The age-dependent role of pre- and perinatal factors in interaction with genes on ADHD symptoms across adolescence.


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Abstract

Little is known about the effects of risk factors on attention-deficit/hyperactivity disorder (ADHD) symptom over time. Here, we longitudinally studied the role of candidate genes, pre- and perinatal factors, and their interactions on ADHD symptoms between ages 10 and 18 years. Subjects were part of the general population or clinic-referred cohort of the TRacking Adolescents' Individual Lives Survey (n = 1667). At mean ages of 11.1 (T1), 13.4 (T2), and 16.2 years (T3), ADHD symptoms were assessed with the Child Behavior Checklist. Linear Mixed Models were used to examine the association of candidate genes (i.e., DRD4, DRD2, 5-HTTLPR, COMT, and MAOA), pre- and perinatal factors (i.e., index measure of various pregnancy and delivery complications, maternal smoking, maternal drinking, and low birth weight), and their interactions with ADHD symptoms across adolescence.

Pregnancy and delivery complications were associated with a higher level of ADHD symptoms across all time points, but with a significantly declining influence over time (p = 0.006). We found no main effects of the candidate genes on ADHD symptoms throughout adolescence. The simultaneous presence of the low activity MAOA genotype and low birth weight (p < 0.001) and of the 5-HTTLPR LL-allele and respectively pregnancy and delivery complications (p = 0.04) and maternal smoking (p = 0.04) were associated with more ADHD symptoms particularly during early adolescence, and these influences significantly decreased over time. Findings suggest an age-dependent role of gene-environment interactions on ADHD symptoms across adolescence.