COMT and DAT1 genes are associated with hyperactivity and inattention traits in the 1993 Pelotas Birth Cohort: evidence of sex-specific combined effect.


Abstract

BACKGROUND:
Attention-deficit/hyperactivity disorder (ADHD) symptoms are dimensionally distributed in the population. This study aimed to assess the role of the catechol-O-methyltransferase (COMT) and of the dopamine transporter (DAT1) genes on ADHD symptoms in the general population.

METHODS:
We investigated 4101 individuals from the 1993 Pelotas Birth Cohort Study using the parent version of the Strengths and Difficulties Questionnaire (SDQ) at ages 11 and 15 years. The SDQ hyperactivity/inattention scores were the main outcomes.

RESULTS:
Linear regression analyses demonstrated that the increasing number of COMT158Val and DAT1 10R alleles significantly predicted increasing SDQ hyperactivity/inattention scores in boys at both 11 and 15 years of age ($\beta$ coefficient = 0.049, $t = 2.189$, $p = 0.029$, $R^2 = 0.012$, and $\beta$ coefficient = 0.064, $t = 2.832$, $p = 0.005$, $R^2 = 0.008$, respectively). The presence of both COMT158Val and DAT1 10R alleles was also associated with full categorical ADHD diagnosis at 18 years of age in boys ($\chi^2 = 4.561$, $p = 0.033$, odds ratio 2.473, 95% confidence interval 1.048-5.838) from this cohort. We did not observe these associations in girls.

LIMITATIONS:
Our analyses of SDQ hyperactivity/inattention scores were not corrected for SDQ scores of conduct problems because these variables were highly correlated.

CONCLUSION:
This study demonstrates a role for COMT and DAT1 genes on hyperactivity/inattention symptoms and provides further support for ADHD as the extreme of traits that vary in the population. It also confirms previous evidence for sexual dimorphism on COMT and DAT1 gene expression.