



THYROID AND PREGNANCY

Thyroid hormone levels during pregnancy may be associated with premature delivery

BACKGROUND

Prematurity, or delivery before the baby is ready to be born, is one of the most important causes of death in newborns and babies. It is also associated with major health problems later in life, leading to long term health and economic costs. Prevention of preterm delivery is difficult as the factors involved in causing premature birth are not well understood. Thyroid hormone level in the mother are very important in the growth and development of the baby, especially early in pregnancy. Thyroid hormones are also important for the normal development of the placenta, a critical component to maintain pregnancy. Research has shown that high thyroid hormone levels (hyperthyroidism) or low thyroid hormones (hypothyroidism) are associated with poor outcomes for the mother and the developing newborn. However, most studies have not followed levels during pregnancy and have only checked levels once during the first or the second trimester of pregnancy. In addition, the influence of mild thyroid dysfunction is not known. This study aimed to determine whether mild variations of thyroid function, measured four times during pregnancy, are associated with preterm delivery in women without thyroid disease.

THE FULL ARTICLE TITLE

Johns LE et al. Longitudinal profiles of thyroid hormone parameters in pregnancy and associations with preterm birth. *PLoS One* 2017;12: e0169542.

SUMMARY OF THE STUDY

Women were recruited before 15 weeks of pregnancy at the Brigham and Women's hospital in Boston. A total of 130 women who delivered babies before 37 weeks of gestation (premature deliveries) were cases and 352 women were controls. Women who had thyroid disease before or during pregnancy were excluded (41 women). Samples were collected up to four times during pregnancy, at a 10, 18, 26, and 35 weeks of gestation. TSH, active, free T₄ (FT₄), Total T₄, and total T₃ were

measured. They studied the difference in the changes of thyroid-function measurements and the association of thyroid function at each time point with premature birth. The final study population included 116 patients with preterm birth and 323 controls, for which 1443 blood samples were available.

The mothers were predominantly white, highly educated, nonsmokers, and either were pregnant for the 1st or 2nd time. Results showed significant differences in the changes of TSH, FT₄, T₄, and T₃ between the cases and controls. Notably, during normal pregnancy, there is a decrease in TSH during early pregnancy, which was seen in the control women but not in the women who delivered premature babies. Also, FT₄ concentrations were lower during early pregnancy in cases than in controls. For total T₄ and total T₃ concentrations, controls displayed a larger increase during early pregnancy than cases. Levels were similar after week 15 of pregnancy. When analyses were done per measurement, higher FT₄ concentrations at weeks 10 and 26 showed a protective effect, while these analyses indicated that higher total T₄ and total T₃ concentrations were associated with a higher risk of prematurity.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors conclude that changes of thyroid function over time during pregnancy are associated with premature delivery. The study shows that the changes seen normally during pregnancy are important determinants for normal pregnancy. As noted, women who delivered premature babies did not have the usual decrease in TSH and had lower FT₄ levels in early pregnancy. It is possible that these variations are critical in the early development of the placenta. If these results can be confirmed, this study may have impact in the care of pregnant women in the future.

— Liuska Pesce, MD





THYROID AND PREGNANCY, continued

ATA THYROID BROCHURE LINKS

Hyperthyroidism (Overactive): <https://www.thyroid.org/hyperthyroidism/>

Hypothyroidism (Underactive): <https://www.thyroid.org/hypothyroidism/>

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

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

ABBREVIATIONS & DEFINITIONS

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

Hyperthyroidism: a condition where the thyroid gland is overactive and produces too much thyroid hormone. Hyperthyroidism may be treated with antithyroid meds (Methimazole, Propylthiouracil), radioactive iodine or surgery.

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

Triiodothyronine (T3): the active thyroid hormone, usually produced from thyroxine.

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 **December** is **Thyroid and Development Awareness Month** and a bracelet is available through the **ATA Marketplace** to support thyroid cancer awareness and education related to thyroid disease.

