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THE EFFECT OF FIFTEEN DAYS OF DIETARY NITRATE SUPPLEMENTATION ON HEMOGLOBIN COUNT OF TRAINED CROSS COUNTRY RUNNERS

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ABSTRACT

The purpose of the study was to find out the effect of fifteen days of Dietary Nitrate Supplementation on Hemoglobin Count of Trained Cross Country Runners. Thirty trained athletes (15 males and 15 females); 18 to 28 years of age were selected for the study. Experimental and control groups were made consisting of male and female athletes. In this study beetroot supplementation was considered as independent variables and athletes' Hemoglobin Count was considered as dependent variable. The blood was collected by the pathologist and it was measured by Automated Cell Counter at pathology. In this study, dietary nitrate supplementation in a form of beetroot juice (250 ml/day for fifteen days) was given to the subjects of experimental group only in afternoon. In order to find out the effect of Dietary Nitrate Supplementation on a Hemoglobin Count, descriptive statistics and analysis of covariance (ANCOVA) was used. The level of significance was set at 0.05 levels. The result of the study showed that there was no significant improvement of dietary nitrate supplementation on hemoglobin count of trained cross country runners.

KEYWORDS : *Dietary Nitrate , independent variables and athletes'.*

INTRODUCTION

Rich vegetable diet has many benefits. All vegetables contain nitrate and it is found in large amount in beetroot and green leafy vegetables. Nitrate found in vegetables lower blood pressure. Consumption of vegetables has been thought to help in protection against various diseases like cardiovascular disease. The Beetroot juice which contains nitrate has been reported to increased plasma nitrate concentration, which leads to decrease blood pressure, inhibits platelet aggregation and prevent endothelial dysfunction.

Nutritional supplements may be designed to provide specialized support for athletes. Some of these consist of high-protein products, such as amino acid supplements, while other products contain nutrients that support metabolism, energy, and athletic performance and recovery. People engaging in intense athletic activity may have increased needs for water – soluble vitamins, antioxidants, and certain minerals, including chromium. Sports drinks contain blends of electrolytes that body loses during exertion and sweating, as well as vitamins, minerals, and performance – supporting herbs.

Dietary Nitrate supplementation, usually in the form of beetroot juice, has been heralded as a possible new ergogenic aid for sport and exercise performance. Rich vegetable diet has many benefits. All vegetables contain nitrate and it is found in large amount in beetroot and green leafy vegetables. Nitrate found in vegetables lower blood pressure. Consumption of vegetables has been thought to help in protection against various diseases like cardiovascular disease.

Beetroot juice helps lungs to work more efficiently, when consumed; beetroot juice has two marked physiological effects. Firstly, it widens blood vessels, reducing blood pressure and allowing more blood flow. Secondly, it affects muscle tissue, reducing the amount of oxygen needed by muscles during activity.

The Beetroot juice which contains nitrate has been reported to increased plasma nitrate concentration, which leads to decrease blood pressure, inhibits platelet aggregation and prevent endothelial dysfunction. Research have found that beetroot contain nitrate and dietary nitrate (NO_3^-) which might serve to maintain or improve blood flow to the skeletal muscles and leads to increased oxygen supply to skeletal muscles and many other physiological benefits which improves cardiovascular efficiency.

The changes from beetroot take effect in about 30 minutes, peak after 90 minutes, stay elevated for 6 hours and remain effective for at least 15 days. Taking beetroot juice daily will build up the effect over a 3 – 4 days then plateau. Recent studies have demonstrated that chronic (3 – 15 d) and acute (single dose prior to exercise) protocols of beetroot juice intake are associated with a consistent enhancement of exercise economy (reduced oxygen cost of exercise). Evidence is also emerging that Supplementation with beetroot juice prior to exercise can enhance exercise capacity and sports performance. The scholar strives to find out the effect of fifteen days of Dietary Nitrate Supplementation on Hemoglobin Count of Trained Cross Country Runners

METHODOLOGY

Selection of the subjects

Thirty male and female athletes of 18 to 28 years of age were selected for the present study. One experimental and one control groups were made consisting of males and females. Details of subjects are given below:

Gender	Group	No. of Subjects
Males	Experimental Group	08
	Control Group	07
Females	Experimental Group	07
	Control Group	08

Administration of Programme

Experimental group was administered 250 ml beetroot juice/day for fifteen days. All the subjects were involved in regular athletics training program for fifteen days.

1. Hemoglobin Count

Objective: To measure the Hemoglobin Count

Unit of measurement: Hemoglobin Count was measured in gm/dL.

Methodology: The blood was collected by the pathologist and it was measured by Automated Cell Counter at pathology.

Research Design

Group	Pre -Test	15 Days Training Programme	Post –Test
Experimental Group (15 Subjects)	Hemoglobin Count	Beetroot Supplementation (250 ml/day at 2 pm) and regular training programme (Morning and evening session)	Hemoglobin Count
Control Group (15 Subjects)	Hemoglobin Count	Regular training programme (Morning and evening session) without any Supplementation.	Hemoglobin Count

Statistical Procedure

In order to find out the effects of fifteen days of Dietary Nitrate Supplementation on Hemoglobin Count of Trained Cross Country Runners, descriptive statistics and analysis of covariance (ANCOVA) was used. The level of significance was set at 0.05 levels.

