EFFECT OF VARIANCE IN TIMES OF REST OF SPECIAL SPEED ENDURANCE EXERCISES IN SOME PHYSIOLOGICAL-BIOCHEMICAL INDICATORS AMONG YOUNG BASKETBALL PLAYERS

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ABSTRACT

This study aims to (1) prepare special speed training in the light of variance of times of rest in the training sessions, and (2) identify the effect of the variance of times of rest in special speed endurance training in some physiological-biochemical indicators among young basketball players. An experimental design was used to guide this study. The study included a purposive sample of the Slaikh Basketball Club players who participate in the 2018-2019 competitive tournament. The researcher selected the variables of lactic acid, the time of anaerobic threshold appearance, and maximum oxygen consumption using the physiologic laboratory technology to measure them. Data were analyzed using the statistical package for social sciences, version 26.

The study results revealed that the inappropriate change and control over the variance of the comfort times during training of basketball transition speed proved its effectiveness in improving both physiological and biochemical indicators (lactic acid, anaerobic differential threshold time, maximum oxygen consumption) and their superiority over players who adopted the conventional training. The researcher recommends that it is necessary that not restriction and pressure on the players in making the required adaptations, which expose them to the harms and problems of the training overload, and working to enable the players to improve their abilities in line with their capabilities by adopting the principle of individualism in the foundations and principles of sports training.

Keywords: Times of Rest of Special Speed Endurance Exercises; Physiological-Biochemical Indicators; Basketball Players

I. INTRODUCTION

"The composition and construction of the training program also include improving and developing the processes of providing the body with the necessary energy (during running) and athletic performance," said Ibrahim. (2) In this sense, the training process is an interactive process with the renewal of other sciences, the innovations or ideas these sciences present can help in going outside the box that lead to the stability of the training thresholds. This calls for paying attention to physiological and biochemical indicators related to energy supply and support for the endurance of the basketball player according to what the specialized game requires due to its specificity. Among these physiological and biochemical indicators that have received the attention of researchers in the physiology of sports training are (lactic acid, the time of the emergence of the anaerobic threshold, and the maximum oxygen consumption)

Allawi states that "the maximum level of lactic concentration does not appear in the blood during the muscular loading, and when the duration of physical exertion does not exceed 1-6 minutes. Therefore, reaching the maximum concentration of lactic acid in the blood requires several minutes after the end of the effort, as well as the equivalence of the level of lactic concentration in the muscles and blood requires a minimum period of time (5 -10min). (7) This rest can be invested between exercises by adopting the convergence with the rest periods known to the anaerobic system (2-5 minutes). Thus, imposing an increase in the training session time in which it is assumed that the training load fits with the appropriate rest time to achieve the physiological responses or required adaptations."
As Al-Qitt states, "Continuing with the same intensity used preserves the acquired adaptations and does not develop them. Here, the need for training with extra, new, and appropriate load. This increase used in training loads is considered as an actual example of achieving the principle of gradual progress." (8)

Bin Dakheel mentions that the special tolerance "that endurance is one of the important elements in determining success in the sporting event so that the intensity used ranges between (85-95%) of the necessary level. Sometimes, the intensity used likes it in competition." (6)

"The special endurance works to achieve a new digital achievement and maintain the level in races with frequent movements," said Al-Aethi. (3)

In order to leave the constraints of the constancy of some intuitions in refining the training load, seeking to raise the physical level, and improve the physiological and biochemical indicators for young basketball players, it is necessary to adopt an academic method in light of the determinants of the scientific research methodology. Due to the importance of transitional speed in basketball, and to achieve this in addressing the problem of following custom and restrictions in the training sessions, this study aims to (1) prepare special speed trainings according to the variation of rest times in the training sessions for young basketball players, and (2) identifying the effect of the variation of rest periods during special speed training exercises in some physiological and chemical indicators among young players in basketball.

Secondly, to achieve the study objectives, the researcher hypothesized the following:

1. There are statistically significant differences in some physiological and biochemical indicators between the pretest and posttest results for the study groups.
2. There are statistically significant differences in in some physiological and biochemical indicators in the posttest results for the study groups.

Thirdly, the study domains will be determined in the following:

1. The human domain: A sample of the young basketball players of the first-class clubs who participate in the 2018-2019 Iraqi basketball tournament.
3. The spatial domain: Slaikh training hall, Cairo neighborhood, Baghdad, Iraq.

