

# The Effect Of Specific Exercises In Stimulating The Enzyme Lactate Dehydrogenase, Level Of Achievement In A 100m Freestyle Swimming For Applicants

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## **Abstract**

*The research aims to investigate the effect of specific skill physical exercise on LDH enzyme stimulation and the level of achievement in 100m freestyle swimming for applicants. The research was conducted on a sample of the Army Sports Club, whose number was (8). The exploratory experiment was conducted on swimmers from the main research sample and after providing all the necessary supplies and needs to carry out the research, the two researchers, in cooperation with the team coach, proceeded to conduct the pre-test, which included drawing a sample of blood intravenously from the hand by (3 cc) and testing 100 meters of free swimming, after which the trainer applied the program's vocabulary The training prepared by the researchers, and after the completion of its application, the post-test was conducted, the data were collected and treated statistically. The two researchers concluded that the quality of the skillful physical exercises had a clear effect on the improvement of the LDH enzyme and also on the development of the level of achievement of the research sample. The researchers recommended the need to be careful in choosing the exercises and training method Which suit the athletes' ages, levels, and the training goal for which it was set.*

**Key words:** training / swimming stilt

## **1. INTRODUCTION**

Sports training is a group of exercises practiced by an athlete with effective training loads to develop physical and physiological capabilities as well as to develop technical and motor performance, the sum of these exercises is a basic case in building energy. Sports training cannot go in the right direction unless the athlete is healthy and his equipment is Functionality is sound and subject to development. Therefore, an athlete cannot develop physically and skillfully unless he develops physiology. Physiology of sports training is one of the most important sciences that must be taken into consideration in the training process for any activity. The idea of this research is based on a combination of sports training and its effect on the functional ability of the body by subjecting a 100-meter free swimmer to a training program based on specific skillful physical exercises carried out in a continuous training method and to identify the effect of these exercises on the LDH enzyme and on the level of achievement, the enzyme LDH (Dehydrogenase) is one of A group of dehydrogenases that do not use oxygen in the future of electrons, but rather use organic compounds called enzyme helpers or the correct groups in the future of electrons, as it is one of the important enzymes in the process of glucose or glycogen as it appears in the last step of the reactions of the glycolysis cycle, stimulating the reduction of pyruvic acid by the help of the enzyme. The importance of the enzyme LDH appears in stimulating the reaction towards

converting lactic acid to pyruvic acid to produce ATP 89: 1. (Risan Khuraibet and Ali Turki) confirms that “the activity of the enzyme dehydrogenase (LDH) reflects the degree of degradation of glycogen to produce energy and that the muscular effort increases the activities of dehydrogenase enzymes. (LDH) from lactic acid, and dealing with the concentration of (LDH) in the blood plasma is an indicator of anaerobic capacity, as increasing the concentration of (LDH) means an increase in the capacity and measuring the anaerobic capacity is one of the measurements of physical efficiency 101: 2 as some types of enzymes are used as a source of energy During short-distance swimming exercises, in order to produce energy that meets the body’s need while performing the exercises, the importance of the research lies in identifying the effect of these specific exercises on the LDH enzyme and the level of achievement under study.

## **2. RESEARCH PROBLEM**

Short distance swimmers who depend on the anaerobic system as a source of energy need the work of enzymes for the production of energy, and from these enzymes LDH, as increasing the concentration of this enzyme is one of the indicators of anaerobic ability and through what was mentioned about this enzyme that is widespread in the tissues of the body and that any increase In the activity of this enzyme is accompanied by an increase in the elimination of lactic acid. Through the researcher's experience and watching many trainings and races, he noticed that there is a weakness in the level of achievement of the swimmers within the 100m freestyle for the applicants. Therefore, the researcher believes that the exercises that are given to short distance swimmers are not able to raise the level of the swimmer, and at the same time, these exercises may be weak in stimulating the enzymes for the production of energy in the body in order to produce high amounts of energy that meet the needs of the body in short distances and if there are no exercises that stimulate The precautionary situation of the body, this means that the energy enzymes are of little activity and their functional duty is very limited, and this is the research problem.

