Association of Bisphenol A exposure and Attention-Deficit/Hyperactivity Disorder in a national sample of U.S. children.

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Abstract

BACKGROUND:
Bisphenol A (BPA) has been linked to changes in the dopamine system and development of an Attention-Deficit/Hyperactivity Disorder (ADHD) phenotype in animal models, with differing effects in males compared to females. We examined the association between urinary BPA concentrations and ADHD in a national sample of U.S. children, and whether this association differs by child sex.

METHODS:
We used data from the 2003-2004 National Health and Nutrition Examination Survey, a cross-sectional, nationally representative sample of the U.S.

POPULATION:
Participants were 8-15 years of age (N=460). Using a diagnostic interview to ascertain the presence of ADHD in the past year, multivariable logistic regression examined the link between concurrent urinary BPA concentrations and ADHD status.

RESULTS:
Of the 460 participants, 7.1% [95% CI: 4.4-11.3] met Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition (DSM-IV) criteria for ADHD. Children who had BPA concentrations at or above the median of the sample had higher prevalence of meeting criteria for ADHD (11.2% [95% CI: 6.8-17.8]) than those with BPA concentrations below the median (2.9% [95% CI: 1.1-7.2]). Higher urinary BPA concentrations were associated with ADHD (adjusted odds ratio [aOR]: 5.68 [95% CI: 1.6-19.8] for BPA concentrations above vs. below the median). In sex-stratified analyses, these associations were stronger in boys (aOR=10.9 [95% CI: 1.4-86.0]) than in girls (aOR=2.8 [95% CI: 0.4-21.3]), although the BPA by sex interaction term was not significant (p=0.25).

CONCLUSION:
We found evidence that higher urinary BPA concentrations were associated with ADHD in U.S. children; these associations were stronger in boys than in girls. Considering the widespread use of BPA and growing literature on neurobehavioral effects of BPA in children, further study is warranted to determine if reducing exposure to BPA may represent an important avenue for ADHD prevention.