



STUDY OF THYROID DYSFUNCTION IN PREGNANCY AND FETOMATERNAL OUTCOME

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ABSTRACT

Background : Thyroid disorders constitute one of the most common endocrine disorders seen in pregnancy. Maternal thyroid function changes during pregnancy and inadequate adaptation to these changes results in thyroid dysfunction.

Aims & Objectives : To estimate occurrence of thyroid dysfunction in pregnancy . To evaluate obstetric and perinatal outcome in patients with thyroid dysfunction. To determine prevalence of subclinical hypothyroidism in pregnant women.

Materials & Methods : Prospective study of all the pregnant females coming for ANC registration in 1st or 2nd trimester or patient coming for first time in 3rd trimester to a tertiary care centre.

Results: Out of total 300 cases , 61.3% were primigravida while 38.7% were multigravida . Prevalence of subclinical and clinical hypothyroidism was 11.7% and 6% respectively. 55.6% cases of clinical hypothyroidism and 37.1% cases of subclinical hypothyroidism underwent LSCS as compared to 22.3% of euthyroid cases. There was no maternal death in this study. Maternal morbidity (spontaneous abortion 11.1% , preeclampsia 27.8% , GDM 5.6% and PPH 11.1%)and neonatal mortality (5.6%) was seen higher in cases of overt and subclinical hypothyroidism as compared to euthyroid cases.

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

KEYWORDS : Thyroid disorder , subclinical hypothyroidism.

INTRODUCTION

Thyroid disorders constitute one of the most common endocrine disorders seen in pregnancy. Maternal thyroid function changes during pregnancy and inadequate adaptation to these changes results in thyroid dysfunction. These changes are a result of various factors like an increase in thyroglobulin due to elevated estrogen and human chorionic gonadotrophin, increase renal losses of iodine due to increase in glomerular filtration rate, modifications in peripheral metabolism of maternal thyroid hormone and modifications in iodine transfer to placenta. The production of thyroid hormone and iodine requirement increases by 50% during pregnancy. Pregnancy is a stress test for thyroid, resulting in hypothyroidism in women with limited thyroidal reserve or iodine deficiency.

Thyroid disorder during early pregnancy has been associated with adverse obstetric and fetal outcome. The main obstetric complications are abortion, preeclampsia, abruptio placenta and preterm labour and the fetal complications are prematurity, low birth weight, still birth and perinatal death. There is an increase in the incidence of NICU admissions and respiratory distress syndrome. Maternal hypothyroidism in the 1st trimester may be harmful for fetal brain development and leads to mental retardation and cretinism which includes impairment of mental and physical growth and development and has a negative impact on most organ systems.

In view of adverse maternal and fetal outcome in pregnant women with thyroid disorder and obvious benefits of early diagnosis and treatment, some expert panels all around the world have suggested routine thyroid function screening of all pregnant women. Therefore , this study was carried out in pregnant women during 1st trimester who attended antenatal clinic of a tertiary care centre to know the prevalence of thyroid disorders in pregnant women and also to know the outcome of pregnancy in women suffering from thyroid disorders.

MATERIALS AND METHODS

This was 12 month prospective study carried out in OBGY department from May 2019 to May 2020 in B.J GMC and SGH Pune. All pregnant women attending Obstetric OPD with singleton pregnancy irrespective of period of gestation were included in this study. The required details were obtained by history taking and follow up of patients till delivery after taking informed written consent of patients and ethics committee permission.

EXCLUSION CRITERIA:

Diagnosed cases of fetal anomaly , multiple pregnancy , gestational trophoblastic disease , women with bad obstetric history and women with known case of thyroid dysfunction.

RESULTS AND OBSERVATION**Table 1. Age distribution of study cases**

Age group (years)	N	%
<= 20	55	18.3%
21-25	168	56.0%
26-30	77	25.7%
Total	300	100.0%
Mean age – 23.32 +/- 3.16 years		

Mean age of the study cases was 22.32 years with 56% of the cases in between age of 21-25 years.

Table 2. Distribution of study cases as per Parity

Parity	N	%
Primi	184	61.3%
Multi	116	38.7%
Total	300	100.0%

Out of total 300 cases, 61.3% were primi-gravida while 38.7% were multi-gravida.

Table 3. Distribution of study cases as per Thyroid status

Thyroid Status	N	%
Normal	247	82.3%
Subclinical Hypothyroidism	35	11.7%
Overt Hypothyroidism	18	6.0%
Total	300	100.0%

Prevalence of subclinical and clinical hypothyroidism in present study was 11.7% and 6% respectively.

