

Pesticide exposure linked to brain changes: study

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A farmer sprays his eggplant plantation with pesticides in 2010. When pregnant women are exposed to moderate levels of a common pesticide, their children may experience lasting changes in brain structure linked to lower intelligence, a US study said Monday.

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The study in the [Proceedings of the National Academy of Sciences](#) examined New York City pregnant mothers who were tested for exposure to [chlorpyrifos](#), or CPF, which is widely used for pest control in farms and public spaces.

The women in the study, which included 369 subjects total, took part prior to 2001 when CPF was banned from household use in the United States, though the chemical continues to be used worldwide in agriculture.

Researchers compared 20 children -- age five to 11 -- whose mothers tested highest for levels of CPF and found "significant abnormalities" in [brain structure](#) compared to 20 children whose mothers showed lower exposures.

However, all the women in the study were exposed at routine levels below the US established thresholds for acute exposure, indicating that even low to moderate exposure could pose hefty risks to a child's brain development.

"The present study provides evidence that the prenatal period is a vulnerable time for the developing child," said lead author, Virginia Rauh, professor at the Mailman School of Public Health and Deputy Director of the Columbia Center for Children's Environmental Health.

"Toxic exposure during this critical period can have far-reaching effects on [brain development](#) and behavioral functioning."

Researchers used [magnetic resonance imaging](#) (MRI) scans of the children's brains, which showed structural changes -- some areas abnormally larger than usual, and some typical male-female differences in brain structure that were eliminated or reversed in the high pesticide group.

More study is needed to determine the long-term effects of the changes, which are "consistent with the IQ deficits previously reported in the children with high exposure levels of chlorpyrifos," according to the research.

The study was the first to use MRI scans to confirm previous findings of brain structure changes in animals exposed to pesticide, the authors said.

"By combining brain imaging and community-based research, we now have much stronger evidence linking exposure to chlorpyrifos with neurodevelopmental problems," said senior author Bradley Peterson, chief of Child and Adolescent Psychiatry, New York State Psychiatric Institute.

Researchers said previous studies have shown that urban levels of the chemical have dropped since the 2001 US restrictions were added, but that risks remain because it continues to be used in food and feed crops, wood treatments, and public spaces such as golf courses, parks and highway medians.

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