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Ali Abdul-Kadhim Shayyal
Directorate of Public Education in Maysan, Iraq

Correspondence Author;
Ali Abdul-Kadhim Shayyal
Directorate of Public Education in Maysan, Iraq

Increased oxygen hemoglobin at rest and physical effort in the muscle tissue of boxers

Ali Abdul-Kadhim Shayyal

Abstract
The aim of the research is to identify (O2Hb) (HHb) (tHb) In muscle tissue during rest and efforts and also identify (O2Hb) (HHb) (tHb) During the performance of the three physical efforts to identify the study variables (O2Hb) (HHb) (tHb) Between the tribal and remote measurement during rest and hospitalization after the third physical performance by pressing to stop the venous cycle, and the hypothesis of the research included that there are statistically significant differences between the tribal and remote tests in the research variables and in favor of the post-tests, the researcher used the descriptive approach to suit the nature of the problem, the research community was determined from Young boxers in Basra Governorate aged (17-18) years and registered in the Iraqi Boxing Federation, Basra Branch for the sports season (2017-2018), weighing (56-60) kg, totaling (11) Boxer The sample has been selected In the intentional way, their number was (6) boxers from the province of Basra. The researcher also used statistical methods to process the data obtained from the tribal and post-tests. After processing the data and the results obtained statistically, the researcher reached many conclusions, the most important of which is a change in the amount of hemoglobin loaded with oxygen and not loaded with oxygen as a result of the pressure on the flexor muscle of the ulna during physical effort.

Keywords: Hemoglobin, rest, physical effort, muscle tissue

Introduction
Those working in the field of physical education work in various fields through the use of practical applications that they make in revealing the facts that arise as a result of the effects and changes that occur to functional organs during rest and physical activity, including the amount of oxygen that combines with hemoglobin and is transmitted through arterial or venous blood and access It is transferred to the internal tissues to produce the energy needed for the working muscles. Suppose the game of Boxing is a result of the pressure generated from matches on the players, especially on the muscle tissue through the contractions that occur to the working muscles while directing blows to the opponent. In that case, it imposes a set of responses and changes on the body's systems, especially the transfer of hemoglobin Loaded with oxygen to the working muscles, hence the importance of research in finding and knowing the extent of the effect on the flow of venous blood circulation during rest and after generating pressure on this blood circulation in the performance of physical effort for boxing players.

Research problem
Undoubtedly, the athlete needs many means in scientific research to progress at the athletic level. Modern devices are among the tools that work to detect the responses and effects that occur in the body, such as a device that detects the level of hemoglobin saturated with oxygen through blood flow. In the veins and arteries to the muscle tissue. Hence the researcher believes that the research problem lies in trying to detect the effects and changes that occur during rest and physical effort on the venous circulation when generating pressure of (50 mm. g) on the muscle tissue of the flexor wrist ulnar muscle among players boxing.

Research Aims
1-Identification of (O2Hb) (HHb) (tHb) in muscle tissue during rest and the three pressure efforts to stop the venous circulation of boxing players.
2-Identifying the differences between the research variables (O2Hb) (HHb) (tHb) during the performance of the three physical efforts without stopping the venous cycle and with controlling the venous process.

3-Identification of the study variables (O2Hb) (HHb) (tHb) between the pre and post-measurements during rest and recovery after the third physical performance by pressure to stop the venous circulation.

Research hypotheses

1. There are differences in (O2Hb) (HHb) (tHb) in muscle tissue during rest and the three pressure efforts to stop the venous cycle among boxing players.
2. There are differences between the research variables (O2Hb) (HHb) (tHb) during the performance of the three physical efforts without stopping the venous cycle and with controlling the venous process.
3. There are differences in the study variables (O2Hb) (HHb) (tHb) between the pre and post-measurements during rest and recovery after the third physical performance by pressing to stop the venous circulation.

Search procedures

The researcher used the descriptive approach to suit the nature of the problem.

The research community was determined from young boxers in Basra Governorate, aged (17-18) years and registered in the Iraqi Boxing Federation, Basra branch for the sports season (2017-2018) in weight (56-60) kg, the number of them (11) boxers, and the sample was chosen Intentionally, their number was (6) boxers from Basra Governorate, and they were at the end of the particular preparation stage, which made up their percentage (54.54%). They represent the club (Al-Janoub Sports, Al-Mina, the Arabian Gulf, Shatt Al-Arab), where homogeneity was made on some variables for individuals. The research sample is as in Table (1).

