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A Clinical Study on Thyroid Dysfunction in Pregnancy and its Effect on the Fetomaternal Outcome

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Abstract: ***Aim: The study was conducted to determine the occurrence of thyroid dysfunction in pregnancy and its effects on the fetomaternal outcome. Materials & Methods: This was a hospital based prospective study conducted in the department of obstetrics & gynecology, TMMCRC, MBD,U.P, India , over a period of 1 year (Jan 2013 to Jan 2014). Results: 1000 Pregnant women were screened for thyroid dysfunction , 60 had abnormal TFT (Incidence 6%) ,out of which 2.5 % had overt hypothyroidism , 2.0 % had SCH ,1.0 % had overt hyperthyroidism and 0.5 % had sub-clinical hyperthyroidism . Incidence of hypothyroidism was 4.5 % and that of hyperfunctioning of the thyroid gland was 1.5%. Maternal complication included abortion (4.5%), pre-eclampsia (7.8%), abruption (2.3%), preterm labour (2.2%), PPH (1.6%) puerperal sepsis (1.3). Neonatal complications observed were seen in 14.5 % pregnancy which included -preterm birth (2.0%), LBW (2.4%), IUGR (1.8%), stillbirth (0.9%) , 0 , low APGAR score (<7) (2.1%) , NICU admission (2.8%) , neonatal sepsis (1.5%) , neonatal death (1.0 %). Conclusion: Thyroid dysfunction in pregnancy ,though has a low incidence , but is associated with adverse maternal and fetal implications . Thus thyroid screening shoud be done in antenatal period to improve fetomaternatal outcome.***

Keywords: thyroid dysfunction, hypothyroidism, hyperthyroidism, fetomaternal outcome, overt hypothyroidism, subclinical hypothyroidism

1. Introduction

Thyroid dysfunction in pregnancy is the commonest disorder encountered among the antenatal women. Because of the very non-specific symptoms and the physioloical hypermetabolic state of normal pregnancy, thyroid dysfunction in pregnancy may be overlooked and undiagnosed. Thyroid is a very important part of the normal functioning of the body and thyroid dysfunction, if present in pregnancy, has myriad adverse impacts on both the mother and her fetus. Autoimmene thyroid disease has very high risk of resulting in irreversible neurological deficit in the newborn and Grave's Disease is known to cause recurrent pregnancy loss as well as fetal thyroid dysfunction.

2. Aims & Objectives of the Study

This study was conducted to evaluate the prevalence of thyroid dysfunction in pregnancy and its consequent fetomaternal outcome. Our special objective was to estimente the prevalence of thyroid dysfunction in pregnancy and to evaluate the obstetric and perinatal outcomes in such pregnancies which will give us an idea about the healtheare burden of thyroid disorders in pregnancy in India.

3. Materials & Methods

This study was conducted in the department of Obstetrics & Gynaecology in Teerthanker Mahaveer Medical College & Research Centre (TMMCRC) , Moradabad , U.P, India over a period of 1 year (January 2013 to January 2014). This was a hospital based prospective study done on 1000 antenatal patients who fulfilled the inclusion criteria irrespective of their period of gestation who were selected by random sampling (singleton pregnancy).

Inclusion Criteria

a) Multiple gestation
b) Known history of thyroid dysfunction .
c) Gestational trophoblastic diseases.
d) Women who are taking medications for thyroid diseases.
e) Other medical disorders of pregnancy eg ;-
   - Parathyroid or Pituitary disorders .
   - Diabetes mellitus
   - Hypertension
f) Bad obstetric History (of known and established etiology)

1000 pregnant women with singleton pregnancy, irrespective of the period of gestation were enrolled in this study by random sampling method from those patients who attended the OPD, labour room & emergency room of the department of Obstetrics & Gynecology, TMMCRC, Moradabad, U.P, India, over one year study period (January 2013 to January 2014), after fulfilling the inclusion & enclusion criteria & taking informed written consent from and approval of the institutioned ethical committee. After detailed history and thorough general physical examination, the patients were subjected to systemic examination, obstetric examination. Routine investigation of ABO-Rh typing, Complete Blood Count (CBC), Random Blood Sugar, Urine routine and microscopy , Obstetric ultrasound and blood sample for serum TSH was sent. Patients with abnormal TSH values were subjected to Thyroid Function test (TFT) with free T3 and free T4 values. These patients

were followed throughout their pregnancy, labour, delivery and puerperium and maternal and neonatal outcomes were noted . Maternal outcome variables studied were mainly- pre-eclampsia, abruptioo placentae, preterm labour and delivery, abortions, PPH, puerperal pyrexia, sepsis, hospital stay. Fetal outcome variables studied were- preterm birth, low birth weight (LBW), IUGR, IUFD, neonatal sepais, low APGAR score at 1 min. & 5 minutes , NICU admission and neonatal death.

