EFFECT OF SELECTED ENDURANCE TRAINING METHODS ON HEMOGLOBIN LEVEL OF WOMEN ATHLETES

Rajkumar

Ph. D Scholar, Department of Physical Education, Banaras Hindu University, Varanasi, India

ABSTRACT

The purpose of the study was to investigate the effect of endurance training methods on hemoglobin level of women athletes. The subjects were from the C.S.J.M University, Kanpur. The female students acted as the source of data. 20 female athletes of department of Physical Education, C.S.J.M University, Kanpur were selected as subjects. Age was ranging from 20-25 years. Hemoglobin was measured by Sahli (Sahli-Adams). To determine the effect of endurance (ANCOVA) was applied. In the light of the findings, it was concluded that a training of six weeks endurance was sufficient to have a significant difference in Hemoglobin of Women Athletes.

Key words: Endurance Training, Hemoglobin and Women Athletes.

INTRODUCTION:

The word training has been a part of human language since ancient times. It denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years. The term ‘Training’ is widely used in sports. It refers to any organized & systematic instructional process. Which aim at enhancing man’s ability with regard to physical, psychological and intellectual aspects. Physical training helps the organism in achieving their physical fitness and also helps in improving their proficiency in games and sports. Every human has the concepts of physical fitness and wants to be physically fit. Individual’s fitness level can be judged by his working capacity. It depends upon the nature of the task which individual performs in his daily life without getting undue fatigue. Among the various objectives of physical education physical fitness is most important and this can be well developed only by good programmers of physical education. Physical Fitness is the ability to last, to bear up, to withstand stress, and to persevere under difficult circumstances where an unfit person would
quit. It is opposite to lacking energy to enter restfully into life activates and to becoming exhausted from unexpected demanding physical exertion.

The greater enemy of a player is not the opponent but fatigue. The only way to keep this enemy at bay is developing and maintaining top physical condition. Physical conditioning leads to a number of changes and makes possible better performance and fast recovery. The physical fitness levels have direct relations with the internal mechanism of the body. If there is proper balance and co-ordination among various systems of the body individual will remain fit and with slight imbalance he will have troubles. Physical fitness is effected by many factors as dietary habits, environment, heredity and type of work he do in his daily life etc. but it ultimately depends on the functional harmony among the different systems of the human body. Endurance training increases the total amount of hemoglobin in the body and this can be used by evaluating the red cells volume and hemoglobin counts. Endurance activity is depends upon the blood hemoglobin concentration that transports oxygen from the lungs. An individual having high physical fitness consumes more oxygen. The transport of oxygen is done by blood. Blood is a tissue in which there is liquid intercellular substance known as plasma and formed elements. The red blood cells, the white blood cells and the platelets suspended in the plasma.

R.B.C. of the blood contains iron containing pigment hemoglobin. In fact hemoglobin is responsible for the transport of oxygen. When the consumption of oxygen increases the R.B.C. number of the concentration of hemoglobin increases which helps in the required supply of oxygen. The normal average R.B.C. (Erythrocytes) count in adult male is taken as 5.5 million per mm and in female 4.8 million per cubic millimeter. A brief period of vigorous exercise may increase the count, mainly owing to the passage of fluid out of the circulation.

METHODOLOGY:
Selection of Subject- 20 female players of Department Of Physical Education, C.S.J.M. University Campus, Kanpur were selected as the subject for this study. The average age of the subjects ranged from 20 to 25 years. The subjects were randomly selected and divided into two groups in equal number of 10 women athletes. The experimental treatment also was assigned to a
group at random and the other group was as control group. Endurance training was administered to the group – A or experimental group and group – B was kept as control group without any type of specific training but the subjects of both the groups were taken part in their daily vigorous activities.

Criterion Measures- To determined the hemoglobin of women athletes with the help of Sahli’s Hemoglobin meter.

Statistical Technique- To determine the effect of endurance training methods on Hb level of women athletes’ the analysis of covariance (ANCOVA) statistical technique was applied. The level of significance was set at 0.05 to test the hypothesis. The results were analyzed statistically and on the basis of statistical results interpretation was done.

The findings pertaining experimental group and control groups mean and standard deviations were computed and data pertaining to that have been presented in table -1.