Table 1: It shows the homogeneity of the research sample

Variables	Measuring unit	Arithmetic mean	Standard deviation	Variation coefficient
Weight	Kg	58.33	1.632	2.79%
Height	Cm	171.83	3.763	2.18%
The age	Year	17.58	0.664	3.77%
Training age	Year	1.46	0.103	7.05%
Arm length	Cm	74.91	1.241	1.65%
Hemoglobin hb	Grams per 100 milliliters of blood	14.21	0.644	4.53

From the above Table, we notice that the coefficient of variation is between (1.65 and 7.05%), which is less than (30%), which indicates the homogeneity of the research sample and its good distribution.

Measurements and tests used in the research

1-Weight and height: The sample members were measured using a medical scale. The research sample members' chronological age and training ages were also recorded.

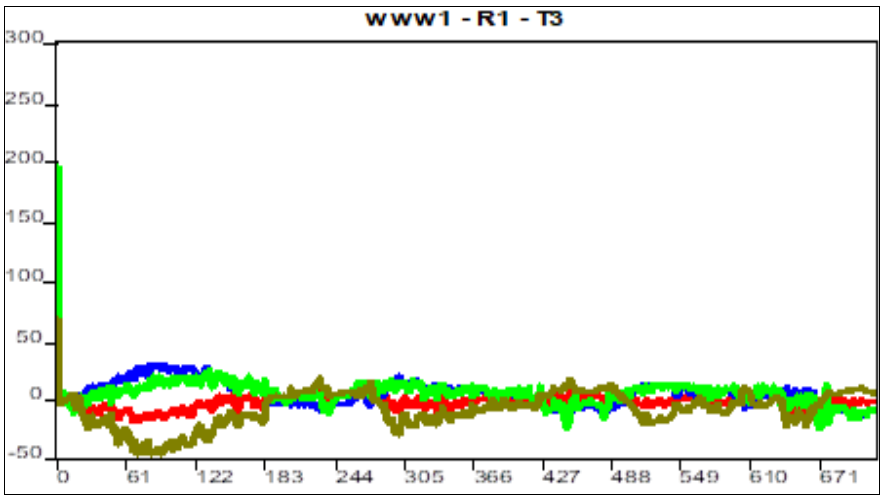
2-Arm length: The subjects were measured from standing from the lateral summit of the acromial process of the bone plate to the end of the last phalanges of the middle finger (Sayed, 2003) [5].

Determining the amount of hemoglobin

The amount of hemoglobin was measured in the boxing hall at the College of Physical Education and Sports Sciences to ensure the consistency of the sample by drawing (5 ccs) of venous blood by a specialist to determine the amount of hemoglobin among the members of the research sample.

Device measurements

The amount of hemoglobin (O 2 Hb- HHb) was measured by the device as mentioned above, as the device's work depends on directing rays at different wavelengths, including infrared and ultraviolet, as energy, which penetrates the skin and tissues to determine the range (O 2 Hb and HHb)) through the spectrum The light that is absorbed and the wavelength of the wave directed at the muscle tissue by placing the Bluetooth and a compressor strap of (50 mm. h) on the muscle (ulnar flexor) using blood pressure, so that the waves coming from the muscle tissue are connected to the computer provided in the program that broadcasts three deviations And shown in Figure (2), the previous variables were measured at rest, before performing the physical effort and during the performance of the effort.



Shape 2: Shows the deviations of the hemoglobin variables (O2Hb - HHb)

Skill endurance test

The researcher conducted a skill performance endurance test on the members of the research sample using a punching bag and performing straight punches in a time corresponding to the scheduled fight time of three minutes. The total time of the test is (9) minutes, which is the total time of the rounds of Boxing. The researcher used virtual honesty, relying on the opinions of experts and specialists in the field of tests, measurement, sports training, and Boxing. They agreed that the test is valid and measures the purpose for which the test was developed.

Main experience

The researcher conducted the main experiment on a sample in the boxing hall at the College of Physical Education and Sports Sciences, University of Basra. The experiment was conducted according to the following mechanism:

First

The sample was seated after arriving at the boxing hall for five minutes, then the chemical variables were calculated using the (Poramon) device for the (O 2 Hb) and (HHb) (tHb) variables.

First

The laboratory warms up for a period of (10 minutes).

Second: The test was performed, which is punching the bag for three rounds, each round lasting three minutes, and the punching is with the skill of the straight punch and alternately with the right and left arms. When performing, the variables (O 2 Hb) and HHb (tHb) are recorded and measured by (Poramon) device.

Secondly

Connected to the Bluetooth compressor of the Poramon device on the muscle (ulnar gripper) with a blood pressure of (50 mm. g) to stop the flow of the venous circulation in the muscle tissue of the muscle using a rubber band, and then the same test is repeated three rounds of time, each round three minutes One minute rest between them and measures the same changes using the (Poramon) device for the (O2 Hb) and (HHb) (tHb) variables.

