

Effect of Yogic Practices and Physical Activity on Selected Biochemical Variables among Sedentary Men

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Abstract

Physical exercise and yogic training will influence the general health and fitness. Only few researches were done on the effects of yoga and physical exercise on biochemical variables. Hence the investigator made an attempt to determine effect of yogic practices and physical activity on selected biochemical variables among sedentary men. Three groups (Yoga group, Physical activity group and control group) of fifteen subjects each were selected at random by a lot sampling technique. Yoga group was given selected asana practice, physical activity group were advised to go for walking regularly and control group was given no activities for six weeks. Blood sample were taken before and after the six weeks of training with the help of bio-chemical laboratory experts from the subject's vein and sent to government hospital at Bangalore to test clinically on Red Blood Cell (RBC) counts, Hemoglobin and White Blood Cell (WBC) counts. The pre test and post test data (report from laboratory) were statistically analyzed by applying ANACOVA and Scheffe's Post Hoc Test. From the result of this study it was concluded that the selected yogasana practice would influence positively on the selected bio-chemical variables among selected sedentary men. Hence, yogasana should be given due importance in modern life so that human life can become meaningful and help to keep an optimal physical fitness. As the result of this study also showed positive result for physical activity, the men who are leading sedentary profession may do physical activity such as walking regularly to maintain health and fitness. This study may assure the men towards a healthy body, peaceful mind and elevated spirit.

KEYWORDS: Yoga, Asana, Physical Exercise, Walking and Bio-chemical Variables.

INTRODUCTION

Blood may be described as a specialized connective tissue in which there is liquid inter cellular substance known as plasma and found elements, the red blood cells, the white blood cells and the platelets suspended in the plasma (**Henry, 1979**). The whole blood composed of Red blood cells, White blood cells and Platelets. Red blood cells contain hemoglobin, which is the molecule that carries oxygen and carbon dioxide through the bloodstream.

White blood corpuscles care important variety of cells in the blood. They do not contain hemoglobin, but bigger than RBC, nucleated, active amoeboid, much less in number and their life span is shorter. White blood cells help fight infections. They are also called leukocytes. There are five major types of white blood cells such as Basophils, Eosinophils, Lymphocytes, Monocytes and Neutrophils. Red blood cells consists of protein called hemoglobin.

The main function of hemoglobin is to carry oxygen from lungs to other organs of the body. And inversely, carries carbon dioxide from the organs back to the lungs and out

from the body. Low level of hemoglobin means less oxygen carrying capacity of the blood (Uhlmann, 2001).

Yoga can help in increasing blood cell count in two ways. One is by making use of breathing exercises and the other is by doing special asanas. Also because of twists and stretched postures, the functioning of endocrine glands, digestive organs, heart and other organs improves. To achieve this even simple Yogasanas are helpful, one can easily practice these yogasanas and get the best for himself (Iyengar, 1995). Walking is a physical activity, considered as one of an aerobic exercise. Aerobic exercise can alter the number of blood cells in several ways. In general, endurance training increases the number of red blood cells (Tran, 2005).

STATEMENT OF THE PROBLEM

Physical exercise and yoga training will improve prognosis of major cardio events and it will improve the blood cell RBC and WBC. The results of the study will reveal the effect of yoga training and physical exercise on blood cells counts. The purpose of this study was to determine effect of yogic practices and physical activity on selected biochemical variables among sedentary men.

HYPOTHESIS

1. It is hypothesized that the yogic practices and physical exercise would improve the selected bio-chemical variables among sedentary men.
2. It is hypothesized that there would be significant mean difference between the selected groups in the improvement of selected bio-chemical variables among sedentary men.

METHODOLOGY

The subjects were requested to assemble in a hall to seek their willingness to act as subjects. The investigator explained to them the purpose, nature, importance of experiment and the procedure to be employed to collect the blood. Further the role of subjects during experimental period and testing period were also explained. Three groups (Yoga group, Physical activity group and control group) of fifteen subjects each were selected at random by a lot sampling technique. The selected subjects were employed in nationalized banks and post offices. Their age ranged between 22-28 years. All the subjects were healthy and normal.

Yoga group was given selected asana practice for a period for six weeks under the supervision of the researcher. Selected compulsory asanas such as Salambasirasana, Salamba Sarvangasana and Savasana were performed by the subjects under the research supervisor regularly in the morning from 6.30 to 7.00AM. Optional asanas such as Tadasana, Virksasana, Parivrtta Trikonasana, Virabhadrasana, Utrasana, Utkatasana, Garudasana, Salabhasana, Dhanurasana, Bhujangasana, Matsyasana and Prasaruta Padottanasana were performed by the subjects as per the availability of time.