Methods

An experimental, pretest-posttest design with study and control groups was used to guide this study.

Sample and Sampling

The study included a purposive sample of 12 young basketball players who were recruited from Slaikh Baseball Club who participate in the 2018-2019 Iraqi basketball tournament who represent 85.714% of the target population. The study subjects were randomly assigned into study and control groups; seven players in each group. The pilot study was conducted on another two players to make sure of the appropriateness of the physiological and biochemical measurements and tests. The homogeneity of the study subjects in terms of the body mass index and the chronological and training ages variables, where the skewness values were -0.103, -0.418, -0.852 respectively which are within the range of ± 3, which implies that they are normally distributed according to Gaussian distribution curve.

Measurement Tools and Test:

The researcher has surveyed the Arabic and English literature available in the libraries of Iraqi universities relevant to sports training, physiology and biochemistry of sports sciences, and academic studies published in the approved official journals related to the topic of research, and conducting direct personal interviews with experts and specialists to determine the time of interfacial comfort between frequencies and groups within the training session. These times of rest were between (15-45) seconds between frequencies, (90-120) seconds between
groups, and (5-10) minutes between exercises. Thereafter, the tests for each dependent variable, represented by (lactic acid, time of appearance of anaerobic threshold, and VO2max); according to sport physiological laboratory measurement and medical devices using the Fitmate pro device and the lactic acid digital acid meter, were chosen, mathematical and.

The exercises were prepared by controlling over the change of rest times according to the return of the pulse in a logical way to the non-advanced levels, which researchers often derive from English literature in which the athletes in their society differ from the local players in Iraq in terms of physique and physiological indicators. Data were analyzed using the statistical package for social sciences (SPSS) for windows, version 25, Chicago, Illinois. The statistical measures of percent, arithmetic mean, standard deviation, independent-sample t-test, and paired-sample t-test were used.

## II. RESULTS AND DISCUSSION

### Table 1. The results of the pretest between the study and control groups

<table>
<thead>
<tr>
<th>Tests</th>
<th>Study Group</th>
<th>Control Group</th>
<th>T-value</th>
<th>Sig.</th>
<th>Assess.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactic Acid</td>
<td>n=6 Mean 14.33, SD 1.033</td>
<td>n=6 Mean 14, SD 0.632</td>
<td>3.667</td>
<td>0.001</td>
<td>S</td>
</tr>
<tr>
<td>Anaerobic Threshold</td>
<td>n=6 Mean 2.433, SD 0.121</td>
<td>n=6 Mean 2.317, SD 0.133</td>
<td>0.167</td>
<td>0.854</td>
<td>NS</td>
</tr>
<tr>
<td>VO2max</td>
<td>n=6 Mean 44, SD 1.414</td>
<td>n=6 Mean 43.33, SD 2.066</td>
<td>0.652</td>
<td>0.529</td>
<td>NS</td>
</tr>
</tbody>
</table>

Degree of freedom (N-2) = 10; Significance level = 0.05; T-value is significant at p < 0.05

### Table 2. The statistical parameters of paired-sample T-test for the study and control groups in the pretest and posttest

<table>
<thead>
<tr>
<th>Tests</th>
<th>Study Groups</th>
<th>Pretest Mean</th>
<th>Posttest Mean</th>
<th>F</th>
<th>SD</th>
<th>T-value</th>
<th>P-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactic Acid</td>
<td>Study</td>
<td>14.33</td>
<td>10.67</td>
<td>3.667</td>
<td>1.211</td>
<td>7.416</td>
<td>0.001</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>14</td>
<td>13.83</td>
<td>0.167</td>
<td>0.753</td>
<td>0.542</td>
<td>0.611</td>
<td>NS</td>
</tr>
<tr>
<td>Anaerobic Threshold</td>
<td>Study</td>
<td>2.433</td>
<td>3.067</td>
<td>0.082</td>
<td>0.633</td>
<td>0.151</td>
<td>10.304</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.317</td>
<td>2.383</td>
<td>0.067</td>
<td>0.147</td>
<td>0.25</td>
<td>0.652</td>
<td>NS</td>
</tr>
<tr>
<td>VO2max</td>
<td>Study</td>
<td>44</td>
<td>52.67</td>
<td>8.667</td>
<td>1.862</td>
<td>11.402</td>
<td>0.000</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>43.33</td>
<td>45.17</td>
<td>1.833</td>
<td>1.329</td>
<td>3.379</td>
<td>0.02</td>
<td>S</td>
</tr>
</tbody>
</table>

n = 6 for each group; degree of freedom (n-1) for each group; Significance level = 0.05

