



Effect of Resisted Sprint Training and Plyometric Training on Selected Hematological Variables among College Kabaddi Players

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Received 26th April 2015, Accepted 20th June 2015

Abstract

The purpose of the study is to find out effect of resisted sprint training and plyometric training on selected hematological variables among college kabaddi players. To achieve these purpose 30 men students were selected from department of physical education, Annamalai university, Chidambaram as subjects. Their age group ranged from 18 to 25 years. They were divided in to three equal groups of 10 subjects each and assigned to Experimental group-I, Experimental group-II and control group. In a week the Experimental group-I underwent resisted sprint training, Experimental group-II underwent plyometric training and control group was not given any training. All the subjects underwent three areas of test namely (RBC count) (WBC count) and Hemoglobin. They assessed before and after the training period of eight weeks. The analysis of covariance was used to analyze the data. The study revealed that the above said criterion variables were significantly improved due to the effect of resisted sprint training and plyometric training on selected hematological variables among college kabaddi players.

Keywords: Resisted sprint training, Plyometric training, RBC, WBC, Hemoglobin.

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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 year. The Basic training procedures will serve better when utilized with modification suited to individuals or a group dealt with. The training programme should look into improving the performance of the athletes and at the same time should prevent injury from taking place (Fox, 1985). Training is a programme of exercise designed to improve the skills and to increase the energy capacity of an athlete for a particular event. Therefore training is essential for the development of physical fitness components (William & Sperryn, 1976). It is the process of sports protection based on scientific and pedagogical principles for higher performance (Singh, 1991). Training adaptation is the sum of transformations brought about by systematically repeated exercises. These structural and physiological and biochemical changes result from a specific demand that athletes place on their bodies by the activity they pursue depending on the volume, intensity and frequency of training. Physical training is beneficial as long as it forces the body to adapt to the stress of the effort (Bompa, 1999).

The resisted sprint training programmes have become highly structured training for athletic performance enhancement. It is an effective training method designed to elicit enhancements in motor fitness, physiological and biochemical parameters. It has vastly different training effects depending upon the intensity and duration of the work and rest period. Plyometric training is a relatively new concept of training that applies the specific principles recording the present strength conditions of the muscle prior to explosive contraction. The effects of plyometric training in increasing vertical jumping ability has studied experimentally, but no attempt has been made if they are more effective than the kinetic exercise (will and Freeman, 1980). The blood serves as a principal transport medium of the body carrying oxygen, nutrients, and chemical messengers to the tissues and waste products and synthesized metabolites away. The circulatory system provides access to all cells of the body for materials ingested or prepared elsewhere in the organism. Thus blood plays many important roles in coordinating the individuals cells in to a whole complex organism. This accomplish by presence in the fluid of dispersed or dissolved nutrients, metabolites, electrolytes, hormones, substances to counteract infection and hemorrhage and by equilibria between the cell and the blood stream so that homeostasis with respect to temperature, oxidation, reduction potential and ionic concentration is maintained throughout the organism (Sajwan & Uppal 1999). The blood consists of the two parts a fluid part and a solid part of the corpuscles. The function of the blood as a whole, are of

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course, the sum total of those of its components – corpuscles, salts, proteins and other substances. The major function of RBC is to transport hemoglobin, which in turn carries oxygen from the lungs to the tissue, volume of blood and hemoglobin contents in the blood increased by training. The numbers of RBC is defiantly affected by exercise (Tamrakar, A.2003).

Holmgren (1963) found own his study that intermittent long term training resulted in the major function of red blood cells is to transport hemoglobin, which in turns carries oxygen from the lungs to the tissue. In some lower animals hemoglobin circulates as free protein in the plasma, not enclosed in red blood cells, however, when it is free in the plasma of the human being, approximately 3 percent of it leaks through the capillary membrane in to the tissue spaces or through the glomerular membrane of kidney in to bowman's capsule each time blood through the capillaries. There fore, for hemoglobin to remain in the blood stream, it must exist in red blood cell there are approximately 4.5-5 million RBC' per micro-liter of blood. More research is required concerning the variation in different methods of sprint training and its effects. The applicability of this method of training to develop motor fitness and physiological and biochemical parameters is not yet completely known. Hence, there is a need to find out whether resisted sprint training is superior to plyometric training in improving the selected hematological variables parameters.

Methodology

The prime purpose of this study was to explore the effect of resisted sprint training and plyometric training on selected hematological variables among college kabaddi players. To achieve these purpose 30 men students were selected from department of physical education, Annamalai University, Chidambaram as subjects. Their age group ranged from 18 to25 years.

Results

Table I. Computation of Analysis of Covariance of RBC Count (Red Blood Cell Count)

Test	Exp.GP 1	Exp.GP 2	CONTROL GR	Sum of variance	Sum of squares	Df	Mean square	F
Pre test mean	4.63	4.56	4.55	Between	0.04	2	0.019	0.08
				Within	6.19	27	0.23	
Post test mean	5.13	4.93	4.58	Between	1.55	2	0.77	4.19*
				Within	5.00	27	0.19	
Adjusted mean	5.09	4.95	4.60	Between	1.23	2	0.62	20.68*
				Within	0.775	26	0.03	

