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A Study of Thyroid Profile among the First Trimeseter Pregnant Women Attending Teritary Care Hospital at SNMC Bagalkot: A Case Series Study

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ABSTRACT
The maternal thyroid dysfunction has an adverse impact on both maternal and fetal outcome. Therefore the evaluation of thyroid functioning during first trimester avoids complications both in mother and fetus. Hence the present study was conducted to assess the maternal thyroid functions (T3,T4 and TSH) during first trimester of pregnancy and also to determine the proportion of thyroid dysfunction in these subjects. A hospital based case series study conducted on 135 first trimester pregnant women, to evaluate the thyroid status in them and also to determine any thyroid abnormalities associated with it. There were 21(15.5%) of thyroid dysfunction cases with P>0.05 and one TPO ab positive among them in this study. According to period of gestation study reveals that higher the period of gestation age have significantly more number of thyroid dysfunction cases as compare to lower gestational age in relation with normal cases. A high proportion of only hypothyroid (15.5% hypothyroid range) was observed in first trimester of pregnancy, and hence a routine antenatal screening is suggested to diagnose the thyroid dysfunction at the earliest gestation.

INTRODUCTION

Thyroid gland is an important endocrine gland and plays a vital role in our life. Thyroxine is needed for cellular oxidation and neurophysiologic development. It regulates our body metabolism and hormone production[1].

Pregnancy is a physiological state, associated with significant, but reversible changes in thyroid function[2]. Pregnancy increases the demand on maternal thyroid gland. When the mother fails to cope up with the increased demands, she will develop hypothyroidism. Overt hypothyroidism is known to cause infertility and amenorrhea. But women with borderline or potential hypothyroidism present with problems due to hypothyroidism during pregnancy.

Thyroid dysfunction during pregnancy includes both maternal and fetal complications. Hypothyroidism is common in pregnancy. Its prevalence is estimated at about 2-3% and 0.3-0.5% for subclinical and overt hypothyroidism respectively[3].

The presentation of hypothyroidism is not always typical. During first trimester the fetus is reliant on transplacental passage of maternal thyroxine, as the fetal thyroid is not fully functional until 16 weeks of gestation. Neuropsychomotor development is impaired and mean IQ scores are reduced in children born to women who had thyroid deficiency during pregnancy. Pregnancy complications include spontaneous miscarriage, gestational hypertension, placental abruption and premature delivery[4].

Hyperthyroidism is known to occur in about 0.2-0.4% of all pregnancy and the commonest cause is grave's disease. But the hyperthyroidism has to be diffentiated from hyper dynamic state of pregnancy, gestational transient thyrotoxicosis. Gestational transient thyrotoxicosis is self limiting hyperthyroid state due to stimulatory effects of beta hCG[5].

Uncontrolled hyperthyroidism in pregnancy is associated with an increased risk of severe preeclampsia and four fold risk of low birth weight deliveries. Maternal hyperthyroidism may also result in fetal and neonatal hyperthyroidism[6].

Hence the present study intends to evaluate thyroid status in apparently normal first trimester of pregnant females during their first trimester to determine the abnormalities associated with thyroid functioning at the earliest and to initiate the measures that helps in preventing both maternal and fetal adverse outcomes.

MATERIALS AND METHODS

A hospital based case series study was conducted among 135 first trimester pregnant women attending to OBG OPD at S. Nijalingappa Medical College and hangal shri kumareshwar hospital and research centre, Bagalkot women confirmed by UPT will be selected randomly during December 2016 to may 2018 for the study.

Sample Size: 135 first trimester pregnant women

Inclusion Criteria for the Study Group:

- <13 weeks gestation.
- Singleton pregnancy.
- Age group of 18-45 years.

Exclusion Criteria for the Study Group:

- Known chronic disorders diabetes mellitus and hypertension.
- Pregnant women with known thyroid abnormalities and on treatment.
- Pregnant women not willing to give consent.

A detailed history will be taken regarding the symptoms and signs of thyroid disorders. Menstural history, obstetric history, past history, medical history, family history, personal history

- A thorough general physical examination with reference to Pulse, blood pressure, temperature, respiratory rate will be noted followed by Cardiovascular system, Central nervous system, Respiratory system, LOCAL THYROID examination and abdominal examination will be done.
- Women are sent for thyroid hormone profile testing FT3, FT4 and TSH by ELISA reader method.
- The normal range of TSH in first trimester is 0.1-2.5 µu/dl values outside this range will be considered abnormal. All such women will be asked to undergo Thyroid Peroxidase antibody testing.

Chemiluminescence Immune Assay31: Chemiluminescence involves the generation of electromagnetic radiation as light by the release of energy from chemical reaction. The light so generated from these chemical reactions can be emitted in ultraviolet, visible, infrared region but most commonly the light will be in the visible wavelength range.

Statistical Analysis: Independent 't' test: was used to compare quantitative variable like T3, T4 and TSH between any two groups or characteristics or variables ANOVA test: was used to compare quantitative variable like T3, T4 and TSH between any more than two groups or characteristics or variables.

