Original Article

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Incidence of Thyroid Disorders in Pregnancy and It's Maternal and Foetal Outcomes

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Abstract

Background: Thyroid dysfunction is due to Failure in compatibility with physiologic changes during pregnancy which leads to adverse maternal and foetal outcomes.There is an increased risk of complications like abortion, preterm delivery, pre-eclampsia, anemia, placental abruption, Post-partum haemorrhage in pregnant women with thyroid disorders. Foetal complications include intrauterine growth restriction, preterm babies, still birth and neonatal deaths. Thyroid dysfunction has its effects on both maternal and foetal outcomes.[2]

Aim & Objective: To assess the incidence of thyroid disorders in pregnancy and to interpret the maternal and foetal outcome.

Methodology: The Prospective study was conducted for a period of two years in Obstetrics & Gynaecology department of Bharati Vidyapeeth University, Pune. The methodology were explained to women and valid informed written consent was recorded. The ethical clearance was obtained from ethical review committee of the tertiary centre.The patients with thyroid dysfunction on treatment/without treatment were followed up till delivery/abortion. The maternal and fetal outcome were studied.

Results: Out of 498 pregnant women 33 (6.6%) had hypothyroidism and 3(0.6%)had hypothyroidism and 462(92.8%) were Euthyroid group. In all the three group majority of the babies were not requiring admission in NICU. In hypothyroid group, 39.39% had complication. In hyperthyroidism group, 66.67% had any complications. In Euthyroid group, 30.74% had complication. Complication rate was comparatively higher in hypothyroidism and hyperthyroidism group compared to Euthyroid group. There was no case of placental abruption in my study.

Conclusion: Due to impact that the maternal thyroid disorders has on pregnancy outcomes, Prompt identification of thyroid disorders and timely initiation of treatment is essential.

Keywords: Hypothyroid; Hyperthyroid; Pregnancy outcomes; Complications.

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INTRODUCTION

In pregnancy the second most common endocrine disorders are thyroid disorders. In first trimester rise in HCG leads to increased FT4 levels and decreased TSH.[1] Total T3 and Total T4 levels increases by 50% during pregnancy leading to 50% increase in thyroxine binding globulin. Serum TSH decreases in 1st trimester however not to pre-pregnancy levels.[1] TSH also increases in 2nd & 3rd trimesters. There is an increased risk of complications like abortion, preterm delivery,

pre-eclampsia, anemia, placental abruption, Post-partum haemorrhage in pregnant women with thyroid disorders. Foetal complications include IUGR, preterm babies, still birth and neonatal deaths. Thyroid dysfunction has its effects on both maternal and foetal outcomes.[2]

Maternal high to normal FT4 levels are associated with Low birth weight babies & increased risk of SGA newborns 5 in early pregnancy. An untreated or inadequately treated thyrotoxic woman is more likely prone for pre-eclampsia, abortions, premature labour and having low birth weight babies.

AIM & OBJECTIVE

- To assess the incidence of hypothyroid and hyperthyroid disorders in pregnancy.
- To assess and correlate the maternal comorbidities in pregnant women with thyroid disorders.
- To assess and correlate the foetal outcomes (still birth, preterm, lbw) in pregnant women with thyroid disorders.

METHODOLOGY

Study setting and design

A Prospective study was conducted in the Obstetrics and Gynecology Department in a tertiary care hospital, Bharati Hospital at Bharati Vidyapeeth University, Pune for a period of two years in antenatal females coming to OBGY Department for delivery.

INCLUSION CRITERIA

- All women attending antenatal OPD in tertiary center, their TSH level will be assessed along with other ANC investigations.
- Also patients who are registered in other hospital but who come for abortion / delivery to this hospital in whom TSH level are to be assessed in this pregnancy will also be taken in study.

EXCLUSION CRITERIA

- Women with confirmed thyroid is orders before pregnancy

Sample size and sampling

A total of 498 study participants were included in the study and after matching the inclusion and exclusion criteria the cases were admitted for induction in the department of OBGY.

