

The Effect of Concentrated Liquids Before Physical Exertion on Some Physiological Variables of 10,000 Meters for Young Runners

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Abstract

The objective of the research is to identify the effect of concentrated fluids before physical exertion on some of the physiological variables of the 10,000-meter runners of youth for the individuals of the research sample, to identify the speed of the hostile response 10,000 meters to the concentrated fluids before the physical exertion of the individuals of the research sample. The research sample was determined by the deliberate selection of young runners in athletics age (18-19 years) according to the classification of the International Athletics Federation, as the research sample included (21) runners representing Baghdad clubs and the National Center for Sports Giftedness, they were distributed randomly (by drawing lots) into three groups, each group consisting of (7) runners, energy and speed of recovery, thus increasing the maximum oxygen consumption and total energy drainage, sugar and sodium chloride have a great effect on energy production and thus increase the maximum oxygen consumption and total energy drainage, as for water, it did not have a significant effect in increasing the maximum oxygen consumption and total energy drainage. The researcher recommended using concentrated liquids with water an hour and a half before running long distances. From fatigue and increases the speed of recovery, drinking concentrated fluids before, during, and after long-distance runs reduces the incidence of fatigue, thus delaying the onset of lactic acid and increases energy production.

Keywords: liquids, physiological variables, Effect, young

Introduction

Studies that are concerned with the physiology of the human body and its function in the sports field have become one of the basic requirements that are based on improving and developing the achievement numbers for various sports, as laboratory and field research is the basis of the training process as it gives clear connotations about the extent of the development of the athlete's functional apparatus and thus improving ¹ the level of achievement, the large amount of fluid that an athlete consumes does not necessarily mean obtaining a greater amount of calories, and the amount of less fluid also does not necessarily mean obtaining a lower amount of calories, and in order to obtain the correct balance of what the body needs, the athlete must use the metered fluids that the athlete needs ². On an ongoing basis before, after and during training, avoiding general habits of consuming unnecessary fluids that negatively

affect the athlete, this leads to a decrease in the ability to perform, whether in daily exercises or matches, and running (10,000 meters) is one of the sports that is characterized by physical exertion and a relatively long period during which the body of the runner loses a lot of fluids, such as sugars and salts, not just water, then this will lead to Feeling tired ³, so drinking appropriate quantities of fluids will help the athlete to delay fatigue because the fluid consumed compensates for part of the body fluids lost during performance.

Research problem: The effectiveness of running 10,000 meters is one of the activities that require the runner to have special physical and physiological abilities in addition to the runner's ability to overcome fatigue by compensating the body with energy sources before and praising the physical effort and before sports competitions in order to achieve achievement, as long-term physical exertion leads to a large consumption

of energy and fluids as a result of sweating caused by long-term physical exertion, the loss of fluids inside the body leads to an obstruction of metabolic processes and thus the appearance of fatigue as a result of a high body temperature, so the intake of sugary fluids before physical exertion leads to energy balance during long-term physical exertion. Consequently, energy balance during competition hence the problem of research through the researcher's vision and follow-up of the training units. He noticed there is a lack of interest in the fluids that are addressed by runners, especially long-distance runners because these fluids have a major role in returning the body to a normal position and compensating for the lack of energy sources in order to continue working during physical exertion sugars and mineral salts with drinking water have a great role in compensating for the energy resources that the body loses during the long effort, as the researcher decided to study the changes that occur to the body through fluid intake before physical exertion and to know the effect of this on some of the physiological variables of the 10,000-meter runners for youth.

Research objectives:

- Identify the effect of concentrated fluids before physical exertion on some physiological variables of the 10,000-meter runners for young people for the research sample.
- Identify the speed of runner response 10,000 meters to concentrated liquids before the physical effort of the individuals of the research sample.

Research fields:

The human field: Runners of Baghdad clubs and the National Center for Sports Talent, the young category .

Time field: From 15/10/2020 to 1/3/2021.

Spatial field: Fitness hall in the College of Physical Education and Sports Sciences / University of Baghdad.

Research methodology and field procedures:

Research Methodology:

The researcher used the experimental method to suit the nature of the research.

Community and sample research:

The research sample was determined by intentional selection of young runners in athletics at the age of (18-19 years) according to the classification of the International Athletics Federation. Draws) into three groups, each group consisting of (7) runners.

Devices, tools and means used in the research:

Means of data collection:

- Arab and foreign sources and the internet.
- Personal interviews.
- Tests and measurements.
- Data dump form.
- Auxiliary work team
- Statistical means
- The exploratory experience.
- Personal interviews for experts.

