

SERUM AND FOLLICULAR FLUID CONCENTRATIONS OF POLYBROMINATED DIPHENYL ETHERS (PBDEs) AND *IN-VITRO* FERTILIZATION (IVF) OUTCOME

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Background and Aims: Human exposure to polybrominated diphenyl ethers (PBDEs) is widespread and body burdens in North Americans are particularly high. There is evidence of reproductive effects of PBDEs in animals, but human studies are limited. Our objective was to investigate the use of serum and follicular fluid as biomarkers of exposure to PBDEs and to explore the relationship between PBDE exposure and early pregnancy loss.

Methods: We measured PBDEs in serum and follicular fluid from 65 women undergoing *in-vitro* fertilization (IVF). Logistic regression models were used to estimate the odds of failed implantation associated with higher levels of PBDEs among the women in the study.

Results: There were moderate Spearman correlations between serum and follicular fluid concentrations of BDE 28, 47, 100 and 154 ($r=0.36-0.51$, all p -values <0.004), but BDE 99 and 153 were not correlated between the two matrices ($r<0.2$, all p -values >0.2). Women with detectable concentrations of BDE 153 (39% had detectable levels) in follicular fluid had elevated odds of failed implantation compared with women who had non-detectable concentrations (adjusted OR=10.0; 95%CI: 1.9 to 52; $p=0.006$; adjusted by age and BMI). There was also evidence for a dose-response trend when the women were divided into equal groups (adjusted OR for non-detect, medium, and high BDE 153 groups = 1.0 [reference], 6.7, and 18.7, respectively; p -value for trend = 0.008).

Conclusions: PBDE exposure may be associated with failed embryo implantation, but this association may be congener specific. Serum PBDE concentrations may not be a good indicator of the more biologically relevant follicular fluid concentrations when studying early pregnancy loss in women undergoing IVF. However, our ability to determine relationships between serum and follicular fluid PBDEs may be hindered by low detection rates.