

The effect of anaerobic effort on the level of triiodothyronine in advanced basketball players

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Abstract

To perform any physical effort, any body needs a lot of energy sources, including carbohydrates, fats, or chemical sources that vary in rates depending on the nature of the activity performed. Therefore, hormones play an important role in regulating the body's functions during physical effort. The hormone triiodothyronine is one of the hormones that work to increase the level of activities of the necessary body systems. The problem of the research lies in identifying more information about the effect of anaerobic effort on the hormone triiodothyronine in some basketball players in order to benefit from it and take it into consideration during the training planning process. The research aims to identify the effect of anaerobic effort on the hormone triiodothyronine in some advanced basketball players. The researchers used the descriptive approach to suit the nature of the problem, and the research sample was the advanced basketball players of the Popular Mobilization Club. The researchers concluded that the hormone triiodothyronine (T3) is decisive in its effect during rest or after effort, which indicates the important effect of exercise, as well as the effect of anaerobic effort on the secretion of Triiodothyronine hormone. Researchers recommended adopting triiodothyronine measurement as an indicator for selecting players as it is a clear indication of sports training adaptations.

Keywords: anaerobic effort, T3, advanced basketball.

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Introduction

After opinions differed about the concept of physical education and its goals, which aim to achieve optimal achievement in general, researchers and those in charge of this vital activity sought to find new ways that could achieve the desired goals. Those in charge of the scientific research process left no stone unturned in their efforts to achieve a better athletic condition.

It is known that athletic achievements cannot be achieved unless they acquire a state of biological improvement, according to which athletic achievements are a reflection of what is happening in the human body. From here, most of the research in the field of physiology was launched, sometimes to understand and sometimes to standardize, and to advance the achievement as an ideal goal, since the human body cannot perform its functional duties unless the appropriate conditions are available, including energy compounds and the metabolic wastes that result from them, which may also cause an obstacle to achieving those paths.

Hence, it was necessary to conduct a comprehensive study of all biological elements in order to provide a suitable environment for practicing various sports activities.

Progress in athletic performance is nothing but functional and biological adaptations that occur in the internal systems, and consequently, the individual's functional capabilities increase, which vary in degree of impact according to the nature of each activity, the time of practice, and the performance style.

While various opinions differed on the extent to which hormones are affected during physical activities and effort, sports activity leads to physiological and chemical changes within the muscle cell to produce the energy needed for physical effort as a result of the increased activity of hormones that participate in the metabolism process. The physical and athletic level of the individual depends on the positivity of the chemical changes in order to achieve adaptation to the body's systems and organs in order to face the effort and fatigue resulting from physical training. (Salama and Baha El-Din, 1999)

Any body needs a lot of energy sources to perform any physical effort, whether carbohydrates, fats, or chemical sources, the rates of which vary according to the nature of the activity being practiced. Therefore, hormones play an important role in regulating the body's functions during physical effort. Triiodothyronine is one of the hormones that works to raise the level of activity of the body's necessary systems, and physical activity.

Hence, the importance of this research in revealing the effect of anaerobic exercise on the level of triiodothyronine in some basketball players is evident, with the aim of providing scientific information, facts, and precise indicators of these effects, which could be of assistance to those working in the field of sports training.

Hence the research problem came about. The challenges facing researchers and those in charge of sports training or the lack of information are among the basic matters that prompt us to search, scrutinize and investigate information and its objectivity so that we may find solutions and answers that explain the phenomena to be studied. Given the scarcity of studies that deal with the balance of the internal environment, which is about maintaining a stable internal environment in the face of internal or external variables, as it is one of the indicators of the body's stability, such as the secretion and maintenance of hormones, the balance of the

internal environment is a measure of the speed of the body's recovery of internal functional indicators and their return to the normal state when exposed to variables, whether external or internal.

The study of the effect of physical effort on hormones is considered one of the most important indicators of the validity of training curricula. As far as the researchers know, our Iraqi library lacks such studies, as well as the ambiguity surrounding that aspect. The researchers considered it an unmet need, and through it, this problem emerged in their quest to learn more information about the effect of anaerobic effort on the level of the hormone

triiodothyronine in some basketball players, to benefit from it and take it into consideration during the training planning process.

The aim of the research was to identify the effect of anaerobic effort on the level of the hormone triiodothyronine in some basketball players. The researchers assumed that there is...Statistically significant differences in anaerobic effort and triiodothyronine levels in basketball players.

