DETERMINANTS OF MERCURY IN BLOOD FROM PREGNANT NORWEGIAN WOMEN – EXPLAINING DECREASING TIME TREND

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INTRODUCTION

High prenatal exposure to methyl mercury (MeHg) is a risk factor for impaired cognitive development. Seafood is the predominant source of MeHg exposure and concurrently an important source of nutrients important for cognitive development. Although strict measures have been taken on environmental Hg emissions, a decreasing time trend of Hg in fish is less evident. The purpose of this study is to identify determinants of blood total Hg (tHg) and to develop and validate a prediction model for blood tHg.

METHODOLOGY

Dietary intake of tHg and maternal blood concentration of tHg is available from 3590 pregnancies during 2002-2008 in the Norwegian Mother, Father and Child Cohort Study (MoBa). Blood tHg primarily reflects MeHg intake in a fish-eating population. Dietary exposure was obtained by a detailed and validated food frequency questionnaire combined with databases on Hg in food. Maternal blood obtained around 17 weeks of gestation was analysed for tHg. Determinants of blood tHg concentrations were identified with linear regression models. The Regional Committee for Ethics in Medical Research approved the study (2015/1346).

RESULTS

The mean blood tHg in women in this study group was 1.28 µg/L and decreased over the participation years. The calculated dietary tHg intake was 0.17 µg/kg bw per week, of which 0.15 µg/kg bw per week originated from seafood. The mean fish consumption in these pregnant women was 33 g per day. Our preliminary regression models show that categories of seafood (lean fish, semi-oily fish, fatty fish, farmed fish, bivalves/crustaceans) (R2 0.30) and estimated dietary intake of Hg (R2 0.31) equally well explain blood tHg. The number of teeth with amalgam fillings, a source of inorganic mercury, is an independent explanator of increasing blood tHg. Participation year is also an independent explanator, but in a decreasing direction. In addition, maternal age, education, parity, civil status and region of

residence were significant in the model. The reported total seafood consumption was quite constant over the participation years.

DISCUSSION

We have previously reported adverse effects of low-level dietary intake of mercury on birth weight and language development in this cohort. For these outcomes we also observed negative confounding by fish consumption. The prediction model will be important for interpreting associations between dietary intake of MeHg, seafood consumption and child development.