METHOD

Written consent was obtained from women matching the inclusion and the exclusion criteria to participate in the study. With predetermined pro-forma, detailed history were obtained:

- The reference range used in the study was based on American Thyroid Association Guidelines (ATA) for the diagnosis and management. First trimester 0.1-2.5mIU/L, second trimester 0.2-3.0mIU / Land third trimester 0.3-3.0mIU/L.
- All pregnant women who fulfilled inclusion criteria were included in the study at the first time visitor respective of gestational age. Written informed consent was taken.
- Detailed history and examination was done. Apart from routine ten at al investigations done in pregnancy TSH was done. Interpretation was done according to reference range as per ATA guidelines.
- The patients with thyroid dysfunction on treatment / without treatment were followed up till delivery /abortion. The TSH values were repeate every trimester and drug dos age altered accordingly. The maternal and fetal outcome were studied.

DATA COLLECTION

Registry based analysis of Thyroid disorders rate in tertiary centre. This is an Prospective study conducted at a tertiary center. All women delivered between September 2019-2021 were included. Data was collected from OPD register, ward register and labour room register of tertiary centre. A proforma made regarding the data i.e., parity, mode of delivery and its indication, gestational age, on se to flab our spontaneous or induced, APGAR score, weight of the baby, NICU admissions.

DATA ANALYSIS

The collected data was coded and entered in Microsoft Excel sheet. The data was analysed using SPSS version 20.0 software.

ETHICAL CONSIDERATION

Protocol was submitted in Institutional Ethical

Committee. Informed written consent from the participants were obtained after informing that the participation will be voluntary and there will be no harm to the participants in the study. Confidentiality of the information obtained from the patient was maintained and the identity of the patient was not revealed.

RESULT

Table 1 shows distribution of pregnant women according to their thyroid disease status. Out of total 498 pregnant women 33 (6.6%) had hypothyroidism and 3 (0.6%) had hyperthyroidism, 462 (92.8%) were Euthyroid. Fig. 1 depicts distribution of women according to thyroid disorder.

Table 1: Distribution of women according to thyroid disorder

Thyroid Disease	Frequency	Percent
Euthyroid	462	92.8
Hyperthyroidism	3	0.6
Hypothyroidism	33	6.6
Total	498	100.0

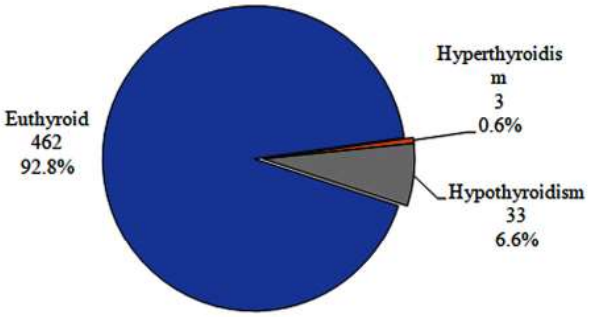

Fig. 1: Distribution of women according to thyroid disorder

Table 2: Shows distribution of women according to the gestational age at the time of diagnosis of thyroid disorder. Out of 33 cases diagnosed as hypothyroidism, 19 (57.6%) had more than 10 weeks of gestational age. In hyperthyroidism, group out of 3 women 2 (66.7%) had more than 10 weeks of gestational age. There was no statistical difference in gestational age at the time of diagnosis of thyroid disorder in hyperthyroidism and hypothyroidism group. Fig. 2: depictsdistribution of women according to the gestational age at the time of diagnosis of thyroid disorder.

Table 2: Distribution of women according to the gestational age at the time of diagnosis of thyroid disorder

Gestational Age at the time of diagnosis of thyroid disorder	Hypothyroidism		Hyperthyroidism		Total		Fisher Exact test p-value
	Cases	%	Cases	%	Cases	%	
<10 weeks	14	42.40	1	33.30	15	41.70	0.99
≥10 weeks	19	57.60	2	66.70	21	58.30	
Total	33	100	3	100	36	100	

