Research on Effects and Compatibility Taking of Different Sports Supplements on the Biochemical Indicators and Body Functions of Elite Walking Athletes

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Abstract: Scientific training, elimination of fatigue, and reasonable nutrition is the three important parts of successful training. Especially in the fatigue recovery and reasonable nutrition of track and field endurance project, which is more important than other project significance? This paper is to more scientific nutritional intervention on the walking athletes to improve athletic performance and provide experimental evidence. 12 male and 12 female athletes were selected from the Chinese national walking team were given the nutrition intervention of a variety of sports supplements for 9 weeks. The serum testosterone (T), blood urea (BU), and serum creatine phosphokinase (CK) and other indicators were tested in several weekends. The results showed that the different exercise taking supplements can increase the T levels of male and female walking athletes, and promote the body protein synthesis and the function of rapid recovery, reduce the levels of serum CK and BU abnormalities after the intensity training, and ensure the smooth completion of the training and a normal competitive level. The different exercise taking supplements can improve the biochemical indicators and improve the level of physical function.

Keywords: Athlete, Biochemical indicators, Blood testosterone (T), Blood urea nitrogen (BUN), Bodily function, Hemoglobin (Hob), Lycopene, Red Jing Tian, Sports supplements, Training level, Walking.

1. INTRODUCTION

The nutritional supplements of general athletes are mainly considered more of protein, fat, sugar and water, inorganic salt, vitamin and other nutritional [1]. The under load of high level endurance athletes body is bigger and bigger, so it is easy to cause a variety of exercise-induced diseases such as excessive fatigue. This study selects national race team high level athlete as the research object, adopts many kinds of sports supplements compatibility, aiming at improving athletes body function and athletic ability. According to the theory of biochemistry analysis, home iron, l-carnation, glutamine, lycopene thistle sapiens and Chinghai JingXianLing etc. supplements are selected as compatibility. Results show that the home iron has good effects on promoting bone marrow hematopoietic and treating animals’ haemolytic and uncontrolled haemorrhagic anaemia, regulating iron enzyme activity, etc. L-carnation in sports can help the body burn fat, fat to improve sports power ratio, it can also remove too much lactic acid and improve the ability of doing work and delay fatigue. Glutamine can effectively prevent muscle protein decomposition, increased cell volume, promote muscle growth. It also can stimulate the secretion of growth hormone, insulin and testosterone, reduce lactic acid accumulation is caused by the movement of the exercise capacity and fatigue. Rheidol rose can adjust the bodies.

Immune function, delays the production of sports fatigue, reduce blood urea nitrogen levels after intensive training, and promote the recovery of body function [2]. This research through taking a variety of supplements compatibility and phase to determine the related biochemical indicators, its purpose is to race walking athlete’s nutrition intervention and monitoring function, and provide experimental basis for scientific training and improve performance.

2. OBJECT AND METHODS OF EXPERIMENT

The objects of study are national race walking athletes of 12 men and women, a total of 24 people.

2.1. Experimental Supplements

Hammer TM home iron, l-carnation capsule, 100% health bit pancreatic phthalic amine capsules, health bit of lycopene, Chinghai JingXianLing. The above medicines are bought in Beijing sports nutrition health Bit Company.

2.2. Training Plan

(1) First stage: basic preparation (1st week). Giving priority to with strength training, the key are the breakthrough of strength and the coordination of the body.

(2) Second stage: improving ability (2-4th weeks, 3 weeks). Training is given priority to with special endurance training, mainly solving the problem of game after the process of physical deficiency, and the lack of ability.

(3) Third stage: periodic adjustment (5th week). With a relatively large intensity, the smaller amount of exercise
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training is given priority to, intermittent training, to maintain the special ability to decline.

(4) Fourth stage: consolidating and rise ability period (6th to 8th week, 3 weeks). Personalized training, the combination of interval training and speed training improve special ability.

(5) Fifth stage: pre-match preparations (9th weeks)

We according to the situation of recently training to carry on positive adjustments, the load and exercise should be less, avoid the fatigue caused by training, and ensure sufficient physical strength to ensure the needs of the game [4, 5].

2.3. Results of Experiment

Different sports supplements compatibility taking effect on morning pulse change walker From Fig. (1) we can see that the morning pulse of male and female intensity change of the fluctuations along with the amount of exercise in the whole training period, and two peaks appeared in the 4th and 8th week, but at the same time three troughs appeared in 1st, 5th, 9th weeks, and that of 9th week to reach the lowest point in the whole training period [6, 7].

