Original Article

Prevalence of Thyroid Disorder in Pregnant Women Visiting a Tertiary Care Teaching Hospital: A Descriptive Cross-Sectional Study

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Abstract

Objective: To determine the prevalence of thyroid disorders among patients attending the antenatal clinic.
Methodology: This descriptive cross-sectional study was done during January 2019 to June 2019 at the Department of Gynecology and Obstetrics of Civil Hospital Karachi. A total of 182 pregnant women from 8 to 26 weeks of pregnancy on their first antenatal visit were selected for this study. Venous blood sampling of the patients was done for thyroid hormones test. All information was recorded in a predefined proforma by the researcher herself. Data analysis was done using SPSS version 26.
Results: A total of 182 pregnant women were studied for thyroid disorders during pregnancy. The average age of the women was 25.29±4.27 years. whereas the average parity of the women was 1.46±1.04, average gestation age was 20.60±5.07 weeks, the average level of TSH was 2.52±0.81 and free T4 was 0.92±0.16. Thyroid disorder was found in 19.8% of pregnant women, with a subclinical hypothyroidism rate of 12.1%, overt hypothyroidism 4.1%, subclinical hyperthyroidism 2.2%, and overt hyperthyroidism 0.7%. There was a statistically significant correlation between age and the prevalence of thyroid disorders (0.014), but there was no association between parity and the disease (p=>0.05)
Conclusion: As per the study conclusion, the prevalence of thyroid disorder was observed to be high among 19.80% of pregnant women. Thus, universal screening of pregnant women for thyroid disorders should be considered, especially in a country like ours where there is a high frequency of undiagnosed thyroid disorders.
Keyword: Thyroid disorder, subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism, and overt hyperthyroidism.

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Introduction

Thyroid hormones undergo dramatic variations throughout the person's lifetime and are related with the numerous, severe negative health effects.[1] During gestation, the thyroid gland goes through a series of physiological alterations in order to accommodate the elevated metabolic requirements of both the mother and the fetus. The thyroid gland produces hormones that regulate metabolism and are crucial for normal fetal growth and development. Imbalances in these hormones can lead to conditions such as hypothyroidism (insufficient hormone production) or hyperthyroidism (excessive hormone production). Although the impact of thyroid autoimmunity and mild hypothyroidism during pregnancy is still being debated.[2] Iodine deficiency is the leading factor in the development of hypothyroidism over the world.[2] However, pregnancy brings about numerous alterations to the thyroid glands and its physiology, with a 50% increase in thyroid hormone production.[3]

It is reported that approximately 2-3% of the women during pregnancy experience thyroid dysfunction, with hyperthyroidism affecting 0.2-0.4% of the women during pregnancy and usually linked to Graves' illness, while hypothyroidism during pregnancy affects 0.5–3.5% of women.[4] Frequency of the hypothyroidism during pregnancy varies highly by region, ranging from 2.5% to 11%.[5] Generally, the occurrence of hypothyroidism is significantly greater in Asian nations in the comparison of Western nations.[5]

Thyroid disorders during pregnancy can lead to complications for both the mother and the fetus, including premature birth, low birth weight, fetal heart issues, a higher rate of c-section deliveries, problems

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with the placenta, gestational hypertension and preeclampsia, increased risk of perinatal complications and infant mortality, and cognitive difficulties for the baby in cases of hypothyroidism.[6,7] In cases of hyperthyroidism, there may be premature deliveries, spontaneous abortion, stillbirth, heart failure, preeclampsia, and the thyroid storm.[6-8]

In addition, euthyroid women who have autoimmune thyroid illness cause decreased thyroid function during the pregnancy and appear to have a higher risk of developing obstetrical complications than other women.[9] Therefore, hypothyroidism is a significant but manageable medical condition during pregnancy.[9] Despite strong evidence of the potential maternal and neonatal complications associated with hypothyroidism, universal screening for the condition is not currently recommended for pregnant women or women of reproductive age by several professional organizations.[9]

However, it's crucial to diagnose and treat thyroid disorders prior to and during pregnancy in order to preserve the health of both the mother and the child.[7] Pakistan is recognized as an iodine deficient nation, with a diet that also contributes to the deficiency, putting the population, especially the women during pregnancy, are susceptible to moderate to severe deficiency of the iodine, which can result in maternal hypothyroidism and have negative impacts on the fetus..[8] However, there is a significant shortage of local data on occurrence of thyroid diseases in the actual population during pregnancy and their effects on the fetus.[8] However, the goal of this study was to find out how common thyroid disorders are among pregnant women visiting the antenatal clinic at a tertiary care Hospital.