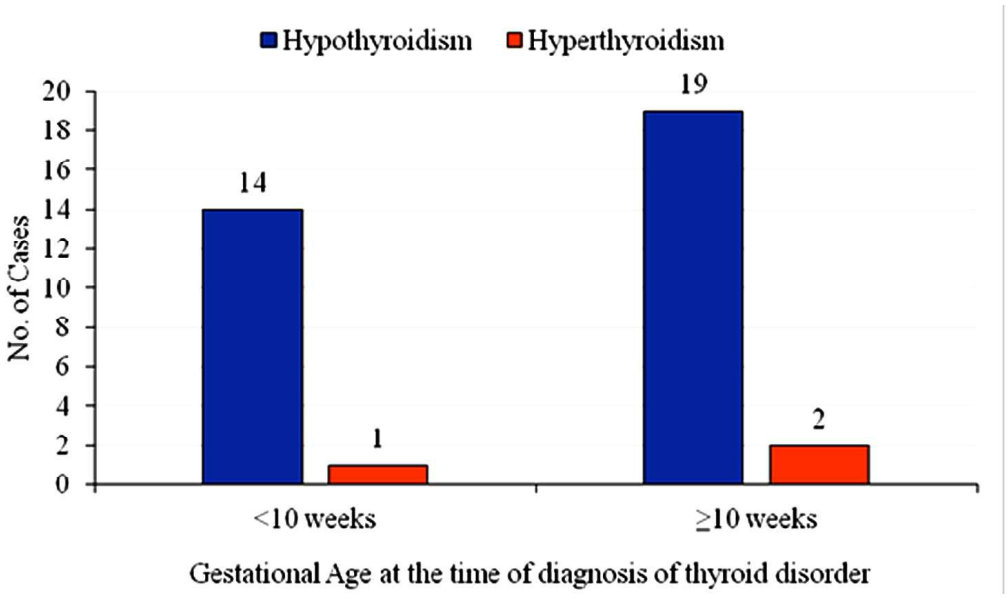

Fig. 2: Distribution of women according to the gestational age at the time of diagnosis of thyroid disorder

Table 3: Shows distribution of women according to the TSH value among hypothyroidism, hyperthyroidism and normal TSH group. In hypothyroidism group (n=33), the mean TSH value was 3.58 in first trimester, 1.99 in second trimester, 1.26 in third trimester. In hyperthyroidism (n=3), group the mean TSH value was 0.12 in first trimester, 2.03 in second trimester, 1.85 in third trimester. In Euthyroid group (n=462), mean TSH value was 2.15 in second trimester. In first trimester mean TSH value is significantly higher in hypothyroidism group and lower in hyperthyroidism group compared to Euthyroid group. Fig. 3: depicts distribution of women according to TSH value.

Table 3: Distribution of women according to TSH value

TSH Value	Hypothyroidism (n=33)		Hyperthyroidism (n=3)		Euthyroid (n=462)		P value (ANOVA)
	Mean	SD	Mean	SD	Mean	SD	
1st trimester (n=301)	3.58	1.73	0.12	0.04	1.79	1.11	<0.001 (S)
2nd trimester (n=265)	1.99	0.81	2.03	1.07	2.15	0.94	0.623 (NS)
3rd trimester (n=232)	1.26	1.13	1.85	1.72	1.79	1.27	0.066 (NS)

