

Biomarker-guided interventions of clinically relevant conditions associated with autism spectrum disorders and attention deficit hyperactivity disorder.

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"Autism spectrum disorders (ASD) and attention-deficit hyperactivity disorder (ADHD) are common and complex neurodevelopmental conditions. Diagnostic criteria for these conditions have traditionally relied solely on behavioral criteria without consideration for potential biomedical underpinnings. Newer evidence, however, reveals that ASDs are associated with: oxidative stress; decreased methylation capacity; limited production of glutathione; mitochondrial dysfunction; intestinal dysbiosis; increased toxic metal burden; immune dysregulation, characterized by a unique inflammatory bowel disease and immune activation of neuroglial cells; and ongoing brain hypoperfusion. Many of these same problems are common features in children with ADHD. These medical conditions, whether co-morbidities or etiopathogenic, would be expected to have synergistically negative effects on the development, cognition, focus, and attention of affected children. It is likely these biological abnormalities contribute significantly to the behavioral symptoms intrinsic in these diagnoses. However, treatment for these underlying medical disorders is clinically justified, even if no clear immediate behavioral improvements are observed. This article reviews the medical literature and discusses the authors clinical experience using various biomarkers for measuring oxidative stress, methylation capacity and transsulfuration, immune function, gastrointestinal problems, and toxic metal burden. These biomarkers provide useful guides for selection, efficacy, and sufficiency of biomedical interventions. The use of these biomarkers is of great importance in young children with ADHD or individuals of any age with ASD, because typically they cannot adequately communicate regarding their symptoms."