Pesticide exposure linked to stillbirth risk in new study

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Living less than about one-third of a mile from pesticide use prior to conception and during early pregnancy could increase the risk of
stillbirths, according to new research led by researchers at the Mel and
Enid Zuckerman College of Public Health and Southwest Environmental
Health Sciences Center.

Researchers found that during a 90-day pre-conception window and the
first trimester of pregnancy, select pesticides, including
organophosphates as a class, were associated with stillbirth.

The paper, "Pre-Conception And First Trimester Exposure To Pesticides
And Associations With Stillbirth," was published in the American
Journal of Epidemiology.

"In this study, some specific ingredients stood out due to their significant
associations with stillbirth risk," said first author Melissa Furlong, Ph.D.,
who studies the chronic health effects of environmental contaminants as
an assistant professor and environmental epidemiologist at the
Zuckerman College of Public Health and a member of the Southwest
Environmental Health Sciences Center at the R. Ken Coit College of
Pharmacy.

"These findings underscore the importance of considering individual
pesticides rather than just the overall pesticide class, as specific
chemical compounds may pose unique risks. It also highlights the
potential for pre-pregnancy exposures to affect reproductive outcomes."

To conduct the study, researchers linked Arizona pesticide use records
for 27 different pesticides with state birth certificate data that included
1,237,750 births and 2,290 stillbirths from 2006 to 2020.

They found that living within .31 miles (500 meters) of specific
pyrethroid, organophosphate or carbamate pesticide applications during
a 90-day pre-conception window or the first trimester was associated
with an increased risk of stillbirth.
Specifically, the pesticides cyfluthrin, zeta-cypermethrin, organophosphates as a class, malathion, carbaryl and propamocarb hydrochloride were linked to increased stillborn births pre-conception. During the first trimester, fenpropathrin, permethrin, organophosphates as a class, acephate and formetanate hydrochloride were associated with stillbirths.

"Among organophosphates, acephate showed the strongest effect estimates on stillbirth, so that exposure to acephate in the first trimester was associated with a doubling of risk," said co-author Paloma Beamer, Ph.D., a professor and interim associate dean at the Zuckerman College of Public Health and a member of the Southwest Environmental Health Sciences Center, U of A Health Sciences Asthma and Airway Disease Research Center and BIO5 Institute. "Within the pyrethroid class, cyfluthrin exposure during the 90 days prior to conception almost doubled the risk of stillbirth."

Pesticides are chemical substances used to control pests in various settings. They are commonly categorized into different classes, such as organophosphates, pyrethroids and carbamates. The primary route of exposure for most people is through diet, but household use, agricultural drift and occupational exposure are also significant pathways.

Researchers say while some pesticides may not have been directly implicated in this study, they could still pose risks to maternal and fetal health.

Pregnant women may be particularly vulnerable to the adverse effects of pesticide exposure due to physiological changes during pregnancy, such as increased metabolic rate, altered hormone levels and changes in the immune system. The developing fetus may be more susceptible to the toxic effects of pesticides during this period of rapid growth and development.
"Further research is essential to fully understand the safety profiles of various pesticides and to understand the underlying mechanisms of pesticide-induced stillbirth," Furlong said. "This study underscores the need to develop strategies for mitigating exposure to protect maternal and fetal health."


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