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EFFECT OF SUDARSHAN KRIYA YOGA ON LIPID PROFILE

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ABSTRACT

Aims and Objectives: This study is undertaken to see whether practice of Sudarshan Kriya Yoga can help in reducing hyperlipidemia which is an independent risk factor of Coronary Heart Disease and also to see whether this simple Yogic technique can be used as preventive measure on large scale.

Material and Method: The present study was conducted at 'Art of Living centre' at Ambajogai and Parli Vaijanath, Maharashtra, India. 60 persons practicing Sudarshan Kriya Yoga and 60 controls were taken from three age groups. The Lipid profile was estimated of study as well as control group on a semi auto analyzer.

Results: Statistically significant decrease in serum total cholesterol, triglycerides, Low Density Lipoprotein-Cholesterol, Very Low Density Lipoprotein-Cholesterol, was observed and a significant increase in High Density Lipoprotein-Cholesterol was observed. These changes in lipid profile are probably due to reduced stress, decreased lipid peroxidation and decreased sympathetic activity due to Yoga.

Conclusion: In conclusion the hypocholestrimic action of Sudarshan Kriya Yoga practice can be useful in prevention of derangement of lipid profile and hypertension which are major risk factors for Coronary Heart Disease.

Keywords: Sudarshan Kriya Yoga – Sudarshan Kriya Yoga, Lipid profile, serum cholesterol, triglycerides Low Density Lipoprotein-Cholesterol, Very Low Density Lipoprotein-Cholesterol, HDL – C.

INTRODUCTION

The ultimate aim of medical science is attainment of optimum physical and mental health for the individual. The ultimate aim of yogic practices is also the same, viz physical and mental well being. The difference, however, lies in the methodologies and modalities to achieve those ends¹. Many scientific studies in India and abroad have focused on beneficial effects of Yoga on central nervous system, hormonal balance, cardiovascular system and respiratory system².

During recent years, a new Yoga practice has been introduced by His Holiness Shri. Shri

Ravishankarji, named Sudarshan Kriya Yoga. The word Sudarshan Kriya is translated from its original Sanskrit - Su = right, Darshan = vision and Kriya means purifying action³.

Modern man has become a victim of various kinds of stresses and stress related disorders like essential hypertension, angina and Coronary Heart Disease. Prevalence of these diseases is increasing in developing countries like India. A few scientists claimed that regular practice of Sudarshan Kriya Yoga lead to fall in serum cholesterol and LDL-Cholesterol and better antioxidant levels^{4,5}.

As scientific research work in Sudarshan Kriya Yoga in this regard is less, this study is undertaken to see whether practice of Sudarshan Kriya Yoga can help in reducing hyperlipidemia which is an independent risk factor of Coronary Heart Disease and also to see whether this simple Yogic technique can be used as preventive measure on large scale.

In present study lipid profile of normal adult was compared with that of regular practitioners of Sudarshan Kriya Yoga and analyzed for effect of Sudarshan Kriya Yoga on lipid profile.

MATERIAL AND METHODS

Selection of Subjects: The present study was conducted between regular practitioners of Sudarshan Kriya Yoga and non practitioners of Sudarshan Kriya Yoga. Estimation of lipid profile was carried out in 120 healthy male individuals. Out of them 60 were regular practitioners of Sudarshan Kriya Yoga (study group, n=60) and remaining 60 were non practitioners of Sudarshan Kriya Yoga (control group, n=60) with same age and socioeconomic status.

The Sudarshan Kriya Yoga practitioners and controls were divided according to age in following three groups.

Table 1: Distribution of cases and controls according to age

Groups	Age Groups (years)	No. of Cases	No. of controls
I	31-40	13	12
II	41-50	25	27
III	51-60	22	21

Daily practice of Sudarshan Kriya Yoga for 45 minutes for minimum six months was the selection criterion for inclusion in study group. Control group subjects were faculties and office workers of medical college. 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.

Study Protocol: The study was conducted at Art of Living Centres located at Ambajogai and Parli Vajjnath and S.R.T.R. Government Medical College, Ambajogai. The study protocol was approved by ethical committee of S.R.T.R. Government Medical College, Ambajogai. Parameters for the present study were serum cholesterol, triglycerides, LDL cholesterol, VLDL cholesterol, HDL cholesterol. For estimation of VLDL Cholesterol = TG/5

LDL Cholesterol = Total Cholesterol – (HDL Cholesterol +TG/5)

these serum lipids 2 ml of blood was collected from every individual in study group as well as control group.

