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Acute effect of trataka on heart rate between university level male and female students: A comparative study

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Abstract
The term yoga is derived from the Sanskrit word 'yuj' meaning to unite; the union of the individual self with the supreme self. According to the classical definition by Patanjali, yoga means controlling the modifications of mind. The hatha yoga cleansing processes have been placed into six groups of purification practices known as shatkarmas, the six shatkarmas are neti, dhouti, nauli, basti, kapalbhati, and tratak, trataka is intense gazing of a point developing concentration and cleansing the mind. Heart rate variability (HRV) is the physiological phenomenon of variation in the time interval between heartbeats. It is measured by the variation in the beat-to-beat interval of the ECG wave. For the present study total 08 university levels students (04 male groups and another 04 female groups) were purposively selected from Dept. of Physical Education, Vinaya-Bhavana, Visva-Bharati University, Santiniketan, Bolpur, West Bengal, India. Their age ranges from 18-22 years. The study was conducted during the year 2017-20118 academic sessions in the institute laboratory. To measured heart rate of the heart, ECG test was used for the study. There were also the experts who helped to conduct the test. Before recording the parameter, the subject was asked to relax physically and mentally for few minutes. ECG was recorded by an ECG machine (BPL 108T-DIGI Single Channel, 12 leads ECG Machine) using standard chest and limb leads and heart rate was calculate from R wave to R wave interval of II lead of ECG graph. Each ECG graph was reported by trained physician. For the collection of data pre and post test was taken. The selected subject underwent an acute effect of 15 minutes trataka programmed at evening sessions, under the instruction and supervision of the supervisor and with the help of others experts. ANCOVA was applied to calculate the collected data at 0.05 level of significance and to identify the significance differences on experimental groups the mean critical difference was used as a post-hoc test.
Presently the study clearly shoes that the table value was greater than calculated value (Tab- $F_{0.05} = 6.61$ > calculated value 1.658) So it was concluded that there was no significant difference on heart rate variability between University level male and female students by the acute effect of trataka practice. But the trataka practice was more affected on heart rate of the female students.

Keywords: heart rate variability, ECG & trataka

Introduction
The term yoga is derived from the Sanskrit word 'yuj' meaning to unite; the union of the individual self with the supreme self. According to the classical definition by Patanjali, yoga means controlling the modifications of mind. There are several styles of yoga, but the core idea of every style is controlling the mind. This concept of yoga (along with various physical postures or asanas) that has got recent attention globally can be traced back to the Indus valley civilization. Since then, it has undergone various modifications and what we know as yoga today is vastly different from the way yoga was originally practiced. Yoga has its roots about 5000 years BC as described in Vedic Philosophy and Tantras. Patanjali, great sage composed this path into a Darshan (Philosophy) in his Book Patanjali Yoga Sutra. In which he has formulated Yoga as an Eight Limbs or Eight Fold path - Yama (Principles), Niyama (Personal Disciplines), Asana (Yoga Positions or Yogic Postures), Pranayama (Yogic Breathing), Pratyahara (Withdrawal of Senses), Dharana (Concentration on Object), Dhyan (Meditation), Samadhi (Salvation) Hatha Yoga, the most popular tradition of yoga was developed during 600 to 1500 AD. Hatha Yoga focuses on strengthening and purification of body – mind. Harmony of body and mind is the main objective and is achieved by practice of asanas, cleansing, pranayama, mudras, bandhas. Hatha yoga was founded by Sage Matsyendranath and Gorakhnath. This form of yoga was more practical and helped everyone improve their health. The hatha yoga cleansing processes have been placed into six groups of purification practices known as shatkarmas, 'Shat' meaning six and 'karma' meaning action. They are described in the ancient texts of the Hatha Yoga Pradipika and Gherand Samhita. The six shatkarmas are neti, cleansing of the nasal passages, dhouti, cleansing of the alimentary canal, nauli, strengthening of the abdominal organs, basti, cleansing of the large intestine, kapalbhati, cleansing of the frontal area of the brain and tratak, intense gazing of a point developing concentration and cleansing the mind. A variety of practices come under these categories. We will look at the following cleansing practices that can be helpful for many problems.

Trataka is a Hatha Yoga method to develop concentration. The literal meaning of the Sanskrit word trataka is "to gaze steadily." Looking intently with an unwavering gaze at a small point or candle flame until tears are shed is known as trataka (Hatha Yoga Pradipika, Ch: 2, V: 31). Hatha Yoga Pradipika mentions that, practice of trataka eradicates all the eye diseases, fatigue and lethargy (Hatha Yoga Pradipika, Ch: 2, V: 32). Though trataka is considered as cleansing technique, the final stage of trataka leads to meditative mental state. There are many types of Trataka. Practitioners use many different objects but most commonly followed technique is gazing on a candle flame.

