

The effect of hypoxic training on the enzymes AST, ALT, CPK and shooting precision for basketball players

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Abstract. The aim of this study is the impact of training on Hypoxic enzyme ALT, AST, CPK and Shooting precision for a basketball player. Applied study on a sample of 12 players from the basketball Players team in Cabsy Club in Port Said, Registered Egyptian Federation of Basketball/Egypt of the season 2015/2016, the researcher used experimental method to design two groups; one experimental consisted of 6 players and the other control group of 6 players. Where the average age of 23.33 ± 1.03 years and height 190.67 ± 4.76 cm, weight 97.50 ± 6.72 kg and age training 14.00 ± 1.10 month for the experimental group, while the average age 23.67 ± 0.52 years, height 191.00 ± 3.35 cm, weight 94.17 ± 7.31 kg and age training 14.50 ± 0.55 month for the control group. The experimental group underwent a Hypoxic Training program while the control group underwent Traditional exercises. Researcher to conduct tests and measurements derived: measuring both lengths is converted Ristamiter device, body weight, the measurement of the rate of enzymes ALT, AST, CPK under discussion by pulling the blood samples of the sample and analyzed the laboratory in Port Said through laboratory reagents, measurement of tripartite Shooting precision, the measurement of near shooting precision. Hypoxic Training program: The program includes training the Pilot Group on a group of Hypoxic training for 12 weeks at a rate 4 training modules in the week, the total number of training modules in the program 48 Training Unit. The program includes the control group on traditional training in addition to warm up and pacification. The statistical analysis of the control and experimental data SPSS was used to apply formulas statistical by calculating: average, standard deviation, volume of effect size, Mann-Whitney and Wilcoxon test. The results showed the use of hypoxic training resulted in an improvement statistically significant at a level of Enzyme ALT, AST, and CPK for basketball players. The use of hypoxic training resulted in an improvement statistically significant shooting near and shooting triple precision for basketball players. These results should be taken into account by the basketball Federation and attention by coaches trained in the application of hypoxic training basketball players programs given the positive impact on the players.

Keywords. Hypoxic training, basketball, enzymes AST, ALT, CPK.

Introduction

Basketball is one of the games, which gained wide interest at the international level and local levels besides being competitive sport interesting to include the skills of high technical require a high degree of mobility techniques. On this basis has been affected by basketball positive impact, which helped to modernize the working methods and procedures, training and players for the development level and access to the highest levels of competitive sports.

Basketball gained popularity in all parts of the world with dynamic characteristics as toys. The major protagonists cut a distance of about 4500 to 5000 meters within 40 minutes performing many movements such as jogging, prevarication and shooting precision. The exercise of the game of basketball needs many physical requirements and physiological and psychological mechanical and to achieve the desired objective of this practice to reach levels high sports (Narazaki et al., 2008).

The Hypoxic training of is to reduce the proportion of consumer oxygen in the body through the performance of physical effort codified control with breathing processes (inspiratory and exhaling) which give the organs of the body ability to bear the highest effort (Martin & Ivan, 2007)

Some of the studies that call for the use of the training with the lack of oxygen to raise the level of sports performance as the training and the lack of oxygen lead to greater debt pulse oximeter using the intensity of carrying less physical with reducing the number of times the breath, which leads to a lack of oxygen even at the level of the cell (Mohammed & Abu El-ala, 2000).

The enzyme Alanine Aminotransferase (ALT) and Aspartate Aminotransferase (AST) of enzymes interference in the process of the transfer of the amino acids from the image to the other there is in the heart, liver, structural muscles and the level of these enzymes in the blood. When breaking the cells and the measurement of the level of the focus of the enzyme level ALT and AST reflects the fitness level per capita (Shirin, 2004).

Accompanying the exercise of many enzymatic changes and these enzymes Creating Phosphokinase (CPK). Where he is in somebody tissues including muscle fabric and contributes to the composition of the Adenine triphosphate (ATP). Which is a unit of energy production in the body off during the session of the Crisp and reflect the proportion of focus of this enzyme CPK. The Situation Center of the person as well as the extent of being torn asunder in fiber musculoskeletal disorders opposite the relationship between the proportions of the focus of the enzyme. The Situation Center and direct correlation with the extent of fiber is torn muscles and increased the proportion of this enzyme that indicates to the decline of the Situation Center of the individual and increases the rate of fiber ruptures musculoskeletal disorders and vice versa (Joshua et al., 2008).

