Pregnancy Outcomes in Patients with Hypothyroidism

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ABSTRACT

Background

Pregnancy is an important event in reproductive years of women life. It has a reversible effect on the thyroid gland and its functions. The role of thyroid gland function and conception has been known for a long time. The most common thyroid gland dysfunction in pregnancy is hypothyroidism. It is estimated that the prevalence is 1.5-4.4% of pregnant women. It is known to cause complications during pregnancy leading to adverse pregnancy outcomes.

Objective

To observe the pregnancy outcomes in patients with hypothyroidism.

Method

This is a retrospective study conducted from January 2015 to December 2018. Two hundred and thirty nine patients with hypothyroidism were included. They were investigated for thyroid stimulating hormone (TSH), free tri iodothyronin (FT_3), free thyroxine (FT_4) levels and for auto-antibodies against thyroperoxidase (anti TPO). All these patients after the detection of hypothyroidism were under thyroxine hormone replacement.

Result

Amongst 239 ladies with hypothyroidism 97.5% came from hilly region. Seventy seven (32%)of them had history of abortions. Twenty three (9.8%) of them had antepartum hemorrhage. Eleven (4.6%) had preeclampsia during this pregnancy. Seven (2.9%) had fetuses with intrauterine growth restriction (IUGR). Seven (2.9%) had fetuses with preterm delivery. Twenty seven (11.3%) of fetuses had APGAR Score of < 6.

Conclusion

Of 239 women with hypothyroidism, many had history of recurrent abortions and also complications during antenatal period like preeclampsia, abruption placenta, IUGR and preterm delivery. After thyroxine replacement, risk is much lowered and it has a positive outcome.

KEY WORDS

Abruptio placenta, APGAR score, hypothyroidism, preeclampsia, thyroxine

INTRODUCTION

Pregnancy is an important event in reproductive years of women life. It has a reversible effect on the thyroid gland and its functions. Pregnancy is considered as a state of excessive thyroid stimulation leading to an increase in thyroid size by 10% in iodide sufficient areas and 20-40% in iodide deficient regions.[1] In general population almost 3% of the world population is on long term thyroid replacement therapy.[2] According to some studies, 4.1 women and 0.6 men per 1000 of the adult population develop hypothyroidism during their life time.[3] The role of thyroid gland function and conception has been known for a long time. The most common thyroid gland dysfunction in pregnancy is hypothyroidism. It is estimated that the prevalence is 1.5-4.4% of pregnant women.[4,5] As for the etiology of hypothyroidism in the context of Nepal is inadequate intake and inadequate supply of iodine remains the first cause. Surgery on thyroid gland, autoimmune thyroiditis or radioactive iodine treatment is other causes of hypothyroidism. A lady with hypothyroidism comes across problems like spontaneous abortions, premature birth, placental abruption and irreversible damage to the fetus like failure of differentiation of nerves, inadequate central nervous system development and increased risk of perinatal death.[6,7] These are serious complications which can be positively influenced by timely detection and prescription of supplementation of thyroxin. So the main of our study is to see the pregnancy outcomes amongst women with hypothyroidism.

METHODS

This was a retrospective study conducted from January 2015 to December 2018 in the department of obstetrics and gynaecology of Dhulikhel Hospital, Kathmandu University Hospital, Kavre. Permission was taken from the ethical committee. We included pregnant women with diagnosed hypothyroidism. All of them had come for at least 4 antenatal visits, and had delivered in our department. Their medical, antenatal and delivery records were studied. Their blood samples reports for TSH, FT_3, FT_4 and anti TPO were taken. Apart from thyroid function test, blood samples reports for oral glucose tolerance test, anti ds DNA, ANA and TORCH were also studied. For this study purpose, we included women with hypothyroidism only. We excluded ladies with gestational diabetes mellitus (GDM) and those who had other connective tissue disorders (like SLE, Multiple sclerosis) and TORCH infections. In determining thyroid stimulating hormone (TSH), free tri-iodothyronin (FT_3), free thyroxine (FT_4) and auto-antibody against thyroperoxidase (anti TPO), the biochemical parameters were analyzed by automatic clinical chemistry analyzer using Johnson and Johnson (Vitros 350-Dry Chemistry analyzer), and immunological parameters were measured by using CLIA (Diarson liason) method. Laboratory reference limits was taken for TSH as 0.3-3.6 µIU/mL, for free T3 as 2.2-4.2 pg/ml, for $freeT_4$ as 0.8-1.7 ng/dl and for anti TPO as 1.0-16 IU/ml. Ultrasound of the thyroid gland was also performed for women with abnormal thyroid function to see for nodularity and calcifications. Thyroxine 25- 125 µg was given to hypothyroid women depending on the level of $freeT_3$, $freeT_4$ and TSH.