## **3. AIM FOR THE RESEARCH**

- 1- Preparing specific physical exercises to stimulate the LDH enzyme under study.
- 2- Identifying the effect of specific physical exercise in developing the level of achievement of 100m freestyle swimming

## **4. RESEARCH HYPOTHESES**

- 1- There are significant differences in favor of the experimental group in the effect of specific skillful physical exercise on LDH enzyme development.
- 2- There are significant differences in favor of the experimental group in the effect of specific skill-based physical exercises on the level of achievement

## **5. RESEARCH AREAS**

The human field: a sample of 100m freestyle swimmers for the Army Sports Club for the category of applicants.

Spatial area: the Olympic indoor swimming pool.

The temporal domain: from 5/6/2017 \_\_ 6/8/2017

## **6. RESEARCH METHODOLOGY**

The researcher used the experimental approach due to its relevance to the nature of the research and because the experimental approach is an attempt to control all the basic factors affecting the variable or dependent variables in the experiment except for one factor that the

researcher controls and changes in a specific way with the aim of identifying and measuring its effect on the variable or dependent variables 59: 3 and because this approach is consistent With the accuracy of his results, the researcher followed the design of the control and experimental groups with the pre and post tests for the purpose of comparison, so that these two groups are equivalent in their properties in all respects, except for the experimental variable that affects the experimental group.

#### *The research sample*

The research sample consisted of the Army Sports Club swimmers, and the deliberate method was chosen and they were (8) swimmers as a sample for the research because they were practicing a 100-meter freestyle swimming that suits the idea of the research. Homogeneity of the research sample.

#### *Search devices and tools*

- Center Fusion device for separating blood samples.
- Blood-holding tubes that contain a blood thinner
- A special container for blood transfusion.
- Medical cotton + Dettol + medical syringes.
- A legal closed swimming pool.
- Electronic stopwatch, number (2). (1) Fox / Fox whistle
- Electronic balance to measure weight and height

### **7. TESTS USED IN RESEARCH:**

#### **LDH enzyme concentration test**

The aim of the test: to measure the level of (LDH) and the concentration in the blood serum  
Method of performance: The test was performed in the closed Olympic swimming pool by a specialist in analyzes, where the blood was drawn from the members of the research sample at three in the afternoon before performing the first training unit by calling the swimmer and sitting on the chair and placing the hand in a comfortable place and straightening it so that the hand face up and after Tie the tourniquet (a compressive band) with sufficient force above the elbow with a distance of approximately two fingers, i.e. between the elbow and the muscle until the vein becomes clear, and then clean the site of the vein with a cotton ball to dry, and then spread the location of the vein with the finger of the left hand and place one of the fingers before the location of the vein by lowering the needle tip with the right hand over the finger The left hand until the syringe takes an inclination angle of 45 degrees, and after the completion of the blood drawing process, the torrent is removed, the needle is taken out, a cotton swab is placed in place and pressed with the finger. The blood in the syringe (3cc) has been discharged into tubes containing an anticoagulant (Sodiu Citrate) and written On it is the name of the swimmer and the sequence, after which the two researchers collected the blood tubes of the sample members and put them in the cooling pad. For serum in order to chemically treat it.

#### **\_ Swimming (100) meters freestyle test:**

The objective of the test: to record a swimming time of 100 meters freestyle for each swimmer to see achievement

Method of performance: After performing all the tests for the control and experimental groups in the pre-test, the swimmers conducted a free-swimming test (100 meters), and that was the start of every two swimmers in one start. The swimmers should begin to take the starting position by presenting at least one foot on the front edge of the launch pads, and the

arms are positioned as desired. When all swimmers remain steady, the launcher should give the starting signal. Swimmers are launched according to Article 4-1 of the International Swimming Law.

