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The contribution of the teams of some physiological indicators before the lactate effort and then with my ability to endure handball players

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Abstract

This study aims to Identify the teams of the lactic level in the blood and the time of the emergence of the anaerobic threshold and the number of breathing times before and after the lactate effort, and to get to know the level of my ability to carry strength and carry speed, And get to know the relationship and the contribution of the level of lactic acid level in the blood and the time of the appearance of the anaerobic threshold and the number of breathing times before the ladder and after that, with my ability to withstand the handball players, And I adopted the descriptive approach in the style of correlation, on a sample that was deliberately chosen from handball players in the clubs (the army and the police) from Baghdad Governorate participating in the sports season (2022-2023), who number (28). (A player, and after the 4th goalkeepers are excluded because they were not included in the research of the research, To be the research sample (24) players by (85.714%) of their origin community, and after identifying measurements and tests, the descriptive study was applied to apply to the research Sam The lactate and after it is linked and contributes to increasing the level of the ability to endure the special muscle strength and affect it directly, and it is linked and contributes to increasing the capacity of the special speed of handball players, and did not affect it, and that is the difference of the level of the level of the Appearance of the anaerobic threshold of the litigious effort and after it is linked and contributes to increasing the level of endurance capacity Special muscle strength and increased the ability to withstand the special speed of handball players and affects each of them positively and in the direction. The increase in the difference of the level of the number of times the number of breathing for the exhaustion and after the exhaustion is related and contributes to increasing the level of the ability to endure the special muscle strength and increased the ability to carry the special speed of handball players and did not affect each of them, and it is necessary to pay attention to planning and implementing curricula training that takes into account the integration of the continuity in the positive impact of each of The level of lactic acid in the blood, the time of the appearance of the anaerobic threshold, and the number of breathing times, because of its positive role by increasing the level of the ability of special muscle strength and increased the ability to carry the special speed of handball players.

Keywords: Physiological indicators, lactate effort, endurance, speed, handball

Introduction

Evaluation of the training status of the players depends on measuring the physiological indicators, as they are highly objective to judge the condition of the handball players and the various players of the rest of the games and sporting events, and finding relationships between these physiological indicators is of great necessity in supporting the knowledge of the trainers and increasing their capabilities in training planning. The athlete and its application according to health conditions without harming the player's condition, especially if the time period of the effect of the effort on the internal reactions of each physiological indicator is known and according to its importance. Breathing, and the importance of measuring it is essential for the handball players whose game is characterized by lactic effort, which requires special endurance for both strength and speed. As "lactic acid is known as a final product of the second anaerobic energy system, which quickly separates to release the hydrogen ion (H⁺) and the remaining substance combines with sodium or potassium salts to form a salt called lactate." (Raisan and Abu El-Ela, 2016) Also, "vital regulators represent the first line of defense in the blood for any change in the pH value, and they work during a very short period of time (part of a second) to reduce the pH value. The second line of defense is the respiratory system that works to remove (CO₂) within several minutes and then remove carbonic acid (H₂CO₂) from the body, and there is an inverse

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relationship between the concentration of lactic acid and the level of bicarbonate." (Ahmed, 2019) ^[1]. Likewise, "the importance of the anaerobic glycolysis system (lactic acid) is evident in the types of sports that require maximum effort." (Mofti, 2010) The enzyme dehydrogenase (LDH) helps to get rid of lactic acid, and an increase in the concentration of this enzyme is accompanied by an increase in the elimination of lactic acid as it is a dehydrogenase, and then converts lactic acid into pyruvic acid, and beta-endorphins (beta-endorphins) (Blood morphine) acts as a chemical messenger, and is involved in many physiological processes, and helps to increase the secretion of some hormones such as glucagon and insulin. (Goldberger & Gurney, 2011) ^[11]. As for the term "anaerobic threshold," it is used in the field of physiological preparation to denote a specific state of fatigue that the player reaches during physical performance. Scientists have defined it as an increase in the intensity of the physical load, at which the rate of lactic acid transfer from the muscles into the blood increases to a degree that exceeds the rate of its elimination, and it has a direct connection with the lactic acid system (anaerobic capacity) and the oxygen consumption system (anaerobic capacity)." It is defined as the "anaerobic threshold" or the lactate threshold (AT) (Lactate Threshold) is the level of intensity of the physical load beyond which the rate of transfer of lactic acid in the muscles into the blood exceeds the rate of blood elimination from it." (Essam, 2015) ^[9].

