Study: Household pesticide use harms infant motor development

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Ixel Hernandez-Castro grew up next to a dairy farm near Fresno, California, where she remembers a plane would fly by on weekends and spray the fields surrounding her family home with pesticides.

"They'd finish spraying, and we'd run outside to play," said Hernandez-Castro, MPH, a doctoral student in epidemiology in the department of population and public health sciences at the Keck School of Medicine of USC. "For kids, there's a lot of touching the environment, rolling on the grass, eating while playing, so though I didn't know it at the time, I was being exposed to these pesticides."

The experience motivated Hernandez-Castro to study the effects of household pesticide use on motor development in infants. Her research began as a capstone project for her master's of public health degree, which she earned in 2020 at USC, and continued as she pursued her doctorate.

Her findings, published recently in *Paediatric and Perinatal Epidemiology*, suggest that early post-natal household use of rodent and insect pesticides may harm infants' gross motor development in early childhood.

"It's critical to understand the impacts of household pesticide use on infant motor development since household pesticide use may be a modifiable risk factor," said Hernandez-Castro, who is first author of the study. "Developing safer alternatives for pest control could support healthier infant development."

Researchers gave telephone questionnaires to 296 mothers with newborns in the Maternal and Developmental Risks from Environmental and Social Stressors (MADRES) pregnancy cohort. Researchers assessed household pesticide use when the infants were three months old. Using the Ages and Stages Questionnaire, researchers assessed gross and fine motor development when the infants were six months old.

Infants with maternal-reported household use of rodent and insect pesticides had significantly reduced gross motor performance relative to infants with no reported use of household pesticides.

"We have known for a long time that many chemicals are harmful to the developing brain," said Tracy Bastain, Ph.D., MPH, an environmental epidemiologist and senior author of the study. "This is one of the first studies to provide evidence that household use of pesticides can harm infant psychomotor development. These results are particularly important for socioeconomically disadvantaged communities who often encounter poor housing conditions and jointly experience a high burden of exposures to environmental chemicals and adverse health effects."

Participants for the MADRES cohort are recruited before they reach 30 weeks at three partner community health clinics and one private obstetrics and gynecology practice in Los Angeles. They are primarily low-income and Latina.

Milena Amadeus, who as project director for the MADRES study creates protocols for data collection, could empathize with mothers who are concerned for their babies.

"It's always scary as a parent when you have a child that is not following the normal growth or developmental trajectories because you just start wondering, "Are they going to catch up? How will this affect them in the future?" " said Amadeus, whose twins were born micro premature,

before reaching 26 weeks gestation, and experienced delayed motor development as a result.

"I was lucky enough that I had insurance. I had the ability to transport them to their appointments. I had the ability to be at home and help them with their development, and I don't know if a lot of our study families do," added Amadeus, whose twins are now healthy 7-year-olds. "I have to acknowledge that I had help and I was privileged in the care that I was able to access."

More information: Ixel Hernandez-Castro et al, Household pesticide exposures and infant gross motor development in the MADRES cohort, *Paediatric and Perinatal Epidemiology* (2021). DOI: 10.1111/ppe.12850

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