

Prevalence of thyroid disorders among pregnant women in lower Assam

Diganta Das, Syed Javed Salman Chisty, Karabi Barman

Corresponding author: Dr. Syed Javed Salman Chisty, Assistant Professor, Department of Biochemistry, Diphu Medical College, Diphu, Assam, India; Email : drjavedchisty2013@gmail.com

Distributed under Attribution-Non Commercial – Share Alike 4.0 International (CC BY-NC-SA 4.0)

ABSTRACT

Background: Prevalence of thyroid disorders during pregnancy has a wide geographic variation. There is paucity of data on prevalence of thyroid disorders in Indian pregnant women. Lower Assam consists of people of different culture and ethnicity. In a pilot study done in lower part of Assam among 1st trimester pregnant lady in which the prevalence was alarmingly high. **Objective:** The objective of the study is to find out prevalence of thyroid disorders among pregnant women in lower Assam. **Materials and methods:** The study was an out patient department (OPD) based randomized, prospective cohort, observational study over a period of one year. The 880 pregnant women between the age group of 18 to 45 years, who were attending the antenatal OPDs of Fakhruddin Ali Ahmed Medical College, were included in the study. **Results:** The mean age and thyroid stimulating hormone (TSH) level of study population was 23.70 ± 4.77 years and 2.83 ± 4.02 mIU/ml respectively. The prevalence of thyroid dysfunction was 62.72%. Of this, prevalence of hypothyroidism was 61.70% and that of hyperthyroidism was 1.02%. The majority of the pregnant lady in their 1st trimester was suffering from hypothyroidism (58.6%) (TSH level 2.8 ± 3.2 mIU/). The prevalence of hypothyroidism is more in pregnant ladies whose age more than 30 yrs (63.8 %). **Conclusion:** In our study we found that more than 58.6% pregnant women in their first trimester were suffering from hypothyroidism. Thyroid disorders are common in pregnancy, and the screening for thyroid dysfunction should be done early in pregnancy.

Keywords: Thyroid-stimulating hormone, pregnant lady, thyroid disorders, Lower Assam.

Thyroid disorders constitute one of the most common endocrine disorders seen in pregnancy. Maternal thyroid function changes during pregnancy and inadequate adaptation to these changes results in thyroid dysfunction. These changes are a result of various factors like an increase in thyroglobulin due to elevated estrogen and human chorionic gonadotrophin, increased renal losses of iodine due to increase in glomerular filtration rate, modifications in peripheral metabolism of maternal thyroid hormone and modifications in iodine transfer to placenta. The production

of thyroid hormone and iodine requirement increases by 50% during pregnancy¹.

Maternal thyroid disorders influence multitudes of mother and fetal outcomes². There's need to treat thyroid disorders in reproductive age women before conception. In pregnancy, overt hypothyroidism is seen in 0.2 % and subclinical hypothyroidism in 2.3 % cases³. Foetal loss, foetal growth restriction, preeclampsia and preterm delivery are the usual complications of overt hyperthyroidism.

Thyroid disorders during early pregnancy have been

Received: 14th June 2020. Peer review completed: 10th July 2020, Accepted: 12th July 2020.

Das D, Chisty SJS, Barman K. Prevalence of thyroid disorders among pregnant women in lower Assam. The New Indian Journal of OBGYN. 2021; 7(2): 202-5.

associated with adverse obstetric and fetal outcome. The main obstetric complications are abortion, pre-eclampsia, abruptio placenta, preterm labour and the fetal complications are prematurity, low birth weight, still birth and perinatal death. Children born to untreated mothers have profound effect on future intellectual development. Prenatal and postnatal adverse effects including attention deficit and hyperactivity syndrome have been reported in children born to hypothyroid mothers.^{4,5} Prevalence of thyroid disorders during pregnancy has a wide geographic variation. Western literature shows a prevalence of hypothyroidism in pregnancy of 2.5% and hyperthyroidism in pregnancy has prevalence of 0.1 to 0.4%.⁶ There is paucity of data on prevalence of thyroid disorders in Indian pregnant women. Few reports show a prevalence of 4.8% to 11% amongst Indian pregnant population.^{6,7}

Lower Assam consists of people of different culture and ethnicity. In a pilot study done in lower part of Assam among 1st trimester pregnant lady, 43 % was suffering from hypothyroidism (both subclinical and overt hypothyroidism) which is alarmingly high in comparison to other studies. In view of adverse maternal and fetal outcome in pregnant women with thyroid disorders and obvious benefits of early diagnosis and treatment, some expert panels all around the world have suggested routine thyroid function screening of all pregnant women. The objective of the study is to find out prevalence of thyroid disorders among pregnant women in lower Assam.