Table 4. Association of thyroid status with maternal complications

Maternal complication	Thyroid status		
	Normal	Subclinical hypothyroidism	Overt hypothyroidism
Spontaneous abortion	0.4%	5.7%	11.1%
Preeclampsia	6.1%	11.4%	27.8%
GDM	0.8%	0.0%	5.6%
PPH	5.3%	5.7%	11.1%

A significant association was observed between clinical and subclinical hypothyroidism with spontaneous abortion and development of pre-eclampsia. Also significantly higher prevalence of GDM was seen in clinical hypothyroidism cases, the difference was however non-significant.

Table 5. Association of thyroid status with Mode of Delivery

Mode of delivery	Thyroid status		
	Normal	Subclinical hypothyroidism	Overt hypothyroidism
Vaginal	77.7%	62.9%	44.4%
LSCS	22.3%	37.1%	55.6%

A significantly higher number of cases of clinical hypothyroidism (55.6%) and subclinical hypothyroidism (37.1%) underwent LSCS as compared to euthyroid cases (22.3%).

Table 6. Association of thyroid status with Neonatal complications

Neonatal complications	Thyroid status		
	Normal	Subclinical hypothyroidism	Overt hypothyroidism
Preterm	11.7%	22.9%	50.0%
IUGR	4.5%	8.6%	22.2%
LBW	23.9%	37.1%	61.1%
RDS	5.3%	11.4%	22.2%
Sepsis	2.4%	2.9%	5.6%
Hypoglycemia	1.2%	2.9%	0.0%
Hypothermia	0.4%	2.9%	0.0%
Death	0.8%	2.9%	5.6%

Overt hypothyroidism was significantly associated with neonatal complications like pre-term delivery, IUGR, low birth weight and respiratory distress syndrome. Prevalence of all these complications was also higher in cases of subclinical hypothyroidism as compared to euthyroid cases. Overall neonatal morbidity and mortality are seen in cases with overt and subclinical hypothyroidism as compared to euthyroid cases.

DISCUSSION

Present study is aimed to find the prevalence of clinical and subclinical hypothyroidism in pregnant women and its obstetric and perinatal complications. A total of 300 consecutive pregnant females, registered at our hospital and satisfying the eligibility criteria were included in the study after talking informed consent.

Demography - Mean age of the study cases was 22.32 years with 56% of the cases in between age of 21-25 years.

Krishnamma B et al. [9] in their study observed mean age of the study group as 23.9 years with over two third of the cases were between 21-30 years. Dhanwal DK et al. [4] in their study reported mean age of the females as 23.5 years with 40% females in the age range of 21-25 years. Meena et al. [8] in their study observed 51% cases in the age range of 20-25 years with mean age of 23.9 years.

Obstetric History - Out of total 300 cases studied, 61.3% were primi-gravida while 38.7% were multi-gravida.

Meena et al. [8] in their study observed 68% cases of primi-gravida while 32% cases were multi-gravida. Krishnamma B et al. [9] in their study observed half of the cases as primigravida and remaining half as multi-gravida. Dhanwal DK et al. [4] in their study reported 52% cases as primi-gravida while 48% cases as multi-gravida.

Prevalence of thyroid dysfunction -

Prevalence of subclinical hypothyroidism (SCH) as observed in present study was 11.7% (n=35). A total of 18 cases (6%) of overt hypothyroidism (OH) were observed in present study. (Table No. 3)

In a North Indian study by Dhanwal D et al. [3] 14.3% cases had either SCH or OH while Pavanaganga et al. [10] in their study observed the prevalence of hypothyroidism as 10.1%. Subclinical Hypothyroidism and Overt hypothyroidism were prevalent among 9.3% and 0.72% cases respectively.

Similarly Saraladevi R [5] in their study observed prevalence of SCH as 6.4% and that of OH as 2.8% (overall 9.2%).

Chunchaiah et al. [6] in their study observed the prevalence of

hypothyroidism as 10.12%, presenting mainly as subclinical hypothyroidism (7.37%).

Prevalence of hypothyroidism as observed in other studies were: Shah et al. [11] (9%), Ajmani et al. [7] (12%), Nambiar et al. [1] (4.8%) and Shau et al. [2] (11%).

Maternal Complications - In present study, Spontaneous abortion was noted in 11.1% and 5.7% cases of OH and SCH as compared to 0.4% in euthyroid cases. Pre-eclampsia was noted in 27.8% and 11.4% cases of OH and SCH as compared to 6.1% in cases with normal thyroid status. The association was statistically significant. Gestational diabetes was also seen in 5.6% cases with overt hypothyroidism as compared to 0.8% normal cases. Caesarean section was also required in more number of cases of SCH (37.1%) and overt hypothyroidism (55.6%) as compared to euthyroid females (22.3%).

