



# THE EFFECTS OF SUPPLEMENTATION ON ANAEROBIC EXERCISE

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## Abstract

**INTRODUCTION:** Anaerobic exercise is most commonly identified as short term, high intensity exercise. During this type of exercise a person is able put forth maximum intensity in regards to speed, strength, and power. The duration for this type of exercise is very short lasting from a few seconds to approximately 2 minutes. One of the most common methods of evaluating anaerobic exercise performance is by having a person perform the Wingate Anaerobic Test (WANT). The WANT provides researchers with many different variables to analyze for anaerobic performance therefore, it is the test that will be utilized for this particular study.

**PURPOSE:** The purpose of this study was to evaluate the effects of Creatine Monohydrate supplementation on anaerobic exercise in men.

**METHODS:** 18 Men (M; age  $23 \pm 2.3$  yrs) who were University of Texas at Arlington students volunteered to participate in this study. Each subject performed the Wingate exercise test on a cycle ergometer with a torque factor of .8 starting with a 1 minute warmup and then a maximal sprint for 30 seconds. Subjects then recovered for 4 minutes before performing another 30 second sprint to complete their testing visit. There were a total of three visits for this study one for baseline and another after 5 days of placebo (PI) loading, followed by another visit once a 5 day Creatine Monohydrate (Cr) (2.5 grams/day) loading had been completed. During each testing day peak power (PP), mean power (MP), total work (TW), and rate of fatigue (RF) were measured by the Lode cycle ergometer for each sprint the subject performed.

**RESULTS:** The peak power measured after supplementing on placebo and creatine was measured at  $1157.18 \pm 193.83$  W (PI) and  $1129.53 \pm 223.31$  W (Cr) and did not result in a significant difference ( $p = 0.473$ ). The mean power values for this study were  $389.71 \pm 93.78$  W (PI);  $389.29 \pm 83.53$  W (Cr) which was also not significantly different ( $p = 0.975$ ). Total work resulted in  $11691.18 \pm 2813.36$  J (PI); and  $11675 \pm 2501.79$  J (Cr). These differences were not significant ( $p = 0.97$ ). Lastly, the results for anaerobic fatigue were  $34.3 \pm 6.23$  (PI);  $33.19 \pm 8.69$  (Cr) which were also not statistically significant ( $p = 0.59$ ).

**CONCLUSION:** After all supplementing and testing was completed, the results of this study did not indicate a significant effect on the anaerobic exercise variables evaluated. These results may have varied if the protocol would have required a higher loading period or higher supplement dosage.

## Purpose

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## Introduction

Anaerobic exercise is most commonly identified as short term, high intensity exercise. During this type of exercise a person is able put forth maximum intensity in regards to speed, strength, and power. The duration for this type of exercise is very short lasting from a few seconds to approximately 2 minutes. One of the most common methods of evaluating anaerobic exercise performance is by having a person perform the Wingate Anaerobic Test (WANT). The WANT provides researchers with many different variables to analyze for anaerobic performance therefore, it is the test that will be utilized for this particular study.

## Methods

**Subjects:**

-18 Men (M; age  $23 \pm 2.3$  yrs) who were University of Texas at Arlington students volunteered to participate in this study.

-All participants signed a consent form prior to beginning the study.

**Procedures:**

-Subjects reported for baseline measurements (height, weight, age) and then exercised on the Wingate Anaerobic Test (WANT) on the first day. The WANT requires the subject to pedal for 30 s at maximal speed against a constant force or resistance (0.8 torque) and to induce a noticeable development of fatigue within the first few seconds. A 1 min warmup of easy cycling is done before the resistance is increased. With the command “start,” subject will pedal as fast as possible against the resistance and will be encouraged to pedal as hard and fast as they can for 30 sec. Subjects will not be allowed to stand up during the 30 sec test. The resistance will automatically be removed at the end of 30 sec and subject may continue pedaling as long as they wish to cool down. After a period of approximately 4 minutes of rest subject will perform another 30 second sprint.

Subjects were then all be on a placebo (PI) loading period of five days. Placebo utilized was a sugar capsule in which subjects took 1 capsule daily. After the five day loading period the subjects reported for the second day of testing in which they performed the WANT again.

Afterwards subjects were all given creatine monohydrate (Cr) capsules (2.5 grams) in order to complete another 5 day loading period before performing their final day of testing on the WANT.

**Statistical Analysis:**

-During each testing day peak power (PP), mean power (MP), total work (TW), and rate of fatigue (RF) were measured by the Lode cycle ergometer for each sprint the subject performed.

