Compare the Forms of ACE Gene According to Maximum Oxygen Consumption before and After the Lactic Voltage in 1500 Meters Running Players

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Abstract

The objective of the study was to identify the forms of ACE gene in mid-distance runners as well as to identify maximum oxygen consumption and the pre-voltage and post-voltage lactation threshold of 1500 meters and to determine the differences between the groups according to the two periods before and after the voltage according to the forms of the ACE gene. The research problem was to identify which alleles of the ACE gene were better in the physiological abilities of the players and included the imposition of research. There were differences in the maximum oxygen consumption and the lactic threshold in the two stages before and after voltage according to the gene shapes of 1500 meters running athletes. The researcher used the descriptive method in the survey method. The sample was randomly selected. They were players of Al-Qadisiyah clubs for the field and field players. The sample consisted of 16 players. The sample divided three groups according to the forms of the gene (II, ID, DD). The researcher concluded that the preferred form is the genetic makeup (II), which gives the physiological potential of players running 1500 meters.

Keywords: ACE gene, Maximum oxygen consumption and lactic threshold.

Introduction

Recently developed in the field of sports the role of genetic influence among athletes, where they are scientific facts should not be overlooked because they have a role in the physiological potential of athletes and the most important in their access to the highest levels in sports competitions [1].

The production of proteins is one of the important functions of DNA, which carries the genetic qualities of athletes and since these genetic characteristics vary depending on the functions performed by the gene and therefore the diversity of forms of the gene leads to the difference of genetic qualities possessed by the individual and that the gene ACE closely linked to the maximum consumption of oxygen so there the difference in the maximum consumption of oxygen, depending on the different forms of the gene and therefore through the conduct of studies and research in the areas of sports races for long and medium distances, which require the possibilities of oxygen and different energy systems in the neighborhood are overlapping [2]. There are many physical acts performed by the individual, especially the athlete, where the effect of the genetic factor is explained, so the functional variables of the body, especially the maximum consumption of oxygen and the lactic threshold, which are one of the most important indicators that affect the physiological efficiency of the athlete so the knowledge of the physiological responses to athletes.

ACE gene gives the coach an opportunity To the selection of players according to the forms of the genetic gene, especially in the players of medium distances so the importance of the problem by the following question: (Any forms of the ACE gene give physiological potential to players running 1,500 meters). It is a combination of aerobic and anaerobic capacity in which the player reaches an anaerobic threshold, which varies in appearance between a rider and another depending on their career and training.
Based on this lies the importance of research on any form of gene earn ACE is the player the possibility of long-distance and high functional performance to complete a 1,500 meters [3].

**Research Objectives**
- Identify the forms of the ACE gene in the arena and field players for distances ran 1,500 meters.
- Identification of the maximum consumption of oxygen and the threshold before the voltage and voltage after the effort in the 1500 meters
- Identify the differences between the periods before the effort and after the effort according to the forms of the gene ACE.

**Research Hypotheses**
There are differences in the maximum oxygen consumption and lactic threshold in the pre-voltage and post-voltage stages according to the gene shapes in the 1,500 meters running athletes.

**Method and Procedure**

**Research Methodology**
The researcher used the descriptive method in the survey method because it is one of the most appropriate approaches to the nature of the research problem. The choice of the appropriate method is one of the basic things to be considered. This method is based on describing a phenomenon to reach the causes of this phenomenon and the factors that control it [4].

**Community and Sample Search**
The researcher randomly selected the research sample from the research community represented by the youth clubs of Al-Qadisiyah province in the field of athletics in running the intermediate distances and ages (18-19 years) and the number of (16) players for the sports season (2017 - 2018). The study sample was divided according to the forms of the ACE gene, which reached three groups. The equivalence and homogeneity of the research sample was obtained according to the length, age and weight of the study as shown in Table (1).

