

HEALTH RESEARCH ABSTRACT SUBMISSIONS

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Name *	Catharyn Turner, II
Email *	catharyn-turner@uiowa.edu
Educational Level *	Other
If Selected Other	M4
College *	College of Medicine
Department *	Psychiatry
Title of Research *	Iron Status May Predict Response to Psychostimulant Therapy in Children with ADHD
Other Authors *	Diqiong Xie, M.S. University of Iowa College of Public Health M. Bridget Zimmerman, Ph.D. University of Iowa College of Public Health Chadi Calarge, M.D. University of Iowa Hospitals and Clinics Department of Psychiatry
Introduction & Purpose *	Iron is crucial for the optimal development of neurotransmitter pathways in the brain. Iron deficiency has been correlated with impaired dopaminergic signaling and emergence of externalizing behavior, including inattention, impaired cognitive functioning, disruptive behavior, and poor academic performance. However, whether iron stores in toddlerhood influence response to psychostimulants in childhood is not known. This study investigates the relationship between iron status and psychostimulant dosage in children with ADHD.
Experimental Design *	In an ongoing longitudinal study investigating the safety of psychotropics in youths, all medical and psychiatric records have been collected, often since birth. Data related to medication use as well as all available results for hemoglobin, hematocrit, red blood cell distribution width, and mean corpuscular volume (MCV) were extracted. Best-estimate diagnoses were generated based on a chart review and a structured interview. Sensitivity to psychostimulants was categorically defined based on the average weight-adjusted dose used during the first year of treatment. Using multiple linear regression analysis, we examined whether the hematological tests were associated with the sensitivity to psychostimulants, while adjusting for age and the time when the blood test was obtained.
Results *	29 participants (93% males) were included in the analysis. ADHD was present in 93% of the children who started treatment with psychostimulants at 5.8 years of age (SD=1.7). They received psychostimulants for a median of 0.85 years at an average daily dose of 0.98 mg/kg (SD=0.38) in methylphenidate-equivalent. The hematological tests were obtained, on average, 3 years (SD=1.5) before the initiation of psychostimulants. Among the measured indices, MCV was strongly associated with the sensitivity to psychostimulants (partial Spearman's $r=0.56$, $p<0.01$).
Conclusions *	This study adds to the growing literature linking iron stores to dopaminergic functioning. If replicated, our findings would suggest that more attention should be given to optimizing body iron in infancy and

early childhood, while avoiding excessive supplementation.

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