-The alpha level for significance was set for  $p \leq 0.05$  for this study.

## Results

Table 1: Subject Characteristics

| Total Subjects | Age (Yrs.)   | Height (cm)   | Weight (Kg)     |
|----------------|--------------|---------------|-----------------|
| 18             | $23 \pm 2.3$ | $177 \pm 7.8$ | $82.6 \pm 13.5$ |

## Results (cont'd)

|                 | Creatine (Cr)          |                        | Placebo (PI)           |                        |
|-----------------|------------------------|------------------------|------------------------|------------------------|
| Peak Power (W)  | $1201.65 \pm 157.45$   | $1129.53 \pm 223.31$   | $1168.18 \pm 180.85$   | $1157.176 \pm 193.83$  |
| Mean Power (W)  | $493.24 \pm 105.56$    | $389.29 \pm 83.53$     | $492 \pm 102.55$       | $389.71 \pm 93.78$     |
| Total Work (J)  | $14826.5 \pm 3202.74$  | $11675.6 \pm 2501.8$   | $14760 \pm 3171.11$    | $11691.18 \pm 2813.35$ |
| Rate of Fatigue | $31.47 \pm 4.28$       | $33.19 \pm 8.69$       | $31.35 \pm 5.01$       | $34.3 \pm 6.23$        |
|                 | 1 <sup>st</sup> Sprint | 2 <sup>nd</sup> Sprint | 1 <sup>st</sup> Sprint | 2 <sup>nd</sup> Sprint |

