Brain Differences Based on Child’s COMT Genotype Affect Cognitive Performance


Study: Early Life Cortical Development Mediates the Effects of the COMT Genotype on Cognitive Development

Key findings:
The results show that the longitudinal cognitive developmental differences in children based on catechol-O-methyltransferase (COMT) genotype can be explained by differences in cortical thickness development.

Why it matters:
This finding is of high importance because it reveals that brain differences in children with at-risk genetics do correlate to differences in cognitive performance.

COMT is a critical enzyme involved in frontal and temporal lobe dopamine metabolism. The rs4680 Valine108/158:Methionine polymorphism has been shown through convergent functional genomics to be one significant genetic variant correlated with an increased risk of schizophrenia.

This is the first study to explore the role of cortical development as a mediator between COMT genotype and cognitive performance and possibly as a mediator for onset of schizophrenia and psychosis.

Background:
T1 MR brain images were obtained from 88 children, 1 to 6 years of age, grouped by COMT rs4680 genotype. Early learning composite scores (surrogate measures of IQ) were also obtained from the children. The researchers identified the areas in the brain that showed developmental differences in children with genetics that increased their risk for psychiatric disease and were able to connect these brain differences to variance in cognitive performance.

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