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EFFECT OF YOGA AND BRISK WALKING ON LIPID PROFILES OF NON- INSULIN DEPENDENT DIABETIC PATIENTS

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Abstract:

The purpose of the study was to find out the effect of yoga and brisk walking on selected Lipid Profiles of Non Insulin Dependent Diabetic Patients. For this purpose, Forty five (N=45) aged between 35 to 45 years working men in a private company at Hosur, Tamilnadu, India were randomly selected as subjects. The training programme was designed for 12 weeks and Experimental group I (n=15) underwent Yoga practices, Experimental group II (n=15) underwent brisk walking for 5 days per week for 12 weeks, group III acted as Control group, they were not allowed to involve any type of physical activities. Yoga and brisk walking were selected as Independent variables. Pre tests and Post test were conducted for all the subjects on the selected lipid Profiles of HDL (High Density Lipo Protein) LDL (Low Density Lipo Protein). The collected data were analysed by using Dependent 't - test' and Analysis of covariance (ANCOVA) was applied to find out the effect of Yoga and brisk walking on selected Lipid Profiles and scheffe's Post hoc method was used for testing the significance between paired adjusted means. The level of significance was 0.05. The results of the study indicated that the effect of yoga and brisk walking had significantly improved the HDL (High Density Lipo Protein) and LDL (Low Density Lipo Protein) of Non Insulin Dependent Diabetic Patients.

Key Words: Yoga, Brisk walking, HDL, LDL & NIDDM

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. 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. 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.

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. Repeated stress is known to lead to persistent elevation of cortisol which causes obesity and insulin resistance. Elevated cortisol is also linked to dyslipidemia and higher blood pressure; further yoga has been reported to lower levels of cortisol.

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. 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 Non -Insulin dependent diabetic patients.

Methodology:

Forty five (N=45) Non -Insulin dependent diabetic patients working in private companies in Hosur, krishnagiri district, Tamil Nadu, India, were selected as subjects. The selected subjects were divided into three equal groups of fifteen each namely experimental group I underwent yoga practices, Experimental group II underwent brisk walking for 5 days per week for 12 weeks and group III acted as control group. The age group of the subjects ranged from 35 to 45 years. However all the three groups were advised to continue the medicines as per the recommendations of their doctors (Physicians). Pre test and Post test were conducted for all the

subjects on lipid Profiles of HDL and LDL. The Experimental group I (Yoga) includes Loosening exercise, Surya Namaskar, Asana, Pranayama, Meditation and Yoga nidra. Experimental group II (Brisk walk) underwent brisk walk for 45 minutes continuously without any rest Control Group had no special training.

Statistical Analysis:

The collected data were analysed by using Dependent 't - test' Analysis of covariance (ANCOVA) was applied to find out the effect of Yoga and brisk walking on selected physiological variables and scheffe's Post hoc method was used for testing the significance between paired adjusted means. The level of significance was 0.05.

Analysis of Data:

Table 1: The pre and post test data and 't' ratio on High Density Lipoprotein of experimental and control groups (Scores in mg/dl)

Group	Test	Mean	Standard Deviation	Mean Differences	't' ratio
Yogic Group	Pre test	42.80	4.48	4.20	3.91*
	Post test	47.00	4.61		
Walking Group	Pre test	43.20	5.95	8.53	7.64*
	Post test	51.73	6.94		
Control Group	Pre test	45.47	6.70	0.54	0.71
	Post test	44.93	6.45		

Table t-ratio at 0.05 level of confidence for 14 (df) =2.15

Table 1 shows the mean, standard deviation and mean difference values of the pre and post test data collected from the experimental and control groups on high density lipoprotein cholesterol. Further, the collected data was statistically analyzed by paired 't' test to find out the significant differences if any between the pre and post data. The obtained 't' values of yogic and walking practices groups are 3.91 and 7.64 respectively which was greater than the required table value of 2.15 for significance at 0.05 level for 14 degrees of freedom. It revealed that significant differences exist between the pre and post test means of experimental groups on high density lipoprotein cholesterol.

Table 2: Analysis of covariance on High Density lipoprotein of experimental and control groups (Scores in mg/dl)

Adjusted Posttest Mean			S o V	Sum of Squares	Df	Mean Squares	'F' ratio
Yoga Group	Walking Group	Control Group					
47.85	52.25	43.56	B	551.315	2	275.657	19.40*
			W	582.458	41	14.206	

(Table value required for significance with degrees of freedom 2 & 41 is 3.23)

*Significant at 0.05 level of confidence

Table 2 shows that the adjusted post-test means on high density lipoprotein cholesterol of yoga, walking and control groups are 47.85, 52.25 and 43.56 respectively. The obtained 'F' value of 19.40 on high density lipoprotein cholesterolis greater than the required table value of 3.23 of 2, 42 df at 0.05 level of confidence. Hence, it is concluded that significant differences exist between the adjusted post test means of yoga, walking and control groups on high density lipoprotein cholesterol.

