International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 04, 2020
ISSN: 1475-7192

Determination of the Power Systems Operating According to the Lactic Acid in the Blood for shooters of Air Weapons (rifle/ pistol) Shooters

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ABSTRACT: *The sport of shooting is one of the fixed endurance sports, which depends on onion it's performance and competition to on enduring withstand the competition time (1.5) hours and the weight of the weapon, indicating that the sport of shooting carries the capacity of physical, functional and mental capacities, There is no doubt that working in them its operational work is subject to energy systems such as like any specific physical effort limited in time and which may interfere with the anaerobic system and aerobic system. The importance of this research is toiles in conducting an analytical study on the determination of the ratios of working systems by identifying the percentages of lactic acid in the blood before the competition in the middle and after the completion of competition (identify the ratios according to the Time of competition).*

The research problem of research is the decline of the performance and achievement levels of the men and women shooters in the middle and the end of the competition, where failures appear clearly in the shooters in the last 10 throws on the target, which led the researcher to study this problem.

The objective of the research is to identify the energy systems employed by the shooters of the air weapons (men/women) and to identify the percentages of the lactic acid in the blood before, in the middle and after the competition, as well as to identify the relationship of these ratios percentages with the results of the competition.

Methodology: The researcher used the descriptive method. The research procedures in the selection of the sample of the research in a comprehensive inventory inclusive method were (52) of the shooters of air weapons (pistol/rifle) participating in the Iraqi club's championship, the sample represented the whole society entire population. After the researcher conducted the pilot experiment two days before the competition, she conducted the main experiment on the same day of competition in relation to the lactic ratios before, in the middle and after completion.

The two researchers concluded: The increase in the ratio of lactic acid in the research sample between the pre-test and the middle test, tribal, middle, for the middle test, and between the middle intermediate test and the post-

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Received: 15 Jan 2020 | Revised: 5 Feb 2020| Accepted: 30 Mar 2020

text in favor of the post-test, and post-secondary gradually, and there is a reverse correlation between the ratios of lactic acid and achievement.

The two researchers recommended that trainers be instructed to develop plans and training programs for shooting according to the working energy systems, taking into consideration the results of the current study.

Keywords: *operational power systems, lactic acid, shooting results, pneumatic air weapons*.

I. Introduction:

The objective of sports training is to develop the athlete's ability to reach high achievements and professional levels. "This depends on the construction of scientific training programs and research on the new updates what is new in the field of sports specialized sports." The biochemical indicators reflect the efficiency of the training programs that must be mastered according to the energy production systems contributing to the type of effectiveness type, Especially specially because that the energy in of the body of is the source that drives the contraction of the muscle, whether fast or slow, fixed or moving according to time performance time.

The sport of shooting is a fixed endurance sport. It relies on its training and competition to on withstanding the competition and the weight of the weapons. The weight of the air pistol is 1.5 kg and the rifle are 4.5-5 kg. The competition time is between 1.15-1.5 hours, and the shooters repeat the performance of the shooting 60 times at the center of the target, and it is difficult to determine the timing of each shot, depending on the individual differences, but it ranges from 20 - 25 seconds and interspersed with 6-9 seconds of holding breaths, associated with shooting and this time Is considered within the limits of possible shooters (men/women) and thus we find that the sport of shooting incorporate carries a capacity of physical, functional and mental capacities and There is no doubt that the work is subject to energy systems.

The two researchers found that the sport of shooting is subject to two systems - the anaerobic energy (Lactic) system with varying proportions and aerobic. , so the two researchers conducted an analytical study of the percentages of proportion of lactic acid in the blood, is since the concentration of acid in the blood is the most important indicator that indicates the severity and nature of performance. The two researchers adopted this test before the start of the competition and in the middle of the competition and after completion. This division was adopted to represent the beginning of the work of the anaerobic system in the middle of the competition, and after the end of the physical effort, to determine the contribution of this system in shooting sport for men and women with air weapons (pistol and rifle).

The problem of research:

Trainers and researchers in the field of air weapons shooting with air weapons seek

to analyze and evaluate the performance of shooters to identify the most important

points that lead to failure of achievement, which lead to the need to discuss the variables of sport - physical, functional, and biochemical - to keep abreast cope with the digital developments that exceeded the global achievement

beyond the upper limits of digital achievement. The experts' opinions on the type of working power system varied according to the time of competition and the accompanying breathlessness during the competition, which led the researchers to engage in these questions. This made the researchers, according to their experience of the two researchers in the field of shooting, training, and field participation in shooting competitions raise these questions and try to find answers for them. They observed the decline of digital shooters in the first half of the competition and the increasing failures of shooting in the last shots on the target center and the dispersion of the shot's paths. Therefore, it is necessary to identify the causes of the decline during the stages of the competition, especially as the pressure of the competition plays a has the main role in the effect of physical, functional, and biochemical changes. The body organs work according to the system of working energy and depending on the functional needs of the performance and duration of muscle contractions. Therefore, the two researchers conducted an analytical study of the lactic ratios of blood for shooting sport to regulate their training according to the working energy systems to increase the efficiency of the athlete and maintain the stability of the achievement level under the conditions and requirements of the competition.

