



THE EFFECT OF CIRCULAR TRAINING ON MUSCULAR ABILITY AND SOME FUNCTIONAL INDICATORS OF THE KIDNEYS IN FENCING PLAYERS

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Abstract:

The research study aimed to find out the effect of circular training style on muscle strength and some functional indicators of the kidneys in fencing players. The researchers used the experimental method and identified their research community, namely the players of Maysan governorate teams in fencing and for the three weapons (fencing sword, shish weapon, Arab sword weapon), and by (4) players for each weapon, which amounted to (12) players, and some procedures were adopted to achieve the objectives of the study. The study came to conclusions about the positive impact of the circular training method on the development of the muscular ability of the arm to carry the weapon and the legs. The study showed that measuring the functional indicators of the kidneys is within normal limits. The training method used has achieved positive results in adapting the functional indicators of the kidneys in the research variables.

Keywords: circuit training, power muscle, kidney physiological indices

1. Introduction and importance of the research

The philosophy of studies on the science of modern sports training was not reduced to presenting it as an intensity, repetition and comfort, but rather expanded to the multiplicity and diversity of means and methods and integrated with training doses in order to return meaningful benefits, by identifying the effects of external load in the various body systems and providing the most accurate information that contributes to the required changes in order to achieve the best achievement.

Due to the importance of diversity in training methods and means and their application in the doses of training curricula, so the method of circular training is one of

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the effective methods of implementing training doses for the purpose of achieving the desired goals that were set for functional adaptation, and according to these functional changes results in an improvement in the level of physical performance.

Training doses occur various functional changes resulting from increasing the efficiency of vital organs and systems of the body in the face of the requirements of the training load for the type of specialized sports activity, and the physiological studies of sports training did not leave any research phenomenon that has been fought in it, but it needs to conduct more research and provide the most accurate information, including the functional responses to the kidneys associated with the physical effort carried out during the training stations, Which we deem worthy of attention to study them as an important aspect of the body, which plays a prominent and vital role in the homogeneous stability of the internal environment, to ward off the risk of metabolic waste products that cause serious damage to the cells of the body's systems, and in order to maintain this, it has become important to provide the most accurate information that contributes to making the required changes in order to achieve the optimal achievement of fencing players.

The importance of the research lies in providing a training vision using the circular training method as it is suitable for the development of the muscular ability of the arms and legs, which reflects positively on the level of skill performance, as well as knowing its internal effects on some functional indicators of the kidneys, hoping that this research will contribute scientifically to solving field problems for fencing players.

2. Research problem

Believing that raising the efficiency of fencers and understanding the correct relationship between pregnancy, comfort and peculiarities of training cannot be done without identifying the internal load and the changes that occur in the functional body systems as a result of the use of exercises, which therefore aim to ration the functional external loads used, and given the lack of information available to our knowledge or lack of modernity, which serves in its outcome to raise the level of achievement, so we decided to delve into this phenomenon as a fertile field for study and research By answering the following question:

- What is the level of changes that can occur in some functional indicators of the kidneys due to the influence of the circular training method, and whether this training vision contributes to the development of the muscular ability of fencers?

2.1 Research objective

- Knowing the effect of the circular training method on muscle strength and some functional indicators of the kidneys of fencing players.

2.2 Imposition of the research

- The circular training method affects the muscular strength and some functional indicators of the kidneys of fencing players.

3. Research methodology and field procedures

3.1 Research methodology

The researchers used the experimental method with one group to achieve the research objective.

3.2 Research community

The researchers identified the research community, which are the players of Maysan governorate teams in fencing and for the three weapons (fencing sword, shish weapon, Arab sword weapon), the category of applicants over the age of (20 years) and registered with the lists of the Fencing Sub-Federation for the season 2021-2022, and by (4) players for each weapon, out of which their number reached (12) players and their percentage was (100%), as clinical examinations were conducted by a specialized medical staff at Al-Zahrawi General Hospital in the governorate to ensure their safety and freedom from diseases that may effect on the results of the research, homogeneity has been done in (height, body mass, chronological age, training age) as well as the equivalence of the study variables in muscular ability and some functional indicators of the kidneys (creatinine, urea), and it was found that there is clear homogeneity and equivalence in those variables for members of the research community.

3.3 Functional tests and measurements used in research

3.3.1 Muscle ability test for extending and bending the arm-bearing arm (10s): (Mustafa Chasib, 2016)

How to perform:

The player stands in the ready position (oncard) in front of the marker where the player is given an attempt to adjust the appropriate distance to perform the movement of extending and bending the arm carrying the foil weapon on the marker after the first examiner places his palm on the player's torso to confirm that the armed arm is back to him. The second examiner gives the player the start signals to perform the test and at the same time presses the start button of the electronic watch for timing purposes, where the player extends the armed arm towards the marker to achieve a touch with the weapon's fly, then bends the arm to the ready position (oncard) within a time of (10 seconds). After the specified time has been exhausted, the examiner gives the signal to stop performing.