SD=Standard Deviation; S=significant; NS=Not significant

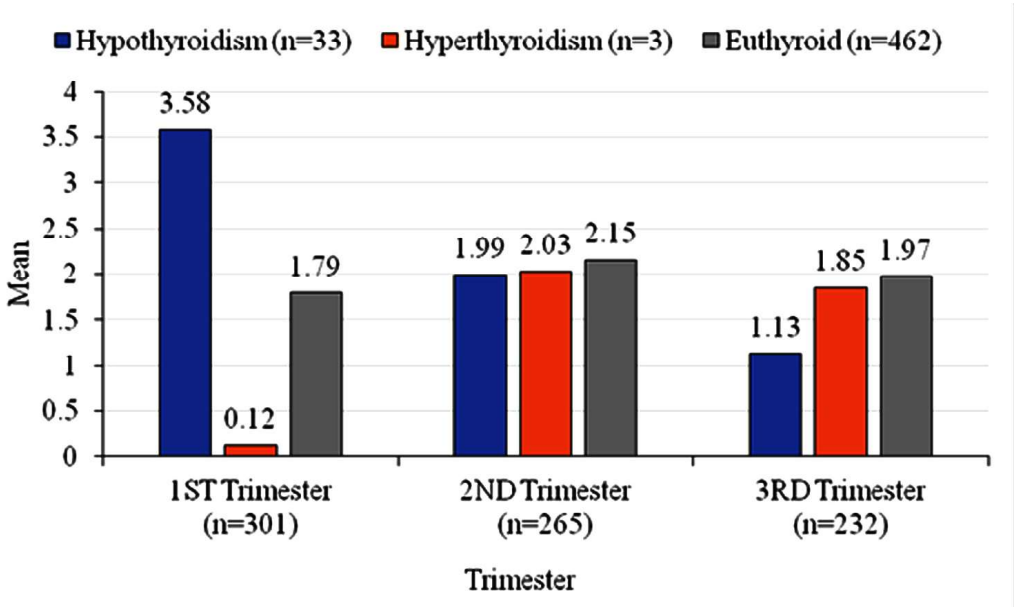

Fig. 3: Distribution of women according to TSH value

Table 4: Shows distribution of women according to the type of delivery and hypothyroidism, hyperthyroidism and Euthyroid group. Out of 33 cases diagnosed as hypothyroidism, 57.6% women were delivered vaginally. In hyperthyroidism, 100% women were delivered by LSCS. In the Euthyroid group, out of 462 cases, 55.2% were delivered by LSCS and 44.8% were delivered vaginally. Fig. 4 depicts distribution of women according to the type of delivery and thyroid disorder.

Table 4: Distribution of women according to the type of delivery and thyroid disorder

Type of Delivery	Hypothyroidism		Hyperthyroidism		Euthyroid		Total		Chi-Square Value	p-value
	Cases	%	Cases	%	Cases	%	Cases	%		
Vaginal Delivery	19	57.60	–	–	207	44.80	226	45.40	3.96	0.138
LSCS	14	42.40	3	100	255	55.20	272	54.60		
Total	33	100	3	100	462	100	498	100		

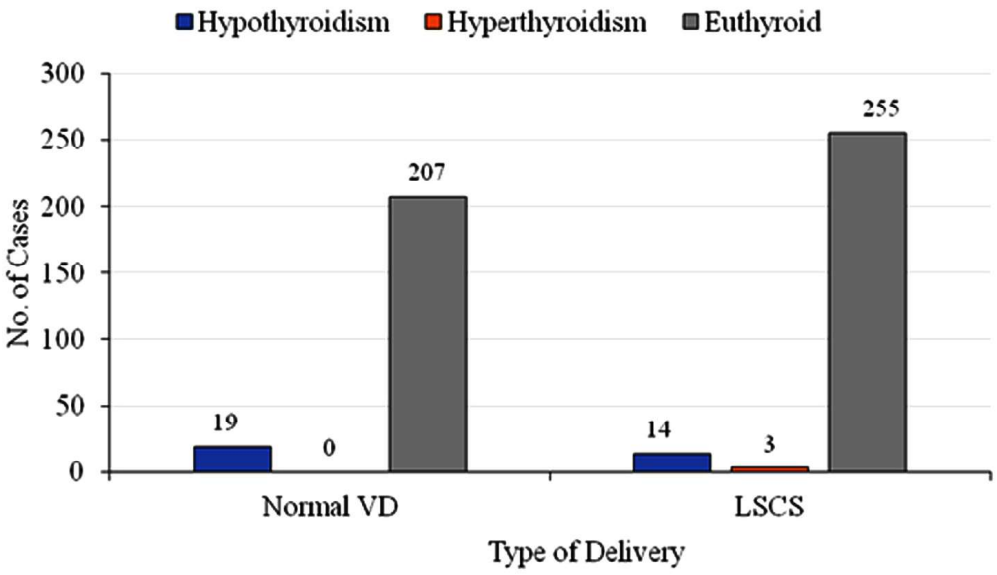

Fig. 4: Distribution of women according to the type of delivery and thyroid disorder

Table 5 : Shows distribution of women according to the treatment received for thyroid disease. In hypothyroidism group, out of 33 mother 26 (78.8%) had received treatment for thyroid disease. Whereas in hyperthyroidism, group out of 3 women 66.7% had received treatment for thyroid disease. Fig. 5 : Distribution of mother according to the treatment received for thyroid disease.