4. Results & Observation

In this study we enrolled 1000 (one thousand) antenatal women. Our observaton was that prevalence thyroid dysfunction in pregnancy was 6.0%. Out of this, 0.7 % patients had sub clinical hypothyroidism (SCH). Overt hypothroidism (OH) was seen in 2.5%, sub clinical Hyperthyroidism in 1.3% & the incidence of overt hyperthyroidism was 2% .

Table 1: Distribution of Thyroid Dysfunction

Thyroid Dysfunction	No. of Patients	Percentage (%)
Overt Hypothyroidism (OH)	25	2.5 %
Subclinical Hypothyroidism(SCH)	20	2.0 %
Overt Hyperethyroidism	10	1.0 %
Subclinical Hyperthyroidism	05	0.5 %
Total	60	

Table 2: Age Distribution

Age (in year)	*No. Of Patients*	*Percentage (%)*
<25 yr.	636	63.6 %
>25 yr.	264	26.4 %
Total	1000	100.0 %

Table 3: Parity-wise distribution of the patients

Parity	*No. of Patients*	*Percentage (%)*
P0	220	22.0 %
P1	260	26.0 %
P2	540	54.0 %
P >3	180	18.0 %
Total	1000	100.0 %

Table 4: Diagnosis

	Diagnosis	*No. of patients*	*Percentage (%)*
Normal		940	95.0 %
Overt	Hypothyroidism	25	2.5 %
Subcinical	Hypothyroidism	20	2.0 %
Overt	Hyperthyroidism	10	1.0 %
Subclinical	Hyperthyroidism	05	0.5 %
Total		1000	100.0 %
	Thyroid Dysfunction	60	5.0 %
	Normal (Euthyroid)	940	95.0 %

Table 5: Maternal Complications

Maternal Complication	*No. Of patients*	*Percentage (%)*
None	803	80.3 %
Abortion	45	4.5 %
Abruptio Placentae	23	2.3%
Pre- eclampsia	78	7.8 %
Preterm Labour	22	2.2 %
P. P .H	16	1.6 %
puerperal sepsis	13	1.3 %
Total	1000	100.0 %

Adverse maternal outcomes were observed in 197 patients (19.7 %) and there were no complications in the rest 803 patients. The most common complications encountered were – abortion (4.5%) , pre-eclampsia (7.8 %) , abruptio placentae (2.3%), preterm labour (2.2%), PPH (1.6%) and puerperal sepsis (1.3%) .

Among the neonatal outcomes , 85.5 % had none , 14.5 % had adverse fetal outcomes - preterm births (2.0%), LBW (2.4 %) , IUGR (1.8%), still bith (0.9%) , neonatal sepsis (1.5 %) , neonatal death (1.0 %) , NICU admission (2.8%) , low APGMR score (<7 at 5 minutes) (2.1%).

Table 6: Neonatal Outcome

Neonatal complication	*No. Of patients*	*Percentage (%)*
None	855	85.5 %
Preterm birth	20	2.0 %
Low birth weight (LBW)	24	2.4 %
Intra-uterine growth retardation (IUGR)	18	1.8 % 14.5 %
Still birth	09	0.9 %
Low APGAR Score (<7)	21	2.1 %
NICU admission	28	2.8 %
Neonatal sepsis	15	1.5 %
Neontal death	10	1.0 %

Table 7: Maternal Complications and thyroid dysfunction Diagnosis

Maternal Complication					
Normal	Overt Hypothyroidism	Sub clinical hypothyroidism	Overt Hypo-Thyroidism	Subclinical Hyperthroidism	Total
None					803
Abortion	6	23	12	3	45
Abruptio placentae	4	2	3	10	23
Pre-edampsia	7	25	3	29	78
Preterem	4	14	2	1	22
Post parteem hemorrhage(PPH)	7	6	1	1	16
Puerperal sepsis	8	2	1	1	13
Total					1000

