Effect of exercises to develop special endurance in some biochemical variables of kidneys for handball players

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Abstract:

The aim of the research was to identify the effect of the induced exercises which are prepared in the development of endurance and some biochemical variables of the kidneys for handball players. The researcher assumed that the exercises have a positive effect in the development of special endurance and some biochemical variables of the kidneys in handball players. The researcher used the experimental method in solving the problem of research by preparing a group of exercises to develop the special endurance and to know its effect in some biochemical variables of the two kidneys of the players of the club Kufa handball players who represented the research community. 12 of them were selected for the sample in a comprehensive manner The researcher recommended that the training units should be conducted in an atmosphere and times suitable for the period of competitions and times of games. As well as compensation of fluids and salts lost to players in hot weather and drink moderate amounts of water with fruit juice, either during training or during competition for keeping the balance of fluids and salts in the body sports, which helps in raising physical and physiological abilities.

key words
Special endurance - biochemical variables - kidneys - handball

1. Introduction:

The concept of special endurance is not limited to the athlete's ability to resist fatigue in a particular physical performance, but the extent of his ability to perform efficiently and in a specific time. The development and maintenance of his level in handball players is an urgent necessity, especially in the special preparation period and the competitions required by these physical abilities Of physiological adaptations in vital organs of the body. Handball is one of the sports in which players are exposed during the performance of the training exercises of different training methods for a number of changes in the functional variables of different body systems. These variables are related to some biochemical indicators of the work of the kidneys (sodium, urea, creatinine). The changes in the levels of the most important indicators of the safety of the work of the two kidneys or handball players in the performance of exercises to develop endurance in this game. Because these variables are also important for their direct association with the safety of muscle contractions necessary to complete the desired goal in the development of special tolerance for handball players. The importance of the research is the need to identify the level of performance of the kidneys in handball players by detecting some of the biochemical changes that occur in the body, such as changes in concentrations (sodium, urea, creatinine), which are vital indicators and important, which reflect the safety of the functions of the kidney and The extent to which the effort is applied to the biochemical viability of the two kidneys for handball players.

The search problem was There are many physiological effects of exercises to develop special endurance on the organs and functions of the body. One of these effects is the function of the kidneys in the body. Special endurance exercises may lead to changes in the functional level of the kidneys. These changes, such as temporary (response), soon disappear with the effect of the effective , including permanent changes (adaptations) Despite the fact that changes in some indicators are the biochemical level of the two kidneys, which is the level of concentrations of sodium salts, creatinine and uric acid in the blood, it is important because it has a direct relationship to metabolic processes to provide

energy for muscle work. As the work of the kidneys here focused on the disposal of some of the remnants of metabolism as well as maintain the balance of fluids and salts in the human body. We find that many trainers lack accurate and accurate information about the extent of changes in the indicators of the functional ability of the two kidneys and the importance of these variables in physical work in general and develop the special tolerance of handball players in particular, in addition to the reluctance of most researchers in such studies. Therefore, the researcher considered the study in this problem to identify the changes that can occur in some biochemical variables of the kidneys when performing special exercises for handball players .

The search had been aimed to Preparing exercises to develop the special endurance of handball players . and knowing the impact of exercises designed to develop the special endurance of handball players. And also identify of the impact of special endurance exercises in some biochemical variables of kidneys for handball players.

The researcher assumed that for the Implemented exercises a positive impact in the development of special endurance for handball players. And The exercise of special endurance has a positive effect in some biochemical variables of kidneys for handball players

2. Research methodology and field procedures

To solve the research problem, the researcher used the experimental method and in the style of the two parallel groups with Before the program and post-test.

