



Prevalence and Outcome of Thyroid Diseases in Pregnancy among Sample of Iraqi Pregnant Women

By

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Abstract

Pregnancy is a time of complex hormonal changes. Thyroid disorders constitute one of the most common endocrine disorders seen in pregnancy, and understanding of changes in thyroid function and the consequences of thyroid disease during pregnancy has rapidly grown in the past two decades. The current study aimed to estimate the impact of thyroid disorder on pregnancy outcomes. The objectives were the calculation of the prevalence and main types of thyroid diseases among pregnant women and to find out the main maternal and fetal complications of thyroid disorder during pregnancy. A cross-sectional study was conducted in Salaheddin General Hospital /Gynecology and Obstetrics department during the period from 1st of January to 30th of June 2022. A convenient sample of 100 women in the first trimester of pregnancy. Inclusion criteria included singleton pregnancy and pregnant women with age 18-40 years old. The results of the current study revealed that the prevalence of thyroid disease among pregnant women was 20%. Those with subclinical hypothyroid disease (12%) followed by overt hypothyroid disease (6%), and subclinical hypothyroid (2%). There was a significant association between thyroid diseases during pregnancy and the age of the participants. There was a significant association between thyroid diseases during pregnancy and family history of thyroid disease, BMI, and previous infertility. There was a significant association between thyroid diseases during pregnancy and anaemia, gestational diabetes, and preterm labour. In conclusion, about one-fifth of the pregnant women had thyroid disorder during pregnancy, and subclinical hypothyroid was the commonest disorder. There was a significant association between the prevalence of thyroid disease and anaemia, gestational diabetes, and preterm labour.

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Introduction

Thyroid hormones affect most body functions as they directly affect a number of physiological processes, and the functioning of many body tissues, and they are necessary for the work of other hormones⁽¹⁾. The prevalence of thyroid disorders varies around the world depending on several variables such as gender, iodine status, propensity for autoimmunity, smoking, alcohol consumption, and genetic factors.

Additionally, the prevalence of undiagnosed thyroid dysfunction is declining globally, at least in the developed world, as a result of a combination of iodine supplementation in iodine-deficient areas, frequent and widespread thyroid function assessments, and lower thresholds for treatment initiation⁽²⁾. Pregnancy is a time of complex hormonal changes⁽³⁾. Thyroid disorders constitute one of the most common endocrine disorders seen in pregnancy⁽⁴⁾, and understanding of changes in thyroid



function and the consequences of thyroid disease during pregnancy has rapidly grown in the past two decades⁽⁵⁾. It's crucial to keep in mind that thyroxine requirements are higher during pregnancy due to the complicated hormonal changes that occur during this time⁽³⁾. Maternal hypothyroidism is the most common thyroid disorder in pregnancy, with a prevalence of hypothyroidism of 9.2%, of which 8.5% were cases of subclinical hypothyroidism and 0.7% were cases of overt hypothyroidism⁽⁶⁾. Untreated or inadequately treated hypothyroidism all can increase the risk of miscarriage, preeclampsia, anaemia, fetal growth restriction, placental abruption, perinatal and neonatal morbidity and mortality, preterm delivery, small head circumference, and low birth weight impaired neuropsychological development⁽⁷⁾. Pregnancy-related hyperthyroidism is uncommon. Nevertheless, early detection and appropriate management of hyperthyroidism in a pregnant woman are crucial because uncontrolled thyrotoxicosis greatly raises the risk of complications for both the mother and the fetus. Additionally, the passage of maternal thyroid-stimulating antibodies through the placenta, which both have the potential to impair fetal thyroid function, may have an impact on the development of the fetus⁽⁸⁾. Thyroid dysfunction usually overlooked and ignored in pregnant women because of the non-specific and hypermetabolic state of pregnancy^(7,9).

Patients and method

A cross-sectional study was conducted in Salahadeen General Hospital /Gynecology and Obstetrics department during the

period from 1st of January to 30th of June 2022. The study was proposed and subsequently approved by the scientific committee of the College of the Medicine/University of Tikrit. Fully informed consent was obtained from the patients verbally after explaining the aim of the study thoroughly and clearly. All the information and questions were communicated to the patients with honesty and transparency objectively to avoid bias as much as possible. A convenient sample of 100 women in the first trimester of pregnancy, Pregnant women with other diseases before the current pregnancy, including diabetes, hypertension, chronic respiratory disease, malignancy, autoimmune diseases, seizure or other convulsive disorders, blood system disorders, cerebrovascular diseases, or cardiopulmonary dysfunction. Endocrine diseases before the current pregnancy, including polycystic ovary syndrome, hyperprolactinemia, pituitary, or adrenal diseases. History of the use of amiodarone or immunosuppressive agents, a history of iodine examinations and radiotherapy within six months before the current pregnancy. After the acceptance of the patient to be enrolled in the study, the data was collected through a direct interview and history taking, examination, and investigation using a standardized questionnaire with closed-end questions was prepared by the researcher with revision of the supervisor after a review of many similar articles.



