Obstetrics; *Maternal-Fetal Medicine and Perinatology*

Antenatal Screening for the Frequency of Subclinic Hypothroidism

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OBJECTIVE: The objective of this study is to investigate the frequency of subclinical hypothyroidism in pregnant population.

STUDY DESIGN: This study was performed in Ondokuz Mayıs University Obstetrics and Gynecology Clinic between January 2006 – September 2006. Six hundred forty nine pregnant women between 17 – 46 ages were included into the study. The pregnant women who have evident or subclinical hypothyroidism in their medical history were excluded from the study. The study was done by searching TSH , fT3, fT4 levels by using Electrochemiluminescence immunoassay (ECLİA) analisators. All pregnant women were evaluated according to age, height, weight, body mass index (BMI). Mann Whitney U and Chi-square test were used for statistical assessment.

RESULTS: Subclinical hypothyroidism was detected in 4 % of 649 screened women. When demographic and physical parameters taken into consideration, there were no statistically significant differences between women having hypothyroidism and normal hormone levels.

CONCLUSION: Subclinical hypothyroidism which was detected in % 4 of pregnant women in Samsun and places near it.

Key Words: Pregnancy, Subclinical hypothyroidism, Screening

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Introduction

Hypothyroidism is a syndrome characterized with general metabolic slowing down as a consequence of deficiency in thyroidal hormones. Subclinical hypothyroidism is defined as normal thyroidal hormones in the circulation with a high Thyroid Stimulation Hormone (TSH) level and a serum TSH level under 10U/L.[1,2] It has been found that the incidence of subclinical hypothyroidism is 2-5% in pregnant women, and the incidence of overt hypothyroidism is 0.3%[3,4] While the most frequent cause of maternal hypothyroidism is autoimmune thyroidal diseases, it can also develop as a consequence of iodine deficiency.

Iodine deficiency is one of the important public health problems in many regions of the world. Maternal and fetal hypothyroidism is seen together in iodine deficiency. This is one of the leading causes of mental retardation in fetuses and causes a spectrum of diseases that have negative effects on the individual for a lifetime starting from fetal life.[5,6,7] Goiter is seen in Turkey endemically, particularly in Eastern Black Sea Region because of iodine deficiency in soil for 90% of the cases, and in water for 10%.[8]

Untreated hypothyroidism increases the possibility of complications in the mother and in the fetus like hypertension, preeclampsia, and abruption of placenta, postpartum bleeding, cardiac dysfunction, and anemia. Negative impacts of subclinical hypothyroidism on the fetus are intrauterine growth retardation, preterm births, stillbirth, or neurophysiologic developmental retardation.[5,6,-7]

Diagnosis of subclinical hypothyroidism can also be made by screening tests. In this study, we aimed to determine the prevalence of subclinical hypothyroidism in pregnant women attending to our hospital.

Material and Method

This study was performed in pregnant women attending to Obstetrics and Gynecology Unit of Ondokuz Mayıs University between January 2006 - September 2006. Total six hundred and forty-nine pregnant women in any gestation aged between 17 and 46 years were included in the study. Patients with previous subclinical or overt hypothyroidism were ex-

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cluded from the study. Pregnant women were recorded according to their age, parity, weight, height, BMI.

Serum TSH and free T4 (fT4) and free T3 (fT3) levels were determined in patient's venous blood samples by using Electrochemiluminescence immunoassay (ECLIA) analyzers in the central laboratory.

Statistical analysis

Statistical evaluation of all the data obtained throughout the study was performed using SPSS for Windows 12.0 package program. Differences between the pregnant women having subclinical hypothyroidism and normal hormone levels regarding age, parity, weight, height and BMI were evaluated using Mann Whitney U Test and Chi-square tests.

Results

Total 26 pregnant women were diagnosed as subclinical hypothyroidism. Prevelance of pregnant women with subclinical hypothyroidism was 4% of the total number of pregnant women. Average age of all the pregnant women in the study was 28.54 ± 5.69 years (17- 46 years). The median age in the healthy and study groups were 28 years and 26 years respectively. The median gravidity was 2 in both groups. There were no statistically significant differences between normal and subclinical hypothyroidism in regard to age, weight, parity, BMI ($p>0.05$). Normal ranges and measuring interval of TSH, fT3 and fT4 were shown in Table 1.