Collection of sample: Collection of blood samples of study group as well as control group had done after overnight fasting. Serum cholesterol was estimated with Modified Roeschlau's method which is dynamic extended stability CHOD-POP method, end point with lipid clearing agent⁶. Serum triglycerides were estimated with dynamic extended stability with lipid clearing agent GPO – TRINDER method⁷. HDL Cholesterol was estimated by Phosphotungstic Acid method⁸. LDL – Cholesterol and VLDL Cholesterol were calculated as reported by Friedwald, Levy and Frederickson as follows:

Statistical Analysis: The results were presented as mean ± S.D. All the results were statistically analyzed by applying 'unpaired t' test. P value less than 0.001 is considered as statistically significant.

RESULTS**Table - 2: Comparison of Serum Cholesterol between Study Group and control belonging to different age groups.**

Groups	31-40 yrs		41-50 yrs		51-60 yrs	
	Group I		Group II		Group III	
	Control	Study Group.	Control	Study Group.	Control	Study Group.
No.	13	12	25	27	22	21
Mean	155.2	135.56	175.05	145.85	190.51	178.49
±SD	16.26	10.25	12.08	10.87	16.15	12.16
t-test	P < 0.001		P < 0.001		P < 0.05	
Significant	Significant		Significant		Significant	

Table - 3: Comparison of Triglycerides between Study Group and control belonging to different age groups.

Groups	31-40 yrs		41-50 yrs		51-60 yrs	
	Group I		Group II		Group III	
	Control	Study Group.	Control	Study Group.	Control	Study Group.
No.	13	12	25	27	22	21
Mean	71.38	57.06	95.28	81.47	140.89	117.06
±SD	10.53	13.63	12.54	11.56	14.13	19.09
t – test	P < 0.01		P < 0.001		P < 0.001	
Significance	Significant		Significant		Significant	

Table - 4: Comparison of LDL Cholesterol between Study Group and control belonging to different age groups.

Groups	31-40 yrs		41-50 yrs		51-60 yrs	
	Group I		Group II		Group III	
	Control	Study Group.	Control	Study Group.	Control	Study Group.
No.	13	12	25	27	22	21
Mean	99.13	81.5	112.45	77.83	123.08	106.55
±SD	13.52	12.67	10.11	12.88	17.65	16.21
t – test	P < 0.01		P < 0.001		P < 0.01	
Significance	Significant		Significant		Significant	

Table - 5: Comparison of VLDL Cholesterol between Study Group and control belonging to different age groups.

Groups	31-40 yrs		41-50 yrs		51-60 yrs	
	Group I		Group II		Group III	
	Control	Study Group.	Control	Study Group.	Control	Study Group.
No.	13	12	25	27	22	21
Mean	14.26	11.42	19.06	16.29	28.18	23.41
±SD	2.11	2.73	2.52	2.32	2.83	3.82
t – test	P < 0.01		P < 0.001		P < 0.001	
Significance	Significant		Significant		Significant	

Table - 6: Comparison of HDL Cholesterol between Study Group and control belonging to different age groups.

Groups	31-40 yrs		41-50 yrs		51-60 yrs	
	Group I		Group II		Group III	
	Control	Study Group.	Control	Study Group.	Control	Study Group.
No.	13	12	25	27	22	21
Mean	41.79	42.65	43.22	51.32	39.32	49.00
±SD	7.77	4.84	5.54	8.63	4.99	6.69
t – test	P > 0.05		P < 0.01		P < 0.001	
Significance	Not Significant		Significant		Significant	

Our study showed that serum cholesterol, triglycerides, LDL – Cholesterol, VLDL – Cholesterol was significantly lower in Sudarshan Kriya Yoga practitioners in all age groups as compared to non practitioners of Sudarshan Kriya Yoga (Table 2 to 5). Our study revealed that HDL – Cholesterol was significantly higher in Sudarshan Kriya Yoga practitioners in Group II & Group III as compared to non practitioners of Sudarshan Kriya Yoga but in Group I increase in HDL – cholesterol was not statistically significant (Table-6).

DISCUSSION

Serum Cholesterol

Our study shows highly significant decrease in serum total cholesterol level when compared with age, sex matched controls of all the three groups. A similar statistical significant decrease was reported by Geeta H. et al (2002)⁹ in Sudarshan Kriya Yoga practitioners. However similar decline in serum total cholesterol in different kinds of yoga practices are also reported by Udupa K.N. et al (1972)¹⁰, Santa Jaseph et al (1981)¹¹, D. Ornish et al (1990)¹², T. Schmidt (1997)¹³, S. C. Machanda et al (2000)¹⁴, Rashmi Vyas et al (2002)¹⁵, J. Yogendra (2004)¹⁶.

Triglycerides

In the present study, triglyceride showed significant decrease in all three groups. Similar findings were reported by S. C. Manchanda et al (2000)¹⁴ in Coronary Heart Disease patients after yoga life style intervention.

