Breastfeeding as a Predictor of Serum Concentrations of Per- and Polyfluorinated Alkyl Substances in Reproductive-aged Women and Children: A Rapid Systematic Review

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### INTRODUCTION

- Per- and polyfluorinated alkyl substances (PFASs) are synthetic chemicals used for a range of manufacturing and industrial purposes.
- PFOA and PFOS are associated with poor health outcomes including developmental and reproductive effects.
- Major sources of human exposure to PFASs include diet, contaminated drinking water and indoor house dust.
- Due to current and prior uses, PFASs are ubiquitous in the environment, widely detected in human serum and breast milk.
- Lactation may be a potential excretion route of PFASs for women who breastfeed, and a source of exposure for infants.

### METHODS

#### Study Selection

- Records retrieved from PubMed and Scopus
- Titles and abstracts screened: n=3,278
- Full-text articles screened: n=432
- Final included studies: n=21

#### Risk of Bias Domains

- Recruitment Strategy
- Blinding
- Exposure Assessment
- Outcome Assessment
- Incomplete Outcome Data
- Selective Reporting
- Conflict of Interest
- Other Bias

### RESULTS

- **Infants/toddlers**
  - Higher serum PFASs per month of breastfeeding (p<0.05)
  - PFOA 4.7-6.0% increase
  - PFOS 3.4-0.0% increase

- **Pregnant and/or postnatal women**
  - Lower serum PFASs per month of breastfeeding (p<0.05)
  - PFOA 1-3.0% decrease
  - PFOS 9-3.0% decrease

### CONCLUSION

- “Sufficient” evidence for the association between breastfeeding and serum concentrations of PFASs among pregnant and/or postnatal women.
- “Limited” evidence for nursing infants/toddlers due to small size of studies, and potential for confounding and exposure misclassification.
- We found variability in exposure variables for breastfeeding across studies, as well as inconsistency in adjusting for parity and other confounding variables.
- One limitation was the lack of information on whether bottle-fed infants/toddlers received formula made with PFOA-contaminated water.
- Breast milk is the optimal food for child health and development. These results underscore the need to further reduce sources of human exposure to PFASs, particularly among these vulnerable populations.
- The Navigation Guide methodology can be a useful tool to identify important determinants of environmental exposure.

### REFERENCES


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