e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(3); 1385-1390

Original Research Article

Prevalence of Thyroid Disorders in Pregnancy: A Prospective Study in a Tertiary Care Centre

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Received: 25-01-2023 / Revised: 25-02-2023 / Accepted: 25-03-2023

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Conflict of interest: Nil

Abstract

Background: One of the most prevalent endocrinopathies in pregnancy is thyroid disease. It's essential to keep in mind that pregnant women have increased thyroxine needs due to the intricate hormonal and metabolic changes that occur during pregnancy. Untreated hypothyroidism during pregnancy is harmful to the mother and the foetus. According to global data, thyroid dysfunction affects at least 2%–3% of expectant mothers. 0.2% to 0.4% of pregnant women get hyperthyroidism, which is most frequently linked to Grave's disease. Instances of hypothyroidism during pregnancy range from 0.5% to 3.5%. According to reports, 11.07% of pregnant women have hypothyroidism. This research was done to find out how prevalent thyroid problems are among pregnant women attending the antenatal clinic of our tertiary care facility.

Materials and Methods: This prospective study was conducted in the Obstetrics and Gynaecology Department at the PES Medical College Kuppam, Andhra Pradesh. 200 first-trimester pregnant women who visited our antenatal clinic were taken into the study. Together with the usual antenatal tests, a thyroid profile including TSH, FT3, and FT4 was sent.

Results: In our study, 81% of the mothers had normal thyroid function. Having subclinical hypothyroidism at 10%, overt hypothyroidism at 6%, subclinical hyperthyroidism at 3%, and overt hyperthyroidism at 0%in our study hypothyroidism was significantly prevalent among pregnant women in their first trimester.

Conclusion: In our study, subclinical hypothyroidism predominated and thyroid problems were more frequent in first trimester pregnant women. The need for timely thyroid disease identification and prompt treatment initiation is because of the detrimental effects that maternal thyroid diseases have on maternal and foetal outcomes. Thereby, early thyroid testing should be performed on all pregnant women.

Introduction

One of the more prevalent hormonal conditions affecting women of childbearing age is a thyroid dysfunction. Because many of the disease's symptoms are also typical of pregnancy, it can be difficult to detect and treat. When treating women with suspected or diagnosed thyroid disease, its essential to comprehend how physiological variations

in serum concentration of pituitary and thyroid hormones might influence the diagnosis. [1-3]

Through the influence of oestrogen which promotes enhanced synthesis but also delayed clearance, pregnancy causes a rise in TBG (and transthyretin). The elevation starts to appear during the first trimester and reaches its peak during the early second trimester. Only free hormone readings should be used in pregnancy since only the free hormone is biologically active. Due to the fact that the glomerular filtration rate increases during pregnancy and iodine is transferred to the growing fetus, pregnancy is a condition of relative iodine deficit. If there is insufficient iodine in the body, cellular hyperplasia and goitre will develop when the thyroid gland increases its blood iodine absorption to make up for the imbalance. [4-6]

Although a physiologic goitre may be seen on ultrasonography by a change in gland size of up to 10% to 20%, it is indicated that this is not clinically discernible. It signifies iodine inadequacy or pathology only if it is clinically evident. During pregnancy, iodine needs and thyroid hormone production both rise by 50%. [7]

Early-pregnancy thyroid disorders have been linked to poor fetal and maternal outcomes. Preterm labour, preeclampsia, placental abruption, and abortion are the main obstetric problems. Perinatal complications include preterm birth, lower birth weight, fetal and neonatal death. Additionally, the frequency of NICU admissions and respiratory distress syndrome has increased. Early-trimester maternal hypothyroidism is reported to be detrimental for fetal brain development, impairing mental and physical growth and development as well as having negative impacts on the majority of organ systems. [8]

Optimal levels of thyroid hormone are necessary for both fetal growth and pregnancy continuation. Women are more likely than males to have thyroid dysfunction. Thyroid issues during pregnancy can have a significant negative impact on the fetus and the mother. In context of this, the current study's objective is to determine the occurrence of thyroid conditions in our tertiary care hospital, including hyperthyroidism, hypothyroidism, and subclinical hypo and hyperthyroidism in women throughout pregnancy. [9]

Materials and Methods

In the department of obstetrics and gynaecology at PES Medical College in Kuppam, Andhra Pradesh, this prospective cross-sectional study was conducted over a period of one year, from December 2019 to December 2020. Among all the pregnant women attending the antenatal clinic for regular checkups 200 women during their first trimester were chosen. 200 participants in the first trimester were chosen at random for our study after the gestational age and informed consent were obtained and were further investigated.

