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STUDY OF PREVALENCE OF THYROID DISORDER AMONG PREGNANT WOMEN OF TERTIARY CARE CENTER OF VADODARA, INDIA

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ABSTRACT

Background:

The function of the thyroid gland is change during pregnancy. Thyroid dysfunctions during pregnancy are related with significant maternal and fetal outcomes. Universal broadcast for thyroid dysfunction is suggested in the 1st trimester of pregnancy.

Objective:

To check the prevalence of thyroid dysfunction during pregnancy in women attending a tertiary care hospital.

Methods:

This retrospective study was conducted from the test result of pregnant women of all trimester suffering from thyroid was collected from PSH (Parul Sevasharam Hospital) from August 2021 to April 2022.

Result:

In this study, the prevalence of thyroid dysfunction was 8.41%. The most predominant thyroidism in 1st trimester was subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism and

overt hyperthyroidism was 45 %, 37%, 9% and 9% respectively. Individually in second trimester the predominance of subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism and overt hyperthyroidism was 62%, 20%, 7% and 11% respectively. And the predominance of subclinical hypothyroidism in 3rd trimester was 12% and Euthyroid was 88%. Overall prevalence of subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism and overt hyperthyroidism were 56%, 27%, 7% and 10% respectively.

Conclusion:

We concluded that maternal thyroid problems have such a significant impact on mother and fetal outcomes, early detection and treatment of thyroid disorders is critical. Thus, universal thyroid disorder screening for pregnant women should be explored, especially in a country like India, where undiagnosed thyroid disorder is common.

Keywords: Thyroid disorder, subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism and overt hyperthyroidism, trimester

INTRODUCTION

Thyroid hormone shows a major role in the development of humans, such as nervous system evolution and skeletal muscle growth **[1]**. The thyroid gland interferes with the female reproductive tract in the non-pregnant as well as in the pregnant state and proper thyroid function is required for reproductive processes **[2]**.

Thyroid disorders are the second most common endocrine dysfunction seen in pregnancy **[3]**. Pregnancy is a natural physiological change that is accompanied with hormonal and metabolic alterations caused by a variety of conditions that results in many pathophysiologic processes, some of which have potentially of consequence outcomes if left untreated **[4]**.

Thyroid disorder during pregnancy is a well-researched area due to the detrimental result of either profoundly low or high circulating thyroid hormones **[5]**. On the lower end of the spectrum where there is an inadequacy in circulating thyroid hormones, exist three distinct state namely; overt hypothyroidism (OH), subclinical hypothyroidism (SCH), and isolated hypothyroxinemia (IH) **[5]**.

It is well record that maternal overt thyroid is associated with an increased risk in adverse maternal and fetal outcomes **[6]**. Thyroid diseases during pregnancy are related to maternal and fetal complications **[4]**. Overt maternal hypothyroidism is associated with gestational hypertension, miscarriage, preterm birth, low birth weight, fetal death, and imperfect fetal neurocognitive development **[7]**.

Overt hypothyroidism and even subclinical hypothyroidism expand the risk of obstetric complications: miscarriage, fetal death, gestational hypertension, preterm birth, and low birth weight **[8]**. When occurring early

in pregnancy, hypothyroidism can cause coherent and neurodevelopment retardation in children. Moreover, thyroid auto antibodies in pregnancy are also associated with recurrent miscarriage **[8]**. During pregnancy, optimum maternal thyroid role is essential for both the mother and the fetus **[3]**.

The diagnosis of thyroid dysfunction in pregnancy requires an understanding of trimester-fixed changes in thyroid function and the spectrum of abnormalities **[9]**. The value of performing thyroid function testing in all pregnant women, rather than just those at high risk, remains controversial **[9]**.

MATERIAL AND METHODOLOGY

- **Source of the data**: This study was done at Parul Sevashram Hospital, Vadodara.
- **Type of study**: Retrospective study was carried out from 606 pregnant women in all 3 trimesters from August 2021 to April 2022.
- **Inclusion criteria**: Pregnant women attended at gynecology department of PSH, the pregnant women of 17-40 age, irrespective of their gestational age and any gravid status.
- **Exclusion criteria**: Pregnant women who is Known case of thyroid disorder and taking Medicine for it. Pregnant women having past history of thyroidectomy.
- **Procedure:** 2330 women who visited gynecology department of PSH from Aug 2021 to April 2022 among them total 606 pregnant women found presence of disease, attending antenatal clinical in all 3 trimesters at Parul Sevashram Hospital, Vadodara and fulfilling all criteria which were enrolled in this study.

This study was approved by Parul University Institutional Ethical Committee for Human Research (PU-IECHR) with approval no. PUIECHR/PIMSR/00/081734/4005.

Patients was informed for the test of serum TSH level. If serum TSH values were insane, FT3 and FT4 levels were checked. The reference range of the test values used in this study were as per the instruction of American thyroid association for the diagnosis and management of thyroid disease during pregnancy and postpartum. As per regulation 14.2 of ATA, if trimester instruction -specific ranges for TSH was not available in the laboratory.

