Research Article

THE EFFECT OF RECOVERY METHODS ON SOME PHYSIOLOGICAL, PHYSICAL AND BIOCHEMICAL VARIABLES OF IRAQI PREMIER LEAGUE TENNIS PLAYERS

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Abstract

The study aimed to know the effect of recovery methods on some physiological, physical and biochemical variables on Iraqi Premier League tennis players by identifying the most important physiological, physical and biochemical variables (blood pressure, diastolic contraction, pulse rate, blood lactate concentration level, vital capacity, respiratory endurance, agility, strength endurance, flexibility, speed-specific strength) among Iraqi Premier League tennis players, where the researcher used the experimental method to suit the nature of the researched problem through an experimental design according to three experimental groups with pre-post measurement, where the research community was represented by the Army Tennis Club, the Hunting Tennis Club, and the Babylon Tennis Club, and their number was (15) players and they were chosen intentionally, and these clubs were divided into three experimental groups, each group consisting of (5 The most significant results were the utilisation of various recuperation methods after training dosages that keep the player away from muscle cramps, weariness, and injury, as well as keeping him excited and away from monotony in subsequent training.

Keywords: Bladder Exstrophy, bladder plate, continence, surgical outcomes, ureteric reimplantation.

INTRODUCTION

Sports training is a scientific method studied in preparing the player to practice sports activity with correct and good performance. This comes through an ideal training method in which the athlete can achieve the accomplishment, as one of the main duties of training is to prepare the player physically in order to confront the sports activity in order to advance the training condition and reach a gradual level of the sports activity practiced and then physical preparation to raise the player's training level by acquiring physical and motor fitness. Tennis depends on a set of motor performances that require the use of different performance strategies as they are implemented at different speeds and directions to achieve the goal. Relying on biological sciences has helped a lot in identifying physiological effects and in describing and interpreting physiological responses and adaptations that have helped in the development of training methods. Recovery is a continuous, gradual, and cumulative process, and its total time depends on the type of physical load and its effect. The importance of recovery comes during the preparation period for the main competition, as recovery here aims to recharge and recharge the technique by gradually reducing the psychological and physiological load of daily training before the competition so that the athlete reaches the highest level of performance on the day of the competition. 1-2 Research problem:

The research problem was that the tennis player is exposed to many and multiple training sessions, and he also has many matches during the sports season, as well as many tournaments. Therefore, the player may play more than (6) matches in one tournament during (3) days, meaning more than one match per day, at a rate that sometimes reaches (80)

matches during the season in a time that exceeds (90) minutes in one match. The player may perform a maximum load in terms of physical, skill, planning and mental aspects in order to win the tournament. Therefore, restoring recovery is very important in the training program in order for the player to achieve the achievement. The researcher conducted this study in order to use recovery methods and means in order to limit the increase in lactate concentration in the blood and return the heart to its normal and natural state so that the next load falls during the period of increased recovery or overcompensation, and this leads to increasing the efficiency of the players in the tournament final, and thus they will have the best performance during the tournament. 1-3 Research objectives:

1 -The research aims to identify the effect of recovery methods on some physiological, physical and biochemical variables on Iraqi Premier League tennis players.

Research hypotheses

- There is a positive effect of recovery methods on some physiological variables of Iraqi Premier League tennis players.
- There is a positive effect of recovery methods on some physical variables of Iraqi Premier League tennis players.
- There is a positive effect of recovery methods on some biochemical variables of Iraqi Premier League tennis players.

Research areas

- Human field: Iraqi Premier League tennis players.
- Spatial field: Al-Shaab International Tennis Stadium.
- Time frame: 5/7/2024- 8/10/2024

Research methodology and field procedures

Research methodology

The researcher employed the experimental method for its applicability and the nature of the research problem by designing three experimental groups with a pre-post measurement.

Research community and sample

The Iraqi Premier League tennis players from the Army Sports Club, the Hunting Sports Club, and the Babylon Sports Club, totalling 15 players, comprised the research sample. The Erbil Sports Club's survey sample also included five players.

