International Journal of Psychosocial Rehabilitation, Vol.24, Issue 02, 2020
ISSN: 1475-7192

The effect of the variation of muscle elongation exercises on the base efficiency and metabolic rate of elite handball players

Alaa Jassim Mkhilf Al-Shihany[1]

Abstract-*The study aimed to prepare exercises that reconsider the training of muscle elongation ranges in line with the requirements of improving the cellular biochemical system, so that the researcher assumes that these exercises have a positive effect in improving the cellular base efficiency and their metabolism rate, and the experimental approach was adopted by designing the experimental and control group on a sample of (12) players Handball was deliberately chosen by (85.714%) from their specific community of handball players affiliated with the Iraqi national team participating in the sports season (2019) competitions. The approved tests were to measure the concentration of lactic acid and sodium bicarbonate in a laboratory after (5) minutes after a physical effort on the treadmill. Moving at a speed of 7 km / hour directly, and measuring (RMR) at rest time without any physical effort with the (Fitmate pro) system from the company (COSMED) for global sports physiological laboratories, and exercises were prepared for (10) consecutive weeks at a rate of (4) units per week And after the end of the experiment and treating its results with the SPSS system, the extracts and applications were that the contrast of muscle stretching exercises had a positive effect in reducing the level of lactic concentration and improving the investment in energy production Corresponding to the high concentration of sodium bicarbonate, thus increasing the level of basal efficiency of elite handball players, and the positive effect on the level of basal competence as a result of the variation in muscle stretching exercises has a role in increasing the level of cellular metabolism of elite handball players. The hand is taken into account when planning pregnancy cycles, especially for muscle stretching or for violent exercises that they receive during the special preparation period.*

Keywords*: variation of muscle elongation exercises, efficiency and metabolic rate, elite handball players*

Introduction

The research problem and its importance: - Muhammad Reda explains that "muscle elongation is one of the important characteristics in activities that require a wide range of motion for the performance of athletic skills, and the availability of this trait guarantees the success of skill performance greatly." (9) This is in agreement with Al-Nusiri's return that "in training explosive force and force characterized by velocity, trainers work to reach the muscles to the maximum ability to elongate in accordance with the relevant physical law (stretching and power generation), which one of its applications is that the greater the length of the muscle after Shortening it whenever you are able to bring out greater muscle capacity. "(5) As (Jack) believes that developing the level of muscle strength is an important thing that every coach seeks to achieve, and every player tries to reach it, as the appearance of fatigue is a physiological problem that negatively affects performance Physical and skill. "(13) And, accordingly, the importance of improving muscle extension provides the player with a high ability to achieve a further distance if they improve at the required level in line with the technical performance of handball skills, and for this work, the players themselves need a biological organization that allows them to continue supplying energy to meet the requirements This work on the one hand and the continuation of the supply on the other hand, as (Goldberger) provides confirmation of what he has concluded from his research that "the continuation of the player efficiently in performance with high training loads confirms that muscle cells are still conservative. Their basic equilibrium, their control of acids, and the availability of bicarbonate plays an important role in this event. (12) For Ahmed and Hussein to indicate, "The process of releasing energy in the event of increased acidity in the blood is temporarily difficult due to a decrease in the activity of enzymes responsible for producing energy." (1), Jabbar Rahima mentions that "the phosphate shielding system is a mixture of phosphates (HPO4). And phosphoric acid ((H2PO4) and the work of the bicarbonate system, if a strong acid such as hydrochloric acid (HCL) is added), it is replaced by weak phosphoric acid and the (pH) changes towards normal, and when the lactic threshold (4 mmol) is exceeded, the (pH) of the blood that can be reduced decreases. It becomes dangerous when vital

