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PREVALENCE OF HYPOTHYROIDISM IN THE FIRST TRIMESTER OF PREGNANCY IN PRIMIGRAVIDA AT A TERTIARY CARE HOSPITAL IN BIHAR

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ABSTRACT Hypothyroidism is a common and importante occurrance during pregnancy. Untreated or undertreated hypothyroidism is seen to be associated with a number of deleterious effects ranging from miscarriage, stillbirth to implication on intellectual development of the child. **Material and method:** This study was conducted with the objective of finding out the prevalence of hypothyroidism in pregnant women presenting to hospital for routine ANC visit. 100 pregnant women, presenting in first trimester of pregnancy were included in this study. **Result:** 6 out of the 100 study subjects showed hypothyroidism as their TSH level was found to be raised. FT4 level assessment was done in these cases to differentiate subclinical hypothyroidism from overt hypothyroidism. **Conclusion:** Duration/trimester of pregnancy, gravid status, socioeconomic status all have possible role in determining the prevalence of hypothyroidism in pregnant population.

KEYWORDS : Hypothyroidism, First Trimester of Pregnancy, Primigravida

INTRODUCTION

Hypothyroidism is a common and importante occurrance during pregnancy.Thyroid disorders are the second most common cause of endocrine dysfunction in the women of child- bearing age group after diabetes mellitus.[1] Development of maternal thyroid disorders during early pregnancy can influence the pregnancy outcome and foetal development. It is now well established that not only overt but also subclinical thyroid dysfunction has significant effect on pregnancy and foetal development. Untreated or undertreated hypothyroidism is seen to be associated with a number of deleterious effects ranging from miscarriage, stillbirth to implication on intellectual development of the child. Number of factors like age of mother, parity, geographical distribution, term of pregnancy etc. may have their impact in deciding the prevalence of hypothyroidism in pregnant population.[2] Due to conflicting data on the prevalence of hypothyroidism during pregnancy from different studies, present study was planned and conducted to find out the prevalence of hypothyroidism in primigravida presenting in a tertiary care hospitral setting which is catering patients mainly from low socio-economic strata in east india.[3] Pregnant women were screened for hypothyroidism during their routine check-up at ante-natal clinic.

AIMS AND OBJECTIVES :

The study was planned to find out the prevalence of hypothyroidism in first trimester pregnancy in primigravida in a tertiary care government hospital of Bihar.

MATERIALS AND METHODS :

This is a prospective study involving 100 pregnant women attending the antenatal clinic, booked since their first trimester in department of Obstetrics & Gynaecology, SKMCH, Muzaffarpur from March 2019 to September 2019. Source of study was OPD and IPD records and the structural proforma. Apart from the routine Obstetrical investigations, TSH will be done as a screening test by chemiluminescence method. Estimation of ftree T3 and Free T4 are advised if TSH is abnormal. Cut off value for TSH will be taken as per American Thyroid Association

1st trimester—0.01 – 2.5 micro IU/L
2nd trimester _ 0.2 – 3.0 micro IU/L
3rd trimester 0.3 __ 3 micro IU/L

Those with abnormal tests are categorized as subclinical hypothyroidism (normal FT4 with high TSH), overt hypothyroidism (low FT4 with high TSH), Hypothyroidism (high T4 with low TSH). Patients will be put on treatment and thyroid function tests will be repeated every 6- 8 weeks during pregnancy and drug doses titrated accordingly. patients will be followed up throughout the pregnancy.

Inclusion Criteria:

1. Primigravid
2. Singleton pregnancy
3. Pregnant women presenting in first trimester (within 12 weeks).
4. Age group 20 – 45 years.

Exclusin Criteria :

1. Multigravida
2. Multiple pregnancy
3. Young mothers (<20 years) and elderly mothers (>45 years)
4. Pregnancy associated with any complications like diabetes , hypertension etc.

RESULTS:

6 out of the 100 study subjects showed hypothyroidism as their TSH level was found to be raised. FT4 level assessment was done in these cases to differentiate subclinical hypothyroidism from overt hypothyroidism. Low FT4 with high TSH was considered as overt hypothyroidism and normal FT4 with high TSH level was considered as subclinical hypothyroidism. Using these criteria 4/6 (4%) patients had subclinical hypothyroidism and 2/6 (2%) had overt hypothyroidism.

DISCUSSIONS:

Using cut off for TSH for diagnosing as 2.5 micro IU/L we found that out of the 100 pregnant women screened for hypothyroidism 6 had TSH > 2.5 micro IU/L. prevalence of hypothyroidism in primigravida in their first trimester was found to be 6%. 4 out of 6 patients (4%) had subclinical hypothyroidism which was diagnosed when TSH was high and FT4 value within normal range.

Overt hypothyroidism was diagnosed when TSH was high with low level FT4 and it was found in 2% of the study population . [4]

Prevalence of hypothyroidism has shown wide variations ranging from 5.6 % to 20 % in present population in different studies done in different regions of the country at different time frame.

At first glance it looks like a major variation in the prevalence data in different study reports , but in depth analysis shows that the study population selected in these various studies were not same with respect to duration of the pregnancy and gravida status of the pregnant population.

