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THE EFFECT OF NIGELLA SATIVA ON THE EFFICIENCY OF ALT AND AST ENZYMES AMONG THE 100 METERS HANDICAP RUNNERS (DEAF AND MUTE)

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ABSTRACT

Physical training leads to physiological and chemical changes inside the muscular cell to produce sufficient energy for physical performance as a result of increasing the energy material that participate in in the process of assimilation. The level of the athlete depends on the extent of positivity in chemical changes that ensure the adaptation of the systems and organs of the body facing the effort, functional and physical fatigue that results from training and competition. As a result of the critical role of the liver, it provides a lot of enzymes that have medical and clinical significance like aspartate aminotransferase (AST) and Alanine Aminotransferase (ALT). These two enzymes perform a process called transamination which is the process of transferring the amino group from amino acid to ketoacidosis where the first one is transformed into ketoacidosis which is also transformed into amino acid. Nigella sativa contains the essential acids that the human body needs. They help increasing the reactions between the enzymes that result in rebuilding damaged cells which is caused by training.

INTRODUCTION

The liver plays a basic and vital role in many processes of metabolic connection inside the body. They include making carbohydrates, fats, and many proteins. It also exchanges the materials with blood plasma; adds some of them to be distributed among body tissues; and removes other materials through additional metabolic processes (Whitby, Smith, Seskett. 1988:103,128-149).

The liver is regarded as one of the organs that essentially effect the flow of metabolism through practicing physical effort as well as those happen in the rest time. So, it is regarded as the effective organ in the metabolic process of the body like storing glycogen which dissolves into glucose depending on the need of the body. Athletics are the activities that the researchers seek to investigate like 100 m running for handicaps through modern techniques that participate in developing the achievement. AST and ALT enzymes are liver enzymes. Increasing their levels in blood serum is an indication of liver diseases. On the other hand, they exist in low concentrations in other tissues like heart, kidneys muscles, pancreas, spleen, and lungs. Those enzymes play an effective role in the process of transamination in the cell due to exhausting the energy through practicing physical effort. Those wide transmission enzymes compensate the shortage of the basic source of energy production.

The significance of the study is demonstrated through investigating the effect of Nigella sativa on the levels of ALT and AST enzymes caused by practicing different types of physical effort as well as the effective role of the liver in the production of energy in human body. This significance shall be considered in two essential aspects: rest and effort times which made the researchers interested in investigating them. The problem that the current study tries to address is investigating the effect of Nigella sativa on those enzymes and the level of achievement in the activity of 100 m free running for handicaps (deaf and mute)

STUDY METHODOLOGY AND FIELD PROCEDURES

Study Methodology

The researchers adopted the experimental methodology as it suits the study problem and because it is the only method that can give accurate results and can really test the hypotheses of the relations of cause and effect (Allawi and Ratib 1999: 277).

**Study Sample**

The study sample was chosen deliberately from Paralympic athletes in Diyala Governorate from the group of deaf and mute athletics in 100 m sprinting. The sample consisted of eight athletes. The sample was balanced in the variables of weight, age, and training period by means of skewness coefficient. The sample then was divided into two experimental groups.

Table (1) Balance of study groups in the variables of weight, training age and height

Indicators	Measurement unit	arithmetic mean	Standard deviation	Median	Skewness coefficient
Weight	k.gm	68.25	1.70	68.54	0.98
Training period	Year	4.85	0.85	4.50	0.885
Height	cm	169.35	1.787	169.50	0.752

Study Variables

- 1) Investigating the rate of AST enzyme after and before the method (after and before activity)
- 2) Investigating the rate of ALT enzyme after and before the method (after and before activity)
- 3) Achievement test in 100 m running

Study Tests**Blood Test**

2 mm of blood was vine punctured using medical syringe then put in a plastic tube to be transferred to the lab directly before vine puncturing along with using an anticoagulant. The blood was drawn from the runner s twice. The first time before the test during rest time. The second was after the 100 m running test of about 3-5 minutes. The samples were tagged and put in a centrifuge to separate the serum and conduct examinations of enzymes.

The Test of 100 m Free Running

- Purpose: assessing the achievement of 100 m runner s.
- Date and time: 12/3/2007, 10:00 a.m.
- Aids: Pistol, 4 stop watches.
- Performance characteristics: the runner s align on the start line of the 100 meters and when they hear the order "on the line" by the shooter, they sit on the line and stand still. When they hear the order "prepare", they rise they rise their hips almost above the shoulders and stabilize. When the shooter shoots, the runners start running as fast as they can to the finish line.
- Terms: Each runner is given one successful attempt only. If the attempt was unsuccessful like having a fault start, it will be repeated.
- Recording: The time that the runner spent during 100 m running to the 1/100th of a second as explained in table (10) appendix (5).

