Prenatal exposure to certain pollutants linked to behavioral problems in young children

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Mothers' exposure during pregnancy to pollutants created by the incomplete combustion of fossil fuels and other organic material may lead to behavioral problems in their children, according to a new study. Researchers found that within a sample of 215 children monitored from birth, those children with high levels of a pollution exposure marker in their cord blood had more symptoms of attention problems and anxiety/depression at ages 5 and 7 than did children with lower exposure.

The study, "PAH/Aromatic DNA Adducts in Cord Blood and Behavior Scores in New York City Children,"
is published in Environmental Health Perspectives online April 12, 2011 and is to be released in an upcoming print issue.

The researchers measured a biologic marker or "fingerprint" of exposure to polycyclic aromatic hydrocarbons (PAH) and other combustion-related pollutants in newborns' cord blood. When inhaled by the mother during pregnancy, these pollutants can be transferred across the placenta and bind to the DNA of the fetus, forming "adducts" in blood and other tissues and providing a biologic measure of pollutant exposure. Mothers completed a detailed assessment of their child's behavior.

In urban air, traffic emissions are a dominant source of the pollutants measured in the study. The authors accounted for other sources such as environmental tobacco smoke and diet in their analyses. None of the mothers in the study were smokers.

The study by researchers at the Columbia Center for Children's Environmental Health (CCCEH) and the Institute of Cancer Research in England is the first to examine the behavioral effects of prenatal exposure to these air pollutants in children using a biologic marker.

"The results are of potential concern since attention problems and anxiety and depression may affect subsequent academic performance as well as peer relationships and other aspects of societal functioning," said Dr. Frederica Perera, the study's lead author and Center Director. "Fortunately, it is possible to reduce these air pollutants through currently available pollution controls, energy efficiency, and alternative energy sources."

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