Materials and methods

The study was an out patient department (OPD) based randomized prospective cohort, observational study. The study carried out over a period of one year (From 10th May 2019 to 20th May 2020). 880 pregnant lady in first trimester between the age group of 18 to 45 years who were attending the antenatal OPDs, from lower Assam , according to the population structure.

Inclusion criteria: all normal pregnant women and those with thyroid problems were included in the study.

Exclusion criteria: all others with diabetes mellitus, collagen disease and heart disease were excluded from the study and women who did not give consent for TSH estimation were excluded from the study. Clearance from ethical committee was also taken.

For the screening of thyroid disorders, we measured only TSH. We have accepted TSH value as per American Thyroid Association (ATA) 2011⁸. As per ATA, the normal range for TSH in the different trimester as follows -

1st Trimester: TSH value 0.1-2.5 mIU/ml.

2nd Trimester: TSH value 0.2-3.0 mIU/ml.

3rd Trimester: TSH value 0.3-3.5 mIU/ml.

Five milliliters of blood were collected in the morning from patient and analyzed immediately. Serum TSH levels were measured in the Central Clinical Laboratory (Biochemistry) of FAA Medical College. The quantification of TSH was carried out with ADVIA Centaur CP/Chemiluminescence which is a two side sandwich immunoassay using direct chemiluminometric technology, which use constant amount of two antibodies. Random blood sugar, serum creatinine were assayed using principles of dry chemistry with Vitros 350 autoanalyzer from Johnson & Johnson. The statistical calculation was done using Medcalc software.

Results

In the study, 880 pregnant women evaluated for TSH estimation. The minimum age of study group was 18 years and the maximum age was 40 years. The minimum levels of TSH were 0.01mIU/L and the maximum was 106.6 mIU/L. Mean age of our study populations with mean TSH level are shown in the (Table 1). The mean age and TSH level of study population was 23.70 ± 4.77 years and 2.83±4.02 mIU/ml respectively.

Table 1: Mean age and TSH of study population

| Parameters | Age (Years) | TSH (mIU/ml) |
|------------|--------------|---------------|
| Mean | 23.70 | 2.83 |
| SD | 4.77 | 4.02 |
| Minimum | 18 | 0.01 |
| Maximum | 40 | 106.6 |

Table 2 shows prevalence of thyroid disorders in various age groups of pregnant patients. Highest prevalence (63.8 %) was seen in pregnant women who were > 30 years of age. Women who were less than 21 years of age had least prevalence (57.8%) of thyroid disorders.

Table 2: Prevalence of thyroid disorders among different age groups

| Age (yrs) | Numbers | No. of thyroid disorders | Prevalence (%) |
|------------|---------|--------------------------|----------------|
| ≤ 20 | 308 | 178 | 57.8 |
| 21- 25 | 314 | 187 | 59.6 |
| 26- 30 | 176 | 109 | 61.9 |
| >30 | 82 | 51 | 63.8 |
| Total | 880 | 552 | 62.72 |

The overall prevalence of thyroid dysfunction in our study was 62.72%. During the study period, a total of n=543 (61.70%) patients were detected with hypothyroidism and hyperthyroid were n=9 (1.02%) patients as shown in table 3. The mean TSH value of hyperthyroid cases was 0.098±0.07 mIU/ml (Figure 1).

In our study, we found that majority of the pregnant lady in their 1st trimester was suffering from hypothyroidism (408 out of 880 with mean TSH level 2.8 mIU/ml with SD of 3.2). In the 2nd trimester 262 ladies studied had TSH value 2.8 mIU/ml with SD of 3.6. In the 3rd trimester 210 ladies studied had TSH value 3.4 mIU/ml with SD of 2.1 (Table 4).