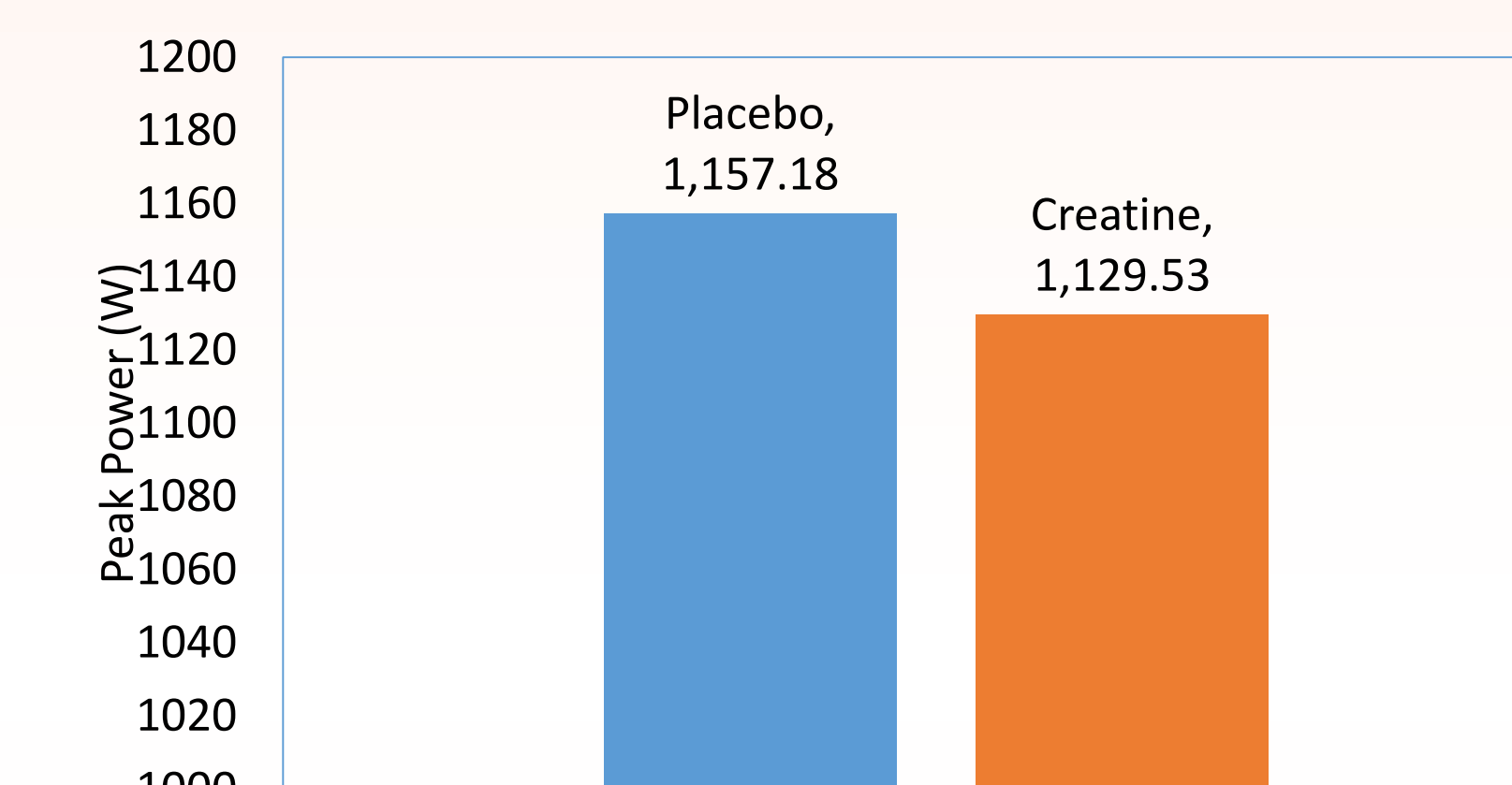


Figure 1: Comparison of Average Second Sprint Peak Power Between Placebo And Creatine

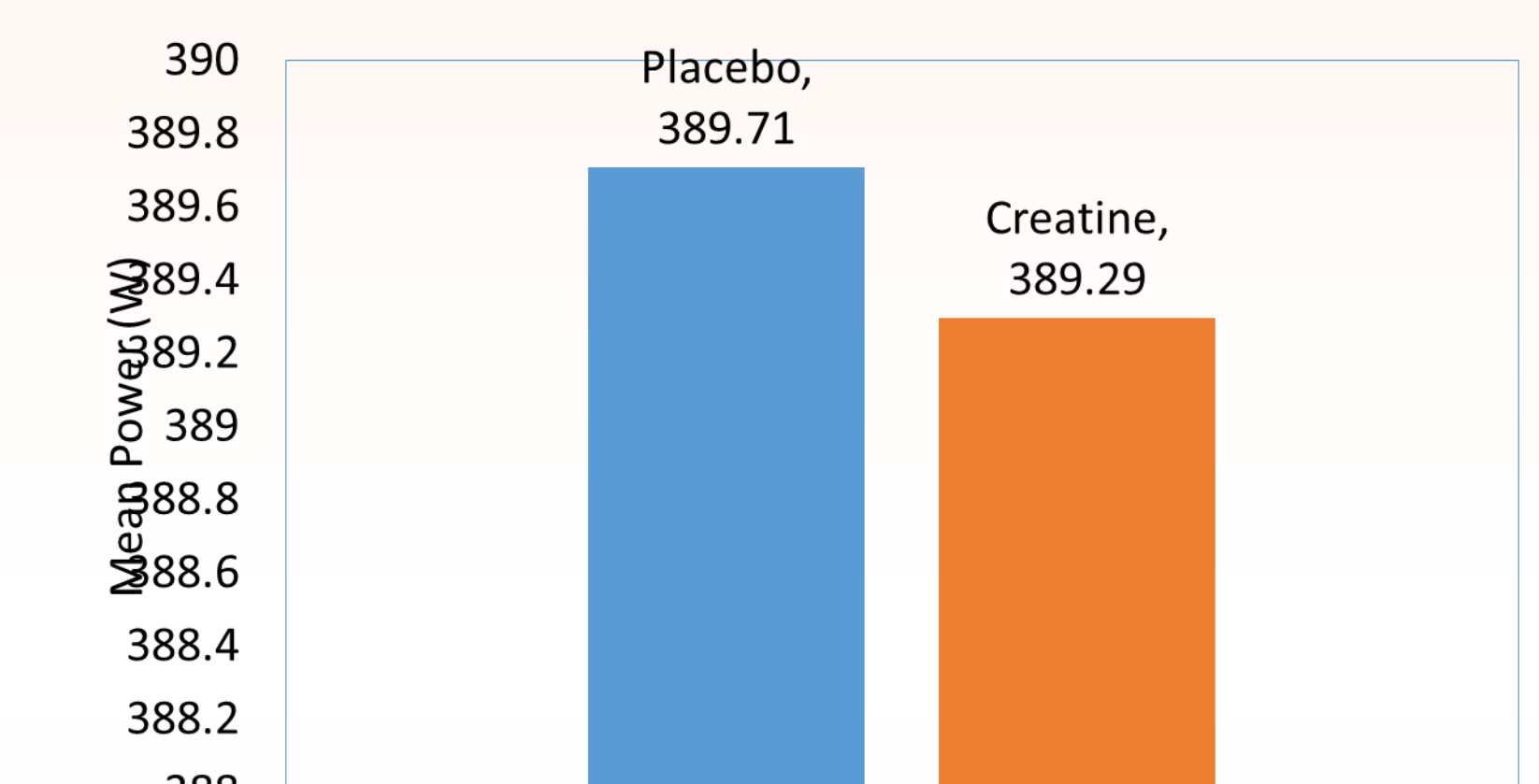


Figure 2: Comparison of Average Second Sprint Mean Power Between Placebo And Creatine

