

The Effect of a Commercially Available Pre-Workout Supplement (The Bracket™) on Wingate Anaerobic Cycle Test Performance in Athletic Females



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ABSTRACT

The Bracket™ is a proprietary blend, pre-workout supplement whose primary active ingredients consists mostly of a mixture of creatine, B-complex vitamins, and a glycerol/taurine combination. It has been third party tested for ingredient accuracy, and is also certified by NSF, meaning that it is certified for sports consumption. Previous research has been done on the ingredients within the supplement utilizing male demographics. However, there is limited research done on the pre-workout supplement as a whole. The little research done has showed no increases in any variables such as power output (relative/absolute) and/or rate of fatigue. Very little research has been done utilizing a female population, let alone athletic females. **PURPOSE:** To examine the effect of a commercially available pre-workout supplement (The Bracket™), in athletic females, on absolute peak power (APP), absolute mean power (AMP), relative peak power (RPP), relative mean power (RMP), rate of fatigue (FTR), absolute total work (ATW), and relative total work (RTW) utilizing the Wingate Anaerobic Cycle Test (WACT), a 30-s supra maximal exercise protocol. **METHODS:** Thirteen athletic females, ages 18-30, with no prior hamstrings or quadriceps injuries within the last years were recruited. All subjects underwent three experimental trials [treatment (TRT, supplement with Gatorade®), placebo (PLC, Gatorade®), and a control (CON, water)] in a single blind balanced crossover design. During the trials the subjects had to ingest one of the three liquids in an 8 ounce serving thirty minutes prior to engaging in the WACT. Each trial was performed approximately one week apart. The differences in the dependent variables between treatments were analyzed using an ANOVA (0 between, 1 within), $\alpha=0.05$. **RESULTS:** No significant difference between trials were seen for APP (TRT=715 ± 126 W; PLC=716 ± 125 W; CON=696 ± 147 W) ($p=0.2940$), AMP (TRT=446 ± 94 W; PLC=436 ± 85 W; CON=441 ± 91 W) ($p=0.3930$), RPP (TRT=11.6 ± 1.4 W·kg⁻¹; PLC=11.6 ± 1.5 W·kg⁻¹; CON=11.3 ± 1.5 W·kg⁻¹) ($p=0.2280$), RMP (TRT=7.3 ± 1.4 W·kg⁻¹; PLC=7.1 ± 1.1 W·kg⁻¹; CON=7.2 ± 1.3 W·kg⁻¹) ($p=0.3920$), FTR (TRT=62 ± 13%; PLC=61 ± 11%; CON=59 ± 11%) ($p=0.1920$), ATW (TRT=13368 ± 2798 J; PLC=13066 ± 2550 J; CON=13246 ± 2749 J) ($p=0.4100$), or RTW (TRT=218 ± 42 J·kg⁻¹; PLC=212 ± 33 J·kg⁻¹; CON=215 ± 38 J·kg⁻¹) ($p=0.4080$). **CONCLUSION:** Ingestion of (The Bracket™) prior to exercise does not affect performance on the WACT in athletic females.

INTRODUCTION

Ergogenic aids, especially pre-workout supplementation, has become increasingly popular in the athletic male and female population.¹ The Bracket™ is a proprietary blend, pre-workout supplement whose primary active ingredients consists mostly of a mixture of creatine, B-complex vitamins, and a glycerol/taurine combination. It has been third party tested for ingredient accuracy, and is also certified by NSF, meaning that it is certified for sports consumption. Previous research has been done on the ingredients within the supplement utilizing male demographics.² However, there is limited research utilizing a female population, let alone athletic females, or utilizing this pre-workout supplement as a whole. The little research done has showed no increases in variables such as- absolute peak power, absolute mean power, relative peak power, relative mean power, rate of fatigue, absolute total work, and relative total work. However, The Bracket™, pre-workout supplement has a high volume of creatine within its ingredients which is supposedly used to boost performance when taken.³ There has been research done on males that discredit this notion but there has yet to be definitive research discerning female demographics.⁴

PURPOSE

The purpose of the study was to examine the effect of a commercially available pre-workout supplement (The Bracket™), in athletic females, on absolute peak power, absolute mean power, relative peak power, relative mean power, rate of fatigue, absolute total work, and relative total work utilizing the Wingate Anaerobic Cycle Test (WACT), a 30-s supra-maximal exercise protocol.

METHODS

IRB Approval. The study was approved by the Institutional Review Board (Human Subjects) at Texas A&M University-Kingsville.