Tools and devices used: To obtain data and reveal facts, the researcher will use the following tools:

- VTEMET device (Korean made, Number (1))
- The Italian-made treadmill
- Temperature and humidity measuring device (Gosonig)
- TDS meter
- laptop type (samsung)
- Korean-made digital camera
- Electronic stopwatch.

Field research procedures:

Determine the tests for the skills studied:

Test name: VO₂max Test.⁽¹⁾

Test objective: To measure maximum oxygen consumption (VO₂max).

Devices and tools:

- Fitmate pro device.
- Treadmills.
- Sanitary paper for cleaning respirator masks.
- Disinfectant solution to sterilize respirator masks.
- Personal electronic balance with a unit of measure (kg) and its parts.
- Iron tape to measure length.

Procedures and performance description: Before starting the test, the person conducting the test cleans the VO₂max respirator with an antiseptic solution, ties the parts of the (Fitmate Pro) system together and attaches the pulse belt to the tester's chest, and installing the pulse signal receiver (Bluetooth) in the (Fitmate pro) device, after entering the tester's information into the device, which includes name, birthdate, gender, height and weight, and choosing the type of test to be performed (VO₂max), And then fixing the breathing mask tightly with its belts and making sure that the breathing air does not leak from the mask, and then the tester climbs onto the treadmills and runs gradually with increasing speed, the tester begins by controlling the running speed increase on the device with a speed gradient from the button for that in the treadmills from (5.5) to (13-15) km / hour, and the (Fitmate Pro) device contains a small screen with a square a graph showing the pulse and the maximum oxygen consumption (VO₂max) with their respective ratios, as the monitoring is done with the rectifier.

Test conditions:

- The tester must be in the normal state before starting the test, and the maximum pulse must be known from the equation (220-age in years) in order to gradually increase the pregnancy.
- Attention must be paid to increasing the load gradient by controlling the speed of the treadmills at the sixth and seventh minutes, monitoring the pulse, and monitoring the tester when the voltage is depleted or based on the tester's request of the inability to continue.

- Stopping the treadmills is by controlling gradually reducing the speed.

- Device readings are accepted when the tester reaches 85% or more of the maximum pulse.

Register : The device provides a comprehensive reading tape for measurements of VO₂max (Measurement of Maximum Oxygen Consumption). Calories spent during exertion, number of times of breathing, pulse rate during exertion, as well as results of (BMI) equations

Measuring unit: milliliter / kg / minute.

Exploratory experience:

The reconnaissance experiment was conducted at nine o'clock in the morning on 10/10/2020 on 9 runners from the research sample in order to familiarize the players with the testing procedures in order to understand them and not be afraid of them.

Main experience:

The researchers prepared the numbers of concentrated liquids, where the ratio of concentrated substances to water from sodium chloride salts reached 0.04 milligrams per kilogram of body weight dissolved in a liter of water, and the percentage of sugars was from 85 to 100 milligrams per liter of water. For each player, the water temperature was 22.5 degrees Celsius, the researchers also distributed the water and concentrated liquids randomly and by drawing a lot to the research groups on the research sample members, after which the researcher conducted the first test (total energy drainage and the maximum oxygen consumption) on the research groups for a period of (3) days, one day for each group after three and a half hours of The standardized meal that the researcher gave to the players. The first test (total energy drainage and maximum oxygen consumption) was performed on the research groups, after the performance, the maximum oxygen consumption and the total energy consumption were recorded, and the measurements were taken through the devices directly after the performance, then the researchers conducted the second test (total energy drainage and the maximum oxygen consumption) on the research groups for a period of (3) days, one day for each group after three and a half hours of a standardized meal that the researcher gave to the players with drinking water and some concentrated

liquids for the research groups and all A group with one type of fluid during eating a standard meal three and a half hours before the performance, and after an hour and a half, some concentrated fluids were consumed by the two research groups, as for the third group, they drank water only, as water and concentrated liquids were taken in doses continuously between one dose and another (20 d) and after an hour and a half had passed from the last dose of water and concentrated liquids, the test was performed (total energy drainage and the maximum oxygen consumption). Research aggregates and after performance, the maximum oxygen consumption and total energy consumption were recorded, and measurements were taken by devices directly after the performance.

Statistical methods used: The statistical package system (SPSS) was used.

Table (1) show the arithmetic mean, the standard deviation, the mean of the differences, the standard error of the differences, the calculated value of (t), and the significant difference for the research indicators for the group (water, sugar and sodium chloride).

