ORIGINAL RESEARCH PAPER
Volume - 9 | Issue - 11 | November - 2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PREVALENCE OF THYROID DISORDERS IN FIRST TRIMESTER OF PREGNANCY

Gynaecology

Dr Himani* R3 *Corresponding Author

Dr Nisha Chakravati Assistant Professor

Dr H U Doshi Professor and HOD

ABSTRACT

Background:Undetected and untreated thyroid disorders are associated with adverse maternal and fetal outcomes. There are limited data on the prevalence of newly diagnosed thyroid disease during pregnancy from India. Therefore, this study was designed to evaluate the prevalence of thyroid dysfunction.

KEYWORDS

INTRODUCTION

Thyroid disorders constitute second 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 gonadotropin , 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 .Pregnancy is a stress test for thyroid , resulting in hypothyroidism in women with limited thyroidal reserve or iodine deficiency . Evaluation of thyroid disease in pregnancy is important for gestational maternal health, obstetric outcome, and subsequent development of the child. Before the onset of fetal thyroid function, that occurs at about 12 weeks of gestation, the fetus is dependent on the placental transfer of maternal thyroid hormone for normal development. Therefore , maternal hypothyroidism early in pregnancy causes decreased availability of thyroid hormone during 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 .It is now well established that not only overt but subclinical thyroid dysfunction also has adverse thyroid outcome on the mother and the fetus .Thus , prompt identification of thyroid disorder and timely initiation of therapy in pregnancy is essential . There are few data from India about the prevalence of thyroid dysfunction in pregnancy. With this background, this study, was carried out to study the prevalence of undetected thyroid dysfunction during the first trimester of pregnancy , including , hypothyroidism , hyperthyroidism , and , subclinical hypothyroidism in pregnancy .

MATERIALS AND METHODS

This study was conducted at GCS Medical College Hospital And Research Centre, Ahmedabad in Department of Obstetrics and Gynecology from January 2019 to December 2019 .

TYPE OF STUDY

Prospective study done in 1000 pregnant women in first trimester attending the out patient department of GCS Medical College Hospital And Research Centre, Ahmedabad in first trimester of pregnancy.

INCLUSION CRITERIA

<12 weeks of gestation
Singleton pregnancy
Primigravida / Multigravida

EXCLUSION CRITERIA

Multi fetal gestation
Known chronic disorders like diabetes and hypertension
Previous bad obstetric history with known cause
Patient planned follow up in another hospital

PROCEDURE

1000 pregnant women attending antenatal clinic in first trimester at GCS Medical College and Hospital , Ahmedabad and fulfilling inclusion criteria were enrolled in the study after institutional ethics approval and consent from the study subjects. Detailed history was taken, regarding the symptoms of thyroid disorders, menstrual history, family history, personal and social history. General examination was done with the reference to general condition of patient, body temperature, pulse rate, blood pressure, respiratory rate and the findings were recorded. Systemic examination of cardiovascular system, central nervous system, respiratory system and the thyroid gland was done and findings were recorded, per abdominal and per vaginal examination was done and findings were recorded.

INVESTIGATIONS

Basic investigations:

Complete blood picture, clotting time, bleeding time, blood grouping and Rh typing, RBS, blood urea, serum creatinine, HIV, HbsAg and complete urine examination were done.

Pregnancy <12 weeks was confirmed by clinical assessment, pregnancy test and ultrasonography.

Specific Investigations:

Patients were sent for testing of serum TSH level. If serum TSH values were deranged, fT3 and fT4 levels were checked. The reference ranges of the test values used in this study were as per the guidelines of American thyroid Association for the diagnosis and Management of thyroid disease during Pregnancy and postpartum. As per regulation 14.2 of ATA guidelines, if trimester specific ranges are recommended: 1st trimester-0.1 to 2.5 m IU/l, 2nd trimester-0.2 to 3.0 mIU/l and 3rd trimester-0.7 to 1.8 ng/ml and free T3 level is 1.7 to 4.2 pg/ml. Depending on the hormonal values, patients were classified into

Subclinical hypothyroidism: High serum TSH level with normal fT4, fT3 level

Overt hypothyroidism: High serum TSH level with fT4 and fT3 less than normal range

Subclinical hyperthyroidism: Low serum TSH level with normal fT3 and fT4 level

Overt hyperthyroidism: Low serum TSH level with fT3 and fT4 more than normal range

Sub clinical/overt hypothyroid cases were treated with thyroxine.
Subclinical/overt hyperthyroid cases were treated with propylthiouracil

Table 1. Distribution Of Prevalence Of Thyroid Disorders According To Habitat Of Population.

HABITAT	NUMBER OF SUBJECTS
Rural	94
Urban	192
Total	286

Table 2.Distribution Of Prevalence Of Thyroid Disorders According To Age Group.