Table 3: Prevalence of thyroid disorders

| Parameters | Numbers (N=880) | Prevalence (%) |
|--------------------------|-----------------|----------------|
| Total hypothyroid cases | 543 | 61.70 |
| Total hyperthyroid cases | 9 | 1.02 |
| Grand total | 552 | 62.72 |

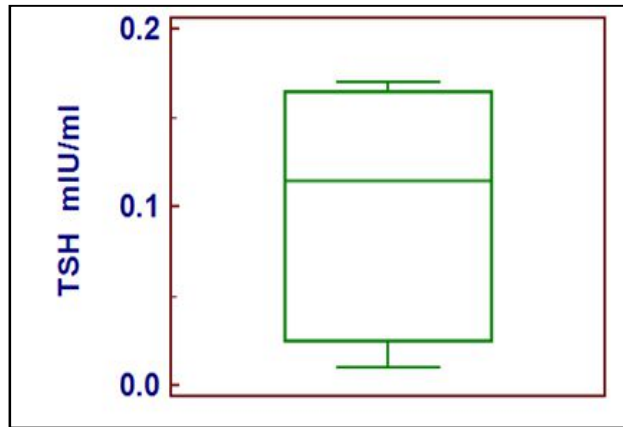


Figure 1: Shows TSH value less than 0.1 mIU/ml

Table 4: Trimester wise distribution of TSH value

| Number of Patients | Trimester | TSH value mIU/ml |
|--------------------|---------------------------|------------------|
| 408 | 1 st Trimester | 2.8 ±3.2 |
| 262 | 2 nd Trimester | 2.8±3.6 |
| 210 | 3 rd Trimester | 3.4±2.1 |

Discussion

In this study a total of 880 patients were screened for thyroid disorders. The overall prevalence of thyroid dysfunction in our study was 62.72%. D Dhawan et al; in their multicentric study over 11 cities across India found the overall prevalence of hypothyroidism to be 13.13%.⁹ B Krishnamma et al;¹⁰ found the prevalence of thyroid dysfunction in 18.7% of population. The higher prevalence of cases in our study could be due to the fact that our study is conducted in area known to endemic for iodine deficiency.

Hypothyroidism as compared to hyperthyroidism is common during pregnancy^{11, 12}. In our study, a total of n=543 (61.70%) patients were detected with hypothyroidism and hyperthyroid were n=9 (1.02%) patients. Korde VR et al;¹³ from Maharashtra reported the prevalence of thyroid dysfunction in their study is 13.9%. Of this, prevalence of hypothyroidism is 12.76% and that of hyperthyroidism is

1.13%. In contrast to this study, we found large prevalence of hypothyroidism of pregnant women.

In our study, we found that majority of the pregnant lady in their 1st trimester was suffering from hypothyroidism. The prevalence of hypothyroidism in 1st trimester was 58.6% (mean TSH level 2.8± 3.2 mIU/). The prevalence of hypothyroidism from different areas of the country is available a study conducted in Delhi has reported a 14.3% prevalence of hypothyroidism during the first trimester of pregnancy.¹⁴ Sahu MT et al;⁷ found in 633 women of the second trimester of pregnancy the prevalence of thyroid disorders to be 12.7%.

In the study it is found that prevalence of hypothyroidism is more in pregnant ladies whose age more than 30 yrs (63.8 %). The findings are consistent with the findings of pilot studies done in the lower Assam¹⁵. If we try to understand the demographic profile of lower Assam we see that it is mixed population with different cultural, ethnic population.

Conclusion

In our study we found that more 58.6 % of pregnant women in first trimester was suffering from hypothyroidism (both subclinical and overt hypothyroidism) which is alarmingly high in comparison to other studies. Even though universal TSH screening is not yet recommended, it should be considered in view of results shown by different studies. Screening for thyroid dysfunction should be done early in pregnancy. Looking at the high percentage of abnormal TSH in pregnancies, universal screening should be considered, especially in this part of the country.

