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The Effect of Cycling Exercises in Some Biochemical Elements and Achievement in Individual Time Trial for Elite Men Cyclist's

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ABSTRACT

A topic related to the work in the sports area is achieving success in the practice of sports sciences in general and cycling in particular, and research has focused on examining all applications of science, sports physiology, and chemistry due to their significance in creating training regimens and understanding the reactions that arise during and following sports practice. This includes involvement in aising performance, since one of the fundamental effects of increased activity of enzymes, hormones, and energy materials that participate in the processes of nutritional financing of adaptations in the body's vital systems and organs to resist fatigue resulting from effort is the release of biochemicals that occur within the lifting cells to produce the energy necessary for performance. Suitably, the research's greatest significance resides in developing a training regimen that enhances the bicycle's performance. The research aims to identify the impact of strikes on specific biochemical components and the accomplishments of individual time trial cyclists. I have already found research from (10) contestants, and searched for new steps in the research. Then the model experiments and the main experiment were conducted, and the researcher explained the basic tools used, and after the basic credits of the basic results were joined to the following basics: 1- Contributing to the gradual construction of innovative elements in achieving modifications to the research sample to achieve. 2- It contributed to bringing about positive changes in the results of biochemical Elements, which were reflected in improved achievement.

INTRODUCTION

The control of voltage or power output is necessary to reach greater heights based on scientific planning. Since science is fundamentally important to the development of training techniques, scientific research has focused on exploring many applications of pure science, such as chemistry and science Sports fabrications. Examine its techniques and be aware of the reactions that happen both during and after sporting activities, This enhances how well sports are performed. Understanding the biochemical alterations that take place in muscle cells to generate the energy required for athletic performance is crucial because of the elevated activity of enzymes, hormones, and energy components involved in metabolic processes. To avoid fatigue and adjust essential bodily devices, Today, it is impossible to continue honing the physical skills necessary for the kinds of sports and activities that are enjoyed. Boost cycling performance holistically without understanding the physiological changes in the body develop a broad range of physical skills to effortlessly and proficiently meet performance standards, The appropriate bicycle sport training regimen focuses on improving and limiting the cyclist's training load, which improves performance and boosts the effectiveness of essential devices. Steer clear of exhaustion, shield yourself from harm, and speed up the healing process. Eating healthily has long been a major priority for people in various cultures. Fasting, dieting, and vegetarianism are a few strategies people use and that society supports in order to live longer and be

healthier. (Macario, 2023).

The significance of research in the planning of an educational program to improve graduate performance and attain success, Goals are set for each training module, and the body will respond differently. Biochemical changes in muscle cells produce the energy required for athletic performance, which is due to increased activity of enzymes, hormones, and energy materials involved in metabolic processes. These changes also result in adaptations in the body's vital organs, enabling them to withstand the exhaustion of physical training.

Cycling is an Olympic sport that has advanced significantly. Despite the demanding and numerous needs throughout the race, cycling has recently witnessed the introduction of spectacular new technologies by accomplishing outstanding successes. Cycling races come in a variety of forms, depending on the venue, conditions, and timing of the event. Only road races are held in Iraq; they consist of general singles races, individual time trail races, and team time trail races, where riders must divide their effort across the designated race distance in order to complete the course in the shortest amount of time.

Research Problem

Selecting the proper training approach, a well-rounded program, and laboratory testing to assist the trainer in assessing the athlete's state both physically and chemically and determining the amount of improvement made, By alerting the researcher, he discovered a flaw or imbalance in the training plans employed as well as the absence of

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biochemical testing, which is based on the analysis of chemical changes occurring within the body and has a direct bearing on the degree of achievement development. These factors demonstrate an athlete's level of health and serve as indicators of their potential for advancement.

Research Aims

1. Prepare special exercises to suit the search sample.
2. Know the impact of cycling exercises on some biochemical Elements and achievement in individual time trials for elite male cyclists.

Research Assumes

1. There are statistically significant differences between tribal - dimensional test results of the research sample's biochemical Elements.
2. The results of tribal-dimensional tests to complete the research sample show statistically significant differences.

