

Effect of Sudarshan Kriya Yoga on Bio-Physiological Parameters among Healthy Individuals- A Randomized Control Trial

Dr. Pramod Kumar Narnolia¹, Dr. Mamta Mehra^{2*}, Dr. Bijendra Kumar Binawara³, Dr. Om Prakash Yadav⁴

¹Assistant Professor, Department of Physiology, SP Medical College, Bikaner Rajasthan, India

²Assistant Professor, IHTM Department, SP Medical College, Bikaner Rajasthan, India

³Professor, Department of Physiology, SP Medical College, Bikaner Rajasthan, India

⁴Research Scientist (Medical), Department Of Microbiology, SP Medical College, Bikaner Rajasthan, India

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*Corresponding author: Dr. Mamta Mehra

Email: drmamta712@gmail.com

Abstract

Original Research Article

Improving and maintaining quality of life for a healthy individual is a critical need in the modern lifestyle. Sudarshan Kriya Yoga (SKY) is a home-based and long term strategy which is scientifically acknowledged for its positive health impact. A randomized controlled trial among two hundred healthy subjects was conducted to assess the effect of SKY on bio-physiological parameters. One hundred subjects who practice SKY were included in the study group while another hundred non-practitioners of SKY were put in the control group. Before the start of the study Systolic blood pressure, Diastolic blood pressure, Pulse rate and Lipid profile was recorded as baseline parameters and follow up was done after three months. A highly significant difference was observed between the mean values of systolic & diastolic blood pressure, pulse rate, triglyceride and high density lipoprotein (HDL) cholesterol ($p < 0.001$). The hypocholesterimic action of SKY can be a key to success in the prevention of derangement of lipid profile and blood pressure which are major risk factors for many cardiac diseases.

Keywords: Sudarshan Kriya Yoga, Lipid Profile, Serum cholesterol, Triglycerides, Very Low density lipoprotein cholesterol, Low-density lipoprotein cholesterol, High density lipoprotein cholesterol.

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INTRODUCTION

'Yoga' word is originated from the root of Sanskrit language 'Yuj' which means binding to and joining to. Yoga integrates body, breath, and mind. It includes postures (asanas), controlled breathing (pranayama), concentrating the thoughts (meditation) and recitation of phrases called mantras. It improves health, happiness and overall quality of life [1]. The goal of yoga is also to achieve physical and mental well being [2]. Sri Sri Ravi Shankar, the founder of Art of Living Foundation designed the Sudarshan Kriya Yoga (SKY). It works based on rhythmic breathing exercise called Sudarshan Kriya (SK), and pranayama [3]. Sudarshan Kriya word is originated from Sanskrit language, Su = right, Darshan = vision, and Kriya mean purifying action [4].

There are many diseases like hypertension, angina, and coronary heart disease, directly related to stress. Prevalence of such diseases is increasing in developing countries like India. There are many studies conducted in India and abroad showing beneficial

results of yoga on the nervous system, endocrine system, cardiac & respiratory system [1,5-6].

Some researcher reported the reduction in serum cholesterol, Low-density lipoprotein (LDL) Cholesterol and increase antioxidant levels due to SKY [7-8]. As per the literature search, there is very limited data available about the effect of yoga on health, particularly regarding the effect of SKY on lipid profile. Therefore the present study was undertaken to assess the effect of SKY on lipid profile among healthy individuals.

MATERIALS AND METHODS

A randomized controlled trial among two hundred healthy subjects was conducted to assess the effect of SKY on bio-physiological parameters. A hundred subjects who practice SKY were included in the study group while a hundred non-practitioners of SKY were put in the control group. Subjects suffering from diabetes, cardiovascular illness or any infection and those who are having addictions of tobacco,

smoking or alcohol were excluded from the study. Subjects of the study group used to do SKY one hour daily for at least five days a week. All the participants of the study group were trained for SKY from the art of living centre at Bikaner by a trained teacher. Before the start of the study, Lipid profile of subjects in both the groups was recorded as baseline parameter. Follow up data was recorded after completion of three months.

The study protocol was approved by the ethical committee of Sardar Patel Medical College, Bikaner. Parameters for the present study were serum total cholesterol (TC), triglycerides (TG), Low-density lipoprotein (LDL) cholesterol, Very low density lipoprotein (VLDL) cholesterol, HDL cholesterol. For estimation of these, 2 ml blood was collected from every individual from both the groups. Collection of blood samples was done after overnight fasting. The results were presented as mean ± S.D. All the results

were statistically analyzed by using 'unpaired t' test. P-value less than or equal to 0.05 was considered as statistically significant.

RESULTS

In the present study, the baseline parameters, systolic and diastolic blood pressure, pulse rate, and lipid profile (TC, TG, HDL, LDL and VLDL) were compared between both groups. A non-significant association was observed in systolic and diastolic blood pressure and pulse rate between both the groups. (Table 1)

Table 2 represents the comparison of different parameters after 3 months between both the groups. A highly significant difference was observed between the mean values of systolic & diastolic blood pressure, pulse rate, TC and HDL (p<0.001).