- Research community and its samples :

The research community was determined by the team of Al-Koufah Sports Club in the handball the advanced, they represent one of the excellent clubs of the handball for the sports season (2016-2017) of the 18 players. The sample was selected in a comprehensive inventory method after the exclusion of the goalkeepers (2)) Because of the different style of training for goalkeepers in handball game, bringing the total number of the sample 16 players. The sample was randomly divided into two equal groups (experimental and control sample). All variables

that would affect the results of the research were evaluated and as shown in Table (1)

Table (1)

Shows the parity of the two experimental research groups

Groups / Variables	control group		The experimental group		Mann Whitney calculated	Level of significance	Significance
	Median	Deviation	Median	Deviation			
Length / cm	175.5	2	174.5	2.25	0.913	0.05	Random
Weight / kg	76.5	2	75	2	0.612		Random
Age / year	21	0.5	20.5	0.5	0.261		Random
Training age / year	7	0.25	6.5	0.75	0.536		Random
strength Endurance arm	31	1.75	30	2	0.253		Random
strength Endurance legs	40.725	0.807	43.405	1.097	0.521		Random
strength Endurance arm	26	2.5	25.5	3.25	0.261		Random
strength Endurance legs	30	1.75	31	2.25	0.261		Random
Sodium	152.44	1.18	152.16	1.25	0.812		Random
Urea	6.57	0.163	6.65	0.725	0.068		Random
Creatinine	94.25	2.434	59.1	2.123	0.416		Random

- The results indicate that the two groups are equal in all variables .

-Mann Whitney Calculated > 0.05 = Random

- Means of data collection and equipment used

- Means of data collection

* Arab and foreign sources and references * Observation and experimentation * Questionnaire * Physical and functional tests

- Machines used in research

* Measuring device of height and weight (American-made). * Centrifuge (used to separate blood components and obtain serum at 3000 rpm) Japanese-made * Spectrophotometer (German-made) * Microbial pipette * Blood-saving tubes (syringes) * Medical injection (5cc) Sterilizer * Cooling Box for transfusion of blood samples * Blocks for the purpose of measuring search variables * Computer hardware.

- Exploration experiment

The researcher conducted exploration experiment on a sample of (4) players from the sample of the research on Saturday, 4/6/2016 was intended to prepare the field and tools and the auxiliary team. In addition to preparing the appropriate place for the process of blood withdrawal and the formation of the medical team competent to withdraw blood from the players.

- Tests used in research: included the following

The Special Endurance Tests (speed Endurance , strength Endurance)

* The first test: pass and receive the ball on the wall for 45 seconds (Ahmed Yousef Meteb, 2003, p. 49)
- Purpose of the test: Measure the bearing speed of the arm musculars .
- Tools: 1- Hand balls. 2 - a flat wall.
3 - adhesive tape fixed on the ground and at a distance of 4 meters from the wall. 4. Stopwatch.
- Tool specifications: The player stands 4 meters away from the wall and holds the ball with his hands and at the start signal passes the ball to the wall and receive it and continue for as many as possible during the time set for performance (45 seconds)
- Recording: The number of scrolling and receiving times is recorded within 45 seconds.

* The second test: Sprinting 8 × 25 m from the high start: (Kamal Abdel Hamid, Mohamed Sobhi Hassanein, 1980, pp. 214-216).
- Tools: 1. Tape measure. 2- Adhesive tape. 3- Stopwatch.
4 - level plane longer than 30 m. 5. whistle.
- Performance specifications: Two parallel lines draw the distance (25 m), the player stands at the starting line and at the start signal is running at

full speed towards the second line to touch the foot and then turn back to the starting line, repeat this performance (8) times to the distance 8 × 25 m = 200 m.
- Registration: The player records the time it takes to Completed the distance (8 × 25 m) in a second and parts.

* Third test: Bend the arms and extend them from the front end position for 30 seconds (Mohammad Subhi Hassanein, 2001, p. 236). - Purpose of the test: Measure the strength Endurance of the muscles of the arms. – tools : 1- Stopwatch. 2 - whistle. - Performance Specification: When starting from the forward position, the player will bend and extend the arms continuously for 30 seconds so that the chest is touched at each time when bending and the elbows extend completely from the tide. - Registration: Record the correct number of times in 30 seconds.

* The fourth test: vertical jump of the position (knees half-bend) for 30 seconds (Mohammad Sobhi Hassanein, 2001, p. 238). - Purpose of the test: Measure the strength Endurance of the muscles of the two legs. - Tools: 1- Stopwatch. 2 - whistle. 3 - rope. - Performance specifications: When starting from the position of (knees bend half) the player jump so high that the knees extend completely and leave the feet in the ground in each jump, the player continues to jump for 30 seconds. - Registration: The player is given the number of jumps within 30 seconds.