According to the above, the researchers should review some studies that have a relationship in terms of the studied variables. Among these related studies are:

Practical sources emphasize the importance of studying and knowing the functional and physiological changes, especially the (hormonal) ones, that occur to the player during performance or during sports training (when he is exposed to a certain effort), and in view of the importance of sports physiology and the extent of its clear impact on sports levels.

This study aimed to study one of the important physiological problems that should be clear to the athlete in general and the trainer in particular, which is (studying the determination of the secretion of the hormones TSH, T3 and T4 in the blood according to the pulse index in athletes). After reviewing the yard of some scientific sources and references, I noticed that the secretion of these hormones in the blood is affected according to the pulse index.

Method and tools

The nature of the phenomenon and the objectives imposed on the researcher to choose the appropriate method. The method is defined as “the art of correctly organizing a series of many ideas, either in order to reveal a truth unknown to us, or in order to prove a truth that others do not know” (Bahi, 2013, p. 65). The researchers used the descriptive method in the survey method because it is closest to the nature of the problem and the goal to be achieved, and also suitable for the method of research procedures, as descriptive research aims to determine the conditions and relationships between reality and appearance. The descriptive survey method aims to collect data from members of society to determine the current state of society in many variables (Rateb, 1999, p. 139). The objectives that the researcher sets for his research and the procedures that he uses will determine the nature of society and the sample that he chooses). Khairy, 1986 (Therefore, the research community was chosen, which is the players of the Popular Mobilization Club in basketball participating in the Iraqi Premier League for the season (2022-2023), as the members of the research sample were chosen randomly from this community, numbering 12 players, and to ensure the homogeneity of the sample, a skewness coefficient test was conducted for both age and training age, and the

results showed a high degree of homogeneity and that they are close to the normal distribution. See Table No.(1) .

Table (1). Sample homogeneity in variables of age, training age and weight for the sports group

Variables	Unit of measurement	Coefficient of torsion
the age	year	0.67
Training age	year	0.79
the weight	kg	0.72
height	right	199

The researchers used Arab and foreign scientific sources, as well as the Internet, tests and measurements, a form for recording test and measurement results, a timer, a weight and height measuring device, and a Lenovo computer. One (1) Japanese-made treadmill (TREAD MILL) type (EC-T220.CATEYE) and one (1) Chinese-made centrifuge (CENTRIFUGE) type (80-2) and laboratory devices for measuring triiodothyronine hormone, tubes for storing blood samples, a medical case for storing blood sample test tubes, a box for transporting blood serum samples, plastic syringes for drawing blood, medical and sterile cotton, and wound dressing.

The research tests were represented by the test: Anaerobic capacity test (Cunningham and Faulkins test) (Abdullah, 2008, p. 54)

Test name: Cunningham and Faulkins test

Purpose of the test: To measure lactic tolerance

Devices used:

1. Treadmill
2. stopwatch

Test specifications:

After the player completes the appropriate warm-up for a period of (5-10) minutes, the player ascends On the treadmill, the device starts to operate at the specified speed (14 km/h) and at an inclination angle of (11) degrees, (20%), noting that the device starts to increase the speed gradually until it reaches the specified speed. This gives the tester enough opportunity to work on the device in a compatible and harmonious manner. After reaching the specified speed, the timing clock is started by the judges and the player continues to work

on the device until he reaches extreme fatigue such that he cannot run on the device. Thus, the timing clock is stopped, meaning that the recording is done from the beginning of the test (the device's speed reaches 14 km/h until it stops working).

Hormone analysis method

To conduct tests for these hormones in any government or private laboratory, the following steps must be followed carefully:

Blood withdrawal method:

We draw blood from the clearest available vein in an amount of (3) ml. The hand can be tied with a tourniquet to increase the clarity of the vein, as the drawing process must be quick and organized to avoid the breakdown of red blood cells and their spread in the serum, which leads to errors in the results.

After drawing the blood, we place the blood in a special tube to separate the blood serum from the rest of its components. It is best for this tube to be of the type that contains gel and is called a "Gel Tube", as this gel speeds up blood clotting and also acts as a barrier between the blood serum and the rest of the components after they are separated.

separation process:

We place the tube (Gel Tube) in the centrifuge and place the device at a speed of (3000-4000) rpm for a period ranging between (5-10) minutes to ensure good separation of the blood components from the serum.

4. After the separation process, we take the serum from the tube and use one of the available devices to measure the hormone. We place the serum in the device according to the mechanism of the available device, as the devices differ from one another in the way they work, as well as in the mechanism of their interactions and the principle of their operation, each according to its different degree of development.

5. blood conservation

When storing, all samples after serum or plasma separation are kept refrigerated to delay chemical reactions and thus prevent changes in component ratios.