Conflict of interest: None. **Disclaimer:** Nil.

References

1. van Raaij JM, Vermaat-Miedema SH, Schonk CM, Peek ME, Hautvast JG. Energy requirements of pregnancy in The Netherlands. *Lancet*. 1987; 2: 953-5.
2. Ali K, Kahtun M. Thyroid status of normal pregnant women in Dhaka City. *Mymensingh Medical Journal*. 2002; 1: 1-5.
3. Biondi B, Cooper D. The clinical significance of subclinical thyroid dysfunction. *Endocr. Rev.* 2008; 29:76–131.
4. Ghassabian A, Bongers-Schokking JJ, de Rijke YB, van Mil N, Jaddoe VW, de Muinck Keizer-Schrama SM, et al. Maternal thyroid autoimmunity during pregnancy and the risk of attention deficit/hyperactivity problems in

- children: The generation R study. *Thyroid*. 2012; 22:178-86.
5. Männistö T, Väärasmäki M, Pouta A, Hartikainen AL, Ruokonen A, Surcel HM, et al. Perinatal outcome of children born to mothers with thyroid dysfunction or antibodies: A prospective population-based cohort study. *J Clin Endocrinol Metab*. 2009; 94: 772-9.
 6. Nambiar V, Jagtap VS, Sarathi V, Lila AR, Kamalanathan S, Bandgar TR, et al. Prevalence and impact of thyroid disorders on maternal outcome in Asian Indian pregnant women. *J Thyroid Res*. 2011; 2011: 4290-7.
 7. Sahu MT, Das V, Mittal S, Agarwal A, Sahu M. Overt and subclinical thyroid dysfunction among Indian pregnant women and its effect on maternal and fetal outcome. *Arch Gynecol Obstet*. 2010; 281: 215-20.
 8. Stagnaro-Green A, Abalovich M, Alexander E, Azizi F, Mestman J, Negro R, et al. Guidelines of the American Thyroid Association for the diagnosis and management of thyroid disease during pregnancy and postpartum. *Thyroid*. 2011; 21(10): 1081-125.
 9. Dhanwal DK, Bajaj S, Rajput R, Subramaniam KA, Chowdhury S, Bhandari R, et al. Prevalence of hypothyroidism in pregnancy: An epidemiological study from 11 cities in 9 states of India. *Indian J Endocrinol Metab*. 2016; 20(3): 387-90.
 10. Krishnamma B. Prevalence of thyroid dysfunction in pregnant women and the need for universal screening: an observational study in Northern Andhra Pradesh population. *IJRCOG*. 2017; 6(6): 2536-40.
 11. Negro R, Mestman JH. Thyroid disease in pregnancy. *Best Pract Res Clin Endocrinol Metab*. 2011; 25: 927-43
 12. Delshad, H, Azizi, F. Thyroid and pregnancy. *J Med Council Iran*. 2008; 26: 392-408.
 13. Korde VR, Barse SP, Barla JS. Prevalence of thyroid dysfunctions in pregnant women: a prospective study in a tertiary care hospital in Maharashtra, India. *Int J Reprod Contracept Obstet Gynecol*. 2018; 7: 3211-15.
 14. Dhanwal DK, Prasad S, Agarwal AK, Dixit V, Banerjee AK. High prevalence of subclinical hypothyroidism during first trimester of pregnancy in North India. *Indian J Endocrinol Metab*. 2013; 17: 281-4.
 15. Das D, Chisty SJS, Barman K, Talukdar B, Talukdar U. Prevalence of hypothyroidism among 1st trimester pregnant women in lower part of Assam: A pilot study. *Journal of Obstetrics & Gynaecology Barpeta*. 1(2): 107-10.
-

Diganta Das¹, Syed Javed Salman Chisty², Karabi Barman³

¹ Associate Professor, Department of Biochemistry, Fakhruddin Ali Ahmed Medical College, Barpeta, Assam, India; ² Assistant Professor, Department of Biochemistry, Diphu Medical College, Diphu, Assam, India; ³ Assistant Professor, Department of Obstetrics and Gynaecology, Fakhruddin Ali Ahmed Medical College, Barpeta, Assam, India.