Prenatal exposure to flame-retardant compounds affects neurodevelopment of young children

January 19 2010

Prenatal exposure to ambient levels of flame retardant compounds called polybrominated diphenyl ethers (PBDEs) is associated with adverse neurodevelopmental effects in young children, according to researchers at the Columbia Center for Children's Environmental Health (CCCEH) at Columbia University's Mailman School of Public Health.

The study is online in Environmental Health Perspectives and will be released in the April 2010 print issue.

PBDEs are endocrine-disrupting chemicals and widely used flame-retardant compounds that are applied to a broad array of textiles and consumer products, including mattresses, upholstery, building materials, and electronic equipment. Because the compounds are additives rather than chemically bound to consumer products, they can be released into the environment. Human exposure may occur through dietary ingestion or through inhalation of dust containing PBDEs.

The researchers found that children with higher concentrations of PBDEs in their umbilical cord blood at birth scored lower on tests of mental and physical development between the ages of one and six. Developmental effects were particularly evident at four years of age, when verbal and full IQ scores were reduced 5.5 to 8.0 points for those with the highest prenatal exposures.

"The neurodevelopmental effects of prenatal exposure to PBDEs have not previously been studied among children in North America, where levels are typically higher than in Europe or Asia," said Julie Herbstman, PhD, first author on the paper and a research scientist in Environmental Health Sciences at the Mailman School of Public Health. "The findings are consistent with effects observed in animal studies and, if replicated in other North American populations, they could have important public health implications."

Frederica Perera, DrPh, professor of Environmental Health Sciences at the Mailman School, CCCEH Director, and coauthor added, "These findings are of potential concern, because IQ is a predictor of future educational performance; and the observed reductions in IQ scores are in the range seen with low level lead exposure." This research underscores the need for preventive policies to reduce toxic exposures occurring in utero."

The investigators controlled for factors that have previously been linked to neurodevelopment in other studies, including ethnicity, mother's IQ, child's sex, gestational age at birth, maternal age, prenatal exposure to environmental tobacco smoke, maternal education, material hardship, and breast feeding.

The study is part of a broader project examining the effects of chemicals released by the World Trade Center's destruction on pregnant women and their children. However, residential proximity to the World Trade Center site did not affect levels of PBDE exposure.

Provided by The Earth Institute at Columbia University

Citation: Prenatal exposure to flame-retardant compounds affects neurodevelopment of young children (2010, January 19) retrieved 25 April 2024 from

https://medicalxpress.com/news/2010-01-prenatal-exposure-flame-retardant-compounds-affects.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.