Because the anaerobic threshold is the turning point between the energy systems on which the athlete relies, it is determined according to the training intensity and the time of performance, which are the important physiological indicators in evaluating the training status of the athlete. One of the modern exercises in the world of sports training that many have researched." (Chad, 2005) ^[8]. As for "the repetition of the respiratory rate, the period of return to the normal state (the recovery period) depends on the physical and training condition of the individual." (Bahaa El-Din, 2008). "Due to the constant increase in the body's need for more oxygen in the case of physical exertion in order to oxidize nutrients to rebuild ATP molecules, there are significant changes in the volume of both inhalation and exhalation." (Mohammed, 2000) It was also noted that muscle stress leads to an increase in the amount of carbon dioxide in the blood, and therefore, in order for the body to get rid of this excess amount of this gas, the rate and depth of breathing must be increased. (Ayesh, 2002) ^[4]. As for strength endurance, they defined it as "the ability to maintain a high level of strength for the longest possible period of time in the face of fatigue and to perform the largest number of repetitions." (Fatima *et al.*, 2017) ^[10]. Strength endurance is defined as "one of the compound capabilities that combine the elements of strength and endurance, and therefore, in light of this complex relationship that combines the elements of strength and endurance as performance requirements in force endurance, and its concept is synonymous with muscular endurance, which describes the biological ability to face the fatigue that occurs during the implementation of Enduring strength." (Mahmoud, 2014) ^[17]. As for "speed endurance, it can be used to develop the consistency of muscle contractions, and repetition methods are used with a high number of groups and a small number of repetitions within these groups, with a training intensity higher than (85%) and an increase in

exercise time to develop speed endurance." (Sports coach, 2014) ^[27].

As "the lack of processing the energy currency in the body represented by (ATP) compound may be considered the main cause of fatigue, and the weakness of the ability to produce this compound is determined by the biochemical mechanisms of the accumulated metabolites and biological control within the cell system that cannot be isolated or put in isolation from this" (Swartz & Other, 2017). It is also more difficult to protect ATP stores with endurance exercise, as a result of increases in inosine phosphate (IMP), a by-product of the breakdown of adenosine monophosphate (AMP), which appears to occur secondarily as endogenous substrate and glycogen. Inosine (IMP) can exacerbate metabolic stress due to the reduction of adenine nucleotide pool and energy charge, and here comes the role of the (MCT1) gene to regulate waste control and the return of muscles to their normal mechanical function, and the balance of metabolism may also face this difficulty by disrupting the activities of many Enzymes involved in oxidative phosphorylation and glycolysis." (Green & Other, 2018) ^[12]. Endurance sports lead to perturbations in a wide range of processes that increase cellular stress, disrupt cellular metabolism to cause one or more of these perturbations ultimately to chemical fatigue, defined as resulting in the inability to generate the required mechanical response. (Allen & Lamb, 2008) ^[3], (Lamb, 2009) ^[16]. While "when the athlete becomes more adequate in training, the need for energy during training decreases or decreases compared to the athlete who is insufficient." (Bahauddin, 2000) ^[6]. From the foregoing, it is clear that attention must be paid to measuring these physiological indicators by finding the effects of the burdens of physical effort inflicted by the handball players' training, as the measurement must go towards finding differences between before and after the effort, given the stability of the resting state as a level for each player, and then knowing its relationship And its contribution and impact on my own stamina, and through the field researcher's follow-up to the handball clubs' training and competitions in Baghdad governorate, she noticed that the players suffer from a clear decline in my own stamina, especially before the end of the training units and the middle of the second half of the matches, which focused her attention on this problem and sought to study it. In the field, by adopting modernity in physiological and physical tests, so that the importance of studying this problem is that the trainers take it upon themselves when planning the exercises to adopt the values of the physiological indicators, which, if improved, will have positive repercussions on the physical condition.

Research objectives

1. Identifying the difference in the lactic level in the blood, the time of appearance of the anaerobic threshold, and the number of respiration times before and after the lactic effort of handball players.
2. To identify the level of my ability to carry strength and carry speed for handball players.
3. Identifying the relationship and contribution of the difference in the level of lactic acid in the blood, the time of appearance of the anaerobic threshold, and the number of respiration times before and after the lactic effort with the special endurance of the handball players.

