Estimation of Hypothyroidism among the Antenatal Women choose to deliver at a Government Tertiary Care Health Facility

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Abstract

Introduction: Hypothyroidism in pregnancy is the potential for maternal and fetal adverse outcomes can be immense. Hypothyroidism is widely prevalent in pregnant women. Rate of detection especially in a country like India, has not kept pace with the magnitude of the problem. Timely detection and treatment of the hypothyroidism could reduce the burden of adverse fetal and maternal outcomes. In order to understand the degree to which hypothyroidism may be prevented by means of health promotion. With this background the present study conducted.

Objectives: To estimate the proportion of hypothyroidism among the antenatal women choose to deliver at a tertiary care government health facility. To describe the distribution of selected factors associated with the hypothyroidism among antenatal women.

Methodology: the study is Cross sectional and study conducted between Aug 2019 to Jan 2020 at Government tertiary care hospital. Total 240 participant mothers were interviewed. Informed consent taken from the mothers. The analysis done using SPSS software.

Results: The prevalence of hypothyroidism was 16.7%. When compared with patients with euthyroid, preeclampsia and intrauterine growth restriction were the most significant complications observed in patients with hypothyroidism, with the incidence of 33.1% versus 7.2% and 16.4% versus 5.8%, respectively. Incidence of cesarean section was documented to be high in hypothyroidism (31.1% vs. 22.9%) and 8.2% of those were performed to avoid fetal distress. Living in joint family (p= .05) and early reporting for first ANC check-up (p= .02) was associated with significant higher odds of hypothyroidism.

Discussion: Pregnancy is a stressful condition to the maternal thyroid gland, due to increase in thyroxin binding globulin, increased demand for iodine and thyroid stimulation by HCG. Fetus depends in the first 12 weeks on the mother for thyroxine and needs thyroxin for brain development, growth and lung maturation. In this study found that the pregnant mother was suffering from hypothyroidism; 40 out of 240.

Conclusions: Prevalence of hypothyroidism was found to be high in our study and was associated with adverse pregnancy outcomes; hence, antenatal thyroid screening should be judiciously offered. Routine testing with serum TSH is a sufficient and cost-effective screening tool.

Key Words: Hypothyroidism, Hypothyroidism in pregnancy, preeclampsia, preterm labor, IUGR

Introduction

Thyroid physiology plays a major role in pregnancy, and thyroid disorders constitute one of the most common endocrine disorders in pregnancy.[1] Pregnancy is associated with significant and reversible changes in thyroid function. There is an increase in thyroxine-binding globulin (TBG) because of elevated oestrogen and decrease in the level of thyroid- stimulating hormone (TSH) with an increase in human chorionic gonadotropin concentration.[3,4] Placenta produces the enzyme deiodinase, which increases the peripheral metabolism of thyroid hormones and regulates the transplacental transport of thyroid hormone and iodide.[5,6] In essence, pregnancy is a stress for the thyroid, resulting in hypothyroidism in women. Evaluation of thyroid disease in pregnancy is important for gestational maternal health, obstetric outcome, and subsequent development of the child. The most frequent thyroid disorder in pregnancy is maternal hypothyroidism. Therefore maternal hypothyroidism in the pregnancy causes decreased availability of thyroid hormone and It is associated with significantly higher frequency of obstetric complications such as with fetal loss, placental abruptions, preeclampsia, preterm delivery, low birth weight and reduced intellectual function in the offspring.[1] There is a wide geographic variation in prevalence of hypothyroidism during pregnancy. It varies from 2.5% from the west to 11% from India [2-10]. Prevalence of hypothyroidism was found to

be more in Asian countries compared with the west. Before the onset of fetal thyroid function, that occurs about 12 weeks of gestation; the fetus is dependent on the placental transfer of maternal thyroid hormone for normal development.[11], during the initial phase of normal brain development and consequently is associated with increased rates of abortion and stillbirth, impaired neuropsychological development of fetus and congenital malformation and increase in perinatal mortality. Hypothyroidism remains untreated is preeclampsia, premature labor, fetal and perinatal loss. Sub-clinical hyperthyroidism (suppressed thyroid-stimulating hormone [TSH] alone) is seen in around 1.7% of pregnancies. Thus, prompt identification of Hypothyroidism and timely initiation of therapy in pregnancy is essential. In order to understand the degree to which hypothyroidism may be prevented by means of health promotion. With this background the present study conducted.

