

## **CARDIOVASCULAR & VENTILATORY RESPONSE DURING VIRASANA**

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### **ABSTRACT**

Ventilatory and Cardiovascular responses to Yogic standing posture are studied in 50 healthy Nursing Female Students. The results of various responses in chair setting are during Virasana are observed. Virasana Postures are characterized by increase in MVV, TV and Heart rate. This suggest temporary hyper metabolic state characterized by increase in sympathetic activity, increased respiratory function which gets stimulated by chair sitting posture.

**Keywords:** *Virasana, Chair Sitting Posture, Hyper Metabolic, Ventilatory Response*

### **INTRODUCTION**

Energy spent by body in particular activity measured by amount of O<sub>2</sub> consumed by body/ min by measuring rate of Respiration, heart rate, minute ventilation, blood pressure temperature of body.

The higher rate in these parameters indicates increased expenditure. Various studies on different types of physiological, Biochemical responses to Yogic Postural exercise and some even including postures in terms of CO<sub>2</sub> elimination and O<sub>2</sub> consumption, MVV have been reported.

In this present study it is to determine the effect of important Yogic Semi standing posture, Virasana on Respiratory System, Cardiovascular System Ventilatory responses are designed.

Lakshmi *et al.*, (2001) reveals that yoga practices reduces anxiety and depression and improve well being. The aim of their study is to examine the safety and feasibility of conducting a week long free yoga camp and also assess its impact on the negative and positive effect in normal healthy volunteers. Three hundred and twelve sets of pre-post data are analyzed. Their study suggests that yoga practices can reduces the negative affect and increase the positive affect within one week.

Shirdey *et al.*, (2013) assessed the effects of yoga or physical exercise on physical fitness, cognitive performance, self-esteem and teacher – rated behavior and performance, in school children. Their results suggest that yoga and physical exercise are useful additions to the school routine, with physical exercise improving social self –esteem.

Naveen *et al.*, (1997) suggested that Uninostri breathing facilitates the performance on spatial and verbal cognitive tasks, said to be right and left brain functions, respectively since hemispheric memory functions are also known to be lateralized, the present study assessed the effects of uninostri breathing on the performance in verbal and spatial memory tests. School children (N=108 whose ages ranged from 10 to 17 years) are randomly assigned to four groups. Each group practiced a specific yoga breathing technique: (i) right nostril breathing, (ii) left nostril breathing, (iii) alternate nostril breathing, or (iv) breath awareness without manipulation of nostrils. These techniques are practiced for 10 days. Verbal and spatial memory was assessed initially and after 10 days. An age matched control group of 27 are similarly assessed. All 4 trained groups showed a significant increase in spatial test scores at retest, but the control group showed no change. Average increase in spatial memory scores for the trained groups was 84%. It appears yoga breathing increases spatial rather than verbal scores, without a lateralized effect.

Shirley *et al.*, (2006) assessed the performance in a mirror star tracing task was in two groups of volunteers (yoga and control) with 26 people in each group, and age range between 18 and 45 years. The star to be traced was six pointed and the outline was made up of 60 circles (4 mm in diameter). At the end of one month the yoga group showed a significant improvement in terms of an increase in the number of circles crossed ( $P<0.001$ , Wilcoxon paired signed ranks test) for both hands and a decrease in the number of circles left out for the right hand ( $P<0.05$ ). The control group showed a significant increase in number

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of circles crossed for the left hand alone ( $P<0.05$ ) at the end of a month attributed to re-test. The study suggests that one month of yoga improved reversal ability, eye-hand co-ordination, speed and accuracy which are necessary for mirror star tracing.

Lazar *et al.*, (2000) reveals that meditation is a conscious mental process that induces a set of integrated physiologic changes termed the relaxation response. Functional magnetic resonance imaging (fMRI) was used to identify and characterize the brain regions that are active during a simple form of meditation. Significant ( $p<10^{-7}$ ) signal increases are observed in the group – averaged data in the dorsolateral prefrontal and parietal cortices, hippocampus / parahippocampus, temporal lobe, pregenual anterior cingulate cortex, striatum, and pre-and post-central gyri during meditation. Global fMRI signal decreases are also noted, although these are probably secondary to cardio respiratory changes that often accompany meditation. The results indicate that the practice of meditation activates neural structures involved in attention and control of the autonomic nervous system.

### MATERIALS AND METHODS

Subjects are 50 healthy Female Nursing Students between 18-25 years of age with mean weight 49-52, height of 149.3 they are having some practice of VIRASANA. The Experiment was carried in morning on empty stomach for 20 min. Various ventilatory responses are recorded by Minjahardy Oxycons connected to computer the cardio ventilator responses of MVV, TV, Heart rate are recorded, photo electric transducer was attached to ear for heart rate.

The Posture of sitting relaxed in chair and was served as control to semi standing posture Virasana. During performance of Virasana readings are taken after period of 20 min had elapsed after assuring particular posture. This period was considered to be sufficient for circulatory, metabolic adjustment to develop steady state in subjects.

The study is based on self control system where initiated preposture observation obtained during relaxed chair setting and Virasana.

Stand on the ground with left leg stretched backwards and the right knee bend. The fist of hands was clenched, with thumb tucked inside them. The right arm was stretched forward in front of chest and left arm bent back. The trunk was stretched backwards with full strength and leg was kept straight. Eyes are kept open without blinking.

The asana was performed again by reversing position of lower limbs by keeping left foot forward and right foot backward.

### RESULTS AND DISCUSSION

Out of 50 subjects, 25 subjects manifested increased cardio respiratory responses.

Cardio Ventilatory responses to Yogic Semi Standing Posture of Virasana compared to chair sitting posture are observed.

Yogic posture of Virasana was characterized by greater MVV, increased TV, and increased Heart Rate. Similar changes in Ventilator responses but of less magnitude are observed in comfortable posture of setting relaxed in chair posture.

Each mean value shows in the column of chair sitting and Virasana are table for period of 5 min after elapsing 10 min of assuming particular posture.

**Table I: Variation of breathing frequency in chair sitting position**

MVV (L/Min)	CS	Asana
Mean	8.6	18.67
SD	1.50	6.66
P	<0.01	<0.005

**Table II: <5 Variation of breathing frequency in chair sitting**

MVV	CS	V
Mean	4.9	12.75
SD	2.66	6.64
P	N Segnify	<0.05

**Table III: Mean value of tide volume (TV) in chair sitting position**

TV	CS	V
Mean	0.54	0.83
SD	0.07	0.25
P	<0.025	<0.01

From the result of Ventilatory responses studied during the 2 postures, The Physiological Parameters increased significantly is MVV in Virasana Posture. It was higher in Virasana Compare to in Chair sitting Posture.

The result of O<sub>2</sub> consumption and increased CO<sub>2</sub> elimination during Virasana indicate that through Virasana is a static posture appear to moderate Exercise in comparison to chair sitting Posture.

As regards to frequency to breathing & MVV, it may be said that Yoga Proficient subjects increases respiratory sufficiency, TV, Virasana above findings increased VE, increased metabolic Rate.

The above observation suggests that Virasana is a moderate Postural Exercise have application value in low cardio ventilatory reserve in patients where heavy exercise contradicted.

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