The Shooting is one of the most offensive skills in basketball, the objective of the game of basketball is injured the challenger basket the largest number of corrections. The Shooting was the final stage of the attack, and its success achieved victory in the match and compromises the Shooting a great deal of time devoted to training the trainers and additional training to improve it (Dave, 2007).

The corrected player good yearns for trainers in order to say on the player that good tune. Must go beyond the Shooting of a barrier 60% of successful Shooting during play and 90 % in free throws. This can only be achieved diligently ways the Shooting of different points in the stadium and the psychological situation of excellent Mental training on the process of Shooting and physical to resist fatigue the first obstacle to the process of Shooting successful minute (Dave, 2007). See (Mustafa, 2010) that basketball depend on the correction in the first place where all the points in the match are not only through the Shooting of all kinds. Whether peaceful or jumping from bilateral and trilateral or free pitch, hence the importance of the Shooting in determining the results of matches. Where the team succeeds in target more than a number of Shootings is the group of who can decide the result of the match in favor of it.

The researcher to conduct a survey of the views of some experts in basketball on more than the main reasons for the decline in the accuracy of the shooting precision to the Egyptian players from their experience in the field of sports basketball. It was the result of the poll as follows: 10% of views went to the main reason for the decline in the accuracy of the Shooting precision to the Egyptian players is the deficiencies in the training of correction. Seventy percent of the consensus went to the main reason for the decline in the accuracy of the Shooting precision to the Egyptian players is the Situation Center players. 15% of consensus went to the main reason for the decline in the accuracy of the Shooting precision to the Egyptian players is the deficiency in the psychological and mental training and the process of correction. 5% went for other reasons.

I went to the great majority of views to the decline of the Situation Center is the main cause of reduced accuracy of the Shooting precision to the players. This agrees with what he referred to as (Mehmet et al., 2010) that the physical aspect and the ability of the player to resist fatigue is the most important factor for the performance of the Shooting precision to the successful this clear in the last minutes of the match. Superior player physically chance to have the highest in successful Shooting.

It is already researcher came the idea of using Hypoxic exercises to achieve the goal of reducing the proportion of consumer oxygen in the body through the performance of physical effort codified control with breathing processes (inspiratory and exhaling). Which gives the organs of the body ability to bear the highest of effort and the impact on the enzyme ALT, AST, CPK and Shooting precision for the basketball player. Through the researcher informed of research and studies on the biological aspects of a physiological train, basketball found that there is a paucity of studies dealing with Hypoxic exercises on the enzyme ALT, AST, CPK and Shooting precision for a basketball player. This prompted the researcher to identify the impact of training on Hypoxic enzyme ALT, AST, CPK and Shooting precision for the basketball player.

Methods

Applied study on a sample of 12 players from the basketball Players team in Cabsy Club in Port Said, Registered Egyptian Federation of Basketball/Egypt of the season 2015/2016, and the researcher used experimental method to design two groups; one experimental consisted of 6 players and the other control group of 6 players. Where the average age of 23.33 ± 1.03 years and height 190.67 ± 4.76 cm, weight 97.50 ± 6.72 kg and age training 14.00 ± 1.10 month for the experimental group, while the average age 23.67 ± 0.52 years, height 191.00 ± 3.35 cm, weight 94.17 ± 7.31 kg and age training 14.50 ± 0.55 month for the control group. The experimental group underwent a Hypoxic Training program while the control group underwent Traditional exercises.

Researcher to conduct tests and measurements derived: measuring both lengths is converted Ristamiter device, body weight, the measurement of the rate of enzymes ALT, AST, CPK under discussion by pulling the blood samples of the sample and analyzed the laboratory in Port Said through laboratory reagents, measurement of tripartite Shooting precision, the measurement of near shooting precision.

Hypoxic Training program: The program includes training the experimental group on a group of Hypoxic training for 12 weeks at a rate (4) training modules in the week, the total number of training modules in the program (48) Training Unit. While the program includes

the control group on traditional training, in addition, to warm up and pacification.

The time of the module by 75 minutes, which allocated 10 minutes warm-up 5 minutes to calm and 60 minutes for the main part, which includes Hypoxic exercises for the experimental Group. The traditional training for the control group. The total time program is 3600 minutes by 60 hours.

Was taken into account and the gradual increase of carrying training so that the escalation carrying gradually training after installing the duration ranging between (14-21) the day until adjustment occurs and proves the progress in the level of achievement of career player in this peaceful escalation could the acquisition of a new adjustment. Install modern adjustment acquisition (Adel, 1999).