Results

A total of 100 pregnant women were enrolled in the current study. Those with age 21-30 constituted the largest percentage of the sample (46%). Most of the participants were living in rural areas and were housewives (70% and 63%, respectively), as shown in table 1.

Table 1: Sociodemographic characteristics of the participants

Sociodemographic characteristics		N	%
Age group (years)	≤20	28	28.0
	21-30	46	46.0
	≥31	26	26.0
Residency	Urban	30	30.0
	Rural	70	70.0
Occupation	Housewife	63	63.0
	Employed	37	37.0

There was no significant association between the prevalence of thyroid disorder during pregnancy and age, residency, and occupation, as shown in table 2.

Table 2: Association between thyroid disorders and age, residency, and occupation

Sociodemographic characteristics		With thyroid disorder	Without thyroid disorder	P-value
		N (%)	N (%)	
Age group (years)	≤20	5 (25.0)	23 (28.8)	0.084
	21-30	6 (30.0)	40 (50.0)	
	≥31	9 (45.0)	17 (21.3)	
Residency	Urban	4 (20.0)	26 (32.5)	0.257
	Rural	16 (80.0)	54 (67.5)	
Occupation	Housewife	13 (65.0)	50 (62.5)	0.836
	Employed	7 (35.0)	30 (37.5)	

Among those with the thyroid disorder, there was a significant association between the type of thyroid disorder during pregnancy and the age of the participants, as shown in table 3.

Table 3: Association between thyroid disease during pregnancy and sociodemographic characteristics

Variables	Thyroid disease					P-value
	Normal thyroid function	Subclinical hypothyroidism	Overt hypothyroidism	Subclinical hyperthyroidism	Subclinical hyperthyroidism	



		N (%)	N (%)	N (%)	N (%)	N (%)	
Age group (years)	≤20	23 (28.7)	3 (25.0)	1 (16.7)	1 (50.0)	0 (0.0)	0.046
	21-30	40 (50.0)	5 (41.7)	0 (0.0)	1 (50.0)	0 (0.0)	
	≥31	17 (21.3)	4 (33.3)	5 (83.3)	0 (0.0)	0 (0.0)	
Residency	Urban	26 (32.5)	3 (25.0)	1 (16.7)	0 (0.0)	0 (0.0)	0.627
	Rural	54 (67.5)	9 (75.0)	5 (83.3)	2 (100.0)	0 (0.0)	
Occupation	Housewife	50 (62.5)	9 (75.0)	4 (66.7)	0 (0.0)	0 (0.0)	0.627
	Employed	30 (37.5)	3 (25.0)	2 (33.3)	2 (100.0)	0 (0.0)	

A significant association was obtained between the prevalence of thyroid disorder and family history, menstrual irregularity, previous infertility, and BMI. While no significant association was obtained between the history of abortion and the prevalence of thyroid disorder in pregnancy. As shown in table 4.

Table 4: Association between the prevalence of thyroid disorder in pregnancy and medical and obstetrical history

Sociodemographic characteristics		With thyroid disorder	Without thyroid disorder	P-value
		N (%)	N (%)	
History of abortion	Yes	6 (30.0)	1 (16.3)	0.161
	No	14 (70.0)	67 (83.8)	
Family history	Yes	13 (65.0)	18 (22.5)	0.001
	No	7 (35.0)	62 (77.5)	
Menstrual irregularity	Yes	12 (60.0)	68 (85.0)	0.001
	No	8 (40.0)	12 (15.0)	
Previous infertility	Yes	10 (50.0)	8 (10.0)	0.001
	No	10 (50.0)	72 (90.0)	
Body mass index	Normal	4 (20.0)	51 (63.8)	0.001
	Overweight	5 (25.0)	24 (30.0)	
	Obese	11 (55.0)	5 (6.3)	

There was a significant association between the type of thyroid disorder during pregnancy and family history of thyroid disease, BMI, and previous infertility (Table 5).

