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Assessment of Maternal Characteristics and Outcomes Affected by Hypothyroidism During Pregnancy in a Teritiary Care Centre

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ABSTRACT

To assess maternal characteristics and outcomes affected by hypothyroidism during pregnancy in a rural area of Tamil Nadu. One hundred ten pregnant women were selected. Parameters such as parity, body mass index (kg m^{-2}), etiology of hypothyroidism, thyroid antibodies, comorbidities, gestational diabetes mellitus (GDM), hypertension, mode of labor, pregnancy outcomes, postpartum hemorrhage and placental abruption etc. was recorded. Age group 18-25 years had 25, 26-33 years had 55 and 34-40 years had 30 subjects. Body mass index showed underweight 10, normal 18, overweight 45 and obese 37. Parity was nulliparous in 48 and multiparous in 62. Hypothyroidism was diagnosed in 35 during pregnancy. Etiology of hypothyroidism was autoimmune in 24 and post treatment in 11. Thyroid antibodies were positive in 20. Comorbidities were gestational diabetes mellitus in 12 and hypertension in 5. The difference was significant ($p<0.05$). Mode of labor was spontaneous in 17, augmented in 13 and induced in 5. Pregnancy outcomes was live birth in 28, abortion in 2, termination of pregnancy in 2 and stillbirth in 3. Postpartum hemorrhage was seen in 7 and placental abruption in 1. The difference was significant ($p<0.05$). There was high prevalence of hypothyroidism diagnosed during pregnancy. Comorbidities found gestational diabetes mellitus and hypertension. There was high prevalence of abortion, termination of pregnancy and stillbirth.

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Key Words
Hypothyroidism, Gestational diabetes mellitus, obesity

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INTRODUCTION

When a pregnant woman's thyroid gland does not generate enough thyroid hormones to satisfy the increasing demands of pregnancy, this is known as gestational hypothyroidism[1]. The thyroid gland is responsible for controlling metabolism, energy levels and other vital body activities[2]. Thyroid hormone requirements increase throughout pregnancy to support the growing fetus and if the thyroid does not produce enough hormones, it can have serious health consequences[3].

Hashimoto's thyroiditis is the most prevalent cause of hypothyroidism during pregnancy. This is an autoimmune disorder in which the body's immune system assaults the thyroid gland, resulting in decreased hormone production[4]. Iodine deficiency, a major component of thyroid hormones, can contribute to hypothyroidism. Some women may have hypothyroidism before to becoming pregnant and the disease might worsen or continue during pregnancy[5]. Thyroiditis, a condition that causes inflammation of the thyroid gland, can impair its ability to produce hormones. Certain drugs, such as those containing lithium, can impair thyroid function[6].

Untreated or poorly managed hypothyroidism during pregnancy can have a number of negative consequences for both the mother and the child. During pregnancy, hypothyroidism can cause fatigue, weight gain, constipation and depression[7]. Thyroid hormone deficiency can have an impact on the baby's development and growth, perhaps leading to low birth weight, developmental difficulties and an increased chance of preterm birth[5]. Thyroid hormones are essential for the fetus's growing brain, especially during the first trimester. During this time, untreated hypothyroidism can cause intellectual and developmental deficits in the child[8]. We performed this study to assess maternal characteristics and outcomes affected by hypothyroidism during pregnancy in a rural area of Tamil Nadu.

MATERIALS AND METHODS

After considering the utility of the study and obtaining approval from ethical review committee, we selected one hundred ten pregnant women attending Department of Obstetrics and Gynaecology Sree Mookambika Institute of Medical Sciences . Patients' consent was obtained before starting the study.

Data such as name, age, etc. was recorded. Parameters such as parity, body mass index (kg m^{-2}), etiology of hypothyroidism, thyroid antibodies, comorbidities, gestational diabetes mellitus (GDM), hypertension, mode of labor, pregnancy outcomes, postpartum hemorrhage and placental abruption etc. was recorded. The results were compiled and subjected for statistical analysis using Mann Whitney U test. P value less than 0.05 was set significant.

RESULTS

Age group 18-25 years had 25, 26-33 years had 55 and 34-40 years had 30 subjects. Body mass index (kg m^{-2}) showed underweight 10, normal 18, overweight 45 and obese 37. Parity was nulliparous in 48 and multiparous in 62. Hypothyroidism was diagnosed in 35 during pregnancy. Etiology of hypothyroidism was autoimmune in 24 and post treatment in 11. Thyroid antibodies were positive in 20. Comorbidities were gestational diabetes mellitus in 12 and hypertension in 5. The difference was significant ($p<0.05$) (Table 1).

Mode of labor was spontaneous in 17, augmented in 13 and induced in 5. Pregnancy outcomes was live birth in 28, abortion in 2, termination of pregnancy in 2 and stillbirth in 3. Postpartum hemorrhage was seen in 7 and placental abruption in 1. The difference was significant ($p<0.05$) (Table 2).