AGE (in years)	NUMBER OF SUBJECTS
20-25	137
26-30	118
31-35	28
>35	3

Table 3.Distribution According To Gravida Status.

GRAVIDA STATUS	NUMBER OF SUBJECTS
Primi	92
Second	74
Third	54
Four or more	66

Table 4.Distribution According To Thyroid Disorder

TYPE OF DISORDER	NUMBER OF SUBJECTS
SUBCLINICAL HYPOTHYROIDISM	190
SUBCLINICAL HYPERTHYROIDISM	10
OVERT HYPOTHYROIDISM	82
OVERT HYPERTHYROIDISM	4
TOTAL	286

Table 5.Distribution According To Haemoglobin Concentration And Type Of Disorder.

HB CONC.	HYPOTHYROIDISM	HYPERTHYROIDISM
>11	109	6
7-11	158	8
<7	5	0

Table 6.Distribution According To Previous History Of Infertility

TYPE OF DISORDER	ASSOCIATION WITH INFERTILITY
HYPOTHYROIDDISM	5
HYPERTHYROIDDISM	1

Table 7.Distribution Of Patient With Previous History Of Abortion

TYPE OF DISORDER	NUMBER OF PREVIOUS ABORTIONS
HYPOTHYROIDDISM	12
HYPERTHYROIDDISM	3

OBSERVATION AND RESULTS

In the present study,286 out of 1000 pregnant women screened had thyroid disorders . The prevalence of thyroid disorders in this study was 28.6

In our study incidence of thyroid disorder in pregnancy was more common in booked and urban cases as compared to unbooked and rural cases. This difference can be explained by the lack of awareness , attendance in antenatal clinic and routine antenatal screening for thyroid dysfuction. Table 1

The prevalence of thyroid disorders was more common in the younger (20-25yrs) as compared to the older ones , primarily because , this is the age group where most of the childbearing age patients lie . The prevalence was 13.7% .

Also, the incidence was maximum in primigravida patients, viz, 9.1% , however there was only marginal gap between the second , third, fourth gravida and so on , viz , 7.4% , 5.4% ,6.6% respectively . Table 2 and Table 3

In the present study the prevalence of subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism and overt hyperthyroidism is 19% , 8.2% , 1%, 0.4% respectively as per table 4 . Out of 1000 pregnant women screened 190 had subclinical hypothyroidism , thus , making it the thyroid disorder with maximum prevalence in pregnant women . 82 and 10 cases respectively had overt hypothyroidism and subclinical hyperthyroidism respectively . Only 4 pregnant women had overt hyperthyroidism , thus it has the least prevalence of 0.4% .Table 4

The prevalence of anemia in our study was 17.1% . Anemia is leading risk factor that is directly associated with maternal morbidity and mortality . This suggests that nutritional deficiencies are known to develop in subclinical hypothyroidism , the most recognised one of which is iron deficieny . The resulting anemia can be in the form of normocytic , normochromic ,microcytic , hypochromic , macrocytic or megaloblastic anemia . Anemia is estimated to affect a large proportion of hypothyroid patients and is totally unrelated to severity or duration of thyroid insufficiency .Table 5

0.5% patients with hypothyroidism and 0.1% patients with hyperthyroidism had history of infertility . Although menstrual irregularities are common , ovulation and conception can still occur in hypothyroidism , where thyroxine treatment restores a normal menstrual pattern and reverses hormonal changes . subclinical hypothyroidism is also associated with ovulatory dysfunction and adverse pregnancy outcome. Table 6

1.2% patients with hypothyroidism and 0.3% patients with hyperthyroidism had history of abortions in previous pregnancy . Serum TSH level is strongly associated with abortion in first trimester . Thus , screening of thyroid disorders in early pregnancy has clinical significance and adequate T4 replacement therapy if given in cases of hypothyroidism would help to reduce the risk of miscarriage in these women . Table 7

CONCLUSION

Maternal thyroid disorders during pregnancy are associated with various adverse outcomes. So screening of thyroid disorders should be done in the early pregnancy . It will help to diagnose the cases at the earliest and to carry out timely intervention to prevent adverse perinatal outcomes.

This study not only emphasizes high risk screening in early pregnancy but also supports that universal screening should be a part of our screening protocols so that all thyroid disorders are screened and treated at the earliest. Even small percentage of thyroid disorders in early pregnancy should not be missed. So in our country we must follow Indian Thyroid Society Guidelines which clearly recommend that "all pregnant women should be screened at 1st antenatal visit by measuring TSH levels , and highlight that " ideally screening should be carried out during pre-pregnancy evaluation or as soon as pregnancy is confirmed"