### Table 3. Posttest results for the study and control groups

<table>
<thead>
<tr>
<th>Tests</th>
<th>Study Group</th>
<th>Control Group</th>
<th>T-value</th>
<th>Sig.</th>
<th>Assess.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactic Acid</td>
<td>n=6 Mean 10.67, SD 0.516</td>
<td>n=6 Mean 13.83, SD 0.753</td>
<td>8.497</td>
<td>0.000</td>
<td>S</td>
</tr>
<tr>
<td>Anaerobic Threshold</td>
<td>n=6 Mean 3.067, SD 0.082</td>
<td>n=6 Mean 2.383, SD 0.147</td>
<td>9.944</td>
<td>0.000</td>
<td>S</td>
</tr>
<tr>
<td>VO2max</td>
<td>n=6 Mean 52.67, SD 0.816</td>
<td>n=6 Mean 45.17, SD 0.983</td>
<td>14.375</td>
<td>0.000</td>
<td>S</td>
</tr>
</tbody>
</table>

Degree of freedom (n-1) for each group; Significance level = 0.05; Measurement unit = Degree

The researcher attributes these results to the good control over the change in the rest times that the researcher adopted with the players and avoiding what the consistency follows that the coaches follow in their planning for
the followed training, which include the restriction to some academic studies whose results; different samples of basketball players, have led to given that the athlete's body does not differ in it regeneration of energy materials a lot from each other.

However, the training history of the player and the type of activity or specialized sports imposes changes in the chemistry of the cellular environment for players as a result of the difference in the difficulty and duration of training loads according to the requirements of each game. Since the period or the duration of the interval rest period is imperative to restore energy sources on the one hand and relieving the stress of the nervous system on the other hand. The type of exercise here should be determined by the specificity or effectiveness of the game so that the planning later consider the type of exercise and not restraining to its difficulty or the duration of its period in planning comfort appropriate when applying it.

Abu Al-Ula indicates that "energy production is associated with both time completed and extreme performance. Running with maximum intensity such as fast running and running for short distances." (1)

Abu Al-Ela Ahmed notes that "energy production is associated with both time completed and extreme performance, for extreme running is as extreme as running fast and running for short distances." (1)

Al-Dalwi believes that "training based on graduation in the training load from one training session to another, with an appropriate increase will lead to appropriate muscle adjustment for this increase, which leads to an improvement in the muscular strength. Thus, the trainee must set specific goals for his/her capabilities." (4)

Abu Zaid emphasizes that, "The load given to the player causes an excitement and change in the vital organs and systems of the body from a functional and chemical point of view. This appears in the form of an improvement in the competency of the various organs and systems, besides an excellence in performance through saving in effort due to his/her continuing in load in spite of his/her feeling of fatigue, then starts to adapt for this load."(5)

III. CONCLUSIONS AND IMPLICATIONS

1. The inappropriate change and control by varying the rest times of the basketball's transition speed training proved its effectiveness in improving both physiological and biochemical indicators (lactic acid, anaerobic differential threshold time, maximum oxygen consumption) and their superiority over the players who adopted the conventional training.

2. It is necessary not to restrain and pressure on the players in making the required adaptations, which expose them to the harms and problems of the training overload and work to enable the players to improve their capabilities in a way that fits their capabilities by adopting the principle of individualism in the foundations and principles of sports training.

REFERENCES

1 Abu Al-Ula AA. Sport training and physiological foundations. Cairo: Egypt; Dar Al-Fikr Al-Arabi, 1997, p.34.
2 Salamah BI. Physiology of sport. Cairo: Egypt; Dar Al-Fikr Al-Arabi, 1994, p.93.
8 Al-Qit MA. Functions of organs of sport training: An applied introductory. 1st ed. Cairo: Egypt; Dar Al-Fikr Al-Arabi, 1999, p.36.