Statistical means

The researcher used statistical methods through the SPSS program to process the search results

1. Coefficient of Variation
2. Arithmetic mean
3. Standard Deviation
4. Percentage
5. T for independent eyes
6. Analysis of variance

Presentation and discussion of results during rest and physical exertion by pressure applied to the muscle

Table 2: It shows the analysis of variance, a sum of squares, and mean of squares, and the value (F) calculated for the individuals of the research sample

Variables	loneliness measurement	Contrast sources	sum squares	degree of freedom	Average squares	F (Computed value	p-value
O2Hb	micromoles per liter of tissue	between groups	43,383	3	14,461	22.950	0.000
		within groups	12,602	20	0.630		
		the total	55,984	23			
HHb		between groups	89.506	3	29,835	32.615	0.000
		within groups	18.296	20	0.915		
		the total	107.802	23			
By		between groups	79,039	3	26,346	20,965	0.000
		within groups	25.134	20	1.257		
		the total	104.173	23			

Table 3: Shows the comparison of the arithmetic mean difference with the value of the least significant difference (LSD) between rest and physical performance with the pressure applied to stop the venous circulation

T	Variables	Arithmetic mean	Media teams	Standard error	Indication level
1	O2Hb	4.5136 - 3.6229	0.8907	0.4582	0.066
		4.5136 - 1.3824	3.1312	0.4582	0.000
2	HHb	4.5136 - 1.5301	2.9835	0.4582	0.000
		3.6229-1.3824	2.2405	0.4582	0.000
		3.6229 - 1.5301	2.0928	0.4582	0.000
		1.3824- 1.5301	- 0.1477	0.4582	0.751
		8.044 – 4.1021	3.9419	0.5522	0.000
		8.044 - 7.7251	0.3189	0.5522	0.570
3	tHb	8.044 - 6.7988	1.2452	0.5522	0.035
		4.1021 - 7.7251	- 3.623	0.5522	0.000
		4.1021 - 6.7988	- 5.1871	0.5522	0.000
		7.7251 - 6.7988	1.5641	0.5522	0.010
		3.5304 - 8.3628	- 4.8324	0.6472	0.000
		3.5304 - 6.9806	- 3.4502	0.6472	0.000

And through Table (2) and (3), which show that there are significant differences in the cases experienced by the research sample members during rest and physical effort (skillful performance similar to the time of the match) through the pressure applied to the muscle (ulnar grip) by (50 mm.) to close the blood flow in the venous blood of the muscle during the endurance performance, which led to a state of response in the muscle and a change in the level of saturation of hemoglobin with oxygen, which led to the oxygen level being affected by the decrease in the amount

of oxygen loaded with hemoglobin (O2Hb) during the performance of the three efforts in The skill performance endured within (9) minutes that the research sample members obtained after applying pressure on the ulnar flexor muscle, which indicates that the level of physical ability of the research sample members was at the required level as a result of endurance of functional devices in the fields of physical performance and similar to competition performance. Thus, it was reflected in a change in the amount of un-oxygenated hemoglobin (HHb) compared to the level of oxygen-laden hemoglobin, which led to the variable (tHb), which represents an absolute difference between the amount of hemoglobin Lupine of the blood loaded with oxygen and not loaded with oxygen has decreased during physical exertion and increased its level during the recovery phase (in-between rest) as in Table (4). Flexors of the ulnar muscle.

(Sami'a Khalil 2006) "Organized sports training positively affects all functions of the heart and the circulatory system (Muhammad, 2006) [4]."

The researcher agrees with Haider Hussein (2015) [6] that the change in the level of oxygen in the blood vessels resulted from the skill performance performed by the research sample members during selection, which is similar to the performance of the competition. (Jaafar, 2015) [3]

Presentation and discussion of the results during the physical effort by applying pressure to stop the venous circulation and without stopping the blood circulation

Table 4: Shows the arithmetic mean, standard deviation, and the (T) value calculated during physical exertion with stopping the venous circulation and without stopping the blood circulation

