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A Study to Evaluate Maternal and Fetal Outcomes of Hypothyroidism Complicating Pregnancy

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Abstract:
Aim: *To investigate for maternal and fetal complications and to compare the perinatal outcomes of hypothyroid pregnant women to normal pregnant women attending Viswabharathi general hospital.*
Materials and methods: *A Comparative prospective clinical study with 50 hypothyroid pregnant women and 50 normal pregnant women is undertaken to study the maternal and fetal outcomes. TSH test was administered to all women with singleton pregnancies in the 1st and second trimesters who came to the Obstetrics and Gynecology out patient department or for admission to the Viswabharathi General Hospital affiliated to Viswabharathi medical college. The usual value for participants in the control arm was 0.1 to 2.5 uIU/L in the 1st trimester and 0.2 to 3 uIU/L in the second trimester. Those with TSH concentrations of more than 2.5 uIU/mL in the 1st trimester and more than 3 uIU/mL in the second trimester will be enrolled in the trial and their fT4 and anti-TPO levels will be monitored.*
Results: *In our study, out of 100 antenatal women, hypothyroidism in pregnancy is assosciated with abortions (16%), anemia (58%),PIH (28%),preterm (24%), low birth weight (35%), low APGAR (11.9%), NICU admissions (23.8%).*
Conclusion: *Thyroid disorders in pregnancy have adverse effects on maternal and fetal outcome emphasizing the need and importance of routine antenatal thyroid screening.*

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I. Introduction

The maternal hypothalamic-pituitary-thyroid (HPT) axis impacts thyroid function in a variety of ways during pregnancy. The foetus goes through a series of changes and develops its hypothalamic pituitary axis, and placenta plays an important role in iodide and T4 transport and metabolism. During pregnancy, the thyroid gland increases in size by ten percent in iodine rich areas and by twenty to forty percent in iodine deplete areas. The production of triiodothyronine (T3) increases by 50%, and recommended daily allowance (RDA) of iodine requirement increases by 50%[3]. About 2-3 pregnancies per 1000 are complicated by overt hypothyroidism, while about 5% are complicated by subclinical hypothyroidism[4]. Untreated or indequately treated overt hypothyroid women had a 40% chance of developing anaemia, preeclampsia, abruptio placenta, and postpartum haemorrhage. Up to 30% of newborns were born small for their gestational age, with 10% of congenital defects and perinatal mortality noted. . Untreated subclinical hypothyroid women (elevated TSH alone) accounted for almost one-third of the cases. In both groups, thyroxine therapy improved mother and fetal outcomes significantly[5].

II. Materials and methods

A Comparative prospective clinical study with 50 hypothyroid pregnant women and 50 normal pregnant women is undertaken to study the maternal and fetal outcomes.

SAMPLE SIZE:
A total of 100 patients were studied, comprising 50 cases and 50 controls.
INCLUSION CRITERIA

- Singleton pregnancy
- Primigravida and multigravida of any age.
- Patients in the 1st and 2nd trimesters.
- The study includes patients who have already been diagnosed and are undergoing therapy.

EXCLUSION CRITERIA

- Multiple pregnancy.
- Any obstetric or medical complications other than hypothyroidism.
- Patients refusing to participate in the study.

METHODS OF COLLECTION

TSH test was administered to all women with singleton pregnancies in the 1st and second trimesters who came to the Obstetrics and Gynecology out patient department or for admission to the Viswabharathi General Hospital affiliated to Viswabharathi Medical College, Kurnool, between December 1, 2019 and November 30, 2020. The usual value for participants in the control arm was 0.1 to 2.5 uIU/L in the 1st trimester and 0.2 to 3 uIU/L in the second trimester.

Those with TSH concentrations of more than 2.5 uIU/mL in the 1st trimester and more than 3 uIU/mL in the second trimester will be enrolled in the trial and their fT4 and anti-TPO levels will be monitored. Patients who had already been diagnosed and were receiving therapy were also included in the trial.

We began treating hypothyroidism patients with an appropriate dose of L-thyroxine based on their gestational age, body weight, and TSH level, as determined by an endocrinologist. Patients who were diagnosed with hypothyroidism during the 1st trimester were seen every four weeks for dose adjustments and follow-up.

Patients who were discovered in the second trimester were also followed up on every two months. Pregnancy-induced hypertension, gestational diabetes mellitus, anaemia, preterm labour, placental abruption, and fetal problems such as RDS and NICU care for the infants, premature stillbirths, and fetal hypothyroidism were all monitored in all of these individuals.

III. Results

A comparative clinical study with 50 pregnant women with hypothyroid and 50 normal pregnant women is undertaken to study the maternal and fetal complications.

Table 1: Distribution of study subjects by reason for termination of pregnancy

Reasons for termination of pregnancy	Cases (n = 50)		Controls (n = 50)		
	Number	Percentage	Number	Percentage	
Uneventful/Term	26	52%	38	76%	0.004, S
Fetal distress	7	14%	4	8%	0.337
Abortion	8	16%	2	4%	0.029, S
Still birth + IUD	2	4%	1	2%	0.557
Abruption	1	2%	1	2%	1
PROM	3	6%	2	4%	0.645
MSL	3	6%	2	4%	0.645
Total	50	100%	50	100%	

In the present study, 52% of the cases and 76% of the controls had term delivery followed by Abortion in 16% & 4%, fetal distress in 14% & 8%, PROM in 6% & 4% and MSL in 6% & 4% of cases and controls respectively. The difference was found to be statistically significant.

In the present study, 58% of the cases and 36% of the controls have Anemia and the difference is found to be statistically significant.

