

ORIGINAL RESEARCH

Assessment of prevalence of hypothyroidism in pregnancy visited to tertiary care centre

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ABSTRACT

Background: Pregnancy has a profound physiological impact on the thyroid gland and thyroid function. The present study was conducted to assess the prevalence of hypothyroidism in pregnancy. **Material & methods:** The study was conducted among 280 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 version 23 (Armonk, NY). P-value less than 0.05 ($p < 0.05$) was considered statistically significant. **Result:** In our study, 60 patients out of 280 pregnant women have a thyroid disorder. The prevalence of thyroid dysfunction in our study was 21.42% in which the prevalence of hypothyroidism and hyperthyroidism was 15% and 6.4%, 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 <25 years and significant distribution was observed between thyroid disorders with age. **Conclusion:** The study concluded that thyroid dysfunction was prevalent in 21.42% and the prevalence of hypothyroidism and hyperthyroidism was 15% and 3.5%, respectively. Hypothyroidism was more common than hyperthyroidism and subclinical thyroid disorders were more common than overt thyroid disorders in pregnancy.

Keywords: Thyroid dysfunction, pregnancy, Hypothyroidism.

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INTRODUCTION

Pregnancy has a significant effect on the thyroid gland and its functioning.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} 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.^{4,5} Classification of hypothyroidism recognized during pregnancy is essential for epidemiological as well as clinical reasons. The American Thyroid Association (ATA) has defined hypothyroidism during pregnancy

as the state of increased TSH level when other rare causes, such as TSH-secreting pituitary tumor and thyroid hormone resistance are excluded. Primary maternal hypothyroidism (MH) observed during pregnancy should be distinguished from preexisting hypothyroidism diagnosed prior to the pregnancy. Two main varieties of primary MH are recognized by the ATA: overt hypothyroidism (OH) and subclinical hypothyroidism (SCH) based on the presence of elevated TSH and whether FT4 level is decreased or within normal range. However, cases of isolated hypothyroxinaemia (IH) with normal TSH have also been recognized by the ATA as a third sub-type of MH.⁶ During the first trimester, approximately 1 in 10 pregnant women develop antibodies to TPO or thyroglobulin and hypothyroidism develops in roughly 16% of these women. The prevalence of hypothyroidism in pregnancy is around 2.5% according to the Western literature.⁷ There are a few reports of prevalence of hypothyroidism during pregnancy from India with prevalence rates ranging

from 4.8% to 11%.^{8,9} The present study was conducted to assess the prevalence of hypothyroidism in pregnancy.

MATERIAL AND METHODS

This was a cross-sectional study conducted to assess the incidence of hypothyroidism in pregnant women. The study was conducted among 280 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) 2017.¹⁰ 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, 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 version 23 (Armonk, NY). P-value less than 0.05 ($p < 0.05$) was considered statistically significant.

RESULTS

In our study, 60 patients out of 280 pregnant women have a thyroid disorder. The prevalence of thyroid dysfunction in our study was 21.42% in which the prevalence of hypothyroidism and hyperthyroidism was 15% and 6.4%, respectively.

Table 1: Prevalence of thyroid dysfunction

Thyroid dysfunction	N(%)
Normal	220(78.57%)
Hypothyroidism	42(15%)
hyperthyroidism	18(6.4%)

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 (31)	10(16.66%)	7(11.66%)	14(23.33%)	
Overt (11)	0(0%)	0(0%)	11(18.33%)	
Hyperthyroidism				
Subclinical(14)	10(16.66%)	3(5%)	1(1.66%)	
Overt(4)	0(0%)	0(0%)	4(6.66%)	

Subclinical hypothyroidism and overt hypothyroidism were observed in 31 and 11 patients, respectively, while subclinical and overt hyperthyroidism was observed in 14 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 <25years and significant

distribution was observed between thyroid disorders with age.

DISCUSSION

Globally, the leading cause of hypothyroidism in pregnancy is iodine deficiency, and in iodine sufficient areas, most common cause is autoimmune thyroiditis.¹¹⁻¹³ Other common causes are radio-iodine therapy, thyroidectomy, congenital hypothyroidism, drug use (i.e., rifampicin and phenytoin) and any

hypothalamic-pituitary disease.¹¹⁻¹³ Women with lower thyroid reserves preconceptually are often unable to cope with increased metabolic demands during pregnancy period and can enter into the hypothyroid state. Maternal thyroid hormone levels are critical to the fetus, especially in the first trimester due to inability to produce iodothyronines before ten weeks of gestation. This is the period when neurodevelopment of fetus can potentially be hampered due to deficiency of iodothyronines.¹⁴In our study, 60 patients out of 280 pregnant women have a thyroid disorder. The prevalence of thyroid dysfunction in our study was 21.42% in which the prevalence of hypothyroidism and hyperthyroidism was 15% and 6.4%, respectively. Subclinical hypothyroidism and overt hypothyroidism were observed in 31 and 11 patients, respectively, while subclinical and overt hyperthyroidism was observed in 14 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 <25years and significant distribution was observed between thyroid disorders with age. A study by Sahu et al reported a prevalence of hypothyroidism of 12.7% with overt and subclinical hypothyroidism to be 4.58% and 6.47%.¹⁵Potlukova et al. and Ezzeddine D et al. also conducted studies on thyroid disorder among antenatal women and found no significant association between age and thyroid dysfunction.^{16,17}Chandrasekhara P et al. they observed 20 cases (83.33%) as subclinical hypothyroidism and 04 (16.77%) cases as overt hypothyroidism and 06 (25%) cases had raised anti TPO levels of which 03 had subclinical hypothyroidism and 03 had overt hypothyroidism.¹⁸Whereas, Dhanwal DK et al. reported 13.1% of pregnant women to be hypothyroid (n = 388) and 40% (n = 155) of hypothyroid pregnant women were positive for anti-TPO antibodies.¹⁹

CONCLUSION

The study concluded that thyroid dysfunction was prevalent in 21.42% and the prevalence of hypothyroidism and hyperthyroidism was 15% and 3.5%, respectively. Hypothyroidism was more common than hyperthyroidism and subclinical thyroid disorders were more common than overt thyroid disorders in pregnancy.

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