Table 1. Sample design

Percentage	Number	Sample type	
%25	5	exploratory	
%25	5	First experimental	The basic
%25	5	Second experimental	
%25	5	controlling	
%100	20	Total	

Homogeneity of the research sample

The homogeneity of the sample individuals was verified by calculating the skewness coefficient for the research sample and through the arithmetic mean, median and standard deviation of the physiological, physical and biochemical variables under study as in Table (2)

Equivalence of research groups: The researcher used analysis of variance between the three research groups and performed equivalence in the researched variables as in Table (3)

From Table (3), (4), (5), we notice that there are no statistically significant differences between the three groups for all variables. This confirms that the three groups are equivalent in these variables.

Methods, tools and devices used in the research:

Tools and devices used

- Dry spirometer to measure vital capacity
- Lactat Pro device to measure lactate concentration in the blood
- Restameter device to measure height (cm)
- Blood pressure measuring device
- Stop watch
- Medical scale to measure weight
- Graduated ruler to measure flexibility
- Blood lactate measurement strips
- Polar watch
- Tennis courts
- Tennis rackets and balls

Tests and measurements of the researched sample:

Physiological and biochemical tests:

- Measurement of blood lactate concentration level
- Measurement of pulse rate
- Calculating vital capacity
- Measurement of blood pressure

Physical tests:

- Strength tolerance- Test of flexing the arms from the horizontal prone position

Table 2. Homogeneity of the sample

Coefficient of skewness	Arithmetic mean	Standard deviation	Median	Unit of Measure	Variables
0.92	20.65	0.44	20.80	Year	Age
0.86	7.80	1.12	7.53	Year	Training age
0.92	66.78	1.23	66.48	Kg	Weight
0.91	177.40	1.35	177.00	cm	Length
-0.71	2.31	0.20	2.33	m	Speed Strength
-0.78	17.04	1.70	17.48	Number	Endurance Strength
-0.82	8.70	0.88	9.00	cm	Flexibility
-0.87	17.99	0.70	18.17	sec	Agility
0.81	28.85	1.90	28.34	Vo2max	respiratory endurance
0.67	1.70	0.55	1.62	mmol	Resting blood lactate
0.81	10.52	0.88	10.2	mmol	blood lactate after exercise
0.62	64.65	0.80	64.48	Pulse/min	Pulse at rest
0.87	163.65	2.25	163.00	Pulse/min	Pulse after exertion
-1.87	117.40	3.98	120.00	mm/Hg	systolic blood pressure at rest
-0.32	139.60	3.94	140.00	mm/Hg	blood pressure after exercise
0.48	4626.00	155.92	4600.00	ml/min	absolute vital capacity at rest
-0.058	3846.99	216.88	3850.00	ml/min	Absolute vital capacity after exertion

Table 3. Analysis of variance between the average results of the pre-measurements of the groups (growth)

F Value	Mean Squares	Degrees of Freedom	Sum of Squares	Source of Variance	Variables
1.22	2.98	2	5.97	Between the groups	Body height
	2.42	6	14.55	Within groups	
0.99	3.03	2	6.8	Between the groups	Body weight
	3.08	6	18.46	Within groups	
1.14	3.64	2	7.26	Between the groups	Chronological age
	3.19	6	19.12	Within groups	
1.08	3.01	2	6.03	Between the groups	Training age
	2.74	6	16.54	Out of groups	

Table (F) value at a significance level of 0.05 = 5.14 (N1 = N2 = N3 = 15)

Table 4. Analysis of variance between the average results of the pre-measurements of the (physical) groups

Value (F)	Mean squares	Degrees of freedom	Sum of squares	Source of variance	Variables
0.61	2.21	2	4.45	Between groups	Bearing strength
	3.62	6	98.18	Within groups	
0.82	0.63	2	1.25	Between groups	Flexibility
	0.75	6	20.46	Within groups	
0.84	0.32	2	0.62	Between groups	Fitness
	0.37	6	10.35	Within groups	
0.91	0.05	2	0.09	Between groups	Power is distinguished by speed
	0.05	6	1.36	Within groups	
0.38	1.40	2	2.80	Between groups	respiratory endurance
	3.56	6	97.02	Within groups	

Tabular F value at 0.05 significance level = 5.14 (N1 = N2 = N3 = 15)