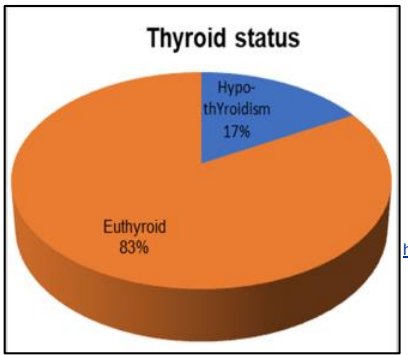
Objectives:

(1) To estimate the proportion of hypothyroidism among the antenatal women choose to deliver at a tertiary care government health facility.
(2) To describe the distribution of selected factors associated with the hypothyroidism among antenatal women.

Methodology:
This is a Cross sectional study conducted on 240 pregnant women who deliver at a tertiary care government health facility in western Maharashtra, over a period of six month from August 19 to January 2020. All these pregnant women were included in the study. Record based data collected and then interviewed through Medico-social based pretested questionnaire of delivered women in said study period. The Informed consent was taken from all participates. Pregnancy outcomes were noted in terms of abortion, anemia, pregnancy-induced hypertension, IUGR, preterm labor and incidence of lower segment cesarean section (LSCS) for fetal distress.

Statistical Analysis
Statistical testing was conducted with the Statistical Package for the Social Science System (SPSS). Continuous variables are presented as mean ± SD, and categorical variables are presented as absolute numbers and percentage. Nominal categorical data between the groups were compared using c2 goodness-to-fit test. The level was set as p value less than 0.05.

Results:
40 (16.7%) mothers with the hypothyroidism and 200 (83.3%) were euthyroid among the 240 mothers interviewed. All of them were on a varying dose of thyroxin and were maintaining euthyroid status.



Demographic baseline parameters of Study Population
As shown in Table 01, most of the cases were primigravida; however, there was no statistically significant association between gravida and thyroid dysfunction. In our study, mean maternal age was 22.42 ± 3.07 years for patients with euthyroid and 24.15 ± 3.80 years for patients with hypothyroidism. Mean BMI was 20.82 ± 2.15 for patients with euthyroid, and 23.16 ± 2.49 for patients with hypothyroidism.

Table 01: Demographic feature of study population

Gravida	Number of cases N=240	Euthyroid N=200(%)	Hypothyroid N=40(%)
Gravida- I	110	89 (80.9%)	21 (19.1%)
Gravida- II	97	84 (86.6%)	13 (13.4%)
Gravida ≥III	43	37 (86.1%)	06 (13.9%)
Mean age	23.29 ± 3.46	22. 42 ± 3.07	24.15 ± 3.80
Mean BMI	21.99 ± 2.32	20.82 ± 2.15	23.16 ± 2.49

Table 02 shows the occurrence of maternal complications in different groups of patients. When compared with euthyroid cases, hypothyroidism was significantly associated with preeclampsia (33.1% vs. 7.2%; p = 0.001) and IUGR (16.4% vs. 5.8%; p = 0.008). No significant increase in miscarriage (3.1% vs. 6.2%), anemia (8.9% vs. 9.9%), gestational diabetes (5.1% vs. 6.7%), preterm labor (4.3% vs. 3.2%), and still birth (0.5% vs. 0%) was noted in patients with hypothyroidism.

Table 02: Pregnancy complications in different group

Pregnancy complications	Euthyroid N= 200 (%)	Hypothyroid N = 40 (%)	P value
Miscarriage	06 (3.1%)	02 (6.2%)	.291
Anemia	18 (8.9%)	04 (9.9%)	.798
Preeclampsia	14 (7.2%)	11 (33.1%)	.001
Preterm Labor	08 (4.3%)	02 (3.2%)	.712
IUGR	12 (5.8%)	06 (16.4%)	.008
GDM	10 (5.1%)	03 (6.7%)	.631
Still birth	01 (0.5%)	00 (0%)	.652

Table 03 shows the route of delivery in different groups. Of the 200 patients with euthyroid, 143 (71.6%) patients had a vaginal delivery [70.1% normal vaginal delivery (NVD); 1.5% instrumental delivery], and 46 (22.9%) patients had a cesarean section. Of the 40 patients in the hypothyroid group, 24 (61.7%) patients had a vaginal delivery (57.1% NVD; 3.6% instrumental delivery), and 12 (31.1%) patients had a cesarean section. NVD was significantly low in the hypothyroid group (57.1% vs. 70.1 %; p = 0.025). The rate of cesarean section was high in cases with hypothyroidism when compared with controls with euthyroid (31.1% vs. 22.9%, p = 0.042). Among

the various indications of cesarean section, cesarean section for fetal distress was significantly high in hypothyroid cases (8.2% vs. 5.4%, p = 0.001).

