

THE EFFECT OF 2.5% GLUCOSE ADMINISTRATION TOWARD FUTSAL PLAYERS AEROBIC ENDURANCE IN TUNGGUL HITAM PADANG WEST SUMATERA

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Abstract: Based on the observations conducted by researchers in the field, one of the factors that affects low achievement of futsal players in Tunggul Hitam Padang is the lack of aerobic endurance. The purpose of this study is to determine the effect of glucose administration on the improvement of aerobic endurance toward the futsal players in Tunggul Hitam Padang. In this study, the study uses quasi-experimental methods. This research was conducted at AW Futsal in Tunggul Hitam Padang at April 2013. The population in this study are 20 people by using total sampling technique. Based on the data analysis, it can be concluded that there is significant effect of glucose administration on the aerobic endurance ($VO_{2\text{ Max}}$) to futsal players in Tunggul Hitam Padang. The obtained result is t_{count} score 7.45 and t_{table} 1.72.

KEYWORDS: Glucose, Aerobic Endurance

INTRODUCTION: One of the sports that has been gaining attention in the present moment is futsal. In recent years, futsal has increasingly gained more popularity. It can be proven from increasing numbers of futsal clubs and futsal tournaments that are routinely held between students and university students both at regional and national levels. "From the ten components of dominant physical condition, a futsal players must have endurance, strength and speed". According to Neiman in Lhaksana (2011:21) "endurance is the ability to work in a long time that O_2 needs to be provided to the active muscles". The longer a certain match happens, then the futsal player must have a good endurance. One characteristic of a player who has good endurance, especially aerobic endurance is from the observation of maximum aerobic capacity or commonly termed as $VO_2\text{ Max}$ (Maximum Oxygen Volume). According to Bafirman (2007:31) " $VO_2\text{ Max}$ essentially describes the magnitude of motoric capability from an athlete's aerobic process". So, the level of aerobic endurance will be influenced by the level of $VO_2\text{ Max}$. Meanwhile, according to Bafirman (2008:40). "The aerobic capability ($VO_2\text{ Max}$) is determined by the function of organs such as the respiratory, heart and blood circulation organs, the amount of blood circulation, the concentration of hemoglobin in the blood." The level of $VO_2\text{ Max}$ is also closely related to the provision of energy. In particular sport that requires aerobic endurance such as futsal, the most dominant energy system that is used is the aerobic system. According to Fox in Bafirman (2007:28) "Sport activity requires endurance dominant energy system (2007:28)" Sport activity that requires endurance dominant energy system is the aerobic system". Irianto (2007:38) explains that, "the main energy source of aerobic glycolysis is carbohydrates". That carbohydrates will be processed and converted into glucose and used as an energy source. Sajoto (1988:10-11) also confirms that "glucose can be used directly as an energy source by the body cells". The lack of aerobic endurance will cause the players to become easily tired in the sport activity. This exhaustion also happens to the futsal players Tunggul Hitam, it can be seen from several futsal competitions by the youth organizations that the opponent team always succeed to score the goals in the second half, and they cannot execute the good strategy, whereas in the first half the team play in good condition. According to Bafirman and Agus (2008:46) "resistance is influenced by several factors: genetic, age, gender, respiratory system, physical activity and aerobic capacity ($VO_2\text{ Max}$). Therefore, the author is interested in studying the effect of glucose administration for aerobic endurance toward futsal players in Tunggul Hitam.