Physical activity group were advised to go for walking regularly in the morning from 6.30 to 7.00AM and the same was monitored by research supervisor for a period for six weeks. They were also allowed to play badminton game on Sundays for one hour. Control group was given no activities for a period for six weeks.

Blood sample was taken before and after the six weeks of training with help of bio-chemical laboratory experts from the subject's vein and sent to government hospital at Bangalore to test clinically on Red Blood Cell (RBC) counts, Hemoglobin and White Blood Cell (WBC) counts. The pre test and post test data (report from laboratory) were

statistically analyzed by applying ANACOVA. To determine the significant mean difference between the paired means 'F' was tested by Scheffe's Post Hoc Test. The level of significance was fixed at .05 level of confidence.

RESULTS AND DISCUSSION

COMPUTATION OF ANALYSIS OF COVARIANCE ON RBC

Table-I

(Scores in trillion cells/Litre)	Physical	Yoga	Control	Source of variance	Sum of squares	Df	Mean squares	Obtained f	Table f
Pre Test Mean	4.83	4.98	4.88	between	0.18	2	0.09	1.24	3.22
				within	3.06	42	0.07		
Post Test Mean	5.69	6.18	4.92	between	12.09	2	6.04	78.48	3.22
				within	3.23	42	0.07		
Adjusted Post Test Mean	5.68	6.19	4.92	between	12.03	2	6.01	76.80	3.23
				within	3.21	41	0.07		
Mean Diff	0.86	1.2	0.04						

Table F-ratio at 0.05 level of confidence for 2 and 42 (df) =3.23. *Significant

Table II

SCHEFFE'S CONFIDENCE INTERVAL TEST SCORES ON RBC

Means(Scores in trillion cells/Litre)				Required C I
Physical	Yoga	Control	Mean difference	
5.69	-	4.93	0.76*	0.26
5.69	6.19	-	0.51*	0.26
	6.19	4.93	1.27*	0.26

* Significant

BAR DIAGRAM ON ORDERED PRE, POST AND ADJUSTED POST TEST MEANS ON RBC

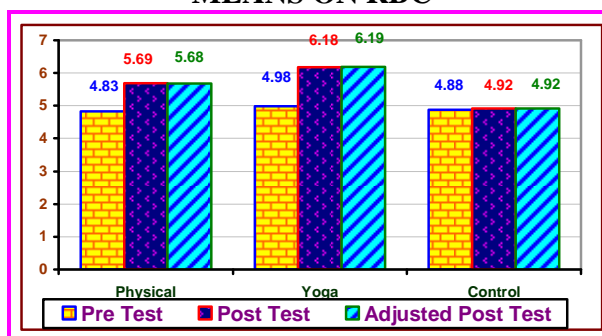


Figure 1

DISCUSSION ON THE FINDINGS OF RBC

The adjusted mean of the result table I and II indicated that, the result of analysis of covariance of RBC among selected groups. Here it was observed that the obtained 'F' value of 76.80 was greater than the table value of 3.23 with 2 and 57 degrees of freedom.

From the post hoc analysis, it was clear that the yoga group outperformed than the physical and control groups and also it is revealed that physical group outperformed control group in the improvement of RBC due to the six weeks of training.

COMPUTATION ON HEMOGLOBIN

Table III
SUMMARY OF ANALYSIS OF COVARIANCE ON HEMOGLOBIN

(Scores in grams/deciliters)	Physical	Yoga	Control	sv	ss	df	MS	F	TF
Pre Test Mean	13.57	13.59	13.62	between	0.016	2	0.00	0.39	3.22
				within	0.88	42	0.02		
Post Test Mean	16.40	17.23	13.77	between	97.94	2	48.97	393.13*	3.22
				within	5.23	42	0.12		
Adjusted Post Test Mean	16.40	17.23	13.77	between	96.52	2	48.26	379.96*	3.23
				within	5.20	41	0.12		
Mean Diff	2.83	3.64	0.15						

Table F-ratio at 0.05 level of confidence for 2 and 42 (df) =3.23. *Significant

Table IV
SCHEFFE’S CONFIDENCE INTERVAL TEST SCORES ON HEMOGLOBIN

Means (Scores in grams/deciliters)				Required C I
Physical	Yoga	Control	MD	
16.40	-	13.78	2.63*	0.33
16.40	17.23	-	0.83*	0.33
	17.23	13.78	3.46*	0.33

