A STUDY ON EFFECT OF YOGA AND VARIOUS ASANAS ON OBESITY, HYPERTENSION AND DYSLIPIDEMIA

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ABSTRACT

The effect of Pranayama and certain yogic asanas on parameters of obesity viz. weight reduction (BMI and waist hip ratio), Blood pressure and lipid profile were studied. Our study Included 150 patients after screening inclusion and exclusion criteria for obesity, hypertension and dyslipidemia. The duration of the study was 3 months. Various parameters on demographic and clinical data for these diseases were recorded at the start of the study.75 study group Patients were to attend Yoga camp daily for 3 months. The clinical data was again recorded at the end of the study period of 3 months for comparison. There were significant decrease in the parameters of obesity viz. BMI and WHR, significant improvement in hypertension both systolic and diastolic blood pressure and significant improvement in various lipid profile parameters viz. decrease in total cholesterol, LDL, triglycerides, VLDL and increase in HDL in study group as compared to control group.

Key Words: Yoga, Obesity, BMI (Body Mass Index), WHR (Waist Hip Ratio), Hypertension, BP (Blood Pressure), Dyslipidemia

INTRODUCTION

Yoga is a science practiced in India over thousands of years. It produces consistent physiological changes which have sound scientific basis (Iyenger, 1968).Yoga provides one of the best means of self-improvement and gaining full potential of one's body, mind & soul.It has been proved beyond doubt that pranayama and certain asanas are a very important means for preventing and curing many ailments. Over the last 10 years, research studies have shown that the practice of Yoga improves strength and flexibility and may help in control parameters as blood pressure, respiration and heart rate, and metabolic rates.

We conduct our study to see the effect of yoga on certain cardiovascular risk factors from a scientific angle that we thought of such a study as this.

Objectives of the study included:

- To study the effect of Pranayama and certain yogic asanas on parameters of obesity viz weight reduction (there by reduction of BMI) and waist hip ratio.
- To study the effect of Pranayama and certain yogic asanas on Blood pressure in patients of hypertension.
- To study the effect of Pranayama and certain yogic asanas on lipid profile in patients of hyperlipidemia.

MATERIALS AND METHODS

Inclusion Criteria

Adult patients suffering from obesity, hypertension and dyslipidemia either singly or in-combination, two or all the three in one have been included in this study.

Exclusion Criteria

Patients suffering from other disorders like liver disease, pulmonary diseases, malabsorption, thyrotoxicosis, alcoholism and non co-operative patients were excluded from the study.

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Selection of Patients and Duration of Study

In this study 150 patients were included after screening by inclusion and exclusion criteria for obesity, hypertension, dyslipidemia. These patients were randomly segregated in two groups each group has 75 patients.

Group I is the study group for evaluation of the effect of yoga and certain asanas in addition to the dietary and other lifestyle modification. Group II was given instruction on dietary and lifestyle modification but was asked not to do yoga and asanas.

Various parameters on demographic and clinical data for these diseases were recorded at the start of the study. The clinical data again recorded at the end of study period of 3 months for comparison.

RESULTS AND DISCUSSION

Table	1: Com	parison	of <i>BMI</i>	of the	control	group	at 0	month	and	after	3	months
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Parameter	O Month			After 3 Mo	nths	t	Р	
	Mean	SD	SE	Mean	SD	SE	L	*
BMI	27.92	2.21	0.27	27.94	2.24	0.28	087	0.093

P < 0.05 = Significant

Table 2: Com	parison of <i>BMI</i>	of the <i>study</i>	<i>eroun</i> at 0 n	onth and aft	er 3 months
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Parameter	Pre Yoga (O Montl	h)		Post Yoga (After 3 M	Ionths)	f	Р	
r ai ametei	Mean	SD	SE	Mean	SD	SE		1
BMI	29.03	4.83	0.585	26.63	4.59	0.557	15.43	0.001

P < 0.05 = Significant

Table 3: Comparison of WHR of the control group at 0 month and after 3 months

Deverator	O Month			After 3 Mo	onths	4	D	
rarameter	Mean	SD	SE	Mean	SD	SE	1 L	ſ
WHR	0.935	0.047	5.91	0.93	0.05	1.02	-0.52	0.602

