

THE WAITING ROOM

THIS WAY IN

New Study Links Parkinson's and Pesticides

Over the past decade, a number of studies have suggested that pesticide exposure may double a person's risk of developing Parkinson's disease. Now, for the first time, a family study has been published that reinforces that link.

In the March 28 edition of the journal *BMC Neurology*, researchers from Duke University Medical Center and the University of Miami Miller School of Medicine reported that people with Parkinson's disease were 61 percent more likely to report direct contact with pesticides—particularly insecticides and herbicides—than their unaffected relatives.

The researchers interviewed 319 people with Parkinson's and more than 200 relatives. Then, they combined data about the frequency of pesticide exposure (how many days per year, on average) and the duration (how many years a person was exposed to pesticides) to get a rate of cumulative exposure.

"We found a dosage effect," says Dana Hancock, Ph.D., currently a research fellow with the National Institute of Environmental Health Sciences. Dr. Hancock co-authored the study when she was a graduate student at Duke University. "Increasing levels of exposure to pesticides were associated with an increasing risk of Parkinson's," she notes. People who were exposed through direct pesticide application on more than 10 days a year were 2.07 times more likely to have Parkinson's

disease than those who were never exposed.

The fact that this study was done in families is important, says Dr. Hancock. "Since you're matching families, cases and controls are well-matched on unmeasured genetic factors, as well as shared environmental factors," she explains. ("Cases" are the patients in a study who have a particular condition; "controls" are healthy people who are studied in comparison.) "As a child, you share a much more similar environment with your sister as compared to the rest of the population. It's a way to get around introducing bias due to factors that may influence pesticide exposure and Parkinson's that we currently don't know about."

The study also began to tease out particular categories of pesticides associated with increased rates of Parkinson's, something that most previous studies have not done. "Pesticides are a very complex group," says Dr. Hancock, suggesting that some people may be vulnerable to developing disease as a result of exposure to one type of pesticide, while others may

be vulnerable to a different one. Some of the most common chemicals found in pesticide classes associated with Parkinson's were the agricultural insecticide chlordane, the now-banned insecticide dichloro-diphenyl-trichloroethane (DDT), the home-and-garden insecticide chlorpyrifos, the household insecticide diazinon, and the agricultural insecticide malathion.

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Dr. Hancock and other experts cautioned against jumping to conclusions. If you have Parkinson's disease today and sprayed Raid in your kitchen periodically a few years ago, that doesn't mean it caused the disease. "Most of us think that Parkinson's is caused by some combination of lifetime exposures to various things, both natural and man-made, superimposed on your genetic makeup," says J. Timothy Greenamyre, M.D., Ph.D., professor of neurology and director of the Pittsburgh Institute for Neurodegenerative Diseases at the University of Pittsburgh. He has also researched the Parkinson's-pesticides connection and found that the agricultural pesticide Rotenone induced Parkinson's-like symptoms in rats.

"Even if you have a strong exposure history, in any individual case, no one's going to be able to tell you with absolute certainty what caused your disease," Dr. Greenamyre says.

That said, you can limit your exposure to pesticides and herbicides with some simple safety precautions. "Wash your fruits and vegetables—that's probably one of the most important things you can do," advises Dr. Greenamyre. Don't rely on buying organic: Rotenone is derived from tropical plant extracts and frequently used in organic gardening. "And if you must use pesticides and herbicides, wear protective gear when applying them, such as masks and rubber gloves, and limit their use indoors, where the fumes aren't going to dissipate as well."

Much more research still needs to be done. "What we don't have are actual biomarkers [a physical sign found in the body, such as changes seen on MRI images or particular proteins in blood or urine] for pesticide exposure, so we have no way of biologically confirming which pesticides people have actually been exposed to, which is very important," Dr. Hancock says. —Gina Shaw

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BY THE NUMBERS

Cerebral Palsy

Cerebral palsy (CP) refers to a group of neurological disorders affecting body movement, posture, and muscle coordination. It is caused by damage to the white matter of the brain, bleeding inside the brain, or a lack of oxygen in the brain (asphyxia).

Damage typically arises during fetal development, but it can also occur shortly after birth or during infancy due to brain infections or head injury.

CP is chronic but does not get worse over time. Although it can't be cured, treatment (the earlier the better) can help improve function. This includes physical, occupational, and speech therapy; drugs to control seizures and relax muscle spasms; surgery to correct anatomical abnormalities or release tight muscles; and braces and wheelchairs.

1/3:

Portion of cerebral palsy cases associated with preterm birth. (37 weeks is considered full term.)

800,000:

Estimated number of children and adults in the U.S. living with one or more CP symptoms. The most common symptoms are tight muscles and exaggerated reflexes, poor muscle coordination, walking with one foot or leg dragging, walking on the toes, and a crouched gait.

10,000:

Number of babies and infants diagnosed with CP each year. The majority of children are diagnosed before age two, but if the child has mild symptoms, a diagnosis may not be made until age four or five.

5.5:

Babies weighing less than this number of pounds at birth have a higher risk of having CP (and the risk increases as the birth weight falls).

65–90:

Percentage of children with CP who live into their adult years, thanks to improvements in medical care, rehabilitation, and assistive technologies.

20:

Estimated percentage of children with cerebral palsy who are unable to produce intelligible speech.

Source: ninds.nih.gov/disorders/cerebral_palsy/detail_cerebral_palsy.htm

—Elizabeth Stump