

The Effects of Chocolate Milk and White Milk on the Hydration Status After Playing Tennis

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ABSTRACT

The main problem when the author makes observations on tennis players at the State University of Padang is that many players do not pay attention to the intake of fluids consumed after playing tennis. It is feared that it can slow down the post-training recovery process to return the body to its previous state, so it is necessary to conduct research on the intake of fluids consumed after playing tennis. This study aims to analyze: (1) the effect of giving chocolate and white milk on hydration status after playing tennis, and (2) the difference in the effect of giving chocolate milk and white milk on hydration status after playing tennis. This research uses experimental methods. The subjects of this research were male gender tennis players at the State University of Padang, totaling 20 people. Instrument for measuring hydration status using an Urinometer. The data analysis technique used was ANOVA (one way) at a significant level $\alpha = 0.05$. The results show that giving chocolate and white milk after playing tennis has not been able to maintain hydration status, as evidenced by the difference in hydration status values before and after playing tennis. However, chocolate milk was better at maintaining hydration status after playing tennis compared to white milk with a significant difference ($p < 0.05$). The data analysis technique used was ANOVA (one way) at a significant level $\alpha = 0.05$. The results show that giving chocolate and white milk after playing tennis has not been able to maintain hydration status, as evidenced by the difference in hydration status values before and after playing tennis. However, chocolate milk was better at maintaining hydration status after playing tennis compared to white milk with a significant difference ($p < 0.05$). The data analysis technique used was ANOVA (one way) at a significant level $\alpha = 0.05$. The results show that giving chocolate and white milk after playing tennis has not been able to maintain hydration status, as evidenced by the difference in hydration status values before and after playing tennis. However, chocolate milk was better at maintaining hydration status after playing tennis compared to white milk with a significant difference ($p < 0.05$).

Keywords: *Chocolate Milk, White Milk, Hydration Status*

1. INTRODUCTION

Regular exercise can improve a person's physical and mental qualities. The game of tennis court is a sport that can be done on an open court or a closed court. The activities carried out in the game of tennis are long and are interspersed with short rest periods. The length of match time cannot be determined, which can result in a player being on the court between one and four hours.

The problem that is often found when playing tennis is fatigue. Many players are unable to cope with the fatigue they experience, or the inability to recover at rest during the game. Things like this will affect the decrease in performance or physical performance after playing tennis. Giving fluids to athletes aims to prevent dehydration and to maintain body fluid balance. Water change after exercise is also very important to maintain optimal appearance and maintain health [7].

Hydration is defined as the balance of fluids in the body and is an important requirement to ensure the

metabolic function of the body's cells [1]. Hydration status is a condition that describes the balance of fluids and electrolytes in the body which comes from the regulation of fluids that enter and leave and is useful for ensuring the metabolic function of the body's cells.

The types of drinks consumed after exercising have experienced many developments. Currently, there are many types of drinks consumed after exercising which can help the post-workout recovery process, one of them is chocolate milk. Chocolate milk contains beneficial carbohydrates and protein and has the potential to be used as a nutrient for post workout recovery. In recent years, chocolate milk has been used as a recovery drink after intense workouts and has been promoted by many sports nutritionists. This is believed to be because the high carbohydrate and protein content in chocolate milk will help replace lost nutrients [8]. Apart from chocolate milk, one of the most popular drinks among sportsmen is white milk. Milk is an emulsion of fat in water containing sugar, mineral salts

and protein in the form of a colloidal suspension. Milk contains nutritional elements which are very good for growth and health. The main composition of milk is water, fat, protein (casein and albumin), lactose (milk sugar) and ash.

2. METHOD

This research is a type of experimental research with the same subject design (treatment by subjects designs). In the same design, several types or variations of treatment are given consecutively to the same group of subjects, and at the same time become a control group (same group) [4].

The subjects in this study were the male tennis players at UNP. The sample size used in this study were 20 male tennis players obtained with the following criteria: (1) male tennis players aged 20-30 years, (2) the sample has relatively the same ability in playing tennis, (3) the sample is in good health and is not taking drugs.

Implementation the initial test (pretest) was carried out to find out the initial data from the research subjects regarding hydration status. Previously the research subjects weighed first. Hydration status data obtained through urine collection and measured using an urinometer to determine the value of urine specific gravity, and urine color is seen using the color indicator that has been suggested by PDGMI. The implementation of the final test (posttest) aims to determine the difference in the value of hydration status after being given treatment.

