TRAINING LOAD AND ITS EFFECT ON THE LEVEL OF PROTEIN CONCENTRATION (IL-6) ACCORDING TO ENERGY PRODUCTION SYSTEMS

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ABSTRACT

The study aimed to know the effect of the training load on measuring the level of protein concentration (IL-6) according to the energy production systems for the three sporting events (athletics, fencing, cycling). The descriptive approach was used for its relevance and the nature of the phenomenon to be studied, and the research community represented the Iraqi national team players, the youth category under the age of (20) years, for sporting events (athletics, fencing, bicycles). The free anaerobic systems were distinguished by the higher level of IL-6 protein than the aerobic systems due to the training load. One of the most important recommendations is to adopt the results that have been reached as a criterion for codifying the level of training status for athletes, conducting periodic examinations to confirm the health status of the athletes.

Keywords: training load, protein (IL-6), energy

1. INTRODUCTION:

The training load leads to various physiological changes in the functional organs and systems of the body, and the improvement of the physical level depends on these positive changes, which is reflected in the performance of the duty of motor action with high efficiency.

The studies of the physiology of sports training did not leave any research phenomenon that it did not engage in, but it neglected the immune system responses accompanying physical efforts that we consider vital and worthy of attention to study, including the so-called oxidation and its enzymatic antioxidants as an important aspect and plays a prominent and vital role in the homogeneous stability of the internal environment, to ward off the danger. Free radicals that cause serious damage to the cells of the body’s systems as products of metabolic waste during the exercise of physical loads, and in order to maintain a balanced environment, it has become important to know the size of the change required for the vital reactions that occur as a result of that load in order to achieve the optimal achievement for the fencing players, and from the above lies the importance of Research on the knowledge of high and low levels of oxidants and their anti-enzymes resulting from metabolic processes, during the implementation of the training load in the small circle of fencers. Hence the problem of the research, where the player is exposed, during the implementation of training doses, to high-intensity physical loads, which may not correspond to his physiological state, which exposes him to increased functional requirements, which cast a shadow on the functions of the body’s systems, and given the lack of information available to our knowledge or its lack of modernity, which As a result, it serves to raise the level of achievement, so we decided to delve into this phenomenon, as it is a fertile field for study by answering the following question: What is the level of changes that can occur in the internal environment of the body, among the members of the research sample in the level of protein concentration (IL-6) Due to the training load.

Research aim: to identify the effect of the training load on measuring the level of protein concentration (IL-6) according to the energy production systems for the three sporting events (athletics, fencing, cycling).

Research hypothesis: The training load affects the measurement of the level of protein concentration (IL-6) according to the energy production systems for the three sporting events (athletics, fencing, cycling).
2- Research methodology and field procedures:

2-1 Research Methodology: The researchers adopted the descriptive-analytical approach in a comparative method for its relevance and the nature of the phenomenon to be studied and its comprehensive investigation.

2-2 Research community:

The researchers identified their research community in a deliberate way, which are the players of the Iraqi national teams in the province of Baghdad, the youth category under the age of (20) years, for sporting events (athletics, fencing, bicycles) and those registered in the statements of the central federations for the sports season (2020-2021), and then selected The research sample, which numbered (24) players, divided into three groups, each according to the prevailing energy production systems for each activity in the above, and consisted of (4) players representing the effectiveness of an enemy (100 m) for short distances for athletics, and (12) players representing the fencing activity, And (8) players representing the cycling activity. In order to obtain a sample characterized by the exact scientific specifications that the two researchers need in carrying out their research procedures, they subjected the research sample to a clinical examination, and conducted some analyzes by a specialist doctor in the Medical City Department / Baghdad Teaching Hospital, to ensure that the players were free of any health problems that would affect the results of the study. The researchers also took into account the homogeneity of the sample for the following variables (height - body mass - chronological age - training age).

2-3 Tools, devices and means used in the research: (tests and measurements, Arab and foreign references and sources, medical scales).

3-4 blood draw procedures:

In order to conduct tests for the variables of the biological process of the study, (5 ml) of venous blood was withdrawn by a specialized medical staff in Elite Laboratories for pathological analyzes of the research sample members at rest time by means of medical syringes size (5 ml) for single use, and the blood was placed in special tubes to prevent it from clotting, then it was separated by a centrifuge to obtain the plasma and then placed in a special cooler box and transferred to the molecular genetics laboratory to be analyzed by special kits prepared to measure the level of protein concentration (IL-6).

3-5 Field Research Procedures:

After obtaining all the fundamental approvals from the central Iraqi federations for sporting events (athletics, fencing, bicycles) and the members of the research sample learned about the importance of the study and the extent of benefit from it, they expressed their willingness, desire and consent to cooperate with the researchers and implement their research procedures, and after completing all the preliminary procedures starting with the results of the examination Clinical and laboratory analysis, which resulted in the safety of the sample and their enjoyment of full health, the two researchers proceeded to conduct the aforementioned blood drawing process with the players’ commitment to health prevention measures in light of the Corona pandemic, according to the directives of the Supreme Committee for National Health and Safety, at exactly ten o’clock in the morning on Friday, 20/11 2020, and after a period of (12) weeks, during which the players were exposed to the training loads of the curricula prepared and followed by the coaches of the Iraqi national teams for each group separately, the second blood draw was performed at ten o'clock in the morning on Friday, corresponding to 12/2/2021.