5. Discussion

This study conducted on 1000 patients in Teerthanker Mahaveer Medical College & Research Centre, Moradabad ,U.P, INDIA where these antenatal patients were screened for thyroid dysfunction in this prospective , hospital based , observational study. We had recuruited women irrespective of their gestalional age. The prevaleuce of thyroid disorder in pregnancy was observed to be 6% which was not causistent with that reported by Sahu M et al (1) at 12.7 % . Subclinical hypothyroidism (SCH) in our study was found in 2.0 % of the patients , as against 6.4 % in Sahu M et al (1) ., but was comparable to that stated by Casey BM et al (2) at 2.3 % . Overt hypothyroidism was 2.5 % in our study and subclinical hyperthyroidism was 0.5 % but that of overt hypothyroidism by Sahu M et al was at . Overt hypothyroidism.

The prevalence of subclinical & overt hyperthyroidism was 0.5 % & 0.4 % respectively in a study by Stagnaro Green (4) ., same in a study by Tuija Mannisto et al (3) were 3.5 % & 1.3 % respectively . In a study by Leung et al the incidence of complications were as follows- pre-eclampsia (15%) , Preterm labour (9%) Low Birth Weight (9%) in cases of subclinical hypothyroidism, which is higher than those found in our study.

Sahu MT et al (1), reported PE (9.8%), Preterm Delivery (10.3%), IUGR (2.4%), Still birth (2.5%) in sunclinical hypothyroidism. In our study, the incidence of overt hypothyroidism was 2.5%. Maternal complications seen were abortions (23), abruptio placentae (2), PreEclampsia (25), Pre Term Labour (14), PPH (6), Puerperal sepsis (2) . Sahu M et al (1) reported PE (20.7%), PTD (4.7%), IUGR (13.8%) ,Still birth (2.9 %) in cases of overt hypothyroidism . Leung et al (5), reported PE (22%), LBW (22 %), Still birth (4%) in overt hypothyroidism. Abolovich et al (2) reported abruption (19%), LBW (6%), Still birth (3 %) in overt hypothyroidism . In our study , the incidence of subclinical hyperthyroidism was 0.5 % out of which maternal complications encountered consisted of - abortion (4) , preeclampsia (14) , preterm birth (1), PPH (1), puerperal sepsis (1). The incidence of overt hyperthyroidism was 1.0 % in which the maternal complication encountered were abortion (1), PE (14), abruption (4), Preterm Birth (1), PPH (1), puerperal sepsis (1). Robert Negro et al (6), reported hyperthyroidism in low risk group with complications eg. Gestational hypertension (16.7%) , pre eclampsia (0%), preterm births (16.7%), abortion (14.3%), still birth (0%). Tuija Mannisto et al (3), reported subclinical hyperthyroidism was associated with complications eg . preeclampsia (4.7%) , low birth weight (2.3%) etc. Miller et al (7) reported preeclampsia (3.5%), abruption (1.0%), preterm births (13.2%) in subclinical hyperthyroidism. Kriplani A et al (8) reported no perinatal deaths and preeclampsia (22%), preterm births (25%) in their study on hypothyroidism in pregnancy. The incidence of complications varied in different studies, but all these studies reinforced the fact that pregnancy with thyroid dysfunctions had adverse maternal and perinatal implications.

There are many limitations in our study, the greatest being the sample size of only 1000 patients. Study on a much larger sample would enable us to understand the exact picture and maginitude of the problem. Also, in our study, we didnot screen the patients for TPO or thyroid antibodies, which would give a much clearer and better understanding of the same.

6. Conclusion

In our study of 1000 antenatal women, 60 patients had thyroid dysfunction (incidence 0.6%) which though low, is of utmost importance as they are associated with a multitude of adverse bearings on both the mother and her fetus. Since we observed high incidence of fetomaternal adverse outcomes and complications in those pregnancies which are complicated with thyroid dysfunction , therefore, it is recomended that it should be made mandatory to do thyroid function screening in antental women universally as a routine procedure and suggest a decreased threohold for screening & detection of thyroid dysfunction among indian pregnant women attending routine antenatal clinic. Increased awareness of associated maternal and fetal complications which may result from thyroid dysfunction if remained uncorrected during pregnancy can ensure a healthy mother giving birth to a healthy baby in every single pregnancy.

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