Original Article

Effect of Whey Protein on Aerobic Exercise Ability of Football Players

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Abstract

Objectives: The objective is to discuss the effects of whey protein on the aerobic exercise ability of football players. **Methods:** A total of 36 college football players were randomly divided into control group and observation group. Eighteen cases in the control group were given pure water for athletes, and 18 in the observation group were given whey protein which was used as an athlete's supplementary ability. The two groups of footballers were given 8 weeks of physical training, and the athletes needed additional energy within 1 h before and after training. The physical fitness test and blood biochemical index of the two groups of football players were observed and recorded. **Results:** Compared with the control group, the erythrocyte function of the observation group was more significant, and the difference between the two groups was statistically significant ($P < 0.05$). The results of physical fitness test in the observation group were significantly higher than those in the control group, and the difference between the two groups was statistically significant ($P < 0.05$). **Conclusions:** The application of whey protein to soccer players can strengthen the protection of erythrocyte function and has certain application value.

Keywords: Aerobic exercise, athletes, blood biochemical, footballers, physical fitness

Introduction

Football is a nonperiodic confrontation with the field project, with football competition, confrontational tactics, complex changes, longer duration of exercise, exercise intensity, and physical consumption characteristics.[1] Studies show that 74.5% of the energy consumption in football matches comes from aerobic metabolism, while anaerobic metabolism accounts for only 25.5%.[2] In addition to the excellent skills and tactics of athletes, good aerobic endurance and anaerobic sprint are crucial factors. Therefore, the influence of nutritional factors on football has been paid more and more attention by sports medical researchers.[3] Ivy believes that in the process of sports training (including the recovery period and after exercise), metabolism, physiological and biochemical process has three phases, namely energy phase, synthesis phase, skeletal muscle growth, and repair.[4] Therefore, according to the characteristics of human biological rhythm, choosing the right time to replenish and get the best benefit is the basic viewpoint of timing nutrition.[5] The experiment takes the amateur college student athletes as the object. During the training and competition of the seventh college sports meeting in Guangdong Province, the effects of "oligosaccharide + whey protein" on Athletes' sports physical fitness are supplemented during the training and competition of the seventh college sports meeting.[6] The aim of this experiment is to apply the timing nutrition supplement theory to the nutrition regulation and control practice of football and the recovery of physical fitness. In the course.

Overview

Usually, a football match consists of 2 45 min of the first half, which is characterized by intermittent moderate intensity aerobic exercise, as well as intermittent anaerobic exercise of high intensity, intense. Therefore, football not only requests the athlete to have superb sports technique and tactics, and for athletes with good aerobic endurance and anaerobic sprint ability. In a fierce football match, the weight of the athletes will drop by 3–5 kg, so the requirement for nutrition is completely closed. In theory, the simple supplement of sugar before exercise can increase the muscle lining, the

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reserve of liver glycogen, keep the blood sugar level, save the muscle glycogen, reduce the consumption of muscle glycogen and prolong the exercise time. After exercise, the lining can accelerate the muscle lining. The original recovery, high content of muscle enamel, fast running speed, prolonged exercise to exhaustion. The preexercise and post whey protein can provide the energy supply of skeletal muscle for long time exercise, promote protein synthesis and muscle growth, remove free radicals and antioxidant, improve the immune ability of the body, and delay the central fatigue. Rarely.

Methods

Nutritional supplement and training plan in preparation for the 2006 seventh University Games in Guangdong Province during the period of the two groups of athletes every day to complete the same training plan, training six times a week, three times/h. During the training period, the single-blind test group was used to supplement the "oligosaccharide + whey protein" (4: 1) drink 800 mL (including whey protein 25 g) before and after 1 h daily training, and supplemented the whey protein 25 g before the training day, while the control group supplemented the same color and smell of pure water and did not supplement any energy before sleeping. The time of taking nutrients was consistent with that of the experimental group, and the test lasted for 12 weeks. All athletes were required to have meals in the student canteen during the experiment. The standard of food was basically controlled at 15–17 yuan/day without additional nutrition supplement. The nutriment super whey protein and oligosaccharide used in the experiment were purchased from Beijing New Technology Development Co., Ltd.

Maximum oxygen uptake test: two groups of athletes before and after the test in 800-Ergometer power bicycle (Holland LodeB. Y) maximum oxygen uptake test. After the 5 min warming up test, the incremental exercise load procedure of the bicycle was started. The initial load was 100 W, increasing 50 W every 3 min to exhaustion. Test exercise to exhaustion time, exercise center rate and $VO_{2\,max}$. Anaerobic capacity test: two groups of athletes before and after the test were carried out in 800-Ergometer power bicycle anaerobic capacity test. The subjects were pedaling 2–4 min on the power car, so that their heart rate reached 150–160/min, during which 4–8 s carried out 3–5 min full drive. The test was carried out after 3–5 min rest. The start of the test after the decree (adjusted within 2–4 s resistance, resistance coefficient is 0.98), the subjects tried to fast load calculation after a specified Qida rim number. The resistance of the power car is 0.98* body mass, and the load resistance (kg) and the number of turns per cycle is 11.765 per 5 s power (W). Physical fitness test: physical fitness test before and after the test [Table 1].

