



## THYROID AND PREGNANCY

### High perchlorate exposure in pregnant women is associated with low IQ in their 3-year old children

#### BACKGROUND

Iodine is a micronutrient that is needed to make thyroid hormone, which is important for brain development in infants. Perchlorate is a chemical in the environment that arises from rocket fuel, airbags and other sources. In high amounts, perchlorate can lower iodine levels in the body, and thus lower thyroid hormone levels to result in hypothyroidism. Babies with hypothyroidism may have impaired brain development and developmental delay. This study was done to assess the possible association of perchlorate exposure in mothers during pregnancy and their infants' IQ scores at 3 years of age.

#### THE FULL ARTICLE TITLE

Taylor PN et al. Maternal perchlorate levels in women with borderline thyroid function during pregnancy and the cognitive development of their offspring: data from the Controlled Antenatal Thyroid Study. *J Clin Endocrinol Metab.* 2014 Nov;99(11):4291-8.

#### SUMMARY OF THE STUDY

This study was part of the Controlled Antenatal Thyroid Study (CATS), in which over 21,000 pregnant women in the United Kingdom and Italy participated in a randomized clinical trial. In the trial, women either received either thyroid hormone replacement if they were found to be hypothyroid during the first trimester of their pregnancy or did not have their thyroid function checked until after delivery. All of the children born to hypothyroid pregnant women (whether hypothyroidism was diagnosed in the first trimester or after delivery) had brain testing performed, including IQ tests, at 3 years of age.

As a part of the larger CATS trial, some of the women had urine perchlorate levels measured as well, as reported in the present study. The researchers found that pregnant women with the highest levels of perchlorate in the urine were the most likely to have children with the lowest IQ scores. This finding remained true even after looking at whether or not hypothyroidism was corrected for, if present, beginning in the first trimester of pregnancy, thus suggesting that perchlorate may have adverse effects independent of thyroid hormone status. Pregnant women, in general, had low urinary iodine levels in this study, consistent with inadequate iodine intake.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study raises the question of whether low-level perchlorate exposure from the environment among pregnant women may have negative effects on brain development in their children. It is also interesting to note that correction of maternal hypothyroidism, the target of perchlorate's effects, did not change this negative outcome. Until further research regarding the effects of perchlorate is available, it would be reasonable to ensure that women receive adequate iodine nutrition and maintain normal thyroid hormone levels throughout pregnancy.

— Angela M. Leung, MD, MSc

#### ATA THYROID BROCHURE LINKS

Iodine Deficiency: <http://www.thyroid.org/iodine-deficiency>

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

#### ABBREVIATIONS & DEFINITIONS

**Iodine:** an element found naturally in various foods that is important for making thyroid hormones and for normal thyroid function. Common foods high in iodine include iodized salt, dairy products, seafood and some breads.

**Hypothyroidism:** a condition where the thyroid gland is underactive and doesn't produce enough thyroid hormone.

Treatment requires taking thyroid hormone pills.

**Perchlorate:** a chemical in the environment that arises from rocket fuel, airbags and other sources. In high amounts, perchlorate can lower iodine levels in the body, and thus lower thyroid hormone levels to result in hypothyroidism.