University Of Al- Mustansiriya[1]

organizations are unable to neutralize the blood and the internal organs and organs are unable to get rid of lactic acid. ”(3)“ McKenna believes, ”it has been shown that overloading the difficulties of exercise in humans leads to disruption of the activity of both sodium potassium and an enzyme. ATP ass, which is a group of enzymes that stimulate the hydrolysis of the phosphate in the molecule (ATP). Interestingly, the restoration of mechanical function after exercise is a slow process and may reach days. ”(14) This is supported by what Ahmed Nasreddin pointed out in It "represents organizations Vitality is the first line of defense in the blood for any change in the pH value. It works during a very short period of time (a fraction 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 The removal of carbonic acid (H2Co2) from the body, and there is an inverse relationship between the concentration of lactic acid and the level of bicarbonate. (2) Through the researcher's work in handball training with elite level players, he noticed that the restrictions imposed on the planning of muscle stretching exercises are governed by the method of training and the way in which they train by focusing on raising levels of explosive power and with a single frequency that does not take into account the improvement of cellular organizations that maintain efficiency The basic principles that would provide the continuity of preparing vital energy for this elongation exercises, especially as they are high-level training difficulties for those elite handball players, so that the need to reconsider the planning of these exercises in an academic manner that supports sports training to reach a state of stability in operations Cellular metabolism, as the exercises cannot be done in isolation from taking into account the requirements of improving or physiological development, so the aim of the study is to prepare exercises that reconsider the training of muscle elongation ranges in line with the requirements of improving the cellular biochemical system, so that the researcher assumes that these exercises have a positive effect in improving cellular base efficiency Their metabolic rate.

Research methodology: An experimental research method was adopted, which is defined as "a deliberate and controlled change of the specific conditions for an incident, and the observation and interpretation of the resulting changes in the event itself." (4) In order to clarify the parameters of the study according to its two groups, the independent variable, and the methodological processes and procedures, the experimental design (the experimental and equivalent control groups with a tight control over the pre and post tests) was chosen for its suitability to the two hypotheses of the study.

Research community and its sample: - The limits of the study community are represented by the handball players affiliated with the Iraqi national team participating in the sports season (2019) competitions, which amounted to (14) players, and after excluding the two guards from them for methodological and technical reasons, (12) players were deliberately chosen at a rate of (85.714%) From their community, they were then randomly divided into two experimental and control groups of equal numbers.

Measuring devices for tests and research procedures: The approved tests were to measure the concentration of lactic acid and sodium bicarbonate in a laboratory after (5) minutes after physical exertion on the treadmill at a speed of 7 km / hour directly, and measuring (RMR) at rest time without any physical effort in the system (Fitmate pro) from the company (COSMED) for global sports physiological laboratories, and the experimentation in these exercises was by controlling the training difficulty to list the weekly units as a whole so that the variation between one week and one week also for a period of (10) training weeks as follows: - The first week varies in intensity from the training units The five for higher levels (75-85), the second week ranges from training difficulty (80-90), the third week ranges from training difficulty (70-80), the fourth week ranges from training difficulty (60-70), and the fifth week ranges from training difficulty (85 The sixth week ranges from training difficulty (55-65), the seventh week ranges from training difficulty (75-85), and the eighth week ranges from training difficulty (60-70), and the ninth week ranges from training difficulty (80-90), and the nest week The training difficulty ranges from (90-95), so that the variance is out of the restrictions imposed in some rules for determining loads that are carried out with high stress or with a single frequency of overloading, and thus these exercises do not intersect with the principle of gradual and waving with the training load, but it comes down to the level of intensity with great variation In between weeks, the goal of these exercises is to raise the increase in muscle elongation within its components to match the content of its exercises with its objectives, and the exercises did not come out of the determinants of the first energy system, with its two types and the variety of different methods and methods of training the pleometric and ballistic elongation defined according to what presented (Baecher & Edrel is a model of the methods Elongation training, which is summarized in the plyometric exercises, "It is an exercise that the muscle can accomplish to reach its maximum strength in the shortest time possible, as the muscle passes two stages. The first is decentralized (lengthening) followed directly by central action (shortening)" (11), so that the elite training of Handball players are not restricted by restrictions imposed on training specific teams, as for the control group players, they train as they are followed only with them, and after completing the experiment according to the design determinants of experimentation In the aforementioned, the researcher verified the results with the (statistical package for social sciences) version (V_{26}), to calculate each of the percentage values, the arithmetic mean, the standard deviation, and the t-test for correlated samples, and the (t-test) for unrelated samples.