Treatment of research subjects was given before and after playing tennis. The treatments given to the research subjects were water, chocolate milk and white milk with a volume of 250 ml. The treatment was given in three periods, namely the first period of plain water, the second period of chocolate milk, and the third period of white milk with two repetitions. Each period is given an interval of seven days which aims to eliminate the effect between treatments.

3. RESEARCH RESULTS

Descriptive statistics of pretest and posttest data on hydration status of tennis players after giving chocolate and white milk.

Table 1. Descriptive Statistics of Pretest and Posttest of Hydration Status

Types of Treatment	Data	Statistics	Pretest Results	Posttest results
Chocolate milk	Hydration Status	amount	20,305	20,353
		Average	1.01525	1.01765
		SD	.002918	.002961
White milk	Hydration Status	amount	20,319	20,369
		Average	1.01595	1.01845
		SD	.003502	.003268

From the table above, there are differences in the pretest and posttest scores. Good results can be seen if the pretest and posttest scores are not much different. Low posttest scores indicate a good hydration status. Therefore, the lower the posttest score, the better the hydration status.

- 1) **The effect of chocolate milk and white milk on the hydration status of tennis players**
 - a. **effect of chocolate milk on hydration status**

Table 2. t-test of pretest and posttest results of hydration status

Group	Average	t-test for Equality of means				
		tht	tth	Sig.	Difference	%
Pretest	1.01525	8,718	2,093	0,000	-.002400	0.24%
Posttest	1.01765					

From the table above, it can be seen that tcount 8.718 and ttable 2.093 (df 19) with a significance value of p of 0.000. Therefore, tcount 8, 718 > ttable 2.093, and a significance value of 0.000 < 0.05, this result shows that there is a significant difference.

- b. **effect of white milk on hydration status**

Table 3. t-test results of pretest and posttest of hydration status

Group	Average	t-test for Equality of means				
		tht	tth	Sig.	Difference	%
Pretest	1.01595	14,694	2,093	0,000	-.00250	0.25%
Posttest	1.01845					

From the table above, it can be seen that tcount 14,694 and ttable 2.093 (df 19) with a significance value of p of 0.000. Because tcount 14,694 > ttable 2,093, and a significance value of 0,000 < 0.05, these results indicate that there is a significant difference.

- 2) **The difference in the effect of chocolate milk and white milk on the hydration status of tennis players**

Table 4. ANOVA Results of Differences in Effect between Administrations Chocolate Milk and White Milk on Hydration Status

Group	Mean	Fcount	Ftable (df 2; 57)	Sig.
Chocolate milk	1.01765	1,625	3.16	0.206
White milk	1.01845			

From the ANOVA test results in the table above, it can be seen that $F_{count} = 1.625$ and $F_{table} (df 2; 57) = 3.16$, while the significance value p is 0.206. Because the value of $F_{count} = 1.625 > F_{table} (df 2; 57) = 3.16$ and the significance value of p is $0.206 > 0.05$, it means there is no difference. Thus H_a was rejected. Based on the analysis, it turns out that giving chocolate milk is better for the hydration status of tennis players with an average value of 1.01765 compared to giving white milk.

4. DISCUSSION

The discussion of the results of this study provides a further interpretation of the results of the data analysis that have been stated. Based on the hypothesis testing, there are two groups of analysis conclusions, namely: (1) there is an effect of chocolate milk and white milk on the hydration status of tennis players, (2) there is a difference in the effect of chocolate milk and white milk on the hydration status of tennis players.

Hydration is defined as the balance of fluids in the body and is an important requirement to ensure the metabolic function of the body's cells [1]. Hydration status is a condition that describes the balance of fluids and electrolytes in the body which comes from the regulation of fluids that enter and leave and is useful for ensuring the metabolic function of the body's cells. Adequate hydration is essential for maintaining homeostasis and human survival, including maintaining brain function. Failure to maintain adequate hydration status acutely will lead to impaired cognitive function, neurological function and organ failure which ultimately affects the quality of life [2].

Dehydration is a state of decreasing total water in the body due to pathological loss of fluids, inadequate water intake, or a combination of both. Dehydration occurs because the discharge of water is more than the amount that is entered, and this fluid loss is also accompanied by a loss of electrolytes [6]. Dehydration has a strong influence on brain function. Dehydration can occur without symptoms and if it continues can cause cognitive impairment, delirium / coma and even death [2]. The clinical manifestations of dehydration are closely related to the depletion of intravascular fluid volume. Continuous dehydration process can cause

hypovolemic shock which will lead to organ failure and death [6].