P < 0.05 = Significant

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Table 4: Comparison of WHR of the study group at 0 month and after 3 months

Donomotor	Pre Yoga (O Month)			Post Yoga (After 3 Me	onths)		D	
Parameter	Mean	SD	SE	Mean	SD	SE	l	ſ
WHR	0.95	0.13	1.66	0.90	0.09	1.15	2.97	0.004

P < 0.05 = Significant

Table 5: Comparison of *BP* of the *study group* at 0 month and after 3 months

Parameter	Pre Yoga (O Month	1)		After Yog (After 3 M	a Ionths)	t	D	
Blood Pressure	Mean	SD	SE	Mean	SD	SE		ſ
Systolic	132.79	15.40	1.86	126.17	13.57	1.64	3.87	0.001
Diastolic	85.08	8.92	1.08	81.14	5.70	0.69	4.31	0.001

P < 0.05 = Significant

Table 6: Comparison of BP of the control group at 0 month and after 3 months

Parameter	O Month			After 3 Mo	onths	f	р	
Pressure	Mean	SD	SE	Mean	SD	SE	<u> </u>	ſ
Systolic	130.28	9.48	1.18	131.40	7.02	0.87	-1.19	0.238
Diastolic	83.25	5.56	0.69	82.93	3.95	0.49	0.56	0.578

P < 0.05 = Significant

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Linid Profile	Pre Yoga (O Month)		After Yog (After 3 M	a Ionths)	f .	D	
	Mean	SD	SE	Mean	SD	SE	L	1
T. Cholesterol	203.73	60.38	7.32	181.52	43.34	5.25	5.55	0.001
Triglyceride	168.26	92.33	11.19	136.50	73.24	8.88	3.07	0.003
LDL Chol.	133.65	37.08	4.49	113.96	31.03	3.76	6.05	0.001
HDL Chol.	45.08	11.59	1.40	46.37	9.49	1.15	-2.04	0.045
VLDL Chol.	34.72	19.98	2.42	28.40	12.82	1.55	5.64	0.001

Table 7: Comparison of *lipid profile* of the *study group* at 0 month and after 3 months

P < 0.05 = Significant

 Table 8: Comparison of *lipid profile* of the *control group* at 0 month and 3 months

Lipid Profile	O Month			After 3 M	onths	t	Р	
	Mean	SD	SE	Mean	SD	SE		
T. Cholesterol	206.37	63.18	7.89	197.36	37.38	4.67	1.13	0.260
Triglyceride	170.18	70.65	8.83	166.03	65.59	8.19	1.79	0.077
LDL Chol.	138.31	41.76	5.22	134.95	38.82	4.85	1.82	0.072
HDL Chol.	43.89	6.45	0.80	44.38	5.94	0.74	-1.53	0.129
VLDL Chol.	35.47	20.09	2.51	33.49	14.96	1.87	1.21	0.229

P < 0.05 = Significant

All over the world, scientists have extensively studied Yoga and claimed that it increases longevity (Iyenger, 1968; Kuvalayananda Swamy, 1968; Tiwari, 1983; Pathak *et al.*, 1978), it has therapeutic (Datey *et al.*, 1969; Khanam *et al.*, 1996; Lakshmikanthan *et al.*, 1979) and rehabilitative effects (Khanam *et al.*, 1996; Lakshmikanthan *et al.*, 1979; and Tulpule and Tulpule 2002).

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Body mass index (BMI)

In this study pre treatment BMI was 29.03 ± 4.83 in study group and 27.92 ± 2.21 in control group, when compared with BMI after 3 months it was 26.63 ± 4.59 in study group and in control group it was 27.94 ± 2.24 . This study also show improvement in BMI in study group which was at pre treatment 29.03 ± 4.83 and after 3 month of yoga therapy was 26.63 ± 4.59 it was statistically significant (P=0.001).

The results of this study are consistent with Manchanda *et al.*, (2000), they had observed weight reduction– $6.8\pm8.2\%$ (P=0.0019) after yogic lifestyle intervention in coronary atherosclerotic patients.

Similarly Schmidt *et al.*, (1997) studied cardiovascular risk factors and hormones during comprehensive residential 3 months kriya yoga training and they observed significant reduction in body mass index.