Pilot Experiment

It is a preliminary study conducted by the researcher on a small sample to ensure the validity of the test and identify the mistakes that face the tests in order to be avoided. Qassim Al Mandalawi (1989:107) defines it as a "practical practice for the researcher to identify the advantages and disadvantages of the tests". To investigate the obstacles that might appear in the main experiment, the researcher conducted a pilot experiment on Wednesday 14/10/2015, 9:00 am on the athletes from the same sample of the Paralympic sub-committee in Diyala for the Deaf and Mute in Diyala Sport Club. The aims of the experiment were:

- Assuring the suitability of the tests on the sample of the study by investigating the validity of the results.
- Determining the time needed for conducting the tests.



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- Identifying the mistakes that might occur the experiment and how to overcome them.
- Training the assistance team on conducting the test.
- Assuring the validity of the devices and tools to be used in the main experiment.

Pretests

The researchers and the assistance team conducted pretests for the study sample which is the athletes of Paralympic sub-committee in Diyala for the Deaf and Mute in Diyala Sport Club after conducting the pilot experiment on Monday 19/10/2015. A blood sample was taken before the test (before warming up) and after performing 100 m free running test for handicaps (deaf and mute) in Diyala Sport Club in 9:00 a.m. The researchers did not interfere with preparing the training method. They just supervised giving Nigella sativa during the experiment (8 weeks and 1 gm) according to the references and previous studies that stress on giving such amount (Heidar, Alaa, Khalaf 2102).

Posttests

Posttests were conducted on the sample of the study considering the same circumstances of pretests.

Statistical Devices

The researchers used SPSS statistical suit to run and process data; and extracting the desired results.

Results, Analysis, and Discussion

The study data were statistically processed using SPSS program in order to extract the rete of development between pretests and posttests.

Table (2) Arithmetic mean, standard deviation, specified and tabulated T value in pretest, posttest and experimental group that used Nigella sativa and training method to investigate the concentration of AST and ALT enzymes and the achievement of 100 m running for handicaps (deaf and mute) with 3 freedom degree and 0.05 error margin

Tests	Unit	Pretest		Posttest		Specified T Value	Tabulated T Value	Function level
		M	SD	M	SD			
AST Enzyme before the method	Before effort	13.45	2.35	18.45	2.40	4.49	3.18	significant
AST Enzyme after the method	After effort	23.67	3.32	35.45	3.98	9.45		significant
ALT Enzyme before the method	Before effort	13.56	2.43	19.45	2.67	4.75		significant
ALT Enzyme after the method	After effort	27.34	3.67	36.67	3.89	8.67		significant
Achievement test 100m running	Time	12.30	0.27	11.90	0.32	3.89		significant

Referring to table (2), it was noticed that all the tests were significant for the first experimental group that took Nigella sativa along with the method. The specified value was bigger than the tabulated value, which refers to the significance of variations between the pretest and posttest and the variables in question in the effect of Nigella sativa on the efficiency of ALT and AST enzymes among 100-meter runners, handicaps, deaf and mute in favor of the posttest. The researchers justify that to organized and repeated training methods that lead to the high concentrations of the enzymes that constantly leak to blood stream through muscular tissues. This leak happens because of continuous physical effort load and fatigue on muscular cells. This leads to leaks of enzymes in blood stream and their high concentration in athletes that took Nigella sativa. This is because it contains essential amino acids like Histidine, Valine, Leucine and secondary amino acids like Tyrosine, Lysine, and Alanine. The protein concentration is estimated between 21.71- 22.87% (Babayyan, V.K.et al.1978). Those acids play a great role in increasing the levels of the two enzymes in blood. The process of muscle building needs the availability of amino acids to complete it properly. In this process, the role of AST and ALT enzymes is vital since they transport amino



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groups among amino acids and ketone acids (Obert Kmarray/ Dary/ K, 1996). Concerning the achievement test of 100 meter running, physical effort and different physical loads have apparent and tangible effects on the two enzymes, especially, in short distances.