Graph 1: Comparison of Incidence of Anaemia between Cases and Controls

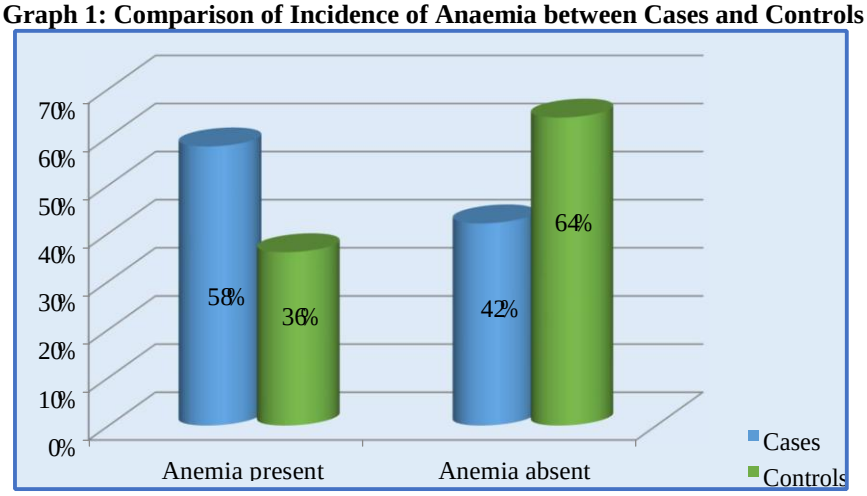

Table 2: Comparison of Incidence of PIH between Cases and Controls

PIH	Cases (n = 50)		Controls (n = 50)	
	Number	Percentage	Number	Percentage
Yes	16	28%	6	16%
No	36	72%	44	84%
Total	50	100%	50	100%

In the present study, 28% of the cases and 16% of the controls had incidence of PIH and the difference was found to be statistically significant.

Table 3: Comparison of Incidence of Pre-term labour between Cases and Controls

Pre-term labour	Cases (n = 42)		Controls (n = 48)	
	Number	Percentage	Number	Percentage
Yes	10	24%	6	14%
No	32	76%	42	86%
Total	42	100%	48	100%

In the present study, 24% of the cases and 14% of the controls had Pre-term labour the difference was found to be statistically not significant.

Table 4: Comparison of Birth Weight of the baby between Cases and Controls

Birth Weight of the baby	Cases (n = 42)		Controls (n = 48)	
	Number	Percentage	Number	Percentage
<1.5 kg	6	14.3%	3	6.3%
1.5 – 2.0 kg	3	7.2%	1	2.1%
2.0 – 2.5 kg	6	14.3%	6	12.5%
2.5 – 3.0 kg	23	54.7%	34	70.8%
>3.5 kg	4	9.5%	4	8.3%
Total	42	100%	48	100%

In the present study, Birth weight of the baby was <1.5kg in 14.3% & 6.3%, 1.5 -2kg in 7.2% & 2.1%, 2 – 2.5 kg in 14.3% & 12.5%, 2.5 – 3 kg in 54.7% & 70.8% and >3.5kg in 9.5% & 8.3% of the cases and controls respectively.

Table 5: Comparison of APGAR score of babies at 1 minute between Cases and Controls

APGAR at 1 minute	Cases (n = 42)		Controls (n = 48)	
	Number	Percentage	Number	Percentage
≥8/10	37	88.1%	46	95.8%
<8/10	5	11.9%	2	4.2%
Total	42	100%	48	100%
Chi – square = 1.87, df = 1, p = 0.330				

In the present study, the APGAR score at 1 minute was <8/10 in 11.9% of cases and 4.2% of controls and the difference was found to be statistically not significant.

Table 6: Comparison of APGAR score of babies at 5 minutes between Cases and Controls

APGAR at 5 minute	Cases (n = 42)		Controls (n = 48)	
	Number	Percentage	Number	Percentage
≥8/10	39	92.9%	47	97.9%
<8/10	3	7.1%	1	2.1%
Total	42	100%	48	100%
Chi – square = 1.35, df = 1, p = 0.245				

In the present study, the APGAR score at 1 minute was <8/10 in 7.1% of cases and 2.1% of controls the difference was found to be statistically not significant.

Table 7: Comparison of NICU admissions between Cases and Controls

NICU Admissions	Cases (n = 42)		Controls (n = 48)	
	Number	Percentage	Number	Percentage
Yes	12	23.8%	10	20.8%
No	30	76.2%	38	79.2%
Total	42	100%	48	100%
Chi – square = 0.726, df = 1, p = 0.544				

In the present study, 23.8% of the cases and 20.8% of the controls had NICU admissions for the new borns the difference was found to be statistically not significant.

Table 8: Comparison of Incidence of maternal complications, LSCS, NICU admissions and Baby weight by Anti TPO levels.

	Anti TPO				P value
	Raised (n = 16)		Not raised (n = 34)		
	Number	Percentage	Number	Percentage	
Maternal Complications					
Yes	12	75%	20	58.8%	0.266
No	4	25%	14	41.2%	
NICU admissions					
Present	8	50%	4	11.7%	0.003, S
Absent	8	50%	30	88.3%	

LSCS					
Yes	10	62.5%	8	23.5%	0.007, S
No	6	37.5%	26	76.5%	
Birth weight					
<1.5 kg	3	30%	3	9.4%	
1.5 – 2.0 kg	1	10%	2	6.2%	0.107
2.0 – 2.5 kg	3	30%	3	9.4%	
2.5 – 3.0 kg	2	20%	21	65.6%	
>3.5 kg	1	10%	3	9.4%	
Total (n = 42)	10	100%	32	100%	

In the present study, in cases with Raised Anti TPO levels, 50% had NICU admissions, 62.5% had LSCS, and 30% had birth weight <1.5kg.

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