Researchers identify metabolic cycles in baby teeth linked to ADHD and autism in children

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Mount Sinai researchers have identified elemental signatures in baby teeth that are unique to attention-deficit/hyperactivity disorder (ADHD), autism spectrum disorder, and cases when both neurodevelopment conditions are present, which suggests that the metabolic regulation of nutrients and toxins play a role in these diseases, according to a study published in *Translational Psychiatry* in September.

The researchers used baby teeth to reconstruct prenatal and early-life exposures to nutrients and toxic elements in neurotypical children and children with autism, ADHD, or ADHD and autism. They found that each condition has a unique metabolic signature, which shows a combination of dysregulation in metabolic pathways involving essential and toxic elements.

"Environmental epidemiologists typically study exposure to essential and toxic elements by examining how much of a given element a child was exposed to, but our work indicates that the way a child metabolizes environmental exposures is essential to healthy neurodevelopment," said Paul Curtin, Ph.D., Assistant Professor of Environmental Medicine and Public Health at the Icahn School of Medicine at Mount Sinai. "The discovery that autism spectrum disorder, attention-deficit/hyperactivity disorder, and the combined presentation of autism and ADHD each have a unique metabolic signature can inform future studies on what might cause the disorders. It could help us determine the pathways implicated in the different diseases, which, in turn, could inform the development of treatment and prevention strategies."

While the method is not a diagnostic tool, the metabolic signatures were present prenatally which may have implications for the development of early detection methods. This study examined the baby teeth of 74 children enrolled in the Roots of Autism and ADHD Twin Study in Sweden (RATSS), which included twin siblings with and without autism and ADHD. Researchers compared elemental metabolism in

neurotypical children to those with ADHD, autism or those diagnosed with both autism and ADHD.

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