Research hypotheses

1. The difference in the level of lactic acid in the blood, the difference in the time of appearance of the anaerobic threshold, and the difference in the number of respiration times before and after the lactic effort are related to the level of endurance of the special muscle strength of the handball players.
2. The difference in the level of lactic acid in the blood, the difference in the time of appearance of the anaerobic threshold, and the difference in the number of respiration times before and after the lactic effort are related to the level of endurance of the special speed of the handball players.

Research methodology

The descriptive approach was adopted, which is defined as "the approach that describes a phenomenon according to a specific research plan that includes describing the phenomena, collecting facts and information about them, evaluating these phenomena in the light of what they should be, and in the light of more appropriate criteria, and proposing the steps that must be taken." be on it." (Magdy, 2019).

Reaching solutions to the current problem also requires the researcher to adopt the method of correlation studies from this descriptive approach, as the method of correlation studies is defined in the research method as "the research that seeks to try to determine the relationship between two or more measurable variables." (Muhammad and Osama, 2017 ^[24]).

Research community and appointed him

The limits of this available community are represented by handball players in the two clubs (the army and the police) from the Baghdad governorate participating in the sports season (2022-2023), with a total of (28) players. The specificity of the research, so that the research sample would be (24) players with a rate of (85.714%) from their original community, and the reasons for the researcher's approach were To this community that they represent the specific category in the community of the research problem themselves, and they are available to the yard For ease of contact with them and ensuring their presence in your judgment Their commitment to regular training in their clubs.

The procedures and the measurement

The researcher relied on the lactic potential to measure each of the physiological indicators using a device bicycle firmware Type (life fitness) with a capacity of (9700) American (robot with each arm and leg) mechanical with an electronic digital screen to monitor the speed and fix the resistance of each tester by multiplying the tester's weight (mass) in kilograms x 0.075 = the required resistance, and performing a continuous high physical effort for a period of (90) bike sec constant, and each indicator is measured before and after the voltage and then find the difference of values as follows:

First: A difference test the level of lactic acid concentration in the blood before and after lactic exertion:

The researcher adopted a lactic acid measuring device Portable (Lactic-pro), and take the measurement at the time of rest before the effort, and then the tester performs the effort on the stationary bike, and after (5) minutes of rest have passed after this effort, the portable (Lactic -pro) device whistles with its own tape, He poked (thumb) the tester with the needle of the device, and took a blood sample with the (kit) placed in the device to get the reading according to the following equation:

The difference resulting from the effort = the level of lactic acid concentration in the blood after effort - The level of lactic acid concentration in the blood before the effort. In millimoles/litre.

Second: A test time difference Appearance of threshold difference anaerobes; (Anaerobic Threshold):

The researcher relied on the (Fitmate pro) device system, and the player performs the effort on the stationary bike and records the readings directly before and after the lactic effort.

The difference resulting from effort = time Appearance of threshold difference anaerobes; after effort - time Appearance of threshold difference anaerobes; before voltage, in seconds.

Test measuring the difference in the number of times of respiration after and before the effort:

To adopt the objectivity and accuracy of the measurement, the researcher decided to fix the number of breathing times before performing the test of the time of the appearance of the anaerobic threshold and immediately after its completion, by recording the reading from the (Fitmate pro) device. According to the following equation:

The difference resulting from the effort = the number of times of breathing after the effort - the number of times of breathing before the effort, in units of the number of times.

As for the special muscular strength endurance test, Appendix (1) was adopted as the unit of measurement for the number of times, and the special speed endurance test was adopted as appendix (2) in the second unit of measurement.

After determining the tests and measurements based on physiological measurement technology, the researcher proceeded to measure the research sample of (24) players in the army and police clubs, as on Sunday corresponding to (10/2/2022) the difference in physiological indicators was measured, and on Tuesday corresponding to (4/10/2022) Test application Special muscular strength endurance, Special speed endurance.

Statistical means

The researcher checked of processing the study data using a system Satchel statistic Social (SPSS) Version (V 26) by automatically extracting each of the Values The ratio percentage, and the mean Arithmetic,, the standard deviation, the skewness modulus, the multiple (regression) coefficient, and the percentage of the contribution, and the test (F) The private matching quality, tilt (effect) with a test (T) private No regression _ a multi.