Low Density Lipoprotein-Cholesterol

In our study Low Density Lipoprotein-Cholesterol showed a highly significant decrease in all groups which correlates with the finding of Geeta H. et al (2002)⁹ in Sudarshan Kriya Yoga practitioners. A similar correlating findings are also reported by D. Ornish et al (1990)¹², T. Schmidt (1977)¹³, S. C. Machanda et al (2000)¹⁴, Rashmi Vyas et al (2002)¹⁵, J. Yogendra et al (2004)¹⁶.

Very Low Density Lipoprotein -Cholesterol

In the present study Very Low Density Lipoprotein-Cholesterol showed highly significant decrease in all groups, however we could not compare our data because so far no study in this regards is available.

High Density Lipoprotein-Cholesterol

Our study revealed significant increase in Group II & Group III. In Group I increase in High Density Lipoprotein-Cholesterol was not significant statistically.

A similar correlating finding was reported by Geeta H. et al (2002)⁹ in Sudarshan Kriya Yoga practitioners.

Similar significant increase in HDL - Cholesterol due to Kriya Yoga practice was also reported by **T. Schemidt (1997)**¹³.

However **D. Ornish (1990)**¹², **S.C. Manchanda et al (2000)**¹⁴, **Rashmi Vyas et al (2002)**¹⁵, reported that there was no significant change in level of serum HDL - Cholesterol.

A careful statistical analysis of observation and results in present study reveals a highly significant decrease in serum level of total cholesterol, triglycerides, LDL - Cholesterol, VLDL -

Cholesterol and increase in Serum High Density Lipoprotein-Cholesterol in all age groups when compared with age, sex matched controls.

These changes are due to:-

- 1) Reduction in stress
- 2) Reduction in sympathetic activity
- 3) Reduction in lipid peroxidation

1) Reduction in stress

Sudarshan Kriya Yoga produces calm and relaxation and decreases stress as proved by increased alpha activity in Sudarshan Kriya Yoga practitioners¹⁷. Various kinds of pranayama, meditation and shavasana are also known to reduce stress^{18, 19, 20, 21, 22}. Stress is known to increase the levels of serum total cholesterol, triglycerides, LDL - Cholesterol, VLDL - Cholesterol and decrease HDL-Cholesterol level by increasing levels of lipolytic hormones like cortisol, adrenaline, noradrenaline, growth hormone. These hormones mobilize lipid store of adipose tissue and liver to meet extra caloric requirement during stress^{23, 24}. Thus reduction in stress in Sudarshan Kriya Yoga practitioners, decreases levels of serum total cholesterol, triglycerides, LDL - Cholesterol, VLDL - Cholesterol and increase HDL-Cholesterol level.

2) Reduction in sympathetic activity

Stimulation of sympathetic innervations to fat releases norepinephrine which act via beta adrenergic receptors to increase lipolysis. Due to this there is increase in the levels of serum total cholesterol triglycerides, Low Density Lipoprotein-Cholesterol & Very Low Density Lipoprotein-Cholesterol^{25, 26, 27}. Yoga lifestyle result in decreased sympathetic activity and increased parasympathetic activity^{20, 21, 28, 29}. Therefore in Yoga lifestyle decreased sympathetic activity may result in decreased lipolysis and thus decreases the levels of serum total cholesterol, triglycerides Low Density Lipoprotein-Cholesterol, Very Low Density Lipoprotein-Cholesterol.

3) Reduction in lipid peroxidation

It is known that increased lipid peroxidation leads to increased total cholesterol, Low Density Lipoprotein-Cholesterol, Very Low Density Lipoprotein-Cholesterol & decreased High Density Lipoprotein-Cholesterol concentration³⁰. Sudarshan Kriya Yoga decreases lipid peroxidation as evidenced by improved status of antioxidants e.g. SOD (Superoxide dismutase), glutathione and decreased level of MDA(Malondialdehyde) in Sudarshan Kriya Yoga practitioners³¹. Yogic breathing exercises decreases lipid peroxidation as evidenced by decreased level of MDA in plasma³². Thus decrease in lipid preoxidation in Sudarshan Kriya Yoga supports decrease in serum total cholesterol, triglyceride, Low Density Lipoprotein-Cholesterol, Very Low Density Lipoprotein-Cholesterol and increase in High Density Lipoprotein-Cholesterol.

CONCLUSION

These changes in lipid profile are probably due to reduced stress, decreased lipid peroxidation and decreased sympathetic activity due to Yoga. Sudarshan Kriya Yoga is very feasible to practice at home and it does not require any money expenditure. In developing countries like India it is very useful exercise for prevention of diseases related to stress and sympathetic over activity. In conclusion the hypocholestrimic action of Sudarshan Kriya Yoga practice can be useful in prevention of derangement of lipid profile and hypertension which are major risk factors for Coronary Heart Disease.

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