Research Areas

Human Domain

Road racing elite men cyclist's category of applicants participating in the iraqi league for the year (2023).

Time Domain

Duration (1/4/2023) to (1/10/2023), including the duration of implementation of the main experiment (10/6/2023) to (18/8/2023).

Area Domain

Roads (Highway Baghdad) in Baghdad City, as well as the laboratories of the Specialized Center for Sports Medicine of the Ministry of youth.

Definition of Terms

Biochemical Elements: interactions that take place inside cells as a result of a molecule changing into a different molecule there under the activity of enzymes. (Bruno, C. Z., Evrim, F., Zachary, R. A., & Betül, K., 2023) , such as the digestive and building processes that are part of the human body's metabolism (Miller, 2021).

Individual time trial race: The rider will begin alone and race a predetermined distance; the winner is the one who completes the distance in the quickest time. Elite Men participants may only race a maximum of 20 to 30 kilometers, per UCI rules for amateur competitors. (Federation, 2010).

METHODOLOGY

Research Methodology

Because it is appropriate for the nature of the study, the researcher employs an experimental strategy, using a single group design with distant and tribal testing.

Research Society and Its Appointment

The research community was deliberately selected from elite men cyclist's National Team of applicants from all of Iraq's 4 clubs (20) cyclist's , represented by clubs cyclist's (Al-sinaa , Kuya, Al-hashed Al-Shabe , Al-atehad Al-basre) For the sports season (2023), the sample was chosen in a deliberate manner in order to cooperate with the Federation and technical staff in the implementation of the training programme and provide all facilities in the implementation of the research procedures, thereby facilitating follow-up and supervising the implementation of the main trial steps. (Al-hashed Al-Shabe , Al-atehad Al-basre) because they could not be with the national team's contestants during the research period. The

Table 1: Indicates the number of the research community, its samples, excluded cyclist and percentage

No	Research society	Num	Sample Exploratory Experience	Research sample	Excluded	Percentage %
1	Al-sinaa	7	2	5	-	25%
2	Kuya	7	2	5	-	25%
3	Al-hashed Al-Shabe	4	-	-	4	0 %
4	Al-atehad Al-basre	2	-	-	2	0 %
	Total sample	20		10		100 %
	research sample			10		50%

percentage of the sample in the research community (50%) as shown in table (1).

Devices and Tools That were Used in the Research

- 1- Sony photocopier chinese-made (1).
- 2- Stop watch (Sewan) (2).
- 3- Whistle (1).
- 4- Hp laptop (1).
- 5- Portfolio of papers (6).
- 6- Speed roller Training (5).
- 7- Cotton wipes (10).
- 8- Paper wipes.

- 9- Sony type charging batteries (2).
- 10- Charger batteries (1).
- 11- Cable (HD).
- 12- Blower Type (Crivit) (1).
- 13- Bike tools (1).
- 14- Racing bikes of different types (10).

Homogenization Sample Research

To avoid influences affecting research results, the researcher performed the homogenization of the sample in variables (height, weight, age and training age) and table (2) shows this.

Table 2: Sample homogenization in variables (length, mass, age and age training)

Skewness	Std. Deviation	Median	Mean	Physical measures
- 0.082	4.450	171.50	171.30	Length (cm)
- 0.249	3.691	67.50	67.60	Mass (kg)
0.296	5.964	211.00	212.75	Age (m)
0.913	3.361	23.00	33.25	Age training (m)

Biochemical Tests and Completion Tests Approved in the Research

Assessing the Alkaline Phosphatase Enzyme’s Efficiency in Urine (Hassan, 2008)

A wine container with a lid is used to collect the urine sample, and it is subjected to rapid laboratory testing. It is kept in a refrigerator at (4) Celsius if it is kept for longer than twenty-four hours. The alkaline phosphatase enzyme’s efficacy in diuresis was assessed using the diagnostic kit; it should be noted that the typical ranges for this enzyme’s efficacy in diuresis are (92-21).