Physical performance	Variables	Measuring unit	stop the intravenous cycle		Without stopping the intravenous cycle		T. value	Sig (2-ailed)
			Arithmetic mean	standard deviation	Arithmetic mean	standard deviation		
First physical effort	O2Hb	Micromoles per liter of tissue	- 0.362	0.94	0.1	0.248	7.363	0.001
	HHb		0.119	1.222	0.897	0.459	18,563	0.000
	tHb		8.362	1.294	- 0.103	0.505	13.244	0.000
The second physical effort	O2Hb	Micromoles per liter of tissue	- 0.138	0.854	1.735	0.563	6.662	0.001
	HHb		8.362	0.857	3.029	1.463	10,064	0.000
	tHb		6.98	0.813	4.764	1.474	2.826	0.037
The third physical effort	O2Hb	Micromoles per liter of tissue	0.153	0.698	3.38	1.075	8.131	0.000
	HHb		6.798	0.771	3.2	0.821	6.212	0.002
	tHb		5.268	1.329	6.581	1.529	1.266	0.261

Table (4) shows the differences between the pressure applied to the muscle tissue to stop the blood flow in comparison with the non-stop blood circulation for the two variables of the study, which the researcher believes that the pressure on the muscle tissue led to a decrease in the speed of blood flow in the blood vessels, which was reflected On the decrease in the amount of oxygen saturated with hemoglobin reaching the muscle tissue as a result of the pressure placed on the muscle, and thus the increase of CO_2 in the muscle tissue as a result of the metabolic reactions that occur as a result of physical exertion and an increase in the burden as a result of the pressure on the muscle. On this basis, we see that the physical efforts that led without the pressure on the muscle tissue were better than the physical efforts that cut the venous circulation on the muscle tissue as a result of increased blood flow and the amount of oxygen loaded with hemoglobin that helped deliver oxygen to produce the necessary energy and reduce the burden on muscle tissue, which It gave the muscle to continue its physical performance better than the other physical effort.

The muscle tissue needs the amount of hemoglobin in the blood loaded with oxygen to fill the deficiency caused by the effects that affect the muscle. (Beekvelt ، 1969) [1].

Presentation and discussion of the results during rest before and after the physical performance by pressing the ulnar flexor muscle

Table 5: Shows the arithmetic mean, the standard deviation, and the (T) value calculated during rest before and after the physical performance by pressing the ulnar flexor muscle of the research sample

Variables	Measuring unit	Rest before the first physical performance		Rest after the third physical performance		T. value	Sig (2-ailed)
		Arithmetic mean	standard deviation	Arithmetic mean	Standard deviation		
O2Hb	Micromoles per liter of tissue	4.513	0.645	- 0.863	0.684	9.501	0.000
HHb		8.044	0.913	6.798	0.771	2.551	0.029
by		3.53	0.959	5.268	1.329	2.597	0.027

And through Table (5), which shows the differences during rest for the ulnar flexor muscle in (O2Hb), which the researcher attributes to an improvement in the decrease in the level of the amount of hemoglobin during rest before starting the physical performance and after the third physical performance of endurance of skill performance as a result of the pressure imposed on The ulnar flexor muscle during the skill performance, which led to obstruction of blood flow in the circulatory system, while the level of (HHb), which represents hemoglobin in the blood not loaded with oxygen, was low in the muscle tissue, and this was observed in the computational circles between the pre and post measurement, which was In favor of the dimensional measurement as a result of the continuity of blood flow in the circulatory system to compensate for the shortage and restore the energy system, and this depends on

the physical level of the athlete in restoring the muscle in the shortest possible time through blood flow in the circulatory system depending on the productivity of the heart to push blood throughout the body, including the flexor muscle For the ulnar rooting.

The increase in local blood flow during muscle contraction results from a lack of oxygen in the muscle tissues, which leads to the expansion of blood vessels. (Hall, 1997) [2].

Conclusions and recommendations

Conclusions

1. Change in the amount of hemoglobin carrying oxygen and not oxygen due to pressure exerted on the ulnar flexor muscle during physical exertion.
2. A decrease in the (tHb) variable, representing the absolute difference between the amount of hemoglobin in oxygen-laden and non-oxygenated blood during physical exertion.
3. A decrease in the amount of hemoglobin loaded with oxygen as a result of the pressure applied to the muscle tissue to stop the venous cycle compared to without stopping the venous cycle in the other physical exertion
4. Decrease in the amount of hemoglobin carrying oxygen and not carrying oxygen during the recovery phase and an increase in the absolute difference between the amount of hemoglobin in the blood carrying oxygen and not carrying oxygen.

Recommendations

1. The need for coaches to use scientific and codified tests, whether physical, kinetic, mental, or skillful, with the equipment to know the level of the players.
2. Emphasis on the attribute of carrying skill performance because of its importance in the boxing game.
3. The necessity of conducting similar studies at different levels and weights in the Boxing game.
4. Emphasis on conducting periodic and sequential tests for boxers during the preparation stages to verify the validity of the curriculum and what is achieved from its objectives.

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