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Effect of Creatine Supplementation on Muscle Oxygen Saturation

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Data have indicated that creatine supplementation can result in an increase in lower leg anterior compartment pressure at rest and post exercise. Although the increased pressures seen during these studies were not pathological, this and additional factors associated with creatine supplementation could possibly influence skeletal muscle oxygen concentration (SmO_2) during exercise and recovery. **PURPOSE:** To determine the effects of acute creatine monohydrate supplementation on SmO_2 during treadmill exercise. **METHODS:** 21 male, physically active participants were randomized in a double-blind fashion to placebo (PL) ($n=10$, 23 ± 2 yrs.) or creatine (CM) ($n=11$, 21 ± 2 yrs.) groups. Subjects received 0.3 g/kg/day creatine monohydrate or placebo in gelatin capsules for 7 days. The subjects performed submaximal exercise tests (10 minute treadmill activity at 3.7 mph and 9% incline) at baseline and on day 7 of the study. During exercise SmO_2 and lower leg pain (LP) were monitored utilizing near infrared spectroscopy and an analog visual scale, respectively. The % change in SmO_2 was defined as: $((\text{Baseline } SmO_2 - \text{peak exercise } SmO_2) / \text{baseline } SmO_2) * 100$. Pre- and post-exercise lower leg pain thresholds (PTH) were determined using a digital force gage. **RESULTS:** There was a significant group effect ($P < 0.03$) but no significant effect of supplementation ($P > 0.05$) on the % change in SmO_2 during the exercise tests (CM: pre 66.49 ± 30.54 ; post 59.61 ± 23.87 vs. PL: pre 39.87 ± 16.72 ; post 38.51 ± 26.95 % change SmO_2 ; $M \pm SD$). No significant effects of supplementation were seen between the groups for PTH ($P > 0.05$) or peak LP during exercise ($P > 0.05$). **CONCLUSIONS:** Using a randomly controlled, double-blind trial with validated measurements of SmO_2 , acute creatine supplementation does not appear to impact skeletal muscle oxygen saturation during exercise in young, otherwise healthy males.