In a study by Sahu MT et al. [2] overt hypothyroids were prone to have pregnancy-induced hypertension and spontaneous abortions as compared to control. Caesarean section rate for fetal distress was significantly higher among pregnant subclinical hypothyroid women.

Significantly higher prevalence of PIH, spontaneous abortions and LSCS was also noted in subclinical hypothyroid cases as compared to controls.

Ajmani et al. [7] observed adverse maternal effects in overt hypothyroidism as: preeclampsia (16.6 vs. 7.8 %) and placental abruption (16.6 vs. 0.8 %) and spontaneous abortion (16.6 vs. 2.39 %). Subclinical hypothyroidism was also associated with preeclampsia (22.3 vs. 7.8 %) and spontaneous abortion (5.5 vs. 2.39 %) as compared to the euthyroid patients.

Chunchaiah et al. [6] in their study observed pregnancy complications in 55.55% of thyroid dysfunctional group with preeclampsia being the most common complication. Pavanaganga et al. [10] in their study observed that 81.4% females with SCH developed complications with most common being Pre-eclampsia (21.8%) and GDM (6.4%).

Nambiar et al. [1] in their study also observed that hypothyroidism both overt and subclinical, was associated with higher rate of miscarriage.

Saraladevi R et al. [5] in their study also observed high prevalence Preeclampsia (14.3%) and spontaneous abortions (7.14%) with hypothyroidism.

Neonatal Complications - In present study, prevalence of pre-term delivery (OH: SCH: Euthyroid: 50% vs 22.9% vs 11.7%), IUGR (22.2% vs 8.6% vs 4.5%), low birth weight (61.1% vs 37.1% vs 23.9%) and Respiratory distress syndrome (22.2% vs 11.4% vs 5.3%) were observed to be significantly more prevalent in cases of Overt and Subclinical hypothyroidism as compared to euthyroid controls. No difference was observed among the study groups with respect to other neonatal complications like sepsis, hypoglycaemia and hypothermia. Neonatal death was observed in 0.8%, 2.9% and 5.6% cases of normal thyroid functions, SCH and Overt Hypothyroidism respectively.

Ajmani et al. [7] in their study observed adverse fetal outcomes in overt hypothyroidism including preterm birth (33.3 vs. 5.8%), low birth weight (50 vs. 12.11%), intrauterine growth retardation (25 vs. 4.9%), and fetal death (16.6 vs. 1.7%) as compared to the euthyroid women. Adverse fetal outcomes in subclinical hypothyroidism included preterm delivery (11.2 vs. 5.8%), low birth weight (25 vs. 12.11 %), and intrauterine growth retardation (8.4 vs. 4.9 %) as compared to the euthyroid women.

Sahu MT et al. [2] in their study observed that hypothyroids both subclinical and overt, were prone to have intrauterine growth restriction and intrauterine demise as compared to control. Pavanaganga et al. [10] also observed higher incidence of preterm labor (7.1%) and IUGR (7.7%) in SCH cases as compared to euthyroid women. Saraladevi R et al. [5] in their study also observed high prevalence LBW (10.7%), IUGR (6.25%) and still births (1.56%) among OH cases.

The present study thus observed a high prevalence of thyroid dysfunction among pregnant females. Hypothyroidism, both

subclinical and overt is associated with increased risk of pregnancy related complications such as spontaneous abortion (SCH only) and preeclampsia. Fetal complications like low birth weight, preterm delivery, intra uterine growth restriction and fetal demise were also more common in both conditions. The severity of both fetal and maternal complications were observed to increase with severity of thyroid dysfunction i.e. from subclinical to overt hypothyroidism.

CONCLUSION

Present study showed a high incidence of subclinical and clinical hypothyroidism in pregnant females. Hypothyroid status was associated adverse outcome both in smothers and newborn. The severity of both fetal and maternal complications were observed to increase with severity of thyroid dysfunction i.e. from subclinical to overt hypothyroidism.

Due to the immense impact that the maternal thyroid disorder has on maternal and fetal outcome, prompt identification of thyroid disorders and timely initiation of treatment is essential. Thus, universal screening of pregnant women for thyroid disorder should be considered especially in a country like India where there is a high prevalence of undiagnosed thyroid disorder.

Apart from universal screening, we also recommend further studies to compare outcome between euthyroid controls and hypothyroid cases where thyroxine supplementation was given and euthyroid state has been achieved.

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