



The Effect of Consumption Breakfast Intake with Different Amount of Carbohydrate on Explosive Power and Velocity of Female Students Age 13-14.

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ABSTRACT

The aim of this study is to compare the effect of two kind of breakfast intake with different amount of carbohydrate on muscle force and velocity of female student aged 13-14. The subject was selected 12 students with the mean aged 13.5 ± 0.522 , mean height of 158 ± 7.92 and mean weight of 43 ± 6.87 from Shahid Orazi in Islamshahr city. They tested three times. In the first time they didn't have breakfast and they were tested sergeant jump test and speed running the second time they consumed low carbohydrate breakfast and two hours later they were tested the same and the third time they consumed high carbohydrate breakfast and two hours later they were tested the same. The data analysis was done Kolmogorov-Smirnov test, Levin test and with non-parametric of Friedman test. The finding showed that there was not a significant difference in peak power and velocity in the three times. Of course subjects performed sergeant jump test good after the consumption of low carbohydrate breakfast.

Keywords: breakfast, explosive power, speed, carbohydrate.

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al, 1986; Febbraio and et al, 1996; Febbraio and et al, 2000; Hargreaves and et al, 1985; Siu and et al, 2004).

INTRODUCTION

Adolescence is one of the most important eras in growth and evolution of human being in which nutrition behaviors are formed. One of the most effective meals in physical health and daily activities is breakfast. In fact, breakfast ignites the engine of body metabolism, and given that the most physical activities of students are performed in early hours of the day, supplying 1/3 daily energy from breakfast is necessary (Li, 2018). Absorbing enough energy in breakfast is correlated with less tiredness and better mental status (Katie and et al, 2015). The recommended percentage of carbohydrate in diet for people involved in physical activities is 55-70% (Demarco and et al, 1999). Nutrition is a significant means in sports. When the nutrition is appropriate, it reduces the tiredness and allows the athlete to function better and longer in practice sections (Williams and et al, 1999). According to DIR¹ recommendation, Carbohydrate must allocate the most part of the energy usage (Maughan and et al, 2004). Glucose oxidation and fatty acids supply the energy within muscle contractions for athletes. Body is not able to digest and absorb any kind of carbohydrate in the same speed. Glycemic index is a scale which indicates the effect of carbohydrate on blood glucose (Jenkins and et al, 1981). Glycemic index can be used as reference guide for nutritional order for athletes in different types of carbohydrate. The correlation between carbohydrate usage before exercise and performance is still questionable. Some research indicates that using it before exercise, results in performance development (Ribeiro and et al, 1998; Hargreaves and et al, 1985) and some other believe that there is no significant effect (Gleeson and et

RESEARCH METHODOLOGY

This is a semi experimental study. The statistical society involves all female students of 13-14 years old and the available society involves 600 13-14 years old students in Shahid Owraki junior school located in Islamshahr town and the sample involves 12 students of the age 13-14 in Shahid Owraki junior school located in Islamshahr town in academic year of 95-96 that participated voluntarily in this research. After coordinating with the principal and examining the students' health certificate, 12 students have been chosen from the school. The method was in the way that participants have done the Sergeant Jump Test and 60-meter running in the first day without consumption breakfast. In the second day, they have done the tests two hours after consumption a low-carbohydrate breakfast with Glycemic Index of 30 involved (30 g of bread and 20 g of cheese) and in the third day, the tests have been performed two hours after a high-carbohydrate breakfast with Glycemic Index of 55 involved (50 g of beans and 20 g of bread).

Sergeant Jump Test

This test is utilized to measure the explosive power of leg muscles. In this test, the participant stands beside the wall, raises his/her hand; the touching place of his/her hand with the wall is marked. Then, he/she jumps beside the wall. The touching place of his/her hand with the wall after jumping is marked. The difference rate between the two marks determines his/her record.

60-Meter Running Test

¹ Diet Ingestion Recommendation

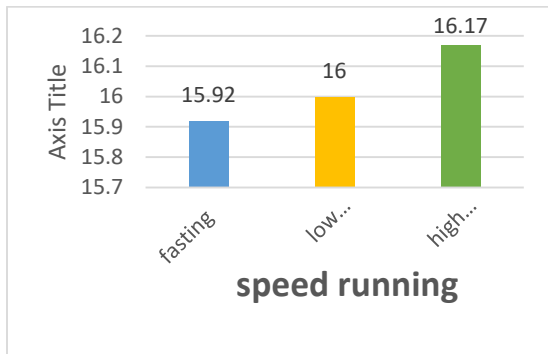
The participant stands behind the start line. After the whistle sound, starts running the 60-meter route. His /her run time in this route is considered his/ her record. In order to data analysis, descriptive and inferential statistics including classification and adjustment of raw scores by the mean standard deviation and drawing tables and shapes were used, and for measuring research hypotheses, inferential test including Kolmogorov-Smirnov test for distribution of data, Levene test for homogeneity of variances, and Fredman test to determine the mean differences were utilized.

