

Genes and pesticide exposure interact to increase men's risk for Parkinson's disease

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Genetic mutations and workplace exposure to some insecticides together appear to be associated with an increased risk for Parkinson's disease among men, according to a report in the June issue of *Archives of Neurology*, one of the JAMA/Archives journals.

"In most cases, the etiology of Parkinson's disease is likely to be multifactorial, and environmental factors as well as their interaction with susceptibility genes are considered to contribute to the disease," the authors write as background information in the article. Humans exposed to certain pesticides, including organochlorines such as DDT, have been shown to develop Parkinson's disease through damage to [neurons](#) that produce the neurotransmitter dopamine.

"If environmental chemicals can increase Parkinson's disease risk, host factors that contribute to variability in their uptake, metabolism and distribution in the body may modulate individual risk," the authors write. "Genetic polymorphisms of xenobiotic [compounds not naturally found in the body] metabolizing enzymes may act as susceptibility factors." The gene ABCB1 may encode the production of compounds essential to this process.

Fabien Dutheil, Ph.D., of Université Paris Descartes, Assistance-Publique Hôpitaux de Paris, and colleagues studied 207 individuals with Parkinson's disease and 482 matched controls. Participants were assessed to detect two known ABCB1 polymorphisms and classified as never users, users for gardening and professional users of [pesticides](#). For

professional users, detailed information on lifelong pesticide use was gathered.

Overall, ABCB1 polymorphisms were not associated with Parkinson's disease risk. However, among 101 men with Parkinson's disease and 234 matched controls, the relationship between organochlorine insecticide exposure and Parkinson's disease was approximately 3.5 times stronger in men who carried two variant alleles (gene copies) compared with those who were not carriers.

"Based on a biological hypothesis, we show that organochlorine insecticides may interact with ABCB1 in determining the risk of Parkinson's disease," the authors conclude. "These findings support the hypothesis of gene x pesticide interactions in [Parkinson's disease](#)."

More information: Arch Neurol. 2010;67[6]:739-745.

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