REFERENCES

1. Vanderpump MP, Tunbridge WM, French JM, Appleton D, Bates D, Clark F, et al. The incidence of thyroid disorders in the community: A twenty-year follow-up of the Whickham Survey. Clin Endocrinol (Oxf) 1995;43:55–68. [PubMed] [Google Scholar]
2. Altomare M, La Vignera S, Asero P, Recupero D, Condorelli RA, Scollo P, et al. High prevalence of thyroid dysfunction in pregnant women. J Endocrinol Invest. 2013;36:407–11. [PubMed] [Google Scholar]
3. Blatt AJ, Nakamoto JM, Kaufman HW. National status of testing for hypothyroidism during pregnancy and postpartum. J Clin Endocrinol Metab. 2012;97:777–84. [PubMed] [Google Scholar]
4. Mosso L, Martínez A, Rojas MP, Margozzini P, Solari S, Lyng T, et al. Frequency of subclinical thyroid problems among women during the first trimester of pregnancy. Rev Med Chil. 2012;140:1401–8. [PubMed] [Google Scholar]
5. Wang W, Teng W, Shan Z, Wang S, Li J, Zhu L, et al. The prevalence of thyroid disorders during early pregnancy in China: The benefits of universal screening in the first trimester of pregnancy. Eur J Endocrinol. 2011;164:263–8. [PubMed] [Google Scholar]
6. 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. [PMC free article] [PubMed] [Google Scholar]
7. Bandela V, Havilah P, Hindumathi M, Prasad DK. Antenatal thyroid dysfunction in Rayalaseema region: A preliminary cross sectional study based on circulating serum thyrotropin levels. Int J Appl Biol Pharm Technol. 2013;4:74–8. [Google Scholar]
8. Gayathri R, Lavanya S, Raghavan K. Subclinical hypothyroidism and autoimmune thyroiditis in pregnancy – A study in south Indian subjects. J Assoc Physicians India. 2009;57:691–3. [PubMed] [Google Scholar]
9. Unnikrishnan AG, Kalra S, Sahay RK, Bantwal G, John M, Tewari N. Prevalence of hypothyroidism in adults: An epidemiological study in eight cities of India. Indian J Endocrinol Metab. 2013;17:647–52. [PMC free article] [PubMed] [Google Scholar]
10. Casey BM, Dashe JS, Wells CE, McIntire DD, Leveno KJ, Cunningham FG. Subclinical hyperthyroidism and pregnancy outcomes. Obstet Gynecol. 2006;107:337–41. [PubMed] [Google Scholar]
11. De Groot L, Abalovich M, Alexander EK, Amino N, Barbour L, Cobin RH, et al. Management of thyroid dysfunction during pregnancy and postpartum: An Endocrine Society clinical practice guideline. J Clin Endocrinol Metab. 2012;97:2543–65. [PubMed] [Google Scholar]
12. Marwaha RK, Tandon N, Gupta N, Karak AK, Verma K, Kochupillai N. Residual goitre in the postiodization phase: Iodine status, thiocyanate exposure and autoimmunity. Clin Endocrinol (Oxf) 2003;59:672–81. [PubMed] [Google Scholar]
13. Teng X, Shan Z, Chen Y, Lai Y, Yu J, Shan L, et al. More than adequate iodine intake may increase subclinical hypothyroidism and autoimmune thyroiditis: A cross-sectional study based on two Chinese communities with different iodine intake levels. Eur J Endocrinol. 2011;164:943–50. [PubMed] [Google Scholar]
14. Das S, Bhansali A, Dutta P, Aggarwal A, Bansal MP, Garg D, et al. Persistence of goitre in the post-iodization phase: Micronutrient deficiency or thyroid autoimmunity? Indian J Med Res. 2011;133:103–9. [PMC free article] [PubMed] [Google Scholar]
15. Demers LM, Spencer CA. Laboratory support for the diagnosis and monitoring of thyroid disease. Thyroid. 2003;13:33–44. [PubMed] [Google Scholar]
16. Price A, Obel O, Cresswell J, Catch I, Rutter S, Barik S, et al. Comparison of thyroid function in pregnant and non-pregnant Asian and western Caucasian women. Clin Chim Acta. 2001;308:91–8. [PubMed] [Google Scholar]
17. Glinoer D, Rihai M, Grun JP, Kinthaert J. Risk of subclinical hypothyroidism in

pregnant women with asymptomatic autoimmune thyroid disorders. J Clin Endocrinol Metab. 1994;79:197–204. [PubMed] [Google Scholar]
18. Hollowell JG, Staehling NW, Flanders WD, Hannon WH, Gunter EW, Spencer CA, et al. Serum TSH, T (4), and thyroid antibodies in the United States population (1988 to 1994): National Health and Nutrition Examination Survey (NHANES III) J Clin Endocrinol Metab. 2002;87:489–99. [PubMed] [Google Scholar]
19. Marwaha RK, Chopra S, Gopalakrishnan S, Sharma B, Kanwar RS, Sastry A, et al. Establishment of reference range for thyroid hormones in normal pregnant Indian women. BJOG. 2008;115:602–6. [PubMed] [Google Scholar]