

Effect of Aerobic Exercise with Green Tea and Hibiscus Tea Supplements on Obesity Related Biochemical Parameters – A Meta-Analysis

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Abstract: The purpose of the study was to found out the effect of aerobic exercise with green tea and hibiscus tea supplements on obesity related biochemical parameters. For this study forty five obese college men were selected as a subjects their age groups were between 18-25 years. The subjects were selected from Rajiv Gandhi Arts and Science College, Puducherry. The selected subjects were randomly divided into three groups, namely Experimental group I underwent aerobic exercise with green tea (n=15), Experimental group II underwent aerobic exercise with hibiscus tea (n=15) and Group III acted as control (n=15). The low density lipoprotein, high density lipoprotein and blood sugar were selected for dependent variables for this study. The data on low density lipoprotein, high density lipoprotein and blood sugar were collected by administering aerobic exercise programme. Pre-test was collected two days before training program and the post-test data were collected at the end of the eight weeks. ANCOVA was applied as a statistical tool to find out the significant difference. Since three groups were compared, whenever the obtained 'F' ratio for the adjusted post-test means was found to be significant at 0.05 level of significance. The result of the study revealed that there was a significant improvement on obesity related biochemical parameters due to aerobic exercise with green tea and hibiscus tea supplements as compared to control group.

Keywords: Aerobic Exercise, Blood Sugar, Green Tea, Hibiscus Tea, High Density Lipoprotein, Low Density Lipoprotein and Obese.

1. INTRODUCTION :

Aerobic exercise is sustained physical activity that uses large muscle groups at a regular, even pace and induces the release of energy in the body through the increased consumption of oxygen in the body's metabolic process. It thus requires the exertion of the heart and lungs. Walking, jogging, swimming, cycling and dancing would be considered aerobic activity.

Aerobic exercise helps push the cardio and pulmonary systems further than the easy pace of everyday activities. This stress forces the body to adapt, strengthening it and making it fitter. The benefit of this type of exercise are not only mental and physical but it is also helps to reduce the risk of developing many common illness and diseases.

1.1. GREEN TEA

Green tea also known as oxidized tea, is made solely from the leaves of the camellia sinensis plant. The leaves are plucked, slightly withered then immediately cooked to preserve the green quality and prevent oxidization. It is promoted for improving mental alertness, relieving digestive symptoms and headaches and promoting weight loss. Studies show this type of tea can help lower blood pressure, triglycerides and total cholesterol.

1.2. HIBISCUS TEA

Hibiscus tea, also called sorrel tea or "sour tea," is a fragrant tea made from the dried calyces of the tropical Hibiscus sabdariffa flowers. Hibiscus sabdariffa flowers are native to Africa and grow in many tropical and subtropical regions around the world, including Thailand, China, and Mexico. Hibiscus tea has a fruity, refreshing flavour that many enjoy hot or iced. Many people drink it because of its purported health benefits.

Hibiscus tea has many purported health benefits including lowering blood pressure and cholesterol, soothing sore throats, and aiding weight management. Modern research has shown that hibiscus tea may in fact be an effective treatment for high blood pressure. Additionally, some researchers believe that hibiscus may be used to treat high cholesterol levels and digestive issues.

2. STATEMENT OF THE PROBLEM :

To find out whether the effect of aerobic exercise with green tea and hibiscus tea supplements on obesity related biochemical parameters.

3. HYPOTHESIS :

It was hypothesized that

- There would be a significant improvement in the biochemical parameters due to the effect of aerobic exercise with green tea and hibiscus tea supplements among obese college men.
- There would be a significant improvement in the experimental groups than the control group due to the effect of aerobic exercise with green tea and hibiscus tea supplements among obese college men.

4. OBJECTIVES OF THE STUDY :

To determine the effect of aerobic exercise with green tea and hibiscus tea supplements on obesity related biochemical parameters.

5. METHODOLOGY :

5.1. SELECTION OF THE SUBJECTS

To achieve the purpose of the present study, forty five obese college men were selected as subjects. The subjects were from Rajiv Gandhi Arts and Science College, Puducherry. The age groups were ranged between 18-25 years. The selected subjects were selected on the basis of body mass index and the subject were divided into three groups as Experimental group I, Experimental group II, control group. Experimental group I consists of fifteen subjects were undergone aerobic exercise with green tea and Experimental group II consists of subjects were undergone aerobic exercise with hibiscus tea supplements. Control group consists of fifteen subjects were not given any supplements.

