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THE EFFECT OF THE TWO PERIODS OF PREPARATION AND COMPETITION ON THE BLOOD LEVEL OF ALDOSTERONE HORMONE AND SOME PHYSIOLOGICAL AND PHYSICAL INDICES IN HANDBALL PLAYERS

By

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Summary

Title:

The Effect of the Two Periods of Preparation and Competition on Blood Level of Aldosterone Hormone and Some Physiological and Physical Indices in Handball Players

Introduction and the Study Problem:

Achievement in athletic performance requires an increase in training in amount and intensity along with thorough knowledge of the effect of the load on play gradually increasing and optimize it and also identify the limits that the load should avoid negative effects on the functional state of the players.

Scientific research in athletic field have paid much attention to study the outcome of preparation, training and competition and what the player gains from them. This study utilized medical biochemistry and athletic training as a field to identify the effects of two periods of preparation and competition on the blood aldosterone, sodium (Na^+) and potassium (K^+) levels, and some physiological and physical indices in handball players.

Athletic training results in changes in levels of blood hormones - a decrease compared to their normal levels at rest. The handball's field has been positively affected via updating training techniques and methods for preparing the players including the pressure of the competition period, all affect the physical, biochemical and physiological characteristics of the players.

The researcher sees that the information available about the changes in hormonal levels as a result of athletic training still needs further specific studies - since previously reported studies concerning the effect of athletic performance on hormone levels versa showed wide variations - depending of the type of training and competition - thing that derived the researcher in a serious try to conduct the present study.

Aim of the study:

This study aims at investigating the effect of the two periods of preparation and competition on blood levels of the aldosterone hormone, Na^+ and K^+ , and some physiological and physical indices in handball players through identifying:

- 1-Differences in aldosterone, Na^+ and K^+ levels and some physiological indices in pre- and post-measurements of each of preparation and competition periods.
- 2-Differences in physical performance level between pre- and post measurements of preparation and competition periods.
- 3-The relationship between aldosterone level and some physiological indices and physical performance level of handball players.
- 4-The predictive indication in the two periods of preparation and competition on aldosterone level and the physiological and physical performance indices.

Hypotheses of the study:

- 1-There are statistically significant differences between the pre- and post-measurements of the levels of aldosterone hormone, Na^+ , K^+ and some physiological indices in preparation and competition periods in favor of the post-measurements.
- 2-There are statistically significant differences between the pre- and post-measurements of physical performance in preparation and competition periods in favor of the post-measurements.
- 3-There is a statistically significant relationship between aldosterone level and some physiological indices and physical performance level in handball players.
- 4-There is a statistically significant relationship between Na^+ and K^+ levels and some physiological indices and physical performance in handball players.

Research procedures:

Methodology:

The researcher has used the experimental method because it fits the study with the pre- and post-test experimental design.

Research sample:

Research sample has been selected intentionally. They are gifted players of the national team, born in 1986. Their number is 14. They have been selected because of the long training of these teams and the intensity of the competition they face. Also, the Federation of Handball concerns with these teams.

Research variables:

The researcher has selected the study variables according to different considerations including the theoretical frame-work of the study and those variables utilized in previous studies. The variables are the measurements of biochemical, physiological and physical indices.

Research Tools:

The researcher has used the following tools and equipments:

1) Tools and equipments for conduction of the biochemical tests:

Sterile 3-mm plastic syringes.

Plastic tubes for collection of blood samples.

Antiseptics and medical cotton.

Ice box with ground ice.

Centrifuge to separate blood plasma.

Gamma Counter to measure irradiation during assay of aldosterone in blood plasma.

Radioimmunoassay kit to measure aldosterone level in blood plasma.

Flame photometer to measure Na^+ and K^+ in blood plasma.

2) Tools and equipments for conduction of the physiological tests:

1-Stethoscope.

2-Sphygmomanometer.

3) Tools and equipments for conduction of the physical tests:

1-Restameter to measure height to the nearest cm.

2-Medical scale to measure weight to the nearest gram.

3-Dynamometer to measure grip power and the power of back and legs muscles.

4-Measuring tape.

5-900-gm medical balls.

6-Stop watch.

7-Balls (handball – tennis).

8-Guarded ruler.

9-Board divided to 3 overlapping squares.

10-30-cm height wooden cubes.

11-Wall and chalk.

The time frame of the study:

The main experiment has been conducted within the following dates:

- Pre-preparation period (11/8 to 14/8/2002).
- Post-preparation period (18/10 to 21/10/2002).
- Post-competition period (22/12 to 25/2002).

The physiological, biochemical and physical measurements were investigated by the following research procedures.

Statistical analysis:

- 1-Arithmetic mean.
- 2-Standard deviation.
- 3-Skeweness coefficient.
- 4-Correlation coefficient.
- 5-Student's 't'-Test.
- 6-Improvement ratio.

Results and Conclusions:

First: Biochemical Responses.

- There were statistically significant differences at 0.01 level between pre and post preparation periods measurements of aldosterone in favor of post-preparation period.
- There were statistically significant differences at 0.05 level between pre and post preparation periods measurements of Na^+ in favor of pre-preparation period.
- There were statistically significant differences at 0.01 level between pre and post preparation periods measurements of aldosterone hormone in favor of post-preparation period.
- There were statistically significant differences at 0.05 level between pre and post preparation periods measurements of Na^+ in favor of pre-preparation period.
- There were statistically significant differences at 0.01 level between pre and post preparation periods measurements, after conducting Carpmann's test of aldosterone in favor of post-preparation period.

