THE FETOMATERNAL OUTCOME OF PREGNANCY IN WOMEN WITH THYROID DISEASE

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ABSTRACT

OBJECTIVES

To determine the frequency of fetomaternal outcomes in women with pregnancy with thyroid disease presented to Khyber Teaching Hospital Peshawar.

METHODOLOGY

A descriptive observational study was conducted in Khyber's Obstetrics and Gynecology Department Teaching Hospital Peshawar from February to July 2022. A total of 160 pregnant patients with thyroid disease were included in the study. All patients were followed till delivery, and fetomaternal outcomes (gestational hypertension, pre-eclampsia, postpartum hemorrhage, mode of delivery, Oligohydramnios, birth weight, neonatal hyperbilirubinemia) were noted.

RESULTS

The age range in this study was from 18 to 40 years with a mean age of 29.787 ±2.23 years, mean gestational age of 25.331±4.14 weeks, mean parity of 1.818±1.23 and mean weight of 68.462±3.30 kg. Hypothyroidism was seen in 76.9% of patients, and hyperthyroidism was seen in 23.1%. Gestational hypertension was observed in 11.9%, pre-eclampsia in 5%, postpartum haemorrhage in 47.5%, the cesarean section in 27.5%, Oligohydramnios in 11.3%, low birth weight in 21.3% and neonatal hyperbilirubinemia in 10.6%.

CONCLUSION

The most frequent complication observed in pregnancy with thyroid disease was postpartum haemorrhage, followed by cesarean section and low birth weight.

KEYWORDS: *Pregnancy, Thyroid Disease, Postpartum Haemorrhage*

INTRODUCTION

Thyroid disorders (Hypothyroidism, subclinical hypothyroidism, hyperthyroidism, and subclinical hyperthyroidism) are the second most common endocrine disorders during pregnancy.[1] Due to its severe implications for pregnancy, thyroid disorders are extensively studied in endocrinology and obstetrics.[2] Anterior pituitary releases thyroid stimulating hormone (TSH) in 1 to 2 hourly cycles. It increases the thyroid gland's synthesis and release of thyroxin (T4) and triiodothyronine (T3). The T3 and T4 are primarily protein-bound to thyroid-binding globulin (TBG), albumin, and transthyretin. More than 75% of thyroid hormones are bound. Only unbound thyroid hormones have biological activity.[3] Iodide is essential for the synthesis of thyroid hormones. Most circulating T3 is produced by peripheral deiodination of T4 by the enzyme deiodinase and is three times more potent than T4. An adequate amount of maternal T4 is needed for fetal brain development during the first trimester. T4 likely crosses the placenta in small amounts before 12 weeks of gestation to facilitate this (otherwise, T3, T4, and TSH do not cross the placenta). The fetal thyroid gland produces both T3 and T4 from 10 weeks gestation, and from this point onwards, the fetus is not dependent on maternal thyroid hormone and needs only transplacental iodine.[4] Thyroid diseases during pregnancy severely affect pregnancy outcomes and the neuropsychological development of offspring.[5] Euthyroid status during pregnancy is required to avoid maternal and fetal complications. Hyperthyroidism can cause maternal hypertension, heart failure, and thyroid storm. In fetuses, it is associated with an increased rate of premature labor, growth restriction, and stillbirths. Deficiency of iodine and impaired synthesis of thyroid hormones make the fetus prone to cretinism, the leading preventable cause of learning disability worldwide. However, several studies across the literature confirmed that subclinical hypothyroidism does not affect pregnancy. With well-controlled disease, typical pregnancy outcomes can be expected.[6,7] In addition to the effects on fetus brain development, many studies have found a significant association of thyroid disease with obstetric complications like postpartum hemorrhage, cesarean section, Oligohydramnios, low birth weight, and neonatal hyperbilirubinemia.[8,9] Despite the severe implications of thyroid disorders in pregnancy, there is a lack of research on this topic in our country. Aims of our study is to find out the frequencies of maternal and fetal complications in women with thyroid disease in our province. The

results of our research can be utilized to provide evidence-based information to our patients and counsel them about the importance of controlling thyroid diseases.