Research Objectives:

– Identifying action of the energy systems operating in the shooters of air weapons (men/women) in the Iraqi championship.

- Identifying cation of the systems of ratios of lactic acid in the blood of shooters with air weapons (men/women) in the Iraqi championship.

- To Identifying the difference in the proportions of lactic acid in the blood according to the time of competition.

- To identify the relationship between the results of the competition and the final rate of lactic acid in the blood after the end of competition.

Research hypotheses:

- There are no statistically significant differences in the ratio of lactic acid to shooters (men/women) in the Iraqi Air Weapons Championship.

- There are no statistically significant differences in lactic rates in blood according to the competition time for air weapons (men/women).

- There is no relationship between the results of the competition and the final ratio of lactic acid in the blood after the competition for the shooters of air weapons (men/women).

Research Fields:

Human Field: - Shooters of air weapons (rifle/pistol) Men and women participating in the Iraqi Air Weapons Championship.

- Time-domain: Duration from 11/7/2019 to 13/7/2019.

Spatial domain: The legal arena for the shooting of air weapons of the Iraqi Central Shooting Association for air Weapons.

II. Research Methodology:

The researcher used the descriptive approach in the analytical method to suit the nature and problem of research.

Community:

The research population community identifies Iraq's clubs with air weapons, which numbered 52 shooters. The researchers selected the research community population in a comprehensive inventory inclusive method. The number of shooters who used the air pistol was 13 men, and the shooters who used the rifle were 15 men.

In the women's section, 14 women participated in the rifle shooting, and 10 women used the air pistol. In other words, the total sample of men and women (52) of the shooters represented 100%.

Tests research:

First: Testing the measurement of the ratio of lactic acid percentage in the blood:

The researcher conducted a test to measure the proportion of lactic in the blood using a (Lactic pro meter) device, a sample was taken from the thumb and placed on the strip test in the device and then the results of the test appear within 60 seconds on the screen of the device, the researchers conducted the measurement test at rest - before the competition and after The end of the competition. (The test should be done after at least 1-2 minutes of effort to ensure that the lactic acid has reached from the muscles to the blood).

Second: Selection of achievement:

The test includes air weapons (pistol and rifle) and weapons targets, as well as 4.5 mm bullets.

Explaining the test: the entry of shooters with a test for air weapons - is a competition for them, giving each of the shooters 60 shots during (1.5) hours.

Method of recording results: The results were calculated on the basis of the number of bullets that hit the center of the target, where each shot is counted on a goal of (10) and thus total 600 as a higher degree of achievement.

Field research procedures

Main experiment:

The researchers conducted the pilot experiment on the research sample on Thursday, 11/7/2019 through a training camp for men and women. Then the researchers conducted the main experiment on Saturday 13/7/2019 on the same day of competition for Iraqi clubs (men and women). Lactic blood tests were performed 15 minutes before the start of the competition, in the middle of the competition, and after completion, and then the achievement numbers were obtained.

Statistical Methods: The researcher used the statistical bag (Spss) to obtain the results of the research.

III. Results review and analysis the results and discuss them:

Table (1) Showings the computational dynamics, standard deviations, and calculated value (t). The table shows the Pre-test and middle-test, a median test of lactic acid for shooters (air pistol and rifle).

Shooters	Variables	T	Pre-test competition		Middle of competition		Q	P	Calculated value	Sig	significance
			s	P	s	P					
women	rifle	14	17,24	1,325	22.58	1,674	5.34	1,924	10,389	0,000	sign
	pistol	10	16.98	2,432	20.35	1,957	3.37	1,367	7,800	0,000	sign
men	rifle	15th	14.27	1,143	19.86	1,367	5,59	2,187	9,911	0,000	sign
	pistol	13	13.95	1,086	18.14	1,752	4.19	1,941	7,788	0,000	sign

Table (1) shows the computational environment, standard deviations, and the value of (T) to denote the differences between the pre and intermediate tests of the lactic acid ratios of the shooters (men/women) for rifle and pistol weapons. The results showed that there were significant differences between the tests before and the middle and in favor of the intermediate test, increasing the ratio of lactic acid in the sample. The researchers noted that this increase is the beginning of the work of the anaerobic energy system after about 40-45 of the competition time. Where the difference in the media increased by the equivalent of 5-6 mg / 100 ml blood and increase the differences for women compared to men and this follows physiological differences and biological between men and women.

Some may wonder that the period of time for mid-competition is within the scientific parameters of the work of the air system, but the accumulation of lactic acid comes as a result of holding breaths with each bullet shot, but the accumulation of acid does not exceed the upper limits because the shooters have the right to breathe oxygen during the race. But the period of time does not allow the shooters to get rid of the increase of lactic acid.

LAMBERT (Lactic acid accumulation gives a clear indication of the intensity of exercise carried out by the athlete) (1)

Table (2) shows the computational dynamics, standard deviations and values (t) calculated between the intermediate test and the post-test of lactic acid for shooters (rifle and pistol).

