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Study on Thyroid Dysfunction in Pregnancy And Its Maternal And Fetal Outcomes in Goa Medical College

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ABSTRACT:
Background:Pregnancy induces significant hormonal changes in thyroid function, the second most prevalent endocrinological condition after diabetes mellitus. Common disorders like hypothyroidism, autoimmune thyroiditis, and Graves' disease are more prevalent in the childbearing age group, affecting 2-3% of women globally and 11.1% in iodine-deficient regions like parts of India. Untreated thyroid dysfunction during pregnancy heightens the risk of adverse outcomes, including miscarriage and hypertensive disorders. The reciprocal impact of pregnancy on thyroid disorders complicates symptom identification. Vigilant antenatal care is crucial for maternal and fetal well-being, emphasizing the importance of controlling thyroid disease for optimal pregnancy outcomes.
Materials and Methods:Patients meeting inclusion criteria consented, providing clinical history and relevant investigations. Thyroid status screening identified dysfunction, tracked until pregnancy termination. Statistical analysis, utilizing SPSS 23.0 and Microsoft Word/Excel, included descriptive analysis and chi-square tests for associations. Fasting state blood collection avoided lipemic interference with serum TSH levels. ELISA estimated serum TSH, prompting fT4 and fT3 estimations for abnormal results. Treatment involved L Thyroxine for hypothyroidism and propylthiouracil followed by methimazole/carbimazole for hyperthyroidism, adjusting dosages based on TSH levels. All patients were followed until pregnancy end, with outcomes statistically studied ($p<0.05$ considered significant).
Results: Examining thyroid dysfunction prevalence and implications in 2000 pregnant women at a Goa tertiary hospital, this study found 11.5% with thyroid issues—8.45% had subclinical hypothyroidism, 2.50% overt hypothyroidism, and low prevalence of subclinical and overt hyperthyroidism (0.30% and 0.25%). TSH levels for subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism, and overt hyperthyroidism were 84.8%, 9.1%, 2.6%, and 3.5%, respectively. The study reported a 2% abortion rate, 27.4% pregnancy-induced hypertension, and 16.1% gestational diabetes in subclinical hypothyroidism. Subclinical hypothyroidism had 15.4% preterm deliveries, 11.3% abruptio placentae, and 34.1% cesarean sections, while NICU admission rates were 14%, mainly due to hyperbilirubinemia and low birth weight.
Conclusion: Commencing proper replacement therapy before pregnancy, maintaining TSH within trimester-specific bounds, is crucial to prevent issues like pregnancy-induced hypertension and low birth weight. Prompt thyroid testing and intervention greatly enhance the chances of a favorable pregnancy outcome for both the mother and the fetus.
Key Word:Thyroid Dysfunction; Pregnancy Outcomes; Antenatal Care; TSH Levels; Replacement Therapy

I. INTRODUCTION

Thyroid dysfunction is the second most common endocrinological disorder affecting pregnant women, after diabetes mellitus. The metabolic needs of pregnancy fluctuate due to a multitude of hormonal changes, which has a profound and intricate effect on thyroid function. Thyroid size increases by 10% in areas with sufficient iodine and 20–40% in areas with insufficient iodide during pregnancy, a condition known as hyperthyroidism. Globally, at least 2-3% of women experience thyroid dysfunction, and 10% of them have autoimmune thyroid disease even though they are euthyroid. In certain regions of India, there is a notable 11.1% prevalence, which may be attributed to iodine deficiency. The current study aims to ascertain the effects of thyroid condition on pregnancy for both the mother and the foetus. Therefore, the purpose of this study is to determine the prevalence of thyroid dysfunction and its associated consequences in pregnant patients admitted to the tertiary hospital in Goa. In addition, consider if it is necessary to evaluate and treat all pregnant women.

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II. MATERIAL AND METHODS

This prospective comparative study was carried out on patients of Goa medical college Bambolim-, Goa. from June 2021 to May 2022. A total of 2000 antenatal patients reporting to OPD of department of obstetrics and gynaecology in Goa medical college were screened, out of which 230 were diagnosed with thyroid dysfunction who were followed till term and their maternal and fetal outcomes were noted.

Study Design: Prospective comparative study.
Study Location: **Goa medical college, Bambolim- Goa Study Duration:** June 2021 to May 2022
Sample size: 2000 patients.

Inclusion criteria:
1.Pregnant women willing to participate in study
2.Pregnant women with abnormal thyroid function test
3.Pregnant women newly diagnosed with abnormal thyroid dysfunction
4.Primigravida/multigravida
5.Women willing for follow up till delivery
6.Singleton pregnancy

Exclusion criteria:
1. Multifoetal gestation.
2. Known chronic disorders like diabetes and hypertension, liver disorders, renal disorders
3. Previous bad obstetric history with known cause.
4. Pregnant women not willing for follow up till delivery

Procedure methodology

Patients meeting inclusion criteria and providing consent were included. Clinical history, investigations, and thyroid screening were conducted, following patients with thyroid dysfunction until pregnancy termination. Fasting state blood collection was emphasized to avoid lipemic interference with serum TSH levels. Serum TSH was estimated using ELISA, with abnormal results prompting fT4 and fT3 estimations. Patients were categorized into overt hypothyroidism, subclinical hypothyroidism, subclinical hyperthyroidism, and overt hyperthyroidism based on biochemical values. Treatment included L Thyroxine for hypothyroidism and propylthiouracil, followed by methimazole/carbimazole for hyperthyroidism. Patients were followed until the end of pregnancy, and outcomes were statistically analyzed.

