

# Effect of Oral Creatine on Anaerobic Sports Ability of Soccer Players

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## Abstract

**Objectives:** The objective of this study is to explore the effect of oral creatine on the anaerobic exercise ability of soccer players. **Methods:** Twenty healthy football players in five football teams were selected as the study participants, and they were randomly divided into the observation group and control group, each of which was 10. The football players in the control group were given glucose at a rate of 5 g/time, and the members of the observation group were given creatine glucose at a rate of 5 g/time and the supplementation of the two groups was 5 g × 4 when they have their meals and before bedtime. During the period, the training of the football players is normal. Moreover, the blood lactic acid and oxygen-free work of the two groups were compared. **Results:** After having oral creatine, the peak of oxygen-free work of the observation group was significantly increased, which was obviously superior to the control group without oral creatine. The difference was statistically significant ( $P < 0.05$ ). After having oral creatine, the lactate level of 3 min in the observation group was significantly lower than that in the control group after exercise, and the difference was statistically significant ( $P < 0.05$ ). **Conclusions:** After the oral creatine is taken orally, the peak of the oxygen-free work, the explosive force and the action quality of the football player can be improved. Significantly, it can increase the speed of movement fatigue recovery and it is worth popularizing.

**Keywords:** Glucose, oxygen-free work, soccer players

## INTRODUCTION

At home and abroad in recent years, reports on the study of creatine, a short period of time, great strength, repetitive motion, supplement creatine will make players better maintain work, delay the development of the fatigue intensity, to improve the power capability of muscle. Creatine is the raw material of creatine phosphate (CP), and the increased concentration of creatine in muscles can provide energy for sports or competitions quickly.<sup>[1]</sup> Human creatine is mainly obtained through two ways, which is synthesized from food into exogenous creatine and *in vivo* into endogenous creatine. Creatine is mainly found in skeletal muscle, cardiac muscle, brain, testicles, kidneys, liver, and other organs of the human body, with the highest content of skeletal muscle, accounting for about 95% of the total amount of creatine in the human body. Studies have shown that the content of creatine in skeletal muscle of normal people is (124), 4-11.2 mmol/kg dry muscle mass. The application of creatine supplementation in sports practice also focuses on sprinting, hurdles, cycling, and basketball in track and field. However, the effect of creatine

supplementation on the sports function of Wuhu athletes has not been reported. The effect of creatine supplementation on soccer players can provide feasible references for the application of creatine in football.<sup>[2]</sup>

## Overview

Creatine is used as a nutritional supplement, mainly to increase the storage of CP in muscles, increase the rate of resynthesize of CP during exercise, and shorten the recovery period after exercise. Although taking creatine will put on weight, the study confirmed that the additional weight belongs to the removal of the fat weight, mainly because of creatine-stimulating protein synthesis, increased muscle mass, and put on weight. According to related literature, many foreign-type creatine supplementation on muscle strength and explosive force of sports performance is helpful. In this study has aimed at

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creatine supplementation on anaerobic capacity, anaerobic power has the highest average anaerobic power and add to explore the influence of fatigue index, in order to understand the use of creatine timing and results.<sup>[3]</sup> Fourteen soccer players were randomly selected for physical health and were randomly divided into two groups: experimental group and control group, with seven players in each group. The participants' general condition is shown in Table 1.

The purpose of this study was to investigate the effects of creatine supplementation on the peak value of lactic acid in blood, maximum anoxic power, anoxic capacity, average anoxic power, fatigue index, and liver and kidney function after exercise.

## METHODS

Supplement creatine methods athletes 59 × 4 supplementary ways, namely the daily meals and before bed every time; every time, 59 take glucose control group, experimental group is creatine + glucose. The time is 1 month. During this period, the athletes do normal training. Double-blind method was used in the experiment.<sup>[4]</sup>

Testing of lactic acid dehydrogenase, blood lactic acid, and anaerobic activity; blood lactic acid: YSI-232 lactic acid analyzer determination. Lactate dehydrogenase: Adopting the raw reagent in anaerobic power test kit to determine: The Wingate method (resistance X0 = weight 85 kg), in an 829 Monarch power on the bike, taking supplements before and after each. Test the maximum power and average power of 30s. All the data were statistically processed using the Excel software for mathematical statistics, *t*-test, and data were represented by mean plus or minus standard deviation.

