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## Effect of “Sudarshan Kriya” on serum cortisol level before terminal examination in undergraduate medical students

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### Abstract

Sudarshan Kriya is a yogic exercise to maintain healthy and stressful life. It plays important role in increasing peaceful and well-maintained healthy life. We examined the effect of Sudarshan Kriya on cortisol level to compare level of stress in study and control group.

62 volunteers (40 male, 22 female) subjected to yogic exercise for six consecutive month from January to June 2016. They were instructed to perform Sudarshan Kriya.

They were performing yogic exercise at Moti Lal Nehru medical college campus at 6 a.m in the morning for 30 minutes. Parameters such as Pulse rate, blood pressure, respiratory rate were measured along with cortisol level at predetermined intervals. Data analysis shows that level of cortisol is lower ( $14.47 \pm 2.95$ ) in study group than control group ( $23.95 \pm 2.95$ ) in morning sample before terminal examination. So Sudarshan Kriya is stress realising exercise reduce stress in study group

**Keywords:** Sudarshan Kriya, serum cortisol level, stress

### Introduction

Yogic exercise, an essential part of improving a happy <sup>[1]</sup> and healthy lifestyle <sup>[2, 3]</sup>, is associated with changes in cardio-respiratory parameters and decreases psychological stress <sup>[4]</sup> as well as decrease chances of breast cancer <sup>[5]</sup> and working memory <sup>[6]</sup>. Yogic breathing <sup>[7]</sup> is a well known relaxation technique from times immemorial. Sudarshan Kriya is a complex phenomenon, involving psychological, neurological and cardio-respiratory changes. Recent studies emphasize the value of Sudarshan Kriya in lowering stress. Yogic exercise acts through the immune neuroendocrine axis and affects cellular process of body and immune functions. stress is also linked to habit of tobacco consumption and substance abuse. Sudarshan Kriya are known to reduce stress and improve immune <sup>[8]</sup> as well as biochemical and physiological function <sup>[9]</sup>. Recent studies emphasize the role of yogic exercise in lowering stress, blood lymphocyte profile <sup>[10]</sup> and in improving the work performance. Use of Sudarshan Kriya is gaining increased importance among athletes and exercisers to augment athletic performance <sup>[11]</sup>.

Yogic exercise can have significant effect on these parameters. Past research has suggested that Sudarshan Kriya and yogic breathing reduces anxiety <sup>[12, 13, 14]</sup>, stress, depression and improves memory as well as immunological power, work performance and cardiac autonomic function <sup>[15]</sup>

### Material and Methods

The study was conducted in the campus of Moti Lal Nehru Medical College, Allahabad over a period of six month (January 2016 to June 2016). Serum cortisol was recorded in 62 male and female of study group as well as 40 control group of first year medical students who satisfy the inclusion criteria during the study period.

- Age in years.
- Body weight in kg
- Height in metre
- Body mass index kg/m<sup>2</sup>

The subjects have been explained about the procedure of the yogic exercise, a prior trial was given for them for acquaintance with Sudarshan Kriya.

**Yogic Exercise:** Yogic exercise occur in three steps.

**Ujaji Pranayam:** A long and deep breathing technique, in which you have to inhale deeply, hold your breath, exhale completely and wait for few seconds before you can repeat the cycle.

**Bhastrika Pranayama:** The practice of forced inhalation and exhalation for around 2 to 3 minutes.

**Cyclical breathing:** Slow, medium-paced fast cycles of rhythmic breathing with respect to word SOHUM. The Sudarshan Kriya should be followed up by the yoga nidra or deep relaxation technique for around 15 minutes or so. Yogic exercise yielded many results. But serum cortisol level is the one of the important parameter to measure stress. Serum cortisol level is measured in the study group as well as in the control group both male and female undergraduate students who fulfilled the inclusion criteria Student ‘t’ test was applied for Statistical analysis.

**Observation and Results:** A total of 62 sufficient students were recruited. The age of students ranged from 18-27 yrs with mean (± SD) 20.77 ± 2.19 yrs and median 20 yrs.

Among students, 42 (67.7%) were males and 20 (32.3%) were females. Further, the weight, height and BMI of students ranged from 42-87 kg, 144-185 cm and 16.41-29.41 kg/m<sup>2</sup> respectively with mean (± SD) 59.32 ± 8.42 kg, 164.74 ± 8.83 cm and 21.90 ± 2.98 kg/m<sup>2</sup> respectively (Table-1). The value of serum cortisol level was found significant ( $p < 0.001$ ) in study group than control group (Table-2).

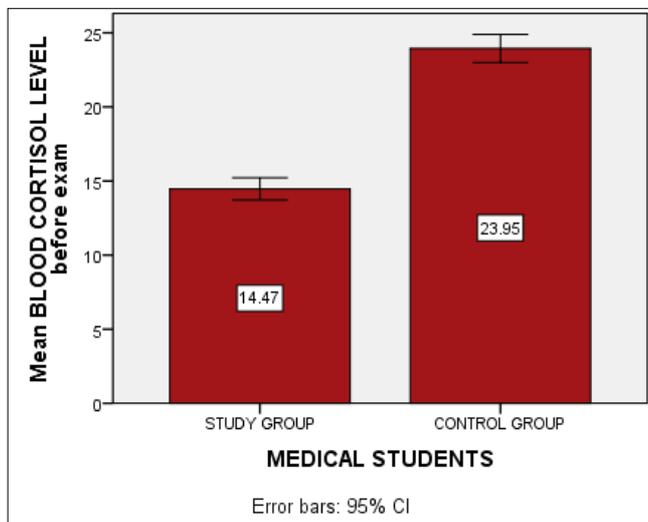
**Table 1:** Demographic profile of study and control group.

Demographic characteristics(study)	Mean± SD (n=62)
Age	20.77 ± 2.19
Sex	M=42,F=20
Height	164.74 ± 8.83
Weight	59.32 ± 8.42
BMI	21.90 ± 2.98
Demographic characteristics(control)	Mean± SD (n=40)
Age	20.17 ± 2.10
Sex	M=24,F=16
Height	163.98 ± 8.80
Weight	59.92 ± 8.50
BMI	22.10 ± 2.80

**Table 2:** Blood cortisol level of study and control groups

	Medical students	n	Mean	Standard. deviation	p≤0.05
Blood Cortisol level Before Exam	Study group	62	14.47	2.957	
	Control group	40	23.95	2.952	.0001

\* Sig diff



**Discussion**

The present study was planned to explore, the effect of Sudarshan Kriya on stress. The Sudarshan Kriya influences blood cortisol level and pulse rate and Rate of respiration. The main findings of our study was that Sudarshan Kriya decreases blood cortisol. Sudarshan Kriya reduces sympathetic nervous control and therefore reduces heart rate and respiration rates<sup>2</sup>, metabolism, oxygen consumption, and tension. It diminishes mental and muscular tension thereby lowering sympathetic stimulation. Additionally, plasma catecholamine is also lowered.<sup>14</sup> Sudarshan Kriya decreases plasma norepinephrine level.

**Conclusion**

The present study supports the view that cortisol level decreases in study group performing regular Sudarshan

Kriya. Hence Sudarshan Kriya reduces stress by reducing blood cortisol level.

**Limitations**

Present study is limited to a small bout of exercise and is conducted on healthy volunteers. Further studies have to be conducted with larger sample size; on patients during the hospital stay; prior, during and following surgical procedures.

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