Table 3: Scheffe's Post Hoc Test for the Differences among Paired Means of Experimental and Control Groups on High Density Lipoprotein (Scores in mg/dl)

Yoga Group	Walking Group	Control Group	Mean Difference	Confidence Interval
47.85	52.25		4.40*	3.50
47.85		43.56	4.29*	3.50
	52.25	43.56	8.69*	3.50

* Significant at 0 .05 level

Table 3 the Scheffe's post hoc analysis proved that significant mean differences existed between yoga and control groups, walking and control groups on high density lipoprotein cholesterol. Since, the mean differences 4.40, 4.29 and 8.69 are higher than the confident interval value of 3.50 at 0.05 level of significance. Hence, it is concluded that due to the effect of yoga and Brisk walking practices the high density lipoprotein cholesterol level of the subjects is significantly increased. It is also concluded that walking practices is significantly better than yoga practices in increasing the high density lipoprotein cholesterol level.

Figure 1: Bar Diagram Showing the Mean Values on High Density Lipoprotein of Experimental and Control Groups (Scores in mg/dl)

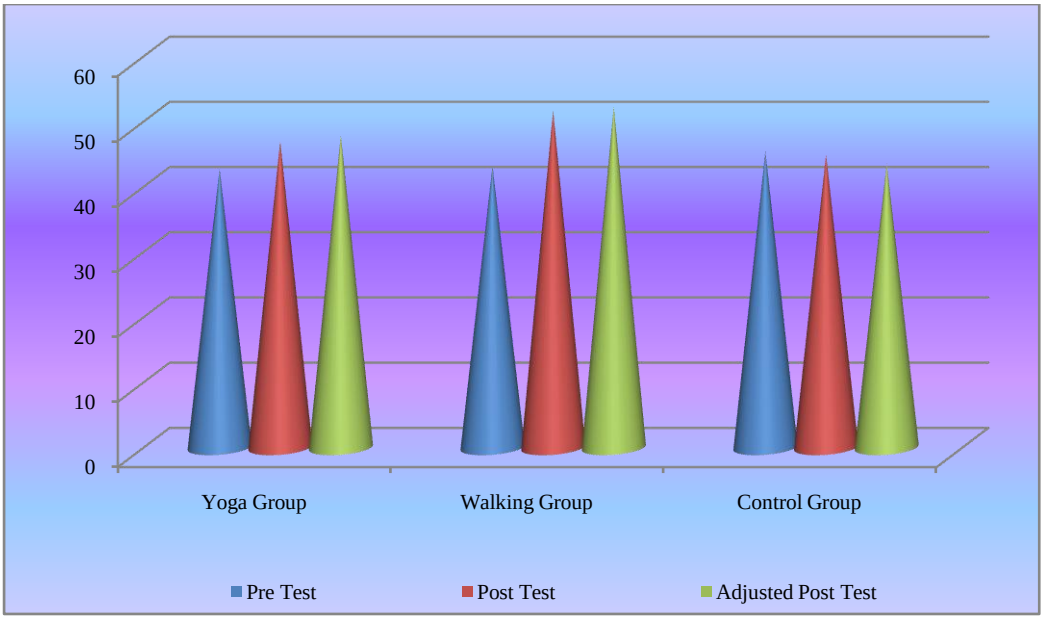


Table 4: The pre and post test data and 't' ratio on Low Density Lipoprotein of experimental and control groups (Scores in mg/dl)

Group	Test	Mean	Standard Deviation	Mean Differences	't' ratio
Yogic Group	Pre test	146.24	27.00	10.50	7.47*
	Post test	135.74	25.32		
Walking Group	Pre test	142.39	35.12	25.84	15.16*
	Post test	116.55	31.96		
Control Group	Pre test	152.96	36.42	4.31	3.19
	Post test	156.99	35.87		

Table t-ratio at 0.05 level of confidence for 14 (df) =2.15

Table 4 shows the mean, standard deviation and mean difference values of the pre and post test data collected from the experimental and control groups on low density lipoprotein. Further, the collected data was statistically analyzed by paired 't' test to find out the significant differences if any between the pre and post data. The obtained 't' values of yoga, walking practices and control groups are 1.90, 1.47 and 1.92 respectively which are lesser than the required table value of 2.15 for significance at 0.05 level for 14 degrees of freedom. It revealed that no significant differences exist between the pre and post test means of experimental and control groups on low density lipoprotein cholesterol.