* Significant

BAR DIAGRAM ON ORDERED PRE, POST AND ADJUSTED POST TEST MEANS ON HEMOGLOBIN

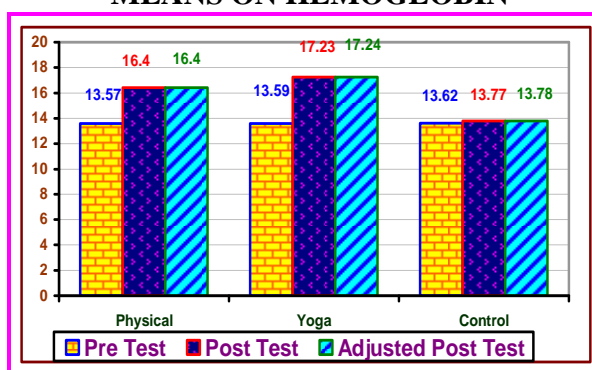


Figure 2

DISCUSSION ON THE FINDINGS OF HEMOGLOBIN

The adjusted mean of the result table III and IV indicated that, the result of analysis of covariance of hemoglobin among selected groups. Here it was observed that the obtained ‘F’ value of 379.96 was greater than the table value of 3.23 with 2 and 57 degrees of freedom. From the post hoc analysis, it was clear that the yoga group

outperformed than the physical and control groups and also it is revealed that physical group outperformed control group in the improvement of hemoglobin due to the six weeks of concerned training.

COMPUTATION ON WBC

Table V
SUMMARY OF ANALYSIS OF COVARIANCE ON WBC

(Scores in billion cells/Liter)	Physical	Yoga	Control	sv	ss	df	MS	F	TF
Pre Test Mean	3.83	4.10	4.033	between	0.60	2	0.30	1.00	3.22
				within	12.55	42	0.29		
Post Test Mean	6.5	8.03	3.96	between	126.53	2	63.26	74.92*	3.22
				within	35.46	42	0.84		
Adjusted Post Mean	6.41	8.09	3.98	between	127.64	2	63.82	81.47*	3.23
				within	32.11	41	0.78		
Mean Diff	2.66	3.92	0.06						

Table F-ratio at 0.05 level of confidence for 2 and 42 (df) =3.23. *Significant

Table VI
SCHEFFE'S CONFIDENCE INTERVAL TEST SCORES ON WBC

Means (Scores in billion cells/Liter)				Required C I
Physical	Yoga	Control	MD	
6.42	-	3.99	2.43*	0.82
6.42	8.09	-	1.67*	0.82
	8.09	3.99	4.10*	0.82

* Significant

BAR DIAGRAM ON ORDERED PRE, POST AND ADJUSTED POST TEST MEANS ON WBC

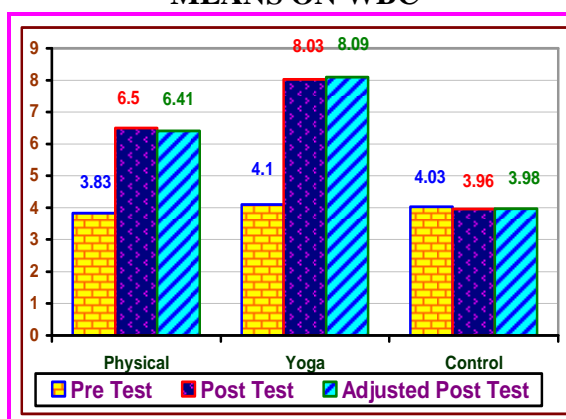


Figure 3

DISCUSSION ON THE FINDINGS OF WBC

The adjusted mean of the result table V and VI indicated that, the result of analysis of covariance of WBC among selected groups. Here it was observed that the

obtained 'F' value of 81.47 was greater than the table value of 3.23 with 2 and 57 degrees of freedom. From the post hoc analysis, it was clear that the yoga group outperformed than the physical and control groups and also it is revealed that physical group outperformed control group in the improvement of WBC due to the six weeks of concerned training.

DISCUSSION ON HYPOTHESIS

1. The results of this study proved that the yogic practices and physical exercise improved the selected bio-chemical variables among sedentary men. Hence the stated research hypothesis one was accepted at .05 level.
2. The results of this study found statistically significant mean difference between the selected groups in the improvement of selected bio-chemical variables among sedentary men. Hence the stated research hypothesis two was accepted at .05 level.

CONCLUSION

The researcher reviewed that the available in yogic exercise physiology literatures pertaining to the study from books, journals and research papers. Considering the feasibility of adaptations by subjects of sedentary men between the age group of 22-28 years the mental level of them, availability of time, the environment around the subjects, the effect of yoga training dealing with the changes on Red Blood Cells (RBC), Hemoglobin and White Blood Cells (WBC) in sedentary men were investigated. From this study it was concluded that the selected yogasanas practice would influence positively on the selected bio-chemical variables among selected sedentary men. Hence, yogasanas should be given due importance in modern education so that human life can become meaningful and help to keep an optional physical fitness. As the result of this study showed positive result for physical activity, the men who are leading sedentary profession may do physical activity such as walking regularly to maintain health and fitness. This study may assure the men towards a healthy body, peaceful mind and elevated spirit.

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