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Environ Health Perspect. 2009 Dec;117(12):1912-8. Epub 2009 Jul 31.

Well-water consumption and Parkinson's disease in rural California.

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INTRODUCTION: Investigators have hypothesized that consuming pesticide-contaminated well water plays a role in Parkinson's disease (PD), and several previous epidemiologic studies support this hypothesis. **OBJECTIVES:** We investigated whether consuming water from private wells located in areas with documented historical pesticide use was associated with an increased risk of PD. **METHODS:** We employed a geographic information system (GIS)-based approach to estimate potential well-water contamination from agricultural pesticides among 368 cases and 341 population controls enrolled in the Parkinson's Environment and Genes Study (PEG). We separately examined 6 pesticides (diazinon, chlorpyrifos, propargite, paraquat, dimethoate, and methomyl) from among 26 chemicals selected for their potential to pollute groundwater or for their interest in PD, and because at least 10% of our population was exposed to them. **RESULTS:** Cases were more likely to have consumed private well water and to have consumed it on average 4.3 years longer than controls ($p = 0.02$). High levels of possible well-water contamination with methomyl [odds ratio (OR) = 1.92; 95% confidence interval (CI), 1.00-2.78], chlorpyrifos (OR = 1.87; 95% CI, 1.05-3.31), and propargite (OR = 1.92; 95% CI, 1.15-3.20) resulted in approximately 70-90% increases in relative risk of PD. Adjusting for ambient pesticide exposures only slightly attenuated these increases. Exposure to a higher number of water-soluble pesticides and organophosphate pesticides also increased the relative risk of PD. **CONCLUSION:** Our study, the first to use agricultural pesticide application records, adds evidence that consuming well water presumably contaminated with pesticides plays a role in the etiology of PD.

PMID: 20049211 [PubMed - in process]

PMCID: PMC

Publication Types, Grant Support

Publication Types:

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[Research Support, U.S. Gov't, Non-P.H.S.](#)

Grant Support:

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[NS 038367/NS/NINDS NIH HHS/United States](#)
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