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ORIGINAL RESEARCH

ASSESSMENT OF MATERNAL THYROID HYPOFUNCTION AND PREGNANCY OUTCOME

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ABSTRACT

Background: Obstetric factors may be responsible for some of the differences in neurologic outcomes seen in the offspring of women with maternal thyroid hypofunction compared with their euthyroid counterparts.

Materials & Methods: 80pregnant women with hypothyroidism were subjected to assessment of thyroid profile that includes T3, T4, TSH, and anti-TPO antibody was performed. Pregnancy outcome was recorded.

Results: There were 25 cases of subclinical hypothyroidism in first trimester and 20 in second trimester. 8 cases of Hypothyroxinemia in first and 7 in second trimester. Overt hypothyroid was seen in 10 in first and 6 in second trimester. There were 5 cases in first and 4 cases in second of euthyroid. The mean parity was 1.2, 1.7, 1.1 and 1.0 in subclinical hypothyroidism, hypothyroxinemia, overt hypothyroid and euthyroid respectively. The mean BMI (Kg/m^2) was 24.3, 27.8, 26.8 and 24.1. There were current smokersie. 4, 3, 1 and 5 and prior pregnancy was seen in 5, 4, 2 and 1 in subclinical hypothyroidism, hypothyroxinemia, overt hypothyroid and euthyroid respectively. Maximum cases of miscarriage (2) were seen in subclinical hypothyroidism and gestational hypertension (5) in overt hypothyroidism. Pre- eclampsia (1) was seen in subclinical and overt hypothyroid, pre- term PROM (3) hypothyroxinemia, pre- term labor (2) in subclinical hypothyroidism and 5 cases of gestational diabetes mellitus was seen in hypothyroxinemia.

Conclusion: Overt hypothyroidism in pregnancy is detrimental to the developing fetal brain. Pregnancy outcome showed cases of miscarriage, pre- eclampsia, pre- term PROM, pre- term labor and GDM.

Key words: hypothyroxinemia, Overt hypothyroid, gestational diabetes mellitus

INTRODUCTION

Hypothyroidism is associated with a wide spectrum of reproductive disorders ranging from abnormal sexual development, menstrual irregularities, and infertility.[1]The impact of hypothyroidism on the menstrual cycle has been identified since the 1950s and leads to

changes in cycle length and blood flow. Subclinical hypothyroidism has been associated with occult menorrhagia before becoming symptomatic.[2] The prevalence of subclinical hypothyroidism is as high as 9.5 % in women. Onset of thyroid disorders increases with age, and it is estimated that 26 % of premenopausal and menopausal women are diagnosed with thyroid disease. Thyroid disorders are more common in women than in men and in older adults compared with younger age groups.[3]

Antithyroid antibodies may also have an influence on the fetal brain and subsequent pediatric neurodevelopment.[4] Obstetric factors may be responsible for some of the differences in neurologic outcomes seen in the offspring of women with maternal thyroid hypofunction compared with their euthyroid counterparts.[5]Prevalence of thyroid autoimmunity among euthyroid women of childbearing age group is quite high. These women are at high risk of pregnancy related complications (spontaneous miscarriage), subclinical hypothyroidism and postpartum thyroiditis.[6]The present study was conducted to assess maternal thyroid hypofunction and pregnancy outcome.

MATERIALS & METHODS

The present study comprised of 80pregnant women with hypothyroidism. The consent was obtained from all enrolled patients.

Data such as name, age, etc. was recorded. Routine investigation like Hb, Platelet count, TLC, DLC, ESR, ABO-Rh, and thyroid profile that includes T3, T4, TSH, and anti-TPO antibody was performed.Pregnancy outcome was recorded. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Trimester	Number	P value
First	45	0.90
Second	35	

Table I shows that there were 45 women in first trimester and 35 in second trimester. The difference was non- significant (P> 0.05).

Table II Assessment of thyroid disorder

Thyroid status	First trimester	Second trimester	P value
Subclinical hypothyroidism	25	20	0.91
Hypothyroxinemia	8	7	0.94
Overt hypothyroid	10	6	0.09
Euthyroid	5	4	0.81

Table II, graph I shows that there were 25 cases of subclinical hypothyroidism in first trimester and 20 in second trimester. 8 cases of Hypothyroxinemia in first and 7 in second trimester. Overt hypothyroid was seen in 10 in first and 6 in second trimester. There were 5 cases in first and 4 cases in second of euthyroid. The difference was non- significant (P> 0.05).

