



THYROID AND PREGNANCY

No association was found between exposures to endocrine disruptors in the mother during pregnancy, infant thyroid function, and birth outcomes

BACKGROUND

Endocrine disruptors are chemical pollutants in the environment that can affect the action of endocrine glands. Persistent organic pollutants (POPs) are common environmental chemical exposures that consist of two major classes of compounds: perfluoroalkyl substances (PFAs) and organochlorines (OCs). These chemicals may affect thyroid function by binding to thyroid hormone receptors, interfering with making thyroid hormone in the thyroid gland and interfering with thyroid hormone binding to carrier proteins in the blood. All of these can lead to apparent mild hypothyroidism. Sources of exposures to POPs include diet, air, house dust, drinking water, and water-based beverages. Thyroid hormone plays an essential role in normal brain development. Because of this, there has been increasing interest in exposure of the mother to endocrine disruptors during pregnancy that may affect the baby's thyroid hormone levels and subsequent brain function. This study examined exposure of mothers to POPs during pregnancy and subsequent thyroid function in the mother and baby and birth outcomes.

THE FULL ARTICLE TITLE

Berg V et al. Persistent organic pollutants and the association with maternal and infant thyroid homeostasis: a multipollutant assessment. Environ Health Perspect. May 24, 2016 [Epub ahead of print].

SUMMARY OF THE STUDY

Data were obtained as part of the Northern Norway Mother and Child Contaminant Cohort Study and collected from May 2007 through June 2009 from a population representative of the general Norwegian population. Analyses were performed in 370 mother-child pairs. Serum was collected from the mother once during the second trimester for the measurement of maternal thyroid function and POP concentrations. TSH concentrations in the baby were obtained by heelprick within 3 days after delivery. Infants' weight, head circumference, and length were assessed as birth outcomes.

TPO antibody titers were detected in 22 women, who were included in all analyses. The average TSH of the children (53% male) was 1.2 mIU/L and 4 children had a TSH >5 mIU/L. Serum analyses showed detectable maternal levels of seven PFAs in >80% of the samples, with perfluorooctane sulfonate (PFOS) having the highest levels (average 8.03 ng/ml). Of the OCs, there were measurable levels of eight polychlorinated biphenyls (PCBs) and four pesticides in >80% of the maternal serum samples. The mother's TSH concentrations were directly related to the concentrations of most PFAs and OCs—the higher the POP level, the higher the TSH, suggesting a decrease in the mother's thyroid function due to the POP exposure. The four children with subclinical hypothyroidism (TSH >5 mIU/L) were born to mothers in the highest levels of TSH concentrations and PFOS exposure. In the full group, no significant associations existed either between maternal POP and infant serum TSH concentrations or between maternal POP concentrations and thyroid function with birth outcomes.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

In this Norwegian mother-child paired study of maternal exposures to primarily PFAs and OCs, there were direct associations between pollutant exposures to the mother and a mild decrease in the mother's thyroid function. However, no associations were found between pollutant exposures to the mother, infant serum thyroid function at 3 days of age, and birth outcomes (birth weight, head circumference, and length).

— Alan P. Farwell, MD,

ATA THYROID BROCHURE LINKS

Thyroid and Pregnancy: <http://www.thyroid.org/thyroid-disease-pregnancy/>

Hypothyroidism: <http://www.thyroid.org/hypothyroidism/>



THYROID AND PREGNANCY, continued

ABBREVIATIONS & DEFINITIONS

Endocrine disruptors: chemical pollutants in the environment that can affect the action of endocrine glands. Examples include bisphenol A (BPA), polychlorinated biphenols (PCBs), perfluoroalkyl substances (PFAs) and organochlorines (OCs).

Hypothyroidism: a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone. Treatment requires taking thyroid hormone pills.

Subclinical Hypothyroidism: a mild form of hypothyroidism where the only abnormal hormone level is an increased TSH. There is controversy as to whether this should be treated or not.