Table-1: Bio-physiological parameters at pre-intervention in the Study and Control Groups

Parameters			Study Group (N=100)		Control Group (N=100)		t	p
			Mean	SD	Mean	SD		
Blood Pressure (mmHg)	Systolic		135.52	8.16	136.32	8.84	0.512	0.674 [#]
	Diastolic		91.54	5.96	91.24	7.64	0.963	0.412 [#]
Pulse/min			86	6.42	88.92	6.3	0.324	0.685 [#]
Lipid Profile (mg/dl)	TC		221.96	37.51	212.14	37.96	1.24	0.211 [#]
	TG		146.13	27.84	151.92	42.01	0.496	0.618 [#]
	HDL		41.12	5.14	38.11	4.11	1.684	0.088 [#]
	LDL		154.96	44.01	143.14	38.42	1.594	0.128 [#]
	VLDL		29.96	5.54	31.11	8.21	0.504	0.593 [#]

[#]Non-significant (p>0.05)

Table-2: Bio-physiological parameters at Post-intervention in the Study and Control Groups

Parameters			Study Group (N=100)		Control Group (N=100)		t	p
			Mean	SD	Mean	SD		
Blood Pressure (mmHg)	Systolic		130.14	6.12	137.14	8.81	3.25	<0.001 [*]
	Diastolic		85.25	3.58	87.36	6.25	2.145	0.025 [*]
Pulse/min			71.25	3.58	87.25	5.14	17.36	<0.001 [*]
Lipid Profile (mg/dl)	TC		191.89	30.98	209.52	35.24	2.301	0.014 [*]
	TG		141.36	30.25	154.39	38.54	1.245	0.214 [#]
	HDL		51.01	5.03	37.25	3.24	14.123	<0.001 [*]
	LDL		126.58	35.96	140.25	34.25	1.784	0.116 [#]
	VLDL		27.15	6.24	31.84	7.86	1.451	0.141 [#]

^{*}Significant (p<0.05), [#]Non-significant (p>0.05)

DISCUSSION

In the present study, significant reduction was observed in pulse rate, systolic blood pressure and diastolic blood pressure reflecting stimulation in baroreflex sensitivity due to yoga activity [3]. A study showed the effect of SKY after two months, there was a significant reduction in diastolic blood pressure, serum urea and plasma MDA (Malondialdehyde adducts) as an oxidative stress marker. It is indicating that yogic breathing activity help in reducing oxidative stress as

well as enhance the status of antioxidant level and overall well being of health [9].

The present study reflects a highly significant change in serum HDL cholesterol level and significant change in the total cholesterol with comparison to controls. It is in the agreement with the study done by Shreechakradhar MU (2013) *et al.* [10] and Sayyed A. (2010) *et al.* [11] while it is contrary in the study done by Dayalan H (2012) *et al.* [12]. This might be due to the fact that yoga is a moderate aerobic type of

exercises and may positively influence the lipid profile [13]. Triglyceride represents a non-significant association between the groups. The finding of the present study is supported by Lorenzo A Gordon (2008) *et al.* [14] and Prasad K V V (2006) *et al.* [15]. On the other hand, the result was found dissimilar in the study conducted by Nisha Shantakumari (2013) *et al.* [16], Dayalan H (2012) *et al.* [12], V Malarvizhi (2015) *et al.* [17].

In the present study LDL cholesterol reflects a non-significant relationship between the groups which is in the line with the study conducted by Vyas R (2008) *et al.* [18] and Shete SU (2012) *et al.* [19] while study done by Shantakumari N (2013) *et al.* [16], Geeta H. (2002) *et al.* [7], J. Yogendra (2004) *et al.* [20] and Narnolia PK (2014) *et al.* [3]. A non-significant relationship was observed for VLDL cholesterol between the groups which is supported by a study done by Taneja D K (2014) [21] and Shete SU (2012) *et al.* [19]. On the contrary, there are some authors did research and observed that there was a significant effect of yoga on VLDL cholesterol between the study and control groups [13, 22-23]. Yogic exercise decreases Lipid peroxidation which results in lowering of MDA level in plasma. Therefore decrease in lipid peroxidation because of SKY provides definitive evidence that it reduces serum total cholesterol, TG, LDL, VLDL and increase HDL.

CONCLUSION

In the present study, yogic exercise has a positive effect on blood pressure, pulse rate and lipid profile. SKY decreases sympathetic activity and lipid peroxidation. It results in the reduction of stress and blood pressure. It is a very convenient practice and one can do it at home and it does not need costly equipment. There is a continuous rise in the burden of non-communicable diseases in developing countries like India. SKY is a useful exercise by which prevention of various lifestyle diseases can be done. The hypocholesterimic action of SKY can be a key to success in prevention of derangement of lipid profile and blood pressure which are major risk factors for many cardiac diseases.

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