

An Observational Assessment of the Prevalence of Hypothyroidism in First Trimester Pregnancy in Primigravida

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Conflict of interest: Nil

Abstract

Aim: To find out the prevalence of hypothyroidism in first trimester pregnancy in primigravida in a tertiary care hospital of Bihar.

Material & Methods: This was conducted in the Department of Obstetrics & Gynecology, Patna Medical College & Hospital, Patna, Bihar, India over a period of 5 months. Total 300 pregnant women with singleton pregnancy presenting in first trimester were included in the study.

Results: In this study 22 out of total 300 study subjects showed hypothyroidism. 6.6% patients had subclinical hypothyroidism 1% patients had overt hypothyroidism.

Conclusion: Duration/trimester of pregnancy, gravida status, socioeconomic status, all have possible role in deciding the prevalence of hypothyroidism in pregnant population.

Keywords: Subclinical hypothyroidism, Overt hypothyroidism, Pregnancy

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Introduction

Thyroid hormones are very significant during intrauterine life because it involved both directly and indirectly in various metabolic process. They help for the somatic growth and neurological development of the offspring. [1] During pregnancy thyroid hormone level will change because of increased demand to the body. [2]

During pregnancy, the maternal pituitary hypothalamic thyroid system undergoes physiological modifications to adapt to the new situation. In the first trimester of

pregnancy human chorionic gonadotropin (HCG) will increases and this hormone have thyrotropin like effect and thus it stimulates the thyroid gland and produce free T4 which results in decreased production of TSH. [3-4] But the recent studies reported that relationship between HCG and TSH is weaker and it will not influence the thyroid function. [5]

Hyperthyroidism is much less common than hypothyroidism. It is seen in 0.5–2/1000 pregnancies and id remains untreated is associated with significantly

higher frequency of obstetric complications such as preeclampsia, premature labor, and low birth weight, fetal and perinatal loss. Sub-clinical hyperthyroidism (suppressed thyroid-stimulating hormone [TSH] alone) is seen in around 1.7% of pregnancies and is not associated with adverse outcomes. [6]

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

Material & Methods:

This was conducted in the Department of Obstetrics & Gynecology, Patna Medical College & Hospital, Patna, Bihar, India over a period of 5 months. Total 300 pregnant women with singleton pregnancy presenting in first trimester were included in the study after getting their informed written consent.

Following inclusion and exclusion criteria were adopted to choose the study subjects

Inclusion Criteria

1. Primigravida
2. Singleton pregnancy
3. Pregnant woman presenting in first trimester (within 12 weeks)

4. Age group 20-45 year

Exclusion Criteria:

1. Multigravida
2. Multifocal gestation
3. Young mothers (<20 years) & elderly mothers (>45 years)
4. Pregnancy associated with any complication like Diabetes, hypertension

Methodology

Nature of study was explained to all the study participants in the language they understood. Well informed written consent was obtained from all the subjects included in the study. Under proper aseptic precaution 2ml of blood sample was taken in plain vacutainer and was centrifuged at 3500 rpm for 4 minutes to separate the serum which was used to estimate TSH, FT3, and FT4 by manual ELISA the kit supplied by 'New life one step analysis'. Statistical analysis was done using SPSS version 12 for Windows.

Results:

22 out of total 300 study subjects showed hypothyroidism, as their TSH level was found to be > 4.5 (mIU/L (7.3% prevalence). [Table 1]

Table 1: Prevalence of hypothyroidism in primigravida

Pregnant women with hypothyroidism	Total Number	Prevalence
22	300	7.3%

FT4 level assessment was done in these cases to differentiate subclinical hypothyroidism from overt hypothyroidism. FT4 level < 8.5 pmol/L was considered as overt hypothyroidism and levels > 8.5pmol/L was considered as

subclinical hypothyroidism. Using these criteria 20/22 (6.6%) patients had subclinical hypothyroidism and 3/22 (1%) patients had overt hypothyroidism. [Table 2]

Table 2: FT4 level assessment

FT4 level	Pregnant women with hypothyroidism [n=22]
Subclinical hypothyroidism	6.6%
Overt hypothyroidism	1%

Discussion:

Using trimester specific ranges proposed by recent guidelines there have been several studies showing a much larger prevalence of SCH and marked variation between different ethnic groups. The prevalence of any degree of hypothyroidism in pregnancy has varied from 12.3% (Finnish), 15.5% (American), and 35.3% (South American) to 17% (Danish) in these recent studies. [7-10] In the American study with samples from over half a million pregnant women, there were significant differences in the prevalence of hypothyroid disorders among Asian American women (19.3%) compared to African Americans (6.7%) and Caucasians (16.4%). [8]

Dhanwal et al. [11] from Delhi in 2013 reported a hypothyroidism prevalence of 14.3%, with a cut-off of 4.5 mIU/L as upper limit of normal in a cohort of 1000 pregnant women. In our study with a cut-off of 5 m IU/L as upper limit of TSH in first trimester suggested by an Indian study, [12] the prevalence rate came down from 32.5% to 8.1%.

Studies about the prevalence of hypothyroidism in pregnancy were 12.3% in Finnish, 15.5% in America, 35.3% in South America. [13-15] Similarly a small study conducted by us, in which we measured thyroid function tests in the first trimester among 200 pregnant women and found that 16.5% of women had TSH levels > 4 micro-unit/L and 53.5% had TSH levels ≥ 2 micro-unit/L. [16] Another small study from Delhi involving 172 normal pregnant women in the first trimester (thyroid normalcy suggested by negative thyroid antibodies, clinical assessment, iodine sufficiency, and routine thyroid ultrasound) revealed that the first-trimester range of TSH in Indian women to be between 0.6-5.0 micro-unit/L. [17]

Aziz et al (2006) [18] have shown the effect of parity on occurrence of hypothyroidism. They have reported

maximum hypothyroidism in gravida 2-4 compared to primigravida. Similarly G. Shobha et al have reported maximum hypothyroidism in multigravida compare to primigravida. [19] Our study has shown comparatively lower prevalence of hypothyroidism which may be due to the fact that our study population had exclusively primigravida women.

Hyperthyroidism is much less common than hypothyroidism. The frequency of the disorder is relatively low, occurring in only 0.5–2/1000 pregnancies. [20]

Untreated hyperthyroidism is associated with a significantly higher frequency of obstetric complications such as preeclampsia, premature labor, and low birth weight, fetal and perinatal loss. Mild or sub-clinical hyperthyroidism (suppressed TSH alone) is seen in 1.7% of pregnancies and is not associated with adverse outcomes. In the present study 15 (3.3%) and 2 (0.4%) of pregnant women were found to have newly diagnosed sub-clinical and overt hyperthyroidism, respectively. 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. [20, 21]

Conclusion:

Duration/trimester of pregnancy, gravida status, socioeconomic status, all have possible role in deciding the prevalence of hypothyroidism in pregnant population.

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