EFFECTS OF THE CREATINE MONOHYDRATE SUPPLEMENT ON POWER OUTPUT AS MEASURED BY THE WINGATE ANAEROBIC POWER TEST (WAnT)

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Introduction

The Wingate Anaerobic Power Test (WAnT) has been a popular method for assessment of anaerobic power. Anaerobic power is determined when the adenosine triphosphate and phosphocreatine (ATP-PCr) energy pathways are used to as the energy source to generate mechanical work. Creatine monohydrate has been a staple supplement because it's inexpensive, safe and natural. Creatine is found and stored in our skeletal muscles as phosphocreatine which is associated with power output.

Purpose

The purpose of this study was to determine the effects that creatine monohydrate supplementation has on power output as measured by the WAnT.

Methods

Participants: Five male participants from the University of Texas at Arlington volunteered for this study.

Table 1: Participant Demographics

	Mean	Standard Deviation
Age (yr)	22.6	± 2.5
Height (in)	68.8	± 3.6
Weight (kg)	76.6	± 10.9

Procedure:

- On the first day, they will be asked to perform a 30-sec WAnT to get a baseline.
- They will warm up on the bicycle ergometer for about 3 to 5 minutes.
- After their warm up, they will pedal at maximum speed with no resistance for 3 sec and then fixed resistance will be applied for 30 sec. Then they will cool down for about 1 to 2 minutes before stopping the test. After a 4 min rest, they will repeat the WAnT.
- After the test, they will receive a week's worth of supplements, in which they will take 20 g a day with any kind of fluid.
- On Day 8, they will come back to perform two 30-sec WAnT with a 3 to 4 minute break in between each test as before.
- When the tests are done, they will be provided with another week's worth of a supplement in which they will repeat the same procedure as last time. Ingest 20 g of the supplement every day for that week.
- On Day 8, they will return for the last day of testing. They will perform two 30-sec WAnT with a 3-4 minute break in between each test.

Results

There was an increase in the overall averages of peak power, mean power, mean and peak power per body mass, rate of fatigue and total work from the placebo group to creatine monohydrate group. For the placebo group, the results were peak power (897.2 ± 341.5 W), mean power (568.9 ± 111.3W), mean power per body mass (7.5 ± 1.2 W/kg), peak power per body mass (11.6 ± 3.6 W/kg), rate of fatigue (61.4 ± 13.0%), and total work (17.0 ± 3.3 kJ). For the creatine group, the peak power (969.8 ± 219.5 W), mean power (575.1 ± 75.9 W), mean power per body mass (7.6 ± 1.0 W/kg), peak power per body mass (12.6 ± 2.0 W/kg), rate of fatigue (64.7 ± 13.6%), and total work (17.2 ± 2.3 kJ).

There wasn't any significant difference ($p > 0.05$) between the placebo group and the creatine group. However, there was a significant difference ($p < 0.05$) in peak power ($p = 0.009$), peak power per body mass ($p = 0.004$), and rate of fatigue ($p = 0.01$) between the baseline values and the placebo group.

Results (cont'd)

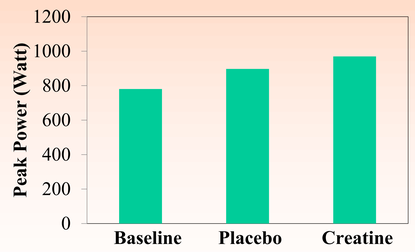

Figure 1. Average Peak Power Between Baseline, Placebo, And Creatine WAnT

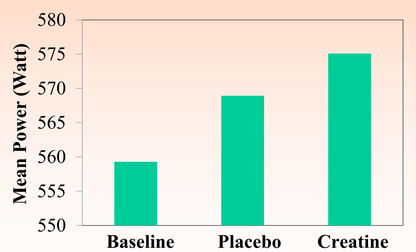

Figure 2. Average Mean Power Between Baseline, Placebo, And Creatine WAnT

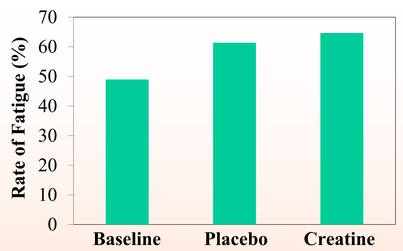

Figure 3. Rate Of Fatigue Between Baseline, Placebo, And Creatine

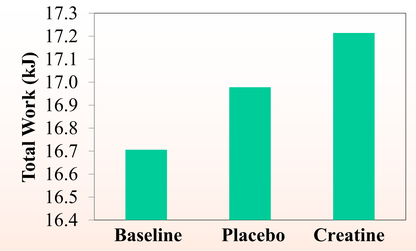

Figure 4. Average Total Work Between Baseline, Placebo, And Creatine

Conclusions

From baseline values to the end of seven days of supplementation with the placebo there was a significant increase in some of the measures of power output, but there were no significant increases after supplementation with creatine. It was concluded that learning may have contributed to the significant differences and that a longer time for supplementation with creatine monohydrate may be needed to show differences in power output.