

PREVALENCE OF THYROID DISORDER IN PREGNANCY

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Abstract— Background and objectives

Thyroid disorders are among the common endocrine disorders in pregnant women. Several changes are observed in maternal thyroid function during pregnancy and failure to adapt to these physiological changes results in thyroid dysfunction. It is now well established that not only overt, but also subclinical thyroid dysfunction also has adverse effects on maternal and fetal outcome. In this study we have excluded women with multifetal gestation, known chronic disorders like diabetes and hypertension, who had bad obstetric history with known cause. There are few data's in India about the prevalence of thyroid dysfunction in pregnancy. With this background, this study aims to know the prevalence of thyroid dysfunction in pregnancy in Indian population.

Methods

The present study was conducted in The Department of Gynecology and Obstetrics, Al-Ameen Medical College and Hospital, Bijapur. It is a prospective study which involved screening of 100 pregnant women coming to routine antenatal check up in first trimester. TSH level was estimated. If it is deranged, then FT3 & FT4 levels estimated. Patients were managed accordingly and followed till delivery. Prevalence of Thyroid dysfunction was noted.

Result

Prevalence of thyroid dysfunction(10%) was high in this study , with subclinical hypothyroidism in (6%) ,overt hypothyroidism in (2%) and subclinical hyperthyroidism in(2%)women ,which is comparable to other studies.

CONCLUSION:

Prevalence of thyroid disorders, especially subclinical hypothyroidism (6%) and overt hypothyroidism(2%) was high ,emphasizing the importance of routine antenatal thyroid screening.

Index terms- Pregnancy, Thyroid Dysfunction, hypothyroidism, hyperthyroidism.

I. INTRODUCTION

For unknown reasons, thyroid disease is more common in women than in men. Because most thyroid disease is autoimmune in nature, an increased susceptibility to autoimmune diseases, perhaps secondary to the female endocrine environment, is a likely contributing factor.

Pregnancy can be viewed as a state in which a combination of events concurs to modify the thyroidal economy. There is change in the level of thyroxine-binding globulin, total thyroid-hormone level and change in the level of thyroid stimulating hormone (TSH) during normal pregnancy¹. Thyroid disorder (TD) may be overlooked in pregnancy because of the nonspecific symptoms and hypermetabolic state of normal pregnancy.

Thyroid dysfunction has varied impact on pregnancy outcome. The risk of miscarriage is increased in autoimmune thyroid disease. Severe maternal hypothyroidism can result in irreversible neurological deficit in the offspring. Graves' disease (GD) can lead to pregnancy loss as well as fetal thyroid dysfunction.

The prevalence of hypothyroidism in pregnancy is around 2.5% according to the Western literature². The prevalence of GD is around 0.1–0.4% and that of thyroid autoimmunity (TAI) is around 5–10%². Thyroid disorders are among the common endocrine problems in pregnant women. Pregnancy has a profound impact on the thyroid gland and thyroid function. During pregnancy, the thyroid gland may enlarge by 10% in countries where iodine sources are sufficient, and to a greater extent in iodine-poor countries¹. Production of thyroid hormones and iodine requirement each increases by approximately 50% during pregnancy². Pregnancy is a stress test for the thyroid, resulting in thyroid dysfunction in women with limited thyroidal reserves. It is now well established that not only overt but subclinical thyroid dysfunction also has adverse outcome on the mother and fetus, including miscarriage, preterm delivery, pre-eclampsia, eclampsia and placental abruption. Decreased availability of maternal thyroid hormones may also impair neurological development of the fetus³. There are few data's from India about the prevalence of thyroid dysfunction in pregnancy. With this background, this study aims to find prevalence of thyroid disorders including hyperthyroidism, hypothyroidism and Subclinical Hypothyroidism in pregnancy.

Universal screening of pregnant women will detect both subclinical hypothyroidism and subclinical hyperthyroidism, each present in a substantial number (around 2% each) of asymptomatic women^{3,4,5}. Advocacy for universal screening is not an established recommendation.

II. MATERIALS AND METHODS

A. Source of data

A total of 100 pregnant women in first trimester of pregnancy and above attending the OPD at the department of obstetrics and gynaecology, Al Ameen Medical College Hospital, Bijapur, Karanataka,

B. Duration of study

This study was conducted during a period of two years from November 2013 to October 2015.

C. Type of study

This is a Prospective study where in all the patients coming to OPD in 1st trimester for regular antenatal visits were selected. After obtaining the gestational age and informed consent of 100 patients in 1st trimester were randomly selected from the study. These patients fulfilled all the inclusion criteria.

D. Place of study

This study was conducted at Department of obstetrics and gynecology, Al Ameen Medical College Hospital, Bijapur.

1) Inclusion criteria

- < 13 weeks gestation.
- Singleton pregnancy.
- Primigravida / multigravida

2) Exclusion criteria

- Multifetal gestation.
- Known chronic disorders (diabetes and hypertension).
- Had previous bad obstetric history with known cause.

