

Iodine Supplementation in Euthyroid Pregnant Women Does Not Alter Maternal Free T₄ Levels

Elizabeth N. Pearce

bodies, thyroxine-binding globulin (TBG), and serum thyroglobulin were obtained at enrollment, week 22, week 33, and 3 months postpartum. Thyroid ultrasound was performed at baseline, at week 33, and at the postpartum visit. Comparisons between groups were performed using χ^2 and Fisher's exact tests for categorical data and Mann-Whitney testing for continuous data.

Results

A total of 86 of the 111 women were followed until delivery, and 36 were followed to 3 months postpartum. Ten women taking iodine-containing supplements and only one woman in the control group dropped out because of nausea and vomiting. Median urinary iodine excretion was similar in the treatment and control groups at baseline (111 $\mu\text{g/L}$ vs. 103 $\mu\text{g/L}$), and 84% of

women in both groups reported using iodized salt. In the treatment group, urinary iodine increased to 161 $\mu\text{g/L}$ by the third trimester, whereas in the controls the urinary iodine concentration decreased to 76 $\mu\text{g/L}$ ($P < 0.001$). Free T₄ decreased by 15% in treated women and 21.6% in the controls between the first and second trimesters ($P = 0.27$), and then remained stable in the third trimester. Total T₄, free T₄, free T₃, TSH, TBG, and thyroid volume did not differ between groups at any time point. Serum thyroglobulin was lower in the treated group than in controls at the second-trimester and postpartum visits ($P < 0.01$).

Conclusions

Iodine supplementation in mildly iodine-deficient, antithyroid antibody-negative, euthyroid pregnant women did not alter maternal free T₄ levels.

ANALYSIS AND COMMENTARY ● ● ● ● ●

Serum free T₄ and free T₃ concentrations typically decrease after the first trimester of pregnancy. This is due, at least in part, to the fall in serum level of human chorionic gonadotropin (hCG), a stimulator of the thyroidal TSH receptor, after weeks 8 to 10 of gestation. In this study, an decrease of approximately 20% in free peripheral thyroid hormone levels was observed in both groups between the first and second trimesters, with no concomitant increase in TSH. The ratio of total T₄ to TBG followed the same pattern as free T₄, arguing against free T₄ assay artifact as a reason for the observed decline in free T₄. These data suggest that the free T₄ decline after the first trimester is physiologic, not pathologic, and is not the result of mild iodine deficiency. There is a need for trimester-specific, assay-specific reference ranges for free T₄ to guide clinical decision-making.

Strengths of the study include its randomized, prospective design and the fact that iodine supplementation was started relatively early in gestation. The supplementation dose of 150 μg of iodine daily is in agreement with ATA and Endocrine Society guide-

lines (3,4). However, results may not be generalizable to antithyroid antibody-positive women or to those with baseline hypothyroxinemia or TSH elevations, who might be more susceptible to the development or worsening of thyroid hypofunction in the setting of iodine deficiency. There was more gastrointestinal intolerance of iodine-containing prenatal multivitamins, leading to differential dropout, in the treatment group. It is important to note that effects of iodine supplementation on fetal and neonatal thyroid function and developmental outcomes were not assessed.

These data should not be interpreted as a reason to avoid iodine supplementation for iodine-deficient pregnant women. Even mild maternal iodine deficiency in pregnancy has been associated with deleterious effects on child cognition (5,6). In the present study, iodine supplementation prevented a rise in serum thyroglobulin levels, a marker for iodine deficiency, and normalized urinary iodine concentrations. Supplementation with 150 μg of iodine daily in mildly deficient regions has been demonstrated to be safe; supplementation should optimally be started before a woman conceives.

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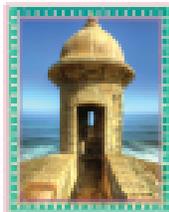


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