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Influence of two different packages of yogic practices on total cholesterol among diabetic patients

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Abstract

Introduction: About 80% of type 2 diabetes is either preventable or controllable by changing diet, increasing physical activity and improving the living environment. The present study was aimed to ascertain and compare the influence of two different packages of yogic practices on total cholesterol among diabetic patients.

Methodology: A total of sixty subjects from the investigator visited many hospitals in Salem district. Whose age ranged between 40 to 50 years was selected as subjects. The selected sixty subjects were randomly divided into three groups of twenty each, out of which yogic practices Group –A (n=20) underwent Package no. 01 yogic training, yogic practices Group – B (n=20) underwent Package no. 02 yogic training. Group – C control group (n=20). Group A and B underwent training for a period of twelve weeks. The control group was not exposed to any specific training apart from their regular routine. The selected criterion variable was Total cholesterol.

Results: (a) In order to analyse the training effects of each group on the selected variable, "t" ratio was used. (b) In order to compare the effect of treatment on the selected variables among the three groups, analysis of covariance was used. Whenever, the 'F' ratio for adjusted post-test was found to be significant to and to determine which of the three paired means significantly differed, the Scheffe's test was applied.

Conclusion: The study results showed that the experimental group had significantly altered selected variables namely Total Cholesterol and this was due to the influence of yogic practices.

Keywords: Yoga, asana, pranayama and total cholesterol

Introduction

Diabetes is one of the major causes of premature illness and death worldwide. The prevalence of diabetes in adult was estimated to around 285 million (6.4%) in 2010 and the number is expected to grow 439 million (7.7%) by 2030. India has the world's largest diabetes population with 50.8 million, followed by China with 43.2 million. Adult diabetes is expected to increase about 69% in developing countries and 20% in developed countries which may be due to population growth, aging, urbanization, increasing prevalence of obesity, physical inactivity.and hereditary nature of the disease. Type 2 diabetes accounts for about 85-95% of all diabetes in high income countries and even higher percentage in low and middle income countries. Diabetic research across the globe has confirmed that uncontrolled diabetes leads to diabetic related complications either acute or chronic which increases the burden, cost of the treatment and finally results in premature death.

Other form of physical activity includes yoga which is being practiced all over the world and has established beneficial effects on human. The yoga may be as effective as or better than exercise in improving a variety of health related outcome measures including heart rate variability, blood glucose, blood lipids, salivary cortisol, oxidative stress, fatigue, pain, and sleep both in healthy and unhealthy populations. Cholesterol is a fat-like substance in the body. Most of the cholesterol in our bodies is produced in the liver, though some of it comes from the foods we eat. The body needs some cholesterol, as it is important to the body's cell membranes and to the production of certain hormones, and helps act as insulation for once nerves. Cholesterol also aids in the manufacture of bile (which is stored in the gallbladder and helps digest fats) (Gillson, 2014) [3]. Total Cholesterol is a measure of approximate cholesterol level in the blood consists of total LDL, HDL and one fifth of Triglycerides.

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Methodology
The total of sixty subjects from the investigator visited many hospitals in Salem district and met diabetes patients and explained to them about the purpose and nature of the study and requested the patients to volunteer for the study. Whose age ranged between 40 to 50 years were selected as subjects. The selected sixty subjects were randomly divided into three groups of twenty each, out of which yogic practices Group –A (n=20) underwent Package no. 01 yogic training, yogic practices Group – B (n=20) underwent Package no. 02 yogic training. Group – C control group (n=20). Group A and B underwent training for a period of twelve weeks. The control group was not exposed to any specific training apart from their regular routine. The control group was not exposed to any specific training apart from their regular routine. The training period consisted of twelve weeks six days per week from morning 6.00 am to 7.00 am. The selected criterion variable was Total Cholesterol. The variable was assessed with CHOD-POD Method.

Training Programme
Intensity is the rate of doing work. It is the pace at which physical activity is done. Minimum intensity to have better effect on the organ is established at the beginning. The yogic practices were fixed for the experimental groups on the basis of the pilot study, yogic literature, related reviews and the personal experiences of the supervisor and the scholar.
During the training period, the experimental groups underwent their respective training programmes six days per week for twelve weeks in addition to their regular activities. Experimental groups-A underwent package no. 01 yogic practices and group-B package no. 01 yogic practices. Training volume and intensity were increased progressively on different phases. The training schedule for all the two experimental groups were presented in tables. Every day the workout lasted around an hour approximately. Control Group-C (CG) served as the control group and the subjects were involved in regular activities.

The subjects underwent their training programme with the strict supervision of the investigator. All the subjects involved in the training programmes were questioned periodically about their status throughout the training period. None of them reported any pain or injury. However, no complained and inability was received from the subjects.