Table 5: Distribution of mother according to the treatment received for thyroid disease

Has mother received treatment for thyroid disease?	Hypothyroidism		Hyperthyroidism		Total		Fisher Exact test: p-value
	Cases	%	Cases	%	Cases	%	
Yes	26	78.80	2	66.70	28	77.80	0.54
No	7	21.20	1	33.30	8	22.20	
Total	33	100	3	100	36	100	

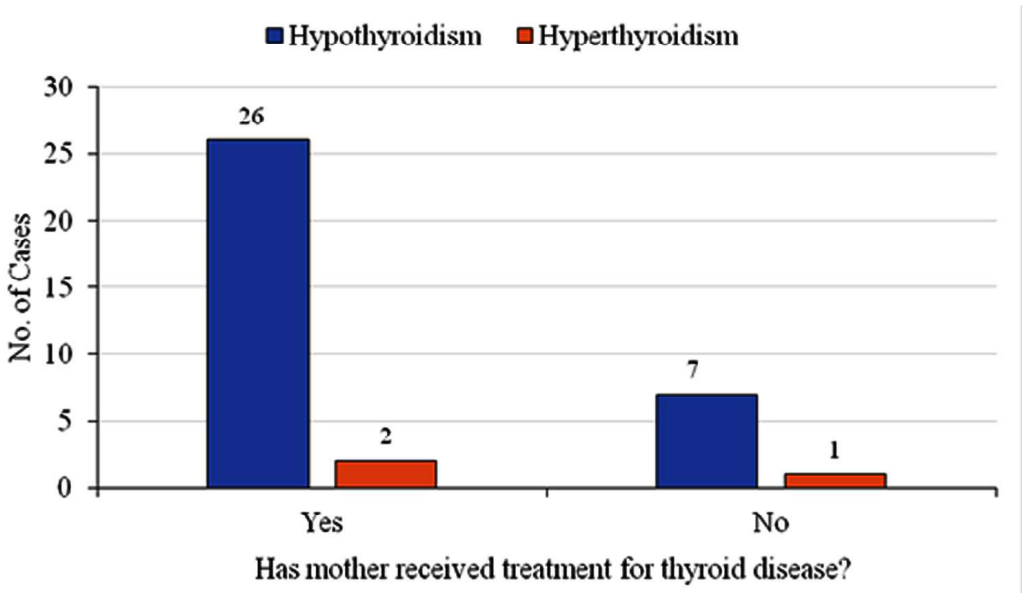

Fig. 5: Distribution of mother according to the treatment received for thyroid disease

Table 6: In the present study in hypothyroidism group, 39.3% had complications like Spontaneous abortion (7.69%), GDM (7.69%), PIH (15.38%), Oligohydramnios (15.38%), Preterm (23.08%), IUGR (7.69%), Low birth weight (23.08%). In hyperthyroidism group, 66.67% had complications like pre-eclampsia (33.33%), preterm delivery (33.3%), IUGR (33.3%). Fig. 6: Distribution of maternal and foetal factor & outcome.

Table 6: Distribution of maternal and foetal factor & outcome

Maternal and Foetal factor and outcome	Hypothyroidism		Hyperthyroidism		Euthyroid		Total	
	Cases	%	Cases	%	Cases	%	Cases	%
Spontaneous abortion	1	7.69	0	0.00	12	8.45	13	8.28
GDM	1	7.69	0	0.00	28	19.72	29	18.47
PIH	2	15.38	1	33.33	18	12.68	21	13.38
Oligohydramnios	2	15.38	0	0.00	21	14.79	23	14.65
Preterm	3	23.08	1	33.33	23	16.20	27	17.20
IUGR	1	7.69	1	33.33	14	9.86	16	10.19
IUFD	0	0.00	0	0.00	7	4.93	7	4.46
FSB	0	0.00	0	0.00	5	3.52	5	3.18
LBW	3	23.08	0	0.00	14	9.86	17	10.83

GDM= Gestational Diabetes Mellitus; PIH= Pregnancy Induced Hypertension; IUGR= Intra Uterine Growth Retardation; IUFD= Intra Uterine Foetal Death; LBW=Low Birth Weight (<2500gm)