Indications	Variables	Pre-test		Post-test		Difference means	standard error	Value (T) Calculated	Level sig	Type sig
		Mean	Std. Deviation	Mean	Std. Deviation					
Vo ₂ max	Water	35.177	.976	38.155	1.055	2.933	0.687	6.423	0.002	Sig
Exchange total energy	Water	458.131	10.877	732.435	23.345	242.285	10.742	21.421	0.001	Sig
Vo ₂ max	Sugar	35.377	1.320	38.854	1.074	3.488	0.577	3.788	0.004	Sig
Exchange total energy	Sugar	439.844	10.233	10.233	8.664	356.877	5.124	85.570	0.003	Sig
Vo ₂ max	Sodium chloride	35.722	1.653	38.185	0.304	2.490	0.691	3.577	0.002	Sig
Exchange total energy	Sodium chloride	433.817	7.588	769.431	10.287	328.543	3.412	94.325	0.000	Sig

Significant $\leq (0.05)$ at a degree of freedom (6).

It can be seen from table (1) for research indicators for the water group we find. That (Vo₂max) was the arithmetic mean in the first test with a value of (35.177) with a standard deviation of (.976). In the second test, the arithmetic mean was valued at (38.155) with a standard deviation of (1.055) and when calculating the value of (T) it was of (6.423) in significance A real value of (.002) and it is less than (0.05) at a degree of freedom (6). This means that the

- Mean.
- Median.
- Skew ness
- Std. Deviation.
- (T) test for symmetric samples.
- (T) test for independent samples.

Presentation, analysis and discussion of results:

Presentation the results of the first and second tests of the group (water, sugar, and sodium chloride) and analyze them.

difference is significant and in favor of the second test.

When displaying the total energy drainage index for the water variable, we find that the arithmetic mean in the first test was (458.131) with a standard deviation of (10.877). As for the second test, the arithmetic mean was (732.435) with a standard deviation of (23.345) and when calculating the value of (T) it was the value (21.421) with a real meaning of (.001) which is less than (0.05) for a degree of freedom (6). This means that the difference is significant and in favor of the second test.

As for the sugar group, we find that in the (Vo_2max) index, the arithmetic mean in the first test was (35,377) with a standard deviation of (1.320). As for the second test, the arithmetic mean was (38.854) with a standard deviation of (1.074) and when calculating the value of (T) it was with a value of (3.488) with a real significance of (400.) and it is less than (0.05) at a degree of freedom (6). This means that The difference is significant and in favor of the second test.

When displaying the total energy exchange index for the sugar group, we find the arithmetic mean in the first test with a value of (439.844) with a standard deviation of (10.233). As for the second test, the arithmetic mean was valued at (356.877) with a standard deviation of (5.124) and when calculating the value of (T) it was a value of (85).

As for the sodium chloride group, we find that in the (Vo_2max) index, the arithmetic mean was in the first test with a value of (35.722) with a standard deviation of (1.653). As for the second test, the arithmetic mean was valued at (38.185) with a standard deviation of (.304) when calculating a value. (T) was a value of (3.577) with a real significance of (.012) and it is less than (0.05) at a degree of freedom (6). This means that the difference is significant and in favor of the second test.

When displaying the total energy drainage index of sodium chloride, the mean in the first test was (433,817) with a standard deviation of (7,588). As for the second test, the arithmetic mean was of (769,431) with a standard deviation of (10.287) and when calculating the value of (T) it was the value of (94.325) with a real significance of (000.) which is less than (0.05) at a degree of freedom (6). This means that the difference is significant and in favor of the second test.

Discuss the Results

When observing table (1) for the first and second test, and for all the research groups, we find that (Vo_2max) was significant, and in favor of the second test, and the researcher attributes that to the fact that all concentrated liquids that were taken up by the three groups contributed positively to increasing production on better performance in the second test. This explains that the concentrated liquids that were taken contributed significantly to improving performance and thus improving the ability to work during physical exertion and delaying the onset of fatigue and thus improving the level of achievement and water that was consumed before the test, it increased the ability of the runners to perform the second test better, and this led to an increase in (Vo_2max) by continuing the physical effort for a longer period and then increasing the ability of the runners to better withstand the second test, and this is what Imad al-Din Abbas confirmed: The player causes excitement and change in vital organs and systems of the body in terms of function and chemistry, and this appears in the form of improvement in the adequacy of the various organs and systems, in addition, the performance was distinguished by economical effort as a result of continuing to perform pregnancy despite the onset of a feeling of fatigue, and then begins to adapt to this load ” ⁽²⁾ as for (Giorgetty) (in his opinion, “the absolute and relative maximum amount of oxygen used increases as a result of regularity in training. This increase comes as a reaction between the exerted muscles and makes them accustomed to extracting the largest amount of (O_2) that qualifies the muscle with increasing its efficiency and reducing the acidity resulting from metabolism to the limit the lowest.

