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The effect of different training program on cardiovascular endurance of long distances runner

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Abstract

The purpose of the study was to find out the effect of different training program on cardiovascular endurance. For the purpose 45 long distance runners were selected randomly from Different College of Vidyasagar University, Burdwan University and West Bengal State University. To find out cardiovascular endurance cooper 12 minutes run and walk test were introduced. The subject was divided three equal group [15 Fartlek Training group, 15Sand Training group and 15 control group]. 6 week alternative day (Monday, Wednesday, Friday) Training was introduced. Age of the subjects was 18-24 years. ANCOVA were applied to calculate the collected data at 0.05 level of significant to find out the exact significant place post-hoc test were introduced. The result of the study there were significant difference among three groups. Fartlek training group and sand training group were no significant difference. Sand training group and control group were significant difference and also significant difference was found between Fartlek training group and control group.

Keywords: cardiovascular endurance, Fartlek training, Sand training, Cooper Test

Introduction

Human-body is one of the most beautiful as well as the most complex things nature has unique creation acts, reacts and interacts is a rare phenomenon. Over the decades the society in general has realized the need for keeping fit and healthy through organized physical activities programme. Scientific evidences from biological science has made clear that man must have to change in the organized programme of physical activity is schools and colleges.

The regular and systematic use of physical exercises, however does not guarantee maximum improvement in performance. The effect of these exercises in increased or decreased by a multitude of factors. Some of these factors, if ignored lead to a drastic reduction in the efficacy of physical exercises. Most important among these are sports equipment and implements, verbal instructions means of recovery, means of assessment of performance capacity, nutrition, and psychological means and so on. In order to achieve best result, all these factors or means are to be used in addition to or along with physical exercise. The physical exercises and the other means or factors are to be judiciously applied in a systematic manner. The process of preparation of a person for improving has performance, therefore should not be confined only to physical exercise.

The cardio-vascular system includes heart, arteries, capillaries & veins. They all differ in structure as well as functions. The volume of the blood in our body is limited but it has to perform un-limited amount of work continuously. This naturally leads to the conclusion that same quantity of blood must be used over again. The total amounts of blood in our body carry about 1200ml of O₂ and this can meet the oxygen needs of the body for about 5 minutes only. So blood must be re-oxygenated and send back to the tissues at every 5 minutes, means blood must circulate continuously in a cyclical manner doing the same job repeatedly.

The resting upright stroke volume of untrained male subject's average between 70 and 90 ml per beat with maximal values ranging between 100 and 120 ml per beat. For trained men both resting and maximal volume are higher averaging about 100 and 120 ml, 150 & 170 ml / beat respectively. For the high trained athletes mentioned earlier maximal stroke volume may reach even exceed 200 ml per beat. Both the total blood volume and the total amount of hemoglobin increase with training. The increase of cardiac output with exercise is brought about through

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increases in stroke volume and in heart rate. The increase in stroke volume which reaches maximum level during sub maximal exercise is a result of a greater emptying of the left ventricle. Heart rate increase linearly with unceasing work load and volume of O₂ in both trained and untrained subject. Training has a very pronounced effect on heart rate even at Vest. For example highly trained athletes of either sex have resting heart rates may be as low as or lower than 40 beat per minutes. In contrast resting heart rate for untrained but healthy individual may be as high as 90 beat per minutes. A slow resting heart beat is a characteristic of trained individual.

Statement of the Problem

The purpose of the study was to find out the effect of different training program on cardiovascular endurance of long distance runner.

Methodology

The objective of the study was to find out the effect of different training programme on cardiovascular endovascular endurance of long distance runner. For the purpose 45 long distance runners were selected randomly from Different College of Vidyasagar University, Burdwan University and West Bengal State University. To find out cardiovascular endurance cooper 12 minutes run and walk test were introduced. The subject was divided three equal group [15Fartlek Training group, 15Sand Training group and 15 control group]. 6 week alternative day (Monday, Wednesday,

Friday) Training was introduced. Age of the subjects was 18-24 years. ANCOVA were applied to calculate the collected data at 0.05 level of significant to find out the exact significant place post-hoc test were introduced.

