Proceeding

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Evaluation of training curriculum in terms of pressure and threshold indexes of for 400m Iraqi national athletics team players

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ABSTRACT

The environment material of this study is the Iraqi athletic team and the research field is to evaluate specific training curriculum by investigating the pressure and anaerobic threshold indexes for 400m sprint activity. Initially, it is assumed that there will be differences of statistical significance in both of the indexes in the primary and final tests. It is more suitable to implement the descriptive method to the 6 samples of this study and to the selection of physiological indexes directly after exercise tension. After collecting and analysing the experimental data statistically, it seems to have an improvement in systolic and diastolic blood pressure by the end of the training program. However, the result shows that there is no genuine change in anaerobic threshold index. **Keywords**: Anaerobic threshold; Training curriculum; 400m sprinting; Athletics physiology.

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INTRODUCTION

Now a day different types of sciences and technologies are employed to develop sport in improve individual athletic and team skills, abilities and performance levels. Sciences are undergoing a strong and fast development and sport science is following the same guideline as a result. As this is become most possible and fairly durable, people work in sport sector start using different scientific facilities and getting more knowledgeable in different filed of sciences, mostly, physiology as it is relating to the correlation between internal body reactions and athlete external load.

400 metre dash is one of the major athletics events which needs high speeding ability, anaerobic endurance capacity and high muscle strength continuity. Sprint athlete should possess speed component and muscle stress endurance to be in an ideal level. To achieve this ideal level, a scientific training needs to applied training modules doses and invest all the scientific potentials. It is so important to understand the changes in the body compared to the changes before and after performance to build a strong knowledge of evaluation for training curricula and how to direct it to gain a unique achievement. Judging from this concept, and to evaluate training curricula we decide to examine blood pressure and anaerobic threshold indexes to determine the effect of specific training on the endurance capacity of the athlete.

Athletics is multi activity events; each athletic type needs specific requirements which are deal with functional parts of human body. The body needs to have a good and robust adjustment to be able to carry on as the parts are suffering from high different burdens. As per of that, the coaches have to justify the body training shortages to be recovered in the future. Sport specialists and researchers chased the Olympic Athletics for years and they found and confirmed that there is a serious issue in 400m dash as the runners haven't got enough endurance capacity and the ability to continue.

The runner loss their performance level and they loss the aspiration for tournament achievement. It is also confirmed that the coaches are not working towards the understanding of physiological changes in human body during the optimum physical effort of performance or even afterward.

Due to the previous reason, the aim of this study is to evaluate training curriculum for the Iraqi national athletic team by studying blood pressure and anaerobic threshold indexes. Our objective is to determine the positive and negative points, strengthen the powerful points and remedy the weaknesses. We assumed there will be statistical significance differences in the measuring indexes in primary and final tests. The place chosen for this study is Athletics stadium in the Faculty of Physical Education and Sports Science / University of Baghdad.

METHODS

Participants

6 members of Iraqi athletic team are the sampling of this study. To carry on with this study, we decide to get support from Sport Physiologists to determine the mean reasonable indexes for the purpose of the study. Sport Physiologists confirmed the method of test and blood pressure (systolic and diastolic) and anaerobic threshold indexes to be measured immediately after exercise effort.

The 400m exercise taken by the runner for the purpose of the test is simulated to be a real 400m dash where the athlete does his best to win or to achieve the highest possible result and then sitting on a chair immediately afterward for blood pressure test. Assistant team was well prepared to this matter and they have a very good

training to check the pressure in this particular condition as it have to be done quickly and accurately to minimize error.

Straight left hand within heart line, open upward wrist and avoiding any tension, in the time where the device is testing the systolic and diastolic pressure.

Measures

FitmatePRO setup was used to measure the anaerobic threshold. The compact Fitmate-PRO unit is ideally suited to use in universities, colleges, health clubs, training centres, corporate wellness and by professional athletes and teams, and allows a wide range of fitness assessments and measurements to be performed including $VO_2\ max$ and sub-max VO_2 testing.

Maximum rate of oxygen consumption measured during incremental exercise$(VO_2\ max)$ is used to determine the threshold and to establish the aerobic endurance of an athlete during the course of training. This test is one of several tests used to determine an athlete's cardiovascular fitness and performance capacity.

Fitmate-PRO setup is facilitated by Bluetooth to transfer the data directly to laptop.

Treadmills are used to determine the development in anaerobic threshold for each individual sample.

Fitmate-PRO is sited properly on the runner body and the test start gradually. The speed is increased due to a certain speed rate. However, there is few conditions should be applied before the test start. The conditions are:

1. First of all, the runner should be in his natural situation before starting the test and the maximum heart rate (HR max) needs to define by using the basic equation of $(HR\ max = 220 - age)$.
2. Treadmills speed controller following one rate of speeding which gradually increasing the speed with full observation to heartbeat and runner performance. The equipment forced to stop in case of runner potential is running out or the runner shows that he is not able to carry on.
3. Stopping process of Treadmills is by decreasing the speed gradually.
4. Three target heart rate zones are indicated; fat burn $(50\% - 69\%\ HR\ max)$, cardio $(70\% - 84\%\ HR\ max)$, and peak $(85\% - 100\%\ HR\ max)$.
5. The selected and recorded value is around $(84\% - 86\%)$ which is almost peak.

