

Study of thyroid stimulating hormone (TSH) in pregnancy in Telangana population

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Abstract

Background: Thyroid dysfunction is commonly encountered in pregnancy and can affect maternal and foetal outcomes.

Method: 95 pregnant women were evaluated clinically. TSH, free T₄, TPO antibody test were carried out. TSH, free T₄ were estimated by chemiluminescence using immulite 100 TSH assay was used with normal range of 0-4-4.0 ml U/L/ the lower detection limit was 0.004mlU/L. Normal Thyroid values were followed by the guide lines of American Thyroid association. **Results:** 46 (48.4%) had normal thyroid status, 24 (25.2%) had SCH 15 (15.7%) OH, 6 (6.3%) Hyperthyroidism. 4 (4.20%) GTT. The clinical manifest station were – Dry skin was in 2 (8.3%) in SCH, 3 (20%) in OH. Cold intolerance was in 3 (12.5%) in SCH, 4 (2.66%) in OH, puffiness – 2 (8.3%) in SCH, 2 (13.3%) in OH, Parasthesis 2 (13.3%) in OH, 2 (33.3%) in Hyperthyroidism weight loss in 2 (33.3%) in Hyperthyroidism, constipation 4 (16.6%) in SCH, 3 (20%) in OH, Goitre 6 (13%) in Normal, 5 (20.8%) in SCH, Hyper emesis 1 (2.5%) in GTT **Conclusion:** This TSH study in pregnant will be helpful to obstetric and Gynaecologist, Endocrinologist to treat such patients efficiently and prevent various risk for foetus and maternal health.

Keywords: TSH, Free T₄, GTT, SCH, OH, Hyperthyroidism.

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INTRODUCTION

It is well documented that maternal thyroid dysfunction is associated with adverse outcomes in the mother and foetus, including miscarriage, preterm delivery, eclampsia, pre-eclampsia and placental abruption.^{1,2} Decreased availability of maternal thyroid hormone may also impair neurological development of foetus including SCH, OH, GTT⁽³⁾. On the other hand hyperthyroidism also at the increased risk for spontaneous miscarriage if un-treated,

moreover congestive heart failure, thyroid storm, preterm birth, foetal growth restriction, increased perinatal morbidity and mortality.⁴ Overt Hypothyroidism leads to endemic iodine are often associated with hypothyroxinemia. Untreated OH in Pregnancy has increased risk for premature birth low birth weight and miscarriage.⁵ Hence it was mandatory to evaluate the thyroid dysfunction during pregnancy for normal growth of foetus and safeguard the health of mother too.

MATERIAL AND METHOD

95 Pregnant women regularly visiting obstetrics and Gynaecology department of Medciti Institute of Medical Sciences Ghanpur Medchal-501401 Telangana were studied.

Inclusive Criteria: Pregnant women irrespective of gestation age having symptoms of thyroid hormones abnormalities were selected for study.

Exclusion Criteria: The pregnant women already on thyroid treatment (medication), history of Diabetes

mellitus, hypertension or any chronic illness were excluded from the study.

Method: Clinical evaluation was done to look for features thyroid dysfunction including goitre. The gestational age and expected delivery date was noted in every patient 2 ml blood was collected and analysed for TSH, free T₄ and anti TPO antibody (Thyroid peroxide antibodies) in their first visit. TSH and free T₄ was planned to be repeated at necessary intervals TSH and free T₄ were estimated by chemiluminiscene using immolate 1000. TSH assay was used with normal range of 0.4 – 4.00 ml U/L. The lower detection limit was 0.0004 ml U/L. The intra assay coefficient of variation was 4.5% and inter assay coefficient of variation was 8% Free T₄ was estimated by immulite 1000 with a normal range of 0.89 – 1.76 mg/dL. The intra assay coefficient variation was 4.5% and inter assay coefficient of variation was 8% Ant TPO antibody was done by chum luminescence method (immulite 1000). The lower detection limit was 7 IU/mL. Anti TPO > 150 IU/mL was taken as positive.

As per guidelines of American Thyroid association 2011

- Normal pregnancy specific reference range for TSH is 0.1-2.5 ml U/L in the first trimester
- 0.2 – 3.00 ml U/L in the second trimester
- 0.3 – 3.0 ml U/L in the third trimester

Hyperthyroidism was defined as suppressed TSH < 0.1 ml U/L with normal or elevated fT₄.

- Gestational Thyrotoxicosis (GTT) was diagnosed in women first trimester with suppressed TSH

with subsequent normalisation and no clinical sign's for gave disease.

The duration of study was about 2 years (July-2018 to August-2020)

Statistical analysis: Various findings were classified with percentage. The analysis was carried out in SPSS software. This research paper was approved by ethical committee of Mediciti Institute of Medical Sciences Ghanpur Medchal-501401, Telengana.