Performance conditions: The player must do the following:

- Extend the armed arm to achieve a touch on the marker with the weapon's fly, provided that the arm is at shoulder level parallel to the ground. The attempt is not counted in the event of not touching the marker.
- After performing each extension of the armed arm on the bar, the arm is then bent to the ready position so that the elbow of the armed arm touches the palm of the

first tester placed on the player's torso. The attempt is not considered successful if the elbow does not touch the palm. Recording: The number of times the armed arm is performed (extended and bent) within a time of (10 seconds) is counted.

3.3.2 Performance test (physical - skill) for the lower limbs (14 m): (Mustafa Chasib, 2020)

A. Performance method

The player stands in the ready position (oncard) on the starting line that is (5 cm) wide so that the phalanges of the front foot touch the outer edge of the line, and from the above position the start signal is given by the tester and at the same time the start button of the electronic watch is pressed to calculate the time taken to complete the specified distance, where the player performs the movement by swinging the front leg forward and extending the knee joint accompanied by pushing the ground with the back leg to help jump to the farthest possible horizontal distance, then descending with both feet together and on the insteps.

B. Performance conditions

The player must do the following:

- The player stands in the ready position (oncard) on the starting line that is (5 cm) wide.
- The player must perform the advance movement by jumping and if the player fails to perform, the attempt is considered a failure.
- After covering a distance of (14 m), the player must remain in the ready position (oncard) to calculate the time.

3.3.3 Measurement of functional examinations: (Majid Shandi Wali, 1994)

In order to conduct laboratory tests of the biological process variables of the study, samples were taken from the adrenaline of individuals society Search At break time By the staff of medical Specialized in the laboratory of Al-Zahrawi General Hospital in Maysan Governorate by means of medical tubes for the examination of diuresis used once, so that laboratory can examine some functional indicators of the kidneys (creatinine, urea).

3.4 Pre-tests

The researchers tested the muscular ability of the arm-bearing arm and legs on individuals' society research in the fencing hall of the Faculty of Physical Education and Sports Sciences / Maysan University at ten in the morning on Thursday, 3/3/2022.

3.5 Main experience

After obtaining all the original approvals from the Fencing Sub-Federation and the members of the research community learned about the importance of the study and the extent of benefit from it, they expressed their agreement to cooperate with the researchers and implement their research procedures, and after completing all preliminary

procedures, starting with the results of the clinical examination and laboratory analysis, which resulted in the safety of the community and their enjoyment of full health, the researchers began to conduct their research, starting from the players' commitment to health prevention measures in light of the Corona pandemic, according to the directives of the Supreme Committee for Health and Safety Al-Wataniya, at exactly ten o'clock in the morning on Sunday, 6/3/2022, in which the players were subjected to doses of the loads of the circular training method in the interval training method in the special preparation stage, as the researchers prepared the station exercises and continued to be applied within the coach's curriculum for a period of (10) weeks and by (30) training units. Where the first training unit was implemented on Sunday, 6/3/2022. The last training unit was on Thursday, 8/5/2022, at a rate of (3) training units per week on (Saturday, Monday, Wednesday), and the partial stress of the special exercises was calculated by the maximum repetition of each exercise \times the required intensity / 100.

3.6 Post-tests

The post-tests of the research sample for the aforementioned variables were conducted on Tuesday, 10/5/2022.

3.7 Statistical methods

The researchers used the statistical bag (SPSS) version (23).

4. Presentation and discussion of results

4.1 Presentation of results

Table 1: The arithmetic means, standard deviations, calculated (T) value, level of significance, significance of differences in the muscular ability test and some total functional indicators (pre-post) for the research community

| Statistical Treatments | Unit of measurement | Going to | \pm | Calculated value (T) | Sig | Significant differences |
|---|---------------------|----------|-------|----------------------|-------|-------------------------|
| Muscle Ability Test of the Arm-Bearing Arm | | | | | | |
| Southern | Number/Time | 15.83 | 0.75 | 11.06 | 0.000 | D 0.01 |
| Go away | | 18.16 | 0.98 | | | |
| Muscle ability test for legs | | | | | | |
| Southern | Time | 5.58 | 0.85 | 4.09 | 0.009 | D 0.01 |
| Go away | | 4.05 | 0.90 | | | |
| Creatinine measurement in the administration | | | | | | |
| Southern | μ . Mol/L | 72.6 | 2.73 | 17.25 | 0.000 | D 0.01 |
| Go away | | 85 | 3.46 | | | |
| Measurement of urea in the administration | | | | | | |
| Southern | M. Mol/L | 4.51 | 1.02 | 7.66 | 0.001 | D 0.01 |
| Go away | | 6.50 | 1.04 | | | |

4.2 Discussion of the results

4.2.1 Discussion of muscular ability test results for the arm, the carrier of the weapon and the legs

The researchers attribute the improvement in muscular ability In the working and opposite muscles of the upper and lower limbs and positively to circular training style and nature rhythm of muscular work in compound exercises for the physical side of the skill, where it gives the possibility of affecting different muscle groups for the training stations, as they resembled and resembled the performance of basic skills in the sport of fencing, and that the performance of the stations Counting an effective and effective way to increase the intensity of the exercises, which formed continuous resistances on the work of those muscles of the fencer and with the increase in the speed of their movement, the resistance to the range of motion increases to them during implementation, therefore, the training method used is characterized by the nature of suspense and excitement to avoid boredom and routine exercise in the overall training process to motivate fencers by changing stimuli and putting them in front of constantly renewed challenges without causing muscle strains, which resulted in the development of the efficiency of the muscle functionally to improve its strength and speed and give it the muscular ability of the arm carrying the weapon and the legs.

