



**IMPACT OF YOGIC PRACTICES AND BRISK WALKING ON LIPID PROFILES
AMONG HYPERTENSIVE MEN**

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ABSTRACT

The main objective of the investigation was to find out the effect of yogic practices and brisk walking on selected lipid profiles (HDL & LDL) among hypertensive men. The subjects were divided into three groups (n=30) where Group I underwent yogic practices, Group II underwent brisk walking and Group III acted as control. The study was designed by the random selection, consisting of a pre test and post test. Pre test were conducted for all the 90 subjects on selected bio chemical variable such as HDL (High Density Lipo protein) LDL (Low density lipoprotein). The study period was twelve weeks for both the cases. The post tests were conducted for all the subjects and the data obtained were analyzed by Analysis of Covariance (ANCOVA) to assess the significant difference among the groups on post test for bio chemical variables to find out the effects of yogic practices and brisk walking among hypertensive men patients. It is concluded that yogic practices increased HDL levels effectively and decreased the LDL in hypertension middle aged men than the control group. Brisk walking also increased the HDL level effectively and decreased LDL. It is found that yogic practices are slightly effective than brisk walking on HDL and LDL which had no significance between the experimental groups, the yogic practices and walking both are equally good in this dependent variable.

KEYWORDS: Yoga, brisk walking, HDL, LDL, hypertension.

INTRODUCTION

The major risk of various systemic diseases and disorders is mainly due to dyslipidemia. The characteristic features of dyslipidemia are a high plasma triglyceride concentration, high density lipoprotein (HDL) concentration and increased concentration of small dense low density lipoprotein (LDL) particles.^[1,2,3,4] The major incidence of increased flux of free fatty acids leads to lipid changes are due to insulin resistance.

Caloric restriction and weight loss for the overweight individuals with diabetic mellitus have been of proven therapeutic value.^[5] However, there is no consensus on the ideal dietary composition for these patients. Genetic factors and the lipid phenotype of the individual determine the way the plasma lipid profile change in these patients. Lifestyle changes including increased physical activity and dietary modifications have however been the cornerstones of management of dyslipidemia in diabetes. Some studies highlighted that yoga play an

important role in risk modification for various systemic diseases.^[6]

A better lipid profile in long and medium term mediators compared to non mediators also determined.^[7] Few studies reported that yoga has a beneficial effect on insulin kinetics and the lipid profile.^[5] Various studies also reported physical, physiological and endocrinological changes with the practice of yoga. Some studies highlighted that after one year of yoga therapy, patients with severe systemic complaints showed significant reduction in serum total cholesterol, triglycerides and LDL cholesterol.^[8,9,10,11]

The beneficial effect of yoga in the management of hyperlipidemia and obesity cannot just be attributed alone to the simple excess calorie expenditure as there is no rapid muscle activity and energy generation involved in yoga.^[5] Repeated stress is known to lead to persistent elevation of cortisol which causes obesity and insulin resistance.^[12] Elevated cortisol is also linked to

dyslipidemia and higher blood pressure; further yoga has been reported to lower levels of cortisol.^[13]

The biochemical benefits of yoga is glucose decreases; sodium decreases; total cholesterol decreases; triglycerides decrease; HDL cholesterol increases; LDL cholesterol decreases; VLDL cholesterol decreases; cholinesterase increases; catecholamines decrease; ATPase increases; hematocrit increases; Hemoglobin increases; Lymphocyte count increases; Total white blood cell count increases; Thyroxin increases; Vitamin C increases and Total protein increases.

Walking is generally distinguished from running in that only one foot at a time leaves contact with the ground. In today's fast paced life, people are leading a very unhealthy lifestyle. The increasing rates of health diseases, stress levels, lack or inadequate sleep are caused due to the fast paced life style.^[12,13] The major benefits of the walking are helps overcome depression, helps fight against stress and aids in relaxation, helps over come sleepless nights, helps to increase the body activity and provides flexibility, helps toning the body and helps to burn fat. A molecule that is a combination of lipids (fats) and proteins are the form in which lipids are transported in the blood.