Table (3) Arithmetic mean, standard deviation, specified and tabulated T value in pretest, posttest and experimental group that used training method only to investigate the concentration of AST and ALT enzymes and the achievement of 100 m running for handicaps (deaf and mute) with 3 freedom degree and 0.05 error margin

Tests	Unit	Pretest		Posttest		Specified T Value	Tabulated T Value	Function level
		M	SD	M	SD			
AST Enzyme before the method	Before effort	12.60	2.02	17.35	2.20	3.35	3.18	significant
AST Enzyme after the method	After effort	13.37	2.25	19.45	2.75	3.23		significant
ALT Enzyme before the method	Before effort	12.70	2.65	19.35	2.45	3.75		significant
ALT Enzyme after the method	After effort	13.68	2.56	19.67	2.65	3.43		significant
Achievement test 100m running	Time	12.65	0.32	12.2	0.27	2.89		Not significant

Through noticing table (3), it is clear that all the tests were significant to the second experimental group that used the method only. Since the specified value is larger than tabulated value, it marks the significance of variations between pretest and posttest in all the variables in question except the achievement of 100 meter free running on the efficiency of ALT and AST enzymes among 100-meter runners (deaf and mute) in favor of pretest. The researchers justify that one test cannot make big changes that make a difference, especially, in high speeds or even in speed endurance and endurance test which represent different physical efforts. This is reflected on the possibility to extract a significant difference between physical efforts.

Concerning the efficiency of ALT and AST enzymes, the suggested physical efforts were not sufficient to trigger catabolism and anabolism. Eventually, no increase in the concentration of ALT and AST enzymes is traced. It is highly believable that muscular cells of athletes are highly adaptable which decreased the mechanism. In addition, there is a good muscle performance that there is no need to increase the concentration of the two enzymes during the process of anabolism by transferring amino acids into muscles. The levels of the enzymes kept their normal levels in the blood of the athletes. This means that they reached a state of biochemical adaptation in their cells for all the chemical reactins inside the body due to the accumulative effect of physical training. This is reflected on biochemical scales like AST and ALT enzymes.

Enzyme leak leads to increasing its concentration in the blood which is one of the causes of malfunction or damage in cell wall. This will lead to extracting the enzymes from the cell. It is known that AST enzyme has isoenzymes in cytoplasm and mitochondria which is the result of any increase in AST enzyme during physical activity (Whitby, Smith, Beckett 1988).

Table (4) Arithmetic mean, standard deviation, specified and tabulated T value in pretests of the effect of Nigella sativa on the efficiency of AST and ALT enzymes among 100 m runners for handicaps (deaf and mute) for the two experimental groups (6 freedom degree and 0.05 function level)

Tests	Unit	Experimental group (method only) Pretest	Experimental group (method + Nigella sativa) Pretest	Specified T Value	Tabulated T Value	Function level



		M	SD	M	SD		
AST Enzyme before the method		18.45	2.40	17.35	2.20	7.35	significant
AST Enzyme after the method		35.45	3.89	19.45	2.75		
ALT Enzyme before the method		19.45	2.76	19.35	2.45	8.24	significant
ALT Enzyme after the method		36.67	3.98	19.67	2.76		
Achievement test 100m running	Time	11.90	0.32	12.02	0.27	4.45	significant

By noticing table (4), it is obvious that all the differences are significant between the two experimental groups. The researchers justify that the intensity and size of the load during the tests accompanied by different chemical and physical processes, changes in the environment of the cell and catabolism. In addition to the changes inside the cell, there are changes in cell walls and surrounding environment. This needs a control mechanism to preserve the surrounding of cell and its inside to maintain its function. One of the mechanisms is increasing the concentration of enzymes to balance the structure of the cell by transamination and transforming amino acids into acids, structural acids, and nucleus pigment in order to be able to face new coming loads.

This increase refers to the adaptation of the biological system of athletes. It refers to dissolving some proteins stored in other cells and can be used when needed in physical effort. The body need to amino acids comes from a process called "reverse balance" between the proteins in the different parts of the body. Plasma and liver proteins can be exploited by other cells and inserted by enzyme transfer through cell walls in a process called pinocytosis (Guyton and Hall 2015). The effect of physical effort on ALT enzyme accompanied by increasing the level of the enzyme in blood after physical effort, especially intense, are near to the same effect on ALT enzyme. However, it is not the same in significant terms because the availability of ALT enzyme in muscles is regarded as the fourth on the body enzyme availability after liver, kidneys and heart. Muscles are regarded as the third tissue after liver and heart in the availability of this enzyme (Varley, Gowenlock and Bell 1980).

ALT enzyme is used in the interactions between Pyrovate and Alanine that happen as a result of energy release in the absence of oxygen through Glycolysis. One of its natural results is Pyrovic acid. This is one of energy production systems that can be noticed in physical activities that can be performed between 30- 1:30 seconds because oxygenic efforts create an adaptation in the organs and systems of the body.

CONCLUSION

Thorough the results, the researchers concluded that the level of ALT and AST enzymes in the blood during the rest is significantly higher in the runners of the first experimental group that had *Nigella sativa* in comparison with the runners of the second experimental group who performed the training method only. The enzymes in question kept their normal levels. There was an increase in the level of the enzymes in the post reading in comparison with the pre-reading (keeping the normal levels) in the posttests of the first experimental group in comparison with the pretest of the second experimental group.

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