The following Normal range: TSH = 0.38-5.33 μIU/ml

Free T3=2.5-3.9 pg/mL

Free T4 =0.54-1.24 ng/dL

RESULTS

Out of 606 pregnant women, 51 pregnant women were found with thyroid disorder. The prevalence of thyroid disorder was 8.41%.

Figure 1 shows the frequency of pregnant women who were having 92% of euthyroid and 8% of were suffering from thyroid disorder. This study involves pregnant women of all trimester in which 1st trimester was 51, 2nd trimester was 45 and 3rd trimester were 43 patients.

Figure 2 as below to increase the understanding of the comparative investigation. The blue color depicts the status of 1st trimester, ruddy color displays the status of 2nd trimester and green color is the status of 3rd trimester. In 1st trimester 43 pregnant women were discovering with hypothyroidism and 8 in hyperthyroidism. In 2nd trimester 37 pregnant women were discovering with hypothyroidism and 8 in hyperthyroidism and in 3rd trimester 5 pregnant women were discovering with hypothyroidism and at last 38 pregnant women recovered in 3rd trimester.

Figure 3 talks about, the predominance of subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism and overt hyperthyroidism in first trimester were 45 %, 37%, 9% and 9% respectively. Individually as per figure 3 in Second trimester the predominance of subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism and overt hyperthyroidism in 62%, 20%, 7% and 11% respectively.

The predominance of subclinical hypothyroidism in 3rd trimester 12% and Euthyroid were 88% show in **Figure 3**. Overall prevalence of subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism and overt hyperthyroidism were 56%, 27%, 7% and 10% respectively.

Table 1 shows a trimester specific range of thyroid function. First trimester of TSH (thyroid stimulating hormone) Mean and SD value was (9.198±5.610) and their Minimum value was (0.001) and their Maximum value was (24.8). In their second trimester of TSH Mean and SD value was (6.6434±3.4734) and their Minimum value was (0.009) and their Maximum value was (12.9), and in 3rd trimester value of TSH is Mean and SD was (4.369±1.694) and their Minimum value was (0.37) and their Maximum value was (6.78).

In their First trimester of FT3 (free triiodothyronine) Mean and SD value was (2.5841±1.39) and their Minimum value was (0.24) and their Maximum value was (4.9). In their second trimester of FT3 Mean and SD value was (2.2927±1.146) and their Minimum value was (0.66) and their Maximum value was (3.9), and in 3rd trimester of FT3 Mean and SD value was (3.184±0.4856) and their Minimum value was (2.2) and their maximum value was (3.99).

In their first trimester of FT4 (free thyroxin) Mean and SD value was (0.708±0.649) and their Minimum value was (0.002) and their Maximum value was (1.87) in their second trimester of FT4 Mean and SD value was (0.821±0.583) and their Minimum value was (0.006) and their Maximum value was (1.65), and in 3rd trimester of FT4 Mean and SD value was (0.9689±0.328) and their Minimum value was (0.28) and their Maximum value was (2.27).