Table 5: Analysis of covariance on Low Density Lipoprotein of experimental and control groups (Scores in mg/dl)

Adjusted Posttest Mean			S o V	Sum of Squares	Df	Mean squares	'F' ratio
Yoga Group	Walking Group	Control Group					
136.40	120.40	152.40	B	7541.32	2	3770.66	15.08*
			W	10249.81	41	250.00	

(Table value required for significance with degrees of freedom 2 & 41 is 3.23)
*Significant at 0.05 level of confidence

Table 5 shows that the adjusted post-test means on low density lipoprotein cholesterol of yoga, walking and control groups are 136.40, 120.40 and 152.40 respectively. The obtained 'F' value of 15.08 on low density lipoprotein cholesterolis greater than the required table value of 3.23 of 2, 42 df at 0.05 level of confidence. Hence, it is concluded that significant differences exist between the adjusted post test means of yoga, walking and control groups on low density lipoprotein cholesterol.

Table 6: Scheffe's post hoc test for the differences among paired means of experimental and control groups on Low Density Lipoprotein (Scores in mg/dl)

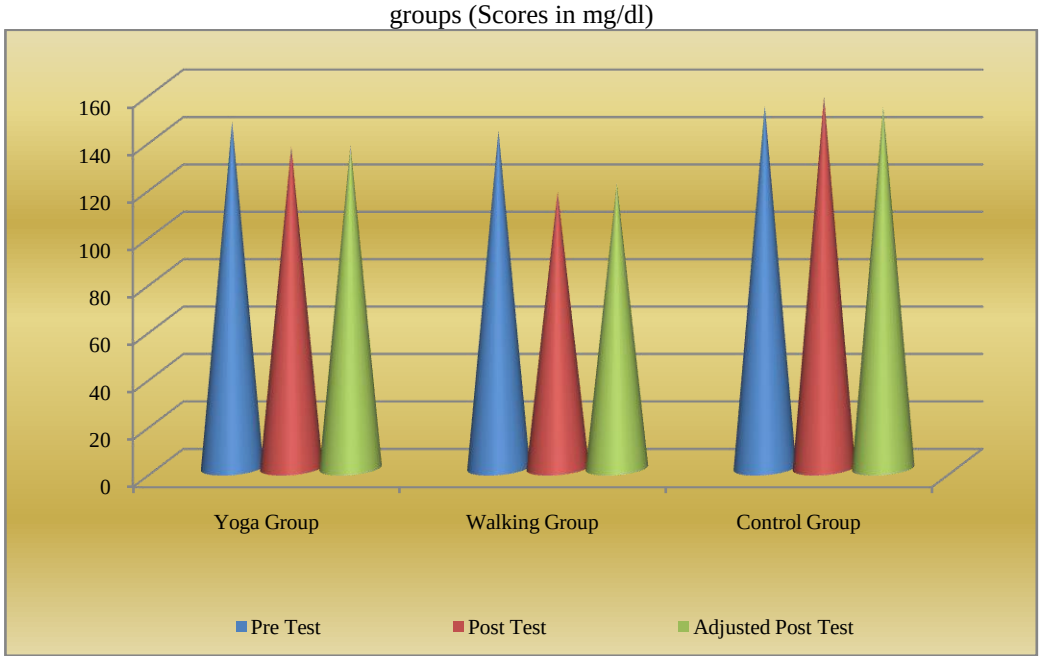
Yoga Group	Walking Group	Control Group	Mean Difference	Confidence Interval
136.40	120.40		16.00*	14.67
136.40		152.40	16.00*	14.67
	120.40	152.40	32.00*	14.67

* Significant at 0 .05 level

Table 6 the Scheffe's post hoc analysis proved that significant mean differences existed between yoga and walking groups, yoga and control groups, walking and control groups on low density lipoprotein. Since, the mean differences 16.00, 16.00 and 32.00 are higher than the confident interval value of 14.67 at 0.05 level of significance.

Hence, it is concluded that due to the effect of yoga and walking practices the low density lipoprotein cholesterol level of the subjects is significantly decreased. It is also concluded that walking practices is significantly better than yoga practices in decreasing the low density lipoprotein cholesterol.

Figure 2: Bar diagram showing the mean values on Low Density Lipoprotein of experimental and control groups (Scores in mg/dl)



Conclusion:

- ✓ It is found that yoga and brisk walking exhibited significantly positive differences on the lipid Profiles of increased HDL and decreased LDL among Non- Insulin dependent diabetic patients.
- ✓ Finally it concluded that yoga practices are slightly effective than brisk walking on the Lipid Profiles of HDL (High density lipoprotein) increased and LDL (Low Density Lipo protein) decreased among Non-Insulin Dependent Diabetic Men.

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