

Metabolic correction for attention deficit/hyperactivity disorder: A biochemical-physiological therapeutic approach

¹Mikirova NA, ¹Rogers AM, ¹Taylor PR, ¹Hunninghake RE, ²Miranda-Massari JR, and ³Gonzalez MJ

¹Riordan Clinic, 3100, N Hillside, Wichita, KS, USA; ²Department of Practice, School of Pharmacy, Medical Sciences Campus, University of Puerto Rico, San Juan, Puerto Rico; ³Nutrition Program, Department of Human Development, School of Public Health, Medical Sciences Campus, University of Puerto Rico, San Juan, Puerto Rico

Corresponding author: Miranda-Massari JR, PharmD, Department of Practice, School of Pharmacy, Medical Sciences Campus, University of Puerto Rico, PO Box 365067 San Juan, PR 00936-5067

Submission date: November 21, 2012, Acceptance date: January, 23, 2013; Publication date: January, 27, 2013

ABSTRACT

Objective: This investigation was undertaken to determine the reference values of specific biochemical markers that have been associated with behavior typical of ADHD in a group of patients before and after metabolic correction.

Background: Attention deficit hyperactivity disorder (ADHD) affects approximately two million American children, and this condition has grown to become the most commonly diagnosed behavioral disorder of childhood. According to the National Institute of Mental Health (NIMH), the cause of the condition, once called hyperkinesis, is not known.

The cause of ADHD is generally acknowledged to be multifactorial, involving both biological and environmental influence. Molecular, genetic, and pharmacological studies suggest the involvement of the neurotransmitter systems in the pathogenesis of ADHD. Polymorphic variants in several genes involved in regulation of dopamine have been identified, and related neurotransmitter pathways alterations are reported to be associated with the disease.

Nutritional deficiencies, including deficiencies in fatty acids (EPA, DHA), the amino acid methionine, and the trace minerals zinc and selenium, have been shown to influence neuronal function and produce defects in neuronal plasticity, as well as impact behavior in children with attention deficit hyperactivity disorder.

Materials/Methods: This study was based on data extracted from our patient history database covering a period of over ten years. We performed laboratory tests in 116 patients 2.7-25 years old with a diagnosis of ADHD. Sixty-six percent (66%) of patients were males. Patients were

followed from 3 month to 3 years. We compared the distributions of fatty acids, essential metals, and the levels of metabolic stress factors with established reference ranges before and after interventions. In addition, we analyzed the association between toxic metal concentrations and the levels of essential metals.

Results: This study was based on data extracted from our patient history database covering a period of over ten years. We performed laboratory tests in 116 patients 2.7-25 years old with a diagnosis of ADHD. Sixty-six percent (66%) of patients were males. Patients were followed from 3 month to 3 years. We compared the distributions of fatty acids, essential metals, and the levels of metabolic stress factors with established reference ranges before and after interventions. In addition, we analyzed the association between toxic metal concentrations and the levels of essential metals. According to these data, the metabolic correction of ADHD by supplementation with minerals, vitamins, essential fatty acids, and amino acids can ameliorate ADHD symptoms. Eighty percent (80%) of children who were treated from several weeks to 1-2 years, demonstrated improvement of metabolic stress level, measured by pyrroles. For these patients the levels of EPA were increased and the omega-6/omega-3 ratio was improved.

Conclusion: In the studied population it was demonstrated that metabolic correction of biochemical disturbances using essential fatty acids, amino acids, and minerals can improve fatty acid profiles and metabolic stress levels. These disturbances or variations from reference values have been associated with behavior typical of ADHD. Further studies need to be conducted with integrative metabolic correction therapy to determine its value in the management of ADHD.

Key words: Attention deficit hyperactivity disorder, metabolic correction, fatty acid composition, essential metals, toxic metals, pyrroles, vitamins and minerals.