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Influence of Altitude Training on Selected Physiological Variables among College Men Students

M. Prem Rajkumar[1] & Dr. K. Sivakumar[2]

[1]*Research Scholar, Department of Physical Education, Bharathiar University, Coimbatore, Tamilnadu, India.*
[2]*Assistant Professor, Department of Physical Education and Sports Sciences, Annamalai University, Chidambaram, Tamilnadu, India.*

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Abstract

The purpose of the study was to find out the effect of altitude training on selected physiological variables such as systolic blood pressure and diastolic blood pressure. To achieve this purpose of the study, thirty men students studying in Kingston Engineering College, Katpadi, Vellore District, Tamil Nadu, India were selected as subjects at random. The age of the subjects were ranged from 18 to 20 years. The selected subjects were divided into two equal groups of fifteen subjects each, such as altitude training group (Group I) and control group (Group II). The altitude training group (Group I) underwent their respective training programme for three days per week for twelve weeks. Group II acted as control in which they did not undergo any special training programme apart from their regular physical education programme. All the subjects of two groups were tested on selected criterion variable such as systolic blood pressure and diastolic blood pressure at prior to and immediately after the training programme by using sphygmomanometer. The analysis of covariance (ANCOVA) was used to analysis the significant difference, if any in-between the groups. The level of significant to test the 'F' ratio obtained by the analysis of covariance was tested at .05 level of confidence, which was considered as an appropriate. The results of the study revealed that there was a significant difference between altitude training group and control group on selected physiological variables such as systolic blood pressure and diastolic blood pressure. Significant changes on selected criterion variables namely systolic blood pressure and diastolic blood pressure were also noticed due to altitude training.

Keywords: Altitude Training, Physiological Variables, College Men.

Introduction

Athletes from many sports have used altitude training to prepare for a big match or event, and not just when the event will be at a high altitude. They do this because the air is "thinner" at high altitudes meaning there are fewer oxygen molecules per volume of air. Every breath taken at a high altitude delivers less of what working muscles require. While the effect is most dramatic at altitudes greater than 8,000 feet (2,438 meters) above sea level, it is noticeable even at 5,000 feet (1,524 meters) above sea level.

To compensate for the decrease in oxygen, one of the body's hormones, erythropoietin (EPO), triggers the production of more red blood cells to aid in oxygen delivery to the muscles. By training at high altitudes, athletes aim to allow their bodies to produce extra red blood cells. Then, they head to a competition at lower elevations to take advantage of their changed physiology, which should last for 10 to 20 days. Hence, Athletes choose to train at high altitude due to the underlying benefits of intermittent hypoxia training – in essence regular exposure to an environment where oxygen availability is reduced due to natural or artificial methods.

Correspondence
M.Prem Rajkumar
E-mail: kingtonped@kingston.ac.in, Ph. +9198429 10498

Methodology

The purpose of the study was to find out the effect of altitude training on selected physiological variables such as systolic blood pressure and diastolic blood pressure. To achieve this purpose of the study, thirty men students studying in Kingston Engineering College, Katpadi, Vellore District, Tamil Nadu, India were selected as subjects at random. The age of the subjects were ranged from 18 to 20 years. The selected subjects were divided into two equal groups of fifteen subjects each, such as altitude training group (Group I) and control group (Group II). The altitude training group (Group I) underwent their respective training programme for three days per week for twelve weeks. Group II acted as control in which they did not undergo any special training programme apart from their regular physical education programme. All the subjects of two groups were tested on selected criterion variable such as systolic blood pressure and diastolic blood pressure at prior to and immediately after the training programme by using sphygmomanometer. The analysis of covariance (ANCOVA) was used to analysis the significant

difference, if any in-between the groups. The level of significant to test the 'F' ratio obtained by the analysis of covariance was tested at .05 level of confidence, which was considered as an appropriate.

Analysis of the Data

The influence of altitude training on each physiological variable were analyzed separately and presented below.