The test for a long period leads to an increase in the number of times of breathing, and this increase is appropriate with the severe and increasing need for oxygen, which is obtained from the air through breathing, and this coincides with a high heart rate that leads to the arrival of large amounts of oxygen to the muscles, and this is associated with high oxygen maximum, this was confirmed by Hassan Al-Ali and Amer Fakher, who emphasized that the use of the maximum oxygen consumption in regulating the intensity of physical pregnancy is one of the most important methods for determining the amount of physiological burden in endurance training, as scientific studies have proven that

there is a relationship between oxygen consumption and heart rate as a determinant of intensity, as equivalent to This is from the percentage of oxygen consumption ⁽³⁾.

When referring to the tables of the first and second tests for the energy drainage test and all the aggregates, we find that they were significant and in favor of the second test, as the researcher attributes the reason for consuming concentrated liquids before the second test that led to the remarkable improvement in the ability of the functional devices to continue to work continuously and well for a long period and this led to an improvement in the final result of the total energy drainage, as it is logical that the total energy drainage increases with the increase in the duration of the work, as the length of the performance period increases the ability of the tissues to expend energy, and an improvement in the work of aerobic and anaerobic enzymes and the production of appropriate heat and not inhibiting the work of these enzymes, so the cells perform a streamlined and integrated work to produce energy during the mitochondrial effort and the reactions associated with the production of aerobic and anaerobic energy, and this was confirmed by Raisan Khuraibet Majeed, who indicated that the cells of the human body It needs energy in order to be able to perform its various functions, and this energy is produced by the mitochondrial bodies located inside the cell's cytoplasm, which are called energy houses, Oxygenic sports training affects the mitochondria effectively, increasing both in number and size, which is important for athletes 'energy needs, and the body's energy needs differ according to the strength and duration of physical work and the level of performance ⁽⁴⁾.

As during the effort, there will be processes of demolishing chemical bonds, resulting in the release of large amounts of heat that are absorbed by the water in the cytoplasm and then the body temperature rises during the performance, and this is an ideal indicator of the amount of energy spent and the quality of the materials consumed, it is also an indicator of the body's adaptation to benefit from burning food and the intensity of exertion, and the more it is counted as an indicator of greater energy expenditure and greater intensity, and this is what Abdullah Mahmoud Thanoun confirmed that the body can perform work using energy, and that energy is in the form of heat released from the body, for this Energy can be measured by measuring heat,

thus, the unit of measurement of energy is the calorie, for food is potential energy, whether it is in the form of food or glycogen stored in the body or fatty tissues in certain areas of the body and through its oxidation or combustion, energy is generated in the form of heat ⁽⁵⁾.

The topic of energy is one of the topics that are directly related to sports activity. The great diversity in various sports activities in general in terms of the size and intensity of the training load is matched by a similar variation in energy production and also differences in the energy spent in the body, and this was confirmed by Fadel Sultan Sherida, who pointed out that energy is considered in the human body the source of movement and the source of muscle contraction, and it is the source of all kinds of activity. Muscle contraction cannot occur to perform movement without producing energy ⁽⁶⁾.

The 10,000-meter run is one of the games that depend directly on the air system, as it is one of the continuous and aerial games that require endurance for long periods. To the development in the proportions of aerobic enzymes accompanied by the development of anaerobic enzymes, this was confirmed by Rafe 'Saleh Fathi and Hussein Ali Al-Ali, who indicated that sugar degrades through a long series of chemical reactions, as the equivalent of (3ATP) is produced through blood sugar, as these reactions are controlled by multiple glycolytic enzymes, including the hikocanes enzyme (HK), the third reaction enzyme (phosphofructokinase) (PFK), the tenth reaction enzyme (pyruvate kinase) (BK) and more of these enzymes are important for the (PFK) enzyme, as it is referred to as the key to the functioning of this system, as its increased activity leads to the rapid decomposition of glucose as well as the formation of (LA) acid and the rebuilding of (ATP) ⁽⁷⁾.

Conclusions and Recommendations

Conclusions:

- Drinking concentrated fluids has great effectiveness in producing energy and speeding up recovery, consequently, it increases the maximum oxygen consumption and total energy drainage
- Sugar and sodium chloride have a great effect on energy production and thus increase the maximum oxygen consumption and total energy drainage. As

for water, it had no significant effect in increasing the maximum oxygen consumption and total energy drainage.

Recommendations:

- Using concentrated fluids with water an hour and a half before running long distances reduces fatigue and increases the speed of recovery.
- The use of concentrated liquids before, during and after running long distances reduces the occurrence of fatigue and thus delay the emergence of lactic acid and increases energy production.

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Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved and all experiments were carried out in accordance with approved guidelines.

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