This explanation is consistent with all previous studies: "*When adopting high-intensity circular training, the effect is clear in the development of some qualities, including muscular ability.*" (Souhail Hermassi, 2020) and "*The effectiveness of circuit training has been proven to reflect special positive changes in fitness and functional adaptation.*" (Bellar D, 2015) & (Butcher SJ, 2015) and "*The process of mixing the physical and skill aspects contributes to the development of special physical abilities that are trained according to the motor paths of the required performance. By using different types of resistors to train this muscle*". (Mustafa Chasib, 2019)

4.2.2 Discussion of creatinine results in diuresis

The researchers attribute these indications to the stations of the circular training method and the nature of the formation of the port load, which increases the contraction of repetitive muscle cells and, in turn, raises metabolic rates, leaving waste toxins and creatinine residues, which is posed with the production of glomerular filtration, which works to get rid of it after rising in the blood, and this reflects the adaptation of the function of the kidneys their vital role regulatory to maintain the necessary cell stability and carry out their various vital activities. This explanation is consistent with all previous studies, which confirmed that "*creatinine is a chemical compound formed in the metabolism resulting from the breakdown of creatine and is filtered through the kidneys, and it was noted that there is an increase in creatinine residues in the urine due to the increasing intensity of physical activity.*" (Bekos C., 2016) and "*creatinine levels increase with the training dose load phase and rise in the urine and decrease in the blood as a result of functional adaptations in the kidneys.*" (Matthew Hall, 2013) and that "*the amount of glomerular filtration of creatinine residues*

depends on the intensity and type of exercise and increases significantly in the urine." (Arakawa K., 2016) & (Zbigniew, 2016)

The researchers also believe that physical effort leads to changes in blood circulation, as the rate of filtration of the renal glomerulus doubles its work despite the amount of blood received by the kidneys compared to the number of muscles in the implementation of physical effort, but the glomerular filtration process works in the excretion of larger amounts of metabolic waste and other substances. The explanation was consistent with all studies that indicated that *"during reduced renal blood flow, the glomerular filtration rate increases when physical exertion reaches high intensity."* (Katarzyna, 2019) and *"high-intensity exercise affects protein excretion in the urine by increasing glomeruli permeability and decreasing blood return"*. (Lamoon S., 2009)

4.2.3 Discussion of the results of urea in diuresis

The researchers explain that the high concentration of urea in diuresis is caused by the metabolism of proteins as a result of the circular training method and the nature of the formation of physical load, and this in turn leads to an increase in amino acid metabolism and thus rises metabolic waste to produce urea concentrations, which are the most important residues in the blood, which constitute a burden on the various organs and systems of the body and therefore limit the efficiency of the work of the muscular system during training and in this case reflects the response and adaptation of the work of the kidneys and the function of filtering the blood and getting rid of its toxins in a way Regular and excreted through the urine to maintain the balance of the body to promote a better level of performance and delay the onset of fatigue. This explanation is consistent with all previous studies respectively (Masato Suzuki, 2015) & (Guido Bellinghieri, 2008) & (Jacques R, 1994) *"The kidneys play an important role in keeping the body's homeostasis from excreting metabolic and harmful waste products from them. The glomerular filtration rate increases with increased metabolic rate under physical exertion"* and *"The excretion of urea in the urine increases in response to high amino acid metabolism and remains elevated for some time. later in proportion to the intensity and duration of the exercise"*. *"Knowing the rates of low urea in the blood and its high urine gives good indications about the function of the kidneys."*

5. Conclusions and recommendations

5.1 Conclusions

- 1) The impact of the circular training method positively on the development of the muscular ability of the arm-bearing arm and legs.
- 2) The study showed that measuring the functional indicators of the kidneys falls within normal limits.
- 3) The training method used has achieved positive results in adapting the functional indicators of the two colleges in the research variables.

5.2 Recommendations

- 1) Adopting the circular training method for the outstanding positive results achieved.
- 2) The need to adopt physical tests and physiological measurements in determining the training and functional status of athletes.
- 3) Conducting similar studies on age groups, different sports events and other functional variables.
- 4) Modern and innovative training methods are needed to develop training in fencing and other sports.

Conflict of interest statement

The authors declare that this research had been conducting without any financial or commercial relationship may consider as a potential conflict of interest.

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