Table (5) Analysis of variance between the average results of the pre-measurements of the groups (physiological variables)

Value (F)	Mean squares	Degrees of freedom	Sum of squares	Source of variance	Unit of measure	Variables
0.11	2.77	2	5.54	Between groups	mm(Hg)	resting blood pressure
	24.00	6	149.00	Within groups		
0.38	8.30	2	16.65	Between groups	mm(Hg)	blood pressure after exercise
	22.18	6	133.30	Within groups		
0.98	4.48	2	9.00	Between groups	mmol	Resting blood lactate
	4.56	6	27.51	Within groups		
1.21	4.51	2	9.02	Between groups	mmol	blood lactate after exercise
	3.69	6	22.24	Within groups		
0.15	5833.33	2	11666.67	Between groups	ml	absolute vital capacity at rest
	38888.89	6	233333.33	Within groups		
0.019	833.33	2	1666.67	Between groups	ml	Absolute vital capacity after exertion
	44722.22	6	26833.33	Within groups		
0.83	1.19	2	2.38	Between groups	pulse	Pulse with comfort
	1.43	6	8.63	Within groups		
0.05	0.33	2	0.67	Between groups	pulse	Pulse after exertion
	6.22	6	37.33	Within groups		

The tabular value of (F) at a significance level of 0.05 = 5.14

- Flexibility- Test of flexing the trunk from standing
- Distinctive strength Speed - Standing Broad Jump Test
- Respiratory Cyclic Endurance - Beep Test
- Body Weight Measurement
- Agility for Tennis Players
- Total Length Measurement (Height)

Exploratory Experiment

The First Exploratory Experiment: The researcher started the first exploratory experiment on (7/13/2024) until (7/15/2024). The aim of the experiment was to discover the problems that the researcher might face and the weaknesses and work to solve the problems that might occur as well as determine the time required for the measurement process and eliminate errors and arrange the tests with the assistant staff knowing their tasks.

The Second Exploratory Experiment

The researcher started the second exploratory experiment on (7/20/2024) until (7/22/2024). One of its aims was to calculate (validity-reliability) as in Table 7, 6.

It is clear in Table (6) that there are statistically significant differences between the distinguished and non-distinguished groups in the physical variables, and this indicates the validity of these tests.

It is clear from Table (7) that there is a statistically significant correlation at a significance level of 0.05 and degrees of freedom 7 between application and reapplication, which indicates the stability of control.

Choosing recovery methods:
First / Active rest.

The researcher determined it (15) minutes, which are:

- (5)minutes of walking with weights after the effort
- (5)minutes of relaxation exercises and vibration exercises with breathing
- (5)minutes of stretching the body muscles (leg, back and thigh muscles)

Second / Manual massage

The researcher determined it as (15) minutes, which are:

- (3) minutes of scanning massage (9) minutes of kneading massage (3) minutes of vibration massage
- Body parts that are massaged in each session
- (2)minutes of foot muscles (3) minutes of leg muscles
- (6)minutes of thigh muscles (4) minutes of back muscles

Thirdly / Alternating compresses (hot and cold)
Fourthly / Ice compresses

The researcher distributed the recovery methods to the groups
First group / Active rest, sliding cupping, ice compresses

Second group / Dry cupping, Alternating compresses, massage
Third group / Sauna, massage, passive rest

Pre-test:

The pre-test was conducted on 7/26/2024 at the Hunting Sports Club stadium

Table (6). The difference between the two groups in the tests of variables (physical)

Calculated value of (T)	Undistinguished set		Featured Collection		Unit of measure	Variables
	Standard deviation	Arithmetic mean	Standard deviation	Arithmetic mean		
5.41	1.72	28.62	1.55	33.12	Vo2 max	Respiratory endurance
7.30	1.60	16.85	1.05	21.85	number	Bearing strength
5.61	0.91	8.84	0.70	11.18	cm	Flexibility
5.67	0.62	18.12	0.75	16.12	second	Fitness
6.84	0.21	2.35	0.22	3.12	meter	Power characterized by speed

The value of (T) tabular at the level of 0.05 and degrees of freedom 14 = 2.145 (n-1)

Table 7. The correlation coordination of the herbal sample between the first application and the popularity in the Internet connection test

