

Researchers link widely used chemicals to ADHD in children

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A new study led by a team of Boston University School of Public Health researchers suggests a link between polyfluoroalkyl chemicals (PFCs), industrial compounds which are widely used in many consumer products, and attention deficit hyperactivity disorder (ADHD) in children.

Published online, ahead of print, in the journal Environmental Health Perspectives, the researchers found "increased odds of ADHD in children with higher serum PFC levels." The researchers used data from the National Health and Nutrition Examination Survey (NHANES) to compare the PFC levels found in serum samples taken from 571 children, ages 12 to 15. The parents of 48 of these children reported their children were diagnosed with ADHD, one of the most common neurodevelopmental disorders in children.

NHANES is an ongoing national survey of a representative sample of the U.S. population that gathers data on dietary and health factors conducted by the <u>Centers for Disease Control and Prevention</u>.

PFCs are highly stable compounds used in industrial and commercial products like stain-resistance coatings, food packaging, and fire-fighting foams. In a 2003-2004 survey, NHANES examined 2,094 blood samples taken from the U.S. population and found more than 98 percent of the sample had detectable serum levels of PFCs, according to the study. Once absorbed into the body, it can take years for some types of PFCs to be partially eliminated.



Although the study indicates there is a link between PFCs and ADHD, lead author Kate Hoffman said it is not known if there is a causal relationship between the two.

"There's a link between this exposure and outcome but we're not really sure what way that goes," said Hoffman, PhD, who conducted the study while completing her doctorate in environmental health at BUSPH. "What we can say is children with this outcome tend to have higher levels of PFCs in their blood." Because the PFC measurements were collected at the same time as the parental report of ADHD diagnosis, Hoffman said it is unknown whether children with ADHD engage in behavior leading to increased PFC exposure or if higher serum PFC levels in children result in ADHD.

The researchers examined the connection between four PFCs, perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), and perfluorohexane sulfonic acid (PFHxS) and samples from <u>children</u> in which there were parental reports of ADHD diagnosis.

The authors focused on ADHD because studies on animals have suggested exposure to PFCs can have neurotoxic effects. There is little information, however, on the chemicals' effects on human development.

ADHD is one of the most common neurodevelopmental disorders, Hoffman said. It is also unknown what causes ADHD, she said, but genetic and environmental factors have been associated with the disorder.

"Given the extremely prevalent exposure to PFCs, further investigation into the impact of PFC exposure on ADHD and other neurodevelopmental endpoints is warranted," the authors wrote.



More information: The full study is available on the Environmental Health Perspectives website: <u>ehp03.niehs.nih.gov/article/info</u> %3Adoi%2F10.1289%2Fehp.1001898

Provided by Boston University Medical Center

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