

The Impact of Exercises in the Lactic Effort in Developing the Rapid Ability and Concentration of Hexokinase in the Blood in Young Basketball Players

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Abstract

This study aims to identify the effect of exercise in the lactic effort in developing the rapid ability and concentration of hexokinase in the blood among young basketball players. The experimental method was used in the two groups (experimental and control) After and before the test for its suitability of the nature of the problem's study. While the research community has identified the young players in the Talent Center in Baghdad, who were aged 16-17 years, for the training season 2019, The researchers has prepared several exercises with anaerobic effort, that the period of application of the exercises was in the time of special preparation which has taken (8) weeks by 3 units per week. The training method was used is high-intensity vocational training and repetitive training (85 - 95%) from the maximum intensity of player performance. The most important conclusions were that the anaerobic exercises that the researcher was used led to the development of some physical capabilities (rapid ability), caused an effect in the concentration of hexokinase in the blood.

Keywords: Concentration of Hexokinase, Blood, Basketball Players.

I. INTRODUCTION:

Basketball's training in is an organized process which is related to other sciences such as physiology, nutrition and many¹ other sciences whose goal is to develop the young players as they are the primary base for achieving the best results and reaching the high level.²

Through the researchers' work in training basketball game for many years and their continuous follow-up to youth teams, they noticed that the training process for special physical capabilities (anaerobic capabilities)³ in the training dose is little, or it is mostly done according to the judgments and self-jurisprudence or what is available from previous experiences without resorting to the scientific foundations in their training, also without studying the impact of functional capabilities (enzymes), as the functional aspect is few in preparing the training program, therefore these things has become clear through the slowdown in the player's speed, movement and the lack of his launches due to the large lack of energy components and the inability of the muscle to break down anaerobic glucose, because the majority of players lack the development of anaerobic ability, as these capabilities became dominant in basketball, so the lactic acid system is the primary anaerobic system¹, that the anaerobic energy is the basic energy of basketball players, as (Fox & others. 1993) indicating that the energy which is used by basketball players is (60%) non-oxygenic and (40%) oxygenic.⁸

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Therefore, the researchers opine that, they should go into this problem , finding the appropriate solutions by developing exercises with a lectical effort , showing the extent of the impact of this with rapid ability, as well as knowing the extent of the impact of these exercises on functional ability (improving the concentration of anaerobic enzymes), Especially hexokinase in the blood, knowing the great role that this enzyme plays in the anaerobic exercises.

II. RESEARCH HYPOTHESIS: THE RESEARCH AIMS TO IDENTIFY:

- There is an effect of exercises in the lectical effort in developing the rapid ability and concentration of hexokines in the blood among young basketball players.

Research fields:

The human field: Talents of the Gifted Care Center in Baghdad for the youth category, between 16 and 17 years of age, for the training season 2019.

Time domain: for the period from 1/3/2019 to 1/5/2019.

Spatial domain: Al Shaab International sport centre.

III. THE RESEARCH TERMINOLOGIES

Hexocaine: the enzyme which responsible for transporting the phosphate group into the hexagon sugar molecule (glucose), it is found in all tissues of the body, it works to make the amid compounds available for the glycolysis process, that is, it is the enzyme which responsible for the decomposition of glucose inside the muscle.²

IV. METHODOLOGY

In this study, the experimental approach was used in the two groups (experimental and control) before and after the test for its suitability to the nature of the problem's study.

The research community and its sample: The research community is defined the young players in the Gifted Care Center in Baghdad aged 16-17 years for the training season 2019, the number of them were 14 players. As the research sample was chosen by using the comprehensive inventory method, the sample was divided into two groups (experimental and controlling), by seven players for each group.

Sample homogeneity and parity

The researchers found homogeneity and parity between the two research groups in terms of physical measurements (length, mass, training and time age as well as "physical and functional variables"). Using appropriate statistical treatments to know the truth about the differences between the two research groups, as shown in Table (1, 2).

Table

(1)

Shows the homogeneity of the sample

No.	Changes	Unit of measuring	Value of a test (Leven)		Level of the indication	
			accounted	Standard error		
1	age	year	1,246	0,322	Not significant	Homogeneous
2	Training age	year	0,372	0,429	Not significant	Homogeneous
3	Length	Kg	0,088	0,871	Not significant	Homogeneous

4	Length	cm	1,270	0,320	Not significant	Homogeneous
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Table 2

Shows the arithmetic mean, the standard deviations, the calculated value (t) and the indication of the differences in the searched tests between the control and experimental groups in the pre- test.

changes	Unit of measuring	Controlling group		Experimental group		Accounted (t)value	Error ratio	دلالة الفروق
		S	P	S	P			
The concentrated of hexokinase	U/MG-HB	0.173	0.083	0.166	0.029	0.066	0.876	random
The rapid ability of the right leg	meter	42.050	5.558	43.887	4.998	1.554	0.065	random
The rapid ability of the left leg	meter	40.800	5.952	42.543	5.864	2.043	0.087	random

* Default at the indication level (0.05) if the error level is less than (0.05).

