



## THYROID AND PREGNANCY

### TSH concentration is increased and FT<sub>4</sub> is decreased in pregnancies resulting in miscarriage or fetal death

#### WHAT IS THE STUDY ABOUT?

Maintaining normal thyroid function in the mother during pregnancy is very important. It is clear that an underactive thyroid (hypothyroidism), where both the TSH is increased and the T<sub>4</sub> level is decreased, has been associated with an increased risk of miscarriage and fetal death. However, the association of miscarriage with mild hypothyroidism where the T<sub>4</sub> is normal and only the TSH is increased (subclinical hypothyroidism) has been less clear. Thus, it is unclear at what level of hypothyroidism the risk of miscarriage starts to increase. This study compared the TSH and T<sub>4</sub> levels in the women whose pregnancy ended in miscarriage or fetal death with the TSH and T<sub>4</sub> levels in women who had a live birth.

#### THE FULL ARTICLE TITLE:

Ashoor G et al. Maternal thyroid function at 11 to 13 weeks of gestation and subsequent fetal death. *Thyroid*. 2010; 20(9):989-993.

#### WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to compare the TSH and T<sub>4</sub> levels in the women whose pregnancy ended in miscarriage or fetal death with the TSH and T<sub>4</sub> levels in women who had a live birth.

#### WHO WAS STUDIED?

A total of 202 women with a pregnancy that ended in miscarriage or fetal death were included in the study. All women were carrying only one child at the time they were consented to be enrolled in the study. Thyroid function tests of these 202 women whose pregnancy ended in fetal death were compared to 4318 women with normal pregnancies. Data from the 4318 women with normal pregnancies were collected as part of an earlier study by these investigators.

#### HOW WAS THE STUDY DONE?

Women presenting between 11 and 13 weeks gestation for their first medical visit during pregnancy were recruited to participate in the study. Basic information about the patients was obtained and blood samples for TSH, free T<sub>3</sub>, Free T<sub>4</sub> and anti-thyroid antibodies were collected. There were a total of 202 women with pregnancies that ended in fetal loss/miscarriage. The thyroid function blood tests of these women that were collected between 11 and 13

weeks gestation were compared with results from women in which the pregnancy did not end in fetal loss.

#### WHAT WERE THE RESULTS OF THE STUDY?

The main results of this study are that the average TSH level was higher and the average Free T<sub>4</sub> level was lower in the women who suffered a fetal loss as compared to women with a live birth. In both cases, the mean Free T<sub>4</sub> and TSH levels were in the normal range. These results suggest there is a progression of risk of miscarriage as the TSH increases and the FT<sub>4</sub> decreases and that the mothers do not need to have abnormal values to be at risk. There were no differences in the presence of anti-thyroid antibodies between groups.

#### HOW DOES THIS COMPARE WITH OTHER STUDIES?

Several studies have shown that hypothyroidism in the mother is associated with reduced fertility and increased risk for miscarriages. There are conflicting studies about whether mild hypothyroidism is associated with fetal loss. This is the first study to show a risk for miscarriage with thyroid levels in the normal range.

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

This study suggests there is a progression of risk of miscarriage and fetal loss as the TSH increases and the FT<sub>4</sub> decreases and that the mothers do not need to have abnormal values to be at risk. It is unclear if treating patients with thyroid hormone would alter this risk. Further, since the patients in this study had normal thyroid function, it is unclear what parameters would be used to suggest treatment with thyroid hormone.

— Whitney Woodmansee, MD

#### ATA THYROID BROCHURE LINKS

Thyroid and Pregnancy: [http://thyroid.org/patients/patient\\_brochures/pregnancy.html](http://thyroid.org/patients/patient_brochures/pregnancy.html)

Thyroid Function Tests: [http://thyroid.org/patients/patient\\_brochures/function\\_tests.html](http://thyroid.org/patients/patient_brochures/function_tests.html)

Hypothyroidism: [http://thyroid.org/patients/patient\\_brochures/hypothyroidism.html](http://thyroid.org/patients/patient_brochures/hypothyroidism.html)

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## **THYROID AND PREGNANCY, continued**

### **ABBREVIATIONS & DEFINITIONS**

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

**Subclinical Hypothyroidism** — a mild form of hypothyroidism.

**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 secreted by the thyroid gland. Thyroxine is broken down to produce

Triiodothyronine (T<sub>3</sub>) which causes most of the effects of the thyroid hormones. Levothyroxine is the available medication to replace thyroid hormone.

**Pregnancy Loss** — Generally, this term refers to stillbirth and/or miscarriage. The term fetal loss is also used in this setting.

**Miscarriage** — this occurs when a baby dies in the first few months of a pregnancy, usually before 22 weeks of pregnancy.

**Fetal death** — this occurs when a baby dies later in pregnancy (usually after 22 weeks of pregnancy) before delivery.