The measure was tribal of withdrawing blood samples, stadium team Cabsy Basketball on Friday 23/10/2015. Where blood samples at the time of the comfort and then tests the shooting precision to withdraw blood samples after the effort. Was the application of the proposed exercises on the experimental group and traditional exercises on control group from Saturday 24/10/2015 to Saturday 16/1/2016. by four training modules in the weekdays on Saturday and Monday, Wednesday and Friday and switch in periods of training between the two groups after 24 training unit to take account of the experimental setting. The measure was the dimensional withdrawal of blood samples on Sunday 17/1/2016. where blood samples at the time of the comfort and then tests the accuracy of correction. The withdrawal of blood samples in comfort and after the effort.

Statistical analyses

The statistical analysis of the control and experimental data SPSS was used to apply formulas statistical by calculating: average, standard deviation, Volume of effect size, Mann-Whitney and Wilcoxon test.

Results

Table 1 shows significant statistical differences of Mann - Whitney test in the pre-test of the Enzymes AST, ALT, CPK and shooting precision for basketball players between the experimental and control groups where the value of $p > 0.05$ in all variables indicating the absence of significant differences between the two groups points to the equal sample before executing the experiment.

Table 2 shows the results of significant statistical differences of Wilcoxon test the control group between pre and post measurements in tests the Enzymes AST, ALT, CPK and shooting precision for basketball players. Where the value of $P < 0.05$ in all variables search which shows statistically significant differences between pre and post measurement for posttest.

Table 3 shows the results of significant statistical differences to Wilcoxon test the experimental group between pre and post measurements in tests of the Enzymes AST, ALT, CPK and shooting precision for basketball players. Where the value of $P < 0.05$ to all variables search which shows statistically significant differences between pre and post measurement for posttest.

Table 1. Statistics-test for the Enzymes AST, ALT, CPK and shooting precision of Mann - Whitney between Control and Experimental group to pre-test.

Variables	Control Group		Experimental Group		Z	p	
	Mean	SD	Mean	SD			
AST	In comfort (UI/L)	27.48	0.59	27.33	0.87	-480	.631
	After the effort (UI/L)	94.43	1.76	94.78	3.59	-480	.631
ALT	In comfort (UI/L)	32.73	0.92	32.70	0.99	-1.366	.172
	After the effort (UI/L)	62.15	1.07	62.12	1.10	-.642	.521
CPK	In comfort (UI/L)	72.92	1.27	73.03	1.26	-.160	.873
	After the effort. (UI/L)	206.08	3.21	206.58	4.38	-.481	.630
Shooting precision	Tripartite (n)	1.83	0.75	2.67	1.03	-.961	.337
	Near (n)	13.00	2.53	12.67	1.03	-.451	.652

The Z= value ± 1.96 at the level of 0.05 (double sided)

Table 2. Statistics-test for the Enzymes AST, ALT, CPK and shooting precision of Wilcoxon between pre-and post-test to control group.

Variables	Pre-test		Post-test		Z	P	
	Mean	SD	Mean	SD			
AST	In comfort (UI/L)	27.48	0.59	26.60	0.41	2.21-	0.028*
	After the effort (UI/L)	94.43	1.76	90.95	1.28	2.21-	0.028*
ALT	In comfort (UI/L)	32.73	0.92	31.22	0.70	2.21-	0.028*
	After the effort (UI/L)	62.15	1.07	60.85	0.71	2.21-	0.028*
CPK	In comfort (UI/L)	72.92	1.27	71.37	0.56	2.21-	0.028*
	After the effort (UI/L)	206.08	3.21	205.32	2.62	1.58-	0.078
Shooting Precision	Tripartite (n)	1.83	0.75	2.33	1.51	1.13-	0.162
	Near (n)	13.00	2.53	14.00	1.55	1.26-	0.172

* Significant different at level of 0.05

Table 3. Statistics-test for the Enzymes AST, ALT, CPK and shooting precision of Wilcoxon between pre-and post-test to the experimental group.

Variables	Pre-test		Post-test		Z	p	
	Mean	SD	Mean	SD			
AST	In comfort (UI/L)	27.33	0.87	24.97	0.97	2.23-	0.026*
	After the effort (UI/L)	94.78	3.59	83.47	2.21	2.21-	0.028*
ALT	In comfort (UI/L)	32.70	0.99	28.38	0.86	2.21-	0.028*
	After the effort (UI/L)	62.12	1.10	58.05	0.78	2.21-	0.028*
CPK	In comfort (UI/L)	73.03	1.26	68.22	1.32	2.21-	0.028*
	After the effort (UI/L)	206.58	4.38	194.05	7.56	2.21-	0.028*
Shooting Precision	Tripartite (n)	2.67	1.03	9.00	1.26	2.23-	0.026*
	Near (n)	12.67	1.03	20.00	1.26	2.21-	0.028*

* Significant different at level of 0.05.