OBSERVATION AND RESULTS

Table-1: Normal laboratory profile of Thyroid Hormone.

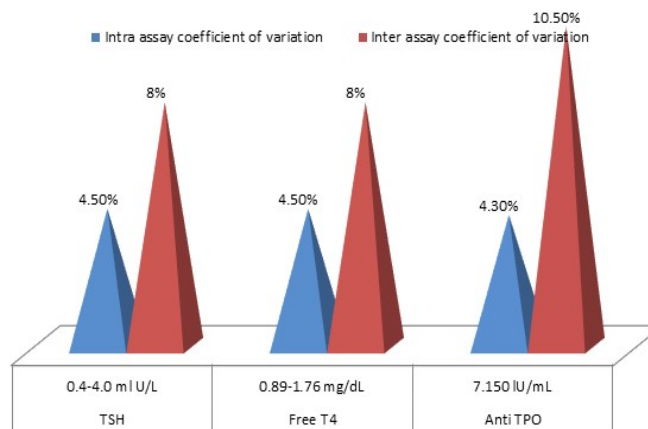
Table-2: Normal value of TSH in each trimester

Table-3: Study of thyroid hormone in pregnant women 46 (48.4%) were normal, 24 (25.2%) had SCH, 15 (15.7%) had OH, 6 (6.31%) had hyperthyroidism, 4 (4.21%) had GTT.

Table-4: Clinical manifestations in pregnant women (a) Dry skin – 2 (8.3%) in SCH, 3 (20%) in OH, (b) cold intolerance – 3 (12.5%) In SCH, 2 (13.3%) in OH, (c) Puffiness – 2 (8.3%) in SCH, 2 (13.3%) in OH (d) Parasthesis – 2 (13.3%) in OH and 2 (33.3%) in Hyperthyroidism (e) Weight loss – 2 (33.3%) in Hyperthyroidism (f) Constipation – 4 (16.6%) in SCH, 3 (20%) in OH (g) Goitre – 6 (13%) in Normal, 5 (20.8%) in SCH, (h) Hyper emesis – 1 (25%) in GTT Hyperthyroidism.

Table 1: Normal laboratory ranges of Thyroid assay

Test	Normal range	Intra assay coefficient of variation	Inter assay coefficient of variation
TSH	0.4-4.0 ml U/L	4.5 %	8 %
Free T4	0.89-1.76 mg/dL	4.5 %	8 %
Anti TPO	7.150 IU/mL	4.3 %	10.5 %



Graph 1: Normal laboratory ranges of Thyroid assay

Table 2: Normal values in each trimester

Trimester	FSH
First trimester	0.1-2.5 ml U/L
Second trimester	0.2-3.0 ml U/L
Third trimester	0.3-3.0 ml U/L

Table 3: Status of thyroid Hormone in pregnant women

Status	No. of patients (95)	Percentage (%)
Normal status	46	48.4
SCH	24	25.2
OH	15	15.7
Hyperthyroidism	06	6.31
GTT	04	4.21

SCH= Subclinical Hypothyroidism, OH= Over Hypothyroidism, GTT= Gestational Thyrotoxis

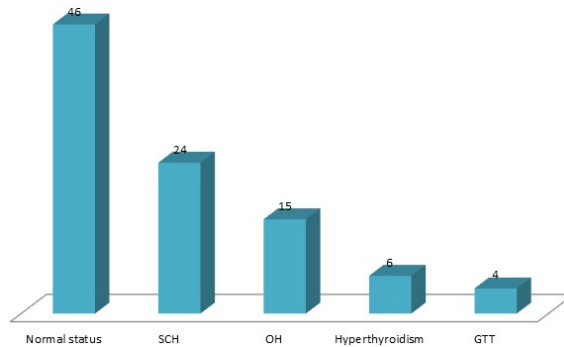


Table 3: Status of thyroid Hormone in pregnant women

Table 4: Clinical Manifestations in Thyroid dysfunction (No. of patients: 95)

Sl No	Symptoms	Normal 46	SCH 24	OH 15	Hyperthyroidism 6	GTT 04
a	Dry skin	--	2 (8.3%)	3 (20%)	--	--
b	Cold intolerance	--	3 (12.5%)	4 (26.6%)	--	--
c	Puffiness	--	2 (8.3%)	2 (13.3%)	--	--
d	Paresthesia	--	--	2 (13.1%)	--	--
e	Weight loss	--	--	--	2 (33.3%)	--
f	Constipation	--	4 (16.6%)	3 (20%)	--	--
g	Goitre	6 (13%)	5 (20.8%)	3 (20%)	2 (33.3%)	--
h	Hyper emesis	--	--	--	--	1 (25%)