Methodology

This descriptive cross-sectional study was carried out over a period of six months, from January 2019 to June 2019, after seeking approval from the hospital's Ethical Committee Review of the hospital. A total of one hundred and eighty-two pregnant women, visiting an antenatal clinic (Obstetrics & Gynecology, or OPD), civil hospital in Karachi and fulfilling the eligibility criteria were included via the non-probability consecutive sampling technique. The sample size was calculated by using the WHO Sample Size Calculator, taking a frequency of 14.2%[7] with a margin of error of 5% and a confidence interval of 95%, then an estimated sample size of 182. All the patients attending the antenatal clinic with a singleton pregnancy and gestational age of 8 to 26 weeks at pregnancy first antenatal visit, aged 18 to 38 years, and with parity 1 to 5 were included in the study.

All the women with gestational trophoblastic disease and multiple pregnancies, history of taking thyroid medications, a past medical history that includes thyroid surgery or treatment with radioiodine, or a history of hypertension, diabetes, cardiac diseases, epilepsy, TB, SLE, hepatitis, asthma, or kidney disease were excluded. A detailed history related to age, parity, gestational age, present history, past history, and surgical history of any medical disorder, including thyroid disorder, was taken and noted on a pre-designed proforma.

About 5 cc of blood drawn from the patient for the thyroid hormone test. The thyroid disorders were considered positive after low or higher values from normal according to the following criteria: Thyroid Stimulating Hormone (TSH) Concentration: Cut off levels of 0.1–2.5 mIU/ml, 0.2–3.0 mIU/ml, and 0.3–3.0 mIU/ml for 1st, 2nd, and 3rd trimesters, respectively. Free T4: Cut off value 1.05 ± 0.22 ng/dL, 0.88 ± 0.17 ng/dL, and 0.89 ± 0.17 ng/dL in the 1st, 2nd, and 3rd trimesters, respectively. All the data was collected via a study proforma, and SPSS version 26 was used for data analysis.

Results

A total of 182 pregnant women were studied for thyroid disorders during pregnancy. The average age of the women was 25.29 years, with a standard deviation of ±4.27. Whereas the average parity of the women was 1.46±1.04, average gestation age was 20.60±5.07 weeks, the average level of TSH was 2.52±0.81 and free T4 was 0.92±0.16. A family history of thyroid disorder was observed in 25(13.7%) women. Table I

Table I: Demographic and Thyroid Profile of the Pregnant Women (n=182)

Variables	Statistics
Mean age	25.29±4.27 years
Mean gestational age	1.46±1.04 weeks
Mean parity	20.60±5.07
Mean TSH	2.52±0.81 mIU/ml
Mean of Free T4	0.92±0.16 ng/dL
Family h/o Thyroid disorder	25 (13.7%)

The frequency of thyroid disorder in pregnant women was observed in 19.80% (36/182), with the frequency distribution of subclinical hypothyroidism being 22 (12.1%), overt hypothyroidism being 8 (4.1%), subclinical hyperthyroidism being 4 (2.2%), and overt hyperthyroidism being 2 (0.7%), as shown in table II.

Table II: Frequency of thyroid disorders in pregnant Women (n=182)		
Thyroid Disorders		**Statistics**
Yes		36 (19.8%)
Particularly as	Subclinical hypothyroidism	22 (12.1%)
	overt hypothyroidism	8 (4.4%)
	Subclinical hyperthyroidism	4 (2.2%)
	Overt hyperthyroidism	2 (1.1%)
No		146 (80.20%)

There was a significant increase in the rate of thyroid disorder with age, while there was insignificant linked with parity and gestation, as shown in table III.

