Abstract

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Effect of creatine supplementation and sleep deprivation, with mild exercise, on cognitive and psychomotor performance, mood state, and plasma concentrations of catecholamines and cortisol.

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Abstract

RATIONALE: Sleep deprivation has a negative effect on cognitive and psychomotor performance and mood state, partially due to decreases in **creatine** levels in the **brain**. Therefore, **creatine** supplementation should lessen the negative effects of sleep deprivation.

OBJECTIVES: The objective of this study was to examine the effect of **creatine** supplementation and sleep deprivation, with mild exercise, on cognitive and psychomotor performance, mood state, and plasma concentrations of catecholamines and cortisol.

METHOD: Subjects were divided into a **creatine** group (n=10) and a placebo group (n=9). They took 5 g of **creatine monohydrate** or a placebo, dependent on their group, four times a time a day for 7 days, immediately prior to the experiment. The study was double blind. Subjects undertook tests of random movement generation (RMG), verbal and spatial recall, choice reaction time, static balance and mood state pre-test (0 h), after 6, 12 and 24 h of sleep deprivation, with intermittent exercise. They were tested for plasma concentrations of catecholamines and cortisol at 0 and 24 h.

RESULTS: At 24 h, the **creatine** group demonstrated significantly less change in performance from 0 h (delta) in RMG, choice reaction time, balance and mood state. There were no significant differences between groups in plasma concentrations of catecholamines and cortisol. Norepinephrine and dopamine concentrations were significantly higher at 24 h than 0 h, but cortisol were lower.

CONCLUSIONS: Following 24-h sleep deprivation, **creatine** supplementation had a positive effect on mood state and tasks that place a heavy stress on the prefrontal cortex.

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