Research results and discussion: -

Table 1. ***Results of pretest for the study and control groups***

The tests	Leven	Sig	Experimental Group			Control Group			(t)	Sig	Ass.
			N	Mean	±SD	N	Mean	±SD			
Lactic Aside in blood	0.672	0.432	6	13.57	.552	6	13.25	.429	1.11	0.293	N.S
$NaHCO_3$ in blood	0.261	0.117	6	13.35	.1356	6	13.96	.492	1.224	0.249	N.S
RMR	0.115	0.741	6	2628.83	23.524	6	2638.83	22.833	0.747	0.472	N.S

df(N-2)=10 Significance level = 0.05; t-test value is significant at p-value ≤ 0.05

Table 2. ***Results of the study and control groups in the pretest and posttest***

The tests	Group	Pretest		Posttest		Mean Differences	±SD Differences	(t)	Sig	Ass.
		Mean	±SD	Mean	±SD					
Lactic Aside in blood	Ex	13.57	.552	10.1983	0.054	3.37	0.531	15.544	0.000	S
	Co	13.25	.429	12.097	0.168	1.155	0.527	5.366	0.003	S
$NaHCO_3$ in blood	Ex	13.35	.1356	16.185	0.062	2.84	1.135	6.129	0.002	S
	Co	13.96	.492	15.265	0.096	1.30167	0.526	6.054	0.002	S
RMR	Ex	2628.83	23.524	2872	14.751	243.167	34.324	17.353	0.000	S
	Co	2638.83	22.833	2736.83	32.344	98	21.119	11.367	0.000	S

Significance level = 0.05; t-test value is significant at p-value ≤ (0.05) df N-1=5

Table 3. ***Results of posttest for the study and control groups***

The tests	Experimental Group			Control Group			(t)	Sig	Ass.
	N	Mean	±SD	N	Mean	±SD			
Lactic Aside in blood	6	10.1983	0.054	6	12.097	0.168	26.391	0.000	S
$NaHCO_3$ in blood	6	16.185	0.062	6	15.265	0.096	19.659	0.000	S
RMR	6	2872	14.751	6	2736.83	32.344	9.313	0.000	S

df(N-2)=10 Significance level = 0.05; t-test value is significant at p-value ≤ 0.05

From the results of the pre-post comparison it is noted an increase in sodium bicarbonate at the expense of a decreased concentration of lactic acid, an increase in the metabolism rate in favor of the post-tests for each of the two research group players, and from observing the results of the post-tests, the statistical significance was in favor of the experimental group players, and the researcher attributes that to the improvement in cellular organizations Which was helped by the contrast of muscle stretching exercises, which helped the periods of low difficulty to facilitate its work, and helped to improve the biochemistry of the muscle in being able to get rid of metabolic waste and recycle it to

produce energy, and this gives an indication that this variation can achieve the desired purposes of this The type of training that was in this study is specific in the biochemistry of the muscles that were undulating outside the limitations of planning for other teams may not be of any use with elite players, but the facts we reach academically through experimentation and this is supported by the improvement in the rate of cellular metabolism. The Law of Mass Action states that when the final products of a chemical reaction accumulate in the medium of the reaction, the speed of the Almost completely interaction "(10)" as (Sawka & Other) states that "a decrease in the concentration of lactic acid in the blood indicates an improvement in the functional state of the athletes, and their ability to continue in physical performance." (15) Imad al-Din Abbas states: "The pregnancy given to the player causes excitement and change in vital body organs and systems in terms of function and chemistry, and this appears in the form of improvement in the adequacy of the various organs and systems; as well as the distinction of performance by economical effort as a result of continuing to perform pregnancy despite the start of feeling Fatigue and then begins to adapt to this pregnancy. "(7) Ayesh Zaitoun mentions that" it has been observed that muscle fatigue leads to an increase in the amount of carbon dioxide in the blood. Therefore, in order for the body to get rid of this extra amount of this gas, the rate and depth of breathing must be increased. " (6).