Results and Discussion

Table 1: Shows the statistical parameters of the variables studied

Variants	Measuring unit	Sample number	Arithmetic mean	Standard deviation	Skewness
The difference in the level of lactic acid in the blood	mmol	24	9.92	0.929	-0.89
The time difference of the emergence of the anaerobic threshold	tha	24	30.33	4,082	-0.091
The difference in the number of respirations	Number	24	34.75	2.09	-0.448
own muscular strength	Number	24	16.58	1.06	0.001
Own speed	tha	24	0.248	0.024	0.206

Table 2: The multiple correlation coefficient and contribution percentage are shown And the standard error of estimation for both force bearing and velocity bearing

Influential	Affected	Multiple regression coefficient _ 2 (R)	Contribution percentage	The standard error of the estimate
Difference of physiological indicators before and after lactic effort	own muscular strength	0.965	0.96	0.212
Difference of physiological indicators before and after lactic effort	Own speed	0.96	0.954	0.00514

Table 3: An examination of the quality of fit of the multiple regression model is shown for both strength endurance and speed endurance

Indication	Degree	Value (F) calculated	Mean of squares	Degrees of freedom	Sum of squares	Variance	Influential	Not affected
D	0.000	184,864	8,311	3	24,934	Regression	Difference in physiological indicators	Own muscular strength
			0.045	20	0.899	errors		
D	0.000	159,642	0.004	3	0.013	Regression	Difference in physiological indicators	Own speed
			0.000	20	0.001	errors		

* Significance level (0.05) n = 24 D if the value of (Sig) score ≤ (0.05)

Table 4: The effect of the multiple regression model for force endurance and velocity endurance is shown Significance level (0.05) n = 24

Variants	betaβ	Standard error	Value (t)	Calculated	Degree _	Indication
Fixed limit		9,052	1,273	7.11	0.000	Moral
Own muscular strength	lactic	0.423	0.081	5,208	0.000	Moral
	Anaerobic threshold	0.216	0.032	6,729	0.000	Moral
	breathing times	-0.093	0.062	1,491	0.152	Non-moral
fixed limit		0.099	0.031	3,215	0.004	Moral
Own speed	lactic	0.003	0.002	1,449	0.163	Non-moral
	Anaerobic threshold	0.006	0.001	7,832	0.000	Moral
	breathing times	-0.002	0.002	1,238	0.23	Non-moral

The value of (t) is significant if it is a degree (Sig) ≤ (0.05)

The results of the research contained in tables (2) mentioned in this research show that the handball players in the police and army clubs have a significant relationship and contribution to the level difference. Each of the physiological indicators before and after the lactic effort is the level of endurance of the special muscle strength of the handball players, with a contribution rate of (0.96), while the rest of the percentage of (0.4) was due to random factors that are not researched, and the ability to withstand the special speed of the handball players. With a contribution rate of (0.954), while the rest of the percentage amounting to (0.446) was due to random, un-researched factors, and the results of Table (3) demonstrated a good fit of the multiple regression models for both strength endurance and speed endurance, as for the effect of the difference in the level of lactic acid in the blood And the difference in the time of appearance of the anaerobic threshold difference and the difference in the number of breathing times before and after the lactic effort are mentioned in Table (4). The results show that the lower the difference in the level of lactic acid in the blood, it directly affects the increase in the level of endurance of muscular strength as well as the level of

endurance of speed. The researcher showed the emergence of these results until the players got rid of lactic acid after exertion, as a result of the good work of the vital organizations in achieving metabolic balance, and this gives an indication of the appropriateness of the good application of the exercises of the second system of energy, and that the greater the difference in the time of emergence of fatigue The anaerobic difference level, as it directly affects the increase in the level of endurance of muscular strength and the absence of a significant effect with the level of the ability to withstand speed despite its association and contribution to this ability according to the results of the regression model. The aerobic ability to withstand strength and increase the duration of special endurance in the lactic system prevailing in the handball game, and it is supposed to suit the ability to withstand speed, which has experienced deficiencies despite the need for speed training to prolong the duration of its special endurance in handball, which gives an indication of the good and appropriateness of the exercises for the players The ability to withstand strength and its inappropriateness to the players' training for the ability to withstand speed. As for the difference in the

