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EFFECT OF PHYSICAL EFFORT ON RATE OF CARDIAC CONTRACTION TIME, BLOOD FLOW IN CORONARY ARTERY, AND MYOCARDIAL OXYGEN CONSUMPTION AMONG YOUTH SOCCER PLAYERS

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Abstract

Physical effort that takes place in football matches or what coaches in the training units is formulated in a way that affects the most important muscle in the body, which is the heart muscle, which has a very important role in affecting the rest of the body. Therefore, exercises must be monitored and what happens to heart muscle during the implementation of physical efforts with different stress, and from here the importance of research in the extent of the effect of physical effort on heart muscle responses to explain the percentage of cardiac contraction and what affects the venous return to the heart and the level of oxygen carried by the blood. Hence the problem can be formulated with the following question: What is effect that heart rate is high on the time of cardiac contraction, the nourishment of heart in blood and the amount of oxygen that is connected to it? The research also aims to identify the differences in the heart rate, the percentage of cardiac contraction, the amount of blood flow in the coronary artery and amount of oxygen consumed between the two physical voltages. The researchers also touched on the descriptive approach to a sample of the youth football category, which numbered (6 players) for the season (2023-2024) in Basrah Governorate. researchers also measured the variables, the amendment of the heartbeat, the percentage of cardiac contraction, amount of blood flow in the coronary artery, amount of consumer oxygen during rest, and after physical effort at a speed (8 km) and (12 km) and at an angle of deviation (zero). Thus, the researchers concluded.

1- There is a variation in the level of heart rate, percentage of cardiac contraction, amount of blood flow in coronary artery and amount of consumer oxygen after performing two physical effort on members of research sample.

Keywords: physical effort, coronary artery, myocardial oxygen consumption, soccer players.

1 -1 Introduction and Importance of Research:

Training curricula and competitions that players perform have a significant impact on changes occurring in the cumulative and hard side in the functional responses of the various body systems that are reflected in performance and access to the stages of adaptation, and since the physical effort that the players are exposed to in football matches or what coaches in the units are prepared Training leads to an effect on the most important muscle in the body, which is the heart muscle, which has a very important role in affecting rest of the body's organs and functional efficiency, including brain, respiratory system, college, and muscular system. Therefore, the exercises must be monitored and what happens to the heart muscle during the implementation of physical efforts with a different stress, and from here the importance of research is highlighted by giving data about the effect of physical effort on the heart muscle responses in explaining the percentage of cardiac

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shrinking time and what affects it on the final diastole and the intravenous return that is reflected in the blood connected to the heart itself To feed it and the level of oxygen loaded with it.

1-2 Research Problem:

Most exercises are measured by time on time and sometimes by measuring the heart rate, but we see that those concerned do not use incident change in a rise in heart rate at time of cardiac contraction, amount of blood that leads to heart, amount of oxygen consumed and its effect at sporting level, so The idea of research that shows effect of physical effort on the time of heart contraction, amount of blood that leads to heart and amount of consuming oxygen. Hence the problem can be formulated with the following question: What is the effect that heart rate is high on percentage of cardiac shrinking time, nourishment of heart with blood and amount of oxygen that leads to it?

1 -3 Research Aims:

1- Knowing the level of members of research sample in two physical effort.

2- Knowing differences in heart rate, percentage of heart contraction, the amount of blood flow in the coronary artery and amount of oxygen consumed between two physical efforts.

1-4 Research Hypotheses

1- The presence of different differences on members of research sample between two physical efforts.

2- The presence of moral differences in heart rate, percentage of heart contraction, amount of blood flow in coronary artery, and the amount of oxygen consumed between two physical efforts.

1-5 Research Fields:

1-5-1 Human Field: Al -Sadiq Sports Club players in Soccer.

1-5-2 Time Field: From 20/11/2023 to 13 /12/2023.

1-5-3 Spatial Field: Dr. Abdul Rahim Al -Hamrani Clinic - Basrah Governorate.

2- Research Methodology:

Nature of research issue to be studied determines the curriculum that is chosen by researchers to solve problem, so he used the descriptive approach to its suitability to solve research problem.

2 - 1 Research sample:

Research sample in intentional was chosen on youth football players representing (Al -Sadiq Sports Club) in Basrah for season (2023 – 2024), which number (6) players. The researchers also conducted homogeneity for individuals of research sample in the variables (age, weight, length, number of heartbeat, percentage of heart contraction, amount of blood connected to heart, amount of oxygen consumed, size of hemoglobin during comfort) and as in Table (1).

Table (1) shows homogeneity of research sample in study variable

Body measurements	Unit Measurement	Arithmetic Mean	Standard deviation	Relative difference factor
Length	Cm	169.82	3.651	% 2.149
Wight	Kg	71.29	2.99	% 4.194
Age	Year	17.32	1.15	% 6.651
Heart rate	Hr./m	69.33	1.211	% 1.746
amount blood flow coronary artery	mil	201	10.751	% 5.348

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percentage heart contraction	**%**	**33.756**	**1.381**	**% 4.091**
amount oxygen consumed	**mil**	**35.446**	**1.464**	**% 4.13**
hemoglobin volume blood	**Gm./Desolater**	**13.498**	**0.455**	**% 3.37**

Table (1) shows variables under study," which was value of the relative difference coefficient of these variables less than 25 % "(Joseph G. Monke Byronl Nekton, 1999) and this shows the homogeneity of research sample.

