TSH test is not part of routine examinations of the pregnancy monitoring care in Brazilian public health system (SUS). The test is not requested in low-risk pregnant women like those at high risk. The Overt Hypothyroidism (no subclinical) is prevalent in 0.3% to 0.5% of pregnant women and is asymptomatic in 70% of these patients. Thus, in order to avoid risks to the mother and fetus health due absence of early diagnosis, it would be ideal for pregnancy monitoring care examinations in the public health system to request a TSH test, especially in high-risk pregnancies. **Method:** A cross-sectional observational study was approved by the Ethics Committee (CAAE 22906619.2.0000.0062) to review 83 medical records of high-risk pregnant women in a Brazilian public hospital, State of São Paulo, Brazil in 2020. Inclusion criteria: All patients who are being followed up in high-risk childbirth or are hospitalized in the high-risk sector on the maternity during the year 2020. Complete medical records containing the data proposed to be researched and results of exams to be analyzed in the research. **Results:** The study included the review of 83 medical records of high-risk pregnant women with average age of 30 years old, average gestational age of 31 weeks and average weight of 84 kg. From these 11.4% (n = 10) declared that they had hypothyroidism and 2.4% (n = 2) hyperthyroidism in the first consultation. The 47% (n = 39) had their TSH measured during pregnancy, of which TSH had changed 30.8% (n = 12), 5.1% (n = 2) with suppressed TSH and 25.6% (n = 10) with TSH above the limit for pregnancy. Of the pregnant women who had a diagnosis prior to the pregnancy of hypothyroidism, only 1 did not have their TSH collected during pregnancy. Of the pregnant women who had hyperthyroidism, all had TSH collected during pregnancy, but kept TSH suppressed and free T4 at the upper limit throughout the pregnancy. 10% (n = 8) had gestational bleeding, of which only 25% (n = 2) had TSH measured at some point during pregnancy, of these, one had an altered TSH, but no medication was prescribed or the test repeated. **Conclusion:** Recognizing that the evolution of pregnancy depends on the normal thyroid eixo, we believe that for high-risk pregnant women they should have their thyroid eixo evaluated in the first trimester.

Thyroid

THYROID BIOLOGY, HYPOTHALAMIC-PITUITARY-THYROID AXIS

Analysis of Hypothalamic TRH Neurons in Regulating Thyroid Hormone Levels

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Thyroid hormone (TH) is a major regulator of development and metabolism. An important mechanism controlling TH production is the negative feedback at the hypothalamic and pituitary level and it has been suggested that thyroid hormone receptor β (TRβ) is the main mediator of TH actions in the hypothalamic paraventricular nucleus (PVN). Nevertheless, the direct actions of TH and TRβ in the negative regulation of TRH have yet to be demonstrated *in vivo*. Here we used two approaches to investigate the TRH neuron. First, we used a chemogenetic tool to directly investigate the role of TRH neurons on the regulation of thyroid hormone levels. Mice expressing Cre-recombinase in TRH neurons received bilateral injections of the activating designer receptors exclusively activated by designer drugs (DREADD) directly into the PVN. Activation of TRH neurons produced a rapid and sustained increase in circulating TSH levels in both males and females. TSH levels increased approximately 10-fold from baseline within 15 minutes of injection of CNO, returning to baseline within 2.5 hours. TH levels were increased approximately 2-fold in males and females. Therefore, using a chemogenetic approach, we were able to directly evaluated the role of PVN TRH neurons on the control of thyroid activity, for the first time. Next, we generated mice deficient in TRβ specifically in neurons expressing melanocortin 4 receptor (MC4R), which overlaps with TRH expression in the PVN. Knockout mice (KO) developed normally and showed no change in TH and TSH levels. TRH mRNA levels in the PVN of KO mice were similar to control mice. To investigate if the deletion of TRβ in the PVN changes the sensitivity of the HPT axis to T3, mice were rendered hypothyroid and given increasing doses of T3 for 2 weeks. Results show no difference in TRH mRNA or serum TSH between controls and KO. Surprisingly, despite the presence of detectable genomic recombination on the TRβ gene in the PVN, there was no difference in TRβ mRNA expression between control and KO mice, suggesting that either MC4R-positive neurons do not express TRβ or they represent a very small population of TRβ-positive cells in the PVN. Present data show that TRH neuron activation rapidly stimulates TSH release and increases TH levels, demonstrating a major role of these neurons in the regulation of the hypothalamic-pituitary-thyroid (HPT) axis. Nevertheless, deletion of TRβ from MC4R neurons had no major effect on either TRH or TH levels in in mice. Additionally, TRβ in MC4R-positive TRH neurons in the PVN is not necessary for TH-induced suppression of TRH mRNA. Although further studies are necessary, these data suggest that there are distinct populations of hypophysiotropic TRH neurons in the PVN, some of which are not regulated by thyroid hormone and TRβ.

Thyroid

THYROID BIOLOGY, HYPOTHALAMIC-PITUITARY-THYROID AXIS

Assessment of the Thyroid Function During the Three Trimesters of Pregnancy Among the Egyptian Population

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Background: Pregnancy is associated with significant but reversible changes in the thyroid function that might cause maternal and fetal complications. Undetected and untreated thyroid disorders are associated with adverse maternal and fetal outcomes, thus screening is important. There are limited data on the prevalence of newly diagnosed thyroid disease during pregnancy from Egypt. Therefore, this study was designed to evaluate the prevalence of thyroid dysfunction during the three trimesters of pregnancy.