Cut Off value of TSH to demarcate hypothyroidism from euthyroid state is also an important criteria for determining the prevalence of hypothyroidism.[5]

It may be assumed that patients of lower socioeconomic strata are more prone to develop hypothyroidism due to poor dietary habit and deficiency of essential trace elements in their diet which increases the chances of developing hypothyroidism in such population. This population highlights the possible role of diet and nutrition in determining the occurrence of hypothyroidism which need to be further strengthen with studies done where diet and nutrition of patient is also taken into consideration.

In a large Chinese study, which included 2899 pregnant women, the prevalence of hypothyroidism was significantly higher in the high-risk group than in the nonhigh-risk group (10.9 vs. 7.0%, $P = 0.008$)**.[6]**

Dhanwal *et al*.**[7]** discovered that 14.3% women attending a tertiary public hospital in Delhi, India had hypothyroidism and majority of those women had SCH. Possible reasons for higher prevalence of hypothyroidism, both overt and sub-clinical, in Asian Countries include: increased iodine intake in diet as suggested by a Chinese study, presence of goitrogens in diet as reported from India and micronutrient deficiency such as selenium or iron deficiency that may cause hypothyroidism and goiter.[**12,13,14**] Thus, it is expected that the prevalence of hypothyroidism during pregnancy is higher in India and Asia. Moreover, prevalence of hypothyroidism in India is variable. Bandela *et al*.[**8**] from Andhra Pradesh reported 10% prevalence of SCH. Gayathri *et al*.[**9**] reported 2.8% prevalence of SCH. Possible reason for such variability could be the different upper limit cut-offs used for TSH.

Normal upper limit of TSH in pregnancy has been a subject of debate since a long time. In 2002, National Academy of Clinical Biochemistry (NACB) had laid down guidelines for the establishment of TSH reference intervals.[**15**] The guidelines said TSH reference intervals should be established from the 95% confidence limits of the log transformed values of at least 120 rigorously screened normal euthyroid volunteers with no detectable thyroid autoantibodies (TPOAb or TgAb), no personal or family history of thyroid dysfunction, no visible or palpable goiter, and no medications. NACB concluded that the upper limit of the serum TSH euthyroid reference range should be reduced to 2.5 mIU/L because >95% of rigorously screened normal euthyroid volunteers have serum TSH values between 0.4 and 2.5 mIU/L. This statement was supported by the 20 years follow-up study on Wickham cohort, which discovered increased risk of progression to overt hypothyroidism in individuals with serum TSH > 2.0 mIU/L, especially with positive TPO antibodies.[**1**] The recent Endocrine Society guidelines for thyroid dysfunction in pregnancy published in 2012 have again lowered the upper limit of reference range for normal TSH and suggested 0.1–2.5 mIU/L as the normal range for TSH values in the first trimester**.[11]** Using these recent trimester specific cut-offs for the diagnosis in the present study, we found a high prevalence (21.5%, 99/461) of SCH in first trimester pregnant women in contrast to various other studies from different parts of India where a higher cut-off using nonpregnant kit reference values had been used. Similar observations were made Dhnawal *et al*.[**7**]

Hyperthyroidism is much less common than hypothyroidism. The frequency of the disorder is relatively low, occurring in only 0.5–2/1000 pregnancies.[**16**] Untreated hyperthyroidism is associated with a significantly higher frequency of obstetric complications such as preeclampsia, premature labor, low birth weight, fetal and perinatal loss.[**16**] Mild or sub-clinical hyperthyroidism (suppressed TSH alone) is seen in 1.7% of pregnancies and is not associated with adverse outcomes. Possible reason for high prevalence of sub-clinical hyperthyroidism in our study population could be higher sensitivity of the thyroid gland to thyrotrophic molecules like human chorionic gonadotropin in our population leading to the gestational toxicosis. Price *et al*.[**16**] made similar observations in their study comparing thyroid function tests in Asian and western Caucasian pregnant nonpregnant women.

Prevalence of autoimmunity in euthyroid pregnant women was reported to be 10–15% in western literature.[**17**] According to data from the third National Health and Nutrition Examination Survey (NHANES-III) TPO positivity and anti-thyroglobulin antibodies were found in 12.6% and 13.6% of euthyroid women, respectively.[17] Anti-TPO were positive in 9.6% of 2899 first trimester pregnant Chinese women.[**6**] Dhanwal *et al*.[**7**] reported an anti-TPO prevalence of 6.82% in pregnant women.

CONCLUSION:

Duration/trimester of pregnancy, gravid status, socioeconomic status all have possible role in determining the prevalence of hypothyroidism in pregnant population. In addition, determination of uniform cut off value of TSH is certainly important to find out the true prevalence of this disorder during pregnancy. This will help in proper and more realistic planning to improve health care strategies for pregnant women. Considering the immense impact that maternal thyroid dysfunction has on maternal and fetal outcomes, prompt identification of thyroid dysfunction and timely initiation of treatment is essential. Thus, universal screening of pregnant women for thyroid dysfunction should be considered especially in a country like India due to the high prevalence of undiagnosed thyroid dysfunction.

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