Increasing Phenotypic and Genetic variations in Hyperactivity/Inattention Problems from Age 3 to 13 Years: A Cross-Sectional Twin Study.

Hur YM.


Abstract
A twin design was used to examine the developmental nature of genetic, environmental, and phenotypic variations in hyperactivity and inattention problems (HIP). Mothers of 662 complete pairs of twins (273 monozygotic [MZ] pairs and 389 dizygotic [DZ] pairs) aged from 3 to 13 years (mean [SD] age = 8.3 [2.9] years) responded to the items of the HIP scale of the Strengths and Difficulties questionnaire via a telephone interview. Maximum likelihood MZ and DZ twin correlations in the total sample were 0.47 (95% CI: 0.37-0.55) and -0.01 (95% CI: -0.11-0.09). A standard univariate model incorporating age as a modifier was applied to the raw data. Results of model-fitting analyses showed that the phenotypic variation of HIP monotonically increased from age 3 to age 12 and that this increase was completely due to an increase in genetic variance, suggesting that it is genes that expand individual difference in ADHD symptoms with age during childhood. Child-specific environmental variance was constant during this age period. In terms of relative influences, total genetic factors increased from 33% (95% CI: 27-44%) at age 3 to 51% (95% CI: 28-71%) at age 13 and this increase was accompanied by a decrease in relative influences of child-specific environmental factors from 67% (95% CI: 56-73%) at age 3 to 49% (95% CI: 29-72%) at age 13. These estimates of genetic influences were somewhat lower than those found in most twin studies of ADHD symptoms. However, the increasing trend of genetic influences with age during childhood was consistent with the results of a recent meta-analysis of ADHD symptoms.