

LONG TERM EFFECTS OF IN-UTERO EXPOSURE TO PERFLUORINATED CHEMICALS ON FEMALE REPRODUCTION

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Background and Aims: The perfluorinated chemical perfluorooctanoate (PFOA) is detected in human blood worldwide. Limited data exist on the possible effect of PFOA on human female reproduction and particularly on the implications of in-utero exposure. There are potential adverse effects on the development of the foetus since PFOA crosses the placental barrier and may act as endocrine disruptor.

The aim of this population-based study was to investigate the effects of in-utero exposure to PFOA on female reproduction.

Methods: The participants were female offspring from a Danish pregnancy cohort established in 1988-89. Maternal serum concentrations of PFOA during pregnancy were related to reproductive parameters of the adult daughters: menstrual cycle characteristics, levels of reproductive hormones and ultrasonographic appearance of the ovaries.

Results: The 246 participants had a median (range) age of 20.1 (19.5-20.8) years. Median (range) PFOA concentration in the mother's serum was 3.7 (0.1-19.8) ng/ml. The cohort was divided into three groups according to PFOA levels (n=82 in each group). When comparing to the reference group of low exposure, the group of medium exposure had a higher median level of sex hormone-binding globulin (110 vs. 147 nmol/l, p=0.01), and a lower median value of free androgen index (1.2 vs. 0.7, p=0.02), of anti-müllerian hormone (2.8 vs. 2.4 ng/ml, p=0.03), and number of follicles/ovary (13.5 vs. 11.5, p=0.03). Compared to the reference group, the high exposure group had a higher median level of sex hormone-binding globulin (110 vs. 150 nmol/l, p=0.04) and a later mean (SD) age at menarche (12.7 (1.2) vs. 13.1 (1.2) years, p=0.03).

Conclusions: Preliminary results showed possible effects of PFOA on levels of reproductive hormones, number of ovarian follicles and age at menarche. Future analyses including control for confounders will provide more information on whether in-utero exposure to PFOA may have adverse long-term effects on female reproduction.