

# Influence of Variance in Rest Interval for the Explosive Power Training for the Arms and Legs in the Light of Some Biochemical Indicators for the Cellular Equilibrium of the Volleyballers

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## **Abstract**

This study aims to prepare training in which the time of the inter -rest is changed to the explosive ability of the arms and the two legs and to learn about its effect in some biochemical connotations of the cellular balance represented by both lactic acid, Sodium bicarbonate, And the concentration of sodium and potassium in volleyball players, And I adopted the experimental approach to the design of one experimental group with a test. The tribal and the dimension, on a sample of volleyball players advanced in the Sports Industry Club participating in the sports tags (2021-2022), Who numbered (14) players, all of whom were deliberately chosen by (100%), And approved the laboratory examination The blood in the tribal and dimensional measurements of the research sample, As the level of the concentration of lactic acid was measured by the concentration of sodium bicarbonate in the blood, the level of concentration (potassium K+) and (sodium Na+), And in the preparation of exercises, The differences have receded in increasing the period of rest between the repetitions and reducing the time of rest between exercises, The application lasted for eight consecutive weeks, with three training units between one day and another per time week, with a total of (24) training units, and after the completion of the experimentation, The results were tackled statistically with a system (SPSS), So that extracts and applications are that it helps to change with inter -comfortable time for explosive ability exercises For arms and legs in blains, the lack of lactic acid, the increase of sodium, And the availability of sodium Potassium is within the health limits of volleyball players, And it is necessary to maintain the chemical mechanisms of the muscle cells that face high constituent efforts to fulfill the requirements of physical capabilities, And to the time required for the time necessary to keep them effectively to ensure energy supply, With facilitated constituent mechanisms, and avoid volleyball players chemical injuries.

**Keywords:** Variance in Rest Interval for the Explosive, Biochemical Indicators for the Cellular Equilibrium.

## **Research problem:**

Modern sports training takes an organizational structure that is consistent with the state of new development by using modern scientific means in the sports training process away from these previous traditional methods dependent and the adoption of new means and methods according to a codified method that leads to knowing the impact of sports training in developing many physical, skill and physiological indicators'. (Adel, 2014) 'And that the most important characteristic of sports training Its association with the theories and foundations of other sciences on which it depends mainly in shaping its various knowledge and information, and thus sports training is the result of that mixed mix of different sciences. Perhaps the reason is that this science aims to raise the development of human physical performance to achieve the highest sports levels. (Wajdi, 2018) The sporting training leads to physiological changes that include body systems, and the level of sports performance is progressing whenever these changes are positive in a way that achieves physiological adaptation of the body's systems and then for physical pregnancy '(Bahaa, 2018), It also leads to changes at the level of cells and tissues as well, and include anaerobic and air changes to produce the energy needed for sports performance, and given

