

Associations between urinary cotinine and symptoms of attention deficit/hyperactivity disorder and autism spectrum disorder

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Abstract

BACKGROUND:

The present study investigated associations between urinary cotinine levels as a biomarker of secondhand smoke exposure and symptoms of attention deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (ASD).

METHODS:

A total of 520 child participants (200 with ADHD, 67 with ASD, and 253 normal control subjects) were assessed using the Korean version of the ADHD rating scale (K-ARS), Autism spectrum screening questionnaire (ASSQ), and Behavioral Assessment System for Children, second edition (BASC-2). The Korean version of the computer-based continuous performance test was used to assess cognitive function. Urinary cotinine was evaluated as a biomarker of secondhand smoke exposure.

RESULTS:

Urinary cotinine levels were significantly and positively associated with K-ARS score ($B = 4.00$, $p < 0.001$), ASSQ score ($B = 1.71$, $p = 0.030$), the behavioral problem subscales of the BASC-2 ($B = 1.68-3.52$, $p < 0.001-0.045$), and omission and commission errors in the continuous performance test ($B = 6.21-8.42$, $p < 0.001-0.019$). Urinary cotinine levels were also associated with the increased odds ratio of ADHD (OR = 1.55, 95% CI 1.05-2.30, $p = 0.028$) and ASD (OR = 1.89, 95% CI 1.12-3.21, $p = 0.018$).

CONCLUSION:

Urinary cotinine levels were associated with lower behavioral adaptation and cognitive function and increased odds ratios of ADHD and ASD, indicating a negative effect of secondhand smoke exposure on the symptomatic manifestation of ADHD and ASD.