The higher the HDL cholesterol level, the lower the risk of coronary artery disease. LDL is a complex molecule (combination of lipid (fat) and protein). Lipoproteins are the form in which lipids are transported in the blood. The low-density lipoprotein (LDL) transports cholesterol from the liver to the tissues of the body. The major purpose of this study was to find out the effect of yogic practices and brisk walking on lipid profile (LDL and HDL) among hypertensive men.

MATERIALS AND METHODS

The study population of ninety (n=90) hypertensive middle aged men were selected as samples at random from a tertiary care teaching hospital and from four private hospitals of Tiruchirapalli district, India. The selected samples were equally divided into three groups (n=30). Group I underwent yogic practices, Group II underwent brisk walking and Group III acted as control. However all the three groups were advised to continue the medicines as per the recommendations of their doctors (Physicians). The subject of the control group was inactive rest. The study was formulated by the random design, consisting of a pre test and post test. Pre test were conducted for all the 90 subjects on selected bio chemical variable such as HDL and LDL. The experimental groups participated in their respective yogic practices and brisk walking exercises for a period of twelve weeks. The post tests were conducted for all the subjects again on the selected bio chemical variable such as HDL and LDL respectively after experimentation of yogic practices and brisk walking exercises. The data obtained were analyzed by Analysis of Covariance (ANCOVA) to assess the significant difference among the groups on post test for bio chemical variables to find out the effects of Yogic practices and brisk walking among hypertensive men patients.

Training Programme: All the subjects included in this study were selected at random and were divided into three groups and the experimental group I was given yogic practices 5.45am to 6.45am and experimental group II was given brisk walking practices between 7.00 am to 8.00am for duration of approximately an hour (5 days a week) for 12 weeks and group III the control group was not given any training. Yogic programs and brisk walking for selected groups are presented in the Table 1.

Table 1: Training programme given to experimental groups

Groups	Training programmes
Experimental Group - I	Loosening exercises, Surya Namaskar, Asanas, Pranayama, and Meditation
Experimental Group - II	brisk walking
Control Group	No training but inactive rest

The detailed description of the yogic training, its duration and rest given between practices among the subjected included were interpreted in table 2. The details of repetitions were also determined thereby 2

repetitions were given in the first four weeks, 3 repetitions in the second found weeks and 4 repetitions in the third four weeks.

Table 2: Details of yogic training

S.No	Yogic Training	Duration	Rest between practices
Loosening Exercises			
1	Sitilikarana Vyayama	5 minutes	-
Surya Namaskar			
2	Surya Namaskar	4 minutes	1 minute
Aasanaas			
3	Padmasana	30 seconds	45 seconds
4	Sasangasana	30 seconds	45 seconds

5	Padahastasana	30 seconds	45 seconds
6	Bhujangasana	30 seconds	45 seconds
7	Chandra badhana Pranayama	1 minute	45 seconds
8	Nadishodana Pranayama	1 minute	45 seconds
9	Bhramari Pranayam	1 minute	45 seconds
10	Japa Meditation	5 minutes	45 seconds
11	Savasana	5 minutes	-

Brisk Walking Training

Experimental group subjects for brisk walking were required to undergo brisk walk for 45 minutes continuously without any rest. They underwent this training from Monday to Friday, five days per week. The experimental period was for 12 weeks. Proper warming up and warm down activities was also given to the subjects during the experimental period. The load dynamics for the walking group were analyzed and depicted in table 3.

The brisk walking program was scheduled in the morning between 7.00am to 8.00am for 5 days (Monday through Friday) a week and the same were continued for 12 weeks. 15 minutes of warming up and cool down practices were also given. Every 4 weeks the intensity

and duration of the training program was gradually increased by the way of repetitions. The following trainings were given.