the stinging capacity and depth of sports physiology in recent years, researchers have been able to obtain important physiological information and facts that contributed to the development of sports training, **(Omar, 2018)** It is possible for the person in charge of sports training in research and applications to provide support and support to volleyball coaches In their reconsideration of their planning for training and all levels and for various physical capabilities, the most important of which is the explosive ability that combines strength and speed, and considering that the speed is governed by heredity, the explosive power exercises focus on the component of the muscle force from it, which is defined as the ability to overcome external resistance or confront it It is also defined as the maximum amount of strength that the muscle can perform in the maximum one muscle contraction, and there are three types of muscle strength represented by the maximum strength and strength that is speeding, and enduring. **(Sayyid, 2019)** Just as 'the ability is greater if the force is used for a relatively long distance or if the force is used in a short period of time or both together, the sports depends on the ability more than its dependence on strength'**(Marwan & Muhammad, 2004)** Essential for energy, especially in high - intensity training, which results in lactic acid as preferences for this work, then it is broken and turns directly into lactate and hydrogen ions and the transmission of lactate from muscles to the blood '. **(Muhammad, 2013)** The lack of processing of the energy currency in the body represented by the ATP compound may be the primary cause of fatigue, and the weakness of the ability to produce this compound is determined by the biochemical mechanisms of the accumulated metabolism products and the bacterial control within the cell system that cannot be isolated or placed in isolation from this' **(Swartz & Other, 2017)** 'The energy liberalization process in the event of increased blood acidity is temporarily difficult due to the threat of enzymes responsible for energy production'. **(Hussein, 2017)** "Metabolism operations are successfully within the cellular system, the low concentration of lactic acid in blood indicates the improvement of the functional condition of the athletes, and their ability to continue physical performance." **(SAWKA & Other, 2004)** 'It is a final output of the second anaerobic system that is quickly separated to produce hydrogen ion (H+) and the remaining substance unites with sodium salts or potassium to form salt called lactate'. **(Risan, Abu Ella, 2016)** 'as That after a series of research, it was found that the province concentrated picarbonate in cells and blood is necessary for the athlete to achieve achievement. **(Goldberger, Gurney, 2011)** To ensure the continued supply of vital energy, the cellular environment for structural muscles must be in a stable condition for the biographies of biochemical interactions that produce the high vital energy required by the explosive ability, and thus the planning of sports training requires the review continuously to take into account the physiological reactions of the body that it receives as a result of high physical efforts By repeating the players to this ability that appears in the jumping movements and hitting the ball, especially in the skills of overwhelming transmission, overwhelming beating, and the wall of its types, as well as jumping movements in the skill of defending the stadium, as in its training, the principle of gradient and ripples in training loads take into account, as' the gradual increase in pregnancy Training is the basis for any planning to train the player and must follow all the players who are interested in their achievement.'**(Jamal, 2018)** This puts us in front of the problem of planning to plan the ripples and determining the duration of each rest, whether between the repetitions or groups or between an exercise and another as required by the balances of the cellular environment, in the balance between metabolic products and the foods represented by the interactive components that result from vital energy, and what helps in the availability of The required quantities of mineral elements, and this is possible to infer it from reviewing the time of each system of energy systems and its branches, and perhaps the phosphgenial system is concerned with the explosive capacity, which includes the height of ability, ability and tolerance, and just as going into this problem requires accuracy in the accounts of the compensation period to avoid Excess pregnancy, and out of restrictions imposed by planning determinants, to aim to do so Research to prepare exercises in which the time for the inter -rest is changed to the explosive ability of the arms and legs and to learn about its effect in some biochemical connotations of the cellular balance represented by both lactic acid, sodium bicarbonate, and the concentration of sodium and potassium in volleyball players, so that the researcher assumes that to change the time of intercourse with the ability to exercise power exercises The explosive of arms and legs has a positive impact on some biochemical connotations of the cellular balance of volleyball players.

## Methods

I adopt the experimental approach, which is known as the 'the curriculum in which we address and control an independent variable to see its effect on a continued variable, noting the resulting changes and their interpretation, whether the experiment includes an independent variable and a continued variable or more of an

independent variable or more of a continued variable' (Majdi, 2019) also approved the exactly one experimental group design.

## Sample and Sampling

The boundaries of the research community with volleyball players advanced in the Sports Industry Club participating in the sports tags (2021-2022) are officially registered in the Iraqi Central Union of volleyball, who were (14) players, who were deliberately chosen by (100%) because they are the phenomenon that is discussed in a problem Search, and they were dealt with as one sample without excluding any of them.