3-6 Statistical treatments: The researchers used the statistical package (SPSS) version (23).

3- Presentation and discussion of the results:

3-1 Show results:

3-1-1 Presentation and analysis of results for IL-6:

Table (1) It shows the arithmetic means, standard deviations, calculated (T) value, (Sig) value and the significance of the differences for pre and post (IL-6) protein measurement for the energy production systems for the three sporting events.
Statistical processors totals | measuring unit | Arithmetic mean | standard deviation | Values \( \left(T\right) \) calculated | Sig | The significance of the differences |
---|---|---|---|---|---|---|
first after me | Tribal Pg/Ml | 4.555 | 0.180 | 7.477 | 0.005 | moral |
the second after me | Tribal Pg/Ml | 4.576 | 0.137 | 17.649 | 0.000 | moral |
the third after me | Tribal Pg/Ml | 4.562 | 0.147 | 13.735 | 0.000 | moral |

Table (2) It shows the results of the analysis of variance for the measurement of (IL-6) protein dimensionally between the energy production systems for the three sporting events.

| Contrast source | sum of squares | degree of freedom | mean squares | Values \( \left(F\right) \) calculated | Sig | indication |
---|---|---|---|---|---|---|
between groups | 0.410 | 2 | 0.205 | 4.732 | 0.020 | moral |
within groups | 0.910 | 21 | 0.034 | | | |
the total | 1.319 | 23 | | | | |

Table (3) It shows the difference of the arithmetic means, the calculated (L.S.D) value and the significance of the differences for the energy production systems for the three sporting events.

3-1-2 Discussion of IL-6 Results:

Tables (7, 6, 5) represented an analysis of the statistical treatments for the study of differences for the variable (IL-6), and those treatments highlighted the existence of a discrepancy in its total concentrations, which was mainly adopted in our current study as an indicator of the state of low energy level and rise in programmed cell death before and after the training pregnancy between Energy production systems for the three sporting events. The researcher explains these indications to the performance of the training load, which increases the repetitive muscle contractions and in turn increases its need for increased energy whose concentrations decrease for the first time during and after those contractions, as the cytokines represented (IL-6) act as a catalyst for the breakdown of glycogen in the liver, which shows an increase in its concentrations in the blood during After a period of training loads of different intensity. This explanation is logical with all previous studies that confirmed this, "The basic functions of the immune system is to rebalance the internal environment of the body affected by a number of external and internal changes." (Keller C, 2002) and “Cytokines play an active role in blood glucose homeostasis through interleukin-6 and interleukin-10.” (Pedersen, 2001) (Keller C, 2001) and “interleukin-6 acts as a catalyst for the liver to break down stored glycogen into glucose to supply working muscles after depleting their muscle glycogen during physical exertion.” (Zharikov, 2013) (CA Hunter, 2015) The researcher explains these differences to the possibility of forming interleukin-6 during training loads of different intensity from skeletal muscle cells and other organs as a direct response to the low level of sugar in muscle fibers, and this explanation is consistent with all previous studies that She confirmed that, "The formation of interleukin-6 in white cells is not limited to various physical efforts, but is also secreted by skeletal muscles." (Youd JM, 2000) and “Interleukin-6 is elevated after physical exertion and is an initial indication of hypoglycemia in muscle.” (Pedersen BK, 2001) (S. Fredj, 2005) and “The concentration of interleukin-6 in the blood increases after physical exertion.” (Steensberg A, 2000). As for the explanation of the increase in the concentrations of interleukin-6 for the three players (running (100 m), fencing, bicycles) in varying proportions during the loads for the period of implementing the training doses, whose effects on the internal environment are reflected in the low energy transformation and consumption of larger quantities as a result of the high volume and intensity of work.
due to The motor units involved in performance, which exposes them to oxidative stress, which causes damage to a number of muscle cells and cells of the immune system, and here comes the active role of interleukin-6 as an antioxidant to repair and compensate for the lack of energy in those cells, and this explanation is logical and consistent with all previous studies “Physical exercises lead to confusion The cellular balance is markedly marked by its effect on plasma levels of several cytokines, including interleukin-6, as a result of the immune response due to internal damage in muscle functioning. (Starkie RL, 2001) and “There is an active role for interleukin in regulating the biological activity of cell inflammation and the decreased function of mitochondria to provide energy” (Rollwagen FM, 2006), (Obydenny, 2016) in addition to “interleukin-6 as an inflammatory cytokine that plays key roles in various cells and organs of the body.” (Tanaka T, 2001) (Pедерсен, 2000). It has become a given that we find an increase in the concentration of interleukin-6 among the members of the three sports activities to meet the increased need for low sugar in the muscles as a result of physical effort to provide the necessary energy, And consistent with the nature of the training load to study the phenomenon.

II. CONCLUSIONS:

1- The biological tests were not recorded as a critical measurement, and the results were within the normal limits for the members of the research sample.

2- The tests recorded a significant increase in the levels of free radicals, as the anaerobic systems were distinguished by a higher level of (IL-6) protein concentration than the aerobic systems as a result of the training load.

Recommendations:

1- Adopting the results that have been reached as a criterion for codifying the level of training status for athletes.

2- Conducting periodic examinations to confirm the health status of the athletes.

REFERENCES