



## HYPOTHYROIDISM

### Lower total T<sub>4</sub> levels in the umbilical cord are associated with higher child brain developmental testing scores

#### BACKGROUND

Thyroid hormone is essential for normal brain development in the baby during pregnancy. Many studies have shown an association between decreased thyroid levels in the mother (hypothyroidism) during pregnancy and eventual decreased brain development in the baby. Most of these studies measured only thyroid hormone levels in the mother's blood. The umbilical cord contains blood from the baby but can only be safely sampled at the time of delivery of the baby. This study was performed to look at the association between thyroid hormone levels in the mother and in the umbilical cord after delivery and brain development in their children.

#### THE FULL ARTICLE TITLE

Williams FL et al. Maternal and Umbilical Cord Levels of T<sub>4</sub>, FT<sub>4</sub>, TSH, TPOAb, and TgAb in Term Infants and Neurodevelopmental Outcome at 5.5 Years. *J Clin Endocrinol Metab* 2013;98:829-38.

#### SUMMARY OF THE STUDY

This study looked at 97 women and their children. Thyroid hormone levels were measured in the umbilical cord at delivery as well as in the mother at 10 weeks and 34 weeks of pregnancy and at delivery. Brain development

was assessed in these children at 5.5 years of age using various standardized development scoring systems.

There was no association between the mother and the umbilical cord in TSH or FT<sub>4</sub> levels. However, the children with the lowest umbilical cord blood total T<sub>4</sub> levels had higher scores on developmental testing.

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

This is the first study to suggest that low T<sub>4</sub> levels in the baby may not be as bad as previously thought. However, all of the T<sub>4</sub> levels were still in the normal range – none were in the hypothyroid range. Also, FT<sub>4</sub> and TSH levels were normal. Further studies are needed to determine the significance of these findings.

— Heather Hofflich, DO

#### ATA THYROID BROCHURE LINKS

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

Hypothyroidism: <http://www.thyroid.org/what-is-hypothyroidism>

#### ABBREVIATIONS & DEFINITIONS

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

**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.

**Thyroxine (T<sub>4</sub>):** the major hormone produced by the thyroid gland. T<sub>4</sub> gets converted to the active hormone T<sub>3</sub> in various tissues in the body

**FT<sub>4</sub> :** blood measurement of the free T<sub>4</sub> level. Only the free hormone is active.

**Total T<sub>4</sub> :** blood measurement of the total T<sub>4</sub> level which includes hormone bound to blood proteins and, thus, not active.