

ORIGINAL RESEARCH

Analysis of Prevalence of Hypothyroidism in Pregnancy: An Institutional Based Study

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ABSTRACT

Background: Thyroid dysfunction is the most common endocrinological disorder in pregnancy, only second to diabetes. The present study was conducted to assess the prevalence of hypothyroidism in pregnancy. **Materials & Methods:** The study was conducted among 400 pregnant women over a period of one year. After a detailed history and thorough examination, screening for thyroid disorder was done. The data were analyzed using the IBM SPSS. P-value less than 0.05 ($p < 0.05$) was considered statistically significant. **Results:** In our study, 42 patients out of 400 pregnant women have a thyroid disorder. The prevalence of thyroid dysfunction in our study was 10.5% in which the prevalence of hypothyroidism and hyperthyroidism was 6.5% and 3.5%, respectively. Subclinical hypothyroidism and overt hypothyroidism were observed in 18 and 8 patients, respectively, while subclinical and overt hyperthyroidism was observed in 10 and 4 women, respectively. Patients with subclinical hypothyroidism, overt hypothyroidism, overt hyperthyroidism were more common in the age group of 30-35 years while patients with subclinical hyperthyroidism were more common in the age group 26-30 years and significant distribution was observed between thyroid disorders with age. **Conclusion:** The present study concluded that thyroid dysfunction was 10.5% in this study. Hypothyroidism was more common than hyperthyroidism and subclinical thyroid disorders were more common than overt thyroid disorders in pregnancy.

Keywords: Thyroid Dysfunction, Hypothyroidism, Hyperthyroidism, Subclinical, Overt.

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Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Pregnancy has a profound physiological impact on the thyroid gland and thyroid function. During pregnancy, the thyroid gland increases in size by 10% in iodine sufficient countries and to a greater extent in iodine deficiency countries.¹ Thyroid dysfunction during pregnancy has been an important area of research due to its imminent impact on maternal and foetal outcome. It has long been recognized that maternal thyroid hormone excess or deficiency can influence the outcome for mother and foetus as well as interfere with ovulation and fertility.^{2,3} Worldwide, several studies have reported 1.5%–4% prevalence of hypothyroidism in pregnant women. Among them, 0.3% to 0.5% had overt hypothyroidism (OH), and the rest had subclinical hypothyroidism (SCH).⁴⁻⁶ In India, reports on the prevalence of maternal hypothyroidism ranged between 1.2% and 67.0% in various studies.^{7,8} Hypothyroidism consists of two clinical forms: subclinical and overt hypothyroidism. The subclinical hypothyroidism is characterized by an elevated serum thyroid-stimulating hormone (TSH)

with normal free thyroxine (FT4) and is observed in 3%-5% of women in pregnancy. Overt hypothyroidism is characterized by an elevated serum TSH and subnormal FT4 is observed in 0.3%-0.5% of women in pregnancy.^{9,10} The present study was conducted to assess the prevalence of hypothyroidism in pregnancy.

MATERIALS & METHODS

This was a cross-sectional study conducted in the Department of Obstetrics & Gynaecology, Meenakshi Medical College Hospital And Research Institute, Enathur, Kanchipuram, Tamil Nadu (India) to assess the incidence of hypothyroidism in pregnant women. The study was conducted among 400 pregnant women over a period of one year. All antenatal women in their first-trimester pregnancy were included after taking consent except patients with known thyroid disorders, multiple gestations, hypertension, diabetes mellitus, and other medical disorders. The patient's demographic profile was noted in all cases. After a detailed history and thorough examination, screening