**Table 1: Show the mean, standard deviation, skewness coefficient, and difference in groups are shown according to the genotypes (II, ID, DD) and variables under study**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>STD.EV</th>
<th>Standard error</th>
<th>Skewness</th>
<th>Coefficient of variation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genetic makeup II</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tactical threshold</td>
<td>3.2</td>
<td>0.3578</td>
<td>0.128</td>
<td>-0.825</td>
<td>11.180</td>
</tr>
<tr>
<td>Length</td>
<td>1.83</td>
<td>0.0606</td>
<td>0.004</td>
<td>-0.045</td>
<td>3.319</td>
</tr>
<tr>
<td>The weight</td>
<td>65.333</td>
<td>2.338</td>
<td>5.467</td>
<td>-0.600</td>
<td>3.579</td>
</tr>
<tr>
<td>The training age</td>
<td>2.833</td>
<td>0.7528</td>
<td>0.567</td>
<td>0.3126</td>
<td>26.57</td>
</tr>
<tr>
<td>Genetic makeup ID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tactical threshold</td>
<td>3.2500</td>
<td>0.4764</td>
<td>0.2270</td>
<td>0.499</td>
<td>14.66</td>
</tr>
<tr>
<td>Length</td>
<td>1.72</td>
<td>0.1152</td>
<td>0.013</td>
<td>-0.106</td>
<td>6.7</td>
</tr>
<tr>
<td>The weight</td>
<td>66.67</td>
<td>1.366</td>
<td>1.867</td>
<td>-0.523</td>
<td>2.049</td>
</tr>
<tr>
<td>The training age</td>
<td>3.167</td>
<td>0.7528</td>
<td>0.567</td>
<td>-0.3126</td>
<td>23.77</td>
</tr>
<tr>
<td>Genetic makeup DD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tactical threshold</td>
<td>2.6750</td>
<td>0.3775</td>
<td>0.1425</td>
<td>-0.368</td>
<td>14.112</td>
</tr>
<tr>
<td>Length</td>
<td>1.80</td>
<td>0.0984</td>
<td>0.010</td>
<td>-0.804</td>
<td>5.477</td>
</tr>
<tr>
<td>The weight</td>
<td>64.25</td>
<td>1.708</td>
<td>2.917</td>
<td>-0.753</td>
<td>2.658</td>
</tr>
<tr>
<td>The training age</td>
<td>3.750</td>
<td>0.9574</td>
<td>0.917</td>
<td>0.8546</td>
<td>25.53</td>
</tr>
</tbody>
</table>

The significance level is below the error rate (0.05)

**Information Gathering Devices and Search Equipment and Supplies**
- Arab and foreign sources
- Remark
- Interview
- watch timing type DIAMOND number (1)
- The device Rstameter measures the weight and height.
- Treadmill (American).
Identification of Study Variables

The variables were determined by the researcher where it was observed that they contribute to solving the research problem if the functional measurements include the following:

- Maximum No Oxygen Consumption (VO2MAX).
- Lactic threshold.

The Pilot Study

The pilot study was conducted on Tuesday on a sample of (4) players on 6/3/2018 to determine the level of the devices used and their selection and identify the negatives that they will face. The experiment was conducted in order to achieve the following objectives:

- Know the efficiency of the devices used.
- Know the time limit for performance.
- The efficiency of the medical staff and the assistant.
- The efficiency of medical supplies.

The Scientific Basis of the Test

Validate the Test

The researcher has used the sincerity of the content as it relies on the opinions of experts and specialists in emphasizing that the test measures the phenomenon for which it was developed. After the tests were presented to experts and specialists, the percentage of agreement reached 100% on the feasibility and suitability of the test.

Test Stability

The researcher used the re-test method to find the stability coefficient. The first test was carried out on Tuesday 13/3/2018 and was re-applied after seven days on any Tuesday, 20/3/2018. First test. The tests were performed on 4 players from the same research sample. The researcher used the simple correlation coefficient Pearson to extract the coefficient of stability. The correlation coefficient was 0.89 and thus the test (maximum air capacity) has a high degree of stability.