Subjects. All subjects were provided informed consent prior to testing. Thirteen female subjects ($N=13$) were recruited from the student population at Texas A&M University-Kingsville. All subjects were current or former intercollegiate athletes.

Pre-participation Screening/Testing. All subjects underwent a health screening according to the American College of Sports Medicine's guidelines for exercise testing and prescription.⁵ Only subjects classified as low risk for untoward events during exercise based on these guidelines were allowed to participate. Additionally, only those who had not previously injured, hamstrings and/or quadriceps, prior to one year before testing were allowed to participate. Tests for body composition (mass, stature, body mass index) were also conducted. A standard physicians scale was utilized to assess body mass, and a stadiometer was utilized to assess body stature. Subjects were given instructions on how to report for each experimental trial, including specific pre-trial diet and hydration instructions.

METHODS, cont.

Wingate Anaerobic Cycle Test (WACT): The WACT⁶ is a 30 sec cycle ergometer task where subjects pedal as fast as possible against a resistance that requires a maximal effort for the 30 sec duration. The flywheel resistance is determined as a fraction of the subject's body mass (0.097 kg·kg body mass⁻¹ for female adult athletes). The test is preceded by a test specific warm-up lasting 4 min (0-1 min = 50 rpm against 0 kg; 1-3 min = 50 rpm against a resistance equal to 50% of the resistance they will be required to pedal against during the actual test where three maximal sprints lasting 3-5 sec are interspersed over the stage; 3-4 min = 50 rpm against 0 kg). Following the warm-up, subjects have a 5 min rest period before the actual 30-s test begins. Recovery from the 30 sec test includes at least 5 min of pedaling against a light-moderate resistance (1 kg). Heart rate is monitored during warm-up, exercise, and recovery for this test. For this study, no verbal encouragement was used during the WACT. Two investigators were present for all tests.

WACT Familiarization Trial: All subjects performed a familiarity WACT trial without any supplementation. Prior to performing the familiarization trial, the subjects were shown a video of the WACT being performed. The familiarization trial was performed at approximately one week prior to the first experimental trial.

WACT Experimental Trials 1-3: All subjects underwent three experimental trials [treatment (TRT, supplement with Gatorade®), placebo (PLC, Gatorade®), and a control (CON, water)] in a single blind balanced crossover design. During the trials the subjects had to ingest one of the three liquids in an 8 ounce serving 30 minutes prior to engaging in the WACT. Each experimental trial was performed approximately one week apart.

Statistical Analysis. One-way (treatment) ANOVA with repeated measures was used to analyze for differences between trials (TRT, PLC, CON) in absolute peak/mean power, relative peak/mean power, absolute/relative total work, and fatigue rate. If needed, appropriate *post-hoc* tests were used to make all pairwise comparisons for specific differences across the three experimental trials or time points. The experimentwise error rate ($\alpha=0.05$) was maintained throughout all *post-hoc* tests for specific differences.

RESULTS

Table 1: Subject Demographics

Variable	Mean	SD	Range
Age (yr)	21.8	1.6	19.0-24.0
Body Mass (kg)	62.2	12.9	51.0-99.0
Body Stature (cm)	163.3	7.9	155.0-183.0
BMI (kg·m ⁻²)	23.2	3.0	18.3-29.6

