Effects of Aerobic and Anaerobic Training on Blood Urea among men Basketball Players

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Abstract

Aim of the present investigation was to find out the effects of aerobic and anaerobic training on selected blood urea among men Basketball players. To achieve this purpose of the study, forty five (N=45) men Basketball players who have participated in inter Collegiate Basketball tournament, in Thanjavur district of Tamilnadu during the year 2018-2019 were randomly selected as subjects. Their age ranged from 18 to 21 years. The subjects were divided at random into three groups of fifteen in each (n=15). Group-I underwent Aerobic Training, Group-II underwent Anaerobic Training and group-III acted as the Control group. Among various bio-chemical components blood urea selected as dependent variable and it was assessed through blood sample test (Diacetyl monoxime method). The experimental groups underwent their respective training of 12 weeks duration. All the subjects were tested prior to and immediately after the experimental period on blood urea. The data obtained from the experimental groups before and after the experimental period were statistically analyzed with dependent 't'-test and Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post assessment means was found to be significant, the Scheffe's Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases. The results of the study showed that Anaerobic Training group has been found to be better than the aerobic training group and Control group in blood urea.

Key words: Aerobic Training, Anaerobic Training, basketball players, blood urea

I. INTRODUCTION

Sport and games involve competition. Without competition, there is no game. Competition provides a forum within which people strive to become competent, to become excellent. The opportunities for rivalry within sport are many and varied: team against team, individual against individual, individual against a record, individual now against a previous best performance and an individual against a physical barrier. Competition involves individuals and groups striving for excellence within the rules and traditions that make up a sport, including all the festival characteristics that give the sport additional flavor and meaning.

Sport can provide the basis for a lifelong participation in regular exercise, and the development of mental and moral qualities, including team spirit, sportsmanship, self-discipline, cooperation, commitment, and competing within a framework of agreed rules. Sport can help channel people's energy and aggression in a controlled and constructive way *(Weiss, 1969).*

Sport training aims at improving the sports performance. The sports performance, as any other type of human performance is not the product of one single system or aspect of human personality.

On the contrary, it is the product of the total personality of the sports person. Therefore the nature and structure of sports performance determine to a great extent the means and methods of training as well as the total planning, organization, implementation and assessment of training. The knowledge about the nature and structure of sports performance must be considered the first and perhaps the most important step towards the successful preparation of sportsmen for higher performance. The process of identification and development of sports talent also has to be based on this knowledge *(Hardayal Singh,1991).*

Basketball is one of the fastest games in which high level of conditioning and coordinative abilities with technical and tactical potentials are essential to perform every skill at desired or required level. Basketball**,** game played between two teams of five players each on a rectangular court, usually indoors. Each team tries to score by tossing the ball through the opponent's goal, an elevated horizontal hoop and net called a basket *(Shoenfelt, 1991).*

Urea is a by-product of protein metabolism that is formed in the liver. Blood Urea Nitrogen (BUN) test is to measure of the amount of nitrogen in the blood in the form of urea, and a measurement of kidney function. Uric acid is a breakdown product of purines in the body. High levels of uric acid can cause gout. High purine foods in a diet can increase uric acid levels in the body. Allopurinol (Zyloric) medication is used to lower uric acid levels in the body.

The liver produces urea in the urea cycle as a waste product of the digestion of protein. Normal human adult blood should contain between 6 to 20mg of urea nitrogen per 100 ml (6–20 mg/dL) of blood. Individual laboratories will have different reference ranges as the assay used will vary between laboratories. Blood Urea Nitrogen (BUN) is an indication of renal (kidney) health. The normal range is 1.8-7.1 mmol/L or 6–20 mg/dL.

