

The Effects of Cannabidiol Supplementation on Measures of Performance & Fatigue Following Eccentric Exercise

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ABSTRACT

Following intense exercise, there is a period of time where performance is decreased. This period of reduced performance is characterized by several factors including myofibrillar disruption, reduced range-of-motion, inflammation, and an influx of enzymes and proteins. Cannabidiol (CBD) has been marketed as a recovery supplement capable of reducing markers of fatigue and inflammation following exercise, yet this claim has not been investigated. **PURPOSE:** The purpose of this study was to determine if CBD supplementation limits fatigue and expedites a return to performance following intense eccentric exercise. **METHODS:** A double-blind, crossover design with repeated measures was used. Twenty-four NCAA female athletes (age = 21.2 ± 1.8 yrs., height = 166.4 ± 8 cm, weight = 64.9 ± 9.1 kg) were randomized to either receive 5 mg/kg of CBD in pill form (Cannabidiol Life, Longwood, FL) or a matched weight placebo. Treatments were consumed two hours prior to, immediately following, and ten hours following muscle damage sessions. All participants consumed both treatments, with each separated by approximately 28 days to control for the menstrual cycle. To induce muscle damage, participants completed 10 sets of 10 repetitions of unilateral eccentric leg extension at $60^\circ/\text{sec}$ on an isokinetic dynamometer (Biodex Medical Systems Inc., Shirley, NY). Concentrations of a blood marker indicative of muscle damage (myoglobin), in addition to measures of fatigue (visual analogue fatigue scale [VAFS]) and performance (vertical jump, peak dynamic knee extensor torque at 60, 180, and $300^\circ/\text{sec}$, and peak isometric knee extensor torque), were collected before and 4, 24, and 48 hours following muscle damaging sessions. A repeated measures MANOVA was conducted to analyze the performance measures, and separate repeated measures ANOVAs were conducted to analyze myoglobin concentrations and results from the VAFS with a significance level of 0.05. **RESULTS:** A significant increase ($p = 0.002$) in myoglobin levels was observed for both treatments 4 hours following the muscle damaging session but no significant differences ($p > 0.05$) were observed between the CBD and placebo groups at any of the 4 measured time points. Peak torque at $60^\circ/\text{sec}$ ($p = 0.001$) and peak isometric torque ($p = 0.02$) were significantly lower 24 hours following muscle damage, but none of the 5 measured performance variables were significantly different ($p > 0.05$ for all) between the CBD and placebo treatment at any time point. Subjective fatigue as measured by the VAFS was not significantly different ($p > 0.05$) between the CBD and placebo treatments at any measured time point. **CONCLUSION:** Cannabidiol supplementation was unable to reduce fatigue and restore performance when compared to a placebo in well-trained female participants. It does not appear that CBD supplementation is of beneficial use as a recovery supplement following intense exercise in athletes.