Systolic Blood Pressure

The analysis of covariance on systolic blood pressure of the pre and post test scores of altitude training group and control group have been analyzed and presented in Table I.

Table 1

Analysis of covariance of the data on systolic blood pressure of pre and post tests scores of altitude training group and control group

Test	Altitude Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test							
Mean	122.67	122.80	Between	0.1333	1	0.1333	0.01
S.D.	3.63	2.38	Within	319.7333	28	11.4190	
Post Test							
Mean	120.07	122.40	Between	40.8333	1	40.8333	4.66*
S.D.	2.86	2.82	Within	245.3667	28	8.7631	
Adjusted Post Test							
Mean	120.11	122.35	Between	37.6903	1	37.6903	18.45*
			Within	55.1688	27	2.0433	

* Significant at .05 level of confidence.

(The table value required for significance at .05 level of confidence with df 1 and 28, 1 and 27 were 4.20 and 4.21 respectively)

The table 1 shows that pre-test means on systolic blood pressure of altitude training group and control group are 122.67 and 122.80 respectively. The obtained "F" ratio of 0.01 for pre -test means is less than the table value of 4.20 for df 1 and 28 required for significance at .05 level of confidence on systolic blood pressure. The post-test means on systolic blood pressure of altitude training group and control group are 120.07 and 122.40 respectively. The obtained "F" ratio of 4.66 for post-test means is more than the table value of 4.20 for df 1 and 28 required for significance at .05 level of confidence on systolic blood pressure. The table I further shows that the adjusted post-test mean values of altitude training group and control group are 120.11 and 122.35 respectively. The obtained "F" ratio of 18.45 for adjusted post-test means is greater than the required table value of 4.20 for df 1 and 28 required for significance at .05 level of confidence on systolic blood pressure. The results of the study indicated that there was a significant difference between the adjusted post-test means of altitude training group and control group on systolic blood pressure.

Diastolic Blood Pressure

The analysis of covariance on diastolic blood pressure of the pre and post test scores of altitude training group and control group have been analyzed and presented in Table II.

Table 2

Analysis of covariance of the data on diastolic blood pressure of pre and post tests scores of altitude training group and control group

Test	Altitude Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test							
Mean	85.33	84.87	Between	1.6333	1	1.6333	0.59
S.D.	1.58	1.68	Within	77.0667	28	2.7524	
Post Test							
Mean	82.20	84.33	Between	34.1333	1	34.1333	9.20*
S.D.	1.63	1.35	Within	103.8667	28	3.7095	
Adjusted Post Test							
Mean	81.99	84.55	Between	48.1788	1	48.1788	263.58*
			Within	4.9352	27	0.1828	

* Significant at .05 level of confidence.

(The table value required for significance at .05 level of confidence with df 1 and 28, 1 and 27 were 4.20 and 4.21 respectively)

The table 2 shows that pre-test means on diastolic blood pressure of altitude training group and control group are 85.33 and 87.87 respectively. The obtained "F" ratio of 0.59 for pre -test means is less than the table value of 4.20 for df 1 and 28 required for significance at .05 level of confidence on diastolic blood pressure. The post-test means on diastolic blood pressure of altitude training group and control group are 82.20 and 84.33 respectively. The obtained "F" ratio of 9.20 for post-test means is more than the table value of 4.20 for df 1 and 28 required for significance at .05 level of confidence on diastolic blood pressure. The table 2 further shows that the adjusted post-test mean values of altitude training group and control group are 81.99 and 84.55 respectively. The obtained "F" ratio of 263.58 for adjusted post-test means is greater than the required table value of 4.21 for df 1 and 27 required for significance at .05 level of confidence on diastolic blood pressure. The results of the study indicated that there was significant difference between the adjusted post-test means of altitude training group and control group on diastolic blood pressure.

Conclusions

1. There was a significant difference between altitude training group and control group on systolic blood pressure.
2. There was a significant difference between altitude training group and control group on diastolic blood pressure.
3. And also it was found that there were significant changes on selected criterion variables such as systolic blood pressure and diastolic blood pressure due to altitude training.

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