Table 4. Statistics - test for the Enzymes AST, ALT, CPK and shooting precision of Mann -Whitney between Control and Experimental group to post-test.

Variables	Control group		Experimental group		Z	p	
	Mean	SD	Mean	SD			
AST	In comfort (UI/L)	26.60	0.41	24.97	0.97	-2.722	.006*
	After the effort (UI/L)	90.95	1.28	83.47	2.21	-2.882	.004*
ALT	In comfort (UI/L)	31.22	0.70	28.38	0.86	-2.882	.004*
	After the effort (UI/L)	60.85	0.71	58.05	0.78	-2.882	.004*
CPK	In comfort (UI/L)	71.37	0.56	68.22	1.32	-2.882	.004*
	After the effort (UI/L)	205.23	2.62	194.05	7.56	-2.722	.006*
Shooting Precision	Tripartite (n)	2.33	1.51	9.00	1.26	-2.882	.004*
	Near (n)	14.00	1.55	20.00	1.26	-2.882	.004*

* Significant different at level of 0.05.

Table 5. Statistics - test for the amount volume of effect size experimental in enzyme (AST) (ALT) CPK comfort, after the effort and shooting precision.

Variables	Control group		Experimental Group		Difference Between Means	Effect Size	Volume of Effect Size	
	Mean	SD	Mean	SD				
AST	In comfort (UI/L)	26.60	0.41	24.97	0.97	1.63	2.19	.80
	After the effort (UI/L)	90.95	1.28	83.47	2.21	7.48	4.14	.80
ALT	In comfort (UI/L)	31.22	0.70	28.38	0.86	2.84	3.62	.80
	After the effort (UI/L)	60.85	0.71	58.05	0.78	2.80	3.75	.80
CPK	In comfort (UI/L)	71.37	0.56	68.22	1.32	3.15	3.11	.80
	After the effort. (UI/L)	205.32	2.62	194.05	7.56	11.27	1.99	.80
Shooting Precision	Tripartite (n)	2.33	1.51	9.00	1.26	6.67	4.80	.80
	Near (n)	14.00	1.55	20.00	1.26	6.00	4.25	.80

Table 4 shows significant statistical differences of Mann-Whitney test in the post measurement of the Enzymes AST, ALT, CPK and shooting precision for basketball players between the control and experimental groups. Where the value of $P < 0.05$ in all research variables indicating that there are statistically significant differences between the control and the experimental group for the experimental group.

Table 5 shows the results of significant statistical that the amount of influence between the control and experimental groups in enzyme AST, ALT, CPK and comfort after a big effort for the sake of the experimental groups of arithmetic average better.

Discussion

The results showed table 2 of significant statistical differences of control group between pre and post

measurements in tests the Enzymes AST, ALT, CPK and shooting precision for basketball players. Where the value of $P < 0.05$ in all variables search which shows statistically significant differences between pre and post measurement for post-measurement. It indicates an improvement in measurements of these variables.

The researcher attributes this improvement in measurements of a posteriori group member and a police officer in the variables under discussion to the traditional exercises legalized, planned scientific planning and appropriate to the situation of the players subject to it. Which in turn led to the improvement in the enzyme rates ALT, AST, CPK and shooting precision near and triple control group.

The planned training prepared on sound foundations by coach have influence few drawbacks on aspects of the physiological and membership of the practitioner player to training planned to facilitate the achievement of the

objective of the training process (Thomas et al., 2005). The systematic training and continuous lead to lifting the physical level of the players, as well as improve the level and effectiveness of performance (Jill & Michael, 2009). This is consistent with the results of the case studies both (Mohamed, 1999; Shirin, 2004; Elsaid, 2013) which showed improvement in the instrument cluster and dimensional tribal for the group because of the officer to attend training.

The results Show Table 3 of significant statistical differences to the experimental group between pre and post measurements in tests of the Enzymes AST, ALT, CPK and shooting precision for basketball players. Where the value of $P < 0.05$ to all variables search which shows statistically significant differences between pre and post measurement for post-measurement indicating an improvement in measurements of these variables. The researcher attributed the improvement to the Hypoxic exercises, resulting in an improvement in the concentration ratios enzymes AST, ALT, CPK and shooting precision of the experimental group.

