

Solvent Exposures and Parkinson Disease Risk in Twins

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Objective: Several case reports have linked solvent exposure to Parkinson disease (PD), but few studies have assessed associations with specific agents using an analytic epidemiologic design. We tested the hypothesis that exposure to specific solvents is associated with PD risk using a discordant twin pair design.

Methods: Ninety-nine twin pairs discordant for PD ascertained from the National Academy of Sciences/National Research Council World War II Veteran Twins Cohort were interviewed regarding lifetime occupations and hobbies using detailed job task-specific questionnaires. Exposures to 6 specific solvents selected a priori were estimated by expert raters unaware of case status.

Results: Ever exposure to trichloroethylene (TCE) was associated with significantly increased risk of PD (odds ratio [OR], 6.1; 95% confidence interval [CI] 1.2–33; $p = 0.034$), and exposure to perchloroethylene (PERC) and carbon tetrachloride (CCl_4) tended toward significance (respectively: OR, 10.5; 95% CI, 0.97–113; $p = 0.053$; OR, 2.3; 95% CI, 0.9–6.1; $p = 0.088$). Results were similar for estimates of exposure duration and cumulative lifetime exposure.

Interpretation: Exposure to specific solvents may increase risk of PD. TCE is the most common organic contaminant in groundwater, and PERC and CCl_4 are also ubiquitous in the environment. Our findings require replication in other populations with well-characterized exposures, but the potential public health implications are substantial.