Calle–Pascual *et al.*, (1991) studied behaviour modification in obese subjects with type–2 diabetes mellitus and observed that BMI reduced from 34.2 ± 0.8 kg/m² to 30.6 ± 1.1 kg/m² (P=0.05).

Waist Hip Ratio

In this study there is significant reduction of waist hip ratio from 0.95 ± 0.13 to 0.90 ± 0.09 in study group after 3 months (P=0.004). This study also showed that waist hip ratio significantly reduced between study and control group when compared after 3 months of yoga (P=0.042).

Bera et al (1993) studied the body composition, cardiovascular complication and aerobic power of yogic practitioner and revealed that there was a significant reduction in waist hip ratio.

Hypertension

In this study there in significant reduction in blood pressure both is systolic and diastolic. Systolic blood pressure decreased from 132.79 ± 15.40 mmHg to 126.88 ± 13.57 mmHg. Diastolic blood pressure reduced from 85.08 ± 8.92 mm of Hg to 81.14 ± 5.70 mm of Hg. (P=0.001, P=0.001) respectively. Murugesan *et al.*, (2000) conducted study in 33 hypertensive patients yoga was offered in morning and in evening for 1hr/ session for 11 weeks and showed reduction in systolic and diastolic blood pressure. Sahay *et al.*, (1994) observed significant reduction in blood pressure i.e. systolic from 143.5 to 130.7 mmHg (P=0.05) and diastolic from 93.7 to 86.9 blood pressure systolic mmHg (P=0.05) after 3 months of Yoga therapy.

Calle–Pascual *et al.*, (1991) observed significant reduction in blood pressure systolic from 145.7 ± 3 to 126.4 ± 5.1 mmHg (P=0.05), diastolic 83.5 ± 2.5 to $65.\pm2.6$ mmHg (P=0.01).

Dyslipidemia

In this study lipid profile i.e. total cholesterol decreased from 203.73 ± 60.38 to 181.92 ± 43.34 mm/dl (P=0.001) triglyceride decreased form 168.26 ± 92.33 mm/dl to 136.50 ± 73.24 mg/dl (P=0.003), LDL decreased from 133.65 ± 37.08 mg/dl to 113.96 ± 31.03 mg/dl (P=0.001) HDL increased from 45.08 ± 11.59 to 46.37 ± 9.49 mg/dl (P=0.45) and VLDL decreased from 34.72 ± 19.98 mg/dl to 28.40 ± 12.82 mg/dl (P=0.001). All of the above results in study group after 3 months are significantly improved.

Sahay *et al.*, (1994) also observed a significant reduction in cholesterol (P=0.001) after 6 months of yoga treatment and observed the significant decrease in FFA LDL & VLDL cholesterol and increase in HDL cholesterol).

Result of this study consistent with following studies. Calle–Pascual *et al.*, (1991) observed the behavioral modification in type–2 diabetic patients that TG lowered from 164. \pm 12 to 109.7 \pm 10 mg/dl (P=0.01), HDL increased from 1.27 \pm 0.05 to 1.53 \pm 0.12 MM (P=0.01). Similarly Manchanda *et al.*, (2006) also found statistical significant improvement in lipid profile as shown by (TC percent change–20.2 \pm 6.12 P=0.001), as shown by percent change –23.2 \pm 17 (P=0.00004), TG percent change –20.1 \pm 26 (P=0.005).

This study has conclusively showed that there in significantly benefit on the important coronary risk factors viz, obesity, hypertension and dyslipidemia. Therefore this type of Indian life style modification if properly done for a sufficient time will go long way towards beneficial modification of coronary risk factors.

Conclusions

• There is significant decrease in the parameters of obesity viz, BMI and WHR.

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- There is significant improvement in hypertension both systolic and diastolic blood pressure, it showed beneficial effects on the study group as compared to control group.
- There is also significant improvement in various lipid profile parameters viz, decrease in total cholesterol, LDL, triglycerides, VLDL and increase in HDL in study group as compared to control group.

It is concluded that the yoga and certain asanas have positive and useful effect on certain cardiovascular risk factors viz, obesity, hypertension and dyslipidemia.

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