Correlation coefficient	Second application		First application		Unit of measure	Variables
	Standard deviation	Arithmetic mean	Standard deviation	Arithmetic mean		
0.88	1.71	28.39	1.75	28.64	Vo2 max	Respiratory endurance
0.92	2.26	16.87	1.62	16.87	Number	Bear strength
0.87	1.07	8.93	0.93	8.87		Flexibility
0.91	0.89	18.02	0.64	18.11	Second	Fitness
0.89	0.19	2.33	0.21	2.35	meter	Power characterized by speed

Standard value (R) at level 0.05 and degrees of freedom 7 = 0.606 (n-2)

Table 8. Analysis of variance between groups in the post-measurement in physiological variables

Value (F)	Mean squares	Degrees of freedom	Sum of squares	Source of variance	Variables
6.46	28.00	2	56.00	Between groups	Systolic blood pressure at rest
	4.33	6	26.00	Inside groups	
10.34	41.42	2	82.87	Between groups	Systolic blood pressure after exertion
	4.00	6	24.00	Inside groups	
10.80	31.13	2	62.30	Between groups	Pulse with comfort
	2.86	6	17.25	Inside groups	
8.32	24.09	2	48.18	Between groups	Pulse after stress
	2.87	6	17.30	inside groups	
5.85	176419.00	2	352832.00	Between groups	Absolute vital capacity at rest
	30119.00	6	180724.00	Inside groups	
6.75	82010.09	2	164020.19	Between groups	Absolute vital capacity after exertion
	12120.28	6	72733.30	Inside groups	

The tabular value of (F) at a significance level of 0.05 = 5.14 (N1 = N2 = N3 = 15)

Table 9. The percentages of improvement in the post-measurement compared to the pre-measurement between the research groups in the physiological variables

Group (3)			Group (2)			Group (1)			Variables
Improvement rate %	After	Before	improvement rate %	After	Before	نسبة التحسين %	After	before	
0.013	63.75	64.60	0.022	63.10	64.50	0.071	60.10	64.65	Pulse at rest
0.61	163.7	164.55	2.70	160.9	165.00	4.00	158.10	164.22	Pulse after stress
0.85	117.24	118.25	1.16	115.20	116.65	4.79	111.30	116.65	Resting systolic blood pressure
0.73	137.23	138.20	0.96	138.65	139.30	1.70	131.57	133.57	Post-exertional systolic blood pressure
4.81	4850.0	4616.7	7.07	4950.0	4600.0	11.82	5311.0	4683.0	absolute vital capacity at rest
1.79	3903.0	3833.0	4.53	4050.0	3867.0	9.06	4233.3	3850.0	absolute vital capacity after exertion

Main experiment:

The main experiment was conducted on the sample from 7/30/2024 to 9/25/2024, and the recovery methods were conducted for (eight Weeks) according to the groups after the end of the daily training unit and the number of training units was 4 training units per week and thus the recovery method was applied (32) times sliding and dry cupping was every first week with the first or second group.

Post-test:

The post-test was conducted under the same conditions as the previous tests on 9/28/2024

Statistical treatments:

The researcher used the statistical package (SPSS)

Presentation, analysis and discussion of the results: Presentation and discussion of the results

Presentation of the results of the first hypothesis: It is clear in Table (8) of the analysis of variance for the three groups in the post-measurement of the physiological variables that there are statistically significant differences. Therefore, the researcher will calculate the significance of the differences between the averages using the least significant difference (L.S.D) test. It is clear from Table (9) that the first group achieved the highest improvement rate in all physiological variables.

Conclusions

1. Using recovery methods (ice packs, alternate compresses, manual massage, active rest) has a positive effect on physiological, biochemical and physical variables.

2. Recovery methods that depend on active rest have a positive effect on physiological, biochemical and physical variables more than passive rest.
3. Using different recovery methods after training doses protects the player from muscle cramps and fatigue and makes him more enthusiastic to accept the upcoming training burdens.

Recommendations

1. Pay attention to measuring blood lactate concentration because it has a positive effect in monitoring the player's physical condition.

2. Pay attention to developing physical and physiological variables through training doses with the use of appropriate recovery methods.

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