The pretest

On 5/6/2017, the researcher, together with the assistant work team, after preparing all the supplies and capabilities needed for the research sample, conducted a pre-test before conducting the first training unit. 100m freestyle test.

Training curriculum

After building quality physical exercises serving 100-meter free swimmers, a category of advanced men, the exercises were built on the rules and foundations of sports training and the use of scientific methods in implementing the training program.

The research sample consisted of two groups, the pre-test and the post-test.

- The researcher used references, scientific sources and expert opinions in developing the training curriculum

- The training curriculum was started on Thursday, 5/5/2017 4 pm.

- The training curriculum was completed on Sunday 6/8/2017 Six in the afternoon.

- The duration of the exercises was (3) months, with six training units per week.

The training unit time (120) minutes.

The time of the main part in which the researcher applied specific physical exercises (50-60) minutes.

- The method of continuous training was used in its two types of low and high intensity (60-80%).

The researchers used the equation for chronological age and maximum pulse to extract the intensity.

Post- tests

On 6/8/2017 at six in the afternoon in the closed Olympic swimming pool, the last training unit for exercises prepared by the researcher was conducted, after which a blood sample of (3 cc) was drawn from the radial vein in the hand. The blood samples were placed in tubes for blood preservation (tubes), after which they were separated by the Center Fusion device, and the serum was taken in a special container to the laboratory for laboratory treatment and to obtain LDH levels.

Presenting, analyzing and discussing the results of the pre- and post-for the experimental and control groups.

Table (1) shows the statistical values of the two groups in the pre and post test for LDH enzyme and the level of achievement

Variables	Groups	Tests	A	ST D	Differences A	Differences STD	T	Error rate	Significance
LDH	Experimental	Pre	156.788	1.536	3.546	4.423	2.406	0.043	Sign
		Post	160.335	4.417					
	Control	Pre	155.454	2.831	.0426	3.613	0.354	0.732	Non-Sign
		Post	155.881	1.898					
Achievement	Experimental	Pre	58.997	0.792	2.448	0.915	8.025	0.000	Non-Sign
		Post	56.54	0.85					

	t	8	7					
Control	Pre	59.12	0.78	0.821	1.686	1.46	0.18	Sign
		5	8					
Pos		58.30	1.70					
	t	4	6					

Through the above table, it is evident that the arithmetic mean of the experimental group in the pre-test for LDH reached (156.788), while the standard deviation was (1.536), and the arithmetic mean of the post test reached (160.335) with a standard deviation (4.417), and that the arithmetic mean of the difference between the test The pre- and post-test reached (-3.546), and the total deviations of the difference reached (4.423), and the calculated value of (t) reached (2.406), with an error ratio of (0.043). Thus, the difference is a statistically significant difference between the results of the two tests and in favor of the post-tests, and it was clear through the results of improvement. The ratio of the enzyme (LDH) in the body of the swimmer among the test results of the experimental group, and the reason for this is attributed to the fact that the skillful physical exercises that the researcher relied on in the research has an effect on increasing the activity of the enzyme (LDH), which is related to physical exertion as the performance of physical exertion accompanies many chemical reactions. During the process of metabolism in order to produce energy, and the researcher agrees with what (Kazem Jaber Amin) referred to as "the enzyme LDH)), which is responsible for increasing the activity of converting pyruvic acid to lactic acid 6: 515 and through the above table it is found that the arithmetic mean of The control group in the LDH pre-test reached (155.454), the standard deviation was (2.831), and the arithmetic mean of the post test reached (155.881) with a standard deviation (1.898), and the arithmetic mean of the difference between the pre and post test reached (426.0) and the sum of the deviations The difference reached (3.613) and that the calculated value of (t) reached (0.354) with an error rate of (732.0), and thus the difference is statistically insignificant between the results of the two tests, while the researcher noticed that there were no significant differences between the pre and post tests of the control group, and the researcher attributes it to The training program prepared by the trainer does not affect this enzyme, and this is what (Safaa Razzouki) confirmed that fatigue during effort leads to a decrease in the activity of the nervous system processes and this drop leads to a decrease in the activity of the enzyme (LDH) in the muscle and liver, and then slow in the disposal of blood and tissues From the lactate 7: 119, and through Table (3) it becomes clear that the arithmetic mean of the experimental group in the pre-test to achieve 100 meters freestyle swimming reached (58.997) and a standard deviation of (.7920). The arithmetic mean of the post test was (56,548) with a standard deviation (0.857) ) And I have average sense The difference between the pretest and the post test reached (2.448) and the sum of the deviations of the difference reached (0.915), and the value of (t) computed reached (8.025) with an error percentage of (.0000). Thus, the difference is a statistically significant difference between the results of the two tests, while the arithmetic mean of the control group In the pre-test, it reached (59.125) and a standard deviation reached (.7880). The arithmetic mean of the post test reached (58.304) and a standard deviation reached (1.706). The arithmetic mean of the difference between the pre and post test reached (.8210) and the total deviations of the difference reached (1.686). And the calculated value of (t) reached (1.461) with an error rate of (.1820), so the difference is not statistically significant between the results of the two tests. It is known that increasing the activity of the enzyme (LDH) helps the metabolism of lactic acid, and as a result it leads to a decrease in its rate in the working muscles resulting from physical exertion, which affected the positive and was a reason for achieving the rate of development of digital achievement for