The pilot experiment was conducted on Tuesday, January 18, 2024, at ten o'clock in the morning in the fitness hall at the College of Physical Education and Sports Sciences at the University of Baghdad. All conditions were prepared for the success of the pilot experiment on (3) players from the research community with the help of the auxiliary work team*. This is to know the ability of the support team to complete its field duties, which are to draw blood and put it in special tubes numbered according to the sequence of players, and then transport it from the test site to the laboratories to measure it and know the suitability of the treadmill to work continuously and its efficiency and to ensure the suitability of the devices and tools used in the tests and to ensure the suitability of the test of increasing physical effort until fatigue for the players to the sample individuals. Identify the time required to conduct the tests for individual samples and the ease of applying them.

The researchers conducted the main experiment after completing the pilot experiment to control all factors and variables that might affect the testing procedure on Wednesday, January 24, 2024. Blood was drawn from the specialist before the effort during rest for hormone analysis. After that, the research sample was exposed to a standardized anaerobic

effort. After completing the effort, a blood sample was taken to conduct a triiodothyronine hormone test. In this test, the level of free triiodothyronine (T3) hormone in the blood serum is checked. The thyroid gland, which is located in the front of the neck, produces triiodothyronine (T3) hormones that regulate metabolic processes in the body.

The researchers used the statistical package (SPSS), and the arithmetic mean, standard deviation, t-distribution, and skewness coefficient were automatically calculated.

Results

table(2) Shows the arithmetic means, standard deviations, calculated t-value, and significance level of the T3 measurement results for anaerobic exercise

Measurements	N	Measure before effort		Measurement after effort		The calculated	Sig Score	significance
		Q	± A	Q	± ε			
Triiodothyronine	12	1.11	0.20	1.37	0.18	3.20	0.009	Dal

Degree of freedom = 11 and significance level(0.05) Table t = 1.79

Discussion

It is clear from Table (2) on the statistical treatments of the triiodothyronine hormone and by looking at the data representing the concentrations of the hormone in the blood plasma of the individuals in the research sample, a group before and after the effort, we notice a difference in those concentrations between the two efforts in the aforementioned measurement. By looking at the same data, it becomes clear that a noticeable increase occurred in the concentration of the hormone after performing physical efforts in the measurement after the effort for the research group. The researchers explain this increase to the urgent need for the role of the hormone in some functions of the body's organs that fall within the spectrum of the effect of that hormone, including the heart, respiratory system, liver and other organs, as the pace of their functions increases during physical effort to provide energy and construction requirements, as the activity of the endocrine glands increases in order to secrete multiple hormones from performing physical effort. This also occurs before a person begins training or training to participate in competition, and the activity of the

endocrine glands continues in their secretions of hormones during the performance of physical efforts, especially those that are characterized by their high intensity and require continuation for a long period of time.

When looking at the same table and through the mathematical means, it became clear that there is a clear difference between before and after the effort, but within the normal limits for the individuals in the research sample. The more important the competition is to the player, the greater the stimulus for the secretion of hormones. There is a group of responses that express an increase in the activity of the endocrine glands under the influence of physical effort. This was clearly evident in the hormone iodothyronine, which is affected like other hormones. This increase is considered normal as a result of the exerted efforts, which affect the functions of the body in general and the hormones in particular. The results of the measurements also agree with the results of Shephard, quoting Baha 'al-Din Salama (that practicing sports for regular and long periods contributes to a decrease in the hormone triiodothyronine during rest) (Salama, 2009, p. 111).

As for the results of the measurements after the effort, the researchers noticed that there were increased differences between the measurements before and after the effort for the sample members, and the results were consistent with the results of (Boen) (where he noticed an increase in the triiodothyronine hormone after anaerobic physical effort) (Salama, 2009, page 112)

The results also agree with what was indicated by (Ibrahim Salama, 1999) (that there is an increase in the concentrations of the hormone triiodothyronine as a result of work, reaching (31%) for anaerobic effort in the hormone triiodothyronine, and the results of the measurements after the effort also agree with the results of (Bahaa El-Din Salama, 1991, page 43)

Conclusions

After presenting the statistically extracted results, the researchers reached the following conclusions:

- The research results are within normal limits.
- Triiodothyronine was crucial in its effect at rest and after exercise, indicating an important effect of exercise.
- Anaerobic exercise has an effect on the secretion of triiodothyronine.
- The research sample members were distinguished by their return to normal levels of triiodothyronine secretion after exertion, which indicates the significant effect of exercise.

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