number of breathing times before and after the lactic effort, it did not show a significant effect, despite its association and contribution to both the ability to withstand strength and endurance of speed. Ridding the body of carbon dioxide gas, which is a catalyst for increasing the number of breathing times, to give the two regression models an indication that each of these indicators mentioned is proportional to the increase in It directly increased the level of endurance of the special strength and the lack of time of endurance of the special speed of the handball players, and with a variation in the effect of each of them on these two abilities. As "the decrease in the concentration of lactic acid in the blood indicates an improvement in the functional condition of the athletes, and their ability to continue their physical performance." (Sawka & Other, 2004) Also, "lactic acid accumulates in the areas of neuromuscular communication, which leads to impeding the arrival of nerve signals incoming to the muscle fibers, and as a result, the player's movement slows down and his speed decreases, despite the strength of the player's will and his attempt to deliver these signals. As a result of this accumulation, the nervous system begins to get tired, especially the nerve cells." Mobility, which leads to an irregular and inconsistent delivery of nerve signals to the muscles in a good way, and the level of neuromuscular compatibility decreases and the level of performance decreases. The meniscus and blood, so a lot of muscle glycogen becomes practically lactic acid, except that in this process large amounts of (ATP) are formed without the consumption of (O₂), which can be used as a quick source of energy when it is required to obtain a muscle contraction of short to medium duration However, it is less fast than the phosphagine system and is about half its speed. In ideal conditions, the lactic acid system can provide great muscle activity for a period of (1.3-1.6) minutes, in addition to (8-10) seconds. The phosphagine system. (John, 2001) ^[15] as "the process of liberating energy in the case of increased acidity of the blood is temporarily difficult due to the decrease in the activity of the enzymes responsible for energy production." That is, "when the muscles train, they use carbohydrates as a primary source of energy, especially in high-intensity training, and this results in lactic acid as waste for this work, then it breaks down and turns directly into lactate and hydrogen ions, and lactate is transferred from the muscles into the blood." (Mohamed, 2013). Likewise, "it must not be exaggerated in giving athletes, such as beginners and intermediates, more than (20) minutes per session of speed endurance exercise consistently, and not more than three times a week. This planning aims to increase the speed by about (0.1) miles per hour in subsequent exercises, and when Reaching the desired point of this increase, he can run three miles in those 20 minutes, and develop his aerobic system, and there is no need to train the athlete's body to run long distances faster than that. " (Ayed and Firas, 2020) Also, "training leads to physiological changes involving body systems, and the level of athletic performance progresses whenever these changes are positive in order to achieve physiological adaptation of body systems and then to physical load." (Bahaa, 2018) ^[5]. Lactic acid, which begins to appear in the first energy system after (16) seconds of high voltage, and when the mechanism for its chemical reactions inside the cell differs and reduces its percentage, this difference in the balance of proportions causes an imbalance that leads to stress on the vital organizations that work to continue supplying energy

and the beginning of the emergence of the differential threshold anaerobes". (Lauralee, 2004). "Breathing problems during physical exertion are manifested in shortness of breath, and an increase in its rate to a degree that impedes the continuation of physical performance" (Bahaa El-Din, 2000).

Abstracts and applications

1. The decrease in the difference in the level of lactic acid in the blood before and after the lactic effort is associated with and contributes to increasing the level of endurance of the special muscle strength and affects it directly. It is associated with and contributes to increasing the endurance of the special speed of handball players, and did not affect it.
2. Increasing the level difference between the time of emergence of the anaerobic threshold before and after the lactic effort is related and contributes to increasing the level of endurance of the specific muscle strength. And by increasing the ability to withstand the special speed of the handball players, and it affects both of them positively and in the direct direction.
3. Increasing the difference in the level of the difference in the number of breathing times before and after the lactic effort is related and contributes to increasing the level of endurance of the special muscle strength. and (b) increasing the endurance of the special speed of the handball players, and it did not affect each of them.
4. It is necessary to pay attention to the planning and application of training curricula that take into account the integration of harmonization in the positive effect of the level of lactic acid in the blood, the time of appearance of the anaerobic threshold, and the number of respirations, because of its positive role in increasing the level of endurance of the special muscle strength. And by increasing the ability to carry the special speed of handball players.

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