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Fig. (1). Mean values of male and female Athletes’ morning pulse in different training phrases.

It can be seen from Table 1 that in the second stage (ability rising period, 2-4 weeks) and the fourth stage (ability consolidating and rising period, 6 to 8 weeks), the athlete's morning, along with the change of physiological load of exercise and intensity of the two peaks; The second, four stage compared with the first stage were significantly higher (P<0.05), showed the athletes to exercise intensity has some does not adapt. In the third stage (periodic adjustment) and the fifth stage (pre-match preparation), we can also see the morning diastolic blood pressure showed a marked decline of average value, compared with the second phase has a significantly decreased (P<0.05), and the fifth stage of the early diastolic blood pressure for men and women average value significantly higher than that of the fourth stage (P<0.01).

As it can be seen from Table 2, in the second stage (improving ability phase) and the fourth stage (ability consolidating and rising period), the athletes' average diastolic blood pressure early in the morning, along with the change of physiological load of exercise and intensity of the two peaks; The second, four stage compared with the first stage were significantly higher (P<0.05), showed the athletes to exercise intensity has some does not adapt. In the third stage (periodic adjustment) and the fifth stage (pre-match preparation), we can also see the morning diastolic blood pressure showed a marked decline of average value, compared with the second phase has a significantly decreased (P<0.05), and the fifth stage of the early diastolic blood pressure for men and women average value significantly higher than that of the fourth stage (P<0.01).

As it can be seen from Table 3, the second stage compared with the first stage, average amount of HCT (blood red blood cell volume), Hob (haemoglobin), MCH (the average amount of red blood cell haemoglobin) and MCHC of male athletes haemoglobin concentration (RBC) has significantly decreased (P<0.05). The third stage compared with the second stage, RBC (red blood cell count), the MCV, Hob, MCH and MCHC of male athletes have increased significantly (P<0.05). Fourth stage compared with the first stage, RBC, MCV and RDW (red blood cell distribution width) of male athletes has increased significantly (P<0.05), the fourth stage compared with the third stage, Hob of male athlete have a significantly decreased (P<0.05), MCH and MCHC have significantly decreased (P<0.01).

4. EFFECT OF DIFFERENT SPORTS SUPPLEMENTS COMPATIBILITY TAKING ON BLOOD BIOCHEMICAL INDICATORS IN WALKER

Different sports supplements compatibility taking effect on blood testosterone levels of race-walkers are shown in Table 4.

It can be seen from Table 4 that the second stage compared with the first stage, male and female athletes blood testosterone levels were significantly lower (P<0.05). The

![Fig. (2). Mean values of male and female Athletes’ diastolic pressure in different training weeks.](image-url)
Table 1. Mean values of male and female athletes’ morning pulse in different training phrases.

| Sex     | First stage (times/min) | Second stage (times/min) | Third stage (times/min) | Forth stage (times/min) | Fifth stage (times/min) |
|---------|-------------------------|--------------------------|-------------------------|-------------------------|-------------------------|
| Man     | 52.30±4.58              | 53.94±4.80               | 52.77±3.93              | 54.39±4.74              | 51.89±4.82              |
| Woman   | 53.29±4.18              | 54.33±3.51               | 53.64±3.83              | 54.69±3.94              | 53.07±4.16              |

Table 2. Mean values of male and female athletes’ diastolic pressure in different training phrases.

| Sex     | First stage (times/min) | Second stage (times/min) | Third stage (times/min) | Forth stage (times/min) | Fifth stage (times/min) |
|---------|-------------------------|--------------------------|-------------------------|-------------------------|-------------------------|
| Man     | 52.30±4.58              | 53.94±4.80               | 52.77±3.93              | 54.39±4.74              | 51.89±4.82              |
| Woman   | 53.29±4.18              | 54.33±3.51               | 53.64±3.83              | 54.69±3.94              | 53.07±4.16              |

Table 3. Mean values of male athletes’ RBC, Hb and other parameters in all training phrases.