* The fifth test: test the functional indicators of the kidneys. - Purpose of the test: Measure changes in some functional indicators of the kidneys. - Tools: 1- Balls. 2 - whistle. 3-Hour Stop. - Performance specifications: At the start of the player to perform the various defensive moves (move forward, then return diagonally, and repeat this according to the defense centers) and then proceed forward and take the long pass from the colleague and progress Albatbp towards the opposite goal and the performance of the whipsawing from jumping high And repeat the correction five times after the return of the player each time to the area of 9 meters, then return to the defense and repeat the same performance (3 repetition) after a break between the frequencies determined by the arrival of the pulse to (120 p/ m). After two minutes of physical pregnancy, the blood is drawn from the players to measure the biochemical variables of the kidneys.

- The main experience

- Before the program measurements

Before the program measurements included the measurement of special endurance components (speed endurance, strength endurance) as well as the measurement of functional capacity indicators of the two kidneys as follows:

First: Before the program measurement of the special endurance components: Before the program measurement of special endurance components (endurance two arms speed, endurance the speed of two legs, endurance the strength of two arms, endurance the strength of two legs) was carried out on Saturday, 11/6/2016 through the application of the tests mentioned previously On the research sample starting with the speed tests for the arms and legs and then the force tests for the arms and legs. (Note that these tests were codified on a sample similar to the sample of the research, which prompted the researcher not to conduct the process of codification of these tests again).

Second: Before the program measurement of functional ability indicators of the kidneys:

Before the program measurement of the functional capacity indicators (sodium, urea, creatinine) for the sample of the research was done on Monday 13/6/ 2016 at 10:00 am by withdrawing a sample of blood (5 cc) For each player after carrying out the handball performance test mentioned above. The blood was then emptied from the medical injection into the blood-preserving tubes. The tubes were numbered from B1-B16, where each number on the tube was matched by the name of the player on the registration form. Blood is withdrawn after two minutes of testing.

Perform special endurance exercises

Special endurance exercises were carried out during the main part of the training modules carried out by the trainer during the special preparation period, with a severity ranging from 80-90% and in the high-intensity infantry style for 6 weeks from 15/6/2016 to 30/8/2016.

After the program measurements: After the program measurements included the following:

1 - Measurement of special endurance components: After measuring the special endurance components (under study) after the implementation of the special endurance exercises for 6 weeks on Wednesday 31/8/2016 to apply the tests for measuring these components used in Before the program measurement under the same conditions and conditions In the Before the program measurement test.

2 - Measuring the indicators of the functional capacity of the two kidneys: After measuring the capacity of the two kidneys after the completion of special endurance exercises were carried out on Friday 2/9/2016 at 10 am and the same procedures for measuring these indicators in Before the program measurement and under the same conditions and conditions for Before the program measurement testing .

- Statistical means: Statistical means based on the statistical system

Median , deviation , Mann Whitney Test , Wilcoxon Signed-Ranks Test

3. Presenting, analyzing and discussing the results

- Presentation, analysis and discussion of the results of the "special endurance tests of the two research groups.

- Presentation of the results of tests (speed endurance) of the experimental and control groups.

Table (2)

Test / Measuring/ unit	The experimental group				Wilcoxon calculated	Level of significance	Significance
	Before		After				
	Median	Deviation	Median	Deviation			
Pass and receive the ball on the wall (45) sec / (number of times	30	2	36.5	1.25	0	0.05	Positive
Sprinting 25 × 8 m from high start / ((second	43.405	1.097	37.56	0.5	0		Positive
Test / Measuring/ unit	Control group				Wilcoxon calculated	Level of significance	Significance
	Before		After				
	Median	Deviation	Median	Deviation			
Pass and receive the ball on the wall (45) sec / (number of times	31	1.75	34	1.5	0	0.05	Positive
Sprinting 25 × 8 m from high start / ((second	40.725	0.807	38.9	0.74	0		Positive