## Measurement Tools and Test:

The laboratory examination of the blood was approved in the tribal and dimensional measurements of the research sample, as the level of the concentration of lactic acid was measured by the concentration of sodium bicarbonate in the blood. A second, and then the laboratory sits without performing any effort for a period of (5) consecutive minutes, and after (5) minutes of complete rest, (5CC) is pulled out of the blood directly after the completion of this effort and preserved in a tube to transfer it to the laboratory analysis, while the content is The exercises in which the time of intercourse is changed For the explosive ability of the arms and the two legs, that was a contrast to the interview with the brightness of the restrictions imposed on some rules for identifying loads that are made with high training difficulties or at the same pace of excessive download, to avoid the stress imposed by these difficulties on muscle contractions, and they intersect with the principle of gradient and ripples except It descends at the level of intensity with a contrast between weeks, the goal of these exercises is to improve the physiological condition and muscle ability and without stress for the working muscles, as the determinants of the CP-system impose the duration of the rest from (2-5) minutes between the exercises, and in this numbers the variations have receded in increasing the duration of the period The comfort between the repetitions of the training intensity (85%) to be at a rate of (1-8), Because of the severity of (90%), it is (1-9) and for the severity of (95%) is at (1-10) in highly severity training in order to allow the efficiency of metabolic energy operations, and reduce the time of rest between exercises for training intensity (85%) to be for a period (100 Tha) and for the severity (90%) is for a period of (120 seconds) and for the severity of (95%) is for a period of (180 Tha) to pressure the cellular organizations represented by carboxyl tankers to respond physiologically to the high -teaching pregnancy, and the exercises continued for eight consecutive weeks, with units Three training between one day and another in one training week, training was applied at the beginning of the main section Of it with a time ranging from (15-19) minutes of it, which included jumping and jumping exercises for the two men at different heights and distances, and throwing medical balls with different weights from above the head and in front of the chest and different distances as well. Experimental completion, the results were collected to be statistically treated with a SPSS system to calculate: arithmetic medium, standard deviation, and T-Test test for interconnected samples.

## Results:

**Table 1. Results of the study groups in the pretest and posttest**

The tests	Pretest		Posttest		Mean Differe nces	SD± Differe nces	t(	Sig	A ss.
	Mean	SD±	Mean	SD±					
Lactic Aside in blood	13.36	0.633	10.64	0.497	2.714	0.726	13.984	0.000	S
NaHCO <sub>3</sub> in blood	12.71	0.914	14.71	0.469	2	0.784	9.539	0.000	S
Na <sup>+</sup>	136.36	1.336	142.64	0.633	6.286	1.437	16.363	0.000	S
K <sup>+</sup>	3.814	0.161	4.55	0.052	0.736	0.198	13.869	0.000	S

Significance level = 0.05; t-test value is significant at p-value ≤ (0.05) df N-1=13