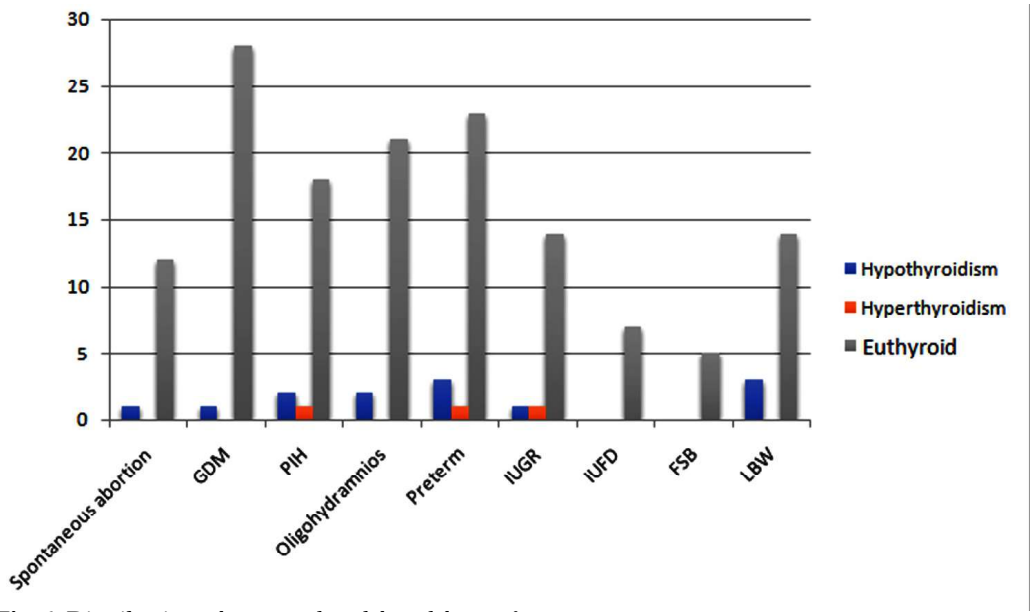

Fig. 6: Distribution of maternal and foetal factor & outcome

DISCUSSION

Hypothyroidism seen in 2-3% and hyperthyroidism seen in 0.1-0.4%.Untreated or inadequately treated thy rotoxic women is more likely prone for pre-eclampsia, abortions, premature labour and having low birth weight babies.

Universal screening for thyroid disorders in pregnant women should be considered especially in country like India where there is high prevalence of undiagnosed thyroid disorder.

Incidence of thyroid disorders in Pregnancy

In present study out of total 498 pregnant mother 33 (6.6%) had hypothyroidism and 3 (0.6%) had hyperthyroidism.

In Indian population, hypothyroidism occurs with a prevalence of 4.8% to 14.3% in pregnant women as reported by Sahu et al.[2] (2010), the incidence appears to be higher in India, in comparison with other countries. Sahu et al.[2] (2010) recorded 11.05% prevalence of hypothyroidism. While Dhaniwal

et al.[7] (2016) reported 14.3% hypothyroidism from Delhi. Stagnaro-Green and Pearce 3 reported 0.5 and 0.4% respectively in subclinical and overt hypothyroidism cases.

TSH VALUE

In the present study in hypothyroidism group (n=33), the Mean TSH value was 3.58 in first trimester, 1.99 in second trimester, 1.26 in third trimester. In hyperthyroidism (n=3), group the mean TSH value was 0.12 in first trimester, 2.03 in second trimester, 1.85 in third trimester.

In the study of Mahadik K et al.[6] (2020) found women with subclinical hypothyroidism, overt hypothyroidism, and subclinical hyperthyroidism had mean serum TSH levels of 8.02±1.25 mIU/ml, 11.92 ± 5.34 mIU/ml, and 0.07±0.03 mIU/ml, respectively.

MODE OF DELIVERY

In present study out of 33 cases diagnosed as hypothyroidism, 57.6% women were delivered vaginally and 42.4% delivered by LSCS. In hyperthyroidism, 100% women were delivered by LSCS.

In the study Mahadik K et al[6] (2020), cesarean delivery was occurred in 26.3 percent of women with hypothyroidism (p = 0.012). Another study has reported rates of caesarean delivery of 22.9% in women with hypothyroidism.[8]

MATERNAL AND FOETAL OUTCOMES

In the present study in hypothyroidism group, those who were on treatment, 30.80% had complication like GDM (12.5%), PIH (25%) Oligohydramnios (25%), Preterm (12.5%), Low birth weight (25%). In hypothyroid group, whereas those without treatment 71.40% had complications like Spontaneous abortion(20%), Preterm delivery (40%), IUGR (20%), Low birth weight (20%).

