture or seat, is Pranayama."^{2,3} All over the world, scientists extensively studied pranayama and claimed that it increases longevity and also has

therapeutic and rehabilitative effects.⁴ We carried out this study to find whether short duration pranayama has impact on sensorimotor performance of individual in terms of audio-visual reaction time.

MATERIALS AND METHODS

One thirty male and one thirty female subjects in age group 19 - 22 years were recruited on a volunteer basis from 1st year M.B.B.S. students from Government Medical College, Miraj. They were selected on basis of inclusion and exclusion criteria. Students with history of any neurologic, psychiatric, cardiovascular, respiratory or systemic illness, smokers, and alcoholics were rejected. Students on psychotic drugs, antihistaminics and antiepileptics were excluded from study. Those who were already practising pranayama or exercise were not included in this study. Visual reaction time and auditory reaction time were measured by using Digital Response Analyser having an accuracy of 1 millisecond. Yellow light was used as a stimulus to measure visual reaction time. High pitch sound was used to measure auditory reaction time. The readings were taken between 11 am -1 pm in daylight in silent room. Instrument was kept on table and subject was made to sit on comfortably on chair. Practice was taken from each subject until they have understood and performed the task as required. Subject

was asked to press and immediately release the switch with the thumb of right hand as soon as he saw the glow of yellow light or hearing sound. This gave reaction time in milliseconds on time display of instrument. Each time 3 readings of VRT and ART were taken and lowest was used as final reading. Readings of VRT and ART were taken before and after pranayama training. Pranayama training was given to all subjects daily six days a week

RESULTS

Table 1: Mean value and standard deviation of Visual Reaction Time before and after pranayama practice

Sr. No.	Phases	Mean	S.D.	t-test	p-value
1.	Before Pranayama	189.52	8.05	11.59	P<0.001*
2.	After Pranayama	174.37	7.99		

*p < 0.001 (significant when compared to control group)

Table 2: Mean value and standard deviation of Auditory Reaction Time before and after pranayama practice

Sr. No.	Phases	Mean	S.D.	t-test	p-value
1.	Before Pranayama	176.40	12.46	14.59	P<0.001*
2.	After Pranayama	151.68	9.18		

As shown in table no. 1 mean and S.D. for auditory reaction time before pranayama was 176.4 +/- 12.46 mSec. which falls to 151.68 +/- 9.18 mSec. after pranayama practice. This decrease in auditory reaction time was statistically highly significant. As shown in table no. 2 mean and S.D. for visual reaction time before pranayama was 189.51 +/- 8.05 mSec. which falls to 174.36 +/- 7.99 mSec. after pranayama practice. This decrease in visual reaction time was statistically highly significant.

DISCUSSION

Medical students undergo tremendous stress during various stages of the MBBS course.⁵ Syllabus of 1st M.B.B.S. is very vast as compared to time they got for reading, understanding and analysing three subjects. Also time is required for adjustment in new environment of college. To overcome all this problems they need to have good concentration power, memory. Present study done to observe effect of pranayama on concentration power of 1st M.B.B.S. students in terms of reaction time. Simple reaction time is indirect index of processing capability of CNS and also simple means of determining sensorimotor performance. Reaction time varies with age, gender, fatigue, fasting, anxiety, stress, personality type, arousal etc. Studies performed earlier found that reaction time varies with nutritional status of person also. In the present study we observed that there was significant reduction in auditory and visual reaction time after 12 weeks pranayama training. Similar results are reported by Madan Mohanet al⁶, Borkaret al⁷ Effect of pranayama on reaction time could be due to greater cortical arousal and

for 10 weeks. It consists of prayer, nadishuddhi, Bhastrika, Anulom-vilom, Suryabhedan, Kapalbhathi, Bhramari and Omkar recitation for 45 minutes. To avoid misinterpretations of our findings due to individual variation, subjects of this study formed their own control. The data was statistically analysed by paired student's t-test.

faster rate of information processing, improved concentration power, ability to ignore external stimuli i.e. less distractibility and Improved memory⁸ During pranayama practitioner not only tries to breathe but also tries to keep attention on breathing, leading to better concentration. This act of breathing removes attention from worries and distress. Practitioner can better handle day to day emotional, physical and mental stress.⁹ this can be the reason to reduced reaction time after pranayama practice.

CONCLUSION

Thus regular practice of pranayama by 1st M.B.B.S. students leads to reduced audio-visual reaction time by improving concentration power, memory and reducing perceived stress. These positive results can be applied to improve their academic performance, to boost up their confidence levels.

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