5.2. SELECTION OF VARIABLES

5.2.1. Independent Variables

1. Aerobic exercise with green tea
2. Aerobic exercise with hibiscus tea

5.2.2. Dependent Variables

1. Low density lipoprotein
2. High density lipoprotein
3. Blood sugar

5.3. EXPERIMENTAL DESIGN

The subject were selected for this study through random group design consisting of pre and post-test, forty five obese college men were randomly divided into three groups, the group was assigned as an experimental group I (aerobic exercise with green tea), experimental group II (aerobic exercise with hibiscus tea) and control group (no training). The experimental groups underwent their aerobic exercise with green tea and hibiscus tea supplements. These are in the form of green tea and hibiscus tea were given daily as 20gm per day for eight weeks.

6. STATISTICAL TECHNIQUE :

The selected variables for which data were collected from three groups prior to and after experimentation on biochemical parameters were statistically examined for significant difference, if any by applying analysis of co variance (ANCOVA) with the help of SPSS package. The study was formulated as true random group design. The level of significance was accepted at 0.05 level.

Table – 1. Computation of Analysis of Covariance of Low Density Lipoprotein (LDL)
(Scores in mg/ml)

Means	Experimental Group I	Experimental Group II	Control Group	Source of Variance	Sum of Square	Df	Mean Square	'F' ratio
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Pre Test	141.33	139.33	141.13	Between	36.40	2	18.20	0.77
				Within	996.40	42	23.72	
Post Test	134.13	134.80	140.47	Between	363.33	2	181.67	8.35*
				Within	913.87	42	21.76	
Adjusted Post Test	133.47	135.94	139.99	Between	324.36	2	162.18	65.18*
				Within	102.02	41	2.49	

*Significant

(Required table value for significance at 0.05 level of confidence for df 2, 41 and 2, 42 are 3.22 and 3.23 respectively)

Table I shows the analysed data low density lipoprotein. The pre-test means of the low density lipoprotein were (141.33, 139.33, and 141.33) for the experimental group I, II and control group respectively. The obtained 'F' ratio of 0.77 of pre-test scores is less than the table of 3.23 for df 2 & 41 required for significance at 0.05 level of confidence on low density lipoprotein. The post-test means of the low density lipoprotein were (134.13, 134.80, and 140.47) for the experimental group I, II and control group respectively. The obtained 'F' ratio of 8.35 of post-test scores is greater than the table of 3.23 for df 2 & 41 required for significance at 0.05 level of confidence on low density lipoprotein. The adjusted post-test means of the low density lipoprotein were (133.47, 135.94, and 139.99) for the experimental group I, II and control group respectively. The obtained 'F' ratio of 65.18 of adjusted post-test scores is greater than the table of 3.23 for df 2 & 41 required for significance at 0.05 level of confidence on low density lipoprotein. The results of the study indicated that there was significance between the adjusted post-test means of experimental group I, II and control group on low density lipoprotein. The ordered adjusted means are presented through bar diagram for better understanding of the result of this study.

Fig: 1 - The Pre-test, Post-test and Adjusted post-test Mean value of Experimental and Control Groups on Low Density Lipoprotein (LDL)

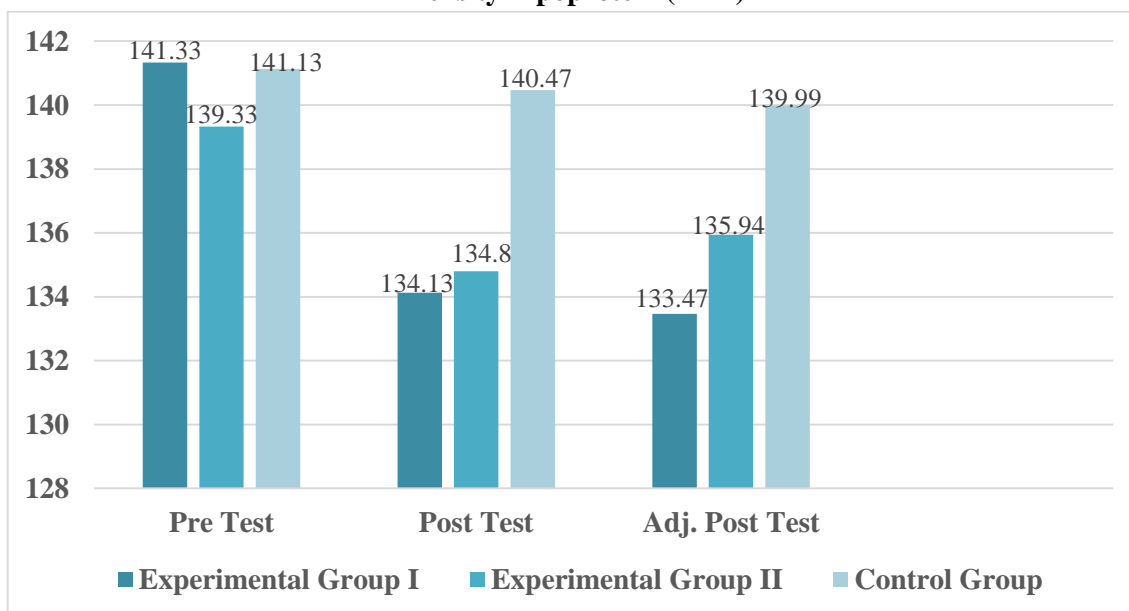


Table – 2. Computation of Analysis of Covariance of High Density Lipoprotein (HDL)
 (Scores in mg/ml)