Table-1
Mean and Standard Deviation of Experimental and control group of female Athletes of Department of Physical Education, C.S.J.M. University, Kanpur

<table>
<thead>
<tr>
<th>Variables</th>
<th>Test</th>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemoglobin</td>
<td>Pre</td>
<td>Experimental</td>
<td>10</td>
<td>12.64</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>control</td>
<td>10</td>
<td>12.71</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>20</td>
<td>12.67</td>
<td>0.58</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>Experimental</td>
<td>10</td>
<td>13.44</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>control</td>
<td>10</td>
<td>12.71</td>
<td>0.68</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>20</td>
<td>13.07</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Fifth and sixth column of table -1 reveals the mean and standard deviation of Hemoglobin Pre (Experimental Group 12.64 ±0.60 Control Group 12.71 ±0.59 Total 12.67 ±0.58) and Post (Experimental Group 13.44 ±0.65 control Group 12.71±0.68 Total 13.07 ±0.75) respectively.
To observe the difference between experimental and control group the analysis of variance and co-variance was adopted and data pertaining to these have been presented in the Table.

Table -2

Analysis of Co-Variance of the Means of Experimental Group And The Control Group in relation to Hemoglobin

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Means sum of squares</th>
<th>F-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>12.64</td>
<td>12.71</td>
<td></td>
<td>A .024</td>
<td>0.068</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>W 6.493</td>
<td></td>
</tr>
<tr>
<td>Post-test</td>
<td>13.44</td>
<td>12.71</td>
<td></td>
<td>A 2.665</td>
<td>5.941*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>W 8.073</td>
<td></td>
</tr>
<tr>
<td>Adjusted post test</td>
<td>13.475</td>
<td>12.675</td>
<td></td>
<td>A 3.194</td>
<td>37.727*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>W 1.439</td>
<td></td>
</tr>
</tbody>
</table>

* Significant at 0.05 level of significance

The analysis of co-variance for hemoglobin indicated that the resultant F-ratio of .068 was insignificant in case of pre-test means from which it is clear that the pre-test mean does not differ significantly and that the random assignment of subjects to the experimental groups was quite successful. The post-test means of all the two groups yielded a F-ratio of 5.941 which was significant at 0.05 level of confidence. The F-ratio needed for significance with 1, 18 degree of freedom is 4.41 at 0.05 level of confidence.

The difference between the adjusted post means was found significant as the obtained F-ratio was 37.727. The F-ratio needed for significance at 0.05 level of confidence was 4.45. Thus, significant difference exits between experimental and control group in relation to hemoglobin.

In order to determine which group differ significantly post hoc mean was applied

Table – 3

Post Hoc mean comparison of experimental and control group in relation to hemoglobin

<table>
<thead>
<tr>
<th>Experimental group</th>
<th>Control group</th>
<th>Mean difference</th>
<th>Critical difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.475</td>
<td>12.675</td>
<td>0.8*</td>
<td>0.275</td>
</tr>
</tbody>
</table>
The above table reveals that significant difference exist between experimental and control group as the mean difference of 0.8 is greater than the critical difference of 0.275. As the mean of experimental group is greater than control, thus there was significant effect of Endurance Training Methods on the Hemoglobin level of Women Athletes.

DISCUSSION OF FINDINGS:

A rise in hemoglobin level was exhibited consequent to exercise in untrained boys. This rise was more marked in untrained boys in comparison to trained indicating already baseline level of hemoglobin in trained individuals this result consents with findings of (Schumacher et al 2002). Rise in hemoglobin level in untrained could possibly be on account of flushing action on hemoglobin stores of augmented hemodynamic states. Spleen can expel 110-258 ml of blood into circulation; the blood in spleen is more concentrated and contains as much as 40% more RBC than normal blood. It may be concluded that in untrained individual blood remains more in stored conditions and are diverted to circulation in the hour of need. While in trained one stored blood is less in quantity as per our results obtained. The impact of exercise is manifested in terms of fall in serum iron level in untrained boys. It indicates that the iron stores through serum iron are diverted to hemoglobin synthesis and since in untrained there is sudden challenge of RBC demand, extent of diversion is more marked. Which is manifested in terms of fall in serum iron consequent to exercise but in trained extent of diversion becomes less due to consistent temporal
diversion but in either case aim is achieved to develop the capacity of meeting the challenge of heightened demand of O through hemoglobin. Kargotich S et.al stated that a 6 weeks of progressive endurance training steadily increased plasma glutamine levels, which may prove useful in the monitoring of training responses. In the present study also significant difference was found between experimental group which pursued a endurance training and control group which followed their normal routines in relation to hemoglobin. Thus, the present study is supported by the above findings.

DISCUSSION OF HYPOTHESIS:
In the light of findings of the study, the hypothesis that there would be effect of Endurance Training Methods on the Hemoglobin level of Women Athletes training on hemoglobin was accepted.

CONCLUSIONS:
In the light of the findings, it was concluded that a training of six weeks endurance training was sufficient to have a significant difference in the hemoglobin of Women athletes.

Reference


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