METHODS: In this study, the authors used a quasi-experimental methods. This research was conducted at the Tunggul Hitam AW Futsal Padang on Date 6 to 7 April 2013. Population of 20 people. The technique of taking the study sample in this study is the total sampling, the sample in this study is 20 people. In order to measure maximum oxygen consumption ability ($VO_2\text{ Max}$), the researcher can perform multi-step test (LMT) or Bleep test. LMT is a test that is carried out by means of back and forth as far as 20 meters (Sports and physical health national seminar and work-study). Glucose that is used in this study is

Dextrose monohydrate, which is classified as monosaccharide), in the beginning this substance is mixed with water. For each sample is given an administration of 300 ml of water with 40 grams of glucose about 5-10 minutes prior to the test. Initial tests (without glucose) and final test (with glucose) are used to measure the maximum oxygen consumption ability (VO_2 Max) that can be done by using multi-stage test (LMT) or Bleep test. LMT is a test that is carried out by means of back and forth as far as 20 meters (Sports and physical health national seminar and work-study). The LMT test instructions and execution are as follow: a) The purpose is to measure the ability (VO_2 Max), b) The test name is multi-stage run / Bleeptest, c) The equipment is trajectory (length 20 meters and width of 1.5 meters), LMT / Bleep testcassette, tape recorders, test forms, stationery, meter, marker, plastic rope and nails. d) The implementation, namely: 1). Length of distance track 20 x 1.5 meters and marked at each end. 2). Prepare the Bleep test tapes and the tape recorder. 3). Participants are advised to warm up and stretch before performing the test. 4). Turn on the tape recorder between the two "tut" signals that marks the one-minute interval. Several test instructions are available in the cassette test. 5). The end of back and forth is signaled with a single "tut". 6). Meanwhile the end of each level is marked with "tut" three times in a row.

RESULTS AND DISCUSSION: Description of the data is described as follow: The highest durability is 42.7 and lowest is 33.9. While in the final endurance test, the highest value is 43.9 and lowest value is 36.4. Therefore, the endurance improvement average is 3.81%. This can be seen from the following table:

Table1. Initial Test And Final Test Analysis Result

Test	Highest Score	Lowest Score	Average	Improvement%	T_{count}	T_{Table}
Initial	42,7	33,9	39,05	3.81	7,45	1,72
Final	43,9	36,4	40,54			

The results of analysis on difference between the initial test and final test is $t_{count} 7.45$ while $t_{table} 1.72$ and $0:05$ with $n-1$ degrees of freedom. This shows that $t_{count} > t_{table}$, so H_0 is rejected and H_a is accepted. There is a significant effect of 2.5% glucose administration to aerobic endurance to futsal players in Tunggal Hitam Padang, where the significant result is the improvement of endurance up to 3.81%. In carrying out this research to the sample, it is conducted by using Bleep test method. The treatment to this samples is performed on the same person in one week. Starting from sample collection activity, preparing the tools to be used in the research, as well as information related to collection of data on samples that will take Bleep test. Based on the above results, there is an improvement in the level of feedback samples. This is in accordance with the opinion of Mc. Ardell in Arisman (2007:27), "recommends that athletes should consume glucose at sports that require endurance but with a dilute solution". This means that glucose drink cannot be too thick because this can lead to excessive insulin response that can cause hypoglycemia (drop in blood sugar levels) that have negative affect on athletes' performance both when playing and practicing. This is supported by Rusli Lutan (1991:203), "if the provision of carbohydrate or glucose is too much before the game, it will increase the production of insulin hormone that can cause a drop in blood sugar levels so that the endurance will be decreased". Further Irianto (2007:129), explains, "the consumption of thick glucose (sugar) can causes hypoglycemia (drop in blood sugar levels) that has negative affect athletes' performance both when competing or practicing. The symptoms of hypoglycemia are body becomes weak, headache, pale, sweating a lot and to the extent of causing unconsciousness". This is caused the brain is deprived of food supply due to glucose (sugar) is the only source of food for the brain. Glucose administration before the practice or game is necessary to be considered on the time between glucose administration because it will affect the athletes' performance since if it is not given at the right time, it will not affect the performance of athletes. This is in accordance with Sadoso (1996:127), "the provision of sugar (glucose) prior to exercise will be able to improve the appearance if given at the right time". Further Brouns in Arisman