2-2 Information collection means

1- Arab and foreign sources.
2- International Information Network (Internet).

2- 3 Tools and Research devices

- Its measuring and weight -scale device, a laptop device, an electronic cardiac measuring device, a device for measuring the electrical effectiveness of the muscles.
- A mobile device, Eco device (audio examination)

2-4 Tests and measurements used in research

First: Measuring weight and length

Weight and length have been measured using the medical scale. The time age was also calculated on the research sample personnel.

Second: Hemoglobin Blood

Blood hemoglobin was measured on research sample personnel after the blood is withdrawn (3 cm 3) and treated in the laboratory during rest at study sample.

Third: heart rate and amount of blood flowing in coronary artery

Ultrasound (ECO) has been measured research sample members during rest and after the two effort, and through heart rate, amount of blood flowing and amount of hemoglobin blood, both percentage of cardiac contraction and amount of consumer oxygen were extracted.

2-5 Main Experience

Researchers performed main experience on research sample personnel within two days, as follows:

The first day on 23/11/2023 The variables under study were measured in the rest mode, after which the running test was made on the moving walk at a speed On the second day on 24/11/2023, running the running test on the moving walk at a speed of 12 km per hour and for a period of (4 minutes) approximately 800 m and at an average of (3.33 m / s), so that after the physical effort is made, the heart rate is measured, cardiac and the amount of blood. The connection to the heart and the amount of oxygen consumed.

2-7 Statistical Means

Researchers used SPSS statistical program to process the following data

1- Medium Arithmetic
2- Standard deviation
3- T -test for unconnected endeavors
4- Relative difference factor

3- View and Discuss Results

3-1 View and Discussion of results between two physical Effort voluntaries under study

Table (2)

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Shows mathematical medium, standard deviation, and T value of calculated and table between two physical efforts for members of research sample

variable	Unit Measurement	physical efforts (8) km		physical efforts (12) km		T collected	sig	Result
		M	S	M	S			
Heart rate	Number	144.83	2.316	168.16	1.471	20.824	0.000	Moral
amount blood flow coronary artery	%	72.3	1.762	83.404	1.448	11.924	0.000	Moral
percentage heart contraction	Mil	625.166	17.451	768	19.183	13.491	0.000	Moral
amount oxygen consumed	Mil	103.64	3.013	134.45	3.302	16.879	0.000	Moral

Through Table (2), which shows mathematical circles and standard deviations in variables under study, which shows that there are differences between physical effort at a speed (8 km) from physical effort quickly (12 km), and these differences were in favor of the members of the research sample that was subjected to physical effort quickly (12 km) In study variables. Researchers believe that this difference was the result of the occurrence of changes and anomalies imposed on members of the research sample as a result of the different physical effort, as the rate of the first effort is (8 km) while the rate of speed in the second effort (12 km) and this shows the change in the requirements of the internal medium towards the high intensity Which increases the requirement for energy production, which increases the high heart rate and increased cardiac product, and this was reflected in the need of the heart muscle by increasing the blood rate of the heart muscle feeding with the blood through the coronary artery and loaded with oxygen in a manner consistent with the increase in the percentage of muscle contraction. “When training is organized on the basis of the heart rate, it leads to a state of responses and changes in various body systems and thus the events of a state of internal balance” (Falah Mahdi & Sadiq Abbas: 2012) . Researchers also believe that the increase in oxygen consumption by the cardiac muscle is directly proportional to the increase in the high heartbeat and the increase in the time of heart contraction. "The increase in physical effort increases functional indicators, including energy production, oxygen consumption and heart rate" (Muhammad Kazim Khalaf, 2013).

Researchers also attribute that physical effort increases expansion of the coronary artery, and it is similar to the increase in the originality of the blood to heart muscle. This requires observance by workers in the training field due to increase in heart rate against the increase in period of contraction against level of extraction, which reflects the extent of blood that returns to the heart muscle. (The increase in the heart rate increases the shrinking time and its percentage ratio against stage of extraction, which causes additional burdens on heart muscle with a lack of returning blood, which reduces blood connected to the working muscles) (Giton & Hall, 1997).

4- Conclusions & Recommendations

4-1 conclusions

1- Physical effort quickly (12 km) was more influential on variables of studied in research.

2- There is a variation in heart rate, time of cardiac contraction, amount of blood flow in coronary artery and amount of consumer oxygen after performing two physical Effort on members of research sample.

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3- There is a compatible increase between physical effort average oxygen consumption of heart muscle and cardiac contraction.

4-2 Recommendations

1- Take advantage of the ultrasound in detecting other variables of the heart muscle.
2- Attention to the time periods of hospitalization against the high heart rate by increasing the rate of cardiac contraction
3- Emphasizing efforts in the training units that suit the improvement of the efficiency of the heart muscle.
4- Conduct these measurements by the trainers specialized in other games.

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