

Interaction of DRD4 Methylation and Phthalate Metabolites Affects Continuous Performance Test Performance in ADHD

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Abstract

Objective:

We investigated the interaction effect between the methylation of dopamine receptor D4 (DRD4) and phthalate exposure in ADHD on continuous performance test (CPT) variables.

Method:

Urine concentrations of mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP), mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP), and mono-n-butyl phthalate (MBP) were tested. The methylation status was analyzed for CpG sites of DRD4. Multivariable linear regression models were applied to investigate the interaction effects of methylation and phthalate levels.

Results:

There was a significant interaction effect of the methylation of CpG26 and CpG28 with the MEHHP level on omission errors in ADHD patients, but not in controls. The post hoc analysis revealed a significant correlation between the MEHHP concentration and omission errors in the methylated group, but not in the unmethylated group.

Conclusion:

The interaction between the methylation status of CpG sites of DRD4, particularly CpG26 and CpG28, and phthalate metabolite levels affects the attention level in ADHD patients.