Investigating the Role of TSH in Parturition and Preterm Birth

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Introduction

A number of large epidemiological studies have demonstrated an association between hypothyroidism and preterm birth. Other studies have identified the presence of anti-thyroid peroxidase antibodies (TPO) but not anti-thyroglobulin antibodies (TG) as an independent risk factor for preterm birth. The aim of this study was to replicate epidemiological findings in a local cohort and to investigate thyrotropin receptor (TSHR) mRNA and protein expression in myometrium obtained from women with and without labour in order to provide evidence for a biological mechanism for the clinical observations.

Methods

We investigated the association between TSH and gestation at delivery in pregnant women attending the Royal Women's hospital. We also investigated the expression of TSHR mRNA and protein in myometrial samples obtained from women at Caesarean Section with or without labour (n=10) by real time RT-PCR and Western Blot.

Results

An audit of 347 TFT results in 180 patients shows a significant positive association between gestation at delivery and TSH only in the second trimester in patients not on thyroxine (r² = 0.2, p=0.04). There was no association between TSH in the first trimester or in patients on thyroxine supplementation at any time.

TSHR mRNA is significantly reduced compared to nonpregnant and not in labour (p=0.0008 ANOVA) and this result is confirmed for TSHR protein by WB (p=0.01).

For the patients who had anti-thyroid antibody tests available, (n=40) there was no significant difference in gestational age at delivery between antibody negative and antibody positive groups all of whom were receiving thyroxine therapy.

Conclusion

TSHR is expressed in myometrium and decreases significantly in labour. Treatment with thyroxine removes the association between TSH and gestational age at birth. Antithyroid antibody status did not effect gestational age at birth.

References