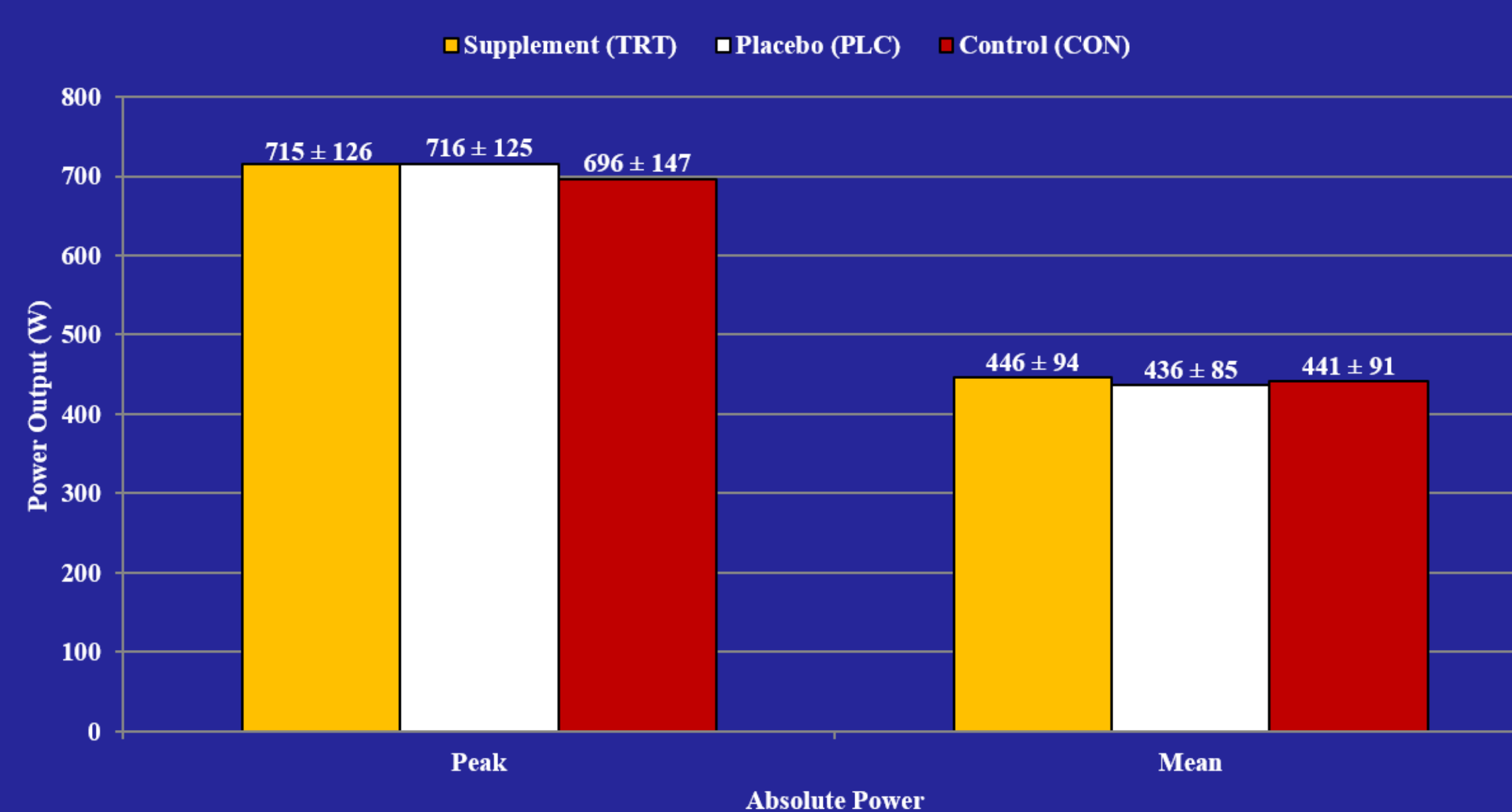


Figure 1: Treatment effect on absolute peak and mean power. Absolute peak ($p=0.2940$) and mean ($p=0.2280$) power output from the WACT did not differ significantly between the treatments. Mean ± SD.

RESULTS, cont.