METHODOLOGY

A descriptive observational study was carried out in obstetrics and gynaecology unit A of Khyber Teaching Hospital Peshawar from 1st February 2021 to 31st July 2021. WHO calculators were used to calculate the sample size. Keeping a confidence interval of 95%, a margin of error of 3% and expected frequency of pre-eclampsia of 3.9%, the sample size was 160. Pregnant patients of any age with thyroid disease with singleton pregnancy with gestational age > 14 weeks on LMP were included in the study. Pregnant patients with a previous history of hypertension, diabetes, and liver diseases were excluded from the study. Ethical approval was obtained from the institution's ethical committee before starting the survey. Patients who fulfilled the inclusion criteria were included in the study. Consent was taken from all the patients participating in the study. Baseline demographic details (age, parity, gestational age, type of thyroid disease) were noted on a structured proforma. All women were followed till delivery, and fetomaternal outcomes were reported in terms of gestational hypertension, pre-eclampsia, postpartum hemorrhage, mode of delivery, Oligohydramnios, low birth weight, and hyperbilirubinemia. All the data was entered into SPSS version 23. Mean ± SD were calculated for numerical data like age, parity, gestational age, and weight. Frequency and percentages were calculated for qualitative data like type of thyroid disease, gestational hypertension, pre-eclampsia, postpartum hemorrhage, cesarean section, Oligohydramnios, low birth weight, and neonatal hyperbilirubinemia. Fetomaternal outcomes were stratified regarding age, parity, type of disease, and weight. A post-stratification chi-square test was applied. P-value≤0.05 was taken as significant.

RESULTS

The age range in this study was from 18 to 40 with mean age of 29.787±2.23, mean gestational age was 25.331±4.14, mean parity of 1.818±1.23, and mean weight was 68.46±3.30 (table no 1). Hypothyroidism was seen in more than half of the patients (table 2). The most frequent complication observed was postpartum hemorrhage (47.5%), followed by cesarean section (27.5%) and low birth weight (21.3%). Details of all complications are given in Table no 3. The stratification of fetomaternal outcomes, including age, parity, type of thyroid disease, and weight, is shown in Table 4. P-value was determined for all variables. Stratification of the data showed that the development of gestational hypertension is significantly associated with thyroid disease. The frequency of postpartum hemorrhage was higher than that of all the variables, but the p-value is not statistically significant. Cesarean section rate, which was seen in 27.5%, was not found to be statistically significant. Details are given in table no 4.

Table 1: Mean +SD for Age, Gestational Age, Parity, and Weight

Demographic	Mean±SD
Age(years)	29.787±2.23
Gestational age(years)	25.331±4.14
Parity	1.818±1.23
Weight (kg)	68.462±3.30

Table 2: Frequency and %age of Patients According to Type of Thyroid Disease

Type of thyroid disease	Frequency	%age
Hypothyroidism	123	76.9%
Hyperthyroidism	37	23.1%

Table 3: Frequency of Maternal and Fetal Complications

Complications	Frequency	%age
Gestational hypertension	19	11.9%
Pre-eclampsia	08	05%
Oligohydramnios	18	11.3%
Caesarean section	44	27.5%
Post Partum Haemorrhage.	76	47.5%
Low Birth Weight	34	21.3%
Neonatal hyperbilirubinimia	17	10.6%

Table 4: Causative Factor for PPH among 97 Patients

Weight in kg	Number (n=65)	%age
Severe pre-eclampsia	22	22.68
Eclampsia	08	8.24
Abruption	09	9.27
Placenta previa	14	14.43
Prolonged labor	12	12.37
Big baby	08	8.24
Prolonged PROM	07	7.21
Multiple pregnancies	17	17.52
Total	97	100

Table 5: Stratification of Fetomaternal Complications to Age, Parity, Type of Thyroid Disease, and Weight of the Patient

Parameter	Gestationalhypertension	Pre-eclampsia	Post partum haemorrhage	Caesarean section	oligohydromnios	LBW	Neonatal hyperbirubinimia
Age							
18-30 years	16(15.2%)	6(5.7%)	48(45.7%)	31(29.5%)	11(10.5%)	27(25.7%)	9(8.6%)
31-40 years	3(5.5%)	2(3.6%)	28(50.9%)	13(23.6%)	7(12.7%)	7(12.7%)	8(14.5%)
p-value	0.069	0.567	0.532	0.428	0.669	0.058	0.244
Parity							
0--2	15(14.4%)	6(5.8%)	49(47.1%)	29(27.9%)	12(11.5%)	25(24%)	10(9.6%)
>2	4(7.1%)	2(3.6%)	27(48.2%)	15(26.8%)	6(10.7%)	9(16.1%)	7(12.5%)
p-value	0.175	0.543	0.894	0.822	0.875	0.240	0.572
Type of thyroid disease							
hypothyroidism	12(9.8%)	5(4.1%)	60(28.8%)	36(29.3%)	14(11.4%)	27(22%)	13(10.4%)
hyperthyroidism	7(18.9%)	3(8.1%)	16(43.2%)	8(21.6%)	4(10.8%)	7(18.9%)	4(10.8%)
p-value	0.131	0.322	0.554	0.631	0.923	0.693	0.967
Weight							
<70 kg	11(8.9%)	7(6.7%)	62(50.4%%)	35(28.5%)	13(10.6%)	28(22.8%)	13(10.6%)
>70	8(21.6%)	1(2.7%)	14(37.8%)	9(24.3%)	5(13.5%)	6(16.2%)	4(10.8%)
kg							
p-value	0.037	0.465	0.179	0.622	0.619	0.393	0.967