Objectivity Test

The tests used in the research (lactic threshold and VO2MAX test) are laboratory tests. Data are taken directly using measuring devices. They do not require objectivity to be subjective and non-subjective.

Laboratory Measurements

First, Detection of ACE Gene

After the blood draw was carried out, the gene was measured to determine the results by 7/31/2018. The ACE I / D primers were obtained. These primers were used to detect the multiple forms of ACE I / D gene and according to the devices used from DNA testing and electrical relay for the across gel in order to determine the interaction of polymerization to the detection to identify the forms of ACE gene. The sample was divided into three groups and according to alleles (II, ID, DD)

Second, Measuring the Concentration of Lactic Acid in the Blood

Objective

To measure the concentration of lactic acid in the blood before and after the effort.

Scientific conditions: The level of concentration of lactic acid in blood is one of the best physiological indicators, especially in the effectiveness of running 1500 meters [5].

The concentration of lactic acid in blood has been measured in two stages before and after the effort as follows:

Before Voltage

Blood was withdrawn from the research sample before the effort (in case of rest) by the medical staff in a special place for laboratory procedures. The blood was withdrawn from each player by (3) sesi from the musculoskeletal vein in the hummers region and then placed in the recorded syllabus with numbers urging each number representing a player from the research sample. The lactic was then examined through the examination apparatus.

After Voltage

After performing warm-up exercises for the first group and testing them running 1500 meters and recording the time of each player upon reaching the finish line, the blood was withdrawn from the testers after 5 minutes of rest after the effort, which is the best duration of the discharge of lactic acid from the muscles to the blood,[6] and the same procedures of blood withdrawal before the effort, where the measurement of the lactic...
through the measurement of the lactic).

**Third Measurement of VO2Max**

The Bose test for VO2MAX was used with a maximum physical effort on the conveyor belt: [7] the speed of the moving and increasing the mileage of every three minutes is increased during seven continuous stages of the following test stages:

- Phase 1 (3) minutes at a speed of 2.7 m / s and a 10%
- Phase II (3) minutes at a speed of 4.7 m / s and a slope of 12%
- Phase 3 (3) minutes at 5.5 m / s and 14%
- The fourth stage (3) minutes at a speed of 6.8 miles / o and the degree of inclination 16%
- Phase 5 (3) minutes at a speed of 8.0 mph /S and a slope of 18%
- Stage 6 (3) minutes at a speed of 8.8 m / S and a slope of 20%
- Phase 7 (3) minutes at a speed of 965 mph / S and 22%
- The measurement is done by Fit mat pro as in figure (2).

**Test Ran 1500 Meters**

**Objective**

Measuring the completion of running 1500 meters.

**The Tools Used**

Playground yard and field, timing clocks number (4), registration forms

**Performance Description**

The player is tested as the test begins when the players hear the call (take your place) from the starting position of the stand, and then the start and start signal and jogging around the track (3) courses and (300) meters for a distance of 1500 meters, rider in registration form.

**Main Experience**

The Main Experiment was conducted in Two Stages
Phase 1

The concentration of lactic acid was measured to determine the effectiveness of the ACE gene by working on the 30-second physical exertion bike according to the Wingate test and repeating it twice for 60 seconds while at the same time measuring the parameters of the heart muscle and the VO2max variables. At the end of the effort, these measurements are obtained through continuous operation of the equipment and measurement of the concentration of lactic acid. Thus, 3 players were measured for each day over 5 days.

Phase 2

The Bruce test to measure maximum air capacity and end of voltage during hospitalization. These variables were obtained directly from the database of these devices, so it was possible to measure (3) players every day over the course of (5) days.

Table 2: Shows the differences between the forms of the gene (II, ID, DD) before the voltage of the lactic threshold

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total squares</th>
<th>df</th>
<th>Average squares</th>
<th>f</th>
<th>Significance</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>lactic threshold</td>
<td>0.915</td>
<td>2</td>
<td>0.458</td>
<td>2.700</td>
<td>0.105</td>
<td>Non sig.</td>
</tr>
<tr>
<td></td>
<td>2.203</td>
<td>13</td>
<td>0.169</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (2) shows the lactic threshold of the test before the effort of the three groups according to the forms of the ACE gene. There are no differences between the groups at the time of rest.