Analysis of the Data and Results of the Study

The analysis of the data of the dependent variables i.e. Hemoglobin Count of Experimental and Control groups were computed by applying Descriptive statistics and the Analysis of Covariance (ANCOVA) to find out the significant improvement using SPSS Software version-16. The level of significance was set at 0.05 levels.

Findings

Table – 1
Descriptive Statistics of Hemoglobin Count of Experimental Group and Control Group in Pre-Test and Post-Test

Descriptive Statistics	Different Groups			
	Experimental Group		Control Group	
	Pre test	Post test	Pre test	Post test
Mean	13.086	12.706	12.386	12.273
Std. Error of Mean	.361	.403	.333	.322
Std. Deviation	1.399	1.564	1.292	1.250
Variance	1.960	2.448	1.671	1.564
Skewness	.111	.041	-.250	-.411
Std. Error of Skewness	.580	.580	.580	.580
Kurtosis	-.971	-1.258	-.646	-.192
Std. Error of Kurtosis	1.121	1.121	1.121	1.121
Range	4.70	4.80	4.30	4.40
Minimum	11.00	10.40	10.00	10.00
Maximum	15.70	15.20	14.30	14.40
N	15	15	15	15

Table – 2
Analysis of Variance of Comparison of Means of Experimental Group and Control Group in relation to Hemoglobin Count

		Sum of Squares	*df*	Mean Square	*f*	Sig.
Pre Test	Between Groups	3.675	1	3.675	2.024	.166
	Within Groups	50.835	28	1.816		
Post Test	Between Groups	1.408	1	1.408	.702	.409
	Within Groups	56.159	28	2.006		

Insignificant at .05 levels

f value required to be significant at 1, 28 *df* = 4.196

In relation to pre test, table 2 revealed that the obtained '*f*' value of 2.024 was found to be insignificant at 0.05 level, since this value was found lower than the tabulated value 4.196 at 1, 28 *df*.

In relation to post test, insignificant difference was found among experimental and control group pertaining to ***Hemoglobin Count***, since *f* value of 0.702 was found insignificant at .05 level.

Table – 3
Adjusted Post Test Means of Experimental Group and Control Group in relation to Hemoglobin Count

Treatment Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Experimental	12.363[a]	.136	12.085	12.642
Control	12.617[a]	.136	12.338	12.895
a. Covariates appearing in the model are evaluated at the following values: pretest =12.7367.				

Adjusted means and standard error for the data on ***Hemoglobin Count*** of Experimental and Control Groups during post testing had been shown in Table – 3 and Fig – 1. This indicated that the initial differences in the scores were compensated in the post-testing or the effect of covariate was eliminated in comparing the effectiveness of the treatment groups during post-testing.

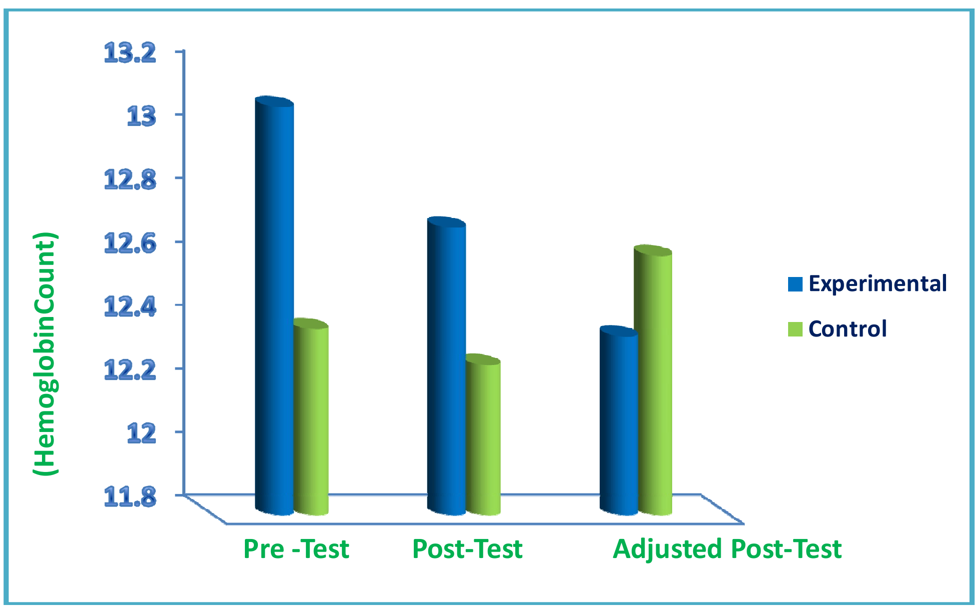

Fig 1: Graphical representation of *Hemoglobin Count* between pre and post test means among the Experimental and Control Groups

Table – 4
Analysis of Covariance of Comparison of Adjusted Post Test Means of Experimental Group and Control Group in relation to Hemoglobin Count

Source	Sum of Squares	*df*	Mean Square	*f*	Sig.
Contrast	.450	1	.450	1.686	.205
Error	7.204	27	.267		

Insignificant at .05 levels

f value required to be significant at 1, 27 *df* = 4.21

Table 4 revealed that the obtained '*f*' value of 1.686 was found to be insignificant at 0.05 level, since this value was found lower than the tabulated value 4.21 at 1, 27 *df*.

RESULT OF THE STUDY

The result of the present study showed no significant improvement of dietary nitrate supplementation on hemoglobin count of trained cross country runners after they were given 250 ml beetroot juice/day for fifteen days.

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