

**THYROID AND PREGNANCY****Environmental perchlorate exposure causes slight decreases in the mother's thyroid function during pregnancy****BACKGROUND**

Iodine is an important part of thyroid hormone and it is actively transported into thyroid cells by special gates located on the cell wall, called “sodium iodine transporters”. Some environmental chemicals like perchlorate, nitrate and thiocyanate affect the function of sodium iodine transporter and may cause problem with thyroid hormone production. The amount of perchlorate in the environment is very controversial, as it is a major component of rocket fuel and high concentrations of perchlorate are found in regions around air force and other military bases. In many studies, long term chronic exposure to perchlorate has not been shown to significantly alter thyroid hormone levels in adults.

However, the story may be different in developing babies during pregnancy. Thyroid hormone is important for brain development before and after birth. The production of thyroid hormone is increased in pregnant women to meet with the higher demand of pregnancy. Some studies have shown that even modest decline of thyroid hormone level in pregnancy might be enough to cause changes like lowering IQ in offspring. The goal of this study was to identify the effect of perchlorate on thyroid hormone levels of pregnant women.

THE FULL ARTICLE TITLE

Steinmaus C et al Thyroid hormones and moderate exposure to perchlorate during pregnancy in women in Southern California. *Environ Health Perspect.* October 20, 2015 [Epub ahead of print].

SUMMARY OF THE STUDY

This study was conducted in San Diego County,

California. The urinary level of Iodine and perchlorate and the blood level of thyroid hormone, TSH, TPO antibody and Thyroglobulin antibody were measured in 1476 women in early stages of pregnancy.

The statistical analysis showed women with higher level of perchlorate had relatively lower levels of thyroid hormone and higher level of TSH. This effect was modest and not enough to cause major thyroid dysfunction in most women. However, this correlation was more significant in women with a higher level of urinary iodine and in women with positive levels of TPO antibody and Thyroglobulin antibody. The same effect was seen for nitrate and thiocyanate.

WHAT ARE THE IMPLICATIONS OF THIS STUDY

This study showed that environmental exposure to perchlorate, thiocyanate and nitrate might cause slight changes in thyroid hormone production. The effect would be more concerning in individuals with positive TPO antibody and Thyroglobulin antibody (basically women who are prone to develop thyroid dysfunction). Considering the large number of pregnant women exposed to these substances and the critical role of thyroid hormone in pregnant mother and her unborn baby, attention to this matter is important. Public effort to minimize the contamination of water supply and other forms of environmental exposures to these chemicals is essential.

— Shirin Haddady, MD

ATA THYROID BROCHURE LINKS

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

ABBREVIATIONS AND DEFINITIONS

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.

TPO antibodies: these are antibodies that attack the thyroid instead of bacteria and viruses, they are a marker for autoimmune thyroid disease, which is

the main underlying cause for hypothyroidism and hyperthyroidism in the United States.

Thyroglobulin antibodies: these are antibodies that attack the thyroid instead of bacteria and viruses, they are a marker for autoimmune thyroid disease, which is the main underlying cause for hypothyroidism and hyperthyroidism in the United States.