Table 3: Shows the differences between the forms of the gene (II, ID, DD) after the effort to limit the consumption of oxygen and the lactic threshold

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total squares</th>
<th>df</th>
<th>Average squares</th>
<th>f</th>
<th>Significance</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>VO2Max</td>
<td>32.472</td>
<td>2</td>
<td>16.236</td>
<td>5.228</td>
<td>0.022</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>40.375</td>
<td>13</td>
<td>3.106</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lactic threshold</td>
<td>1.165</td>
<td>2</td>
<td>0.582</td>
<td>4.588</td>
<td>0.031</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>1.650</td>
<td>13</td>
<td>0.127</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Shows the least significant difference (L.S.D) for the variables of the maximum oxygen consumption and the lactic threshold for all groups (II, ID, DD)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>Differentiate of mean</th>
<th>Standard error</th>
<th>Significance</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>VO2Max</td>
<td>II</td>
<td>ID 2.84*</td>
<td>1.01747</td>
<td>0.038</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DD 3.09083*</td>
<td>1.13757</td>
<td>0.044</td>
<td>Sig.</td>
</tr>
<tr>
<td>lactic threshold</td>
<td>II</td>
<td>ID 0.5833.*</td>
<td>0.20571</td>
<td>0.035</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

The significance level is below the error rate (0.05)
Table (4) shows the least significant difference. The variable VO2Max has a significant difference between genotype (II) and (ID) by (2.84*). There is also a significant difference between (II) and (DD) by (3.09083 *). Genetic makeup (II) The difference in the threshold is significant between (II) and (ID) by (0.5833- *) and for the genetic makeup (ID). For VO2Max, preference was given to The process of providing O2 and processing it to the muscles operating the rest of the consumption during the physical exertion falls on the responsibility of the periodic and respiratory organs, which are the main factor in increasing Vo2max According to the central theory in the interpretation of the maximum consumption of oxygen, which sees this theory that the circulatory system have a significant role in increasing the maximum aerobic potential in athletes and attributed the researcher that the individual differences between individuals is the relationship of this.

The gene with the maximum oxygen consumption and the type of muscle fibers that determine the human abilities in certain activities [8] where the ACE gene has the preferred characteristics associated with sports performance. The human genes of the performance map and health fitness phenomena which was studied by, [9] in medicine and sports science.ACE gene was selected because allele variations are believed to play a large role in the performance of sports activities [10]. For the lactic threshold, (II) The researcher attributed this to the balance between my work Oxygen consumption in the working muscles and on the other hand created a balance between the processes of production of lactic acid in the muscles in exchange for disposal. Both cases are considered complementary to each other. The concept of the lactic threshold refers to the amount of physical effort exerted or the amount consumed for maximum oxygen before a condition called lactic acidification, the phase in which the processes of lactic acid production are disposed of, which leads to a marked increase in the concentration of lactic acid in the working muscles, that athletes who have high-efficiency aerobic capabilities can delay their arrival at the lactic threshold because their maximum aerobic capacity can counteract the production processes of lactic acid by elimination.

This study is similar to the study In the study of a group of British athletes found that the allele II represents 35% of the races to 65% in distance sports, [11] and the same results were in another study included Russian athletes (swimming, skate, yard and field) Where the allele D represented 72% of the short distance in which the allele was 63% in the mean distance [12].

Conclusions

- Differences between genotypes (II, ID, DD) in maximum oxygen consumption and lactate.
- The advantage of the gene forms for the appropriate players for the 1500 run is for genetic makeup II.

References

6. Authony D Mehon blood, Lactate and preceved exerion relative to Ventilartoy Shold boys Versus men , In medical and Since and in Sport and exercise , 129 10: 129.