The hypoxic training is considered one of the important ways that lead to an improvement in the functional efficiency, which reflected on the level of achievement (Ashraf, 1995). In the same context (Marwa, 2009) quoted the results of the medical academy lack of oxygen to hypoxic exercises conducted on the category levels of upper sports have positive effects in the improvement of the physiologic level of sports performance. This is consistent with the results of the case studies both (Ahmed, 2008; Tariq, 2012; Sohee et al., 2013) that the training programs that contain hypoxic exercises to improve the level of physical performance.

The results show significant statistical differences in the post measurement of the Enzymes AST, ALT, CPK and shooting precision for basketball players between the control and experimental groups. Where the value of $P < 0.05$ in all research variables indicating that there are statistically significant differences between the control and the experimental group for the experimental group.

Table shows the results of amount of influence between the control and experimental groups in enzyme AST, ALT, CPK amounted respectively (2.19) (2.14) (3.62) (3.75) (3.11) (1.99) and comfort after a big effort amounted respectively (4.80) (4.25) for the sake of the experimental groups of arithmetic average better.

This is consistent with the mechanism of (El-Bisatti, 1998) hypoxic exercises working on improving the work of the respiratory and economy in the use of glucose inventory muscles and delay the emergence of fatigue to reduce lactic acid collects and increase the rate of getting rid of him and improvement of the work of enzymes within the muscles.

The hypoxic training of lead to a series of changes of training breathing muscles and improves its work. The increase in the volume of the abnormal blood plasma

after a temporary drop. An increase in the capacity of enzymes oxidation muscle. Currency consumption of muscle of fats and glycogen to blood glucose. The lack of ammonia production and lactic acid (Marwa, 2009).

As a result of hypoxic training happens the adaptation of the body to avoid the situation of hypoxic (lack of oxygen) in the muscles. Therefore the anaerobic mechanism protection muscles, which must work quickly because of exhaustion and continue to work. when the muscles under a lack of oxygen in the muscles work on the consumption of maximum oxygen to correspond to the effort which depletes anaerobic treatment capacity and thus provoke the body to benefit from the least amount of oxygen as a result of continuing training and adaptation happens memorizing body muscles higher efficiency (Will, 1999).

In the exercise of the sports activity and the attendant, some changes in the enzymes and these enzymes enzyme AST, ALT and CPK, this found that the rates of increase adversely commensurate with the level of efficiency center (Haitham, 1999). This confirms that training programs for the regulated lead to the adaptation of the organs of the body that is evident through the low concentration of enzyme ALT, AST, and CPK (Hader, 2005).

The researcher attributed the improvement in the instrument cluster and dimensional pilot group in the enzyme AST, ALT, CPK, comfort after the effort and the accuracy of the tripartite correction due to the training program. In addition, its hypoxic exercises as it contributed to the improvement of the situation on the careers of the players, which in turn reflected the situation center and training the players had had a positive impact on the enzyme AST, ALT, CPK, as well shooting precision. Those agree with the findings of each of the (Bialek et al, 2000; Hader, 2005) hypoxic exercises improvement of some of the physical abilities of physiological level performance for the Basketball player.

Classified Basketball sports activities with high intensity and occasional, which entail the burdens of physiological high impressive basketball players during matches for those burdens leads' basketball players to fatigue. Which reflected the cycle on the nature of the performance and tactical players fatigue is the enemy of the effectiveness of the kinesthetic skills where slows down scrolling speed decreases are also affected by the rapid reaction the receipt, swipe smaller proportions successful correction and capacity to implement the lightning (Ayman, 2002).

That the effects of fatigue on the device muscular lie in the lack of ability to retain or repeated contractions musculoskeletal disorders in the same standard strength and therefore weaken the performance of a person capable of maintaining the level of intensity required or performance technique and compelled to refusing to continue in performance (Resan, 1997).

In addition, agrees that the results of the study with the results of both (Ahmed, 2008; Fayza, 2012; Czuba, 2013) Attendance hypoxic exercises led to improved antenna endurance and anaerobic muscular efficiency and the development and improvement of performance for basketball players. The training of regulated hypoxic had contributed to the delay in the emergence of fatigue on players by improving the vital functions have which reflected positively on the enzymes AST, ALT, CPK and shooting precision basketball players.

As a conclusion, the study concluded that use of hypoxic training resulted in an improvement statistically significant at a level of Enzyme ALT, AST, and CPK for basketball players. The use of hypoxic training resulted in an improvement statistically significant shooting near and shooting triple precision for basketball players. These results should be taken into account by the basketball Federation and attention by coaches trained in the application of hypoxic training basketball players programs given the positive impact on the players.

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