Wilcoxon calculated ≤ 0.05 = Positive

The results indicate that there are positive differences between the two measurements toward of measurement after the program

- Presentation of the results of tests (strength endurance) of the experimental and control groups.

test / measruing unit	The experimental group				Wilcoxon calculated	Level of significance	Significance
	Before		After				
	Median	Deviation	Median	Deviation			
Bend the arms out of the forward position (30) seconds. (The number of times)	25.5	3.25	33.5	2.75	0	0.05	positive
Vertical jump from the position of the knees (half bend) 30 seconds (The number of times)	31	2.25	35.5	2	0		positive
Test / Measuring unit	Control group				Wilcoxon Calculated	Level of significance	Significance
	Before		After				
	Median	Deviation	Median	Deviation			
Bend the arms out of the forward position (30) seconds. (The number of times)	26	2.5	29	2	0	0.05	positive
Vertical jump from the position of the knees (half bend) 30 seconds (The number of times)	30	1.75	32	1.5	0		positive

Table (3)

Wilcoxon calculated ≤ 0.05 = Positive.

The results indicate that there are positive differences between the two measurements toward of measurement after the program .

- Results of the tests (speed endurance and strength endurance) after the program for the two groups of research, analysis and discussion .

Table (4)

Mann whitney calculated ≤ 0.05 = Positive

Groups / Tests	The experimental group		control group		Mann Whitney Calculated	Level of significance	Significance
	Median	Deviation	Median	Deviation			
Pass and receive the ball on the wall (45) sec / (number of times	**36.5**	**1.25**	**34**	**1.5**	**0**	**0.05**	Positive
Sprinting 25 × 8 m from high start / (second)	**37.56**	**0.05**	**38.9**	**0.74**	**0**		Positive
Bend the arms out of the forward position (30) seconds. (The number of times)	**33.5**	**2.75**	**29**	**2**	**0**		Positive
Vertical jump from the position of the knees (half bend) 30 seconds (The number of times)	**35.5**	**2**	**32**	**1.5**	**0**		Positive

The results showed significant differences between the two research groups to for the experimental group.

- Presentation, analysis and discussion of the results of the measurement of functional capacity indicators of the two kidneys.

- Presentation of the measurement results for the functional capacity indicators of the two groups for the experimental and control groups

Table (5)

Groubs	Variables	Befor		After		Wilcoxon calculated	Level of significance	Significance
		Median	Deviation	Median	Deviation			
Experimental	Sodium	152.16	1.25	146	0.73	0.012	0.05	Positive
	Urea	6.65	0.725	5.01	0.12	0.011		Positive
	Creatinine	95.1	2.123	88.25	0.47	0.012		Positive
Control	Sodium	152.44	1.18	150	0.88	0.012		Positive
	Urea	6.57	0.163	5.56	0.56	0.012		Positive
	Creatinine	94.25	2.434	89.67	0.52	0.012		Positive

Wilcoxon calculated ≤ 0.05 = Positive

•The normal range :

Sodium: (136-155) M.MOL / L

Urea: (3.3-7.5)M.MOL / L

Creatinine: (62-124) M.MOL / L

The results indicate that there are positive differences between the two measurements toward of measurement after the program .

3.2.4 Presentation of the results of the differences between the experimental and control groups for post-program measurements of the biochemical variables For both kidneys.

Table (6)

Groups	The experimental group		control group		Mann Whitney Calculated	Level of significance	Significance
Variables	Deviation	Median	Deviation	median			
Sodium	146	0.37	150	0.88	0	0.05	Positive
Urea	5.01	0.12	5.56	0.56	0		Positive
Creatinine	88.25	0.47	89.67	0.52	0		Positive

Mann whitney calculated ≤ 0.05 = Positive

-The results indicate a significant difference between the two groups towards the experimental group