DISCUSSION

Our study showed that the incidence of hypothyroidism is higher than hyperthyroidism, and the frequency of maternal and fetal complications is more seen in women with thyroid disorders. In countries with good antenatal care, the frequencies of these complications are relatively low, but there is a lack of ante-natal care and access to health care facilities, which is why the rate of complications is higher in our setup.[10,11] Although the etiology of hypothyroidism is not precisely known in the majority of cases, we found that the most common cause of hypothyroidism was autoimmune thyroiditis in our population, which is per the results published in the literature.[12] Other causes include radio-iodine ablation, post-surgical hypothyroidism, and postpartum thyroiditis. Our study found 22.3% of the women to be anti-TPO (thyroid peroxidase) positive among hypothyroid pregnancies. Another study revealed that anti-TPO positive cases were 40% in hypothyroid patients.[13] Another study reported 57.1% in subclinical hypothyroidism.[14] Data regarding maternal comorbidities affecting hypothyroidism is scarce and controversial in the literature. A study on Bangladeshi pregnant women concluded that cases with overt hypothyroidism were prone to have gestational hypertension (42.9%) and gestational diabetes (38.1%) as compared to sub-clinical cases. A study on more than 5000 pregnant women in Finland reported that overt hypothyroidism predicts the risk of developing diabetes later [hazard ratio (HR) 6.0 (95% confidence interval) (2.2-16.4)].[15] Our study also showed gestational hypertension in 11.9%, and stratification of data showed the difference to be significant. (p-value 0.037). In our study, hypothyroidism was seen in 76.9% of the patients, and hyperthyroidism was found in 23.1% of patients. A retrospective cohort study based on 500 pregnant women in the Indian city of Chennai conducted in 2007 reported 2.8% subclinical hypothyroidism, and a prospective study from Iran reported 11.3% subclinical hypothyroidism.[14] In contrast, clinical hypothyroidism was found in 2.4% of 600 pregnant women with singleton pregnancy.[16] A large study from the United Kingdom database found 7.4% subclinical hypothyroidism in women already taking thyroxin with an increased risk of miscarriages as the level of TSH rises above 2.5 uIU/ml.[17] A cross-sectional multicenter study of different states of India reported an overall prevalence of 36.07% of hypothyroidism in pregnancy according to the ATA cut-offs.[13] In our study, gestational hypertension was found in 11.9%, pre-eclampsia at 5%, postpartum hemorrhage at 47.5%, cesarean section at 27.5%, Oligohydramnios 11.3%, low birth weight at 21.3%, and neonatal hyperbilirubinemia 10.6%. Our study results compare favorably with the results of a study conducted by Kiran Z et al., who showed the frequency of gestational hypertension at 10.1%, pre-eclampsia at 3.9%, postpartum hemorrhage at 45.9%, and cesarean section at 35.94%.[8] In another study, Sreelatha S et al. have shown that the frequency of gestational hypertension was 14.7%, Oligohydramnios 16.7%, postpartum hemorrhage 6.3%, cesarean section 22.9%, low birth weight 21.9%, neonatal hyperbilirubinemia 9.4% in women with thyroid disease.[9] In addition to these two references, there are various studies worldwide where results are comparable to our study results.[18,16] In our study, no miscarriage was noted. All patients reached term, and there were no neonatal deaths. Recent studies in the literature also showed similar trends.[19, 20] Our study showed an increased frequency of postpartum hemorrhage in patients with thyroid disease, which is different from a small retrospective analysis in the UK.

21 However, a study from china showed results similar to ours.[22] In our study, gestational hypertension was found to be significantly associated with thyroid disease. This contrasts with a case-control study conducted in India, where gestational hypertension was not significantly associated with thyroid disease.[23] Another study from Finland also does not show any significant association between gestational hypertension and thyroid disease.[15] The most frequent complication reported in our study was postpartum hemorrhage; however, this is less reported in the literature.[24,25] Similarly, a Turkish study also found no association between postpartum hemorrhage and thyroid disease.[26] Caesarean section was done in 27.5% of cases in our study; however, it is not significantly associated with thyroid disease. The results of our study can be regarded as a baseline reflection of our pregnant population. We, therefore, recommend further prospective large-scale multicenter studies to establish the strength of the association between thyroid disease and pregnancy and outcome variables.

LIMITATIONS

The study involved a relatively small sample size and study period, which may limit the generalizability of the findings.

CONCLUSIONS

The most frequent complications in pregnancy with thyroid disease are postpartum haemorrhage, cesarean section, and low birth weight of the newborn.

CONFLICT OF INTEREST: None

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