Medical Xpress

Exposure to air pollution during pregnancy does not appear to increase symptoms of ADHD

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Exposure to air pollution during pregnancy may not be associated with an increased risk of attention-deficit and hyperactivity symptoms in children aged 3 to 10 years. This was the conclusion of a new study led by the Barcelona Institute for Global Health (ISGlobal), a centre supported by the "la Caixa" Banking Foundation. The study included data on nearly 30,000 children from seven European countries.

With a worldwide prevalence of 5 percent, ADHD is the most common childhood behavioural disorder. ADHD is characterized by a pattern of inattention, hyperactivity and/or impulsivity that is atypical for the child's age. These symptoms can interfere with development and have been associated with academic problems in school-aged children as well as an increased risk of problems with addiction or risky behaviours.

Recent studies have concluded that prenatal exposure to air pollution could affect brain development in children, but the evidence on the effects of air pollution on ADHD symptoms is limited.

The new study, published in the journal *Epidemiology*, forms part of the European Study of Cohorts for Air Pollution Effects (ESCAPE). It included 30,000 children between 3 and 10 years of age from eight birth cohorts in Germany, Denmark, France, Italy, the Netherlands, Sweden and Spain (the latter consisting of four sub-cohorts from the INMA project in Gipuzkoa, Granada, Sabadell and Valencia). The study

estimated exposures to nitrogen oxides (NOx) and particulate matter (PM10 and PM2.5) throughout pregnancy at each participant's home address. ADHD symptoms were assessed using various questionnaires completed by parents and/or teachers.

Joan Forns, lead author of the study, said, "Our findings show no association between exposure to air pollution during pregnancy and increased risk of ADHD symptoms."

"Given the conclusions of this study and the inconsistent findings of previous studies, we hypothesise that exposure to air pollution might not increase the risk of ADHD in children in the general population," explained ISGlobal researcher Mònica Guxens, who coordinated the study. "However, we believe that exposure to air pollution could have harmful effects on neuropsychological development, especially in genetically susceptible children."

It has been shown that ADHD is the result of complex interactions between genetic background (heritability is approximately 75 percent), environmental factors and social determinants. "We will continue to study the role of air pollution in order to rule out its association with childhood ADHD and improve our understanding of what causes this disorder," said Guxens.

More information: Joan Forns et al, Air pollution exposure during pregnancy and symptoms of attention deficit and hyperactivity disorder in children in Europe, *Epidemiology* (2018). DOI: 10.1097/EDE.0000000000000874

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