(2007:27), explains "glucose administration 5-10 minutes before exercise will make the athletes' appearance better than without glucose administration". Glucose is the simplest form of carbohydrates, where carbohydrates mostly come from the food that we consume daily. Glucose administration before exercise can make the appearance of an athlete to become better, so they will quickly feel tired so they have to stop the exercise or activity or we have to drastically lower the exercise intensity. Basically, according to Tan and Kirana Rahardja (2010:24-25), "the administration of glucose that serves to replace water lost through sweating, therefore it can avoid dehydration". According to Musrifatul Uliyah and A. Aziz Alimul Hidayat (2008:46-47), "the lack of external liquid may occur due to decreased liquid intake and expenditure of excess liquid. There are 3 kinds of external liquid deprivation or dehydration, i.e., 1). Isotonic dehydration, it occurs when liquid and electrolyte loss amount is balanced. 2). Hypertonic dehydration, it occurs if the water loss amount is more than the electrolyte. 3). Hypotonic dehydration, it occurs when the body loses more water than electrolyte. Lack of liquid in the body can occur slowly or quickly and it cannot always be quickly identified. The requirement of electrolytes in the body's liquid is influenced by factors 1). Age, differences in age and body surface area determines the activity of the organ, so it can affect the amount of liquid and electrolyte needs. 2) High temperature, it can cause the discharge process through sweat quite a lot, so the body will lose a lot of liquid. 3) Diet, if the body lacks nutrients, the body will break down the reserved food in the body so it will cause the movement of interstitial liquid into intercellular, which can affect the amount of liquid fulfillment. 4) Stress, it can affect the fulfillment of liquids and electrolytes, through ADH production improvement process, it can promote metabolism, which causes muscle glycolysis that further causes retention of sodium and water. 5) Sickness, in this condition, there are a lot of damaged cells, so the cells need to fix the process of fulfilling the needs of enough liquid. Sickness causes an imbalance in the body system, such as hormonal imbalance that can interfere with the balance of the liquid needs". According to Lanham (2011:61), "Dehydration to this extent generally appears to reduce endurance". Dehydration can reduce endurance. Apart from being an important nutrient that regulates body liquid balance, some of the mechanisms that lead to the consumption of carbohydrates or glucose can make a positive contribution in improving the body's physical performance during exercise. According to Jalu (2010): "1) Maintaining blood glucose levels. 2) Maintain the rate of oxidation (burning) carbohydrates remain high. 3) Prevent an increase in stress hormones".

CONCLUSIONS: The implications and applications that can be given of the results of this study are: 1). Efforts to improve the ability VO_{2max} of one of them is through the provision of glucose. Glucose will be able to increase endurance capabilities futsal players Tunggul Hitam Padang. This glucose can be done by give dextrose monohydrate is a monosaccharide group mixed with water prior to the athlete, the way of administration is by giving drink 300 ml of water was mixed with 40 grams of glucose 5-10 minutes before practice or competition; 2). Based on the results stating that there is a significant effect of glucose for aerobic endurance ($VO_{2 Max}$) at futsal players Tunggul Hitam Padang. So athletes are encouraged to consume as much as 2.5 grams of glucose, glucose Giving as much as 2.5 grams can be provided with beverages containing sugar, or brown sugar that high glucose levels; 3). Another way in an effort to improve VO_{2max} is through intense exercise, with due regard to the provision of training load, sets and repetition. This exercise will be done well, of course with the structure of other programs that monitored and coordinated; 4). Coaches should always provide supervision to the players. Supervision must be accompanied by sufficient knowledge about nutrition, especially in the case of glucose. Besides the coach should have a store of information about the physical condition of futsal players, as an evaluation; 5). The club officials and manager should be able to give a good boost in morale, and material by providing a special allocation of funds to finance the preparation of glucose either during training or in a match. This funding should be controlled as tightly as possible so that the process of training and immersion in games uninterrupted glucose intake.

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