DISCUSSION

Primary hypothyroidism, defined as the presence of high TSH concentrations, is classified as overt hypothyroidism if blood thyroxine (Ft4) levels are low

Table 1: Patients characteristics

Parameters	Variables	Number	p-value
Age group (years)	18-25	25	0.05
	26-33	55	
	34-40	30	
Body mass index (kg m^{-2})	Underweight	10	0.91
	Normal	18	
	Overweight	45	
	obese	37	
Parity	Nulliparous	48	0.05
	Multiparous	62	
Hypothyroidism diagnosed during pregnancy	Yes	35	0.01
	No	75	
Etiology	Autoimmune	24	0.02
	Post treatment	11	
Thyroid antibodies	Positive	20	0.87
	negative	15	
Comorbidities	Gestational diabetes mellitus	12	0.03
	hypertension	5	

Table 2: Assessment of maternal outcomes

Parameters	Variables	Number	p-value
Mode of labor	Spontaneous	17	0.05
	Augmented	13	
	Induced	5	
Pregnancy outcomes	Live birth	28	0.01
	Abortion	2	
	Termination of pregnancy	2	
	Stillbirth	3	
Postpartum Hemorrhage	Yes	7	0.03
	No	28	
Placental abruption	Yes	1	0.01
	No	34	

and subclinical hypothyroidism if serum Ft 4 levels are within normal limits[9,10]. Overt hypothyroidism affects between 0.2 and 1% of all pregnancies, whereas hypothyroidism affects 2-3% of all pregnant women[11,12]. Untreated overt hypothyroidism in pregnancy has consistently been linked to negative effects on the maternal-foetal unit, including an increased risk of prematurity, low birth weight, intrauterine growth restriction, an increased risk of gestational hypertension, an increased risk of foetal loss and an increased risk of neurocognitive deficits in the developing foetus[13,14]. We performed this study to assess maternal characteristics and outcomes affected by hypothyroidism during pregnancy in a rural area of Tamil Nadu.

Age group 18-25 years had 25, 26-33 years had 55 and 34-40 years had 30 subjects. Body mass index showed underweight 10, normal 18, overweight45 and obese37. Parity was nulliparous in 48 and multiparous in 62. Hypothyroidism was diagnosed in 35 during pregnancy. Etiology of hypothyroidism was autoimmune in 24 and post treatment in 11. Thyroid antibodies were positive in 20. Comorbidities were gestational diabetes mellitus in 12 and hypertension in 5. Vella *et al*.[15] found that among 46,283 women, thyroid insufficiency affected 587 pregnancies (1.3%). There were 67.3% who were hypothyroid, 3.2% who were hyper thyroid, 28.3% who had isolated hypothyroxinaemia (IHT) and 1.2% who had a history of thyroid cancer. IHT and hypothyroidism patients were older than euthyroid individuals. IHT and hypothyroid patients exhibited significantly higher BMIs than euthyroid women (p = 0.001 for hypothyroid women, p = 0.035 for IHT). Women who were hypothyroid or IHT were more likely to have had a previous lower segment caesarean section. In hypothyroid pregnancies, type 1 diabetes and gestational diabetes were more common related comorbidities. Children born to IHT patients had a higher birth weight than those born to euthyroid individuals. Patients with hyperthyroidism were shown to have a significantly higher chance of developing diabetes.

Mode of labor was spontaneous in 17, augmented in 13 and induced in 5. Pregnancy outcomes was live birth in 28, abortion in 2, termination of pregnancy in 2 and stillbirth in 3. Postpartum hemorrhage was seen in 7 and placental abruption in 1. Kiran *et al*.[16] found that among 708 hypothyroid women 638 had live births. Postpartum hemorrhage was the most frequent maternal outcome (38.8%). The emergency caesarean section occurred in 23.4% of cases. They determined TSH levels in 53.2, 56.7, 61.7 and 66.6% of cases in preconception, 1st, 2nd and 3rd trimester periods. A significant association existed between caesarean section and preconception thyrotropin levels >2.5 mIU L^{-1}, whereas postpartum hemorrhage was significantly associated with thyrotropin levels >2.5 mIU L^{-1} in the preconception and third trimester.

Leung *et al*.[18] in their study pregnancy outcomes such as gestational hypertension, low birth weight, fetal death, congenital abnormalities, maternal anemia and postpartum hemorrhage were identified. Eclampsia, preeclampsia and pregnancy-induced hypertension were considerably more common in overt and subclinical hypothyroid individuals than in the general population, with rates of 22, 15 and 7.6%, respectively. Furthermore, 36% of overt hypothyroid subjects and 25% of subclinical hypothyroid subjects who remained hypothyroid at delivery developed gestational hypertension. Premature delivery for prenatal hypertension resulted in low birth weight in both overt and subclinical hypothyroid individuals. With the exception of one stillbirth and one case of clubfeet, hypothyroidism was not linked to poor fetal and neonatal outcomes.

In their study, Sahu *et al*.[19] recorded 633 pregnant women in their second trimester. Thyroid dysfunction was common with 6.47% of women having subclinical hypothyroidism and 4.58% having overt hypothyroidism. When compared to controls, overt hypothyroids were more likely to suffer pregnancy-induced hypertension (p = 0.04), intrauterine growth restriction (p = 0.01) and intrauterine demise (p = 0.0004). The rate of caesarean section for fetal distress was considerably greater (p = 0.04) in pregnant subclinical hypothyroid mothers. Neonatal problems and gestational hyperglycemia were considerably higher in the group with overt hyperthyroidism.

CONCLUSION

There was high prevalence of hypothyroidism diagnosed during pregnancy. Comorbidities found gestational diabetes mellitus and hypertension. There was high prevalence of abortion, termination of pregnancy and stillbirth.

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