Table 1: Normal ranges and measuring interval of TSH, fT3 and fT4

Analysis	Measure Interval	Normal Range	Unit
fT3	0,26-32,55	2,3-4,2	pg/ml
fT4	0,0023-7,77	0,93-1,7	ng/dl
TSH	0,0005-100	0,27-4,2	µIU/ml

Discussion

Prevalence of overt hypothyroidism in pregnancy is between 1/1000 and 6/1000, and incidence of subclinical hypothyroidism is between 2-5%.[3,4] Overt or subclinical hypothyroidism is important causes of mortality and morbidity for both the mother and the fetus. Therefore, it can be considered that subclinical hypothyroidism should be screened for the prevention of such morbidity and mortality. However, in literature three was no any consensus. American Clinical Endocrinologists Association recommends that TSH screening is not a requirement in the early pregnancy in women without goiter, and it should be left to the initiative of the physicians. Multiplication, migration and organization of neurons in central nervous system of the fetus, which is completed before second trimester, depend on the thyroidal hormone resources coming from the mother. Therefore, hypothyroidism in the mother can result in permanent neurological damage in the infant.[9] Adequate functioning of thyroid glands in the mother and in the fetus is required for a normal psycho-intellectual development in the fetus.[10] Impairment in the neurological development of the fetus depends on the level and timing of the deficiency in the thyroidal gland in the mother.[11,12]

In a cohort study, AS Leung and colleagues divided 68 pregnant women into two groups according to their thyroidal functions, and showed that gestational hypertension, eclampsia and pre-eclampsia were more frequent conditions in the first group including 23 women with overt hypothyroidism (22%) and in the second group including 45 women with subclinical hypothyroidism (15%) when compared to the general population (7.6%). They found that low birth weight was secondary to preterm birth caused by gestational hypertension which was seen more frequently in overt and sub clinic hypothyroidism, and advocated in conclusion that normalization of thyroid function tests in hypothyroid patients could prevent gestational hypertension and complications of it.[13] Abalovich M and colleagues followed 150 patients with hypothyroidism, and treated 99 patients with adequate thyroxin enough to render them euthyroid; 51 patients were treated with inadequate amounts. Of these fifty-one patients, 16 were found to have overt hypothyroidism, and 35 to have subclinical hypothyroidism. While pregnancy concluded with abortion in patients with overt hypothyroidism that was treated inadequately with levothyroxin ended with abortion with a rate of 60%, the same rate was 71.4% for subclinical hypothyroidism.[14]

Diagnosis of clinic or subclinical hypothyroidism can be made using a single blood sample, and follow-up can be performed easily. Mortality in the pregnant women and their children and morbidity in their future lives can be minimized with this simple method. We also think that screening performed in pregnant women, rather than diagnosing the thyroidal dysfunctions in the newborns, will help to prevent the complications in pregnant women, and will also prevent the thyroidal dysfunctions in the newborns and its clinical reflections. Although necessity for screening for subclinical hypothyroidism in pregnancy is not widely accepted yet, a study published recently appears to have the capability of significantly changing this point of view. It has been reported that treating patients with thyroid auto-antibodies before hypothyroidism becomes even subclinical reduces the rate of abortions and premature births.[15]

Since our country is in the endemic region of iodine deficiency and particularly since our Black Sea Region has a higher prevalence of goiter, we expected to find a higher detection rate of subclinical hypothyroidism in the present study. We found 26 cases of subclinical hypothyroidism in our study carried out on 649 women. This made 4% of the total patients.

This ratio was no higher than the data found in the literature. The reason for this can be the commencing of the program for preventing diseases related with the iodine deficiency and by using iodinating salt according to the General Directorate guide for Mother and Child Health and Family Planning of Ministry of Health and UNICEF in 1994, and also rendering iodinating table salt according to the Edible Salt Regulations in Turkish Food Codex in 1998.

As a conclusion, we believe that screening of thyroidal dysfunctions in pregnant women and even women who plan to become pregnant is an important preventive medicine to reduce the incidence of maternal and fetal complications and to optimize the neonatal neurodevelopment.

We hope in the future that cost effective studies will reveal the necessity of antenatal subclinical hypothyroidism screening as a routine antenatal care.

Subklinik Hipotiroidi Sıklığının Antenatal Taranması

AMAÇ: Bu çalışmanın amacı gebe kadınlardaki subklinik hipotiroidizmin sıklığını tespit etmektir.

GEREÇ VE YÖNTEM: Bu çalışma Ocak 2006 - Eylül 2006 tarihleri arasında Ondokuz Mayıs Üniversitesi Obstetri ve Jinekoloji Kliniği'nde gerçekleştirilmiştir. Çalışmamıza 17 - 46 yaşları arasındaki 649 gebe dahil edildi. Öncesinde belirgin hipotiroidi ve subklinik hipotiroidi öyküsü olan gebeler çalışma dışı bırakıldı. TSH, serbest T3 ve serbest T4 değerleri Electrochemiluminescence immunoassay (ECLİA) yöntemi kullanılarak çalışıldı. Çalışmaya dahil edilen gebelerin demografik ve fizik parametreleri dikkate alındığında, iki grup arasında fark yoktu.

BULGULAR: Tarama yapılan 649 gebenin 26'sında (%4) subklinik hipotiroidi tespit edildi. Subklinik hipotiroidi tespit edilen ve edilmeyen gebeler arasında yaş, boy, kilo, parite ve vucut kitle indeksine gore istatistiksel olarak bir fark bulunmadı.

SONUÇ: Samsun ve çavresinde gebelerdeki subklinik hipotiroidi sıklığı %4 olarak bulunmuştur.

Anahtar Kelimeler: Gebelik, Subklinik hipotiroidi, Tarama

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