

# THE EFFECTS OF PFOS AND PFOA IN MATERNAL SERUM ON MATERNAL AND INFANT THYROID HORMONES

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**Background and Aims:** Perfluorooctanesulfonate (PFOS) and Perfluorooctanoate (PFOA) are widely used in variety of industrial products and have been alleged persistent organic pollutants due to the chemical stability. However, there was no epidemiological report addressing the effects of these compounds on human thyroid hormones among mothers and their infants. The aim of this study was to examine the association of the concentrations of PFOS and PFOA in maternal serum with thyroid hormones, TSH and FT4, in maternal and infant serum.

**Methods:** 514 women who took prenatal health care at the Toho hospital (Sapporo, Hokkaido, Japan) were selected to participate in this study. We obtained the perinatal information from the questionnaire and medical records. PFOS and PFOA concentrations in maternal serum were measured after the second trimester of pregnancy or after delivery by LC/MS/MS, and TSH and FT4 in maternal and infant serum were measured by ELISA. The univariate and multiple linear regression analyses were performed to investigate the relationships between PFOS and PFOA levels and thyroid hormones.

**Results:** The concentration levels of PFOS and PFOA in maternal serum after delivery decreased compared to those before delivery. The thyroid hormone levels of infants were approximately twice as much as those of mothers. In the analyses of the correlations of PFOS and PFOA and thyroid hormones, there were significant association between PFOS and TSH of mothers and only male infants. No association between PFOS and FT4 in maternal serum was seen. PFOA had no effect on even maternal thyroid hormones.

**Conclusions:** This study showed that there was significant association between PFOS and TSH in maternal serum at low level exposure. PFOS also had an effect on infants' TSH. These results also indicate the possibility that PFOS and PFOA may have the ability of placental transfer.