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# Researchers to study baby teeth in effort to identify autism risk factors

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University of Washington researchers are part of a national team that will study the baby teeth of children who have siblings with autism to determine if prenatal exposure to chemicals increases their risk of developing the disorder.

The study will involve testing children's teeth for levels of environmental chemicals that they might have been exposed to in the womb, a critical time for neurodevelopment. Additionally, for a smaller number of children whose genetic data has been collected, the researchers hope to explore whether genetic susceptibility plays a role in how chemical exposure might impact autism risk.

The initiative is focused on children with older siblings who have autism, since they have a much higher risk of developing it—roughly one in five is diagnosed with autism spectrum disorder, or ASD, versus the national average of one in 68. The study could provide new insight on whether those children are also at a higher risk of autism from environmental factors, said Annette Estes, one of three UW researchers involved in the study.

"The causal factors related to autism are largely genetic, but the risk of autism doesn't seem to be accounted for by genetics alone," said Estes, director of the University of Washington Autism Center and a research professor in speech and hearing sciences.

"There are probably a lot of different environmental factors that might

increase the risk for someone who already has that genetic risk."

The study is being led by Drexel University in Philadelphia and will involve more than 1,700 children, including almost 1,300 who have siblings with autism and are therefore considered high-risk, and a comparison group of more than 400 children classified as low-risk since they don't have siblings with autism. The UW researchers will work with children that have undergone brain imaging and other autism testing at the UW over the past decade, starting at between three and six months of age.

The other UW researchers are Wendy Stone, director of the Research in Early Autism Detection and Intervention (READi) Lab, and Stephen Dager, a UW professor of radiology and associate director of the UW Center on Human Development and Disability.

"This is an innovative and exciting approach," Dager said. "The opportunity to analyze deciduous teeth as a reservoir of toxin exposure before birth and in the post-natal period holds great promise for better understanding environmental influences on the development of autism."

Chemicals being examined in the study include heavy metals and organochlorine pesticides such as DDT, and polychlorinated biphenyls that were once widely used in electrical equipment. Though banned in the 1970s, the chemicals remain in the environment and human exposure continues. The study will also look at phthalates, used to soften plastic and as solvents in cosmetics and other consumer goods.

The work is being funded by the National Institutes of Health under its new Environmental Influences on Child Health Outcomes Initiative. Announced Wednesday, the seven-year effort will provide $157 million for a variety of projects looking at how exposure to environmental factors in early development—from conception through early

childhood—impacts health in children and adolescents.

"This project provides a unique opportunity for us to learn about the contribution of environmental risk factors to the development of ASD," Stone said. "Studying the shed teeth of children who were high-risk infants, in combination with information about which infants have later been diagnosed with ASD, will help us understand which specific environmental chemicals may or may not be associated with ASD symptom development."

By providing new insights into the complex mechanisms underlying autism, the study could lead to more effective prevention, said Stone, who is also a UW professor of psychology.

"Identifying different levels and types of autism risk will enable us to provide specialized preventive strategies, with the goal of improving outcomes for children as well as their families," she said.

Provided by University of Washington