Health & Pregnancy

Prenatal Pesticide Exposure May Harm Kids' Brains

Common Crop Pesticide Chlorpyrifos May Be Linked With Structural Changes in Developing Brain, Experts Find

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WebMD Health News

Reviewed by Laura J. Martin, MD

April 30, 2012 -- Prenatal exposure to a pesticide used on many crops may be linked with abnormal changes in a child's developing brain, scientists report.

Compared to children with low prenatal exposure, those with high exposure to the pesticide chlorpyrifos had abnormalities in the cortex (the outer area of the brain), says Virginia Rauh, ScD, professor and deputy director of the Columbia Center for Children's Environmental Health at the Mailman School of Public Health at Columbia University.

The cortex helps govern intelligence, personality, muscle movement, and other tasks.

"In areas of the cortex, we detected both enlarged and reduced volumes that were significantly different from the normal brain," she tells WebMD. "This suggests the process of normal brain development has been disturbed in some way."

The study is published in Proceedings of the National Academy of Sciences' Early Edition.

In 2001, the U.S. EPA banned the residential use of chlorpyrifos. It still allows it on crops. It can also be sprayed in public places such as golf courses.

Some environmental advocates have petitioned the EPA to ban agricultural use.

Prenatal Exposure to Pesticides: Study Details

Rauh's team selected 40 children from a larger group of 369 children, followed from birth.

All had been born between 1998 and 2001, before the household-use ban. Rauh had sent their umbilical cord blood samples to the CDC to analyze pesticide levels.

For this study, she selected 20 children with high prenatal exposure and 20 with low prenatal exposure. She took MRIs of their brains when they were about 6 to 11 years old.

Overall brain size did not differ much between the two groups. However, the high-exposure group had enlargements in many areas and reduced volumes in other areas.
The findings reflect those from animal studies, Rauh says.

In other studies, Rauh has found higher exposure to the pesticide is linked with lower IQs and a decline in working memory in children.

The pesticide works by blocking an enzyme needed by pests -- and people -- for proper nerve functioning. It belongs to a class known as organophosphates.

**Chlorpyrifos and the Food Supply**

In 2007, the Natural Resources Defense Council petitioned the EPA to cancel all agricultural registrations for the pesticide. The EPA is reviewing the role of chlorpyrifos in agriculture.

Symptoms of poisoning from the pesticide include nausea, dizziness, confusion, and sometimes loss of respiratory muscle control and death, according to the NRDC.

*Prenatal Pesticide Exposure: Two Perspectives*

The new research finding is concerning, says Sonya Lunder, MPH, senior analyst at the Environmental Working Group. EWG supports a ban on the pesticide.

"Once you have changed the way the brain is born, and the structure, we are talking about things you can't offset with a good education or a good diet," she tells WebMD.

Meanwhile, industry groups say the pesticide should not be banned.

On a web page, "Chlorpyrifos Protects," Dow AgroSciences, its manufacturer, says: "Growers clearly need a trusted, well-established product to protect a wide range of crops from a diverse spectrum of damaging pests."

Since the pesticide was registered by the EPA in 1965, its use has become common in more than 50 crops, according to Dow. Among them are citrus fruits, apples, soybeans, sweet corn, and peanuts.

Research offers little support for claims that prenatal exposure could lead to reduced IQ scores, according to Dow.

**Advice for Pregnant Women**

Rauh advises women who are pregnant to avoid farming jobs.

Wash produce well before eating, she says. Buying organic produce is a good idea, she says, though not always practical. "It's a very expensive way to go and I think is out of reach of the average person," Rauh says.

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**SOURCES:**


Sonya Lunder, MPH, senior analyst, Environmental Working Group.
My Notes:

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