Graph I Assessment of thyroid disorder

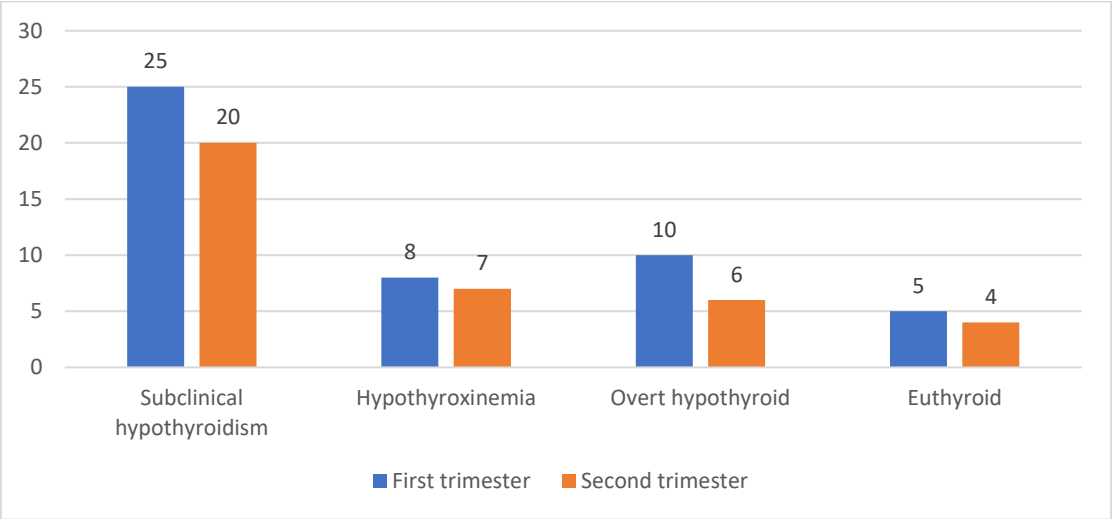

Table III Demographic Characteristics of patients

Parameters	Subclinical hypothyroidism	Hypothyroxinemia	Overt hypothyroid	Euthyroid	P value
Parity	1.2	1.7	1.1	1.0	0.82
BMI	24.3	27.8	26.8	24.1	0.90
Current smoker	4	3	1	5	0.12
Prior pregnancy	5	4	2	1	0.05

Table III shows that mean parity was 1.2, 1.7, 1.1 and 1.0 in subclinical hypothyroidism, hypothyroxinemia, overt hypothyroid and euthyroid respectively. The mean BMI (Kg/m^2) was 24.3, 27.8, 26.8 and 24.1. There were current smoker 4, 3, 1 and 5 and prior pregnancy was seen in 5, 4, 2 and 1 in subclinical hypothyroidism, hypothyroxinemia, overt hypothyroid and euthyroid respectively. The difference was non- significant (P> 0.05).

Table IV Pregnancy outcome

Outcome	Subclinical hypothyroidism	Hypothyroxinemia	Overt hypothyroid	Euthyroid	P value
Miscarriage	2	1	1	0	0.04
GH	3	3	4	3	0.91
Pre-eclampsia	1	0	1	0	0.12
Pre- term PROM	2	3	2	1	0.84
Pre- term labor	2	1	1	1	0.91
GDM	4	5	2	2	0.05

Table IV shows that maximum cases of miscarriage (2) were seen in subclinical hypothyroidism and gestational hypertension (5) in overt hypothyroidism. Pre- eclampsia (1) was seen in subclinical and overt hypothyroid, pre- term PROM (3) hypothyroxinemia, pre-

term labor (2) in subclinical hypothyroidism and 5 cases of gestational diabetes mellitus was seen in hypothyroxinemia.

