Health & Medicine

Prenatal Air

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Researchers at the Columbia Center for Children's Environmental Health (CCCEH) have found that when women are exposed to high levels of air pollution while pregnant, their unborn babies are at risk for cognitive problems early in life. Previous research at CCCEH showed that prenatal exposure to the polycyclic aromatic hydrocarbons (PAHs) in automobile exhaust and in most other types of smoke can stunt a fetus's physical growth. The new study, published online April 24 in Environmental Health Perspectives, is the first to link the common air pollutants to delays in mental development.

Lead author Frederica Perera and her colleagues conducted cognitive tests on 183 3-year-old children of nonsmoking African American and Dominican women in the New York City neighborhoods of Washington Heights, Central Harlem, and the South Bronx. While pregnant the women carried backpack monitors that measured their exposure to PAHs. Children whose mothers were exposed to the highest levels of pollutants were almost three times as likely to show developmental delays than children with less prenatal exposure. The researchers controlled for exposure to tobacco smoke, lead, and other environmental contaminants, as well as for socioeconomic factors.

"These findings are of concern because compromised mental performance in the preschool years is an important precursor to subsequent educational performance deficits," says Perera, CCCEH's director and a professor of environmental health sciences at the Mailman School of Public Health.

Perera's research team has referred the developmentally delayed children to early intervention remedial services; CCCEH also provides educational resources to local women about how to minimize their exposure to air pollutants. Levels of airborne contaminants tend to be disproportionately high in poor areas such as northern Manhattan and the South Bronx due to heavily trafficked roadways and large numbers of bus depots and sewage waste treatment plants. For this reason, CCCEH

encourages area residents to join community activist organizations such as West Harlem Environmental Action and the South Bronx Clean Air Coalition, which have been successful in pressing the city to decrease harmful emissions from its diesel bus fleet.

“Fortunately, airborne PAH concentrations can be reduced by currently available pollution controls, greater energy efficiency, and the use of alternative energy sources,” Perera says. CCCEH plans to follow its young research subjects through adolescence to understand the long-term effects of prenatal exposure to air pollution.

Guide to school abbreviations

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