INFLUENCE OF DIFFERENT YOGIC PRACTICES ON SELECTED BIOCHEMICAL VARIABLES

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Abstract

The aim of this study was designed to find out the effects of different yogic practices namely, yogasana and pranayama on the selected biochemical variables. Sixty male students studying Bachelors Degree, in the Department of Physical Education, Annamalai University were selected randomly as subjects and their age ranged between 22-28 years. They were divided into three groups of twenty each. Group I served as Asana; Group II Pranayama and Group III as control. Yogasana and pranayama practices were given to experimental groups and control group was not given any exposure and were kept under control. Initial and Final data were collected on lipid profiles, cholesterol and triglycerides, and statistically analyzed using ANCOVA and Scheffe's Post hoc test. Results showed that Asana and Pranayama treatment moderates the lipid levels and influences antioxidant status of young healthy individuals.

Keywords: Yogic Practices, Bio-chemical Variables.

INTRODUCTION

The exercises produce biochemical changes in the cardiorespiratory system and other important alterations in body composition such as High Density Lipo Protein, Low Density Lipo Protein, blood cholesterol, blood glucose and triglyceride levels (Fox and Mathews, 1981). Researches also proved that yogic exercises significantly alter blood glucose, blood cholesterol, blood lipids and other benefits to different population. Thus, yoga places an important role in reducing the blood glucose level by increasing the level of secretion of insulin. During exercise, oxygen consumption can increase by a factor of more than 10. This leads to a large increase in the production of oxidants and results in damage that contributes to muscular fatigue during and after exercise. The inflammatory response that occurs after strenuous exercise is also associated with biochemical variables, especially in the 24 hours after an exercise session (Tan DX et.al. 2000) .

Yogic techniques are known to improve ones overall performance. Pranayama is known to be a part of yogic techniques. Patanjali in its yoga sutra describes-Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana and Samadhi as eight angas (parts) of yoga (Yoga Sutra of Patanjali, cited by Christopher C. 2008) . Amongst them, in the present materialistic world, the third and fourth part, Pranayama and Asana (Postures) are considered as very important parts and prescribed by modern medicine too.

Researchers have proved the beneficial effects of different yogasanas and pranayama are well reported and has sound scientific basis (Raghuraj et al., 1998: Bhattacharya et al., 2002) , . Different types of pranayama produce different physiological responses in normal young volunteers (Raghuraj et al., 1998; Bhattacharya et al., 2002; Madanmohan et al., 2005) . Breathing exercises are reported to influence cardiorespiratory and autonomic functions (Srivastav et al., 2005) and also help in reducing the scores of anxiety (Brown and Gerbarg 2005) and stress (Bhattacharya et al., 2002). However, there was dearth of research to find out the effect of yogasnas and pranayama exercises on biochemical variables. The present study was designed to find out the effect of yogasana and pranayama exercises on selected biochemical variables in young healthy individuals.

METHODOLOGY

To achieve the purpose, sixty male healthy students studying bachelors degree in the Department of Physical Education, Annamalai University, Tamil Nadu were selected randomly as subjects and their age ranged between 22-28 years. The selected subjects were divided into three groups, namely, yogasanas group, pranayama group and control group, consisting of 20 subjects in each. The selected yogasana group was given Padmasana, Dhanurasana, Bhujangasana, Vajrasana, Matsyasana, Pachimototsana, Artha Chakrasana and Sarvangasana for 12 weeks. The pranayama group was given Nadi Sodhana (Alternate Nostril Breathing), Sama Vritti Pranayama (Equal Breathing), Bastrika Pranayama (Bellow Breath), Ujjayi Pranayama (Ocean Breath), and Kapalabhati Pranayama (Skull Shining Breath) for 12 weeks. The control group was not exposed to any treatments and was strictly under control. Biochemical variables, which has direct influence namely, total blood cholesterol and triglycerides were tested prior to and

after the experimental treatment from all the three groups. Boehringer- Manheim kit was used to measure the selected variables. The differences between the initial and final scores were considered as the effect of asanas and pranayamas on the selected biochemical variables. The collected data were analysed through Analysis of Covariance (ANCOVA) and if significant differences were recorded post hoc test using Scheffe's Confidence Interval test was done to compare the differences between paired means.

