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Study of Prevalence of Thyroid Disorders in Pregnant Females of a Tertiary Care Hospital of Garhwal Region of Uttarakhand.

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ABSTRACT

Background: In our country there is paucity of studies related to thyroid dysfunctions in pregnancy. Hence the present study was planned to evaluate the prevalence of thyroid disorders in second trimester of pregnancy. **Methods:** Assay of FT3, FT4 and TSH were done in 100 pregnant women in their second trimester of pregnancy selected from Obstetrics & Gynaecology OPD. **Results:** Out of total 100 women, 35 (35%) had sub-clinical hypothyroidism and 32 (32%) of them had overt hypothyroidism. None of the women had either sub-clinical hyperthyroidism or overt hyperthyroidism. **Conclusion:** Universal screening in pregnancy should be done in country like India for thyroid disorders as the prevalence of these undiagnosed thyroid dysfunctions is high.

Keywords: Pregnancy, second trimester, thyroid disorder

INTRODUCTION

Detection of thyroid disorders in pregnancy is of utmost importance just because of its crucial effects on maternal and foetal wellbeing. In our country there is paucity of studies related to thyroid dysfunctions in pregnancy. Hence the present study was planned to evaluate the prevalence of thyroid disorders in second trimester of pregnancy. The most frequent thyroid disorder in pregnancy is maternal hypothyroidism. It is associated with fetal loss, placental abruptions, preeclampsia, preterm delivery and reduced intellectual function in the offspring.[1] There is a wide geographic variation in prevalence of hypothyroidism during pregnancy. It varies from 2.5% from the west to 11% from India.[2-10]

MATERIALS AND METHODS

The study was conducted in the Department of Biochemistry, Himalayan Institute of Medical Sciences (HIMS), Swami Ram Nagar, Dehradun, uncomplicated intrauterine singleton pregnancies over a period of 12 months. The subjects were 100 pregnant women in their second trimester with without any history of thyroid disease or intake of any thyroid medication , selected from Obstetrics and Gynecology OPD, HIMS, Dehradun. Prior approval from ethical committee was obtained and written informed consent of the pregnant women were taken before collection of the data.

Peripheral venous blood samples were collected under basal conditions and after taking aseptic precautions. Following biochemical investigations were done for all the pregnant women:

- Free Triiodothyronine (FT3): by two step Immunoenzymatic assay.[11]
- Free Thyroxine (FT4): by two step Immunoenzymatic method.[11]
- Thyroid stimulating hormone (TSH): by two step Immunoenzymatic method.[11]

The FT3 assay was done by a competitive binding immunoenzymatic assay and FT4 assay was done by a twostep enzyme immunoassay on Access-2 fully automated chemiluminescence analyzer marketed by Beckman Coulter, India (Pvt.) Ltd.

TSH assay was done by a twostep immunoenzymatic – 'sandwich assay' on Access-2 fully automated chemiluminescence analyzer marketed by Beckman Coulter, India (Pvt.) Ltd.

The analytical sensitivities for FT3, FT4 and TSH were 0.2 pg/ml, 0.1 ng/dl and 0.010 µIU/ml respectively. Intra assay coefficients of variation for

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FT3, FT4, TSH were 3.8%, 2.20% and 5.2% respectively. Laboratory reference range for FT3, FT4 and TSH were 2.3-4.2 pg/ml, 0.89-1.76 ng/dl and 0.35-5.5 mIU/L, respectively.

Trimester specific cut off value for TSH in second trimester of pregnancy i.e. 0.2-3.0 mIU/L was used to diagnose hypothyroidism and hyperthyroidism.[12]

Women with FT3, FT4 below the reference range along with elevated TSH were classified as having overt hypothyroidism while those having FT3, FT4 in normal range with TSH more than 3.0 mIU/L were diagnosed having subclinical hypothyroidism. Women with FT3, FT4 above the reference range along with TSH value <0.1 mIU/L were classified as having overt hyperthyroidism while those having FT3, FT4 in normal range with TSH <0.1 mIU/L were diagnosed as having sub clinical hyperthyroidism.

Table 1: According to the above criteria the details are depicted in the following.

Category	Frequency	Percentage
Sub-clinical Hypothyroidism	35	35%
Overt Hypothyroidism	32	32%
Normal	33	33%
Sub-clinical Hyperthyroidism	NIL	-
Overt Hyperthyroidism	NIL	-

RESULTS

In the present study 100 pregnant females were included. Mean maternal age was 26.6±4.13 years. 45% of women were primigravida and 55% were multigravida. The median FT3, FT4 and TSH were 2.1 pg/mL, 0.88 ng/dL and 3.485 mIU/L, respectively.

35 (35%) women had sub-clinical hypothyroidism and 32 (32%) of women had overt hypothyroidism whereas none of the women had either sub-clinical hyperthyroidism or overt hyperthyroidism.

DISCUSSION

Our study demonstrates a high prevalence of undiagnosed thyroid dysfunction in the second trimester of pregnancy. Out of total 100 women, 35 (35%) had sub-clinical hypothyroidism and 32 (32%) of them had overt hypothyroidism. None of the women had either sub-clinical hyperthyroidism or overt hyperthyroidism. In a large Chinese study, where 2899 pregnant women were included, the prevalence of hypothyroidism was significantly higher in the high-risk group than in the non-high risk group (10.9 vs 7.0%, P=0.008).[5] Dhanwal et al.[6] discovered that 14.3% women attending a tertiary public hospital in Delhi, India had hypothyroidism and a majority of those had sub-clinical hypothyroidism. In Asian countries, the probable reasons for more prevalence of hypothyroidism are increased iodine intake in diet as suggested by Chinese study, presence of goitrogens in diet as reported from India and micronutrient deficiency that may cause hypothyroidism and goitre.[12-14]

Prevalence of hypothyroidism is variable in India. Bandela et al.[7] from Andhra Pradesh reported 10% prevalence of sub-clinical hypothyroidism. Gayatri et al.[8] reported 2.8% prevalence of sub-clinical hypothyroidism. This variability may be due to different upper limit cut –offs used for TSH.

According to recent Endocine Society guidelines for thyroid dysfunction in pregnancy published in 2012, the recommended reference range for normal TSH in second trimester of pregnancy is 0.2-3.0 mIU/L.[12] By using these trimester specific cut off we have found high prevalence of sub-clinical hypothyroidism in our study as 35% (35/100) as compared to various other Indian studies where a higher cut off using non-pregnant kit reference values had been used. This also correlates well with the study done by Rajesh rajput et al in 2015.[15]

Hyperthyroidism is far less common than hypothyroidism. The frequency of the disorder is relatively low, occurring in only 0.5-2/1000 pregnancies.[16] Rajesh rajput et al in their study found 15 (3.3%) and 2 (0.4%) of pregnant women having newly diagnosed sub-clinical and overt hyperthyroidism, respectively.[15] Unlike that ,we found none of the women in the present study having either sub-clinical hyperthyroidism or overt hyperthyroidism.

CONCLUSION

Thus, the most common thyroid disorder detected in our study is hypothyroidism specially sub-clinical hypothyroidism. Keeping in mind this fact and the maternal as well as foetal impact of thyroid disorders, prompt identification of thyroid disorders and timely treatment is mandatory. Therefore, universal screening in pregnancy should be done in our country for thyroid disorders as the prevalence of these undiagnosed thyroid dysfunctions is high.

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