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AN EPIDEMIOLOGICAL STUDY ON THE PREVALENCE OF HYPOTHYROIDISM IN PREGNANT WOMEN AND ITS OUTCOME

Gynaecology

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ABSTRACT

Thyroid disorders are the most common endocrine disorders affecting women of reproductive age group Hypothyroidism is common in pregnancy with an estimated prevalence of 2-3% Maternal hypothyroidism leads to many maternal and perinatal complications like miscarriage, gestational diabetes mellitus, pre-eclampsia, pre-term labor, placental abruption, and fetal death. **AIMS AND OBJECTIVE:** To find out the effect of hypothyroidism on the course of pregnancy, to study the neonatal outcome, to know the prevalence of subclinical and overt hypothyroidism in pregnant women. **MATERIALS AND METHODS:** This prospective study was conducted in the department of Obstetrics and Gynecology, Nalanda medical college and hospital, Patna. All pregnant women attending the obstetric unit during this period were included in the study after informed consent 10 ml of blood sample of pregnant women was drawn at the first visit in the first trimester; then it was centrifuged and stored at -70 degree Celsius until assays, which were done after delivery, TFT was assessed by quantitative analysis of serum TSH and FT4 (ELISA). The pregnancy outcome variables like miscarriages, preterm deliveries, IUGR, preeclampsia, anemia, low birth weight, intrauterine fetal demise, antepartum hemorrhage, stillbirth, postpartum hemorrhage, birth asphyxia were studied. The neonatal outcome was also studied. The statistical analysis was done using the odds ratio. P-value <0.05 was considered significant. **RESULTS:** Out of the 250 pregnant women 25 had hypothyroidism (9.5%). The prevalence of subclinical hypothyroidism was more as compared to the overtone (Table 2). Abortions were seen in 12.5% of subclinical and 11.1% of overt hypothyroid women. PIH and abruptions were significantly higher in subclinical cases (P<0.05) while in the overt group both complications were higher as compared to the normal women but the p-value was not significant for abruption. More of the hypothyroid women had preterm delivery (37.5% in subclinical and 44.4% in the overt group), Regarding neonatal complications, IUD and Early neonatal deaths were significantly higher in overt hypothyroidism (P<0.01) Hypothyroid women had more low birth weight babies (31.25% in subclinical and 35.5% in overt) and IUGR babies (18.70% in subclinical and 22.21% in overt), **CONCLUSION:** The present study shows that, though the occurrence of hypothyroidism in pregnancy is less yet it causes many maternal and neonatal complications therefore universal screening of thyroid disorder should be done in pregnancy.

KEYWORDS

Introduction:-

In gravidity, hypothyroidism is the most frequent thyroid disorders. The prevalence of hypothyroidism during gravidity varies from 2.5% from the west to 11% from India [1,2].

Untreated or inadequately treated and subclinical hypothyroidism all are associated with increased risk of miscarriage, anemia, fetal growth restriction, perinatal and neonatal morbidity and mortality, placental abruption, preeclampsia, preterm delivery, small head circumference, low birth weight impaired neuropsychological development [3].

Pregnancy can be viewed as a state in which a combination of events concurs to modify the thyroidal economy. There is a change in the level of thyroxine-binding globulin, total thyroid- hormone level, and change in the level of thyroid-stimulating hormone (TSH) during normal pregnancy [4].

Hypothyroidism can be overt or subclinical. Overt hypothyroidism is characterized by elevated serum levels of TSH (TSH > 10mIU/L) and subnormal thyroxin (FT4) levels, whereas subclinical hypothyroidism is characterized by elevated levels of TSH usually beyond the upper reference limit but normal FT4 levels.

Before 12-14 weeks of gestation, Fetus has to exclusively depend on the maternal system for thyroid hormone, thus maternal hypothyroidism at this stage may lead to a neurological deficit, serious cognitive defect, low intelligence quotient, and psychomotor development impairment.[5,6,7] For neurological development Tri-iodothyronine activates enzymes required hence maternal hypothyroidism cannot be left untreated even beyond 1st trimester.[8]Data on the prevalence of Thyroid Dysfunction during pregnancy is lacking in the Asian- Indian population. Hence, this study was planned to establish the prevalence of Thyroid Dysfunction and to evaluate maternal outcome in patients with Thyroid Dysfunction

Aim and Objectives:-

1. To know the prevalence of subclinical and overt hypothyroidism in pregnant women.
2. To find out the effect of hypothyroidism on the course of pregnancy.
3. To study the neonatal outcome.

Materials and Methods:- The present Cross-Sectional study was conducted in tertiary care center NMCH Patna in the department of Obstetrics and Gynecology, from September 2019 to September 2020. All pregnant women attending the obstetric unit during this period were included in the study after informed consent and after taking permission from the institutional ethical committee.