3) Ethical consideration

Blood samples were collected after obtaining the consent from them. The patients then selected were studied as per the proforma formulated. A detailed history was taken with regard to age, marital status, educational qualification, occupation, religion, personal hygiene, period of gestation and parity. Past history of Thyroid disorder, tuberculosis, hypertension and diabetes mellitus if any, were recorded.

E. Laboratory diagnosis

- Patients are sent for Thyroid Hormone Profile testing .
- If TSH increased and FT4 decreased then it is subclinical / overt hypothyroidism.
- If TSH Decreased and FT4 increased then it is hyperthyroidism,

- TSH, FT4 and FT3 measured by High-sensitive Radioimmunoassay.

III. HYPOTHYROIDISM

Subclinical hypothyroidism means increase in TSH with normal FT3 & FT4.

Overt hypothyroidism means increase in TSH with decrease in FT3 & FT4.

A. HYPERTHYROIDISM

Subclinical hyperthyroidism is defined as serum TSH concentration below the lower limit of reference range, with FT3 & FT4 concentration within normal range.

Overt hyperthyroidism is defined as serum TSH concentration below the lower limit of reference range, with increase in FT3 & FT4 concentration.

- Thyroid Peroxidase Antibody (TPOAb): less than 35 IU/ML
- Thyroglobulin Antibody (TgaAb): less than 20 IU/ml.

Pregnancy specific 1st trimester normal reference values:

	First trimester
FT3	3-5.7 pmol/L (1.9-3.5 pg/ml)
FT4	11.1-22.9 pmol/L (0.86-1.77 ng/dl)
TSH	0.03-2.3 µU/ml

American thyroid association (2007) recommends cut off values for TSH as,

- First trimester - < 2.5mIU/L (range 0.1 – 2.5)
- Second & third trimester - <3 mIU/L (0.2 – 3.0)
- Lower limit of normal – 0.04 mIU/L

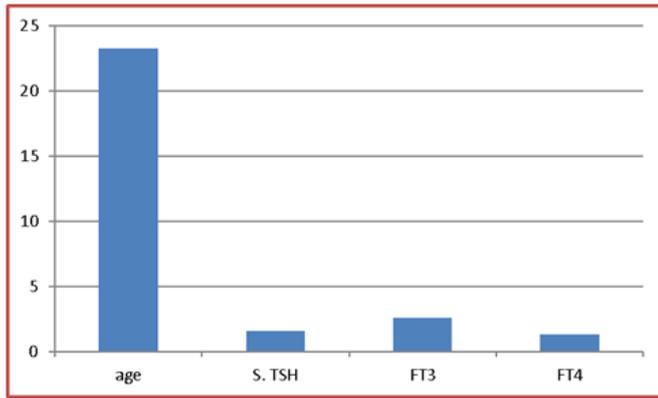
At the end the prevalence of thyroid disorders in pregnancy was noted.

IV. RESULTS

A total of 100 pregnant women in there first trimester were included in this study.

Table -1: Baseline characteristics of Pregnant women.

	Age	STSH	FT3	FT4
Mean	23.2700	1.5984	2.5900	1.3075
Std. Deviation	3.28097	.84381	1.33037	.92703
Minimum	17.00	.02	.70	.17
Maximum	30.00	5.70	5.20	3.30

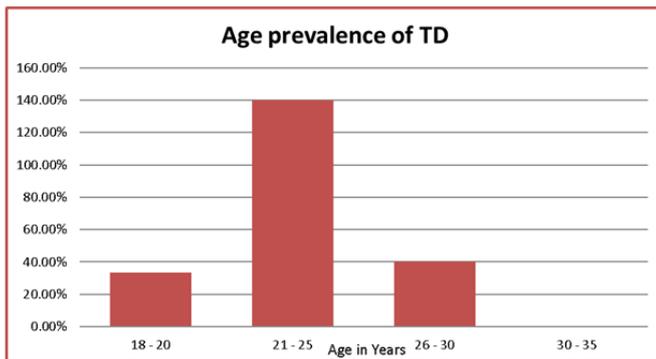


Graph -1:

Mean age, S TSH, FT3 and FT4

Table - 2 : Age related Prevalence of thyroid disorder in 100 pregnant women.

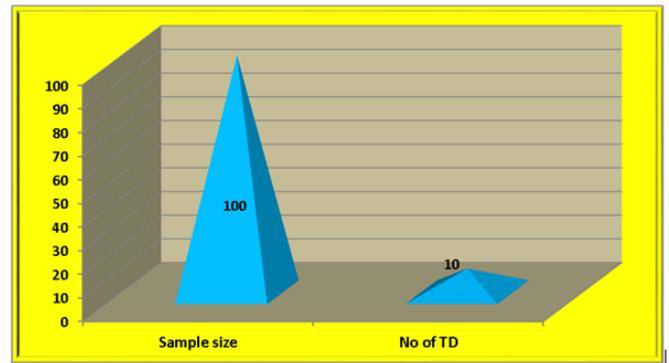
Age Group(years)	No. of TD	Percentage	Prevalence
18 - 20	1	1%	33.33%
21 - 25	7	7%	140%
26 - 30	2	2%	40%
31 - 35	Nil	Nil	Nil
Total	10	100%	



Graph - 2: Age Prevalence of TD among 100 pregnant women screened.

