

## Effect of Sudarshan Kriya (SDK) On Heart Rate, Blood Pressure & Peak Expiratory Flow Rate

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**Abstracts: Background:** Sudarshankriya(SDK) is a powerful rhythmic breathing technique that is said to work on mental, physical, and spiritual level. It is found to be effective in improving well-being and peace of mind. **Aims & objectives:** The purpose of this study was to assess the effects of Sudarshankriya on heart rate (HR), systolic blood pressure (SBP), and peak expiratory flow rate (PEFR). **Method:** The study and control Group consisted of 50 subjects of each. Group (A) included 50 subjects who performed SDK for 3 months while Group (B) consisted 50 subjects who had not performed SDK or other yogic kriya for 3 months. Resting data were obtained from all the subjects. Then, resting heart rate (HR) was taken for 1 min, blood pressure was then measured at the 15-min interval and averaged using a Mercury Sphygmomanometer by the auscultatory method and PEFR was measured with a standard Peak Expiratory Flow Meter and MVV was measured by digital spirometer before & after SDK & Shavasana session in both groups. **Result:** Results show significantly decrease heart rate & systolic blood pressure & increased peak expiratory flow rate in study group. **Conclusion:** This study showed that short-term SDK significantly improves the cardio respiratory system at rest. Hence, it seems clear that by decreasing HR and SBP by way of breathing meditation, the work of the heart (i.e., myocardial oxygen consumption, MVO<sub>2</sub>) is decreased as well. [Parmar J NJIRM 2014; 5(6):31-33]

**Key Words:** Sudarshankriya; heart rate; blood pressure; peak expiratory flow rate

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**Introduction:** Sudarshankriya(SDK) is a powerful rhythmic breathing technique that is said to work on mental, physical, and spiritual level<sup>1</sup>. This breathing technique was founded in 1982 by Sri Sri Ravi Shankar. It is found to be effective in improving well being (support immune system, detoxification, reduce stress) and peace of mind (reduce stress, relieve depression, improve creativity, enhance brain function<sup>2</sup>). Hence, the current study was undertaken to assess the effects of SDK on heart rate (HR), systolic blood pressure (SBP) and peak expiratory flow rate (PEFR). The purpose of this study was to assess the effects of SDK (Ujjaiyi, Bhastrika, OM chanting, 3 cycles of deep, normal, rapid breathing & meditation) on heart rate (HR), systolic blood pressure (SBP), and peak expiratory flow rate (PEFR).

**Material and Methods:** The present study was undertaken at ShrishriRavishankar vidhyamandir, shivranjani, Ahmadabad during yes! + Course, which has been organised by Art of living body. Study group included 50 subjects who performed SDK for 3 months. Control group included same number of subjects who had not performed sudarshan kriya or any other yogic breathing techniques before this study.

### Inclusion Criteria:

- (1) Comparable age, height & weight for both groups.
- (2) For group (A): performed SDK since 3 months
- (3) For group (B): not performed SDK or other physical activities on regular basis.
- (4) Non-smokers & non-alcoholic
- (5) Similar dietary habit (pure vegetarian)
- (6) No any drug addiction
- (7) No any cardiac & respiratory problems.

### Exclusion Criteria:

- (1) For group (A): Performed SDK since less than 3 months
- (2) For group (B): Performed SDK or other physical activities on regular basis.
- (3) Smokers & alcoholic.
- (4) Non-vegetarian
- (5) Drug addiction
- (6) Any cardiac & respiratory problems.
- (7) Orthopaedic injury.

Initially, the subjects performed a 30-min resting period during which they were seated comfortably to complete a general physical examination and subject history forms. Resting data were obtained from all the subjects. This included: (1) name, age, sex, height, and weight of the subject; (2) asking

the subject to relax in the sitting position for 5 min. Then, resting heart rate (HR) was taken for 1 min; (3) blood pressure was then measured at the 15-min interval and averaged using a Mercury Sphygmomanometer by the auscultatory method; and (4) peak expiratory flow rate (PEFR) was measured with a standard Peak Expiratory Flow Meter.

After recording of the cardio respiratory responses, the subjects were given instructions for carrying out the SDK under expert guidance. SDK used in particular were Ujjayi followed by bhastrika in VAJRASHAN position followed by OM chanting 3 times followed by 3 cycle of deep, normal & rapid breathing in SUKHASHAN. 1 hour session included Ujjayi technique lasted for 30 min and consisted of 7 breaths for each posture, three different postures were used including both hands being placed on the sides, on the armpits as well as on the back. This was followed by 3 cycles of bhastrika which consisted of 8 breaths per cycle. This was followed by OM chanting 3 times in sukhasan position & finally 3 cycles of deep, normal & rapid breathing 20, 40 & 40 breaths respectively & meditation. Control group was told to allow the free flow of thoughts in their mind during the parallel 1 hr SDK session. After the completion of the SDK, the same cardio respiratory responses were measured and recorded.