RESULTS AND DISCUSSIONS

Study observed that, maximum number of cases 76(56.3%) were belongs to in the age group of 21-25 years and minimum no. of cases were 8(5.9%) belong to the age group of $\geq$31. The mean and SD of age was 24.5±3.57

Study observed that, maximum number of cases were multigravida 81 (60.0%). Out of which G2 were 51 (37.8%), G3, G4 and G5 cases were 21 (15.5%), 7 (5.2%) and 2 (1.5%) respectively. There were 54 (40.0%) of primi cases.

Study observed that, maximum number of cases 68 (50.4%) were belongs to in the gestational age group of 9-11 weeks and minimum no. of cases (8.9%) belonged to the gestational age group of ≥12 weeks. The mean and SD of gestational age was 10.20±1.43

Study observed that, there were 21 (15.5%) of thyroid dysfunction cases in the study. The proportion of thyroid dysfunction with normal cases were 5.4:1 and the hospital incidence rate of thyroid dysfunction in first trimester pregnant women was 15.5% Study reveals that, there was no statistical significance difference of normal and thyroid dysfunction cases in relation with age (P>0.05).

Study reveals that, there was statistically very highly significance association normal and thyroid dysfunction cases in relation with period of gestation (P<0.001). Higher the period of gestation age have significantly more number of thyroid dysfunction cases as compare to lower gestation age in relation with normal cases.

Study observed that, there were 20 (95.2%) of thyroid dysfunction cases in which TPO was done and found out to be negative. Only one case 1(4.8%) had positive TPO among thyroid dysfunction in the study. In the study hospital TPO rate was 4.8%.

Study reveals that, there was statistically very highly significance difference of mean TSH values among

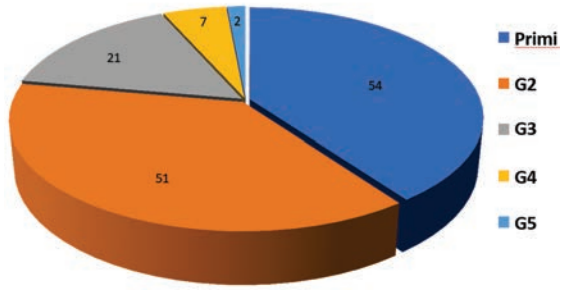

Fig. 1: Represents Obstetrics Parity wise Distribution of Cases

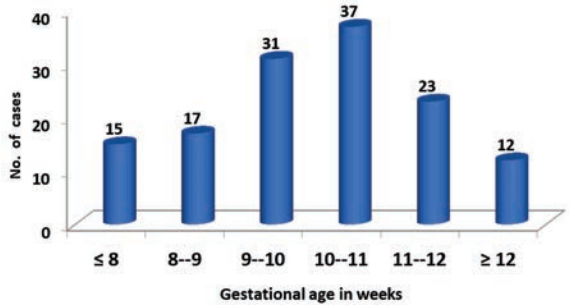

Fig. 2: Represents Period of Gestation wise Distribution of Cases

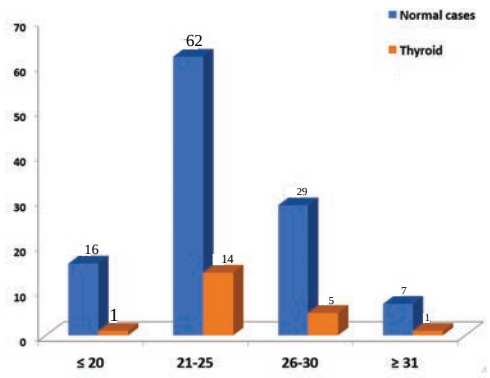

Fig. 3: Represents age wise Comparison of Normal and Thyroid Dysfunction

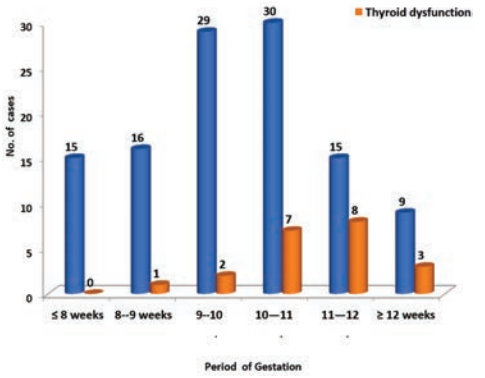

Fig. 4: Represents Comparison of Period of Gestation with Normal and Thyroid Dysfunction

