

Greenlandic pregnant women: Diet and Serum Persistent Organic Pollutants

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The Greenlandic Inuit have high blood concentrations of environmental persistent organic pollutants (POPs), reported to be associated with age, smoking and intake of marine food. Studies have indicated that exposure to POPs during pregnancy can have adverse effect on fetal and child developmental health.

The study aimed to assess geographical differences in exposure to POPs of pregnant women in Greenland. The pregnant women in this ACCEPT sub-study were enrolled during 2010-11 and few from 2013. Questionnaire data and blood samples were collected from 207 pregnant women living in five Greenlandic regions (North, Disco Bay, Mid-West, South, East). Blood samples were analyzed for 11 organochlorine pesticides (OCPs), 14 polychlorinated biphenyls (PCBs), 5 polybrominated diphenyl ethers (PBDEs), 15 perfluoroalkylated substances (PFAS) and 63 metals.

The trend of higher marine food intake in the East and North was supported by a higher plasma n-3/n-6 fatty acids ratio. Significant regional differences were found for blood concentrations of PCBs, OCPs, PFAS and mercury, with significantly higher levels in the North and East regions. Most of the POPs were moderately associated to the n-3/n-6 ratio. The PFAS were significantly associated with the PCBs and OCPs in most regions. Moreover, in the North region the PFAS were associated with both selenium and mercury. No significant regional difference was observed for PBDEs.

The regional difference of POPs and mercury levels were related to marine food intake and plasma n-3/n-6 ratio. Compared to earlier reports, decreased levels of legacy POPs and perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) were observed. However, for other congeners such as perfluorohexane sulfonate (PFHxS), perfluorononanoic acid (PFNA) the level sustained. The detection of relatively high level of POPs and heavy metals in the maternal blood indicate that the fetus is exposed to these compounds that might influence the fetus development.