



THYROID AND PREGNANCY

Endocrine disrupting chemicals during pregnancy and thyroid function in the mother and the baby

BACKGROUND

Normal thyroid function is very important for normal development of the baby, especially brain development. A number of studies have shown an association with low thyroid hormone levels and impaired brain development. Endocrine disrupting chemicals (EDC's) are chemicals in the environment that have been shown to affect hormonal systems in humans and animals. A growing body of literature has linked EDC exposure to alterations in thyroid function. Synthetic chemicals known as Per and polyfluoroalkyl substances (PFASs) are believed to be endocrine disrupters. PFASs are synthetic chemicals found in the environment where they are commonly used in consumer products such as food packaging and fire-fighting foam. PFASs from environmental exposure are measurable in human blood and have been shown to alter thyroid function. This study measured six different PFASs in the blood of both mother and baby and compared levels with measurements of thyroid function

THE FULL ARTICLE TITLE

Preston EV et. 2018 Maternal plasma per- and polyfluoroalkyl substance concentrations in early pregnancy and maternal and neonatal thyroid function in a prospective birth cohort: Project Viva (USA). *Environ Health Perspect* 126:027013. PMID: 29488882.

SUMMARY OF THE STUDY

These investigators measured the concentrations of six EDC's in mother and newborn blood samples. They measured six PFASs, which are EDC's that humans are typically exposed to in the environment. These PFAS are often used in food packaging, nonstick surfaces and firefighting foam and can be measured in human blood.

Higher concentrations in the blood suggest higher exposures. They measured blood concentration of PFASs and thyroid function (TSH, T₄, Free T₄ index) in 732 pregnant women participating in a prospective study in Boston, MA known as Project Viva, at approximately 10 weeks of pregnancy. They also examined thyroid hormone (T₄) levels in the blood from 480 newborn babies as part of the New England neonatal thyroid screening program. Higher levels of 4 of the 6 PFASs measured in the mothers were associated with lower free T₄ index levels in pregnant women and lower thyroid hormone (T₄) levels in male newborn babies. TSH levels in the mother were not affected by PFAS exposure in mothers except those with positive anti-thyroid peroxidase antibodies (a marker of auto-immune thyroid disease). These results indicate that environmental exposure to EDCs, specifically PFASs, during pregnancy can negatively impact thyroid function in both the mother and the newborn.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

These results suggest that exposure to PFASs in the environment can affect thyroid hormone levels in mothers and their babies. Higher measured blood concentrations of PFAS's were associated with lower free T₄ index in mothers and lower thyroid hormone levels in male newborns. This is concerning since thyroid hormone deficiency has been associated with negative effects on brain development. Additional research is needed to determine whether PFAS exposure during pregnancy can cause impairments in brain development of the baby related to alterations in thyroid function.

— Whitney W. Woodmansee MD

ATA THYROID BROCHURE LINKS

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

Thyroid Function Tests: <https://www.thyroid.org/thyroid-function-tests/>





THYROID AND PREGNANCY, continued

ABBREVIATIONS & DEFINITIONS

Endocrine Disrupting chemical (EDC): A synthetic compound that can affect the function of the endocrine system of humans or animals when exposed to the substance in the environment.

Thyroxine (T4): the major hormone produced by the thyroid gland. T₄ gets converted to the active hormone T₃ in various tissues in the body.

TSH: thyroid stimulating hormone — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.

Thyroid Awareness Monthly Campaigns

The ATA will be highlighting a distinct thyroid disorder each month and a portion of the sales for Bravelets™ will be donated to the ATA. The month of **July** is **Graves' Disease Awareness Month** and a bracelet is available through the **ATA Marketplace** to support thyroid cancer awareness and education related to thyroid disease.