RESULTS

TABLE 1
RESULTS ON CALCULATION OF ANALYSIS OF COVARIANCE
(Scores in mg/dl)

	Asanas Group	Pranayama Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F ratio
Calculation of Analysis of Covariance on Blood Cholesterol								
Pre Test Mean	175.25	180.99	173.87	Between	569.7	2	284.87	2.91
Std Dev	7.88	12.22	9.06	Within	5576.2	57	97.83	
Post Test Mean	164.84	167.22	173.69	Between	839.3	2	419.63	4.82*
Std Dev	8.18	10.84	8.77	Within	4966.0	57	87.12	
Adjusted Post Test Mean	166.16	163.32	176.27	Between	1744.1	2	872.04	140.43*
				Within	347.8	56	6.21	
Mean Difference	10.41	13.77	0.18					
Calculation of Analysis of Covariance on Triglycerides								
Pre Test Mean	165.0	162.0	161.7	Between	129.3	2.0	64.6	0.8
Std Dev	6.6	6.8	12.2	Within	4515.7	57.0	79.2	
Post Test Mean	153.1	156.2	162.3	Between	882.6	2.0	441.3	4.7*
Std Dev	8.5	6.3	13.0	Within	5312.2	57.0	93.2	
Adjusted Post Test Mean	151.4	157.0	163.3	Between	1384.5	2.0	692.3	17.3*
				Within	2245.8	56.0	40.1	
Mean Difference	11.9	5.8	0.6					

Required $F_{(0.05, 2,57)} = 3.15$ *Significant

TABLE 2
SCHEFFE'S POST HOC ANALYSIS RESULTS

Asanas Group	Pranayama Group	Control Group	Mean Difference	C.I
Post Hoc Analysis for Blood Cholesterol				
166.2	163.3	-	2.8	2.9
166.2	-	176.3	10.1*	2.9
-	163.3	176.3	13.0*	2.9
Post Hoc Analysis for Triglycerides				
151.4	157.0	-	5.6*	5.1
151.4	-	163.3	11.9*	5.1
-	157.0	163.3	6.3*	5.1

*Significant

The obtained results proved that twelve weeks yogasanas and pranayama treatments have been significantly moderated the blood cholesterol and triglycerides (P<0.05) as the obtained values were greater than the required F value of 3.15 to be significant. The post hoc analysis proved that the paired differences of means between asanas group and control group, pranayama group and control group were significant. It was also found that asanas were significantly better than pranayama in reducing triglycerides.

DISCUSSIONS

In this research, the antioxidant status of the subjects was measured through the lipid profiles of cholesterol and triglycerides. The interventional programmes, namely twelve weeks asanas and pranayamas proved that biochemical variables cholesterol and triglycerides can be significantly reduced and thereby the antioxidant status of the young healthy individuals can be moderated. According to Matill HA (1947) fats are a subgroup of lipids called triglycerides. Biochemical variables also encompass molecules such as fatty acids and their derivatives, as well as other sterol-containing metabolites such as cholesterol. There is strong evidence that one of the adaptations resulting from exercise is a strengthening of the body's antioxidant defenses, particularly the glutathione system, to regulate the increased oxidative stress. (Leeuwenburgh C, Fiebig R, Chandwaney R, Ji L 1994). The findings of this study that asanas and pranayama would significantly reduce biochemical variables cholesterol and triglycerides is in agreement with the findings of (Bhattacharya et.al. 2002)) who reported that the practice of yoga was found to be associated with significant decrease in cholesterol and influences oxidative status.

CONCLUSIONS

The findings of this study proved that yogasanas and pranayama significantly moderated cholesterol and triglycerides of the young healthy individuals. The biochemical status of the individuals were limited to only cholesterol and triglycerides in this study, in future researches similar other profiles can be included to get more accurate influences of yogic practices on other biochemical variables.

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