II. METHODOLOGY

The present study was to find out the effects of aerobic and anaerobic training on *blood urea* among male Basketball players. To achieve this purpose of the study, forty five (N=45)

men Basketball players who have participated in inter Collegiate Basketball tournament, in Thanjavur district of Tamilnadu during the year 2018-2019 were randomly selected as subjects. The age of the subjects were ranged between 18 to 21 years. The subjects were divided at random into three groups of fifteen in each (n=15). Group-I underwent Aerobic Training, Group-II underwent Anaerobic Training and group-III acted as the Control group. The dependent variables selected for this study was blood urea was assessed by blood sample test (Diacetyl monoxime method). All the subjects were tested prior to and immediately after the experimental period on the selected dependent variable. All the subjects of the three groups were tested on selected criterion variables at prior to and immediately after the training programme.

III. ANALYSIS OF THE DATA

The data collected from the experimental groups and control group on prior and after experimentation on selected variables were statistically examined by analysis of covariance (ANCOVA) was used to determine differences, if any among the adjusted post test means on selected criterion variables separately. Whenever they obtained f-ratio value in the simple effect was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed.

The results of the dependent 't'-test on the data obtained for Blood Urea of the subjects in the pre-test and post-test of the Experimental groups and control group have been analyzed and presented in Table-1.

Table – 1

Summary of mean standard deviation and dependent 't' test for the pre and post tests on Blood Urea of Experimental groups and Control group (Blood Urea is expressed in mg/dL)

Test	Descriptive Statistics	Aerobic Training Group	Anaerobic Training Group	Control Group
Pre Test	**Mean**	24.73	24.80	25.00
	SD (±)	1.00	1.17	1.26
Post Test	**Mean**	21.87	20.53	24.80
	SD (±)	1.02	1.26	0.98
"t" Test		**7.76***	**9.63***	**0.48**

**** Significant at 0.05 level.***

The table value required for 0.05 level of significance with df 14 is 2.15.

Table-1 shows that the pre-test mean and standard deviation of Blood Urea values of Aerobic Training group, Anaerobic Training group and Control group are 24.73±1.00, 24.80±1.17 and 25.00±1.26 respectively. The post-test mean and standard deviation are 21.87±1.02, 20.53±1.26 and 24.80±0.98 respectively.

The obtained dependent t-ratio values between the pre and post test means on Blood Urea of Aerobic Training group, Anaerobic Training group and Control group are 7.76, 9.63 and 0.48 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.15. It

was concluded that aerobic training group and anaerobic training group had registered significant decrease in Blood Urea.

The analysis of covariance on Blood Urea of the pre, post, and adjusted test scores of Aerobic Training group, Anaerobic Training group and Control group have been analyzed and presented in Table – 2.

Table – 2

Computation of Analysis of Covariance of pre test, post test and adjusted post test on Blood Urea of Experimental groups and Control group

Test	Aerobic Training Group	Anaerobic Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	24.73	24.80	25.00	Between groups	0.58	2	0.29	0.20
				Within Groups	59.33	42	1.41	
Post-Test Mean	21.87	20.53	24.80	Between groups	142.93	2	71.47	55.72*
				Within groups	53..87	42	1.28	
Adjusted Post-Test Mean	21.95	20.57	24.68	Between sets	130.63	2	65.3	136.38*
				Within Sets	19.64	41	0.48	

**** Significant at 0.05 level of confidence***
Table value for df (2, 42) at 0.05 level = 3.22 Table value for df (2, 41) at 0.05 level = 3.23
(Blood Urea scores are in mg/dL)

Table-2 shows that the obtained F-ratio value 0.20 for pre test mean of Aerobic Training group, Anaerobic Training group and Control group on Blood Urea is lesser than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 55.72 for post test mean of Aerobic Training group, Anaerobic Training group and Control group on Blood Urea is more than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 136.38 for adjusted post test mean of Aerobic Training group, Anaerobic Training group and Control group on Blood Urea is higher than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence.

The results of the study indicated that there is a significant difference between the adjusted post-test means of Aerobic Training group, Anaerobic Training group and Control group on Blood Urea.