Means	Experimental Group I	Experimental Group II	Control Group	Source of Variance	Sum of Square	Df	Mean Square	'F' ratio
Pre Test	47.00	44.93	45.07	Between	40.13	2	20.07	0.51
				Within	1643.87	42	39.14	

Post Test	54.67	49.47	44.67	Between	750.40	2	375.20	9.49*
				Within	1660.40	42	39.53	
Adjusted Post Test	53.47	50.12	45.20	Between	511.37	2	255.69	30.92*
				Within	339.07	41	8.27	

*Significant

(Required table value for significance at 0.05 level of confidence for df 2, 41 and 2, 42 are 3.22 and 3.23 respectively)

Table I shows the analysed data on high density lipoprotein. The pre-test means of the high density lipoprotein were (47.00, 44.93, and 45.07) for the experimental group I, II and control group respectively. The obtained 'F' ratio of 0.51 of pre-test scores is less than the table of 3.22 for df 2 & 42 required for significance at 0.05 level of confidence on high density lipoprotein. The post-test means of the high density lipoprotein were (54.67, 49.47, and 44.67) for the experimental group I, II and control group respectively. The obtained 'F' ratio of 9.49 of post-test scores is greater than the table of 3.22 for df 2 & 42 required for significance at 0.05 level of confidence on high density lipoprotein. The adjusted post-test means of the high density lipoprotein were (53.47, 50.12, and 45.20) for the experimental group I, II and control group respectively. The obtained 'F' ratio of 30.92 of adjusted post-test scores is greater than the table of 3.23 for df 2 & 41 required for significance at 0.05 level of confidence on high density lipoprotein. The results of the study indicated that there was significance between the adjusted post-test means of experimental group I, II and control group on high density lipoprotein. The ordered adjusted means are presented through bar diagram for better understanding of the result of this study.

Fig. 2 - The Pre-test, Post-test and Adjusted post-test Mean value of Experimental and Control Groups on High Density Lipoprotein (HDL)

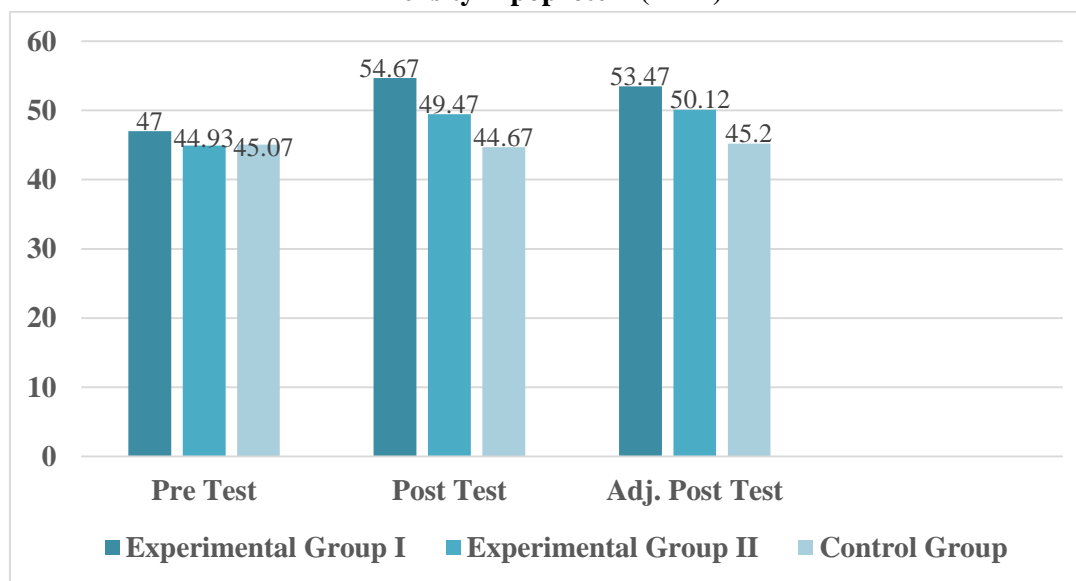


Table – 3. Computation of Analysis of Covariance of Blood Sugar (Scores in mg/ml)