Hemoglobin Levels in Blood Measured (HB) , (Haider, 2007)

The test’s goal is to determine the blood’s hemoglobin (HB) content.

Five milliliters of Drakken-Sulperexine solution are used in the analysis tube for the measurement process.

Next, a blood sample measuring ten micrometers is added, well mixed, and left for ten to fifteen minutes. During this time, the mixed compound turns hematitic, and the reading in the Hb measuring device is taken.

Recording

The form is read in grams straight from the instrument.

Blood Sugar Measurement (F.B.S.). (Hussein M. G., 2013)

Within an hour of drawing the blood, a medical assistant who specialized in blood collection took a five milliliter sample. The blood was then directly analyzed in a medical laboratory, where it was stored in a designated container.

The Achievement Test. (Karim, 2017)

Test objective: To measure the achievement of riders in a team time trial race.

Devices and tools used in the test:

- Bikes for racers that comply with legal specifications.
- Stop watch.
- Whistle.

Performance Description

With the assistance of standing officials, the riders take their starting positions as they stand on the starting line. When the start signal is issued, the riders begin their race against time to travel a distance of roughly 20 km on a flat road with a route length of approximately 5 km. The timekeeper notifies the cyclists of how much time is left for the start.

Registration Method

The time it takes to complete the test distance is computed, and testers are only allowed one attempt.

Scientific Conditions for the Tests

Validity Assessments

“Honesty is one of the most important standards of test quality” (Yassin, 2015). and that it measures what it was intended to measure, as the researcher discovered the subjective honesty factor, which provides statistical significance and a real value to the validity of objective tests by employing reliability under the square root to validate the tests that were created. as displayed in Table (3).

Tests for Reliability

“Stability of measurement means that the scores obtained are accurate and free of error, This means that if the same measurement tool (test or scale) is applied to the same individual or thing any number of times in the same manner and conditions, we will obtain the same value every time” (Radwan, 2011). The stability coefficient was found by repeating the tests, and it was applied to (4) riders on days for the period (5/27 - 28/2023), and the tests were repeated after (5) days, that is, on Saturdays and Sundays for the period (3 – 4/6/ 2023) and to find the stability of these tests by conducting a simple correlation (Pearson) between the tests as shown in Table (3).

Objectivity

Objectivity is due to the clarity of the instructions for applying the tests and calculating their grades or results

Table 3: Reliability coefficient and self-validity of the tests

NO	Variables	Measuring unit	Stability coefficient	Self-honesty	Sig
1	ALP in Urine	L/U	0,86	0,92	0.00
2	HB	D/G	0,92	0,95	0.00
3	F.B.S	Mg/dl	0,84	0,91	0.00
NO	Achievement test				
1	Achievement	M/S	0.96	0.93	0.00

(Yassin, 2015). Objectivity is represented in the accuracy and objectivity of measuring devices such as the electronic watch, the HB meter, the glucose measuring device, and the medical laboratory devices for medical analyses.

Main Experiment Procedures

The pretests were carried out in the laboratories of the Specialized Center for Sports Medicine affiliated with the Ministry of Youth and Sports, as well as on the Baghdad-highway, on Saturdays and Sundays for the period (10-11/6/2023), and the conditions related to the implementation of the tests were proven, including sequence, place, time, and air pressure in Bicycle tires and others, for the purpose of carrying out post-tests.

The training program was implemented on Sunday (6/18/2023) and ended on Sunday (8/13/2023). The training program included the following:

- 1- A training program was built for a period of (8) weeks, with two medium training sessions and (5) training units in the small training course, so that the total number of training units was (40) training units.
- 2- The load is in the average cycle (1:3) and according to the intensity of the maximum work.
3. General preparation exercises were used in the first intermediate cycle and customized preparation exercises in the second.
- 4- The duration of the training unit ranged from (25) minutes to (150) minutes, according to the principle of gradual loading, and the total time of the training program was (2124.68) minutes.
- 5- The distance of the training unit ranged from (15) km to (80) km, and according to the principle of gradual increase, the total distance of the training program was (1412) km.
- 6- The method of continuous and phased training

(interval), low and high intensity, was used in implementing the program within the main department.