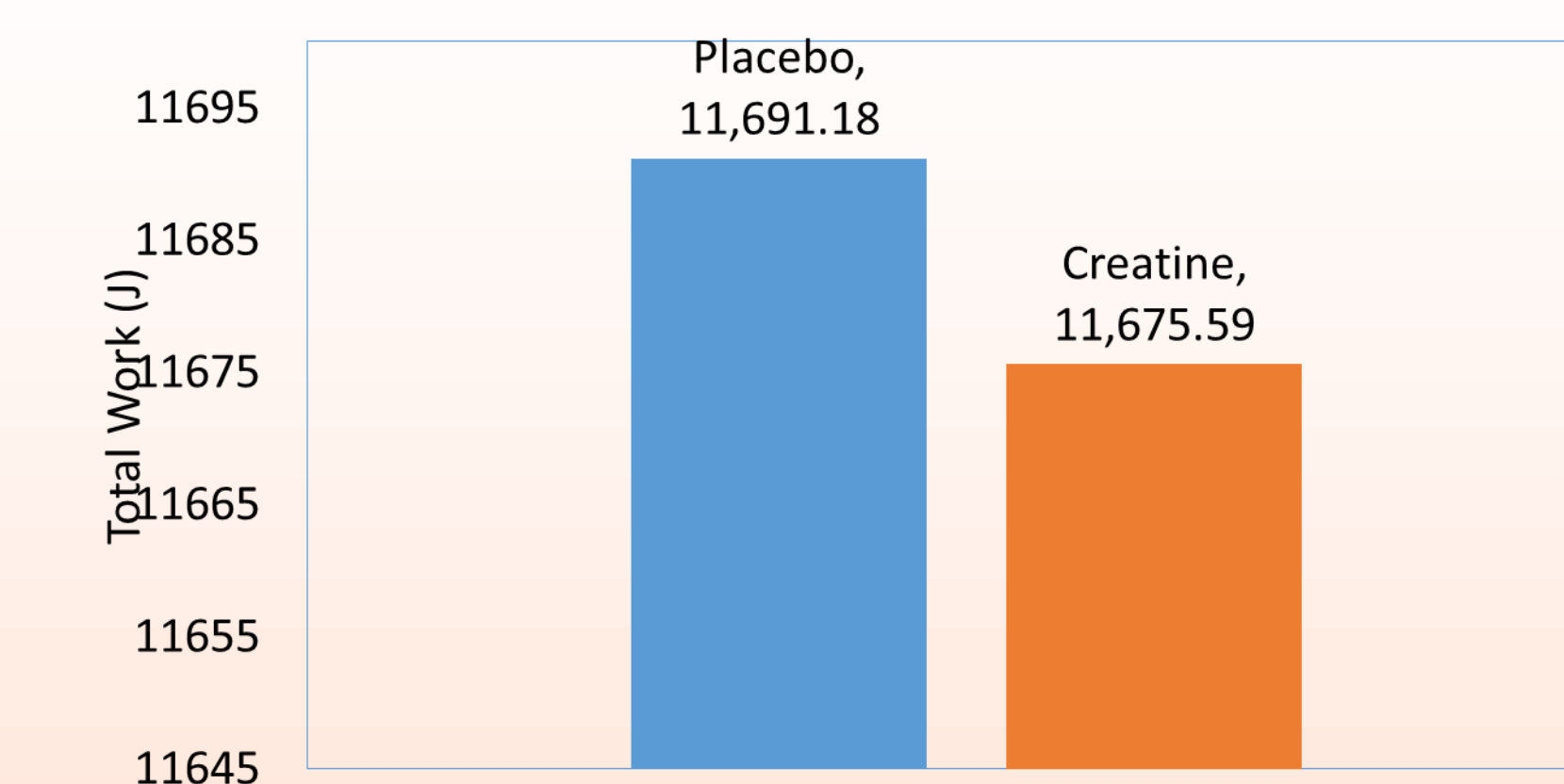


Figure 3: Comparison of Average Second Sprint Total Work Between Placebo And Creatine