Extracts and applications: -

1- Contrasting muscle stretching exercises has a positive effect on lowering the level of lactic concentration and improving energy production, to be matched by a higher concentration of sodium bicarbonate, thus increasing the baseline efficiency of the elite players with hand reel.

2- The positive effect on the level of basal competence as a result of contrasting muscle stretching exercises has a role in increasing the level of cellular metabolism of elite players with handball.

3- It is necessary to pay attention to the organization of the internal cellular environment of the elite handball players and to take it into account when planning pregnancy cycles, especially for muscle stretching or violent exercises that they receive during the special preparation period.

References

1. Ahmed Farhan Ali and Hussein Manati Sajit; Physiology of Exercise: Babel, Dar Al-Sadiq Cultural Foundation, 2017, pp. 154-155.

2. Ahmed Nasruddin Syed; Principles of Sports Physiology, 3rd Edition: Cairo, Modern Book Center for Publishing, 2019, p. 69.

3. Jabbar Rahima Al Kaabi; Physiological and Chemical Foundations of Sports Training: Qatar, Doha, Qatar National Press, 2007, pp. 207 -275.

4. Raheem Yunus Crowe; An Introduction to Scientific Research Methodology: Amman, Dijlah House, 2008, pg. 171.

5. The return of Sabah Hussein al-Nusiri; Training with added weights to develop some special physical abilities and their effect on some physiological and skill indicators of young volleyball players: PhD thesis, College of Physical Education and Sports Sciences, University of Baghdad, 2009, p. 36.

6. Ayesh olives; Human Biology, Principles in Anatomy and Physiology, Edition 4: Amman, Dar Ammar for Publishing and Distribution, 2002, p. 251.

7. Imad al-Din Abbas Abu Zeid; Planning and scientific foundations for team building and preparation in group games, theories - applications, 2nd Edition: Alexandria, Knowledge Foundation, 2007, pg. 126.

8. Muhammad Hassan Allawi and Osama Kamel Ratib; Contemporary Trends in Scientific Research for the Sciences of Physical Education and Sports: Cairo, Dar Al-Fikr Al-Arabi, 2017, p. 243.

9. Muhammad Reda Al-Madamaghh; Field application of the theories and methods of sports training: Baghdad, 2008, p. 573.

10. Arthur C .Guyton & John E. Hall.(2006); Textbook of medical physiology : 11thed, Philadelphia, PA , USA: Library of Congress Cataloging-in-Publication,p:12.
11. Baechle TR and Earle RW.(2000); Essentials of Strength Training and Conditioning: 2nd Edition. Champaign, IL: Human Kinetics, p5.
12. Goldberger, M, & Gurney.(2011); the effects of direct teaching styles on motor skill acquisition of fifth grade children. Regearch Quarterly for Exercise and sport. USA.p:18.

13. Jack Wilmore,et.,al.(2008); Physiology of sport and exercise , 4 ed , Human Kinetics, , U.S.A. P:2
14. McKenna MJ, Bangsbo J, Renaud J-M.(2008);. Muscle K+, Na+, and Cl disturbances and Na+-K+ pump inactivation: implications for fatigue. Journal of Applied Physiology Jan 104(1):288–95.
15. Sawka, M., Knowlion,R., & Miles, P., (2004): Competition Blood lactate concentration in collegiate swimmers Eur., Journal of Appl. Physiology, Vol. 62.p:99.