Table 5: Association between thyroid disease during pregnancy and family history of thyroid disease, BMI, and previous infertility



Variables	Thyroid disease					P-value	
	Normal thyroid function	Subclinical hypothyroidism	Overt hypothyroidism	Subclinical hyperthyroidism	Overt hyperthyroidism		
	N (%)	N (%)	N (%)	N (%)	N (%)		
History of abortion	Yes	13 (16.3)	4 (33.3)	2 (33.3)	0 (0.0)	0 (0.0)	0.353
	No	67 (83.8)	8 (66.7)	4 (66.7)	2 (100.0)	0 (0.0)	
Family history	Yes	18 (22.5)	7 (58.3)	4 (66.7)	2 (100.0)	0 (0.0)	0.002
	No	62 (77.5)	5 (41.7)	2 (33.3)	0 (0.0)	0 (0.0)	
Previous infertility	Yes	8 (10.0)	8 (66.3)	1 (16.7)	1 (50.0)	0 (0.0)	0.001
	No	72 (90.0)	4 (33.3)	5 (83.3)	1 (50.0)	0 (0.0)	
Body mass index	Normal	51 (63.7)	2 (16.7)	0 (0.0)	2 (100.0)	0 (0.0)	0.001
	Overweight	24 (30.0)	3 (25.0)	2 (33.3)	0 (0.0)	0 (0.0)	
	Obese	5 (6.3)	7 (58.3)	4 (66.7)	0 (0.0)	0 (0.0)	

There were significant associations between the prevalence of thyroid disorders in pregnancy and anaemia, gestational diabetes, and preterm labour, as shown in table 6

Table 6: Association between the prevalence of the prevalence of the thyroid disorders in pregnancy and pregnancy complications

Sociodemographic characteristics		With thyroid disorder	Without thyroid disorder	P-value
		N (%)	N (%)	
Anaemia	Yes	11 (55.0)	9 (11.3)	0.001
	No	9 (45.0)	71 (88.8)	
Gestational diabetes	Yes	9 (45.0)	5 (6.3)	0.001
	No	11 (55.0)	75 (93.8)	
Preeclampsia	Yes	3 (15.0)	7 (8.8)	0.405
	No	17 (85.0)	73 (91.3)	
Preterm labour	Yes	8 (40.0)	1 (1.3)	0.001
	No	12 (60.0)	79 (98.8)	



The current study revealed a significant association between the type of thyroid disorders during pregnancy and anaemia, gestational diabetes, and preterm labour (Table 7).

Table 7: Association between thyroid disease during pregnancy and anaemia, gestational diabetes, and preterm labour

Variables		Thyroid disease					P-value
		Normal thyroid function	Subclinical hypothyroidism	Overt hypothyroidism	Subclinical hyperthyroidism	Overt hyperthyroidism	
		N (%)	N (%)	N (%)	N (%)	N (%)	
Anaemia	Yes	9 (11.3)	7 (58.3)	3 (50.0)	1 (50.0)	0 (0.0)	0.001
	No	71 (88.8)	5 (41.7)	3 (50.0)	1 (50.0)	0 (0.0)	
Gestational diabetes	Yes	5 (6.3)	6 (50.0)	3 (50.0)	0 (0.0)	0 (0.0)	0.001
	No	75 (93.8)	6 (50.0)	3 (50.0)	2 (100.0)	0 (0.0)	
Preeclampsia	Yes	7 (8.8)	1 (8.3)	2 (33.3)	0 (0.0)	0 (0.0)	0.258
	No	73 (91.3)	11 (91.7)	4 (66.7)	2 (100.0)	0 (0.0)	
Preterm labour	Yes	1 (1.3)	4 (33.3)	4 (66.7)	0 (0.0)	0 (0.0)	0.001
	No	79 (98.8)	8 (66.7)	2 (33.3)	2 (100.0)	0 (0.0)	

Discussion

It is known that thyroid diseases are common in women of childbearing age and it is well known that untreated thyroid disturbances result in an increased rate of adverse events. Best to our knowledge, this was the first study in Iraq specified to assess the prevalence of thyroid disease in pregnancy and its complications⁽¹⁰⁾.

The first finding of the current study was that about 20% of pregnant women

developed thyroid disorder during their pregnancy. In comparison, another study that was done in India revealed that about 10% of pregnant women had thyroid disorder during pregnancy⁽⁴⁰⁾. Another study that was done by Rajesh et al concluded that 26.5% of women develop thyroid disorders during pregnancy⁽¹¹⁾. Kalpana et al. concluded that about 10% of pregnant women developed thyroid disease during pregnancy⁽¹²⁾.



A significant association was obtained between the prevalence of thyroid disorder and the family history of thyroid disease. The same results were obtained by another study that was done in India⁽⁴⁰⁾. In contrast, revealed that there is no significant association between thyroid disease in pregnancy and family history⁽¹²⁾.

Regarding the complication, thyroid disorders were significantly associated with anaemia, gestational diabetes, and preterm labour. In comparison, the same results were obtained by another study that was done in China by Zhou et al.⁽⁴⁴⁾. Kalpana et al. obtained the same results in their study that was done in⁽¹²⁾.

Conclusion

About one-fifth of the pregnant women had thyroid disorder during pregnancy, subclinical hypothyroid was the commonest disorder. There was a significant association between the prevalence of thyroid disease and anaemia, gestational diabetes, and preterm labour. Thyroid function tests should be done on regular bases during the antenatal care.

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