Inclusion criteria:-

Pregnant women age 20-40 years and newly diagnosed as hypothyroid, attending the ANC clinic, the women who gave consent

Exclusion Criteria

1. Antenatal women with multifetal gestation.
2. Pregnant women with a chronic disorder like diabetes mellitus and hypertension. H/O Cardiac disease, H/O Bronchial asthma, H/O Hematological disorder, Diabetic, Liver disorders
3. Pregnant women of previous bad obstetric history with a known cause.
4. Those who underwent surgery for thyroid.
5. Those who did not give consent.

Method

Information regarding demographic data, personal characteristics, menstrual cycle, obstetric, family, and history were noted. Emphasis was given on risk factors. A thorough general and physical examination concerning temperature, pulse, BP, and respiratory rate followed by an examination of the CNS, CVS, respiratory system, and local thyroid examination was done. Per abdomen and vaginal examinations were done and pregnancy was confirmed. All the routine investigations and thyroid profile estimation were carried out.

Thyroid function test (TFT) were assessed by quantitative analysis of serum TSH and FT4 (ELISA). For TFT 10 ml of blood sample of pregnant women was drawn at the first visit in the first trimester; then it was centrifuged and stored in aliquots at -70 degree Celsius until assays, which were done after delivery,

Depending upon the fasting TSH and FT4 values they were grouped as subclinical/overt hypothyroidism.

- Overt hypothyroidism was defined as an elevated TSH (>2.5 IU/L) in conjunction with a decreased FT4 concentration or women with TSH levels of 10.0mIU/L or above.
- Subclinical hypothyroidism was defined as serum TSH levels between 2.5 and 10mIU/L with a normal FT4 concentration.
- Euthyroid patients were defined as normal serum TSH and FT4 levels.

Thyroxine was given in both types. Every 8 weeks TSH level was estimated and the dose of the drug adjusted. In the end, the obstetric outcome and perinatal outcome of the pregnancy was noted.

Statistical analysis

The data obtained were analyzed with SPSS version 17.0. The association between two qualitative data was analyzed by chi-square test and P-value <0.05 was considered significant

RESULT

The present study was conducted in tertiary care center NMCH Patna in the department of Obstetrics and Gynecology, from September 2019 to September 2020. A total of 250 pregnant women who attended the ANC clinic and newly diagnosed with hypothyroidism was studied.

Table 1:- Socio-Demographic Profile

AGE	<20 Years	100 (40 %)
	21-30 Years	140 (56 %)
	31-40 Years	10 (4 %)
SES	Upper Class	10 (4 %)
	Upper Middle Class	30 (12 %)
	Middle Class	85 (34%)
	Lower Middle Class	115 (46 %)
	Lower	10 (4 %)
Residual Area	Urban	155 (62 %)
	Rural	95(38 %)
Booking status	Booked	170 (68%)
	Unbooked	80 (32 %)
Education Status	No formal	20 (8 %)
	Primary	155 (62%)
	Higher	75 (30 %)

As seen in the above table,

1. most of the study population belongs to the age group 20-30 years (56 %) followed by less than20 years of age (40%) and age group 31-40 years (10%).
2. most of the study population belongs to lower middle SES (46%) followed by middle SES (34%) and upper-middle SES (12%).
3. most of the study population belongs to Urban (62%) followed by Rural (38%).
4. most of the study population booked (68%) followed by un-booked (32%).
5. most of the study population have primary education (62%) followed by higher education (30%) and no formal education (8%)

Table 2: The distribution of patients based on the parity index.

Parity	Frequency	Percent
Primigravida	90	36 %
Multigravida with NVD	125	50%
Multi with pro LSCS	35	14 %
Total	250	100 %

As seen in the above table, most of the study population belongs to Multigravida with NVD (50%) (followed by primigravida (36%) and Multi with pro LSCS (14%)

Table 3: Distribution of patients based on serum TSH level at the time of diagnosis:-

Serum TSH level at the time of diagnosis	Frequency	Percent
Overt	50	20%
Subclinical	200	80%
Total	250	100%

As seen in the above table, most of the study population belongs to Subclinical hypothyroid (80%) followed by overt (20%) hypothyroidism

Table 4: Distribution of study group as per gestational age at the time of diagnosis.

Time of diagnosis	Overt hypothyroidism		Subclinical hypothyroidism		Total	
	number	%	number	%	number	%
1st trimester	1	2 %	1	0.5	2	0.8 %
2nd trimester	25	50%	169	84.5 %	194	77.6 %
3rd trimester	24	48%	30	15 %	54	21.6 %
TOTAL	50	100%	200	100%	250	100%
$X^2 = 27.427$ p= 0.00001						

There is a significant association between the time of diagnosis and serum TSH level (P=0.00001) As per Table, 78% of patients were diagnosed during the second trimester and 22% were diagnosed during the third trimester. Most cases were diagnosed in 2nd trimester because most patients in our ANC OPD came for registration in the second trimester followed by the third trimester.