## RESULTS

Table 2 shows that oral creatine significantly increased the peak value of anaerobic work in the experimental group from 718.21–59.74 W went up to 776.33–108.38 W, the change of control group is unknown. However, the effect of creatine on the mean value of anaerobic work was not obvious.

Oral creatine had no significant effect on the quiet level of blood lactic acid in soccer players but reduced the level of blood lactic acid 3 min after exercise. Oral creatine can increase the peak of anaerobic power in soccer players. It is suggested that creatine can improve the explosive power of martial arts routine athletes and optimize the quality of action. Oral creatine can reduce the concentration of lactic acid in athletes after exercise. It is suggested that oral creatine may accelerate the recovery of exercise fatigue [Table 3].

The reason can be discussed from intrinsic motivation. Before the experiment, there was no significant difference between the two groups, showing that the group of participants was homogeneous. After the experiment, the peak value of blood lactic acid increased significantly after the exercise, but there was no significant difference between the two groups.

**Table 1: Experimental group and control group, with seven players in each group**

Group	<i>n</i>	Age	Height	Weight
T-group	7	16.15±1.21	167.52±3.89	65.81±6.64
C-group	7	16.22±1.13	165.77±4.02	68.16±5.10

**Table 2: Effect of creatine supplementation on anaerobic work**

Group	<i>n</i>	Peak of anaerobic work	Mean value of anaerobic work
Experimental group	Pre	7	730.45±101.32
	Post		738.65±59.74
Control group	Pre	7	718.21±59.74
	post		776.33±108.38

**Table 3: Effect of oral creatine on blood lactic acid**

Group	<i>n</i>	Blood lactic acid in silence	Blood lactic acid 3 min after exercise
Experimental group	Pre	7	2.12±0.32
	Post		2.00±0.41
Control group	Pre	7	1.85±0.64
	post		1.80±0.66

Due to the double-blind experiment design, the experimenter and were all don't know what it is to belong to which group. Therefore, can be concluded that, under trend of motivation participants in the test, after all make more effort to trample power bicycle, used by anaerobic lactic acid sex ability is a pre-test, make the two groups after the post-test movement the peak value of blood lactic acid significantly increased when the previous test.<sup>[5]</sup>

After the experiment, the creatine group has highest anaerobic power and anaerobic ability than Ann has markedly improved comfort agent group. The results showed that the supplement of the creatine for the irregular movement of anaerobic exercise capacity has practical effect. After the experiment, the average anaerobic power of the creatine group was significantly increased compared with that of the previous measurement, and the results showed that the supplementation of creatine had a practical effect on the average anaerobic power of the creatine group. After the experiment, creatine group fatigue index (power decline rate) compared with placebo group obviously higher, and the results showed that creatine supplementation for the participants' highest has markedly improved anaerobic power, but for the participants to maintain highest anaerobic moving force, and whether the ability of motion duration has a significant effect, it is worth further deep into the research and discussion.<sup>[6]</sup>

## CONCLUSIONS

Our study observed that oral creatine significantly increased

the peak value of anaerobic work in the experimental group. The peak value of anaerobic work mainly reflects the explosive power of athletes. The higher the peaks value of anaerobic work, the better the explosive power of ordinary athletes. This effect of creatine has positive significance for martial arts routine athletes because in martial arts, turning ups and downs, flickering movements, rapid changes in speed and rhythm, the strength of explosive force can often determine the quality and level of a set of movements. In the creatine group, blood lactic acid was significantly reduced 3 min after exercise. Athletes after shipment move ever-increasing blood flow, enhance the function of the sodium pump, therefore, extracellular sodium concentration increased, for sodium and creatine into muscle cells were provided the driving force, the transfer process may be creatine supplementation to reduce the generation of blood lactic acid and accelerate lactic acid removal rate, but its mechanism is unclear.

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#### **Conflicts of interest**

There are no conflicts of interest.

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