Statistical analysis

The statistical software namely SPSS 23.0 was used for the analysis of the data. Microsoft word and excel were used to generate graphs,tables etc. The results were analysed using following statistical methods: Descriptive statistical analysis was carried out in the present study. Chi-square test was done for studying association. $p<0.05$ is considered as statistically significant.

Maternal outcomes were assessed by the following:
1. Abortion
2. Anemia
3. Abruption
4. Pregnancy induced hypertension
5. Preterm Delivery

Foetal Outcomes were assessed by the following:
1. Birth Weight
2. APGAR Score
3. Hyperbilirubinemia
4. NICU Admission

III. RESULT

Table 1: Frequency distribution of participants based on age and parity

		Frequency	Percent
Age	<20 years	7	3
	20-25 years	73	31.7
	26-30 years	80	34.8
	31-35 years	54	23.5
	36-40 years	15	6.5
	>40 years	1	0.4
Parity	Primi	127	55.2
	Multi	103	44.8
	Total	230	100

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Table 1 reveals a predominance of participants aged 26-30 (34.8%) and 20-25 (31.7%), with a minimal representation above 40 years (0.4%). Primigravida accounted for 55.2%, while 44.8% were multigravida.

Table 2: Frequency distribution of participants based on diagnosed at gestation

		Frequency	Percent
Diagnosed at gestation	Pre conception	40	17.4
	<5 weeks of gestation	4	1.7
	5-10 weeks of gestation	71	30.9
	10.1-15 weeks of gestation	60	26.1
	15.1-20 weeks of gestation	27	11.7
	20.1- 25 weeks of gestation	19	8.3
	>25 weeks of gestation	9	3.9
	Total	230	100

Table 2 outlines the diagnosis distribution during gestation, with 30.9% diagnosed at 5-10 weeks and 26.1% at 10.1-15 weeks. Additionally, 17.4% were informed of their diagnosis before pregnancy.

Table 3: Frequency distribution of participants based on term/preterm and delivery

		Frequency	Percent
Term/Preterm	Term	167	72.6
	Preterm	58	25.2
	Miscarriage	5	2.1
	Total	230	100
Delivery	Vaginal/VBAC	124	53.5
	LSCS	101	43.9
	Total	225	97.39

Table 3 illustrates term/preterm deliveries: 72.6% full term, 25.2% preterm, and 2.1% experienced miscarriage. Delivery modes were 53.5% vaginal and 43.9% LSCS.

Table 4: Frequency distribution of participants based on maternal complications

		Frequency	Percent
Maternal Complications	Abruption placentae	9	3.9
	Pregnancy induced hypertension	21	9.1
	GDM	20	8.7
	Mild/moderate anaemia	7	3
	Miscarriage	2	0.9
	IUGR	2	0.9
	Total	61	26.52

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Maternal complications were crucial in the study; among 230 participants, 26.52% experienced complications, with pregnancy-induced hypertension and GDM being the most prevalent. Abruption placentae affected 9 participants, while anaemia, miscarriage, and IUGR were less common complications.

Table 5: Frequency distribution of participants based on baby complications

		Frequency	Percent
Baby Complications	IUD	11	4.7
	Hyperbilirubinemia	30	13
	Anomalies	1	0.4
	Low birth weight	51	22.2
	NICU admission	33	14.3
	Total	126	54.7

Newborn complications were evaluated (Table 5) with 126 babies facing issues post-birth. The most prevalent complication was low birth weight, followed by NICU admissions. Hyperbilirubinemia, IUD, and other anomalies were less common among the newborn complications.

IV. DISCUSSION

The study, involving 2000 pregnant women, identified thyroid disorders in 11.5%, primarily subclinical hypothyroidism (8.45%) and least overt hyperthyroidism (0.25%) [1,2]. Cesarean section rates were 34.1% in subclinical hypothyroidism and 7.9% in overt hypothyroidism, an under explored area in prior research. Comparison with existing studies revealed consistent prevalence rates for subclinical hypothyroidism and aligned overt hypothyroidism rates [1,2,3,4]. The study emphasized the importance of monitoring thyroid conditions during pregnancy due to associated risks, including a 2% abortion rate, pre-eclampsia, and preterm labor, in line with existing literature [5]. Presence of thyroid antibodies heightened risks, including miscarriages, premature births, gestational diabetes, and postpartum thyroiditis. The study also explored the impact of thyroid disorders on pregnancy-induced hypertension (27.4%), gestational diabetes (16.1%), preterm births (15.4%), and anemia (6.4%), aligning with relevant literature [2].

V. CONCLUSION

Emphasizing the critical aspects of thyroid dysfunction during pregnancy, early identification and treatment of conditions like hypothyroidism, Graves' disease, and autoimmune thyroiditis are paramount. Essential for fetal development, thyroid hormone plays a vital role in placental formation and optimal growth, particularly in the initial twelve weeks. The initiation of adequate replacement therapy before conception, ensuring TSH stays within trimester-specific limits, is vital to prevent complications such as pregnancy-induced hypertension and low birth weight. Timely thyroid testing and swift intervention significantly contribute to a positive pregnancy outcome for both the mother and the fetus.

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