

PREVALENCE OF THYROID HORMONE ABNORMALITIES AMONG PREGNANT WOMEN

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Abstract

Objective: The aim of present study was to identify thyroid abnormalities-Hypothyroidism, hyperthyroidism and autoimmune diseases in women during pregnancy.

Method: The study covers 106 pregnant women with thyroid abnormalities. The females were included irrespective of their gravid status and multiple pregnancies were also included. The age of the women ranged from 20-50 years. The study was to determine Serum TSH, FT₄, FT₃, anti-TPO and anti-Tg by Assay methods.

Results: Hyper and hypothyroid pregnant group showed significant changes in serum TSH and in autoimmune thyroid disease showed significant changes in Anti-Tg & Anti-TPO. Our study shows that prevalence of hypothyroidism in pregnancy is 48%, autoimmune thyroid disease is 29% and hyperthyroidism is 23%. So the prevalence of hypothyroidism is high.

Conclusion: TSH, TG-AB & TPO-Ab can be used to assess thyroid abnormalities in pregnancy. If untreated thyroid abnormalities cause many complications in pregnancy.

INTRODUCTION

A normal adult thyroid weighs 10-20 and receives blood from bilateral superior and inferior thyroid arteries and small artery called the thyroid ima. The thyroid gland makes two thyroid hormones, triiodothyronine (T₃) and thyroxine (T₄). T₃ is the active hormone and is made from T₄. Thyroid hormones affect metabolism, brain development, breathing, heart and nervous system functions, body temperature, muscle strength, skin dryness, menstrual cycles, weight, and cholesterol levels. Thyroid hormone production is regulated by thyroid-stimulating hormone (TSH), which is made by the pituitary gland in the brain. When thyroid hormone levels in the blood are low, the pituitary releases more TSH. When thyroid hormone levels are high, the pituitary responds by decreasing TSH production.

Two pregnancy-related hormones—human chorionic gonadotropin (hCG) and estrogen—cause increased thyroid hormone levels in the blood. Made by the placenta, hCG is similar to TSH and mildly stimulates the thyroid to produce more thyroid hormone. Increased estrogen produces higher levels of thyroid-binding globulin, also known as thyroxine-binding globulin, a protein that transports thyroid hormone in the blood.

Maternal thyroid hormone excess or deficiency can influence the outcome for mother and fetus at all stages pregnancy, as well as interfere with ovulation and fertility. It has associated with fetal loss, pregnancy induced hypertension, preterm delivery, placental abruption and reduced intellectual function in offsprings. Maternal hyperthyroidism is less common, affecting approximately two of 1000 pregnancies. Autoimmune hypo and hyperthyroidism also increase the risk of obstetrical complications. It appears that low birth weight, prematurity and eclampsias are associated with severity of the thyroid function. Thyroid failure and even low normal free thyroxine FT₄ level in early pregnancy are associated with impaired neuropsychological development.

MATERIAL AND METHODS

The study covers 106 pregnant women with thyroid abnormalities. The females were included irrespective of their gravid status and multiple pregnancies were also included. The age of the women ranged from 20-50 years. Serum TSH, FT₄, FT₃, anti-TPO and anti-Tg by using commercially available kit. All assays were performed by Electrochemiluminescence immunoassay

(ECLIA) by using Beckman coulter, Roche Hitache (cobase 411) and Roche Elecsysv1010/2010 immunoassay system. It is designated for both quantitative and qualitative invitro determination using a wide variety of tests. All assay reagents; calibrator and control information is automatically entered in to the software by bar codes.

Procedure: 500µl of serum samples from each patient was added into the cups provided by Roche Diagnostics. The cups were loaded in the sample area of the analyzer. The analyzer will process the sample with appropriate parameters at the reaction area of the analyzer. Finally results were displayed on the monitor of the instrument.

Statistical analysis : data are given as mean \pm SD. Statistical analysis were performed using unpaired t-test since the maximum frequency is <45 ; for normally distributed samples. A level of $P<0.05$ was accepted as statistically significant.

RESULTS

In our result hyper and hypothyroid pregnant group showed significant changes in serum TSH and in autoimmune thyroid disease showed significant changes in Anti-Tg & Anti-TPO. The statistical analysis of FT₃ and FT₄ in pregnant women with hypothyroidism and hyperthyroidism compared to controls shown no significant values. This study shows that prevalence of hypothyroidism in pregnancy is 48%, autoimmune thyroid diseases is 29% and hyperthyroidism is 23%. so the prevalence of hypothyroidism is high.

DISCUSSION

Pregnancy is a stressful condition in which many physiological and metabolic functions are altered to a considerable extent because of high energy demands and increased oxygen requirement. Thyroid hormones are well known for their calorogenic effect. Pregnancy is associated with significant but reversible changes in thyroid function tests. Thyroid hormones play an important role in embryogenesis and fetal development during pregnancy.

The main thyroid hormones include FT₄, FT₃, TSH, TRH, TG-Ab, TPOAb, T₄, T₃, rT₃, T₃ etc. variations in these hormones were used for the purpose of identifying the thyroid abnormalities such as hypothyroidism, hyperthyroidism & autoimmune thyroid diseases in pregnant women.

The prevalence of hypothyroidism is higher in the western literature and a previous Indian study. Having untreated hypothyroidism during pregnancy, increases your risk of having miscarriage, preterm labor and hypertension. Majority of the thyroid problems that can develop during pregnancy are autoimmune conditions in which your body recognizes the thyroid tissue as a foreign substance and produces antibodies against it. These antibodies can cause damage to the thyroid cells resulting in Hashimoto's thyroiditis. Certain other antibodies can stimulate the thyroid to make too much hormones causing Grave's disease, Thyroid nodules, goitre and variations other problems may also be detected for the first time during pregnancy, but these occur very rarely.

The core of this study shows that these hormones can be used as useful biochemical hormones in pregnant women with thyroid abnormalities. But further studies, involving large number of samples are necessary to determine the relationship of these hormones at various stages of pregnancy and possibility of these hormones in clinical practice.

CONCLUSION

TSH, TG-AB & TPO-Ab can be used to assess thyroid abnormalities in pregnancy. If untreated thyroid abnormalities cause many complications in pregnancy. Early treatment of the thyroid disorders is the key to prevent these complications. The goal of treatment is to protect both mother and the developing fetus.

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