It is clear from the results that the disparity and variation in the rest period in the training units of the explosive ability of the two men and the arms and the out of the ordinary and the fixed determinants that do not apply to all players, had a positive impact in improving the internal organization of the cellular environment and making it an environment that tends to base stability that supports the continued energy supply. And, and to provide the metal elements that support the process of muscular contracting, and thus giving the appropriate rest period to each training intensity and its repetitions allows the cells to regain their capabilities to regulate the biochemical interactions producing energy during the high -intensity efforts or what is called violent efforts, meaning that the increase in pregnancy requires an increase in production. For this vital energy, Moreover, the processes of polarization in the electricity of the cell membrane of the Union of Calling Protections and its separation require a suitable flow in its ionic sessions according to what suits the arrival of the electrical signal and the launch of the Istle Cologne, which helped these exercises to stabilize its homogeneity, in a way that suits these high efforts in the explosive power exercises. Thus, the province of the cellular environment is a necessity for every player that the coaches must pay attention to, according to the results of the players in this research. As "the player's continued efficiency in high training loads confirms that muscle cells are still preserving their basic balance and control over acids and the availability of bicarbonate is an important role in this event." **(Goldberger, 2013)** The Law Mass Action Law provides that when the final products of a chemical reaction accumulate in the midst of the reaction, the speed of the reaction depends almost completely. ' **(Arthur, John, 2006)** E. Sugar decomposes with a long chain of chemical reactions, as the equivalent (3ATP) is produced through blood sugar, as these reactions control multiple cable enzymes, including the enzyme (HK) and the third reaction enzyme (PFK) and the tenth interaction enzyme (BK). Most of these enzymes are the importance of the enzyme (PFK), as it is indicated as the key to the work of this system, as increasing its activity leads to the rapid decomposition of glucose in addition to the formation of lactic acid and rebuilding (ATP) '**(Hussein, Rafeh, 2008)**' muscle strength development exercises make The player is able to deal with the requirements of the specialized game. ' **(Sabr, 2010)** Also 'biological organizations represent the first blood defense line for any change in the value of the Hydogenic A. CO<sub>2</sub> removal within a few minutes and then remove carbonic acid (H<sub>2</sub>CO<sub>2</sub>) from the body. There is an inverse relationship between the concentration of lactic acid and the level of bicarbonate '. **(Ahmad, 2019)** Also, 'The phosphate shield is a mixture of phosphate (HPO<sub>4</sub>) and phosphoric acid (H<sub>2</sub>PO<sub>4</sub>) and works of the bicarbonate system. ... And when the lactate threshold (4 mmol) exceeds the blood (pH), the blood that can become dangerous when vital organizations are unable to equal the blood and the inner organs and organs can be able to get rid of lactic acid '. **(Jabbar, 2007)** As the importance of the availability of sodium and the avoidance of its decrease or an extremism, the arrival of nervous instrument causes the launch of the moving end of the neurotransmitter of the Clay Colan, which is the specialized nervous link between the end of the nerve and the muscle (muscular nervous forum) and is linked to the sarcoplasm with the receptors of the acetyl Colane, this causes the opening of sodium channels, And it leads to the flow of sodium to the muscle fiber, leading to the removal of the membrane. Sending instructing to the sites where the membranous links adjacent to the sarcoplasmia (the father) causes the issuance of calcium (ion Calcium temporarily) and the sarcoplasm liberates the concentration of calcium rises above (10)  $\mu\text{m}$ . The active continuously by returning calcium to the sarcoplasmia (usually within about 30 ms) and when the concentration of calcium in the sarcoplasm is very low, it prevents the trapiocin again, and this series is repeated whenever another moving nervous incentive reaches the moving ending plate, and when the frequency rush is high, the ions continue Calcium by launching from the sarcoplasmia. Calcium focus in sarcoplasm surrounds the hairs' increases, in this case, the muscle fibers are not fully comfortable between stimulation and successive constriction will be stronger, proven and more (to some extent) until nervous stimulation stops. **(John, 2001)** In addition to the decrease in sodium and potassium leads to damage to local home balances (Local Homeostatic Responses), which is another group of non -reflexive responses, when a change in the internal environment or the external environment occurs, this change is considered an alert and this alert leads to A change in cellular activity, its final result is anti -alert, that is, this response is like all the responses that begin and end with the response, but it differs from other responses (the reflexive action) in that it occurs only in the alert area. **(Milteer & Ginsburg, 2012)** As it is steadily or decreasing in sodium and potassium concentrations, it will lead to the loss of (account) in the individual, which is the adaptation of physiological compensation that lasts for days or weeks as a result of changing one factor of external or internal environmental factors. And sodium is responsible for absorbing sugars in the intestine, responsible for muscle contraction, supports the amount of water inside the cells of the body, regulating the pH in the blood and various body fluids'. **(Firas, Aaid, 2020)**

## Conclusions and Implications:

- 1- The change in the inter-comfort time for the explosive ability of the arms and the two legs helps in the decrease of lactic acid, increased soda bicarbonate, and the availability of potassium sodium within the health limits of volleyball players.
- 2- It is necessary to preserve the chemical mechanisms of the muscle cells that face high constituent efforts to fulfill the requirements of physical capabilities, and to the time required to keep them effectively to ensure energy supply, with facilitated constituent mechanisms, and avoid volleyball players chemical injuries.

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