7- The work-to-rest ratio between one exercise and another was used (0.5), (1.1) and (1.2).

8- Modern exercises have been adopted and used in training units in the field of bicycles, and these exercises are used in developed countries.

9- Flexibility and stretching exercises were adopted in the warm-up process to prepare the muscles and avoid injury, and in the cool-down process after training to rest and relax the muscles.

Post-tests were conducted on Thursday and Friday for the period (17 - 18/8/2023), in the laboratories of the Specialized Center for Sports Medicine and on the Baghdad-highway, with the assistance of the assistant work team.

Statistical Methods Used in the Research

The skewness coefficient, simple correlation (Pearson), arithmetic means, standard deviations, and the t-test for correlated samples were all extracted using the statistical bag system. The concept of statistical bags was employed to obtain (Hussein M. H., 2024).

Presentation, Analysis and Discussion of the Results

The results of the pre- and post-tests were arranged in a table and discussed with the aim of achieving the research objectives and validating its hypotheses, as indicated in Table (4). The researcher had finished gathering data on the research Elements, including biochemical Elements and achievement, and had used the statistical package (SPSS) to treat this data in order to determine the true differences and the impact of using areas of severity on the research sample.

Table 4: The significance of the differences between the pre- and post-test results for the biochemical Elements and research sample's achievement, as well as the arithmetic means of the differences and the estimated (t) value

Statistical laboratories Test name	Measuring unit	Pretest		Posttest		Mean	SD	t	df	Sig
		Mean	SD	Mean	SD					
ALP in Urine	L/U	67.74	15.598	55.00	16.852	12.742	6.759	5.962	9	0.000
HB	D/G	13.840	0.977	14.570	1.044	- 0.730	0.362	6.373 -	9	0.000
F.B.S	Mg/dl	98.20	9.531	83.70	8.782	14.500	5.339	8.589	9	0.000
Achievement	M/S	28.375	1.464	27.191	1.500	1.184	0.440	8.508	9	0.000

The special exercises used in the training program, which helped to achieve the significant differences, as well as the muscular strength exercises used in the bicycle training program are credited by the researcher for these significant differences in favor of the post-tests in (measuring the effectiveness of the alkaline phosphatase enzyme in urine, blood hemoglobin, blood sugar, and performance). It was created with the competitors' age group in mind, and the interval training method's use of high-intensity exercises had the effect of causing adaptations that helped the cyclist maintain a high blood and muscle lactic acid

percentage. This helps the cyclist withstand increases in lactic acid levels and maintain a high level of performance to succeed during crucial competition periods.

Since alkaline phosphatase (ALP) is one of the recognized biochemical markers for diagnosing bone deformities, the researcher explains the significant differences in measuring the effectiveness of the enzyme in secretion as the result of a natural significant decrease in the concentration of the enzyme, indicating the presence of a significant decrease in the concentration of (ALP) secretion in favor of the post-tests. Additionally, the researcher notes that

the enzyme Alkaline phosphatase (ALP) increases in cases of rickets, osteomalacia, osteoporosis, and liver diseases like jaundice (Abu Saffar). (Hussein I. b., 2015). ALP levels that are lower assist prevent osteoporosis, restore baseline bone regularity, and boost the density of mineral bones, all of which lower the risk of injuries and spinal fractures in athletes. (Murray, 2006).

The researcher credits post-traumatic intensity exercises in the lactic threshold area and at the lactic threshold, which have aided in alterations in blood and body organs, for the moral disparities in blood hemoglobin in favor of distant testing. Because it supplies the necessary amount of oxygen to the working muscles, an increase in hemoglobin in the blood has a major effect on cyclists' performance in the individual time trail, More hemoglobin in the blood means that muscles will receive more oxygen, which aids in the process of oxidizing energy, developing the functioning of functional devices, and reaching the adaption stage needed to meet the demands of the training loads. (Eastell, R., Robins, S.P, Colwell, T., Assiri, A. M., Riggs, B. L., & Russell, R. G., 1993).