Table 5:- Distribution of study group based on gestational age at the time of delivery.

Gestational age at delivery	Overt hypothyroidism		Subclinical hypothyroidism		Total	
	number	%	number	%	number	%
<37 weeks	15	30%	85	42.5 %	100	40%
>37 weeks	35	70%	115	57.5 %	150	60%
TOTAL	50	100%	200	100%	250	100%
X^2= 2.1094 p=0.07						

As shown in Table, 150 patients were delivered at term among them 35 were overt and 115 were subclinical hypothyroid, while 100 had preterm delivery. Among them 15 were overt and 85 were subclinical but none of the patients was delivered post-term.

Table 6:- Distribution of study group as per birth weight.

Birth Weight	Overt hypothyroidism		Subclinical hypothyroidism		Total	
LBW	Number	%	Number	%	Number	%
	28	56%	77	38.5%	105	42%
Normal	22	44%	123	61.5%	145	58%
Total	50	100%	200	100%	250	100%

As shown in the above table 105(42%) women delivered Low Birth Weight baby in which 28 pregnant ladies had overt hypothyroidism and 77 had subclinical hypothyroidism.

Table 7:- Distribution of patients as per indication for NICU admissions.

Indication for NICU admission	Frequency	Percent
Preterm	29	29%
Blood glucose monitoring	24	24%
IUGR	24	24%
Thick MSAF	11	11%
Hyperbilirubinemia	6	6%
Respiratory distress	6	6%
Total	100	100%

As shown in the table among 250 cases of hypothyroidism 100 babies ie. (40 %) got admitted to NICU after birth, in which 29% were delivered preterm followed by IUGR 24 (24%) and 24 (24%) babies were admitted for blood glucose monitoring

Table 8:-Treatment

Treatment	Frequency
Adequate treated	120 (48 %)
Inadequate treated	130 (52 %)
Total	250 (100 %)

For those who have been diagnosed before 10 weeks and on treatment, if their repeat TSH values become normal they were grouped under an

adequately treated group. Those who have been diagnosed after 10 weeks of gestation and treated those who fail to reach normal levels of TSH despite aggressive treatment were classified as inadequately treated. In our study group, 48% of patients are adequately treated and 52% of the patients are inadequately treated.

Discussion

The present study was done in a tertiary care center, Patna. The study was performed to gain insight into the impacts of Subclinical hypothyroid and overt hypothyroidism on maternal and perinatal outcomes.

In the present study, 250 newly diagnosed cases were studied in which 140 (56%) cases belongs to 21-30 years ago while in a study conducted by **Sharma et al**[9] 32 cases (64%) belongs to the age group of 18- 24 years followed by 18 (36%) belongs to 25-30 years age group.

Most of our population belongs to the low socioeconomic status which is similar to **Sharma Et al**[9] that is Most of their study population belongs to low socioeconomic status who conceive in the early '20s.In our study In Table 2 total numbers of primigravidae patients are 90 and multigravida are 125 which is comparable to **Dhara et al**[10] and **Jayanti et al.**[11] . Our study done in tertiary health center Patna where most population belongs to low socioeconomic class, these populations had multiple pregnancies, so the majority of the present study cases are multigravida. There is a significant association between time of diagnosis and serum TSH level (P=0.00001) As per Table 4, 78% of patients were diagnosed during the second trimester and 22% were diagnosed during the third trimester. Most cases were diagnosed in 2nd trimester because most patients in our ANC OPD came for registration in the second trimester followed by the third trimester. In our study sub, clinical hypothyroidism (80%) cases were more than overt hypothyroidism (20%) which is similar to **Abalovich et al**[12]. As shown in table 5 In the present study preterm delivery rate was 40% which is almost similar to **Sharma D et al[9]** which is much higher as compared to **Patwari M et al**[13] and **Abalovich et al**[12] where the preterm delivery rate was 19.4% and 20%respectively. As shown in the above table 105(42%) women delivered Low Birth Weight baby which is similar to **Sharma D et al**[9] comparable to Dhara, Jayanti, and Nidhi et al were low birth weight were seen in 13.26%, 24%and 29.73% cases respectively. As shown in table 7 among 250 cases of hypothyroidism 100 babies ie. (40 %) got admitted to NICU after birth which is comparable to **Jayanti et al**[11] where it was 62.2% but higher than **Nidhi et al**[14] in which 29% were delivered preterm followed by IUGR 24 (24%) and 24 (24%) babies were admitted for blood glucose monitoring

Recommendation

Given the high prevalence of thyroid dysfunctions in Indian gravid woman and its sodality with different adverse gravidity cognate complications, we recommend routine screening for thyroid dysfunctions in gravidity.

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