

Long-term exposure to ambient air pollution and autism spectrum disorder in children: A case-control study in Tehran. Iran

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Abstract:

Background: Autism spectrum disorder (ASD) is a developmental disorder (a type of social relations) that characterized by abnormal behavior and verbal communications. The main characteristic of autism is impaired communication. The number of autism in the world increased, but main reason for autism is unknown. Researchers have been examined; genetic and environmental factors for ASD, which is one of the factors, exposure to air pollution during pregnancy and early life of a child. We aimed to investigate the association between long-term exposure to ambient air pollution and increased odds of ASD among 2 to 10-year-old children.

Methods: We conducted a case-control study in Tehran, Iran. . Cases were 152 children born between 2004 and 2012 with ASD whose mothers were resident in Tehran during their pregnancy. Controls (393) were children of the same age range without any documentation of neurodevelopmental outcomes, and history of mental and physical illnesses in their family members (e.g., autism spectrum disorder, intellectual disabilities, etc.). We used data collection form to record their clinical, demographic characteristics and maternal residence during pregnancy. Before the interview sessions all participants sign the consent form. Land Use Regression model was used as exposure assessment model. We used the univariable logistic regression model for detecting the potential confounders and the effect of variables with p-values

< 0.2 (maternal age at birth, maternal education, paternal education, consanguinity (first cousin marriage), maternal smoking during pregnancy, birth order, gestational age (weeks), multiple births, maternal disease, paternal disease) was adjusted in the multivariable model.

Results: In this study 522 of the participants (n = 134 Autism, 388 controls) were able to finish study. After controlling for the effects of confounders, no statistically significant association between autism and exposure to air pollutants (PM10 particulate matter with a diameter less than 10 microns, sulfur dioxide SO₂ and BTEX compounds) during pregnancy was observed.

Conclusion: Further research on fine particles, with better control of confounding variables, and studies with larger sample size is recommended.

Keywords: Autism Spectrum Disorders (ASD), Land Use Regression (LUR), Air Pollution, PM10, SO₂, BTEX.