

Additional hormone measurement reveals pregnant women at high risk of preeclampsia

An additional blood test for pregnant women accurately predicts which women with high thyroid function are at risk of developing preeclampsia, according to a study presented today at the European Congress of Endocrinology. The findings may help identify high-risk pregnant women and potentially avoid unnecessary treatment that carries the risk of foetal abnormalities.

Preeclampsia is a condition that occurs during the second half of pregnancy, where women have high blood pressure and pass protein in their urine. It occurs in 2-8% pregnancies and in some cases leads to serious complications for both mother and child, including seizures, kidney failure, haemorrhage and preterm birth.

One of the risk factors for preeclampsia is hyperthyroidism, which can be caused by medical conditions such as Graves' Disease or toxic thyroid nodules. However, high levels of hCG, a hormone that rises naturally during pregnancy, also leads to high thyroid function but this type of pregnancy-related hyperthyroidism does not have an increased risk of preeclampsia.

As taking drugs to treat high thyroid function during pregnancy carries the risk of causing foetal abnormalities, it is important to distinguish between an overactive thyroid caused by pregnancy-related hCG or one caused by a conventional underlying thyroid condition.

In this study, researchers measured the hormones of 5153 women during early pregnancy (before the 18th week) and found that women with high levels of thyroid hormone but low levels of hCG were between three and eleven times more likely to develop preeclampsia. Women with high levels of thyroid hormone and high levels of hCG were not at increased risk of preeclampsia. The researchers accounted for other factors including the age, smoking, education and ethnicity of the expectant mothers as well as the gender of the baby.

"Most pregnant women will have high thyroid hormone levels because of a natural rise in hCG, rather than an underlying thyroid condition like Grave's Disease or toxic nodules", said lead author of the study Dr Tim Korevaar from the Erasmus University Medical Center in Rotterdam.

"Doctors do not currently screen for preeclampsia, although many do measure thyroid hormone during pregnancy," continued Dr Korevaar. "Measuring hCG as well may help doctors to more accurately interpret thyroid function tests in pregnant women."

"Our work will potentially reassure the vast majority of patients who do not actually have an underlying thyroid condition by helping them avoid unnecessary treatment".

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Abstract

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Additional measurement of hCG distinguishes physiological high-normal thyroid function and reveals large differences in the risk of developing preeclampsia.

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Context: Preeclampsia is a leading cause of maternal and perinatal morbidity and mortality worldwide, affecting 2–8% of all pregnancies. We have previously shown that women with high-normal levels of FT4 during early pregnancy have a 2.1-fold increased risk of preeclampsia – but there was no apparent association with low TSH. However, the thyroid is stimulated by human chorionic gonadotropin (hCG) during early pregnancy and therefore we hypothesized that women with high-normal thyroid function due to high hCG levels would have a different risk of preeclampsia as compared to women with high-normal thyroid function and low hCG.

Design, Setting, and Participants: In 5153 women TSH, FT4, hCG and TPO-antibody levels were measured during early pregnancy (<18th week). The association of high-normal FT4 (5th quintile) or low TSH with preeclampsia was analysed using multivariable logistic regression stratified per 20.000 IU/L hCG (up to >60.000). All analyses were adjusted for gestational and maternal age, smoking, education, ethnicity, parity, BMI and fetal gender.

Results: The combination of high-normal FT4 levels with low hCG (<20.000 IU/L) was associated with an 11.1-fold increased risk of preeclampsia ($P<0.05$).

The combination of low TSH with low hCG (<20.000 IU/L) was associated with an increased risk of preeclampsia ranging between a 9.2-fold increased risk for TSH <0.1 mU/L, to an 8.7-fold increased risk for TSH <5th percentile and to an 3.8-fold increased risk for TSH <0.4 mU/L (all $P<0.05$). The combination of high-normal FT4 and hCG > 20.000 or low TSH and hCG>20.000 was not associated with an increased risk of preeclampsia. All analyses remained similar after exclusion of TPOAb positive women.

Conclusion: The additional measurement of hCG in women with high normal thyroid function tests markedly improves the identification of women at high-risk of developing preeclampsia. This is likely to be due to the fact that hCG measurements allow for distinguishing physiologically high thyroid function caused by high hCG levels from pathophysiological high thyroid function due to autonomous production and/or TSH receptor stimulation antibodies.

Notes for Editors

1. For further information about the study please contact:

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2. The study "[Additional measurement of hCG distinguishes physiological high-normal thyroid function and reveals large differences in the risk of developing preeclampsia](#)" will be presented at 12.15PM on Sunday 29 May 2016 at the European Congress of Endocrinology at the ICM in Munich, Germany.

3. For other press enquiries please contact the ECE 2016 press office:

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4. The European Congress of Endocrinology is held at the Internationales Congress Center München between 28-31 May 2016.
5. The [European Society of Endocrinology](#) was created to promote research, education and clinical practice in endocrinology by the organisation of conferences, training courses and publications, by raising public awareness, liaison with national and international legislators, and by any other appropriate means.