

## Abstracts

PCB and DDE and child motor development have found contradicting results. The aim of this follow-up study was to examine the association between prenatal exposure to DDE and PCB and motor development and developmental milestones; crawling, standing-up and walking in children in Greenland, Ukraine and Poland.

**Methods** CB-153 and p,p'-DDE were measured in maternal blood in second or third trimester of pregnancy as a bio-marker of the child's prenatal exposure to the compounds. A total of 1,103 children aged 5 to 9 years were followed up in 2010–2012. Motor development were measured in terms of the parentally assessed screening tool Developmental Coordination Disorder Questionnaire 2007 (DCDQ'07) and developmental milestones were assessed via parental reports of child age at the first time of crawling, standing up and walking. The association between PCB/DDE and motor skills and milestones were analysed by means of linear multiple regression analyses using tertiles of exposure and stratified by country. Both complete case analyses and multiple imputation based analyses were executed. Adjustment were performed for the co-variables; maternal age, maternal smoking during pregnancy, maternal alcohol before pregnancy, maternal education, parity, gestational age at blood sampling, pre-term birth, breastfeeding, child sex and child age at interview.

**Results** We found no associations between prenatal PCB and DDE exposure and developmental milestones or motor skills. Complete case- and multiple imputation based analyses showed adjusted mean differences in motor skills and age at milestones around null, in all three countries.

**Conclusions** These results on 1,103 mother-children-pairs from the INUENDO cohort in Greenland, Warsaw (Poland) and Khar-kiv (Ukraine), indicate no association between in utero PCB/DDE exposure and developmental milestones and motor skills.

## 224 EXPOSURE TO POLYCYCLIC AROMATIC HYDROCARBONS AND SPERM QUALITY OF COKE-OVEN WORKERS

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**Objectives** The study aimed to assess whether exposure to polycyclic aromatic hydrocarbons (PAHs) alter sperm quality of coke-oven workers.

**Methods** Personal breathing zone, urine, and semen samples were collected from nonsmoking workers at top-side ovens (high exposure, N = 16) and side-ovens (low exposure, N = 20), and administrative staff members serving as the control group (N = 15). PAH concentrations were analysed by a gas chromatography quadrupole spectrometer. Routine semen was analysed by procedures in accordance with the World Health Organization guidelines. Urinary 1-hydroxypyrene (1-OHP) was analysed by HPLC with a fluorescence detector.

**Results** ANOVA analysis showed a significant difference in urinary 1-OHP levels ( $14.7 \pm 12.9$ ,  $4 \pm 4.3$ ,  $0.3 \pm 0.2$  g/g creatinine respectively,  $p = 0.02$ ) between the exposed groups and the control. Mean concentrations of 16 species of PAHs significantly

differed among the three groups (Total PAHs =  $41620.3 \pm 17697.6$  ng/m<sup>3</sup>,  $19887.6 \pm 1378.1$  ng/m<sup>3</sup>,  $57.0 \pm 18.1$  ng/m<sup>3</sup>,  $p < 0.0001$ ; Benzo (g,h,i)perylene =  $3553.9 \pm 1250.7$  ng/m<sup>3</sup>,  $3001.9 \pm 1367.7$  ng/m<sup>3</sup>,  $2.0 \pm 1.5$  ng/m<sup>3</sup>,  $p < 0.0001$ ,  $p = 0.067$ ). Asthenospermia was found more frequently in the high exposure group as compared to the control (37.5% and 13.3%, respectively,  $p < 0.01$ ). The exposed groups had lower percentages of normal morphology as compared with the control group ( $14.5 \pm 3.4\%$ ,  $15.0 \pm 3.1\%$ ,  $34.5 \pm 2.6\%$   $p < 0.01$ ). Multiple regression analysis showed that PAH species positively correlated with abnormality of morphology and motility of sperm.

**Conclusion** Abnormal morphology of sperm was associated with PAH concentrations, especially those with heavy molecular weights, e.g. benzo (g,h,i)perylene and benzo (k)fluoranthene.

## 225 EXPOSURE TO POLYBROMINATED DIPHENYL ETHERS AND MALE REPRODUCTIVE FUNCTION IN ARCTIC AND EUROPEAN POPULATIONS

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**Background** Animal and a few human studies suggest that polybrominated diphenyl ethers (PBDEs) may affect male reproductive function. The aim of the present study was to evaluate if male reproductive function was associated with serum levels of PBDEs.

**Methods** We evaluated the effects of environmental exposure to BDE-28, BDE-47 and BDE-153 on reproductive hormones and semen quality, including markers of DNA damage and apoptosis, in 299 men from Greenland, Poland and Ukraine.

**Results** Adjusted linear regression models indicated that sperm DNA damage measured by the TUNEL assay increased by 0.22%, confidence interval (CI) 0.03% to 0.42% for each percentage increase in lipid adjusted BDE-47 concentration, and semen volume decreased by 0.11% (0.01% to 0.19%) for each percentage increase in BDE-28 exposure.

**Conclusions** Adverse effects of PBDE exposure on semen volume and sperm DNA damage were observed but other conventional semen parameters and reproductive hormones were not affected. Harmful effects of PBDE exposure on sperm DNA damage is supported by experimental evidence based on other cell types.

## 226 PRENATAL BLOOD LEAD LEVEL AND CHILDHOOD NEUROBEHAVIORAL DEFICIT

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