Inclusion Criteria

- <13 wks of gestational age
- Singleton pregnancy
- Primi/multigravida

Exclusion Criteria

- Multiple pregnancy
- k/c/o diabetes or hypertension
- Previous history of BOH
- Women who already had a thyroid disorder or were undergoing treatment for it.

Menstrual history, obstetric history, prior surgical or medical history, family history, and others, encompassing both personal and social economic history, were all meticulously recorded, together with symptoms of thyroid diseases. There was a thorough general physical examination. The vitals were noted. The thyroid gland was inspected. The respiratory system, central nervous system, and cardiovascular system were all thoroughly examined.

Examinations of the abdomen and vagina were performed separately. The most basic tests were performed, including complete blood analysis, urine routine, bleeding and clotting times, blood grouping and Rh typing, RBS, HIV, HbsAg, and HCV. Apart from the clinical examination and pregnancy test ultrasound was done which confirmed that the pregnancy was less than 13 weeks.

Serum samples were submitted for FT3, FT4, and TSH testing. In accordance with the American Thyroid Association (ATA), locally determined baseline limits from a specific population of expectant women were used. The reference range for the first trimester is 0.1-2.5 mIU/L; the second trimester reference range is 0.2-3.0 mIU/L; and the third trimester reference range is 0.3-3.0 mIU/L as per the American Thyroid Association (ATA) Guidelines in Pregnancy. Normal free T4 and free T3 levels range from 0.7 to 1.8 ng/ml and 1.7 to 4.2 pg/ml, respectively.

The reference value for this study were the guidelines of the American Thyroid Association for the diagnosis and management of thyroid problems in pregnancy and postpartum.

Patients were divided under subclinical/overt hypothyroidism and subclinical/overt hyperthyroidism groups based on their hormonal results. To detect abnormalities in serum TSH during pregnancy, the ATA suggests using reference ranges specifically adapted for this condition.

Overt hypothyroidism is characterized by an elevated TSH (>2.5 mIU/L) with a correspondingly lower FT4 level. Women with TSH levels of 10.0 mIU/L or greater are also classified to have overt hypothyroidism, regardless of their free levels of thyroid hormone. Overt hyperthyroidism, which is defined by decreased thyroid-stimulating hormone (TSH), elevated free thyroxine (T4), and/or triiodothyronine (T3), found in 0.1 to 0.4 percent of pregnancies.

Subclinical hypothyroidism is defined as a high TSH level with a normal value of T4 level, either total or free, or a high TSH level between 2.5 and 5 mIU/L. In iodine-sufficient regions, subclinical hypothyroidism, a condition more prevalent than overt hypothyroidism, affects 15% to 28% of pregnant women.

In our study, overt hyperthyroidism was characterized by low serum TSH levels with fT3 and fT4 levels above standard range, whereas subclinical hyperthyroidism was characterized as low serum TSH levels with normal fT3, fT4 levels. TSH, FT3, FT4 trimester-specific ranges were employed in accordance with the ATA recommendations previously mentioned.

Thyroxine was used to treat cases of subclinical and overt hypothyroidism after receiving the investigation results. Propylthiouracil was used to treat cases of overt or subclinical hyperthyroidism.

Results

This study comprised 200 pregnant women who visited our antenatal clinic throughout their first trimester. The patients age ranged between 19 to 35, with an average age of 23.5±3.2 years. The population under study had an average gestational age of 9.58±1.67 weeks. The average TSH, FT3and FT4 results were 2.02, 2.56 and 1.21 respectively as mentioned in Table 1.

Table 1: Baseline characteristics of the subjects of this study

Sl. No.	Parameters	Mean+_SD
1	Age	23.52+_3.23 years
2	GEST Age	9.58+_1.67 weeks
3	TSH	2.02+_2.23 IU/L
4	FT3	2.56+_0.87 ng/ml
5	FT4	1.21+_0.39 pg/ml

Table 2: Percentage of thyroid diseases in our research population

Sl. No.	Type	No of Cases	Percentage
1	Euthyroid	162	81
2	Subclinical Hypothyroidism	20	10
3	Overt Hypothyroidism	12	6
4	Subclinical Hyperthyroidism	6	3
5	Overt Hyperthyroidism	0	0
6	Total	200	100

38 among 200 cases (about 19%) in our study had thyroid problems.