- Discussion of results

3.3.1 Discussion of the results of the special endurance tests of the experimental and control groups

Tables (2, 3, 4) shows significant differences between the measurements before and after the program in the special endurance components (speed endurance, strength endurance) of the arms and legs of both experimental and control groups. The results also showed significant differences between the two groups and towards of the experimental group. And the researcher impute the cause of the emergence of significant differences for the experimental group to follow the foundations and principles of the scientific training in the effect of positive required for the program prepared, where the researcher focused on the exercise to be the first speed at the beginning of each training Unit and then followed by exercise force, Their success depends largely on the safety of the central nervous system. In addition, following the Principle of the ripple in the implementation of training loads was one of the most important factors that helped in the obvious development in the components of special endurance in the research sample. The researcher concentrate on the loads should not be one level (high or low intensity) In both the training program and the training methods. This is consistent with what he concluded Mohammed Reza (2008) that the intensity of training in games is very complicated because the Speed of play is fast and the intensity changes and changes constantly between the Maximum and the Low. (Mohammad Reza Ibrahim, 2008, p. 112). This has helped to make good adaptations in organs and body parts that have helped develop the components of endurance (speed endurance, strength endurance) by increasing muscle effectiveness on A high degree of acidity is generated by the accumulation of lactic acid and Residues of muscle metabolism. While increasing the efficiency of the heart and circulatory system in delivering sufficient amounts of oxygen to the muscles to complete the metabolic processes to produce the energy necessary for performance and rid the muscles of the waste Residues from these Metabolism .

All of the above also explains the superiority of the experimental group on the control group in the development of the special endurance components. Although these components of the control group have also been attributed by the researcher to the program followed by the trainer

has included appropriate training loads for the development of special tolerance components to some extent beyond There was stability in the level without continuing to develop in those components, while continued development in the experimental group, which resulted in significant differences in favor of the experimental group.

- Discussion of the results of functional variables of the both kidneys

Table (5) showed an improvement in concentrations (sodium, urea, creatinine) in the post-measurement of special endurance exercises, while the results in Table (6) indicate an improvement in the results of these variables for the experimental group is greater than it is to the control group.

The researcher impute the increase in concentrations (sodium, urea, creatinine) in the measurement before the program , after the implementation of the test of Load performance to the weak adaptations in the sample when implement the load on the sample in the measurement before the program in hot weather where the increase here is a negative indicator of the work of the kidneys, The cardiac output of the blood is concentrated in the working muscles. This, of course, is at the expense of the amount of blood that reaches the rest of the body organs, including the kidneys, thus reducing its functional efficiency. The variables of sodium, urea and creatinine are important variables of kidney function. However, it is important to note that the increase in these variables was all within normal proportions and this is in line with Japues (1984) that the blood reaching the kidneys at rest 22% of the blood rate for this device functions important to clear the body of Residues and toxins , This percentage is reduced to 3% during the long-term physical effort and effort to go to the largest proportion of blood to the working muscles to do the physical effort required (Japues R Poortmos:, 2012 , p56).

The researcher also impute the decrease in serum concentrations of sodium, urea and creatinine after the special endurance exercises in Measure after program to the adaptations experienced by the players due to training in hot weather during the months (June, July, August) The the weather of severe effects on the work of the both kidneys and follow the researcher to the exact scientific method in the implementation of special endurance exercises, taking into account the principles and foundations of

modern sports training in how to raise exercises speed endurance and strength endurance and link between them and the use concentration of training load suitable for the objectives study in the development of special endurance and functional ability indicators of the both kidneys. This is in line with Guton's statement that such results indicate the adaptation of the players with the hot weather by the continuous and increasing exposure to training under this weather, which causes the adaptation of the sweat glands by increasing sodium assimilation of the sweat before reaching the skin and compensating salts and sodium chloride by drinking Water, fluids and salts among the training units (Arthur C Guton M.Doc, 2001, p927). This is also consistent with Hazza bin Mohammed al-Hazza's 2009 study that physical training in the hot air increases the size of sweat glands and their potential to produce sweat, while the concentration of the fluids in the sweat liquid, especially sodium, is a sign of the rationalization of this balanced element Body fluids. This can be explained by the fact that excessive sweating during physical exertion in the hot atmosphere accompanied by loss of fluids and sodium ions stimulates the action of the hormone dextron by stimulating the release of sodium in the urine, thus maintaining its concentration in the plasma while antidiuretic hormone ADH within the body Stimulate the kidneys to increase the absorption of water, which helps to keep fluids inside the body (Hazza bin Mohammed al-Hazza, 2009, pp. 542-547).

