

Topic: Exposure to flame retardants

Title: Prenatal exposure to polybrominated diphenyl ethers and child attention problems at 3-7 years

Conclusion: The findings demonstrate a positive trend between prenatal PBDE exposure and early childhood attention problems, and are consistent with previous research reporting associations between prenatal PBDE exposure and disrupted child behaviors.

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Abstract: Introduction: Polybrominated diphenyl ethers (PBDEs) comprise a class of halogenated compounds used extensively as flame retardant chemicals in consumer products resulting in nearly ubiquitous human exposure. Mounting evidence suggests that PBDEs are developmental neurotoxicants; however, associations between early life exposure and child behavior have been largely limited to a single developmental time point. Methods: The study population consists primarily of white, black and Chinese women who were pregnant on 11 September 2001 and delivered at 1 of 3 downtown New York City hospitals. Maternal-child pairs were followed through age 7 years. Cord blood was collected at delivery and PBDE plasma levels for 210 samples were analyzed by the U.S. Centers for Disease Control and Prevention. The Child Behavior Checklist, a validated maternal-report instrument used for assessing child behavior, was administered annually between the ages of 3 and 7 years. We analyzed the association between natural log-transformed and dichotomized (low vs. high) PBDEs and attention problems using multivariable adjusted negative binomial regression. Results: We detected 4 PBDE congeners in more than 50% of samples, with concentrations highest for BDE-47 (median \pm IQR: 11.2 \pm 19.6 ng/g). In adjusted analyses, we detected associations between BDE-47 (1.21, 95% CI: 1.00, 1.47), and BDE-153 (1.18, 95% CI: 1.00, 1.39) in cord plasma and increased attention problems among children at age 4 (n = 109) but not 6 (n = 107) years. Conclusions: Our findings demonstrate a positive trend between prenatal PBDE exposure and early childhood attention problems, and are consistent with previous research reporting associations between prenatal PBDE exposure and disrupted child behaviors.

Keywords: PBDEs; flame retardants; prenatal; neurodevelopment; attention