New Research Finds Fine Particulate Air Pollution Associated with Increased Risk of Childhood Autism

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Pittsburgh, Pa (PRWEB) May 21, 2015 -- New Research Finds Fine Particulate Air Pollution Associated with Increased Risk of Childhood Autism

Exposure to fine particulate air pollution during pregnancy through the first two years of a child’s life may be associated with an increased risk of the child developing autism spectrum disorder (ASD), a condition that affects one in 68 children, according to a University of Pittsburgh Graduate School of Public Health investigation of children in southwestern Pennsylvania.

The research is funded by The Heinz Endowments and will published in the July edition of Environmental Research.

“Autism spectrum disorders are lifelong conditions for which there is no cure and limited treatment options, so there is an urgent need to identify any risk factors that we could mitigate, such as pollution,” said lead author Evelyn Talbott, Dr.P.H., professor of epidemiology at Pitt Public Health. “Our findings reflect an association, but do not prove causality. Further investigation is needed to determine possible biological mechanisms for such an association.”

Dr. Talbott and her colleagues performed a population-based, case-control study of families with and without ASD living in six southwestern Pennsylvania counties. They obtained detailed information about where the mothers lived before, during and after pregnancy and, using a model developed by Pitt Public Health assistant professor and study co-author Jane Clougherty, Sc.D., were able to estimate individual exposure to a type of air pollution called PM2.5.

This type of pollution refers to particles found in the air that are less than 2.5 micrometers in diameter, or 1/30th the average width of a human hair. PM2.5 includes dust, dirt, soot and smoke. Because of its small size, PM2.5 can reach deeply into the lungs and get into the blood stream. Southwestern Pennsylvania has consistently ranked among the nation’s worst regions for PM2.5 levels, according to data collected by the American Lung Association.

“There is increasing and compelling evidence that points to associations between Pittsburgh’s poor air quality and health problems, especially those affecting our children and including issues such as autism spectrum disorder and asthma,” said Grant Oliphant, president of The Heinz Endowments. “While we recognize that further study is needed, we must remain vigilant about the need to improve our air quality and to protect the vulnerable. Our community deserves a healthy environment and clean air.”

Autism spectrum disorders are a range of conditions characterized by social deficits and communication difficulties that typically become apparent early in childhood. Reported cases of ASD have risen nearly eightfold in the last two decades. While previous studies have shown the increase to be partially due to changes in
diagnostic practices and greater public awareness of autism, this does not fully explain the increased prevalence. Both genetic and environmental factors are believed to be responsible.

Dr. Talbott and her team interviewed the families of 211 children with ASD and 219 children without ASD born between 2005 and 2009. The families lived in Allegheny, Armstrong, Beaver, Butler, Washington and Westmoreland counties. Estimated average exposure to PM2.5 before, during and after pregnancy was compared between children with and without ASD.

Based on the child’s exposure to concentrations of PM2.5 during the mother’s pregnancy and the first two years of life, the Pitt Public Health team found that children who fell into higher exposure groups were at an approximate 1.5-fold greater risk of ASD after accounting for other factors associated with the child’s risk for ASD – such as the mother’s age, education and smoking during pregnancy. This risk estimate is in agreement with several other recent investigations of PM2.5 and autism.

A previous Pitt Public Health analysis of the study population revealed an association between ASD and increased levels of air toxics, including chromium and styrene. Studies by other institutions using different populations also have associated pollutants with ASD.

“Air pollution levels have been declining since the 1990s; however, we know that pockets of increased levels of air pollution remain throughout our region and other areas,” said Dr. Talbott. “Our study builds on previous work in other regions showing that pollution exposures may be involved in ASD. Going forward, I would like to see studies that explore the biological mechanisms that may underlie this association.”

Additional co-authors of this study are Vincent C. Arena, Ph.D.; Judith R. Rager, M.P.H.; Drew R. Michanowicz, Dr.P.H.; Ravi K. Sharma, Ph.D.; and Shaina L. Stacy, Ph.D., all of Pitt Public Health.

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