Training Schedule
Two experimental groups (yogic practices group-A and Yogic practices group-B groups) underwent their respective training programmes six days per week (Monday to Saturday) for twelve weeks. Group A underwent yogic practices of package no. 01 and Group B underwent yogic practices of package no. 02 was yoga training. Group C was instructed not to participate in any strenuous physical exercise and requested to be in active rest.
The two experimental groups (yogic practices group – A and yogic practices group –B) were informed to report at the early hours of the day around 6.00 am.

Table 1: Yogic practices prescribed for training group

S. No.	Group – A (Package Number – 01)	Group – B (Package Number – 02)
1	Loosening the Joints	Trikonasana
2	Pavanamuktasana	Utiyanabandha
3	Suriyanamaskar	Setubandha Asana
4	Matsyasana	Vipareethakarini
5	Gomukhasana	Padhagasthasana
6	Ardha matsyendrasana	Salabasana
7	Paschimottansana	Sasaggasana
8	Bhujangasana	Vajrasana
9	Sarvangasana	Suriya Pranayama
10	Nadi Shodhana Pranayama	Bhramari Pranayama
11	Bhastrika Pranayama	Suriya Mudra
12	Yoga Nidra	Savasana

Analysis of data and interpretation of the study
The data collected prior to and after the experimental period on Total cholesterol on yogic practices group – A, Yogic practices group – B and control group C were analysed and presented in Table- 2 & 3

Table 2: Significance of mean gains / losses between pre test and Post test of total cholesterol experimental and Control group

S. No	Variables	Pre Test Mean (±SD)	Post Test Mean (±SD)	MD	SE	't' ratio
		Yoga Practices Group A (Package -1)				
1	Total Cholesterol	214.8 (4.06)	194. (3.01)	20.1	1.16	17.32*
		Yoga Practices Group B (Package -2)				
2	Total Cholesterol	215.7 (6.11)	206 (9.00)	9.7	1.82	5.32*
		Control Group C				
3	Total Cholesterol	215.0 (5.47)	216.3 (5.58)	1.25	0.61	2.04

*significant at 0.05 level ('t' value 2.10) with df 19

Table-2 shows that the pre and post mean values of experimental and control group of Total cholesterol. The obtained 't' value of 17.32 yogic practices package 1 group-A is greater than table the value of 2.10 with df 19. The yogic practices package 2 group-B of obtained 't' value of 5.32 which is greater than table value 2.10 with df 19. The obtained 't' value of the control group is 2.04 lesser than which is the table value of 2.10 and is insignificant.

Table 3: Analysis of covariance on total cholesterol of yogic practices group a package 1, yogic practices group b, package 2 and control group C

Test	Yogic Practices Group A Package-1	Yogic Practices Group B Package-2	Control Group C	Source of Variances	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test Mean	214.8	215.7	215	Between	7.90	2	3.95	0.141
SD	4.06	6.11	5.47	Within	1593.7	57	27.96	
Post Test Mean	194.7	206	216.3	Between	4668.93	2	2334.4	57.6*
SD	3.01	9.00	5.58	Within	2306.4	57	40.46	
Adjusted Post Test Mean	194.9	205.57	216.4	Between	4611.04	2	2305.5	76.20*
				Within	1694.1	56	30.25	

* Significant at 0.05 level of confidence.

(The table value required for significance at 0.05 level of confidence with df 2 and 57 and 2 and 56 were 3.19 and 3.18 respectively).

Table-3 shows that the pre-test means on Total cholesterol of the Yogic practices package-1 Group A, Yogic practices package-2 Group B and control group are 214.8 ± 4.06, 215.7 ± 6.11 and 215 ± 5.47 respectively. The obtained 'F' ratio value of 0.141 for pre-test score of Yogic practices package-1 Group A, Yogic practices package-2 Group B and control group on Total cholesterol is less than the required table value of 3.19 for significance with df 2 and 57 at 0.05 level of confidence.

The post-test mean values of Total cholesterol for Yogic practices package-1 Group A, Yogic practices package-2 Group B and control group are 194.7 ± 3.01, 206 ± 9.00, and 216.3 ± 5.58 respectively. The obtained 'F' ratio value of 57.6 for post-test scores of Yogic practices package-1 Group A,

Yogic practices package-2 Group B and control group is greater than the required table value of 3.19 for significance with df 2 and 57 at 0.05 level of confidence.

The adjusted post-test mean values of Yogic practices package-1 Group A, Yogic practices package-2 Group B and control group are 194.9, 205.57 and 216.4 respectively. The obtained 'F' ratio value of 76.20 for adjusted post-test scores of Yogic practices package-1 Group A, Yogic practices package-2 Group B and control group is higher than the required table value of 3.18 for significance with df 2 and 56 at 0.05 level of confidence.