DISCUSSION

In the present study of TSH in pregnancy in Telangana Population. The normal status women were 46 (48.4%), 24 (25.2%) SCH, 15 (15.7%) OH, 6 (6.31%) Hyperthyroidism, 4 (4.21%) GTT (Table-3). The clinical manifestation were Dry-skin was observed in 2 (8.3%) in SCH, 3 (20%) in OH, cold intolerance, 3 (12.5%) in SCH, 4 (26.6%) in OH, Puffiness 2 (13.3%) in OH, 2 (33.3%) in Hyperthyroidism, parenthesis 2 (13.3%) in OH, 2 (33.3%) in Hyperthyroidism weight loss 2 (3.33%) in Hyperthyroidism, Constipation 6 (13%) in Normal, 5

(20.8%), 3 (20%) in OH, 2 (33.3%) in Hyperthyroidism, 1 (25%) Hyper emesis in GTT (Table-4). These findings were more or less in agreement with previous studies. There are two common causes of Hyperthyroidism in pregnancy are to Grave Disease (GD), due to thyroid stimulation by TRAbs and GTT. GTT influence elevated human chorionic gonadotrophin (HCG) levels during pregnancy which causes thyrotoxis symptoms⁽⁹⁾ while GD causes sleeplessness, anxiety fatigue, weight loss, presence of goitre, ocular changes¹⁰. Auto immune thyroiditis remains the most common cause for both hypothyroidism

and Hyperthyroidism. WHO recommends 200 micrograms of daily iodine intake by mother. The *foet al.* thyroid gland begins to produce thyroid hormone at about 10 to 12 weeks of gestation, so during first trimester, foetus depends on maternal supply of thyroid hormones which is necessary for *foet al.* growth. From second trimester onwards demand is met by mother and foetus¹¹. The availability of thyroxin to the developing *foet al.* neuron is vital for their maturation and proper function. Maternal alteration in thyroid function, OH or SCH, can adversely affect the foetus directly by way of trans placental passage of abnormal level of maternal hormone, thyroid antibodies or prescribed medication or indirectly by way of altered physiology. Serum T₃ and T₄ levels rise 30 minutes after delivery and persist for 5 days. This is due to TSH elevation caused by stress delivery. So new born screening should be done from the cord blood or 5 days after delivery.¹²

SUMMARY AND CONCLUSION

Although screening of thyroid dysfunction is not yet for recommendation, it should be considered for the prediction of un-wanted consequences. TSH level study is sufficient and should be done pre conceptionally or early in first trimester. But this study demands further hormonal, genetic, patho-physiological study because there are no exact parameters to find out the quantum of hormones.

REFERENCES

1. Davis LE, Levano KJ – Hyperthyroidism complication pregnancy, obstetrics and Gynaecology 1998, 72 (1). 108-112.
2. Leung A S, Millar LK – Perinatal outcome in Hypothyroidism, pregnancies – obstr. and Gynae. 1993, 81 (3), 349-353.
3. Haddow JE, Palomaki GE – Maternal thyroid deficiency during pregnancy and subsequent neuropsychological development of the child. The new England J of Medicine. 1999, 341 (8), 549-555.
4. Davis LE, Kucas MS – Thyrotoxicosis complicating Pregnancy Am. J. of Obg. 1989, 160 (1), 63-70.
5. WHO Assessment of iodine deficiency disorders and monitoring their elimination. A guide for programme managers, 3rd edition Geneva Switzerland WHO 2007.
6. Burrow G N – Thyroid function and hyper function during gestation Endocrine reviews 1993, vol. 14 (2), 194-202.
7. Le Beau and SI Mendel – Thyroid disorder during pregnancy. Endocrinology and metabolism clinics North America 2006, 35 (1), 117-136.
8. Hallowell NW, Staehling WD – Serum TSH, T4 and thyroid antibodies in the united endocrinology and metabolism 2002, vol. 87 (2), 489-499.
9. Cooper DS, Lau berg F – Hyperthyroidism in pregnancy. Lancet Data base Endocrinal. 2013, 1, 238-49.
10. Marx H, Amin P – Hyperthyroidism and pregnancy Brit. Med. J. 2008, 336, 663-7.
11. Van den Boodaard E, Vissenger R – Pregnancy thyroid screening: significance of (sub) clinical thyroid dysfunction and thyroid and in early pregnancy J. of Hum. Reprod. Update 2011, 17, 605-19.
12. Wang W, Teng W, Shan Z – The prevalence of thyroid disorders during early pregnancy in china. The benefits of universal screening in the 1st trimester of pregnancy Eur. J. Endocrinal. 2011, 164, 263-8.

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