

CROSS-SECTIONAL ASSOCIATION BETWEEN POLYFLUOROALKYL CHEMICALS AND TWO MEASURES OF COGNITIVE FUNCTION IN THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES)

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Background and aims: Epidemiologic and animal research suggests that non-steroidal anti-inflammatory drugs, especially ibuprofen, may be protective against cognitive decline and Alzheimer disease. The underlying mechanism is unclear but may be related to activation of peroxisome proliferator-activated receptors (PPARs). Polyfluoroalkyl chemicals (PFs) also appear to activate PPARs; therefore we hypothesized that exposure to PFs may be inversely related to measures of cognitive function in older adults.

Methods: We used data from participants 60 years and older from the 1999-2000 and 2003-2008 National Health and Nutrition Examination Surveys to evaluate the association between serum concentrations of four PFs, perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorononanoic acid (PFNA), and perfluorohexane sulfonic acid (PFHxS), and two measures of cognitive function: performance on the Digit Symbol Substitution Task (DSST) (1999-2000 only) and self-reported functional limitation due to poor memory or periods of confusion (1999-2000 and 2003-2008).

Results: In multivariable adjusted models, higher exposure to PFs was associated with reduced odds of self-reported functional limitation due to poor memory or periods of confusion (OR: 0.84 for a doubling in PFOS, 95% CI: 0.70, 0.99; OR: 0.82 for a doubling in PFOA, 95% CI: 0.66, 1.01; OR: 0.84 for a doubling in PFNA, 95% CI: 0.71, 0.99; OR: 0.95 for a doubling in PFHxS, 95% CI: 0.75, 1.16). However, there was little evidence to suggest an association between performance on the DSST and PF exposure in multivariable adjusted models.

Conclusions: This cross sectional study suggests that there may be an inverse association between exposure to PFs and self-reported functional limitation due to poor memory or periods of confusion. However, this study cannot establish temporality and further exploration in prospective analyses is warranted. No association was seen between PFs and performance on the DSST.