Main outcome measures: the changes of $VO_{2\,max}$, anaerobic capacity, and physical fitness index before and after the two groups of athletes. Statistical analysis: by second the author uses the software SPSS11.5 IBM Corporation statistical processing, all the data [Table 1] show a set of data, *t*-test was used to compare the differences between groups, $P < 0.05$ for the difference was significant.

Table 1: Physical fitness test: Physical fitness test before and after the test

Project	Representative quality
Standing long jump	Lower limb explosive force
1 min push up	Strength endurance of upper limb
1 min' sit ups	Lumbar abdominal strength endurance
A standing 3 min run	Short distance moving speed
5 m × 25 m shuttle run	Speed endurance
12 min run	General endurance
1llmois sensitive test	Sensitive
Body forward flexion	Pliable
Change run	coordinate

Table 2: Comparison of aerobic capacity indexes between the two groups before and after the experiment

Group	Quiet heart rate	Incremental load exercise heart rate		
		50 W	100 W	150 W
Control group				
Before the test	65.3±5.9	86.1±7.4	108.3±9.7	141.4±1.9
After the test	65.1±6.4	87.3±7.3	109.9±8.4	139.3±2.2
Experience group				
Before the test	64.5±6.1	85.0±6.8	105.9±8.2	139.8±0.3
After the test	64.1±7.7	88.7±7.7	111.1±6.5	138.3±1.1
Group	**Heart rate at convalescence**			**Maximum oxygen content**
	1 min	**3 min**	**5 min**	
Control group				
Before the test	94.6±2.6	82.3±14.0	78.1±0.5	55.62±6.72
After the test	108.9±3.3	101.4±2.3	88.0±2.1	61.79±6.2
Experience group				
Before the test	92.0±3.7	80.1±3.5	77.0±9.5	53.54±7.22
After the test	105.9±0.3	85.1±3.0	80.0±0.1	56.85±1.2

Results

The number of participants in the amateur men's soccer team was 16. All of them entered the result analysis without falling off. The effect of "sugar + whey protein" beverage on aerobic capacity of college football players is shown in Table 2.

The effect of "sugar + whey protein" beverage on the anaerobic capacity of college football players is shown in Table 3. The influence of "sugar + whey protein" beverage on the physical fitness and competition performance of college football players is shown in Table 4. In football matches, the intensity of movement varies greatly, and the characteristics of different positions are different. According to statistics, the sprint of athletes from 10 to 30 m distances accounted for 40%, 30–50 m of sprint accounted for 40%, and the distance between 50 m and above accounted for 20%. The offensive and defensive transformation in sports is fast and frequent, and a fast attack

Table 3: Comparison of the anaerobic capacity test results between the two groups before and after the experiment

Group	Maximum power (W)	Maximum power time (s)	Average power (W)
Control group			
Before the test	775.1±73.4	8.6±0.6	661.5±46.0
After the test	869.6±63.1	8.1±0.2	784.1±100.8
Experience group			
Before the test	786.6±99.4	8.3±0.5	675.4±52.8
After the test	920.1±127.8	7.8±0.6	823.8±65.4

Table 4: Comparison of physical fitness indexes between the two groups before and after the experiment

Test index	Control group	
	Before the test	After the test
Standing long jump	2.41±0.97	2.54±0.10
1 min push up	33.13±5.08	35.38±4.80
1 min' sit ups	37.80±3.11	40.25±3.21
A standing 3 min run	4.26±0.15	4.25±0.15
5 m × 25 m shuttle run	21.84±0.70	21.71±0.74
12 min run	2818.75±212.03	2844.38±251.79
1llmois sensitive test	15.85±0.34	15.72±0.37
Body forward flexion	15.11±6.50	16.01±3.21
Change run	9.35±0.68	9.11±0.68
Test index	**Experience group**	
	Before the test	**After the test**
Standing long jump	24.8±0.18	2.61±0.17
1 min push up	34.38±4.41	38.75±4.86
1 min sit ups	36.70±3.16	41.13±2.95
A standing 3 min run	4.25±0.17	4.22±0.17
5 m × 25 m shuttle run	21.73±0.85	20.58±0.86
12 min run	2856.25±272.02	2947.50±308.53
1llmois sensitive test	15.9±0.50	15.78±0.50
Body forward flexion	16.23±6.73	16.95±1.71
Change run	9.43±0.62	9.09±0.60

time is around 10s. In the game, pass, pass breakfast jump for the ball, tackle, shooting, fast, reasonable collision back all the time in the movement of <8s, therefore, requires good anaerobic capacity. In addition, a football game time at about 90 min in the game, with or without the ball athletes running distance reached 10,000 m, the aerobic energy supply accounted for 70%–80%.

Conclusions

Before, during, and after the human body physiological biological rhythm, metabolic processes, body nutritional requirements, and the body's digestion and absorption capacity are not the same. The change of the blood flow in the gastrointestinal tract and its rhythmic changes in exercise and secretion can affect the digestion and absorption of nutrients. Therefore, at different time, the optional nutrition supplement can not only provide the nutrition and energy needed for the exercise, promote the rapid recovery of the physical energy after the exercise, but also ensure that the supplemental nutrition can be absorbed and utilized in a short time and exerts its function. From the experiment, the following conclusions can be drawn; the timing of joint replenishment oligosaccharides plus whey protein can improve the anaerobic and aerobic capacity ability of body football in the process, and promote physical recovery.

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Conflicts of interest

There are no conflicts of interest.

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