In hyperthyroidism group, 50% had complications in cases who were on treatment like IUGR. In hyperthyroid group, whereas those without treatment, 100% patients were found to have complications like pre-eclampsia (50%), preterm delivery (50%).

In the study by Mahadik K et al[6] (2020), Pre-eclampsia was seen in 15.8% of women with hypothyroidism (p = 0.041).

In the study Mahadik K et al[6] (2020), preterm birth occurred in 5.3 percent of hypothyroidism patients but was not linked to the condition. 31.6% had Low birth weight babies, and the association between Low birth weight babies and hypothyroidism was significant (p = 0.001). Women with hypothyroidism have a 6.3 times higher chance of having Low birth weight babies than women with euthyroidism (95 percent CI = 2.03–19.5). There was no case of placental abruption in this my study.

CONCLUSION

Due to impact that the maternal thyroid is orders has on maternal & fetal out comes, Prompt identification of thyroid disorders and timely initiation of treatment is essential for decreasing the incidence of complications like Abortions, pre-eclampsia, glucose intolerance, placenta labruption, oligohydramnios, preterm labor, low birth weight babies, IUGR, stillbirth.

Adequate treatment of thyroid is orders in pregnancy significantly reduces complications. Universal screening for thyroid is orders in pregnant women should be considered especially in country like India where there is high prevalence of undiagnosed thyroid disorder.

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REFERENCES

1. Thammiah, J. (2016) 'Screening for thyroid disorders in pregnancy with TSH estimation', International Journal of Reproduction, Contraception, Obstetrics and Gynecology. Medip Academy, pp. 1052–1055. doi: 10.18203/2320-1770.ijrcog20160856.
2. Sahu MT, Das V, Mittal S, Agarwal A, Sahu M (2010). Overt and subclinical thyroid dysfunction among Indian pregnant women and its effect on maternal and fetal outcome. Arch. Gynecol. Obstetr. 281: 215-220.
3. Stagnaro-Green A, Pearce E (2012). Thyroid disorders in pregnancy. Nat. Rev. Endocrinol. 8: 650-658.
4. Ajmani SN, Aggarwal D, Bhatia P, Sharma M, Sarabhai V, Paul M. Prevalence of overt and subclinical thyroid dysfunction among pregnant

women and its effect on maternal and fetal outcome. The Journal of Obstetrics and Gynecology of India. 2014 Apr 1;64(2):105-10.

5. Medici M, Timmermans S, Visser W, de Muinck Keizer-Schrama SM, Jaddoe VW, Hofman A, Hooijkaas H, de Rijke YB, Tiemeier H, Bongers-Schokking JJ, Visser TJ. Maternal thyroid hormone parameters during early pregnancy and birth weight: the Generation R Study. The Journal of Clinical Endocrinology & Metabolism. 2013 Jan 1;98(1):59-66.

6. Mahadik K, Choudhary P, Roy PK. Study of thyroid function in pregnancy, its feto-maternal outcome; a prospective observational study. BMC Pregnancy Childbirth. 2020 Dec 10;20(1):769. doi: 10.1186/s12884-020-03448-z. PMID: 33302910; PMCID: PMC7726876.

7. Dhanwal DK, Bajaj S, Rajput R, Subramaniam KA, Chowdhury S, Bhandari R, et al. (2016). Prevalence of hypothyroidism in pregnancy: An epidemiological study from 11 cities in 9 states of India. Indian J. Endocrinol. Metab. 20: 387-390.

8. Sreelatha S, et al. The study of maternal and fetal outcome in pregnant women with thyroid disorders. Int J Reprod Contracept Obstet Gynecol. 2017; 6(8):3507–3513. doi: 10.18203/2320-1770.ijrcog20173473.

9. Casey BM, Dashe JS, Wells CE, McIntire DD, Leveno KJ, Cunningham FG. Subclinical hyperthyroidism and pregnancy outcomes. Obstet Gynecol. 2006 Feb; 107(2 Pt 1):337-41. doi: 10.1097/01.AOG.0000197991.64246.9a. PMID: 16449121.