

Thyroid profile in pregnancy

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Abstract

Background: Thyroid gland plays a critical role in cell differentiation during development and health maintaining thermogenic and metabolic homeostasis in the adult. Hypothyroidism occurs in 1 to 2 percent of pregnant females and hyperthyroidism in 0.2%. **Aims and Objectives:** To monitor thyroid profile in healthy pregnant women. **Material and Methods:** 600 women of 18 to 32 age group attending antenatal clinic and admitted as indoor patients was selected for study. Their thyroid hormone level was checked in all three trimesters. **DISCUSSION:** The women in this study ranged from 18 to 32 years. Majority of the patients were in the age group 24 to 26 years. Another study in India evaluated 124 pregnant women using Radioimmunoassay showed increase in TSH progressively with each trimester. **Conclusion:** it is important that thyroid function tests in pregnancy should be interpreted against gestational age related reference intervals and this can decrease the possibility of the misinterpretation of thyroid function tests in pregnant women.

Key words: Thyroid Profile, Pregnancy.

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INTRODUCTION

Thyroid gland plays a critical role in cell differentiation during development and health maintaining thermogenic and metabolic homeostasis in the adult. Thyroid gland is under continuous stress and strain in the women of child bearing age thereby increasing the vulnerability of this gland for dysfunction. The female sex is susceptible from all ages from womb to tomb from the ravages of autoimmune thyroid epidemic. Thyroid disorders are observed 4 to 5 fold more frequently in women with compared with men especially during child bearing period. Pregnancy poses an important challenge to maternal thyroid gland as hormonal requirements are increased during gestation. Hypothyroidism occurs in 1 to 2 percent of pregnant females and hyperthyroidism in 0.2%. Neuroendocrine development of foetus is depends on thyroid hormone. Foetus remains dependant on mother for ingestion of adequate amount of iodine which is essential to make

thyroid hormone. Thyroid function tests changes during pregnancy due to 2 main hormones hCG and estrogen. The peak rise in hCG and nadir in serum TSH occurs together at 10 to 12 weeks of gestation. Thyroid increases in size during pregnancy. Several complex etiological changes take place during pregnancy which tends to modify function of thyroid gland. This study aims to evaluate variation in thyroid function tests during different trimester of pregnancy.

MATERIAL AND METHODS

Study was undertaken in Department of obstetrics and gynaecology DMCH and laboratory associated with DMCH. Study population was selected from patients attending antenatal clinic of DMCH Laheriasarai. The duration of study was one year from Oct 2015 to Nov 2016. Sample size was 600 patients. 600 women of 18 to 32 age group attending antenatal clinic and admitted as indoor patients was selected for study. Their thyroid hormone level was checked in all three trimesters. The parameters studied were serum T3 T4 TSH and was measured by double sandwich Elisa method.

OBSERVATION AND RESULTS

Table 1: Distribution of total patients in this study according to their age

Age (years and group)	No of women (n=600)	Percentage
18-20 GROUP A	135	22.4
21-23 GROUP B	128	21.3
24-26 GROUP C	136	22.7
27-29GROUP D	96	16

30-32 GROUP E	105	17.6
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Table 2: MEAN VALUES OF TSH (mIU/MI) across 3 trimesters (n=600)

Trimester	Mean value
1 st	1.69
2 nd	2.66
3 rd	3.52

Table 3: MEAN VALUE OF TSH mIU/ml ACROSS THE THREE TRIMESTER in different age groups

Age (year and group)	1 st trimester	2 nd trimester	3 rd trimester
18- 20 GROUP A	1.69	2.40	3.44
21-23GROUP B	1.76	2.80	3.60
24-26GROUP C	1.81	2.87	3.66
27-29GROUP D	1.69	2.69	3.37
30-32GROUP E	1.55	2.55	3.51

Table 4: Mean value of T4 nmol/l ACROSS the THREE TRIMESTER in different age groups

Age (year and group)	1 st trimester	2 nd trimester	3 rd trimester
18-20	164.22	196.08	140.02
21-23	169.45	205.45	140.77
24-26	166.63	198.33	135.43
27-29	172.35	192.66	139.20
30-32	175.96	194.34	145.58

Table 5: Mean value of T3 nmol/l across the three trimester in different age groups

Age (year and group)	1 st trimester	2 nd trimester	3 rd trimester
18-20	1.94	2.65	1.74
21-23	1.97	2.81	1.75
24-26	1.98	2.78	1.72
27-29	1.96	2.72	1.76
30-32	1.99	2.76	1.71

Table 6: Range of TSH T3 T4 in different trimesters of pregnancy

Trimester	TSH(mIU/mL)	T3(nmol/l)	T4(nmol/l)
1 ST	0.53-2.5	1-2.88	113.52-200.140
2 ND	1.75-3.42	0.78-3.65	98.94-254.100
3 RD	2.23-4.63	1.10-3.00	91.46-193.670

DISCUSSION

The changes caused by pregnancy in the mother established a new homeostasis equilibrium starting when the zygote is implanted and only ending at the puerperium. According to the ACOG thyroid disorders are the second most frequent endocrine disorder in child bearing age women. The value of serum T3 T4 and TSH in nonpregnant women are not applicable during pregnancy and also differ in iodine deficient area. Goitre frequently accompanies pregnancy in geographic areas with iodine deficiency, but not in iodine replete areas. During this study period 600 pregnant women upto 3rd trimester were evaluated. The women in this study ranged from 18 to 32 years. Majority of the

patients were in the age group 24 to 26 years. Another study in India evaluated 124 pregnant women using Radioimmunoassay showed increase in TSH progressively with each trimester. Kumar A *et al* also show that mean TSH level rose progressively through the trimester of pregnancy. Mean TSH level were seen to rise progressively through the 3 trimesters of pregnancy from 1.20mIU/mL in the 1st trimester to 2.12 in the 2nd trimester and further to 3.30 in the 3rd trimester of pregnancy. In the present study mean TSH was 1.69mIU/mL in 1st trimester, 2.65 in 2nd and 3.49 in 3rd. T4 and T3 levels increased significantly during 1st half of gestation. In this study mean T3 in 1st trimester was 1.98nmol/l, 2.73 in 2nd trimester and 1.75 in 3rd. In the present study mean T4 value was 167.99nmol/l in 1st trimester, 197.82 in 2nd and 141.86 in 3rd. The present study revealed that age does not affect trimester specific change in thyroid hormone level during pregnancy.

CONCLUSION

Association of thyroid dysfunction in pregnant women suggest evaluation of thyroid status for all of them. Inclusion of serum TSH as a screening test for hypothyroidism during the antepartum period at the time of 1st antenatal checkup. Age doesnot affect trimester specific changes in thyroid hormone level during pregnancy. Mean TSH level rises progressively through the 3 trimesters of pregnancy. Mean T3 level increases during the 2nd trimester and then declines in the 3rd trimester compared to the 1st trimester. Mean T4 level rises in the 2nd trimester and then decreases during the 3rd trimester. In conclusion it is important that thyroid function tests in pregnancy should be interpreted against gestational age related reference intervals and this can decrease the possibility of the misinterpretation of thyroid function tests in pregnant women.

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