the experimental group and also the researcher attributes that the lack of development The digital achievement of the control group is that most athletes cannot swim at maximum effort for more than (40 seconds) before the severe acidity becomes the reason for the slow performance to a large extent, which affected the energy production and the high level of lactic acid in the muscles and thus the inability of the swimmer to achieve Best achievement.

Table (2) shows the statistical values of the two groups of LDH enzyme and the level of achievement in the post test

Variables	Groups	A	STD	T	Error rate	Significance
LDH	Experimental	160.335	4.417	2.406	2.779	Sign
	Control	155.881	1.898	0.354		
Achievement	Experimental	56.548	0.857	8.025	2.757	Sign
	Control	58.304	1.706	1.461		

Through the above table, the arithmetic mean of the experimental group of the LDH enzyme is (160,335) and a standard deviation of (4,417)) and the arithmetic mean of the control group is (155,881) and a standard deviation ((1.898) and the value of T is (2.779) and the percentage of error is (0.013). Morally, the researcher attributes, as was indicated in the results of the previous research, that the enzyme LDH ( ) is responsible for the metabolism of lactic acid by converting pyruvate to lactic acid, in addition to that any increase in the activity of this enzyme is accompanied by an increase in the elimination of lactic acid and therefore, skillful physical exercises The effective role in increasing the activity of this enzyme, which was placed according to correct scientific foundations, and through the results of the above table it is evident that there are significant differences in favor of the experimental group in the level of achievement despite the improvement of the control group in achieving (100 meters) free swimming for the post test, and the researcher attributes the reason for the improvement in the level of The achievement of the two groups and the superiority of the experimental group indicated that the adaptation processes occurring to the swimmer's body through the training program and the skillful physical exercises were sufficient for the development of the two groups and the superiority of the experimental group practiced dates The skillful physical growth, which significantly affected the functional indicators of the swimming body and the LDH enzyme, which gave positive results in improving the digital achievement of the swimmers.

### 8. CONCLUSIONS

- The type of exercises that the researcher entered into the research sample were targeted exercises appropriate to the age of the swimmers and the training objective for which they were set.
- The high level of the enzyme LDH in the body means an improvement in the physiological state of the swimmer.

### 9. RECOMMENDATIONS

- Carelessness in choosing the exercises and training method, in a way that suits the age, level of the athlete and the training goal.

- Searching for specific exercises in order to increase his impulse towards training and rid the athlete of the cycle of boredom and routine.

Conducting similar research on different activities and studying other enzymes and the extent to which athletes benefit from these enzymes as a main source of energy.

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