Significant at 0.05 level with 2 and 27 (df) = 3.37

They were divided in to three equal groups of 10 subjects each and assigned to Experimental group-1, Experimental group-2 and control group. In a week the Experimental group-1 underwent resisted sprint training, Experimental group-2 underwent plyometric training and control group was not given any special training. All the subjects underwent three areas of test namely (RBC count) (WBC count) and Hemoglobin. The selected independent variables was resisted sprint training and plyometric training and the dependent variables were red blood cell count and white blood cell count and hemoglobin. All the subjects underwent three areas of test namely (RBC count) (WBC count) and Hemoglobin. Blood samples "were drawn from anti cubical vein before and after the training with assistance from qualified lab technician. The selected hematological variables were tested in the medical laboratory, Annamalai university medical college, Chidambaram. During the experimental period, group-1 underwent resisted sprint training and group-2 underwent plyometric training for eight weeks, 3 days per week alternative days. On every day of the training session, the exercises done were approximately 45 to 60 min, which included warming up and relaxation. Group-3 acted as control who did not participated any special training programme. In the present study, random group design was used. the data were collected on selected hematological variables such as, (Rbc count) (wbc count) and hemoglobin at before and immediately after the 8 weeks of resisted sprint training and plyometric training as pre and post test. The selected variables for which data were collected from two groups prior to and after experimentation on selected hematological variables were statistically examined for significant difference, if any, by applying the analysis of covariance (ANCOVA) with the help of SPSS package. The level of significance was accepted at 0.05 level of confidence, which was considered to be appropriate.

Table I shows the analyzed data on RBC Count (Red Blood Cell Count). The pre test, post test and adjusted post test means of the RBC Count (Red Blood Cell Count) were (4.63,4.56,4.55) (5.13,4.93,4.58) (5.09,4.95,4.60) for the experimental group I, II and Control group respectively. The obtained 'F' ratio for pre

test 0.08 post test 4.19 and adjusted post test 20.68. The obtained F ratio of post and adjusted post test were 4.19 and 20.68. The table value is 3.37 at 5% level of significance for the degree of freedom (2 & 27 and 2 & 26). Therefore it is proved that experimental group I has been better than the other two groups.

Table II. Computation of Analysis of Covariance of WBC Count (White Blood Cell Count)

Test	Exp.GP 1	Exp.GP 2	CONTROL GR	Sum of variance	Sum of squares	Df	Mean square	F
Pre test mean	9575	9650.00	9345.00	Between	505166.67	2	252583.333	0.34
				Within	20313500.00	27	752351.85	
Post test mean	10080	10135.00	9255.00	Between	4860166.67	2	2430083.33	3.39*
				Within	19348500.00	27	716611.11	
Adjusted mean	10031.93	10017.16	9420.90	Between	2375234.66	2	1187617.33	17.47*
				Within	1767829.261	26	67993.43	

Significant at 0.05 level with 2 and 27 (df) = 3.37

Table II shows the analyzed data on WBC Count (White Blood Cell Count). The pre test, post test and adjusted post test means of the WBC Count (White Blood Cell Count) were (9575,9650.00,9345) (10080,10135.00,9255.00) (10031.93,10017.16,9420.90) for the experimental group I, II and Control group respectively. The obtained 'F' ratio for pre test

0.34 post test 3.39 and adjusted post test 17.47. The obtained F' ratio of post and adjusted post test were 3.39 and 17.47. The table value is 3.37 at 5% level of significance for the degree of freedom (2 & 27 and 2 & 26). Therefore it is proved that experimental group I has been better than the other two groups.

Table III. Computation of Analysis of Covariance of Hemoglobin

Test	Exp.GP 1	Exp.GP 2	CONTROL GR	Sum of variance	Sum of squares	Df	Mean square	F
Pre test mean	11.84	11.88	11.99	Between	0.12	2	0.060	0.06
				Within	27.13	27	1.00	
Post test mean	13.64	12.74	12.09	Between	12.12	2	6.06	7.32*
				Within	22.36	27	0.83	
Adjusted mean	13.69	12.76	12.02	Between	14.01	2	7.01	46.79*
				Within	3.893	26	0.15	

Significant at 0.05 level with 2 and 27 (df) = 3.37

Table III shows the analyzed data on Hemoglobin. The pre test, post test and adjusted post test means of the Hemoglobin were (11.84,11.88,11.99) (13.64,12.74,12.09) (13.69,12.76,12.02) for the experimental group I, II and Control group respectively. The obtained F' ratio for pre test 0.06 post test 7.32 and adjusted post test 46.79. The obtained 'F' ratio of post and

adjusted post test were 7.32 and 46.79. The table value is 3.37 at 5% level of significance for the degree of freedom (2 & 27 and 2 & 26). Therefore it is proved that experimental group I has been better than the other two groups. The reason for obtaining a significant change in the concentration of red blood corpuscles, white blood corpuscles and hemoglobin a result of general cardio-

vascular fitness in the experimental groups might have resulted in release of more amount of fluid from the blood vessels leading a significant increase in red blood corpuscles concentration in every session of training. As it is general belief that red blood cells per unit volume of blood is increased by training practices. The present investigation also supports these earlier findings by Morehouse and miller, (Physiology of exercise) p.180. Krebs et al (1983).

The analysis of data clearly reveals that all experimental groups obtained significant improvement in R.B.C, W.B.C and hemoglobin. The resisted sprint training group was higher than other groups. It is because of (resistance exercise) an apparent increase in the concentration of red blood corpuscles is observed which is due to the mobilization of plasma from blood to tissue fluid. Besides this the resisted exercise makes a greater amount for oxygen supply thus putting in to circulation the red blood corpuscles stored in spleen and accessory spleen. Resisted exercise also increase the myoglobin pigment (store keeper of oxygen), which is helpful to supply more amount of oxygen. (Jeff Migdow, M.D., 2004).

Conclusions

1. There was a significant difference among resisted sprint training and plyometric training groups, resisted sprint training and control groups, plyometric training and control groups on selected hematological variables.
2. There was a significant improvement were noticed on selected hematological variables due to the

effect of resisted sprint training and plyometric training among college kabaddi players.

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