The above statistical analysis indicates that there is a significant difference in total cholesterol after the training period. Further to determine which of the paired means has a significant difference, the Scheffe's test was applied. The result of the follow-up test is presented in Table-4.

Table 4: Scheffe's post hoc test for the difference between adjusted post-test mean of total cholesterol

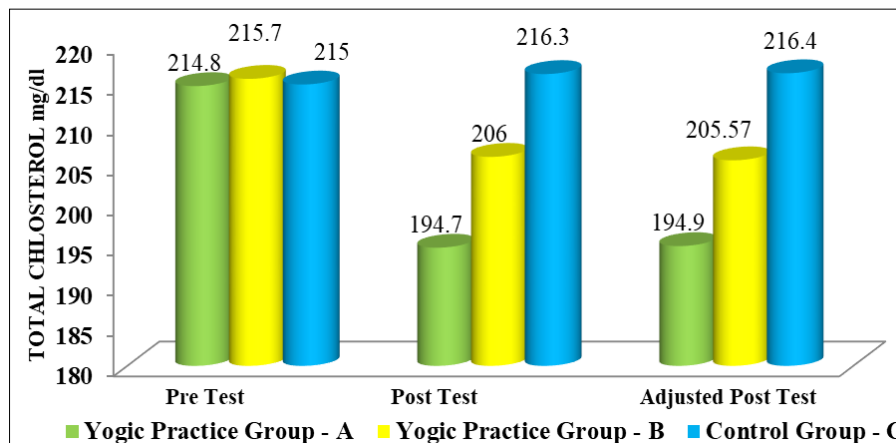| S. No.	Adjusted Post-Test Means			Mean Difference	Confidence Interval
	Yogic Practices Group A Package-1	Yogic Practices Group B Package-2	Control Group C		
1.	194.9	205.57	-	10.67*	4.38
2.	194.9	-	216.4	21.5*	4.38
3.	-	205.57	216.4	10.83*	4.38

*Significant at 0.05 level of confidence.

Table-4 shows that the adjusted post-test mean difference in Total cholesterol between Yogic practices package-1 Group A and Yogic practices package-2 Group B, Yogic practices package-1 Group A and control group, Yogic practices package-2 Group B and control group are 10.67, 21.5 and 10.83, which were greater than the confidence interval value of 4.38 at 0.05 level of confidence.

It may be concluded from the results of the study that Yogic practices package-1 Group A, Yogic practices package-2

Group B have significantly reduced the Total cholesterol when compared with the control group. Moreover, the Yogic practices package-1 Group A, has reduced in the total cholesterol than the Yogic practices package-2 Group B and control group.

The mean values on Total cholesterol of Yogic practices package-1 Group A, Yogic practices package-2 Group B and control group are graphically represented in Figure-1.

Fig 1: Mean values on total chlosterol of yogic practices group a package-1, yogic practices group b package-2 and control group c

Discussion on findings

The results of the study on body composition variable Total Chlosterol, reveals that the experimental group namely yogic practices group-A (package no. 1) and yogic practices group-B (package no. 2) had significantly altered selected variable after the 12 weeks of yoga training. Besides, the analysis of the data indicated that there was a significant difference between the namely yogic practices group-A (package no. 1) and yogic practices group-B (package no. 2) and Control group C on all the selected dependent variables. More over yogic practices group-A (package no. 1) showed better results in the entire selected dependent variables Total Chlosterol, than the yogic practices group-B (package no. 2).

The results of this investigation are also supported by the following studies of Kumar and Kalidasan, (2014) [8]; Maninder, *et al.*, (2013) [10]; Kanaya, *et al.*, (2013) [5]; Thankur, *et al.*, (1996); Tenzin, *et al.*, (2010) [10]. Results showed a significant improvement through yoga asana on lipid profile in type 2 Diabetes (Savita Singh, *et al.*, (2008) [14] conducted a study with fifty six patients of Type-2 Diabetes Mellitus (NIDDM) There was a noticeable decrease in triglyceride levels, LDL and VLDL cholesterol. The reduction in lipid profiles, such as, total cholesterol, triglycerides, low density lipoproteins and blood glucose and uric acid, and an increase in high density lipoproteins were significant after the yogic practice period. These results are in line with the findings of l.A.Gordon, *et al.*, (2008) who found that there was a significant decrease in TC, TGL and LDL and a significant rise in HDL after yoga practice.

Conclusion

It was concluded that experimental group were significantly altered the selected criterion variable than the control group. It was concluded that yogic practices group A (package no.1) were decreased than the yogic practices group B (package no.2) and control group C in Total Cholesterol of diabetic patients.

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