EFFECTS OF PRENATAL EXPOSURE TO ORGANOCHLORINES AND MERCURY ON GROWTH PARAMETERS IN INUIT NEWBORNS FROM THE CANADIAN ARCTIC

Gina Muckle, *CHUQ Medical Research Center and Laval University, Canada*
Renée Dallaire, *CHUQ Medical Research Center and Laval University, 2875 boul. Laurier, 6th Floor, Édifice Delta 2, room 600, Québec City (Québec), Canada, renee.dallaire@crchul.ulaval.ca*
Pierre Ayotte, *CHUQ Medical Research Center and Laval University*
Éric Dewailly, *CHUQ Medical Research Center and Laval University, Canada*
Nadine Forget-Dubois, *CHUQ Medical Research Center and Laval University, Canada*
Sandra W. Jacobson, *Wayne State University, USA.*
Joseph L. Jacobson, *Wayne State University, USA*

Background: Maternal consumption of seafood during pregnancy has been shown to be a source of exposure for the foetus to several environmental contaminants (ECs), including polychlorinated biphenyls (PCBs), chlorinated pesticides (CPs) and methylmercury (MeHg). These ECs have been found to be related to impaired foetal growth and shorter pregnancy duration in previous studies. On the other hand, seafood products are also an excellent source of docosahexaenoic acid (DHA), which has been shown to have beneficial effects on pregnancy outcomes and foetal growth. So far, it remains unclear if DHA intake during pregnancy can attenuate the potential adverse effect of ECs on foetal growth.
Objectives: To investigate the association of *in utero* exposure to ECs with pregnancy duration and foetal growth while taking into account the possible beneficial effects of DHA.
Methods: Pregnant Inuit women (n = 251) from Nunavik (Canada) were interviewed at mid-pregnancy and 1 month postpartum. Umbilical cord blood samples were collected from their newborns and analyzed for contaminants and DHA. Birth weight, length and head circumference were measured, and gestational age was assessed from date of last menstrual period. Multiple linear regressions and path models were used to evaluate direct effects of exposure to ECs on growth parameters and indirect effect on foetal growth through their impact on pregnancy duration.
Results: PCB 153, two CPs and MeHg were negatively associated with pregnancy duration in multivariate models. Indirect models revealed that all ECs were negatively associated with growth measurements through their negative relationships with pregnancy duration. Conversely, umbilical cord DHA concentration was positively related to growth parameters through its positive association with gestation duration.
Conclusion: *In utero* exposure to ECs of Inuit newborns was associated with reduced pregnancy duration, which adversely affects foetal growth. However, cord DHA appears to mitigate these effects on growth by prolonging gestational length.