Shooters	Variables	T	Middle of competition		Post-test competition		Q	P	Calculated value	Sig	Statistical significance
			s	P	s	P					

women	**rifle**	**14**	**22.58**	**1,674**	**27.15**	**2,731**	**4,57**	**1,879**	**9,103**	**0,000**	**moral**
	pistol	**10**	**20.35**	**1,957**	**24.86**	**3,478**	**4.51**	**1,614**	**8,843**	**0,000**	**moral**
men	**rifle**	**15th**	**19.86**	**1,367**	**24.93**	**1,989**	**5,07**	**1,941**	**10,119**	**0,000**	**moral**
	pistol	**13**	**18.14**	**1,752**	**23.75**	**1,148**	**5,61**	**1,756**	**11,519**	**0,000**	**moral**

As shown in Table (2), the computational and standard deviations and the calculated value of (t) of the lactic acid ratios between the intermediate and post-competitive tests. And the significance of the differences for the shooters (men and women) with pistols and air rifles.

The researchers believe that this increase in the proportions logical and synchronized with the competition time of up to 1.5 hours and repeat the performance of the shooting, which includes the time of holding breath, in addition to the weight of the weapon and the participation of two-thirds of the muscles of the body while shooting. The sources indicate that the right shot takes 6-8 seconds to hold the breath, and the repetition leads to an increase in the proportion of lactic acid in the muscles and blood (2)

The two researchers also attribute the effect of the competition effort and the duration of the competition, which effectively affect the increase of the lactic acid levels from the natural level in varying degrees but do not reach its peak in the middle and end of the competition, these percentages give a clear indication of the reason for the decline in performance and failures in shooting, Thus, the shooters breathe deeply to supply the body with sufficient air and to eliminate lactic acid deposition. The competition begins toward the oxygen energy system. The sources state that the lactic level in the blood provides us with important information about the energy produced by the anaerobic system. The change in lactic is associated with the period of time of performance resulting in changes in the work of the muscles through the slow arrival of the nerve signal and the movement of positive and negative ions and the activity of anaerobic oxidation enzymes, which leads to a reduction in the proportion of the contribution of anaerobic load towards the work of oxygen. (3)

Table (3) Its showings the correlation coefficient values between the results of the discussion and lactic acid concentrations after the competition for shooters (rifle and pistol)

Shooters	**Variables**	**Calculated value of (r) and competition results**	**Sig**	**Statistical significance**
Women	**Concentration of lactic acid after competition (rifle)**	**0.658**	**0.001**	**Moral reverse**
	Concentration of lactic acid after competition (pistol)	**0.533**	**0.001**	**Moral reverse**

Received: 15 Jan 2020 | Revised: 5 Feb 2020| Accepted: 30 Mar 2020

men	**Concentration of lactic acid after competition (rifle)**	**0.594**	**0,000**	**Moral reverse**
	Concentration of lactic acid after competition (pistol)	**0.588**	**0,000**	**Moral reverse**

Table (3) shows the values of the correlation coefficients calculated between the concentration of lactic acid after the competition and the results of the competition in air weapons (rifle/pistol). The results showed an adverse correlation between acid and the results of the competition. This means that the increase of lactic acid is reflected negatively on the results of the competition. This was clearly shown in the last ten shots on the target, where failures appear in the correction due to the competitive performance of the shooting sport, which relies on the use of three-quarters of the body muscles, which are the heavy physical performance at a specific time, and this is the main reason for the decline Level at the end of the competition. where the sources indicate that (the physical load imposed on the muscles of the general leads to a decrease in the adequacy of the work of nerve centers due to time due to the increase of lactic acid) (4).

Thus, the researchers concluded that shooting sport depends on the performance of two operating systems mixed between oxygen and non-oxygen, where the contribution of the anaerobic system by 30% of the competition effort and time - located under the system of anaerobic energy with an average time ranging from 30-60 seconds. (5)

IV. Conclusions and recommendations

Conclusions:

The researchers concluded:

-Increasing the ratio of lactic acid gradually during the competition of shooters (men/women) and arms (pistol/rifle).

- The rate of lactic acid was limited between 4-5 mg / 100 ml of blood for men and women according to differences between them.

- The sport of shooting is a sport in which energy systems are mixed, the average anaerobic energy system forms 30% and 70% of the aerobic system.

Recommendations:

-Pay Attention should be given to the medium-time anaerobic endurance exercises for their effective effect in the results of the competition for the shooters.

- attention should be given to oxygen exercise oxygen to increase the efficiency of functional organs of the body like the respiratory system to remove the waste of lactic waste and stability of the level of achievement in competition.

Received: 15 Jan 2020 | Revised: 5 Feb 2020| Accepted: 30 Mar 2020

-Directing training by trainers and researchers in the field of shooting by developing training programs according to the current study taking into consideration the ratios extracted in the research.

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Received: 15 Jan 2020 | Revised: 5 Feb 2020| Accepted: 30 Mar 2020