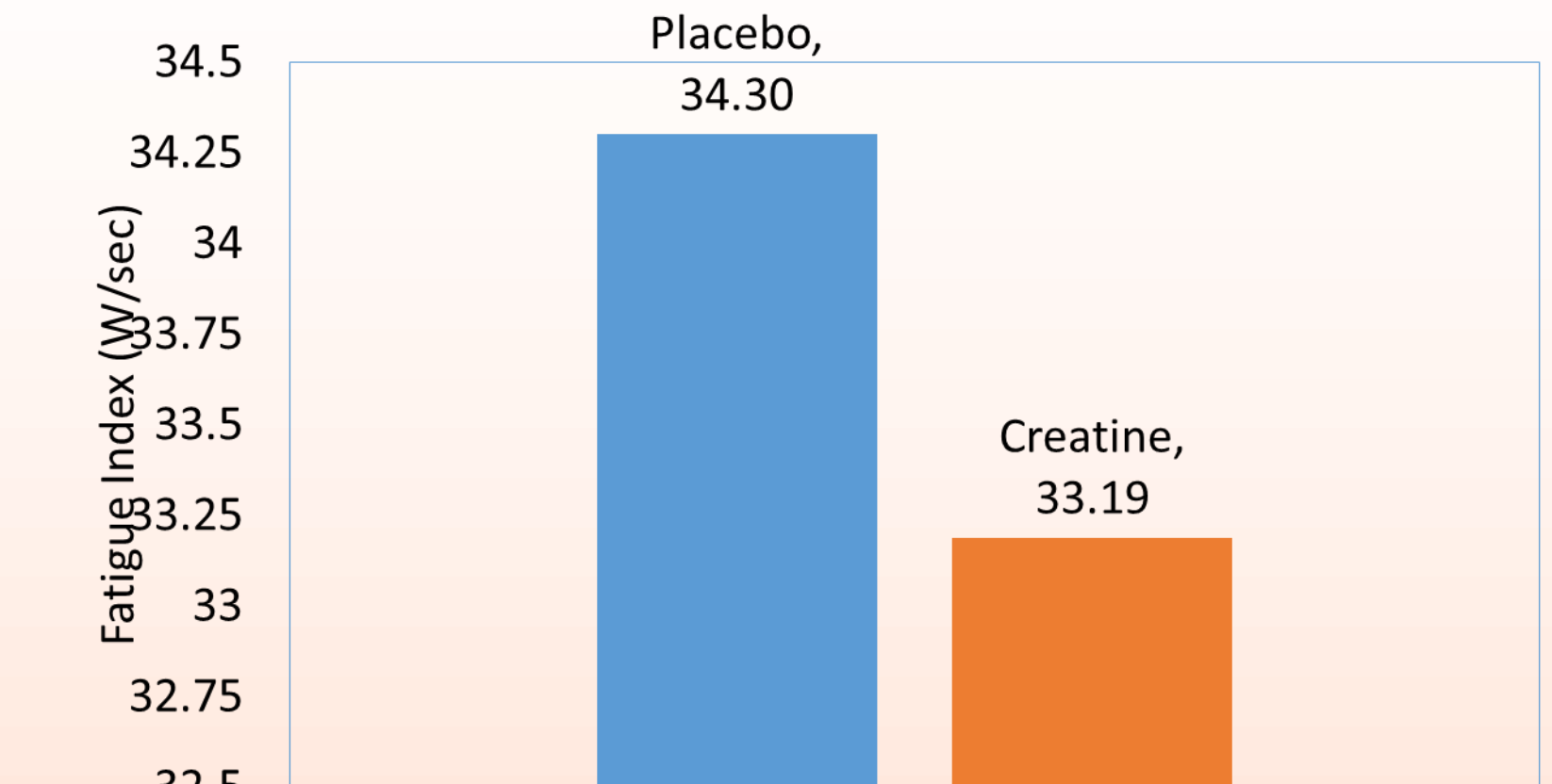


Figure 4: Comparison of Average Second Sprint Fatigue Index Between Placebo And Creatine

**Statistical Analysis**

- Listed below are the difference on the second Wingate sprints between both supplements
  - Peak Power:  $p = .473$
  - Mean Power:  $p = .975$
  - Total Work:  $p = .969$
  - Fatigue Index:  $p = .594$

## Conclusions

After all supplementing and testing was completed, the results of this study did not indicate a significant effect on the anaerobic exercise variables evaluated. These results may have varied if the protocol would have required a higher loading period or higher supplement dosage.