

Abstract

Behav Brain Res. 2017 Aug 30;333:179-183.

Supplementation with zinc in rats enhances memory and reverses an age-dependent increase in plasma copper.

Sandusky-Beltran LA, Manchester BL, McNay EC.

Behavioral Neuroscience, State University of New York at Albany, Albany, NY, USA.

BACKGROUND: Zinc and copper are essential trace elements. Dyshomeostasis in these two metals has been observed in Alzheimer's disease, which causes profound cognitive impairment. Insulin therapy has been shown to enhance cognitive performance; however, recent data suggest that this effect may be at least in part due to the inclusion of zinc in the insulin formulation used. Zinc plays a key role in regulation of neuronal glutamate signaling, suggesting a possible link between zinc and memory processes. Consistent with this, zinc deficiency causes cognitive impairments in children.

METHODS: The effect of zinc supplementation on short- and long-term recognition memory, and on spatial working memory, was explored in young and adult male Sprague Dawley rats. After behavioral testing, hippocampal and plasma zinc and copper were measured.

RESULTS: Age increased hippocampal zinc and copper, as well as plasma copper, and decreased plasma zinc. An interaction between age and treatment affecting plasma copper was also found, with zinc supplementation reversing elevated plasma copper concentration in adult rats. Zinc supplementation enhanced cognitive performance across tasks.

CONCLUSION: These data support zinc as a plausible therapeutic intervention to ameliorate cognitive impairment in disorders characterized by alterations in zinc and copper, such as Alzheimer's disease.

PMID: 28693861