Chocolate milk is a drink that is beneficial and the most potential for athletes to recover after doing sports activities and also contains a source of antioxidants. The antioxidant content in chocolate is very high, namely flavonoids, which are derived from polyphenols. The benefits of the content contained in milk really help restore energy and muscle tissue that has been used during physical exercise. While the benefits of antioxidants contained in chocolate can help reduce the bad effects of damage caused by free radicals [3].

Chocolate milk is a recovery drink that provides the most optimal post workout benefits. Chocolate milk drink is necessary for high endurance athletes, compared to regular milk drinks, water or most other sports drinks. The chocolate milk drink has an additional double the carbohydrate and protein content perfect for replenishing tired muscles and helping to restore energy. The high water content in chocolate milk can replace lost fluids as sweat and prevent dehydration, while the antioxidants present in chocolate milk help prevent athletes from damaging cells during exercise, so that chocolate milk recovery drinks are said to have advantages and advantages over drinks. other remedies such as plain milk or other commercial sports drinks [5].

Milk is an emulsion of fat in water containing sugar, mineral salts and protein in the form of a colloidal suspension. Milk contains nutritional elements which are very good for growth and health. The composition of these nutritional elements varies greatly depending on several factors, such as heredity, type of animal, food which includes the amount and composition of feed given, climate, time, location, milking procedure, and age of the cows. The main composition of milk is water, fat, protein (casein and albumin), and lactose (milk sugar).

White milk has many benefits for the human body, including that it contains complete proteins such as: raw fresh cow's milk provides all the standard amino acids, which our bodies will store and then convert into usable forms. About 80% of the protein in milk is casein (quite heat stable but easy to digest). The other 20% is whey protein, easy to digest but very heat sensitive. Immunoglobulins are a very complex type of milk protein which is also known as antibodies which are useful to protect our body from viruses, bacteria, toxins and can also help reduce the severity of asthma symptoms.

5. CONCLUSION

Based on the results of the study, it was concluded that (1) there was an effect of giving

chocolate milk and white milk on the hydration status of tennis players, (2) there was a difference in the effect between giving chocolate milk and white milk on the hydration status of tennis players. Feeding chocolate milk is better than white milk on hydration status.

REFERENCES

- [1] Alim, A. (2012). *Persepsi atlet terhadap kebutuhan cairan (hidrasi) saat latihan fisik dan recovery pada unit kegiatan mahasiswa olahraga universitas negeri yogyakarta*. Artikel Penelitian, Fakultas Ilmu Keolahragaan, Universitas Negeri Yogyakarta, Yogyakarta.
- [2] Asiah, N. (2013). Air Dan Gangguan Fungsi Kognitif. *Majalah Kesehatan Pharmamedika*, 5 (1).
- [3] Gilson SF, Saunders MJ, Moran CW, Moore RW, Womack CJ, Todd MK. (2010). Effect of Chocolate Milk Consumption On Makers of Muscle Recovery Following Soccer Training : A Randomized Cross-Over Study. *Journal Int Sport Nutrition*. 7-19.
- [4] Hadi, S. (2004). *Metodologi research, jilid 4*. Yogyakarta: Andi Press.
- [5] Ilham, D., Afriwardi, Yerizel, E. (2015). Pengaruh Pemberian Susu Coklat Terhadap Kadar F2-Isoprostan pada Siswa di Pusat Pendidikan dan Latihan Olahraga Pelajar (PPLP) Sumatera Barat. *Jurnal Kesehatan Andalas*, 4 (3), 659-663.
- [6] Leksana, E. (2015). Strategi Terapi Cairan Pada Dehidrasi. *CDK-224*, 42 (1).
- [7] Primana, D. A. (2000). *Kebutuhan air & elektrolit pada olahraga*. Pedoman Pelatihan Gizi Olahraga untuk Prestasi. Direktorat Gizi Masyarakat.
- [8] Safitri, A., Sumekar, T. A & Supatmo, Y. (2016). Pengaruh Akut Susu Cokelat Dan Minuman Olahraga Komersial Sebagai Minuman Pemulihan Pasca Latihan Pada Program Interval Training (Studi Pada Sekolah Sepak Bola Universitas Diponegoro). *Jurnal Kedokteran Diponegoro*, 5 (4), 534-544.