Since, three groups are compared and whenever the obtained 'F' ratio for adjusted post test is found to be significant, Scheffe's test is used to find out the paired mean difference and it is presented in Table-3.

Table – 3

Scheffe's test for the difference between paired means on Blood Urea

A T G	An T G	C G	Mean Difference	C I
21.95	20.57	---	1.38*	0.64
21.95	---	24.68	2.73*	0.64
---	20.57	24.68	4.11*	0.64

Significant at 0.05 level of confidence.

Table-3 shows that the mean difference values of Aerobic Training group and Anaerobic Training group, Aerobic Training group and Control group, Anaerobic Training group and Control group are 1.38, 2.73 and 4.11 respectively, which are greater than the confidence interval value of 0.64 on Blood Urea at 0.05 level of confidence.

The results of the study showed that there was a significant difference between Aerobic Training group and Anaerobic Training group, Aerobic Training group and Control group, Anaerobic Training group and Control group on Blood Urea.

The above data also reveal that Anaerobic Training group had shown better performance than Aerobic Training group and Control group in Blood Urea.

The pre and post test mean values of Aerobic Training group, Anaerobic Training group and Control group on Blood Urea are graphically represented in the Figure -1.

The adjusted post mean values of Aerobic Training group, Anaerobic Training group and Control group on Blood Urea are graphically represented in the Figure -2.

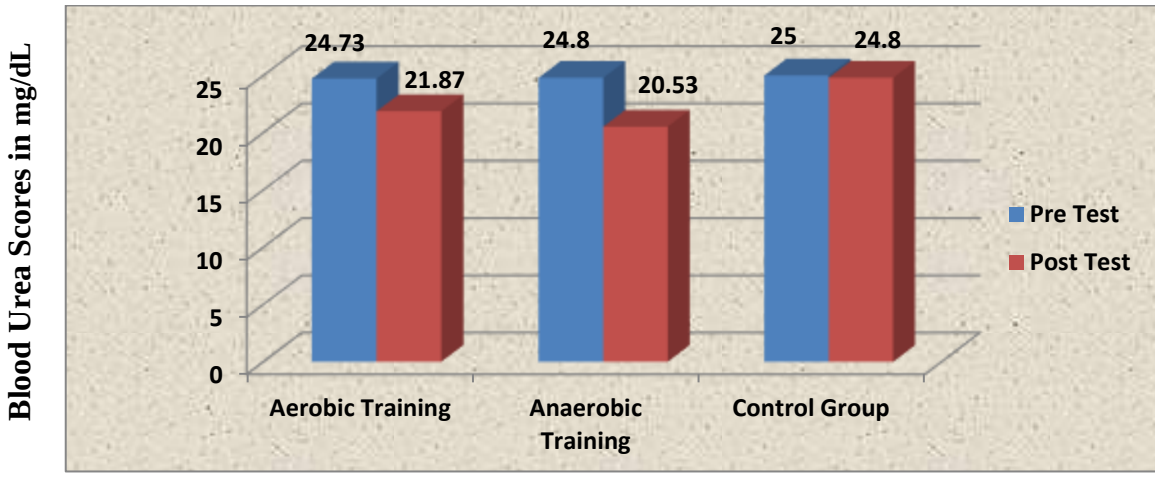

Figure – 1 The Pre and Post test Aerobic Training Group, Anaerobic Training Group and Control Group on Blood Urea