for thyroid disorder was done with serum TSH assay along with other routine investigations of pregnancy as per The Federation of Obstetric and Gynaecological Societies of India-Indian College of Obstetricians and Gynaecologists (FOGSI-ICOG) good clinical practice recommendation. Those with abnormal TSH were subjected to FT4, FT3, and anti-thyroid peroxidase antibody assay. Women diagnosed with abnormal thyroid functions were referred to the endocrinology department for the treatment of thyroid dysfunction. Hypothyroid patients (subclinical and overt variety) were treated with levothyroxine while hyperthyroidism was treated with propylthiouracil. Repeat thyroid profiles were done at 4-6 weeks intervals and treatment was adjusted to keep the serum TSH levels within normal limits. The reference range used in the study was based on the guidelines of the American Thyroid Association (ATA) 2017.¹¹ According to which normal levels of TSH during 1st, 2nd, and 3rd trimester of pregnancy are 0.1-2.5 mIU/L, 0.2-3.0 mIU/L, and 0.3-3.0 mIU/L, respectively, and normal levels of FT4 and FT3 during pregnancy are 0.7-1.8 pg/mL and 1.7-4.2 pg/mL, respectively. Depending on the normal values, patients were classified into subclinical hypothyroidism (high serum TSH with normal FT4,

Table 1: Prevalence of thyroid dysfunction

Thyroid dysfunction	N(%)
Normal	358(89.5%)
Hypothyroidism	26(6.5%)
hyperthyroidism	14(3.5%)

Table 2: Distribution of thyroid disorders with age group

Thyroid dysfunction	Age group (years)			p-value
	<25	26-30	30-35	
Hypothyroidism				<0.001
Subclinical (18)	4(22.22%)	6(33.33%)	8(44.44%)	
Overt (8)	0(0%)	0(0%)	8(100%)	
Hyperthyroidism				
Subclinical(10)	5(50%)	3(30%)	2(20%)	
Overt(4)	0(0%)	0(0%)	4(100%)	

DISCUSSION

It is well documented that normal pregnancy is associated with an elevation in urinary iodine excretion as well as increase in TBG and thyroid functional hormones induced by hCG which followed by subsequent decrease in serum concentration TSH values.¹² All of these factors influence thyroid function tests in the pregnant women¹³; responses of the maternal thyroid gland to these changes make through alteration in thyroid metabolism. Hence serum concentrations of thyroid hormones especially TSH and FT4 are significantly different from non-pregnant female populations. However, its amount gradually increases later in pregnancy, but does not reach the pre-conception level.¹⁴

In our study, 42 patients out of 400 pregnant women have a thyroid disorder. The prevalence of thyroid dysfunction in our study was 10.5% in which the

FT3 level), overt hypothyroidism (high serum TSH with FT4, FT3 less than normal), subclinical hyperthyroidism (low serum TSH with normal FT3, FT4), and overt hyperthyroidism (low serum TSH with FT4 and FT3 more than normal range). The data were analyzed using the IBM SPSS. P-value less than 0.05 ($p < 0.05$) was considered statistically significant.

RESULTS

In our study, 42 patients out of 400 pregnant women have a thyroid disorder. The prevalence of thyroid dysfunction in our study was 10.5% in which the prevalence of hypothyroidism and hyperthyroidism was 6.5% and 3.5%, respectively.

Subclinical hypothyroidism and overt hypothyroidism were observed in 18 and 8 patients, respectively, while subclinical and overt hyperthyroidism was observed in 10 and 4 women, respectively. Patients with subclinical hypothyroidism, overt hypothyroidism, overt hyperthyroidism were more common in the age group of 30-35 years while patients with subclinical hyperthyroidism were more common in the age group 26-30 years and significant distribution was observed between thyroid disorders with age.

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Prevalence of hypothyroidism was found to be more in Asian countries compared with west. In a large Chinese study, which included 2899 pregnant women, the prevalence of hypothyroidism was significantly higher in the high-risk group than in the non high-risk group (10.9 vs. 7.0%, $P = 0.008$)¹⁵. Possible reasons

for higher prevalence of hypothyroidism, both overt and sub-clinical, in Asian Countries include: increased iodine intake in diet as suggested by a Chinese study, presence of goitrogens in diet as reported from India and micronutrient deficiency such as selenium or iron deficiency that may cause hypothyroidism and goiter.¹⁶⁻¹⁸

Marwaha et al who reported a prevalence of sub-clinical hypothyroidism of 19.3%.¹⁹

The study of Jaikhani et al. who reported sub-clinical hypothyroidism with prevalence of 33%.²⁰

CONCLUSION

The present study concluded that thyroid dysfunction was 10.5% in this study. Hypothyroidism was more common than hyperthyroidism and subclinical thyroid disorders were more common than overt thyroid disorders in pregnancy.

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