There were statistically significant differences at 0.01 level between pre- and preparation periods measurements of K^+ in favor of pre-preparation period conducting Carpman's test of stress.

There were statistically significant differences at 0.01 level between pre- and preparation in recovery period in aldosterone in favor of pre-preparation period.

There were statistically significant differences at 0.01 level between post-preparation and post-competition periods at rest before conducting Carpman's test of stress in aldosterone and Na^+ in favor of post-preparation period measurement.

There were statistically significant differences at 0.01 level between post-preparation and post-competition periods after conducting Carpman's test in stress in aldosterone and K^+ in favor of post-preparation period. Concerning K^+ it was in favor of post-competition period.

There are statistically significant differences between pre-preparation and competition measurements at rest after conducting Carpman's test in aldosterone and K^+ in favor of post-competition.

There were statistically significant differences at level 0.01 between pre-preparation and post-competition periods' measurements after conducting Carpman's test, of (aldosterone and Na^+) in favor of post-competition period. Concerning K^+ it was in favor of pre-preparation period.

second: Physiological Responses:

There were statistically significant differences at 0.05 level between pre- and preparation in rest before conducting Carpman's in diastolic blood pressure in favor of pre-preparation period.

There were statistically significant differences at 0.01 level after conducting Carpman's test (directly after the stress) between pre-preparation and post-preparation in pulse in favor of post-preparation period. Concerning diastolic blood pressure, it was in favor of pre-preparation period.

There were statistically significant differences at 0.01 level between post-preparation and post-competition periods measurements after conducting Carpman's test (directly after the stress) in impulse in favor of post-preparation and post-preparation in pulse in favor of post-preparation period.

post-preparation period. Concerning diastolic blood pressure, it was preparation period.

- There were statistically significant differences at 0.01 level between post- and post-competition periods measurements after conducting Carpman's test (stress) in pulse in favor of post-preparation period measurement.
- There were statistically significant differences at 0.05 level between post- and post-competition after conducting Carpman's test in recovery in systolic in favor of post-competition period measurement.
- There were statistically significant differences at 0.01 level between preparation periods measurements in relative physical fitness in preparation period.

Third: Physical Responses

- There were statistically significant differences at 0.05 between pre- and post-competition periods measurements in physical test (grip power - back muscles power - legs power - standing vertical jump - standing board jump - arms bending - sit-ups - balls to wall - Nelson Test - pointing at overlapping squares - throwing 900 - standing trunk bending - moving backwards and forwards diagonally - running) in favor of post-preparation period.
- There were statistically significant differences at 0.05 level between pre- and post-competition in physical tests (grip power - back muscles power - legs power - standing vertical jump - standing board jump - arms bending - sit-ups - overlapping squares - moving backwards, forwards diagonally - Copper's test) of post-competition period.
- There were statistically significant differences at 0.05 level between preparation measurements in physical tests (grip power - back muscle power - standing vertical jump - standing board jump 30 m running - balls to wall - Nelson test - pointing at overlapping squares - throwing 900 - Standing trunk bending - moving backwards forwards diagonally) in preparation period measurements.
- There was statistically significant correlation between aldosterone after conducting Carpman's test) and physical tests (grip power - back muscle

muscles power - standing vertical jump - pointing at overlapping squares - Co Test).

There was a statistically significant positive correlation at 0.05 level between aldost and physical tests (grip power back muscles power - legs muscles power sta vertical jump - Nelson test - pointing at overlapping squares).

There was a statistically significant correlation at 0.05 level between Na^+ and ph test (grip power - back muscles power - standing vertical jump - pointing at overla squares-Copper's Test) at rest.

There was a statistically significant positive correlation at 0.05 level between N physical tests (grip power - back muscles power - standing vertical jump - point overlapping squares - Copper's tests) after conducting Carpmann's test of stress.

There was a statistically significant negative correlation at 0.05 level between K physical test (grip power - back muscles power - standing vertical jump - standing ump - pointing at overlapping squares - Copper's test) after conducting Carpmann's of stress.

There was a statistically insignificant correlation at 0.05 level between K^+ in rec period and physical test in question in handball players of research sample.

Recommendations of the study;

Recording the activity of endocrine glands regularly to identify the effects of phy loads on blood composition and their adaptive changes with the load of the perform and using them as a physiological criterion to determine the physical load a guarantee its stability at the normal level.

Providing sport clubs with updating equipments for physiological measurement also with specialists to benefit from them in monitoring the training level of athlete evaluate it.

It is necessary to measure the activity of endocrine glands when juniors are selected to spread the awareness of the importance of these measurements before pract sport and through different training periods to assess the advancing of the program.

4-Researchers should concern with doing research in body hormones respons training and the relationship between hormones and different sport act attempt to identify the relationship between every endocrine gland act nature of sport activity.

5-Monitoring hormones of top athletes.

6-Doing similar research about changes of hormones levels and blood compo this study has shown to make sure to what extent they can be used as : predict the training level and the future performance of the athletes.

References:

The researcher used 171 references: 103 arabic and 68 foreign.