Acute *vs*. Chronic Citrulline Malate Supplementation on Muscle Fatigue

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ABSTRACT

Citrulline malate has been proposed to aid in reducing fatigue by increasing blood flow through promoting an increase in the nitric oxide synthase pathway along with the ability to remove ammonia and lactate accumulations. Results on the effectiveness of an acute supplementation are mixed, but it is proposed that regular consumption may help to attenuate the onset of fatigue during exercise. **PURPOSE**: To investigate the effects of acute and chronic citrulline malate supplementation on fatigue rate of the quadriceps. **METHODS:** Recreationally trained males (n=18, 24±5 yr, 83±14 kg, 174±6 cm) participated in seven testing sessions. The familiarization session consisted of participants performing a graded exercise test to determine max power output. In a randomized, counterbalanced order, participants consumed a placebo (PL) and citrulline malate (CM) treatment for two separate dosing periods. For each dosing period, participants reported on three separate days with seven days between each visit. The first experimental testing session for each dosing period was considered the baseline day (BL), the second session the acute day (D1), and the third session the chronic day (D2). For chronic supplementation, all participants consumed each treatment for seven consecutive days. The exercise protocol all testing sessions and the four supplemental testing sessions included exercising on a cycle ergometer at 50-60% of their max power output for 30 min. Following the bout, all participants performed the Thorstensson test on an isokinetic dynamometer for torque, power, and fatigue rate of the dominate leg quadriceps. **RESULTS:** The acute supplement x time interactions were not significant (p>0.05) for peak power (PL BL 469±81 W, PL D1 490±97 W *vs.* CM BL 465±85 W, CM D1 480±103 W), peak torque (PL BL 150±26 Nm, PL D1 157±32 Nm *vs*. CM BL 149±26 Nm, CM D1 156±33 Nm), fatigue rate (PL BL 57±9%, PL D1 57±10% *vs*. CM BL 57±10%, CM D1 56±9%), and heart rate (PL BL 156±17 bpm, PL D1 146±13 bpm *vs*. CM BL 155±11 bpm, CM D1 146±11 bpm). The chronic supplement x time interactions were not significant (p>0.05) for peak power (PL BL 469±81 W, PL D2 501±99 W *vs*. CM BL 464±85 W, CM D2 501±81 W), peak torque (PL BL 150±26 Nm, PL D2 161±31 Nm *vs*. CM BL 149±27 Nm, CM D2 161±26 Nm), fatigue rate (PL BL 57±9%, PL D2 58±9% *vs*. CM BL 57±10%, CM D2 58±9%), and heart rate (PL BL 156±17 bpm, PL D2 146±9 bpm *vs*. CM BL 155±11 bpm, CM D2 146±9 bpm). **CONCLUSION:** The results of this study suggest that neither acute or chronic supplementation of CM had an effect on recovery or fatigue rate of the quadriceps. Based on the data collected there were no significant differences between the recorded values for torque and power for each participant.