Table 3: Prevalence of TD among 100 pregnant women screened.

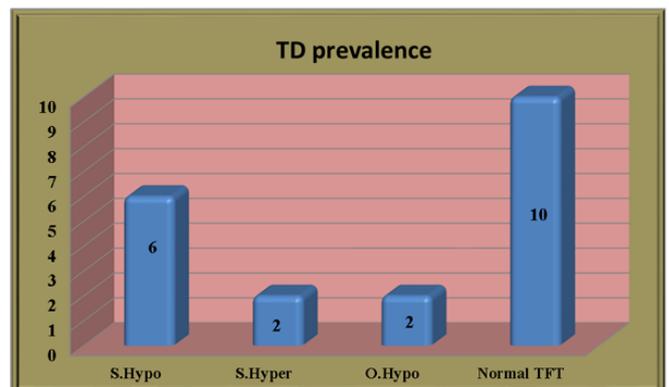
Sample size	No of TD	Percentage	Prevalence
100	10	10	10



Graph - 3: Prevalence of TD among 100 pregnant women screened.

Table 4: Prevalence of thyroid Disorder among 100 pregnancy

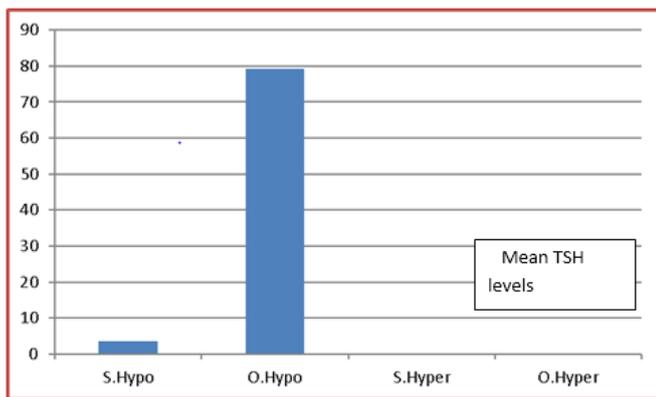
Types	Frequency	Prevalence
S.Hypo	06	6.0
S.Hyper	02	2.0
O.Hypo	02	2.0
Normal TFT	90	10.0
Total	90	90.0



Graph- 4 : Prevalence of Thyroid Disorder among 100 women screened.

Table -5: TSH levels in different types of Thyroid disorders

Types	No. of cases	Mean	SD
S. Hypo	6	3.50	2.43
O. Hypo	2	79.2	72.93
S. Hyper	2	0.05	0.07
O. Hyper	Nil	Nil	Nil



Graph -5: TSH levels in different types of Thyroid disorders

V. DISCUSSION

The present study was done at Department of Gynecology and Obstetrics, Al-Ameen Medical College and Hospital, Bijapur. A total of 100 patients were screened for thyroid disorders in this study.

It was prospective study. The main aim of the study was to know the prevalence of thyroid disorders in pregnancy. The prevalence of thyroid disorders in our study was 10%. Our findings are consistent Sahu MT et al⁴, who studied 633 women in second trimester. In their study the prevalence of thyroid disorders was also 12.7%, which is comparable to our study.

The prevalence of subclinical hypothyroidism in our study was 6%. In the study of Sahu MT et al⁴ the prevalence was 6.47%, which is comparable to our study. In a study done by Casey BM et al⁷, the prevalence was 23% which is very high and not consistent with our study.

The prevalence of overt hypothyroidism in our study was 2%, which is partly consistent with a study done by Sahu MT et al⁴, in which the prevalence is 4.58%.

The prevalence of subclinical and overt hyperthyroidism in our study was 2% & Nil respectively. In a study done by Sahu MT et al⁴, the prevalence was 0.9% & 0.7% for subclinical and overt hyperthyroidism. In a study done by Tuija mannisto et al⁸, the prevalence was 3.5% & 1.3% for subclinical and overt hyperthyroidism. The prevalence of subclinical

hyperthyroidism is comparable with other studies. The prevalence of Subclinical and Overt Hyperthyroidism was 0.5 and 0.4% respectively in a study done by Stagnaro Green A study⁹.

At present there is no available recommendations for detection or screening of thyroid dysfunction among Indian pregnant women. Recent consensus guidelines do not advocate universal thyroid function screening during pregnancy, but recommend testing for high risk women with personal history of thyroid or other autoimmune disorders or with a family history of thyroid disorders. Our study shows high prevalence of thyroid dysfunction, especially subclinical and overt hypothyroidism among Indian pregnant women with associated adverse pregnancy outcome.

Based on the results of the present study we therefore suggest for a decrease threshold for screening and detection of thyroid dysfunction among Indian pregnant women attending to routine antenatal clinic and to be potentially aware of associated maternal and fetal complications.

VI. CONCLUSION

Prevalence of thyroid disorders, especially subclinical hypothyroidism (6%), overt hypothyroidism (2%) and subclinical hyperthyroidism (2%) was high. To prevent adverse effects on maternal and fetal outcome, we emphasizing the importance of routine antenatal thyroid screening.

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