Discoveries on the Genetics of ADHD in the 21st Century: New Findings and Their Implications

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Abstract

The 21st century has witnessed the discovery of multiple rare and common gene variants associated with attention deficit hyperactivity disorder (ADHD), and these discoveries have already provided a starting point for the investigation of the biology of the disorder and novel treatments. The purpose of this selective review is to examine genetic findings from the past 5 years and consider their implications for the conceptualization of ADHD and future clinical practice. Recent discoveries reveal the strong genetic overlaps between ADHD and autism spectrum disorder (ASD) as well as intellectual disability. Thus, the removal of the previous diagnostic exclusion criteria for ADHD in the presence of ASD is a welcome change in DSM-5. However, ADHD also shows substantial genetic correlations with a much broader group of neuropsychiatric disorders as well as with nonpsychiatric conditions (e.g., lung cancer). Investigating potential explanations for these links is an important next step. ADHD, while usefully conceptualized as a disorder in clinical practice, can be viewed as a trait. Recent genome-wide association study findings, consistent with twin studies, highlight that ADHD lies at the extreme end of a continuously distributed dimension, akin to hypertension along the continuum of blood pressure. Although ADHD levels typically decline with age, twin and molecular genetic studies suggest that a persistent trajectory is associated with higher genetic loading. Routine testing for rare mutations in ADHD is not yet recommended, although guidelines in many countries recommend testing individuals with mild intellectual disability or ASD, so practice could change. Common gene variants for ADHD are only weakly predictive and therefore have limited clinical value at present, as does pharmacogenomics. [AJP at 175: Remembering Our Past As We Envision Our Future November 1938: Electroencephalographic Analyses of Behavior Problem Children The electroencephalogram was the first biological technique to be applied to childhood behavioral disorders. Jasper, Solomon, and Bradley reported that "the electroencephalogram has succeeded in revealing a definite abnormality of brain function in over one half of a group of childhood behavior disorders which had been previously considered as largely psychogenic."