Findings

For each of the chosen variable the results pertaining to significant difference, if any, between the pre-test and post-test means for the three groups after six weeks training period, which were submitted to analysis of co-variance, are given in Table - I to III

Table I: Significance of Difference Between The Pre-Test And Post-Test Means of Two Experimental Groups and Control Group In Cardio-Vascular Endurance

Groups	Pre-test mean	Post test mean	Difference Between mean	SE _{MD}	't' ratio
Fartlek training	2173	2279	106	6.68	15.86*
Sand running	2127	2259	132	14.85	8.88*
Control group	2052	2062	10	11.82	0.84

*Significant at 0.05 level of confidence 't' 0.05 (14 df) = 2.14

It is evident from the Table-I that the fartlek training group improved significantly showing 't' value of 15.86 & Sand running group also improved significantly than pre-test, the 't' ratio being 8.88. However no significant improvement was marked in case of the control group.

Table – II: Analysis of Variance and Co-Variance of the Means of two Experimental Groups and the Control Group Incardio-Vascular Endurance

Particulars	Groups			Sum of square	Df	Mean square	'F ratio
	Fartlek training	Sand running	Control group				
Pre-test	2173	2127	2052	(B)29071 (W) 22.0007	2 42	.145350 .523826	0.27
Post-test	2279	2259	2062	(B)-4311501 (W)-15.2687	2 42	.215750 .363540	0.59
Adjust	2244.76	2253.05	2102.18	(B)-1.45332	2	.72666	4.39*
Post Test mean				(W)-6.789272	41	.165592	

*Significant at 0.05 level of confidence

N= 45, B = between group variance, W= within group variance, F = Ratio needed for significance at 0.5, Level of confidence 3.22

The analysis of co-variance for cardio-vascular endurance indicated that resultant 'F' ratio were not significant in case of pretest and post-test means indicating that initial and final mean difference among the groups were not significant. The

difference between the adjust final means for three groups were found significant and the obtained 'F' ratio was 4.39*. As difference between the adjusted final mean for three groups, were found significant, the critical difference for adjusted means (post -hoc test) was applied to find out which of the differences between the paired adjusted final mean were significant, which are shown in table -III.

Table III: Paired Adjusted Final Means & Difference Between the Mean for the Three Experimental Groups &Control Group in Cardio-Vascular Endurance

Fartlek training	Sand running	Control	Difference between mean	Critical difference statistical adjusted mean
2244.76	2253.05		8.29	66.58
	2253.05	2102.18	150.87*	66.58
2244.76		2102.18	142.58*	66.58

Discussion

The analysis of data indicates that the two experimental groups trained by Fartlek training method, sand running method showed significant gains the performance of the cardio-vascular endurance, when Pre-test and Post-test data were compared. The control group did not show any significant increase in the performance of cardio-vascular endurance.

With regard to performance of cardio-vascular endurance, the Fartlek training group was effective and improved significantly as compared to sand running group and control

group and sand running group was superior to control group whereas no significant difference was marked between fartlek training group and sand running group.

The significant improvement incase of Fartlek training & sand running may be due to, both the training brought about specific metabolic physiologic adaption that involve subtle cellular as well as gross physiological changes. At the same time the treatment brought about both functional and dimensional changes in the cardio-vascular endurance. These include decreases in resting and sub-maximal exercise heart rate enhanced stroke volume rate and cardiac output and

expanded O₂ differences. Other factors might be decreased in percent body fat and increased in lean body weight the increases in the trained muscle capacity to mobilized and oxidize fat and selective hypertrophy to different muscles fibers which enhanced cardio-vascular endurance of the subjects.

Conclusion

On the basis of the analysis of the data and within the limitation imposed and the experimental conditions, the following conclusions maybe drawn.

The two experiment methods (Fartlek training and sand running) proved to be effective in improving performance of cardio-vascular endurance. It was also observed that Fartlek training method was significantly better than the sand running method. However, no statistical significant difference was found between Fartlek training and Sand running method as measured by Cooper's 12 minutes run/walk test. The reason may be due to the training duration of six weeks was not sufficient to produce significant training effect between the fartlek training and Sand running.

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