



TO STUDY MEAN THYROID STIMULATING HORMONE(TSH) LEVELS IN PREGNANT PATIENTS IN INDIA

Biochemistry

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ABSTRACT

AIMS AND OBJECTIVES: Thyroid disorders are common in pregnancy and associated with adverse maternal and foetal outcome. This study aims to find mean TSH values in pregnant patients blood sample coming to our biochemical lab. **MATERIALS AND METHODS:** The study comprised of 500 pregnant women. free t4, serum TSH and TPOab were estimated in addition to routine investigations. Patient in any gestational week and singleton pregnancy were enrolled for study. **RESULTS:** Patients with low ft4 and tsh> trimester specific range [2.5 for first and 3.0 for second and third trimesters] were considered overt hypothyroid; those with normal ft4 and increased tsh were considered subclinical hypothyroidism. Among 500 patients screened 64 patients were found to have thyroid disorders, prevalence being 12.8%. **CONCLUSION:** There is a high prevalence of thyroid dysfunction. Universal screening should be done to screen pregnant patients with thyroid disorders.

KEYWORDS

Thyroid Stimulating Hormone, Pregnancy, Enzyme Linked Chemiluminescence Assay

INTRODUCTION

Thyroid disorders are common during pregnancy and the postpartum period. Thyroid disease is the second most common endocrine condition encountered in women of childbearing age after diabetes. There are hormonal changes during pregnancy, HCG mimics thyroxine in structure due to which tsh receptor is stimulated which leads to increase in thyroxine (T_4) and triiodothyronine (T_3) production, which results in inhibition of thyroid-stimulating hormone (TSH) in the first trimester of pregnancy. A large plasma volume and thus an altered distribution of thyroid hormone, increased thyroid hormone metabolism, increased renal clearance of iodide, and higher levels of hepatic production of thyroxine-binding globulin (TBG) in the hyperestrogenic state of pregnancy are responsible for higher thyroxine requirements in pregnancy. In pregnancy free thyroid hormone is estimated as total hormone will mislead showing more than normal value when the patient is euthyroid. Most studies also report a substantial decrease in serum FT4 concentrations with progression of gestation. Serum FT4 measurements in pregnant women are complicated by increased TBG and decreased albumin concentrations that can cause immunoassays to be unreliable. Therefore the analytical method used for serum FT4 analysis should be taken into consideration.

MATERIALS AND METHODS

The study was done in Ram Manohar Lohia Institute of Medical Sciences, Lucknow for a duration of one year from September 2019 to September 2020. Ethical clearance was taken from the ethical committee. The study comprised of 500 pregnant women. Informed consent was taken from all patients. free t4, serum TSH and TPOab were estimated in addition to routine investigations. Patient in any gestational week and singleton pregnancy were enrolled for study. Inclusion criteria was singleton pregnancy, without any medical illness, spontaneous conception, primigravida or multigravida. Patients with multiple pregnancy, known medical disorders or assisted reproduction, had previous bad obstetric history with known cause were excluded from the study. Overt hypothyroidism was defined as elevated TSH > 2.5 mIU/L in conjunction with a decreased FT4 concentration. Women with TSH levels of 10 or more, irrespective of their FT4 levels were also considered to have overt hypothyroidism. Subclinical hypothyroidism was defined as TSH between 2.5-10 mIU/L with normal FT4. TSH, FT4 and FT3 was estimated by enzyme chemiluminescence assay (ELISA).

RESULTS

Among 500 patients screened 32 patients were found to have thyroid disorders, prevalence being 12.8%. Mean TSH levels in subclinical hypothyroidism was 4.11 mIU/L, overt hypothyroidism was 8.82 mIU/L, subclinical hyperthyroidism was 0.022 mIU/L and in overt hyperthyroidism was 0.013 mIU/L. There was increased prevalence of

thyroid disorders in urban population; P value being 0.01 which is significant. Among 278 Hindu patients 48 were found to have thyroid disorder, 14 among 196 Muslim patients were having thyroid disorder and 2 patients among 26 Sikh patients were found to have thyroid disorder; P value being 0.02 which is significant.

Table 1

No. of persons screened	No. with thyroid disorders	% prevalence
500	32	12.8%

Table 2 TSH levels in different thyroid disorders

Type	No. of cases	Mean	SD
Subclinical Hypothyroidism	34	4.11	1.30
Overt Hypothyroidism	18	8.82	3.22
Subclinical Hyperthyroidism	10	0.022	0.017
Overt Hyperthyroidism	2	0.013	0.008

Table 3 Demographic characteristics of population studied
Age distribution of study subjects

Age group	Number	Percentage (%)
<18 years	32	6.4
19-25 years	204	36.8
26-35 years	224	44.8
>35 years	40	8.0
Total	500	100

Table 4 Association between sociodemographic characteristics and thyroid disorder

Sociodemographic characters		Status of thyroid disorders		Chi square test results
		TD present	TD absent	
Age group	<18 yrs	8	24	p value = 0.06
	19-25 yrs	16	188	
	26-35 yrs	30	194	
	>35 yrs	10	30	
Area of residence	Rural	12	180	p value = 0.01
	Urban	52	256	
Religion	Hindu	48	230	p value = 0.02
	Muslim	14	182	
	Sikh	2	24	

P value < 0.05 is significant

CONCLUSION

The study shows high prevalence of thyroid disorders, especially subclinical and overt hypothyroidism among Indian pregnant women, especially urban population. The difference may be due to more exposure to environmental toxins in urban areas leading to derangements in thyroid function. Based on the results of this study

universal screening of thyroid dysfunction should be done to screen patients with thyroid disorders.