| Index               | First stage (kpa) | Second stage (kpa) | Third stage (kpa) | Forth stage (kpa) | Fifth stage (kpa) |
|---------------------|-------------------|--------------------|-------------------|-------------------|-------------------|
| RBC(x10^9/L)        | 5.19±0.43         | 4.87±0.52          | 5.15±0.46         | 4.78±0.57         | 5.15±0.52         |
| HCT(L/Lx10^2)       | 45.38±1.12        | 43.13±1.58         | 4499±1.25         | 43.42±1.51        | 45.67±1.54        |
| MCV(FL)             | 89.69±3.42        | 92.68±3.85         | 90.90±3.68        | 93.88±1.44        | 91.30±4.52        |
| RDW(FL)             | 13.04±0.52        | 14.26±0.69         | 13.67±0.55        | 14.57±0.75        | 12.50±056         |
| Hb(g/L)             | 139.20±9.95       | 129.62±10.20       | 141.56±8.14       | 131.56±10.24      | 148.63±12.56      |
| MCH(pg)             | 27.64±1.80        | 24.85±2.06         | 28.77±2.65        | 25.75±2.65        | 30.46±2.41        |
| MCHC(g/L)           | 308.93±9.21       | 288.15±10.36       | 293.31±12.56      | 293.31±12.56      | 328.93±13.92      |

Table 4. Changes of serum testosterone content in male and female athletes at various training phrases.

| Sex     | First stage (kpa) | Second stage (kpa) | Third stage (kpa) | Forth stage (kpa) | Fifth stage (kpa) |
|---------|-------------------|--------------------|-------------------|-------------------|------------------|
| Man     | 564.39±119.32     | 524.35±128.77      | 575.19±128.54     | 538.89±1.72       | 605.57±216.30    |
| Woman   | 32.53±8.52        | 27.55±15.88        | 35.22±9.59        | 29.16±1.65        | 36.85±14.36      |

Table 5. Changes of blood urea content in male and female athletes at various training phases.

| Sex     | First stage (kpa) | Second stage (kpa) | Third stage (kpa) | Forth stage (kpa) | Fifth stage (kpa) |
|---------|-------------------|--------------------|-------------------|-------------------|------------------|
| Man     | 12.30±2.31        | 16.54±3.25         | 13.74±3.25        | 16.80±2.55        | 12.85±3.46      |
| Woman   | 10.62±2.82        | 15.69±3.62         | 12.68±3.40        | 15.92±3.35        | 11.69±3.92      |

third stage compared with the second stage, the male and female athletes blood testosterone levels have a significantly higher (P<0.05). The fourth stage compared with the third stage, the male and female athletes blood testosterone levels have a significantly lower (P<0.05). The fifth stage compared with the second stage, male and female athletes blood testosterone levels have a significantly higher (P<0.05).

5. INFLUENCE OF BLOOD UREA LEVELS ON RACE WALKING ATHLETES

Different sports supplements compatibility taking effect on the race walking athletes blood urea levels are shown in Table 5.
It can be seen from Table 5 that the second stage compared with the first stage, male and female athletes blood urea levels had a significantly higher ($P<0.05$). The third stage compared with the second stage, the male and female athletes blood urea have more levels decreased significantly ($P<0.05$). The fourth stage compared with the third stage, the male and female athletes blood urea levels had a significantly higher ($P<0.05$). The fifth stage compared with the second stage, male and female athletes blood urea levels had a significantly reduced ($P<0.05$); The fifth stage compared with the fourth stage, male and female athletes blood urea levels had significantly lower ($P<0.01$).

CONCLUSION

Through this experiment the following conclusion can be drawn: Taking of different sports supplements compatibility can accelerate the morning pulse recovery level of male and female walkers in the big strength training, suggesting that the ability of the athlete's heart rate reserve improved, is advantageous to the athletes function recovery after exercise. Different sports supplements can be used to adjust the blood pressure levels by the compatibility of male and female walkers in the big strength training period, suggesting that the ability of the athletes of myocardial contraction improved, make it be able to adapt quickly due to the movement of the load. Different sports supplements can be used to take can inhibit the intensive training of red RBC, Hob and T level, this shows that the composite supplements can prevent the oxidative damage of red blood cells and the aging process, so as to protect the structural integrity of red blood cells. Different sports supplements can be used to adjusted the compatibility of different sports supplements take big BUN level caused by abnormal load movement, reduce the level of fatigue of athlete, and ensure the smooth completion of the training mission and normal play of the competitive level.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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