ISEE Symposium

Prenatal exposure to POPs and age of puberty

**INFLUENCE OF PERFLUORINATED COMPOUNDS (PFCs) EXPOSURE ON DEVELOPMENT AND HORMONES OF CHILDREN FROM THE DUISBURG BIRTH COHORT STUDY**

Michael Wilhelm ¹, Monika Kasper-Sonnenberg³, Hermann Fromme³, Wolfgang Völkel³, Jürgen Wittsiepe¹, Claudia Cramer², Ulrich Ranft²

¹Department of Hygiene, Social and Environmental Medicine, Ruhr-University Bochum, Bochum, Germany.
²IUF Leibniz Research Institute for Environmental Medicine Düsseldorf, Germany
³Department of Chemical Safety and Toxicology, Bavarian Health and Food Safety Authority, Munich, Germany, Bavarian Health and Food Safety Authority, Oberschleissheim, Germany

Among the Duisburg Birth Cohort Study which was initiated 2000-02 (Wilhelm et al., 2008, Mutat. Res. 659, 83-92) we studied associations between prenatal and postnatal PFOS and PFOA exposure and infants development and hormones. 149 mother-newborn pairs were included in the PFC study. Blood PFC levels were measured in pregnant women, in newborns, and in children at ages 6-8 years. Outcome measurements were birth weight, neurodevelopment (Bayley scales motor and mental development of infants) at 12 and 24 months, assessment of the gender role behavior in young children (Pre-School Activities Inventory (PSAI) at 6-8 years. Estradiol, testosterone, thyroid hormones (TSH, T3, T4, fT3, fT4), were measured in cord serum and at ages 6-8 and 8-10 years, dihydroxyepiandrosteronesulphate (DHEA-S) was analyzed at ages 8-10 years. Median PFOA and PFOS concentrations in serum samples were as follows: pregnant women 2.7 (PFOA) and 8.9 (PFOS) µg/l, cord serum 2.0 (PFOA) and 2.9 (PFOS) µg/l, at age 6-8 yrs 4.6 (PFOA) and 3.6 (PFOS) µg/l. The prenatal PFOS/PFOA concentrations are correlated with the concentrations at 6-8 yrs after birth. Multivariate regression analysis revealed no significant associations between the birth outcomes and thyroid hormones of the newborns and the prenatal PFOA/PFOS exposures. Prenatal PFOS exposure was negatively associated with the mental development at 12 months of infants. This effect was more pronounced in German children (mean decrease 1.7%; 95% CI 0.2% - 3.1% per doubling of exposure). We also found associations between the prenatal PFOA/PFOS concentrations, and the gender role behaviour at 6-8 yrs, the sexual hormones and the DHEA-S levels at age of 8-10 years.

Conclusion: PFOS influences early mental development at a low level of effect. This effect disappears when the children are getting older. PFOA and PFOS seem to be involved in adrenal maturation and pubertal development.