

The role of genetic and environmental influences on the association between childhood ADHD symptoms and BMI

Do EK, Haberstick BC, Williams RB, Lessem JM, Smolen A, Siegler IC, Fuemmeler BF.

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Abstract

BACKGROUND/OBJECTIVES:

Although childhood attention deficit hyperactivity disorder (ADHD) has been previously associated with concurrent and later obesity in adulthood, the etiology of this association remains unclear. The objective of this study is to determine the shared genetic effects of ADHD symptoms and BMI in a large sample of sibling pairs, consider how these shared effects may vary over time, and examine potential sex differences.

SUBJECT/METHODS:

Sibling pair data were obtained from the National Longitudinal Study of Adolescent to Adult Health (Add Health); childhood ADHD symptoms were reported retrospectively during young adulthood, while three prospective measurements of BMI were available from young adulthood to later adulthood. Cholesky decomposition models were fit to this data using Mx and maximum-likelihood estimation. The twin and sibling sample for these analyses included: 221 monozygotic (MZ) pairs (92 male-male, 139 female-female), 228 dizygotic (DZ) pairs (123 male-male, 105 female-female), 471 full-sibling (FS) pairs (289 male-male, 182 female-female), 106 male-female DZ twin pairs, and 234 male-female FS pairs.

RESULTS:

The magnitude of the association between childhood ADHD symptoms and BMI changed over time and by sex. The etiological relationship between childhood ADHD symptoms and the three prospective measurements of BMI differed for males and females, such that unique or non-shared environmental influences contributed to the relationship within males and genetic factors contributed to the relationship within females. Specifically, among females, genetic influences on childhood ADHD symptoms were partially shared with those effecting BMI and increased from adolescence to later adulthood (genetic correlation = 0.20 (95% CI: 0.07-0.36) in adolescence and 0.24 (95% CI: 0.10, 0.41) in adulthood).

CONCLUSION:

Genetic influences on ADHD symptoms in childhood are partially shared with those effecting obesity. However, future research is needed to determine why this association is limited to females.