From the previous two tables (2,1), the randomness of the differences between the control and experimental research groups in the changes under discussion are all physical and functional at the level of indication (0.05) and at a degree of freedom (12), as all error levels appeared greater than (0.05), which indicates the homogeneity and equivalence of the two research groups in all physical and skill tests under investigation and discussion.

Devices and the tools which are used in the research:

1 -A device for measuring height and weight

2 -Basketball stadium, number 1.

3 -Legal Basket Balls, number 14.

4 -A leather tape measure of 20 meters.

5-(7) Poling

6- Casio electronic stopwatch number 3.

7- (Measurement kit to reveal the enzyme hexokinase (ketate). Medical materials and tools. Blood-pull syringes size (5) cc. Plastic tubes to keep blood containing anticoagulant. Preservation tubes (tubes) containing ice. Sterilization materials. Medical cotton.

Distinguished strength test with speed

Test name: Hopping test for maximum distance in 10s. ⁵

The goal of the test: to measure the force marked by the speed of the two legs.

Instruments used: stopwatch, Bork for pointing, whistle, tape measure, registration form.

Performance description: The player stands behind the starting line and after hearing the signal, he hops in the straight line running at full speed.

Test Instructions: The player hops with the right leg for a period of (10) seconds from the starting line, then he hops on the left leg for the same period.

The Recording method: Recording the distance of the person who took the test during a period of 10 seconds. Measuring the concentration of Hexocaine enzyme in the blood:

The Name of the functional test: Measuring the concentration of hexokinase in the blood.

The goal of the measurement: To determine the concentration of hexokinase in the blood before starting anaerobic exercises.

Method of measurement: a quantity of blood is taken from each player in the research sample one hour after the physical test by (3) (cc) , then treated in the laboratory with chemicals, an enzyme detection kit (Kitat) which is used to detect its concentration in the blood. The enzyme has been measured from serum and the unit of measurement is U / MG-HB.

The exploratory experiment: The researchers conducted the exploratory experiment on a sample consisting of (5) players on Tuesday, 25/25/2019 at three o'clock in the afternoon in the talent center of the Gifted Care Center. The exploratory experiment benefited the researchers in identifying: the validity of the devices and tools which are used in the research, the time that have taken to perform the tests, also to determine the difficulties that the researcher may be exposed to him when he is performing the main tests.

The pre-tests: The two researchers conducted the pre tests on Sunday 29/2/2019 at three o'clock in the afternoon, after giving the researchers a brief explanation of how to perform the tests and the goal of taking them, then it was taken measurements of length, weight, time and training, then tests, physical and functional were conducted on the research sample.

The Special exercises which were Suggested:

The researchers have prepared several exercises with anaerobic effort, that the period of application of the exercises was in the period of special preparation, as follows:

- The implementation of the proposed exercises started on 1/3/2019.
- The duration of the exercises held in weeks: (8) weeks.
- The total number of training units: (24) training units.
- The number of weekly training units: (3) units.
- Weekly training days: (Sunday - Tuesday - Thursday).
- Total training unit time: (90) minutes.
- The main section time in the training unit: (30-45) minutes.
- The training method used: high intensity interval training and repetitive training.
- The intensity of the training used: (85 - 95%). From the extreme intensity of the player's performance.

The Post-test:

After completing the implementation of the training exercises which were set within the prescribed period, then conducting the post-tests which were specialized for the research, on 1/5/2019 at three o'clock in the afternoon in the hall of the Gifted Care Center in Baghdad, the researchers took under considerations the provision of conditions similar to the pre-tests in terms of (time, place, tools which are used and method of carrying out the tests).

Statistical methods that are used in the research:

The researchers used the (SPSS) to find the appropriate statistical treatments.

- Showing the results of the differences between the pre and post-tests of the experimental and control groups in the researched changes and analyzing them.