Schedule for 12 weeks of brisk walking group (Experimental Group – 2)

Mode of exercise - Walking – on flat surface

Frequency - Five days per week for 12 weeks

Duration - Approximately – forty five minutes

Intensity - Mild intensity 50-55%

Walking Programme for a Session

5 minutes - Warming up

45 minutes- Brisk Walking

10 minutes - Warm down

Table 3: Load Dynamics for walking group

Weeks	Intensity	Duration
1 st to 4 th Week	40 – 45%	45 minutes
5 th to 8 th Week	45 – 50%	50 minutes
8 th to 12 Week	50 – 55%	55 minutes

RESULTS AND DISCUSSION

The Biochemical variable of HDL was measured through the blood test in the standard laboratory. The results on

the effect of yogic practices and brisk walking among hypertensive male patients are presented in table 4.

Table 4: Computation of mean and analysis of covariance of HDL of experimental and control group (Scores in mg/dl)

Test	Experimental Group – I (Varied Yogic Practices)	Experimental Group – II (Brisk Walking)	Control group	Source of variance	df	Sum of square	Mean square	F
Pre-test mean	54.5	54.30	54.33	Between	2	0.69	0.344	0.11
				Within	87	262.47	3.02	
Post-test mean	59.13333	58.33	54.53	Between	2	362.40	181.20	53.69*
				Within	87	293.60	3.37	
Adjusted mean	59.12	58.34	54.54	Between	2	360.72	180.36	53.22*
				Within	86	291.466	3.39	
Mean Gain	4.63333	4.03	0.20					

*Significant at 0.05 level of confidence. (Table F- ratio at 0.05 level of confidence. For 2 and 87 (df) = 3.1, 2 and 86 (df) = 3.103).

Table shows that the pre test mean scores of HDL (High Density Lipo protein) of Experimental group I Yogic practices was 54.5. Experimental Group II Brisk Walking was 54.30 and control group was 54.33. The post test means showed differences due to Twelve weeks of yogic practices and brisk walking and mean values recorded were 59.133, 58.33 and 54.53 respectively. The

obtained F value on pre test scores 0.11 was lesser than the required F value of 3.1 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal.

The post test scores analysis proved that there was significant difference between the groups as the obtained

F value at 53.69 was greater than the required F value at 3.1. This proved that the differences between the post test mean at the subjects were significant. Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 53.22 was greater than the required F value at 3.1. This proved that there were significant differences among the means due to twelve weeks yogic practices and brisk walking on the biochemical variable HDL.

The biochemical variable LDL was measured through blood test in standard laboratory. The results on the effect of yogic practices and brisk walking among hypertensive male patients are presented in Figure 1. Figure showed that the pre test mean scores of LDL (Experimental group I yogic practices was 104.033. Experimental Group II brisk walking was 105.20 and control group was 103.01. The post test means showed differences due to Twelve weeks of yogic practices and brisk walking and mean values recorded were 95.54, 96.21 and 101.73 respectively.

The obtained F value on pre test scores 0.55 was lesser than the required F value of 3.1 to be significant at 0.05 level. This proved that there was no significant difference between the groups at initial stage and the randomization at the initial stage was equal. The post test scores analysis proved that there was significant difference between the groups as the obtained F value at 4.05 was greater than the required F value at 3.1. This proved that the differences between the post test mean at the subjects were significant.

Taking into consideration the pre and post test scores among the groups, adjusted mean scores were calculated and subjected to statistical treatment. The obtained F value at 16.46 was greater than the required F value at 3.1. This proved that there were significant differences among the means due to Twelve weeks of yogic practices and brisk walking on the biochemical variable LDL. Since significant improvement were recorded. The results were subjected to post hoc analysis using Scheffe`s Confidence Interval test.

