

Males who take citicoline show increased motor speed and attention

Citicoline is marketed as a nutritional supplement in the United States and has been shown to influence cellular metabolism in the brain and to contribute to the synthesis of essential neurotransmitters including acetylcholine and dopamine. Citicoline is found in small amounts in a variety of foods, primarily the brain and liver, and has been shown to produce limited side effects as a nutritional supplement. Interestingly, research has found that individuals who take citicoline show increased cognitive performance on tasks involving attention, visual acuity, and impulsivity.

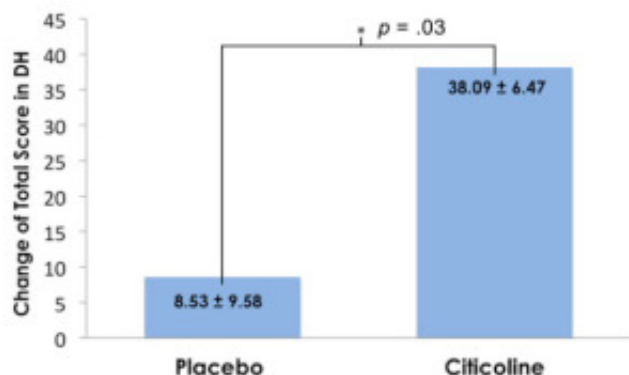


Fig. 1. Improved performance on the Finger Tap Test after supplementation. * p less than 0.05
Note. DH = Dominant Hand

Prior research with citicoline has focused on people with cognitive concerns such as stroke, traumatic brain injury (TBI), vascular dementia, and Parkinson's disease. Few studies have examined whether citicoline has cognitive-enhancing properties for individuals without cognitive impairment. Therefore, the current study focused on evaluating whether citicoline supplementation in healthy adolescent males would result improved cognition.

In the current study seventy-five healthy adolescent males between the ages of 13 and 18 years were assigned to a citicoline supplementation (n=51 with 250 or 500 mg of citicoline per day) or placebo group (n=24). Participants took either citicoline supplementation or placebo every day for four weeks; at the beginning and end of this study period they also completed clinical and neurocognitive assessment to examine changes associated with citicoline supplementation compared to placebo. Neither the participants nor the researchers knew which group the adolescents were in (i.e., double blind to citicoline supplementation or placebo).

At the end of the 28 days of supplementation, individuals in the citicoline group showed increased motor speed on Finger Tap Dominant Hand as well as increased attention and motor speed on

Ruff 2&7 Speed (see Figures 1 & 2). Because male adolescents in the study presented with a wide range of heights and weights, analyses for dose-related effects of citicoline also were completed. Dosage (mg) of citicoline was divided by the weight of participants (kg) to enable analyses based on weight-adjusted dose (mg/kg). Weight-adjusted dose of citicoline was significantly related to improved attention (Ruff 2&7 Accuracy and Computerized Performance Test-II Detectability and Commission Errors) with higher doses related to improved attention. After 28 days of taking placebo or citicoline, the two groups did not differ on their side effect profile.

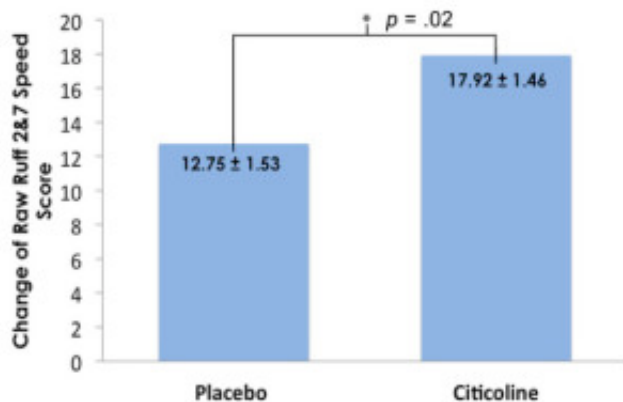


Fig. 2. Improved performance on the Ruff 2&7 Speed task after supplementation.

Importantly, between-group analyses prior to supplementation showed no placebo/citicoline differences in age, education, estimated IQ (Wechsler Abbreviated Scales of Intelligence), motor speed (Finger Tap Total Dominant and Non-dominant Hand), or attention (Ruff 2&7 Speed and Accuracy and Computerized Performance Test-II Errors and Detectability).

Overall, the current study showed that healthy adolescent males who took citicoline for 28 days showed increased performance on motor speed and attention tasks compared to those who took the placebo. Previous research has focused on improvement of deficits, whereas the current study focused on enhancement of abilities that were already in the average to above average range. Given the results of this study, further research should be done not only to examine cognitive enhancement in healthy populations but also in populations with other cognitive deficits such as individuals with psychiatric disorders. Citicoline may be particularly helpful for populations with decreased dopamine such as Attention Deficit Hyperactivity Disorder, as citicoline aids in the synthesis of essential neurotransmitters including acetylcholine and dopamine.

Publication

[The Effect of Citicoline Supplementation on Motor Speed and Attention in Adolescent Males.](#)

McGlade E, Agoston AM, DiMuzio J, Kizaki M, Nakazaki E, Kamiya T, Yurgelun-Todd D
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