Table (3)

Difference of arithmetic mean and its standard deviation, (t) value, the indication of the differences between the results of the pre and post tests of the experimental and control groups in the changes during researching

Tests	groups	Pre-test		Post-test		Accounted (t) value	Error level	The differences indication
		S	P	S	P			
The concentration of hexokinase	experimental	0.166	0.029	0.959	0.371	3.898	0.000	Default
	controlled	0.173	0.083	0.212	0.044	3.065	0.000	Default
The rapid ability of the right leg	experimental	43.887	4.998	46.400	4.429	7.896	0.003	Default
	controlled	42.050	5.558	43.888	5.883	6.986	0.023	Default
The rapid ability of the left leg	experimental	42.543	5.864	44.750	4.077	9.643	0.000	Default
	controlled	40.800	5.952	42.864	4.862	6.875	0.005	Default

* Default at the level of significance (0.05) if the error level is lesser than (0.05)

Table (3) shows: that the error level ranged between (0.00 to 0.023) for all search changes, which is smaller than (0.05), this indicates that the significance of the differences between the pre and post-tests at a level of error (0.05) in front of the degree of freedom (6) for the post test.

Showing the results of the differences between the pre and post tests of the experimental and control groups in the studied changes and their analysis.

Table (4)

Difference of arithmetic mean, standard deviation, the value of (t, significance of differences between the results of the pre and post tests of the experimental and control groups in the changes during the research

Tests	Experiment group		Controlled group		Accounted (t) value	Error level	Differences indication
	S	P	S	P			
The concentration of hexokinase	0.959	0.371	0.212	0.044	13.987	0.007	Default
The rapid ability of the right leg	46.400	4.429	43.888	5.883	12.854	0.000	Default
The rapid ability of the left leg	44.750	4.077	42.864	4.862	7.998	0.003	Default

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* Default at the significance level (0.05) if the error level is less than (0.05).

Table (4) shows that the error level ranged between (0.00 to 0.007) for all research changes, which is smaller than (0.05), which indicates the default of the differences between pre tests at an error level (0.05) in front of the degree of freedom (12), which is for the experimental group.

V. THE RESULTS DISCUSSION:

The results showed that there was a default difference between the pre and post tests of the experimental and control sample in all studied changes for of the post test. The researchers attribute that Default difference to the effectiveness of the exercises with anaerobic effort, especially if it is built on an organized scientific basis through the use of appropriate and gradual stresses, taking into account individual differences and this development in the special rapid ability which is reflected on the results of functional tests, as this is confirmed by Essam Abdel Khaleq, 1999) by his saying "the performance is related with some enzymes and physiological abilities with the individual's physical and motor abilities, so special physical numbers must be taken care of to master the skills of the activity practiced "

So researchers explain the development of rapid ability is caused by anaerobic exercises, so anaerobic exercises can be considered one of the most important exercises that are used in the field of athletic training to develop strength characterized by speed, then basketball coaches in the development of special muscle groups are advised to be speedily, i.e. developing the rapid strength of its importance in the playing. ⁶

The characteristic of the strength which is distinguished with speed can be developed by developing strength or speed or both. The researcher attributes this to the application of high-intensity anaerobic exercises which is followed by the method of the high-intensity periodical training and repetitive training which leads to changes in the level of its concentration in the blood where it performs the training that focuses on the anaerobic side basically to increase the capacity of anaerobic enzymes. states that "in anaerobic training loads, the proportion and capacity of glucose enzymes increases as well as sports activity accompanies many chemical reactions during the metabolism of energy production, from these processes the chemical division and the breakdown of glycogen which is stored in the body, so the production of glucose and its direct use to produce energy, here it shows us the importance and role of the hexokinase enzyme in chemical reactions to control the anaerobic process of breaking down glucose, as this enzyme is the enzyme which is responsible for the first reaction in the system of decomposition of glycogen within the muscle. As (Emin Ergen) notes after experimenting with a sample of athletes who have undergone training for a certain period, Then it was measured the percentage of decomposition glucose, it was found that it increases with the increase of the training period and that this degradation is carried out with the help of a group of enzymes whose rate and activity increase with the training operations to which the player is subject.

VI. CONCLUSIONS:

All of the enzyme tests were among the results of the research tests. The anaerobic exercises that the researcher used led to the development of some physical capabilities (rapid ability). Anaerobic exercises according to the method of high-intensity interval training and repetitive training have brought about an evolution in the concentration of hexokinase in the blood. There is a great importance of anaerobic exercises in developing the physical and functional condition of the basketball player during the special preparation period and competitions.

Financial disclosure

There is no financial disclosure.

Conflict of interest

None to declare.

Ethical Clearance

All experimental protocols were approved under the University of Karbala and all experiments were carried out in accordance with approved guidelines.

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