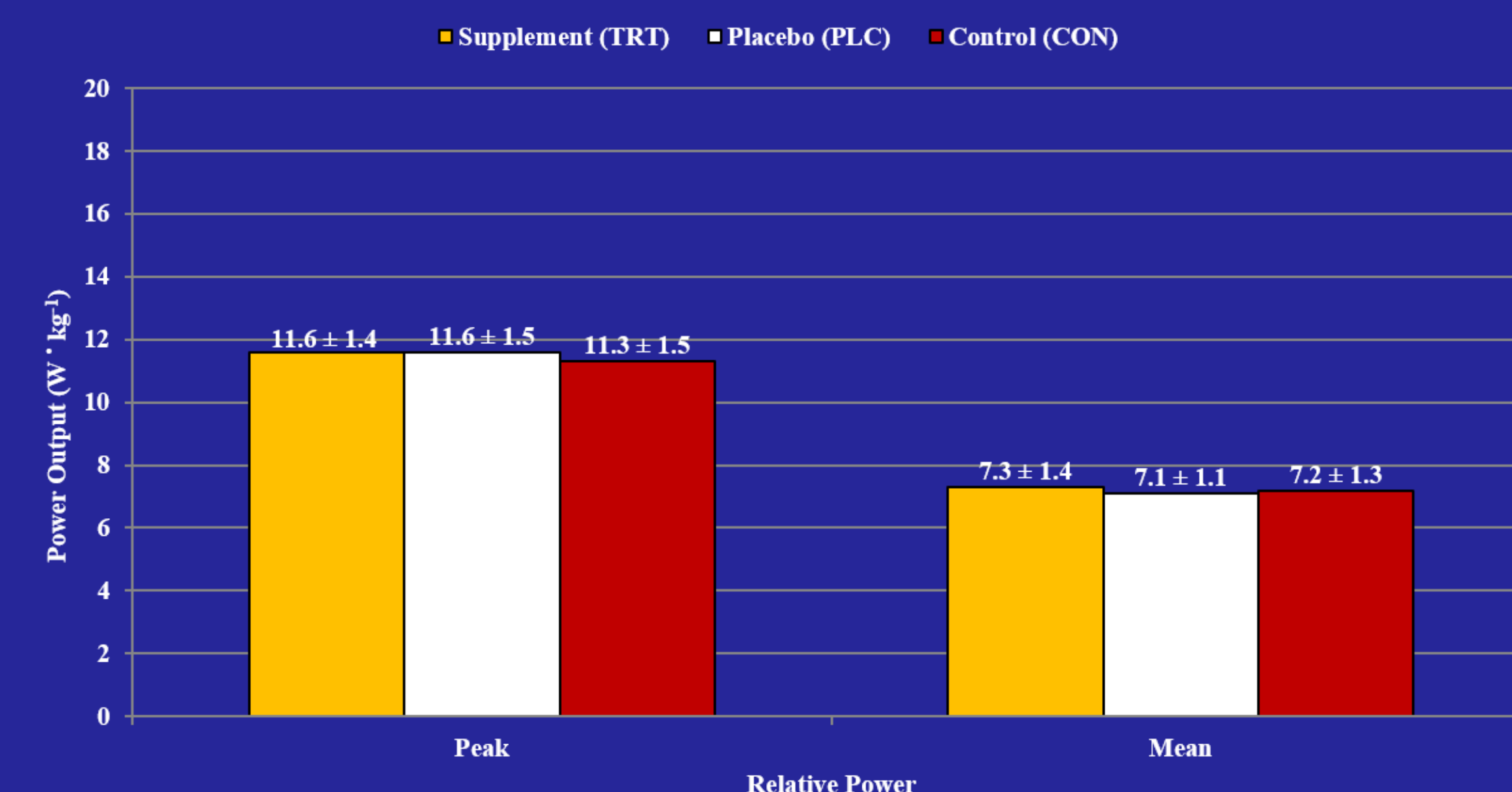


Figure 2: Treatment effect on relative peak and mean power. Relative peak ($p=0.2280$) and mean ($p=0.3920$) power output from the WACT did not differ significantly between the treatments. Mean ± SD.

Table 2: Treatment Effect on Total Work and Fatigue Rate

Variable	TRT	PLC	CON
Total Absolute Work (J)	13368 ± 2798	13066 ± 2550	13246 ± 2749
Total Relative Work (J·kg ⁻¹)	218 ± 42	212 ± 33	215 ± 38
Fatigue Rate (%)	62 ± 13	61 ± 11	59 ± 11

Absolute total work ($p=0.4100$), relative total work ($p=0.4080$), and fatigue rate ($p=0.1920$) from the WACT did not differ significantly between the treatments. Mean ± SD.

CONCLUSIONS

The study examined changes to absolute/relative mean and peak power, rate of fatigue, and relative/absolute total work following consumption of a pre-workout supplement (The Bracket™). According to the data, there was no significant difference between treatments as the performance on the WACT remained relatively constant across trials.

Previous research has been done, which has shown promising differences within trials due to the ingredient creatine. The pre-workout supplement (The Bracket™) which was used contains creatine in its active ingredients; however, no changes were observed between trials. This is most likely because in previous research the subjects undergoing testing, following consumption of creatine, had been utilizing the supplement for at least five consecutive days prior to engaging in testing. Human muscle only holds small amounts of creatine, which can help the ATP-PCr system produce energy, but acute consumption as in the present study, is not sufficient for storage. Likewise, most of the studies examined the effects of long term creatine use coupled with a resistance training program. In this study, we were looking at immediate performance effects following acute consumption.

Regardless, this information is useful for athletic females who use ergonomic aids, specifically, The Bracket™ pre-workout supplement to increase the power performance and reduce their rate of fatigue. Further investigation using larger sample sizes, and increase pre-workout supplementation on a long term diet plan is warranted to examine the effects of this pre-workout supplementation.

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