Table 2 lists the various thyroid conditions that our study population has, along with the prevalence of each.

Our research population was reported to be euthyroid in 81% of cases. 10% of cases had subclinical hypothyroidism, it was observed. A subclinical hyperthyroidism was seen in 3% of individuals and an overt hypothyroidism in 6% of cases.

In our study population, there were no instances of overt hyperthyroidism.

Discussion

At the PES Medical College Kuppam, Andhra Pradesh, in the department of obstetrics and gynaecology this prospective research study was conducted. [10-14] In this study, 200 women who were antenatal clinic visitors had their thyroid health evaluated. Our study's primary goal was to determine how common the thyroid diseases are in pregnancies at our tertiary care facility.

In our analysis, thyroid problems were 19% prevalent. Similar findings have been obtained from numerous previous research. In their study, Taghavi et al [16] reported that 14.6% of people had thyroid problems. In their study, Ajmani et al [1] found that 13.25 percent of people had thyroid problems. [15]

Similar findings were found in research by Weiwei Wang et al [18] (10.2%), Sahu et al [9] (12.7%), and Dhanwal DK et al [5] (14.3%).

A study conducted by Thanuja PM et al. [17] found that only 5% of people had thyroid problems. In contrast in a study by Rajput et al. [8] the frequency was exceedingly high (26.5%). In our study, subclinical hypothyroidism was 10% prevalent. A research by Sangeeta Pahwa et al. [10] found that 6% of people had subclinical hypothyroidism. Likewise, Sahu MT et al. [9] conducted a study in which the prevalence was 6.47%, which was comparable to our data. [19]

Most often, subclinical hypothyroidism affects women. In Andhra Pradesh, 10% of people have subclinical hypothyroidism, according to Bandela et al. [3] In their study, Gayathri et al.6 found that 2.8% of participants had subclinical hypothyroidism. The geographical variance in mineral content of iodine across different regions, variations in food habits, the impact of goitrogens, and various upper limit cut-offs employed for TSH in the studies are all potential causes of such fluctuation in findings.

All pregnant women who already have been recently diagnosed as having subclinical hypothyroidism should be checked for antithyroid antibodies since they can be associated with other autoimmune illnesses such as type I diabetes and have negative consequences on the mother and the fetus. In 2017, the ATA revised its recommendations for treating thyroid conditions during pregnancy. If antithyroid antibodies were detected and the value of TSH is 2.5–4 mIU/L, they advised starting thyroxine. If the preliminary TSH level is more than 4mIU/L, thyroxine should be started

irrespective of whether antithyroid antibodies are present or not. To treat subclinical hypothyroidism, Thyroxine is often started at a dose of 50 micrograms per day, and thyroid function values are repeated four weeks after treatment begins.

The prevalence of overt hypothyroidism in the current study was 6%, which is comparable to the studies by Saraladevi et al. [11] and Sahu MT et al. [9] where the occurrence was 2.8% and 4.58%, respectively. In the current study, the prevalence of overt and subclinical hyperthyroidism was 3% and 0%, respectively. The prevalence of overt and subclinical hyperthyroidism were 0.5 & 0.4%, respectively, in the study done by Stagnaro Green A et al. [12-15]. In a similar manner, research by Saraladevi et al [11] found that 1.8% and 0.6% of cases respectively, were prevalent.

In our research a major shortcoming was the exclusion of fetomaternal outcomes. Moreover, the study sample was limited. Therefore, additional studies with a high sample size are needed.

Conclusion

During pregnancy, maternal thyroid disease is indeed a frequent endocrine disorder. Maternal thyroid impairment has been found to have a significant impact on both fetal and maternal outcomes. As a result, it's important to detect thyroid issues early and start therapy as soon as possible. There are regional differences in the incidence of hypothyroidism during pregnancy. According to published research, thyroid problems during pregnancy are more common in underdeveloped nations like India than they are in western nations.

Early screening for thyroid abnormalities can aid in the diagnosis of people who need to be treated for thyroid conditions, thereby improving maternal and fetal outcomes. Consequently, it is imperative to promote thyroid dysfunction testing of all pregnant women during the initial trimester, which will aid in diagnosis, therapy, and continuous pregnancy monitoring.

In our study, thyroid disorders were quite common, especially overt & subclinical hypothyroidism. In order to diagnosis early and start treatment efficiently, it is advised to lower the threshold for testing and diagnosing the thyroid disorders amongst Indian pregnant women visiting regular antenatal clinics.

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