DISCUSSION

Thyroid hormone plays an important role in normal reproductive physiology through direct effects on the ovaries and indirectly by interfering with sex hormone binding globulin.[7] Alterations in production and activity of the thyroid hormones thyroxine (T4) and tri-iodothyronine (T3) may result in menstrual abnormality that is both hyperthyroidism and hypothyroidism may result in menstrual disturbances.[8]The present study was conducted to assess maternal thyroid hypofunction and pregnancy outcome.

We found that there were 45 women in first trimester and 35 in second trimester. Goldman et al[9] estimate whether maternal thyroid hypofunction is associated with complications. A total of 10,990 patients had first- and second-trimester serum assayed for thyroid-stimulating hormone (TSH), free thyroxine (freeT4), and antithyroglobulin and antithyroid peroxidase antibodies. Thyroid hypofunction was defined as 1) subclinical hypothyroidism. Patients with thyroid hypofunction were compared with euthyroid patients (TSH and free T4 between the 2.5th and 97.5th percentiles). Subclinical hypothyroidism was documented in 2.2% (240 of 10,990) in the first and 2.2% (243 of 10,990) in the second trimester. Hypothyroxinemia was documented in 2.1% (232 of 10,990) in the first and 2.3% (247 of 10,990) in the second trimester. Subclinical hypothyroidism was not associated with adverse outcomes. In the first trimester, hypothyroxinemia was associated with preterm labor (adjusted odds ratio [aOR] 1.62; 95% confidence interval [CI] 1.00–2.62) and macrosomia (aOR 1.97; 95% CI 1.37–2.83). In the second trimester, it was associated with gestational diabetes (aOR 1.7; 95% CI 1.02–2.84). Fifteen percent in the first and 14% in the second trimester had antithyroid antibodies. When both antibodies were positive in either trimester, there was an increased risk for preterm premature rupture of membranes.

We found that there were 25 cases of subclinical hypothyroidism in first trimester and 20 in second trimester. 8 cases of Hypothyroxinemia in first and 7 in second trimester. Overt hypothyroid was seen in 10 in first and 6 in second trimester. There were 5 cases in first and 4 cases in second of euthyroid. Ajmani et al[10] comprised of 100 women aged between 15 and 45 years had 50 patients presented with menstrual complaints. The control group consisted of 50 women of same age group with complaints other than menstrual disorders. Thyroid function tests, anti-TPO antibody estimation, and endometrial sampling were done in all patients. In patients with menstrual disorders, 44% had thyroid disorders in which subclinical hypothyroidism was prevalent in 20%, overt hypothyroidism in 14%, and overt hyperthyroidism in 8% of the women. Autoimmune thyroid antibodies were present in 30% patients of women with menstrual disorders. On endometrial sampling, hypothyroid patients mainly had proliferative endometrium (42.85%) whereas hyperthyroid had atrophic endometrium (60%).

We found that mean parity was 1.2, 1.7, 1.1 and 1.0 in subclinical hypothyroidism, hypothyroxinemia, overt hypothyroid and euthyroid respectively. The mean BMI (Kg/m^2) was 24.3, 27.8, 26.8 and 24.1. There were current smoker ie. 4, 3, 1 and 5 and prior pregnancy was seen in 5, 4, 2 and 1 in subclinical hypothyroidism, hypothyroxinemia, overt

hypothyroid and euthyroid respectively. Casey et al[11] stated that it is possible that the increased risk for adverse outcomes in the patients with subclinical hypothyroidism.

We found that maximum cases of miscarriage (2) were seen in subclinical hypothyroidism and gestational hypertension (5) in overt hypothyroidism. Pre- eclampsia (1) was seen in subclinical and overt hypothyroid, pre- term PROM (3) hypothyroxinemia, pre- term labor (2) in subclinical hypothyroidism and 5 cases of gestational diabetes mellitus was seen in hypothyroxinemia. Pop et al[12] indicated that free T4 levels below the fifth and 10th percentiles in the first trimester but not at 32 weeks were associated with lower Bayley Psychomotor Developmental Index scores in offspring at 10 months of age when compared with offspring whose mothers had higher free T4 levels, excluded patients with complicated pregnancies such as preterm delivery and low birth weight.

CONCLUSION

Authors found that overt hypothyroidism in pregnancy is detrimental to the developing fetal brain. Pregnancy outcome showed cases of miscarriage, pre- eclampsia, pre- term PROM, pre- term labor and GDM.

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