Moral arguments in favor of post-blood sugar testing are linked to training program activities that are tailored to the heart rate threshold's severity areas. This strategy helped reduce the blood sugar level, which is a good thing because it improved cells' ability to absorb insulin. In the second region, aerobic endurance activities have enhanced heart and other organ function, stimulated circulation, and lowered the rate of sugar. (Kress, B. C., Mizrahi, I. A., Armour, K. W., Marcus, R. Emkey, R. D., & Santora, A. C., 1999).

The exercises used in the training program that assisted in the appropriate adaptations in the functioning body organs of athletes and the program's construction based on the appropriate scientific bases have influenced the development of performance and achievement are responsible for the moral differences in favor of remote tests in the completion of the research sample. Along with avoiding injuries and expediting hospital stays, the stage's objective aligns with the purpose of the exercises that are performed, because "The organization of training must be within a basis consistent with the objective of the training phase within the preparation phase and the continuation of this type of training will achieve the best performance in competitions leading to the achievement of the best levels of sports achievement" (Earlen., 2011).

CONCLUSIONS

According to the research findings, the researcher reached the following conclusions

The development of ethically significant disparities in biochemical test results favoring remote testing between tribal and postgraduate tests.

The completion test findings showed ethically significant differences between the tribal and post tests, favoring the distant test.

The achievement of adequate adaptations in the body's devices for the research and achievement sample has

been facilitated by graduation in the creation of training modules.

The proposed cycling exercises contributed to positive changes in biochemical test results that reflected improved digital achievement in the individual time trail race of the research sample.

Scientific training that is planned and executed helps increase the degree of adaptability to functional body devices, accelerate recovery both during and between training modules, and prevent injuries, all of which have a favorable impact on physical performance.

Dedicated muscle strength training have led to faster and better performance from riders.

Conventional exercises don't specifically assist in achieving the necessary development.

The use of cycle workouts and their purpose has been made possible by low- and high-intensity, frequent, continuous, and phased training approaches.

The creation of the results was aided by the proper use of the trainers' training program's language and the dedication to applying it to the experimental research sample.

During and in between training modules, the hospitalization and adaption speeds up thanks to the initial intensity zone activities.

By adjusting to internal body devices and influencing the development of physical and functional capacities, second intensity (endurance) activities aided in the development of aerobic tolerance.

The man's rotation speed increased to endure force and speed throughout the third intensity zone (rhythm) activities.

The development of force tolerance, anaerobic tolerance, speed tolerance, and functional skills was aided by the fourth and fifth tensile zone exercises (lactic threshold and higher, respectively).

Exercises in the sixth intensity zone, or aerobic capability, improved maximal oxygen consumption, strike size, and heart rate, all of which had a favorable impact on cardiac output and the development of aerobic endurance.

The seventh intensity zone exercises (anaerobic capability) contributed to the development of anaerobic and antenna tolerance, speed tolerance, force, tolerance and improved functional capabilities.

The research sample's attainment of the individual time trail was a direct result of the assessment's contribution to the development of functional and physical capacities.

RECOMMENDATIONS

The training program for cycling instructors is accredited. Verification of the necessity of using suitable physical workouts and each rider's capabilities during training phases in order to preserve fitness and prevent overtraining.

Verification of the training program's usage of carefully considered and scientifically prepared workouts to achieve the exceptional achievement of the individual time trail race.

Verification of the necessity of progressively raising training loads while in the training phases.
 Verification of the importance placed on athletic prowess in order to accomplish goals efficiently and without wasting time, money, or effort.
 Verification of the biochemical element measurement conducted prior to the beginning of the cycling season.
 Validation of the achievement rate measurements made throughout the training phases.
 The necessity of hiring qualified coaches for cycling clubs and national teams.
 Use various training courses in your sample research.
 Using the training program with different age groups and sports.
 Use a different sample of cyclists to see how the exercises affect the development of the cyclists' total individual time trial race.
 Using training plans and implementing cycling drills on specific riders in preparation for important races aids in improving goal focus.

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