Table III: Stratification withrespect to age, gestational age and parity (n=182)				
Variables		**Thyroid disorders**		**P-value**
		Yes	No	
Age groups	< 20	03	23	0.014
	20 to 30	31	89	
	>30	02	34	
Parity	Nulliparous	01	24	0.262
	1-2	33	99	
	3-4	01	20	
	>4	01	03	
Gestational Age	First trimester	02	35	0.143
	Second trimester	34	111	

Discussion

Thyroid problems during pregnancy may be overlooked because the symptoms can be unspecific and the pregnancy metabolic state is hyper.[11] Pregnancy-related physiological changes can trigger thyroid disorders, and the incidence of such problems varies widely across different regions.[11] However, this limited effort has been done to explore incidence of thyroid disease among pregnant women seeking treatment at a maternity clinic during pregnancy at the local level. In this study, the average age of the women was 25.29 ±4.27 years, whereas the average gestation age was 20.60±5.07 weeks. Consistently Vella K et al[12] reported that mean age of the pregnant women was 29.2 ±5.4 years. In the comparison of this study, Javed A et al[13] reported that the average age of the women was 26.63±7.41years and the average gestational age was 19.64±6.88 weeks. The age of the mother may play a role in the risk and management of these conditions. Younger mothers are more likely to have autoimmune thyroid conditions. On the other hand, older mothers are more likely to have age-related changes in thyroid function and an increased risk of gestational thyroid disorders, Therefore, both younger and older mothers may need close monitoring and appropriate management of their thyroid function during pregnancy to ensure the best outcomes for both mother and baby.

In this study, the frequency of thyroid disorder in pregnant women was observed in 19.80% (36/182), with the frequency distribution of subclinical hypothyroidism being 22 (12.1%), overt hypothyroidism was 8 (4.1%), subclinical hyperthyroidism being 4 (2.2%), and overt hyperthyroidism being 2 (0.7%). In the comparison of this study, Vella K et al[12] reported a very low frequency of thyroid disorder during pregnancy: out of 46,283 pregnancies, 1.3% experienced thyroid dysfunction, with the majority (67.3%) being hypothyroid and a smaller portion (3.2%) having hyperthyroidism, while 28.3% had isolated hypothyroxinemia, and only 1.2% had a history of thyroid cancer. On the other hand, Javed A et al[13] reported a higher prevalence of thyroid disorder (44.2%) among women during pregnancy out of 360 cases. In the study by Borzouei S et al[14] reported that, the out of 852 women during pregnancy, 26.5%, had subclinical hypothyroidism. A smaller number, 1.2%, had overt hypothyroidism, while only a small fraction (0.5%) had overt hyperthyroidism, and only 0.2% found with subclinical hyperthyroidism. On the other hand, Khakurel G et al[15] reported that, in their study, 329 pregnant women were analyzed, the results showed that 24.62% of the women had some form of thyroid disorder, the most frequently observed condition being subclinical hypothyroidism, affecting 65 women (19.75%), while overt hypothyroidism was present in 8 women (2.43%). In a study by Sharma S et al[16] demonstrated that the 14% of individuals out of the total of 200 women who participated in the study had thyroid problems. Few other recent studies also found some different prevalence of thyroid disorder in pregnancy form different countries.[17-19]

The prevalence of thyroid disorders in pregnancy may vary depending on several factors, including the study population, the criteria used for sample selection and diagnosis, and the method of screening and testing. In the present study, the frequency of thyroid disorders was noted in the 19.80%. This result is higher than some other studies but lower than others, indicating that the prevalence of thyroid disorders in pregnancy can vary widely. It is important to note that different studies may use different methods for screening, diagnosis, and treatment, that have the potential to influence the overall frequency of thyroid disease during gestation. For example, some studies may use more sensitive tests or criteria for diagnosis, which can lead to a higher prevalence of thyroid disorders. Additionally, some

studies may only include women with known thyroid disease, while others may include all pregnant women, which can affect the overall prevalence. However, thyroid disorders are frequently found in pregnant women, and there may be a significant variation in the prevalence of thyroid disorders depending on the population studied and the methods used for diagnosis. Further research is needed to better understand the prevalence and management of thyroid disorders in pregnancy and to improve outcomes for both mothers and babies.

Conclusion

As per the study conclusion, the prevalence of thyroid disorder was observed to be high among 19.80% of pregnant women. It's essential for women who are pregnant or planning to become pregnant to have regular check-ups to monitor their thyroid function, and to receive prompt and appropriate treatment if necessary. Due to several limitations of the study, the most significant of which is the limited size of the sample, the findings cannot be considered conclusive. Nevertheless, it is recommended that additional large-scale studies be carried out, especially at the local level, to confirm the observations.

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