Table 1. Showing parity index of delivered women. (n=239)

Parity index	Frequency	Percent
G2A1	51	21.3
G3A2	26	10.9
G4A3	14	5.9
Primipara	72	30.1
Multipara	76	31.8
Total	239	100

G= Gravida and A= Abortion.

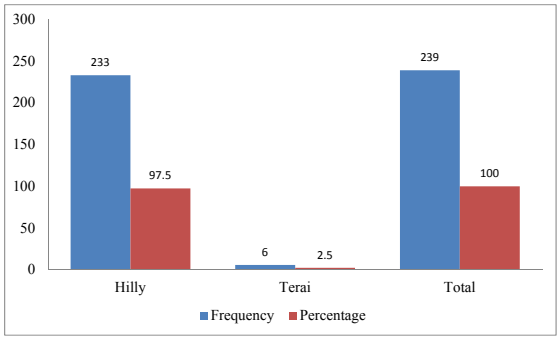

Figure 1. Showing geographic variation. (n=239)

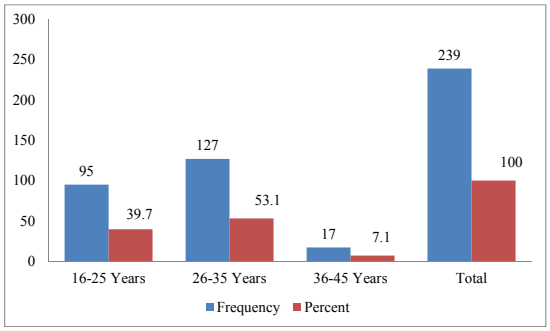

Figure 2. Showing age distribution. (n=239)

RESULTS

In the past four years, we had a total delivery of twelve thousand and eight hundred and the women with hypothyroidism was 239. So the incidence of hypothyroidism was 1.9%. As we see in table 1, ninety one (38.07%) patients amongst 239 were ladies who had one or more abortions in the past. As shown in fig. 1, hypothyroidism was common amongst ladies coming from hilly regions. Though ladies who deliver in our institution are mostly in the age group of 20-25 years. We observed that ladies with hypothyroidism were mostly in age group of 26-35 years as shown in fig. 2. In table 2, we see that 23 (9.8%) women had antepartum hemorrhage, amongst them 21 (9%) had

abruption placenta and 2 (0.8%) had placenta previa. 11 (4.6%) women had preeclampsia and 7 (2.9%) women had IUGR. In table 3, we see that 49.8% women had cesarean section to deliver the fetus. We observed that only 13 (5.4%) were fetuses with weight less than 1499 grams, as shown in table 4. As shown in table 5, Two hundred and ten (88%) had newborn babies with APGAR score of > 6. Two fetuses (0.8%) had APGAR scores of 0/3.

Table 2. Showing Complications during pregnancy and delivery. (n=239)

Complication in antenatal and postnatal period	Frequency	Percentage
Uncomplicated	175	73.2
Abruptio placenta	21	9
Placenta previa	2	0.8
Oligohydramnios	12	5
Preeclampsia	11	4.6
IUGR	7	2.9
PPH	6	2.5
Meconium stained liquor	3	1.2
Cleft lip and cleft palate	2	0.8
Total	239	100

Table 3. Showing mode of deliveries. (n=239)

Type of delivery	Frequency	Percent
EL LSCS	33	13.8
EM LSCS	85	35.6
Instrumental delivery	6	2.5
Intrauterine death	2	.8
Normal delivery	104	43.5
Preterm delivery	7	2.9
< 28 weeks delivery	2	.8
Total	239	100.0

Table 4. Distribution of birth weight. (n=239)

Birth weight	Frequency	Percent
≥ 2500 grams	199	83.3
1500-2499 grams	27	11.3
≤ 1499 grams	13	5.4
Total	239	100.0