RESULTS AND FINDINGS

Individual characteristics of the participations are mentioned in the following table

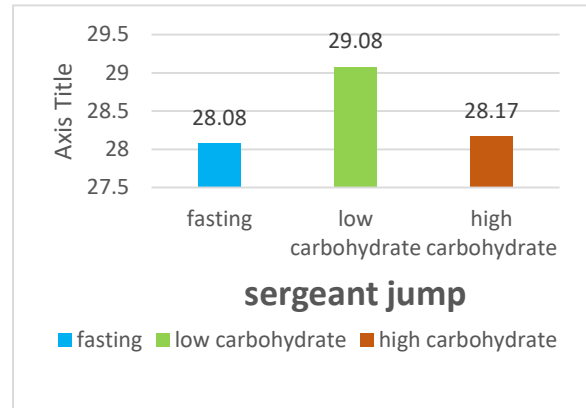
number	Age(years)	Weight(kg)	Height(cm)	Index group
12	13.5 _{+0.522}	43 _{+6.87}	158 _{+7.92}	Fasting, low carbohydrate, High carbohydrate

Speed running test in fasting phase, 15.92 seconds, in low-carbohydrate breakfast phase, 16 seconds, and in high-carbohydrate breakfast phase, 16.17 seconds was recorded (shape 1)



shape 1

Also, Sergeant Jump Test in fasting phase, 28.08 cm, in low-carbohydrate breakfast phase, 29.08 cm, and in high-carbohydrate breakfast phase, 28.17 cm was recorded (shape 2).



shape 2

Hypothesis 1

There is no significant difference between consumption breakfast with different carbohydrates and explosive power. Results of Fredman test determined any significant difference between having breakfast with different carbohydrates and explosive power (table 1).

Hypothesis 2

There is no significant difference between consumption breakfast with different carbohydrates and speed. Results of Fredman test determined any significant difference between consumption breakfast with different carbohydrates and speed (table 1).

p	DF	Rank	stages	tests
0.496	2	1.75	fasting	Explosive power
		2.25	Low carbohydrate	
		2.00	High carbohydrate	
0.264	2	1.92	fasting	speed
		2.25	Low carbohydrate	
		1.83	High carbohydrate	

Table 1

DISCUSSION AND CONCLUSION

Consumption breakfast had no significant effect on explosive power and speed. However, since even hundredth of a second has effect on the result of speed running, in fasting phase, time improvement is observed. Also, in Surgent Jumping despite the lack of significant effect, improved jump record is observed in low-carbohydrate breakfast phase. The findings of this research is compatible with the results of much research that have proved negative effect or any effect of consumption breakfast and carbohydrate on performance (Katiuce Borges Sapata 2006, Katie Adolphus 2015, Nicholas,C,W 1995, Foskett,A 2008, Ali,A 2009, Morris,J,G 2003, Robert,S 2010, Welsh,R,S 2002,Currel,K 2009) in which it was mentioned that having carbohydrate with high glycemic index increases blood glucose level and pancreas starts insulin secretion and a short time after consumption carbohydrate, the blood glucose is dropped out and even

reaches to less than initial amount at the beginning of the test which causes performance reduction of participants. Also it was incompatible with the research of (Gant, N 2007, Winnick, J 2005, Baker, L, B 2007, Dougherty, K 2006). Gant in his research, provided carbohydrate solution %6.2 to his participants before the test and Winnick, J carbohydrate solution %6. These researchers justified that in long-term sport exercises significant Glycogen depletion occurs in muscle fibers types 1 and 2 (14). Muscle Glycogen depletion causes reduction of muscle calcium organizing and it damages muscle calcium and muscle contractile property (15) and explosive power (16). Usage of solution %6.4 in one of the researchers' study, caused %21 speed capacity increase in participants which resulted in faster running (17). Plasma glucose concentration and insulin serum in participant's consumption carbohydrate caused more tiredness at the starting point (18). Perhaps the reason of incompatibility with above mentioned research from physiologic aspect is as follows:

Since we have two types of carbohydrates in oxidation speed: Carbohydrates with high oxidation speed (60g per hour) such as Maltose sucrose, Malto Dextrin, Amyl pectin, and carbohydrate with low oxidation speed (40 g per hour) such as Fructose, Galactose, Isomaltose Amyl (19). Time and amount of carbohydrate usage depend on the need and desire of the athlete and due to its harm at sports, sports goals are different (20). Time, desire, experiences, and goals affect limitation or antedate carbohydrate gastrointestinal absorption (21). If the blood glucose concentration stays stable during sport exercises, it causes progress in skill and speed performances (21).

In research that examined the effect of carbohydrate on speed performances, any significant positive effect has been observed, given that when carbohydrate was used before the performance and what different effects it could have on performance. Also, all research done on the effect of carbohydrate on vertical jumps, regardless of few researches that found positive effect of carbohydrate, the other researches have not reported any significant effect of carbohydrate on positive performance of vertical jumps (23, 24).

Since the type of test in this research was more interval exercises and the time was more than 60 minutes, and the time of carbohydrate usage for participants was 30-45 minutes before the test, and the type of carbohydrate in some research was solution, results of this research were incompatible with the mentioned research.

Moreover, since carbohydrates require enough water to be absorbed, and the used carbohydrate in this research was not accompanied with enough water, probably its absorption was delayed and it had no significant effect on participants' power and speed performance in this study.

Also, for the reason that the participants were mature girls and probably they were in menstrual period, and due to the special physical condition of this period, they did not apply all their efforts, no significant effect has been found from this study.

According to this research, it is recommended to other researchers, to recommend carbohydrate accompanied with enough water to the athletes before sport performances in order to reduce the tiredness during sport exercises.

Also using a little carbohydrate before vertical jump performance helps to improve athletes' functions.

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