Table 03: Mode of delivery in different groups

Mode of delivery	Euthyroid N= 200 (%)	Hypothyroid N= 40 (%)	P value
NVD	140 (70.1%)	23 (57.1%)	.025
Instrumental delivery	03 (1.5%)	01 (3.6%)	.317
LSCS	46 (22.9%)	12 (31.1%)	.042
LSCS for fetal distress	11 (5.4)	04 (8.2%)	.001

Table 04 denoting that living in joint family (P=0.05) and early reporting for first ANC check-up (P=0.02) was associated with significant higher odds of hypothyroidism.

Table 04 Social baseline parameter

PARAMETER		FREQUENCY	PERCENT
Sex of Newborn	Female	114	47.70%
	Male	125	52.30%
Living Status	Rural	62	28.05%
	Semi-urban	28	12.67%
	Urban	108	48.87%
	Urban slums	23	10.41%
Type of family	Joint Family	147	66.52%
	Nuclear family	74	33.48%
Religion	Buddhism	7	3.17%
	Christianity	3	1.36%
	Hinduism	164	74.21%
	Islam	45	20.36%
	Sikhism	2	0.90%
Age Class Mother	24-29	89	40.27%
	29-34	69	31.22%
	above 34	14	6.33%
	Below 24	49	22.17%
Education of mother	Illiterate	5	2.26%
	Primary school	11	4.98%
	Middle school	12	5.43%
	High school	25	11.31%
	Intermediate	61	27.60%
	Graduate	63	28.51%
	Professional	44	19.91%
Pre-pregnancy Nutritional Status	Morbid Obesity	25	12.89%
	Normal	85	43.81%
	Obese	23	11.86%
	Overweight	27	13.92%
	Underweight	34	17.53%
Class Reporting	Early	96	43.44%
	Late	125	56.56%
Diet during pregnancy	Lacto-Vegetarian	49	22.69%
	Ovo-Vegetarian	12	5.56%
	Non-Vegetarian	155	71.76%

Discussion:

Pregnancy is a stressful condition to the maternal thyroid gland, due to increase in thyroxin binding globulin, increased demand for iodine and thyroid stimulation by HCG. Fetus depends in the first 12 weeks on the mother for thyroxine and needs thyroxin for brain development, growth and lung maturation.

Thyroid disorders are one of the most common endocrine disorders in women during pregnancy and are associated with adverse maternal and foetal outcomes in pregnancy.

Thyroid disorders are one of the most common endocrine disorders in women during pregnancy and are associated with adverse maternal and fetal outcomes in pregnancy. However, an early detection of thyroid dysfunctions and treatment of mother during gestation improves the outcome.[4]

Early detection of thyroid dysfunctions during pregnancy is possible if the patient is suggested thyroid function test during her first prenatal visit or soon after the pregnancy is confirmed.[2] The prevalence of hypothyroidism was found to be high in our study, at 16.7%, thus, necessitating the need of universal screening of thyroid dysfunction. A study done by Sahu et al.,[12] in 2009, reported the incidence of subclinical and overt hypothyroidism in India as 6.5% and 4.6% respectively. However, the prevalence of subclinical hypothyroidism in northern and southern parts of India was separately reported as 6.47% and 2.8%, respectively, in another study.[13] In our study, preeclampsia and IUGR were the most common pregnancy complications in patients with hypothyroidism. NVD was less common and the occurrence of cesarean section was also high in patients with hypothyroidism when compared with patients with euthyroid.

In addition, hypothyroidism increased the risk of fetal distress, which agrees with the study done by Goel et al., in 2005.[14] Their study reported a higher incidence of fetal distress in pregnancies complicated by maternal hypothyroidism. It has been suggested that hypothyroidism may exert irreversible effects on the fetus and placenta in early pregnancy, which impair their ability to tolerate the stress of a normal delivery, thereby increasing the incidence of fetal distress in labor.

In our study, the incidences of abortion, anemia, preterm labor, gestational diabetes, and PPH were almost the same in the cases of hypothyroidism and euthyroid, which could probably be the result of an early detection and a good thyroid control with medications. Although hyperthyroidism in pregnancy is uncommon, its effects on both mother and child are critical.

Recommendation:

This study concludes that there is a high prevalence of hypothyroidism in pregnancy (16.7%). Even though universal TSH screening is not yet recommended, it should be considered in view of results shown by different studies. Further studies are required to evaluate impact of thyroid disorders during pregnancy to decide whether universal screening is needed.

Conclusions:

Thyroid dysfunction in pregnancy is associated with adverse pregnancy outcomes; hence, antenatal thyroid screening should be judiciously offered. Prompt detection and corrective treatment with thyroxine can prevent many obstetrical complications and result in the delivery of a healthy baby. Therefore, routine testing with serum TSH is a sufficient and cost-effective screening tool.

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