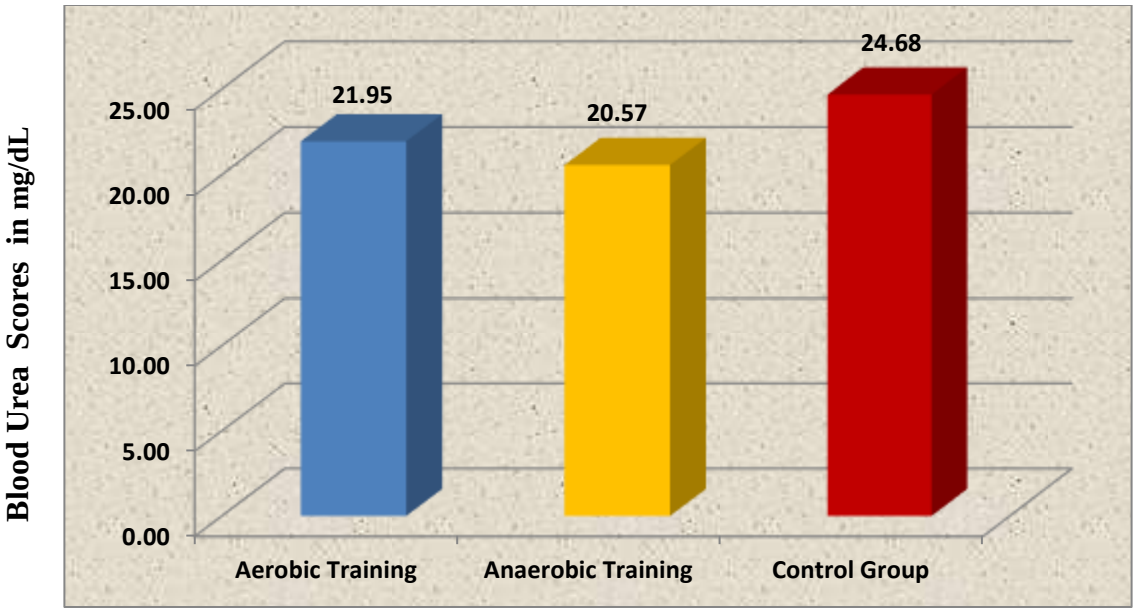

Figure – 1 The Adjusted Post test Aerobic Training Group, Anaerobic Training Group and Control Group on Blood Urea

IV. CONCLUSIONS

From the analysis of the data, the following conclusions were drawn.

1. The Aerobic Training group and Anaerobic Resistance Training group had registered significant changes on blood urea.
2. When the experimental groups were compared with each other, the Anaerobic Training group was found to be greater than the Aerobic Training programme, and Control group on the decrease of selected criterion variable namely blood urea.

V. DISCUSSIONS

The results of the study showed that anaerobic training and aerobic training groups have significantly differed on blood urea when compared to control group, and also between the training groups anaerobic training group was found to be greater than the aerobic training group. Hence it was concluded that both anaerobic training and aerobic training was better method to improve the blood urea.

Paweł Sokal and others found that blood urea concentrations are lower in subjects who are earthed (connected to the earth potential with the use of copper wire) during physical exercise and recovery compared with the same subjects who are not earthed during the same period of exercise and recovery. These results suggest that earthing during exercise inhibits hepatic protein catabolism or increases renal urea excretion. Earthing during exercise affects protein metabolism, resulting in a positive nitrogen balance. This phenomenon has fundamental importance in understanding human metabolic processes and may have implications in training programs for athletes.

Calles-Escandon and others found that sweat losses are an important route for urea excretion during exercise.

Warburton and others mention that the athletes commonly display high resting urea concentrations, probably as a result of the continual stress of training. Urea concentrations are also generally increased after the performance of PSE and may remain elevated for 24–40 hours after exercise. An increase in urea concentration may be related to a reduction in renal blood flow (and glomerular filtration rate) secondary to fluid volume deficiency, increased protein catabolism, and/or bleeding into the intestine, all of which may occur after PSE.

Haralambie and Berg observed after about 60–70 min of exertion, there is a significant fall in serum amino nitrogen and a rise in urea and free tyrosine; the magnitude of these changes correlated well to the duration of exercise. Likewise, there is a significant correlation between increase in serum urea and decrease in amino nitrogen. The observed changes strongly suggest an increased breakdown of nitrogen-containing compounds during prolonged exercise.

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