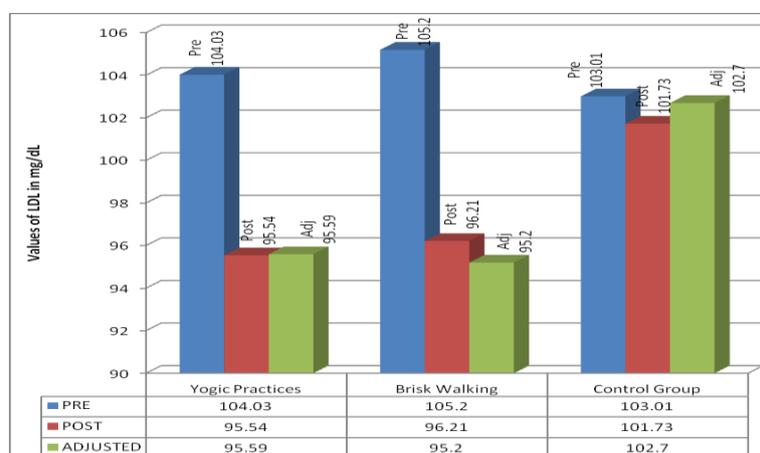


Figure 1: Bar diagram showing pre, post and adjusted post-test values of control group, two experimental groups on LDL

The results showed that the obtained adjusted means on HDL among yogic practices group was 59.72 followed by Brisk Walking group with the mean value of 58.34 and control group mean value of 54.54. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 0.11, 53.69 and 53.22 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 3.1. The data obtained were compared and correlated with other studies revealed that the LDL level gets reduced and HDL increased.^[14] Dyslipidemia is commonly associated with abnormalities in lipolysis; triglyceride metabolism and free fatty acid turn over in a case of insulin resistance. Impaired lipoprotein lipase and increased hepatic lipase activity is

thought to be a resulting from insulin resistance in diabetes. Chronic exposure to elevated free fatty acids has been associated with impaired insulin secretion. The improvement in lipid profile with practice of yoga could be due to increased hepatic lipase and lipoprotein lipase. This would increase the uptake of triglycerides by adipose tissue and affect the lipoprotein metabolism.^[5]

The post hoc analysis through Scheffe`s confidence test proved that due to Twelve weeks treatment the Yogic practices group and Brisk Walking group there was significant improvement (increase) in HDL (High Density Lipo Protein) than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental group namely yogic practices group and Brisk Walking proved that there was significant difference. The result of this study on HDL (High Density Lipo Protein) has in line with the study conducted. From this study, we clearly learned the

modification in lipid profile lowers the risk of coronary artery disease. It is claimed that yoga and transcendental meditation have a cholesterol lowering effect.^[5,15]

The results presented in table showed that the obtained adjusted means on LDL among yogic practices group was 95.59 followed by brisk walking group with the mean value of 95.20 and control group mean value of 102.70. The difference among pre test scores Post test scores and adjusted mean scores of the subjects were statistically treated using ANCOVA and F values obtained were 0.55, 4.05 and 16.46 respectively. It was found that obtained F value on pre test score was not significant at 0.05 level of confidence as the obtained value was lesser than the required table value and post test Scores was significant at 0.05 level of confidence as the value was greater than the required table F value of 3.1.

The post hoc analysis through Scheffe's confidence test proved that due to Twelve weeks treatment yogic practices group and brisk walking group there was significant improvement (decrease) in LDL than control group and the differences were significant at 0.05 level. The post hoc analysis between the experimental group namely yogic practices group and brisk walking proved that there was significant difference. The result of this study on LDL has in line with the study conducted.

CONCLUSION

Conclusions drawn from the results are as follows

1. It is found that yogic practices and Brisk walking have made significant positive differences on the selected bio chemical variable such as increased HDL and decreased LDL among hypertensive middle aged men.

2. It is found that yogic practices are slightly effective than brisk walking on the selected Bio chemical variable increased High density lipoprotein among hypertensive middle aged men and yogic practices and brisk walking which had no significance between the experimental group both are equally good in the dependent variables on the selected bio chemical variable such as decreased LDL (Low Density Lipo protein) among hypertensive middle aged men.

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