Heart rate variability (HRV) is the physiological phenomenon of variation in the time interval between heartbeats. It is measured by the variation in the beat-to-beat interval. Other terms used include: "cycle length variability", "RR variability" (where R is a point corresponding to the peak of the QRS complex of the ECG wave; and RR is the interval between successive Rs), and "heart period variability". The starting point for any study of RR intervals, heart rate, or HRV is usually an electrocardiogram (ECG). Electrocardiography (ECG) is the process of recording the electrical activity of the heart over a period of time using electrodes placed on the skin. These electrodes detect the tiny electrical changes on the skin that arise from the heart muscle's electrophysiologic pattern of depolarizing and repolarizing during each heartbeat. It is a very commonly performed cardiology test. A normal resting heart rate for adults ranges from 60 to 100 beats a minutes. Generally, a lower heart rate at rest implies more efficient heart functions and better cardiovascular fitness. For example, a well trained athlete might have a normal resting heart rate closer to 40 beats a minutes. The present study has been concluded ECG test and compares heart rate between University level male and female students by the acute effect of trataka practice.

Purpose of the study

Purpose of the present study was to compare the heart rate between university level male and female students by acute effect of trataka programmed on the basis of pre and post ECG test.

Methodology

For the present study total 08 university levels students (04 male groups and another 04 female groups) were purposively selected from Dept. of Physical Education, Vinaya-Bhavana, Visva-Bharati University, Santiniketan, Bolpur, West Bengal, India. Their age ranges from 18-22 years. The study was conducted during the year 2017-20118 academic sessions in the institute laboratory. To measured heart rate of the heart, ECG test was used for the study. There were also the experts who helped to conduct the test. Before recording the parameter, the subject was asked to relax physically and mentally for few minutes. ECG was recorded by an ECG machine (BPL 108T-DIGI Single Channel, 12 leads ECG Machine) using standard chest and limb leads and heart rate was calculate from R wave to R wave interval of II lead of ECG graph. Each ECG graph was reported by trained physician. For the collection of data pre and post test was taken. The selected subject underwent an acute effect of 15 minutes trataka programmed at evening sessions, under the instruction and supervision of the supervisor and with the help of others experts. ANCOVA was applied to calculate the collected data at 0.05 level of significance and to identify the significance differences on experimental groups the mean critical difference was used as a post- hoc test.

Table 1: Trataka practice (15 minutes)

Particulars	Duration
Sabasana	3
Trataka	2
Sabasana	2
Trataka	2
Sabasana	2
Trataka	2
Sabasana	2

Pictorial of Trataka practice & ecg test

Fig 1

Fig 2

Fig 3

Fig 4

Findings

Table 2: Analysis of co-variance of the mean of heart rate between male and female groups

Mean	Male Groups	Female Groups	Sources of Variances	SS	Df	MSS	F-ratio
Pre- test	51.5	68.5	Among	578	1	578	10.703
			Within	324	6	54	
Post-test	51.75	65.5	Among	378.125	1	378.125	14.566
			Within	155.75	6	25.958	
Adjusted Post-test	51.348	62.083	Among	34.229	1	34.229	1.658
			Within	103.19	5	20.638	

Significant at 0.05 level of confidence

Tab- $F_{0.05}$ (1, 6) = 5.99, $F_{0.05}$ (1, 5) = 6.61

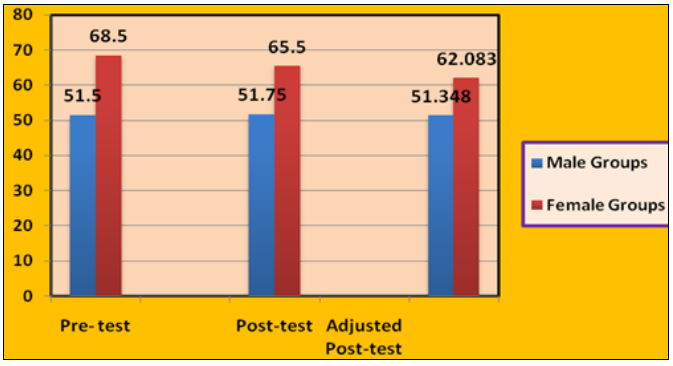

Fig 5: Mean of heart rate between male and female groups.

Discussion

The table clearly revealed that the table value was greater than calculated value (Tab- $F_{0.05}$ = 6.61 > calculated value 1.658) so there was no significant difference on heart rate between male and female groups by the acute effect of trataka practice. But the trataka practice was more affected on heart rate of female groups. The significant reduction in the heart rate occurs in the subjects practicing yoga (Devasena and Pandurang Narhare -2011) [1]. The another study also revealed that yoga therapy in addition to standard medical therapy reduces blood pressure, load on heart and improves parasympathetic activity in heart failure patients (Bandi Hari Krishna *et al* -2014) [2]. Other study also revealed that Different strategies for identifying potential outliers are associated with significant differences in HRV parameters (Kathi J Kemper-2007) [3]. The study also analysis of HRV mainly reflects parasympathetic outflow and frequency domain analysis reflects overall autonomic balance and is the most widely used tool to investigate HRV and involves decomposition of sequential RR Intervals into sinusoidal components of different amplitude and frequency. And Results of this study suggest that there might be a parasympathetic withdrawal during the practice of Bhramari that revert back to normal after the practice (L Nivethitha, NK Manjunath, and A Mooventhan - 2017) [4].

Conclusion

This study was concluded that there was no significant difference on heart rate between University level male and female students by the acute effect of trataka practice. But the trataka practice was more affected on heart rate of the female students.

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