**Statistics**

Analysis of the physical characteristics and cardio respiratory responses were carried out by graph pad software. Standard deviation (SD) and mean value calculated before and after Sudarshan Kriya in study group as well as in control group. Physical characteristics and differences in mean values for resting HR, SBP, DBP and PEFR for the study population were subjected to the paired-t test. A P-value of <0.05 was considered significant.

**Result:** Table no.1 shows Physical characteristics of the subjects in each group. There is no any significant difference in age, height & weight in both groups.

**Table 1: Physical Characteristic of the Subjects In Each Group**

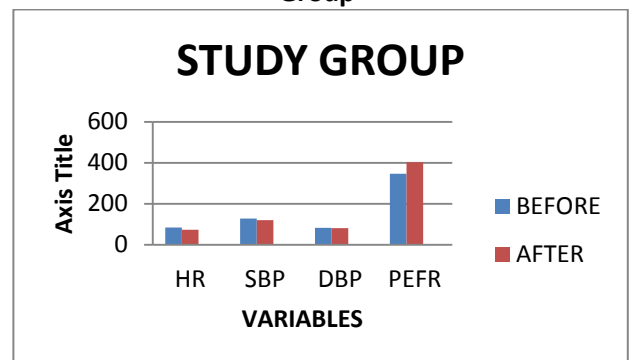
Physical characteristics	Study Group (Mean ± SD) N = 50 (26males 24 females)	Control Group (Mean ± SD) N = 50 (24 males 26 females)
Age (Yr)	26 ± 8.0	27 ± 6.6
Height(cm)	162.2 ± 6.6	162.2 ± 6.6
Weight(kg)	67.1 ± 14.6	66.3 ± 13.3

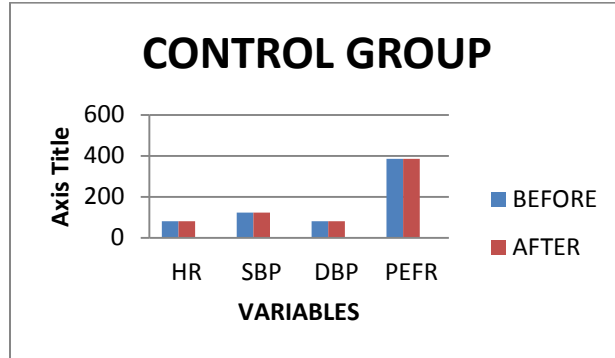
Table – 2 shows, (HR = heart rate; SBP = systolic blood pressure; DBP = diastolic blood pressure; PEFR = peak expiratory flow rate. \*Significant (P = 0.0001) between before and after in the Study Group. No significant differences between before and after in the Control Group)

**Table 2: The hemodynamic responses of the subjects in each group (Values are mean ±SD)**

Variables	Study Group (Mean ± SD)		Control Group (Mean ± SD)	
	Before	After	Before	After
HR(bpm)*	83.6 ± 11.1	72.4 ± 11.4	80.4 ± 8.9	80.3 ± 8.6
SBP(mmHg)*	127.7 ± 9.2	119.1 ± 8.8	123.3 ± 5.9	123.4 ± 6.1
DBP(mmHg)	81.9 ± 8.8	80.0 ± 7.1	81.1 ± 7.9	80.9 ± 7.3
PEFR(L/min) *	346.8 ± 113.5	402.8 ± 105.2	384.6 ± 111.7	385.8 ± 111.7

**Graph 1: Effect Hemodynamic Response in Study Group**



**Graph 2: Effect Hemodynamic Response in Control Group**

**Discussion:** Table no-1 shows Physical characteristics of the subjects in each group. There is no any significant difference in age, height & weight in both groups. Table no-2 shows that when compared to the Control Group, the Study Group showed that the mean values for HR, SBP, and DBP were significantly decreased while PEFR was significantly increased. It is reasonable to conclude that the decrease in HR after the practice of SDK is directly related to an increase in vagal tone and a corresponding decrease in sympathetic activity<sup>3</sup>. Also, the decrease in sympathetic activity leads to a decrease in the secretion of catecholamine which allows for vasodilatation and hence improves peripheral circulation in the body<sup>4</sup>.

SDK decreases  $O_2$  consumption, which will decrease HR in study group. Decrease HR will decrease work of heart which will ultimately decreases SBP. Practice of SDK alters hypothalamic discharges, resulting in a decrease in sympathetic tone and peripheral resistance<sup>3</sup>; both physiological responses lead to decrease DBP. SDK also provides strength to respiratory muscles, thus increasing the excursions of the diaphragm and lungs along with increased thoracic compliance. Apart from this, SDK decreases airway resistance. All these factors may contribute to the increase in PEFR as was observed in the Study Group.

**Conclusion:** This study showed that short-term SDK significantly improves the cardio respiratory system at rest.

**Limitation of This Study and Future Research:** Larger Sample size would be more conclusive. Study of other confounding factors like effect of

other asana & pranayam on hemodynamic parameters will helpful. Furthermore effect of sudarshankriya on mental wellbeing is also broad area of research.

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