Table 5. Distribution of APGAR score. (n=239)

APGAR score	Frequency	Percent
≥ 6	210	88
< 6	27	11.2
0	2	0.8
Total	239	100.0

DISCUSSION

Pregnancy is an eminent event in reproductive years of women life. The clinical diagnosis of hypothyroidism in pregnancy can be difficult as it can mimic some of the signs that are observed in hypothyroidism, like weight gain, constipation, fatigue, anxiety and muscle cramps.[8,9] The thyroid gland and its functions is altered during pregnancy. Pregnancy is considered as a state of excessive thyroid stimulation leading to an increase in thyroid size by 10% in iodide sufficient areas and 20-40% in iodide deficient regions.[1] Like in a study performed by Delshad et al. and Banerjee et al. we have an incidence of 1.9% of women with pregnancy with overt hypothyroidism.[10,11] Moreover, most signs of hypothyroidism can be hidden by a woman's status following the increase in metabolism in pregnancy.

We noticed that hypothyroidism is very common during pregnancy as compared to hyperthyroidism like in a study performed by Lazarus et al.[4] The hypothyroid status can lead to abnormal sexual development to menstruation irregularity and even recurrent pregnancy loss to infertility.[7,8] We noticed the same in our study where ninety one (38.1%) patients amongst 239 ladies had one or more abortions in the past. Bannerjee et al. has commented in his study that main etiology for hypothyroidism during pregnancy worldwide is iodide insufficiency, we noticed the same findings as most of the women who were diagnosed with overt hypothyroidism came from hilly regions, where there is lack of iodine in the soil.[8]

Though ladies who deliver in our institution are mostly in the age group of 20-25 years. We observed that ladies with hypothyroidism were mostly in age group of 26-35 years. It is because many of them had problems with infertility and many of them had recurrent abortions in previous pregnancies. In a study by El Baba et al. overt hypothyroidism is associated with increased prevalence of recurrent abortions which is similar to our observation.[12]

In our study 11 (4.6%) women had preeclampsia which is similar to study performed by Wolfberg et al. which showed incidence of 4.3%.[13] In our study, we saw that 23 (9.8%) women had antepartum hemorrhage, amongst them 21 (9%) had abruption placenta and 2 (0.8%) had placenta previa which is similar to a study done by Breathnach et al.[14] This is because thyroid hormone has a role in proper trophoblastic development of placenta. When there is hypothyroidism, it increases the risk of abruptio placenta and leading to antepartum hemorrhage. Hypothyroidism is also associated with abnormal iron absorption thus leading to anaemia and may cause increased incidence of PPH.[15]

Cleary et al. suggested that hypothyroidism is associated with intrauterine growth restriction (IUGR) and low birth weight however in our study only 7 (2.9%) women had IUGR which is similar to study done by Jennifer et al.[16,17] This is because, thyroid hormone affects the weight and metabolism in the fetus and in ladies with overt

hypothyroidism. So, deficiency of thyroid hormone can lead to low birth weight fetuses and IUGR.

We observed that 118 (49.4%) women had cesarean section as most of these ladies were in high risk pregnancy group and, many opted for elective LSCS. As it was a high risk pregnancy and they were worried, that there might be problems while attempting for normal delivery like birth asphyxia. Many were worried because they were already in their mid-thirties, and they might not get pregnant again.

According to a study by Nasirkandy et al. the incidence of preterm birth was higher among mothers with clinical and subclinical hypothyroidism during pregnancy compared to euthyroid mothers which is also similar to our study.[18] As in a study by Donnelly et al. and Glinoer et al. premature birth, intrauterine fetal death, neonatal respiratory distress and oligohydramnios are common in women with hypothyroidism, but in our study we observed the incidence of very low birth fetuses of 5.4% and also intra uterine fetal death of 0.8%, amongst 239 women. The fetal death was amongst fetuses who were preterm and also very low birth weight ,who were admitted in neonatal ICU.[19,20]

This study would have been better if it had been a prospective and multi institutional study.

CONCLUSION

Hypothyroidism is a common condition in areas where there is iodine deficiency in the soil, like in our country. Hypothyroidism during pregnancy, if detected and treated early can prevent many adverse pregnancy outcomes like recurrent abortions, preeclampsia, abruption placenta and adverse neonatal outcomes like low birth weight babies with poor APGAR score.

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