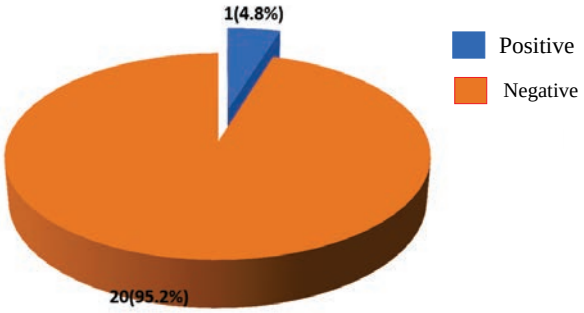

Fig. 5: Represents TPO wise Distribution of Thyroid Dysfunction Cases

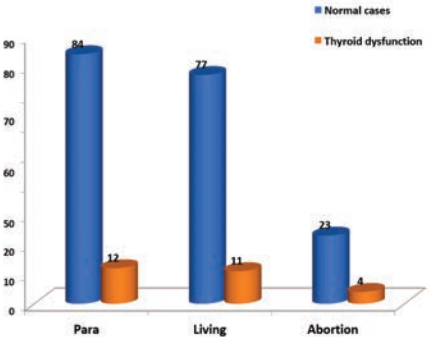

Fig. 6: Represents Comparison of Para, Living and Abortion Cases with Normal and Thyroid Dysfunction cases

normal and thyroid dysfunction cases (P<0.001). The mean TSH values of thyroid dysfunction were significantly higher as compare with mean TSH normal values.

Study reveals that, there were no statistical significance difference of mean FT3 and FT4 values among normal and thyroid dysfunction cases (P>0.05).

Study reveals that, there were no statistical significance difference of Para, Living and Abortions among normal and thyroid dysfunction cases (P>0.05).

The age distribution of the subjects., majority of the subjects were in the age group of 21-25 years (56.3%). Among the study, it was observered that 54 (40%) were primigravida and 81% (60%) were multigravida. which were divided based on number of gravidity. It was observed that 68(50.4%) were belong to in gestation age group of 9-11 weeks. This is similar to study conducted by Nambiar[7] which showed that mean gestational age at presentation was 10.03±1.87 wks. Study observed that, there were 21 (15.5%) of thyroid dysfunction cases in the study.

The proportion of thyroid dysfunction with normal cases were 5.4:1 and the hospital incidence rate of thyroid dysfunction in first trimester pregnant women was 15.5% Study reveals that, there was no statistical significance difference of normal and thyroid dysfunction cases in relation with age (P>0.05).

Study reveals that, there was statistically very highly significance association normal and thyroid dysfunction cases in relation with period of gestation (P<0.001). Higher the period of gestation age have significantly more number of thyroid dysfunction cases as compare to lower gestation age in relation with normal cases. Study observed that, there were 20 (95.2%) of thyroid dysfunction cases have negative TPO among thyroid dysfunction. Only one case 1(4.8%) had positive TPO among thyroid dysfunction in the study. In the study hospital TPO rate was 4.8%. Similar study done by Dinesh K. Dhanwan, Sudha Prasad[8] screened 1000 pregnant women in first trimester. If TSH was deranged, then free T4 and T3 and thyroid peroxidase antibody were done. Their result showed that prevalence of thyroid dysfunction was high in this study, with subclinical hypothyroidism 13.5%, overt hypothyroidism 0.7%, thyrotoxicoses 0.3% and TPO Ab was positive in 6.82% of total, 18.5% of subclinical and 71% overt hypothyroid patients.

Comparison of mean TSH, FT3 and FT4 with normal and thyroid dysfunction. Study reveals that, there was statistically very highly significance difference of mean TSH values among normal and thyroid dysfunction cases (P<0.001). The mean TSH values of thyroid dysfunction were significantly higher as compare with mean TSH normal values. Study reveals that, there were no statistical significance difference of mean FT3 and FT4 values among normal and thyroid dysfunction cases (P value were >0.05).

Comparison of Para, Living and Abortion cases with normal and thyroid dysfunction cases. Study reveals that, there were no statistical significance difference of Para, Living and Abortions among normal and thyroid dysfunction cases (P>0.05).

The observations of present study is similar to the study conducted by Nambier[7], who reported the prevalence of hypothyroidism and thyroid autoimmunity as 4.8% and 12.8% respectively.

This study is also in favour of study conducted by sahasrabuddhe[9] who reported the prevalence of hypothyroidism as >10%. A study done by Mukhopadhyay[10] reported the incidence of hypothyroidism in pregnancy about 3.69% unlike the observations found in the present study.

A study by Goel[11] reported the prevalence of hypothyroidism of about 6.3% which is in favour of the findings of the present study. A study done by Shah[12] reported the prevalence of hypothyroid in 4.4% and overt hyperthyroidism in 0.6% in their study subjects which is quite less compared to the observations of the present study.

The subjects in hyperthyroid state could be due to gestational transient thyrotoxicosis (GTT) which occurs in 1-3% of pregnancies, due to elevated hCG levels or due to overt hyperthyroidism which occurs in 0.4-0.7 % of pregnancies.

This is in support of the fact that there is a high prevalence of gestational thyrotoxicosis in Asian women during 8-11weeks of gestation than during 1214weeks[13].

CONCLUSION

Applying ATA guidelines for TSH values in the present study showed that 84.44% were eythyroid, 15.5% were hypothyroid among them only was TPO ab positive state. The thyroid dysfunction determined based on TSH values (as per ATA guidelines) is quite high. This indicates proportion of the thyroid dysfunction present in the local population. Further studies are required in this regard in a larger population so that gestational age specific reference intervals can also be established for local population of particular geographic area to avoid misinterpretation of thyroid function tests during first trimester of pregnancy.

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