

Study: Researchers find link between plastic additive and autism, ADHD

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The incidence of autism spectrum disorder (ASD) and attention deficit hyperactivity disorder (ADHD) has greatly increased over the last few decades. The reasons are largely unknown, although environmental

factors are believed to be important.

According to [a new study](#) published in the public access journal *PLOS ONE* by researchers at Rowan-Virtua School of Osteopathic Medicine and Rutgers University-New Jersey Medical School, Newark, [children](#) with ASD and ADHD often have a reduced ability to clear the common plastic additive, bisphenol A (BPA), from their bodies, thereby increasing their exposure to BPA.

Previous studies found associations between children with [autism](#) and exposure to BPA. This study, "Bisphenol-A and phthalate metabolism in children with [neurodevelopmental disorders](#)," has found that the reason for the link is decreased efficiency in a key step involved in BPA detoxification.

After BPA is ingested or inhaled, it is filtered from the blood in the liver through a process called glucuronidation. Glucuronidation is the process of adding a sugar molecule to a toxin. Doing so makes the toxin water soluble, allowing it to quickly pass out of the body through urine.

Humans show [genetic variability](#) in their ability to detoxify BPA. Genetically susceptible individuals have more difficulty detoxifying their blood through this process, meaning their tissues are exposed to BPA at higher concentrations for longer time periods.

The study showed that for a significant proportion of children with autism, the ability to add the glucose molecule to BPA is about 10% less than that of control children. For a significant proportion of children with ADHD, it's about 17% less.

The compromised ability to clear such environmental pollutants from the body is "the first hard biochemical evidence of what the linkage is between BPA and the development of autism or ADHD," said T. Peter

Stein, the study's lead author and a Rowan-Virtua professor of surgery. "We were surprised to find that ADHD shows the same defect in BPA detoxification."

More research is needed to determine whether autism and ADHD are developed in utero through increased exposure to the mother or to the child sometime following birth, Stein said.

There are likely to be other factors behind the development of autism and ADHD, Stein said. The inability to effectively clear these chemicals from the blood is not present in every child with the neurodevelopmental disorders, but compromised clearance of BPA is a "major pathway, otherwise it would not have been so readily detectable in a study of moderate size," Stein said.

The team measured the efficiency of glucuronidation in three groups of children recruited from Rutgers-New Jersey Medical School clinics: 66 with autism, 46 with ADHD and 37 healthy children.

The study's co-authors are Margaret D. Schluter and Robert A. Steer at the Rowan-Virtua School of Osteopathic Medicine and Xue Ming at Rutgers University–New Jersey Medical School, Newark.

More information: T. Peter Stein et al, Bisphenol-A and phthalate metabolism in children with neurodevelopmental disorders, *PLOS ONE* (2023). [DOI: 10.1371/journal.pone.0289841](https://doi.org/10.1371/journal.pone.0289841)

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