Means	Experimental Group I	Experimental Group II	Control Group	Source of Variance	Sum of Square	Df	Mean Square	'F' ratio
Pre Test	97.80	100.33	100.53	Between	69.64	2	34.82	0.40
				Within	3661.47	42	87.18	
Post Test	87.13	90.73	99.20	Between	1151.24	2	575.62	10.42*
				Within	2319.07	42	55.22	

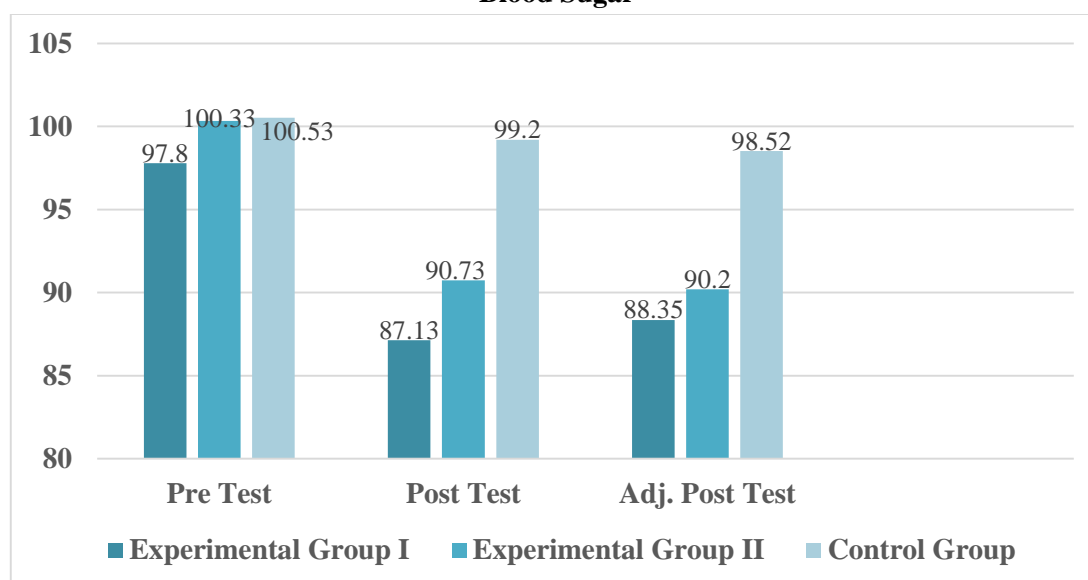
Adjusted Post Test	88.35	90.20	98.52	Between	874.04	2	437.02	31.40*
				Within	570.70	41	13.92	

***Significant**

(Required table value for significance at 0.05 level of confidence for df 2, 41 and 2, 42 are 3.22 and 3.23 respectively)

Table III shows the analysed data on blood sugar. The pre-test means of the blood sugar were (97.80, 100.33, and 100.53) for the experimental group I, II and control group respectively. The obtained 'F' ratio of 0.40 of pre-test scores is less than the table of 3.22 for df 2 & 42 required for significance at 0.05 level of confidence on blood sugar. The post-test means of the blood sugar were (87.13, 90.73, and 99.20) for the experimental group I, II and control group respectively. The obtained 'F' ratio of 10.42 of post-test scores is greater than the table of 3.22 for df 2 & 42 required for significance at 0.05 level of confidence on blood sugar. The adjusted post-test means of the blood sugar were (88.35, 90.20, and 98.52) for the experimental group I, II and control group respectively. The obtained 'F' ratio of 31.40 of adjusted post-test scores is greater than the table of 3.23 for df 2 & 41 required for significance at 0.05 level of confidence on blood sugar. The results of the study indicated that there was significance between the adjusted post-test means of experimental group I, II and control group on blood sugar. The ordered adjusted means are presented through bar diagram for better understanding of the result of this study.

Fig: 3 - The Pre-test, Post-test and Adjusted post-test Mean value of Experimental and Control Groups on Blood Sugar



7. CONCLUSION :

From the data analysis

- There was a significant difference among selected aerobic exercise with green tea group, aerobic exercise with hibiscus tea group and control group on selected biochemical parameters namely low density lipoprotein (LDL), high density lipoprotein (HDL) and blood sugar.
- There was a significant reductions were noticed on selected bio chemical parameters namely low density lipoprotein (LDL) and blood sugar and due to aerobic exercise with green tea and hibiscus tea among obese college men.
- There was a significant improvement were noticed on high density lipoprotein (HDL) due to the influence of aerobic exercise with green tea and hibiscus tea among obese college men.

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