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**Pesticide levels in blood linked to Parkinson's disease,
UT Southwestern researchers find**

DALLAS – July 13, 2009 – People with Parkinson's disease have significantly higher blood levels of a particular pesticide than healthy people or those with Alzheimer's disease, researchers at UT Southwestern Medical Center have found.

In a study appearing in the July issue of *Archives of Neurology*, researchers found the pesticide beta-HCH (hexachlorocyclohexane) in 76 percent of people with Parkinson's, compared with 40 percent of healthy controls and 30 percent of those with Alzheimer's.

The finding might provide the basis for a beta-HCH blood test to identify individuals at risk for developing Parkinson's disease. The results also point the way to more research on environmental causes of Parkinson's.

"There's been a link between pesticide use and Parkinson's disease for a long time, but never a specific pesticide," said Dr. Dwight German, professor of psychiatry at UT Southwestern and a senior author of the paper. "This is particularly important because the disease is not diagnosed until after significant nerve damage has occurred. A test for this risk factor might allow for early detection and protective treatment."

About 1 million people in the U.S. have Parkinson's, a number expected to rise as the population ages. The disease occurs when brain cells in particular regions die, causing tremors, cognitive problems and a host of other symptoms.

The study involved 113 participants, ages 50 to 89. Fifty had Parkinson's, 43 were healthy and 20 had Alzheimer's. The researchers tested the subjects' blood for 15 pesticides known as organochlorines.

These pesticides, which include the well-known DDT (dichlorodiphenyltrichloroethane), were widely used in the U.S. from the 1950s to the 1970s but are more tightly regulated now. They persist in the environment for years without breaking down. In the body, they dissolve in fats and are known to attack the type of brain nerves that die in Parkinson's disease, the researchers said.

"Much higher levels of the beta-HCH were in the air, water and food chain when the

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Parkinson's patients were in their 20s and 30s," Dr. German said. "Also, the half-life of the pesticide is seven to eight years, so it stays in the body for a long time."

Parkinson's disease is more common among rural men than other demographic groups, but it is not a matter of a single factor causing the devastating disease, Dr. German said.

"Some people with Parkinson's might have the disease because of exposure to environmental pesticides, but there are also genes known to play a role in the condition," Dr. German said.

Although the current study points to an interesting link between the pesticide beta-HCH and Parkinson's, there could be other pesticides involved with the disease, he said.

For example, the pesticide lindane often contains beta-HCH, but lindane breaks down faster. Beta-HCH might simply be a sign that someone was exposed to lindane, with lindane actually causing the damage to the brain, the researchers said.

In future research, Dr. German hopes to test patients from a wider geographical area and to measure pesticide levels in post-mortem brains. He and his team also are collecting blood samples from both patients with Parkinson's and their spouses to see if a genetic difference might be making the one with Parkinson's more susceptible to pesticides than the other.

Other UT Southwestern researchers involved in the study were Dr. Padraig O'Suilleabhain, associate professor of neurology; Dr. Ramón Diaz-Arrastía, professor of neurology; and Dr. Joan Reisch, professor of clinical sciences. Researchers from the Robert Wood Johnson Medical School, including lead author Dr. Jason Richardson, and the Environmental and Occupational Health Sciences Institute in New Jersey also participated in the study.

The study was funded by the National Institute of Environmental Health Sciences, the National Institute on Aging, the Dallas Area Parkinsonism Society, Rowe & Co. Inc., the Dallas Foundation and the Michael J. Fox Foundation for Parkinson's Research.

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