The device gives full information$\left(VO_2\ max - \frac{ml}{kg}/min\right)$ including anaerobic threshold time, Calories spent in the exercise, number of breaths, heart beat average and other variables.

Procedure

The preparation to the experimental test starts with warming up exercise on Treadmills for $2min$ with speed of $(3.5 - 5km/h)$. The supervisor will increase the speed gradually afterward, until receiving the first reading signal for heartbeat and oxygen combustion from Fitmate-PRO device.

This is the test starting point, the speed continues to increase, the supervisor keeps watching the device to avoid the saturation in heartbeat reading and oxygen combustion.

The process undergoes applying the same boundary condition to approach the maximum runner power when he feels very exhausted. At this point, the test is considered to be over. The device automatically analysis the respiration gases and calculates $VO_2\ max$ value depending on sprinter mass (weight), age and tall.

SPSS program was used to analyse all database to extract the mean, standard deviation, T value of correlation…etc.

DISCUSSION

It is so clear the improvement in measuring the systolic pressure before and after completing the training unit for the period of one month. In the primary test and before the coach start implementing the training Curriculum, the mean of the systolic pressure was$158\ mmHg$. The final systolic pressure (after training) was $166.8mmHg$, with an improvement of about $(\sim 18mmHg)$.

Table (1) shows the statistical analysis of the pressure in the primary and the final test. The standard deviation for both of the reading is small as this is a good conformation of the results.$T\ value = 18.508$, this is a strong value in conjugate with (Sig=0.00), which confirm real significance result as it is less than 0.05 within the degree of freedom of 5. This is for sure a good evidence that the final test result is stronger than the primary test result with high significant.

Table (1) is also shows that diastolic pressure is getting significance result on its final test as it is improving from $97.33\ mmHg\ to\ 111\ mmHg$with small standard deviation$(no\ more\ than\ 5\%)$.

Table 1. Primary and final test pressure results for 400m dash.

Variables	Primary result (mmHg)		Final result (mmHg)		T value	Sig	
	Mean	Standard Deviation	Mean	Standard Deviation			
Systolic pressure	158	1.41	166.83	1.94	18.5	0.000	Significant
Diastolic pressure	97.33	2.16	111	5.8	6.74	0.001	Significant
							$\text{Significan} < 0.05\ at\ 5\ dgree\ of\ freedom$

By the end of the training course, the tension is in the optimum and the 400m dash performance is in the highest level of stress. This effect the heart directly and increase the systolic pressure as a result of acceleration of the heart rate. Diastolic pressure is also increased because the muscles are full of blood and high vascular resistance. This result is confirmed my Naif and Subhi (2012) as arterial hypertension is a normal result by the end of this training. Blood pressure is the driving force of the blood inside the body and it gives the continuity of blood circulation as the pressure is not constant in the arteries because the arteries are constricting and breadth following heart pumping.

Physical exercising generates pressure on body organs and the response is high blood pressure. At the moment the exercise finished, blood pressure is steeply declined which is called as blood deficiency.

Hypertension during training is due to increased systolic blood pressure without an increase in relaxation blood pressure. Therefore, hypertension and high heart rate beat during training does not pose a risk to healthy heart function.

Table (2) shows the statistical analysis of anaerobic threshold in the primary and the final test. The result shows that there is no difference between the two readings with a strong T value. Sig obtains 0.075 which is defiantly random as it is (> 0.05).

Table 2. Primary and final test anaerobic threshold results for 400m dash.

Variables	Primary result (min)		Final result (min)		T value	Sig	
	Mean	Standard Deviation	Mean	Standard Deviation			
Anaerobic threshold	2.83	0.121	2.88	0.132	2.23	0.075	Random
					Random > 0.05 at 5 dgree of freedom		

However, likely this is relating to the maximum oxygen consumption which is already achieved in the primary and the final tests on the same level. Percentages slightly below the maximum level can be used as a point where the anaerobic threshold is indicated. Thus, the threshold appears so late for the highly trained players, when oxygen consumption reaches about $(85\% - 90\%)$ of the maximum.

Anaerobic threshold is a clear indication of the value of anaerobic tolerance for athletes and it is of paramount importance in evaluating the athlete's condition.

Jabir mentioned that athlete reached Lactate threshold when lactic acid production rate starts to be more than disposal rate. The heartbeat will be $(170 - 190\ bpm)$ at this moment which about $(85\% - 95\%)$ of heart rate.

CONCLUSION

It has been generally approved by the end of this study that blood pressure and threshold indexes can be used as good indicators to evaluate any athletics training curriculum. Specifically, for 400m dash the indexes show the following:

1. There was clear improvement in systolic and diastolic blood pressure after 400m sprinting training course.
2. Anaerobic threshold doesn't show and significant change.

The researchers are recommending future research plan:

1. Conducting similar studies on different athletics type activities and indexes.
2. It is important to share the advantages of these results with coaches and athletes.
3. Utilize research scientific result in athletics.

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