4. Conclusions and recommendations

4.1 Conclusions

1- Functional variables of the kidneys are severely affected by exposure to high-intensity physical loads in hot weather.

2- Continuation of the exercise of special endurance exercises in hot weather and scientifically regulator to adapt the work of the two kidneys through the improvement in the concentrations of functional variables (sodium, urea, creatinine) with training.

3 - In spite of adaptation to the functional variables of the two kidneys (under study) for both groups, the development in the proportions of these

variables in the experimental group was much better than in the control group.

4.2 Recommendations

1 – confirmation the need to conduct training units in the weather and times appropriate to the period of competitions and times of games.

2 - the need to compensate fluids and salts lost in the players in the hot weather and drink moderate amounts of water with fruit juice, whether during training or during the competition to maintain the balance of fluids and salts in the body of the player, which helps in raising physical and physiological abilities.

3 - Conduct similar studies on other Functional variables of the two kidneys in hot weather such as (potassium, uric acid, alRenin enzyme, creatinine , phosphate enzyme, clopulin).

4 - The need for a similar study on the effect of cold weather on the functions of the kidneys.

Annex (1)

Shows samples of endurance exercises during the main part of the training units

The first training units

- Objective: Develop the endurance of the hand ball - Category: applicants 20-22 years - Training method: Interval Training by High intensity - Method of regulation (circular training) - The intensity of special endurance exercises: 80%

Section	the exercise	intensity		Repeat for each exercise	Number of courses	rest between stations		rest between courses	
		Pulse / min	Exercise time			Pulse / min	Time	Pulse / min	Time
Preparation	Introduction - Field configuration and tools - Attendance		5 m						
General Preparation	Various jogs, rotate two arms and legs.	140	10m						
Special preparation	-Exercises for muscle flexibility . -Feelings of ball Exercises and different defensive moves.	120	10m 5m						

	-Exercises of Pass, receiving and various Scoring .	90 %	10m						
	It also includes the following stations	80 %	30sec	20	2	120	1.5 m	100	3m
	1-Pass and receive			8					
the main	the ball on the wall	152	30sec	5					
	2. - The running		30sec	5					
	over Hoops 3-	168	30sec						
	defensive	168							
	movements.	168		5					
	4 - push the		30sec						
	colleague By hands								
	with the resistance	152		5					
	by the colleague .		30sec						
The final	5-From the lying down position throw a medical ball (3) kg	168							
	towards the colleague .	110							
	6-Intermittent jump between feet back and forth (3) meters -		10m						
	A normal jog								
	-Flexibility exercises.								

References

-Ahmed Yousef Meteb: Effect of a training curriculum using a proposed field in the development of special tolerance for young people handball game, (PhD thesis, Faculty of Physical Education - University of Baghdad), 2003, p.

-Arthur C Guton M.Doc : Meddical physiology "SAUNDERS" company , 20 thed , USA , 2001,p927 .

- Hazza Bin Mohammed Al-Hazza: physiology of physical effort - theoretical foundations and laboratory procedures for physiological measurements, C 2, Riyadh King Saud University, 2009, pp. 542-547.

-Japues R Poortmos : Exercise & Renal function in jur- sports medicin , vol 1, Brax celles,2012.

-Kamal Abdel Hamid, Mohamed Sobhy Hassanein: Measurement in Handball, Cairo, Arab Thought House, 1980, pp. 214-216.

-Mohamed Reza Ibrahim: Field Application of Mathematical Theory and Methods, 1, Baghdad, Alfadli Office, 2008, p. 112.

-Mohamed Sobhi Hassanein: Measurement and Evaluation in Physical Education and Sports, C1, I4, Cairo, Dar Al-Fikr Al-Arabi, 2001.

-https://www.journals.elsevier.com/psychology-of-sport-and-exerciese