The Familial Co-Aggregation of Attention-Deficit/Hyperactivity Disorder and Intellectual Disability: A Register-Based Family Study

Stephen V. Faraone, Laura Ghirardi, Ralf Kuja-Halkola, Paul Lichtenstein, Henrik Larsson

Journal of the American Academy of Child & Adolescent Psychiatry
DOI: http://dx.doi.org/10.1016/j.jaac.2016.11.011

Abstract

Objective
Although many studies document an association between attention-deficit/ hyperactivity disorder (ADHD) and intellectual disability (ID), little is known about the etiology of this comorbidity and how it should be addressed in clinical settings. We sought to clarify this issue.

Method
All individuals born in Sweden between 1987 and 2006 (n=2,049,587) were identified using the Medical Birth Register (MBR). From this we selected seven cohorts of relatives: 1,899,654 parent–offspring pairs, 4,180 monozygotic twin pairs, 12,655 dizygotic twin pairs, 914,848 full sibling pairs, 136,962 maternal half-sibling pairs, 134,502 paternal half-sibling pairs, and 2,790,164 full cousin pairs. We used within-individual and within-family analyses to assess the association between ADHD and ID.

Results
Individuals with ID were at increased risk for ADHD compared to those without ID, and relatives of participants with ID had an increased risk of ADHD compared with relatives of those without ID. The magnitude of this association was positively associated with the fraction of the genome shared by the relative pair and was lower for severe compared with mild and moderate ID. Model fitting analyses demonstrated that 91% of the correlation between the liabilities of ADHD and ID was attributable to genetic factors.

Conclusion
These data provide evidence that nearly all of the comorbidity between ADHD and ID can be attributed to genetic factors, which has implications for diagnostic practice.