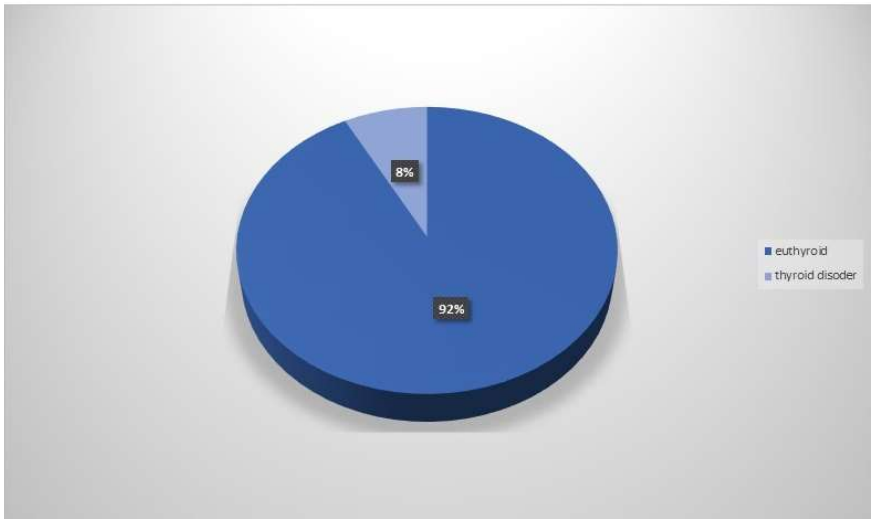

Figure 1: Frequency of Euthyroid and Thyroid disorder among pregnant women

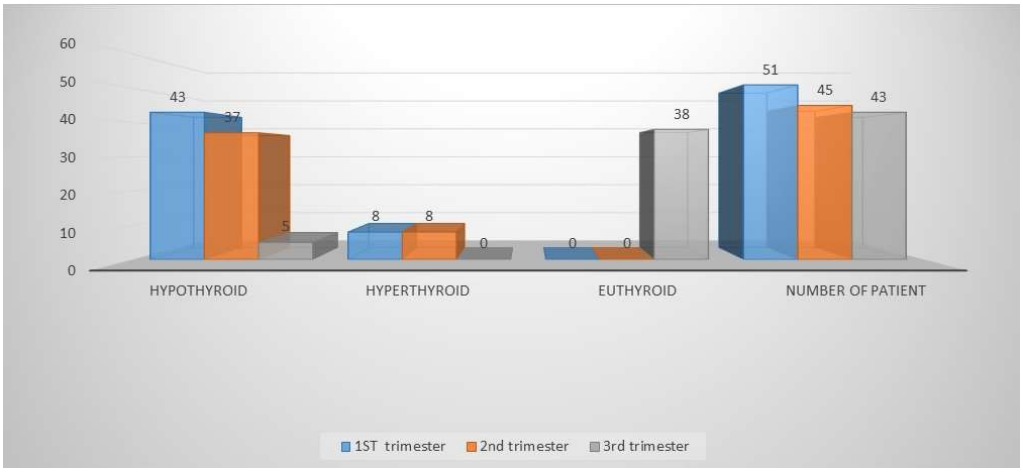

Figure 2: Comparison between Euthyroid and thyroid disorder in trimester

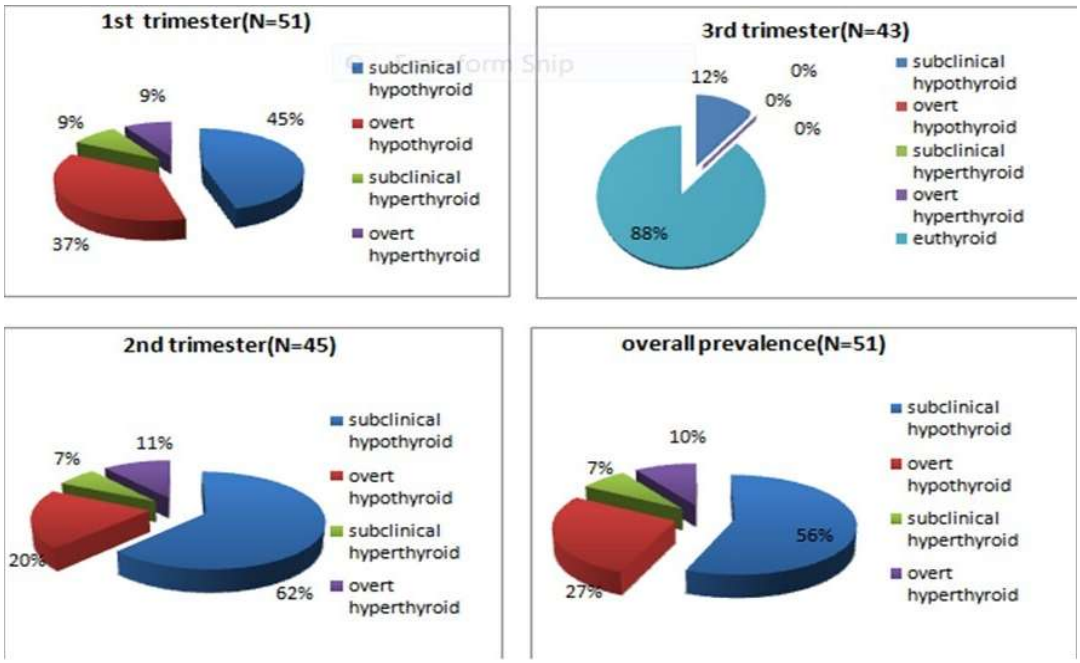

Figure 3: Predominance of thyroid conditions under different trimesters

Table 1: Trimester specific range of thyroid function TSH, FT4, FT3

Trimester	N	Minimum	Maximum	Mean ± SD
TSH				
First	51	0.001	24.8	9.198±5.610
Second	45	0.009	12.9	6.6434±3.4734
Third	43	0.37	6.78	4.369±1.694
FT3				
First	51	0.24	4.9	2.5841±1.39
Second	45	0.66	3.9	2.2927±1.146
Third	43	2.2	3.99	3.184±0.4856
FT4				
First	51	0.002	1.87	0.708±0.649
Second	45	0.006	1.65	0.821±0.583
Third	43	0.28	2.27	0.9689±0.328

DISCUSSION

The prevalence of thyroid dysfunction in pregnancy and the maternal and fetal complications in the pregnant women with thyroid dysfunction **[3]**. In the current study aim to determine the prevalence of thyroid dysfunction during pregnancy in women attending a tertiary care hospital.

Thyroid dysfunction during pregnancy was a well –researched area due to the detrimental effects of either profoundly low or high circulating thyroid hormones **[10]**. In other study, High Prevalence of Thyroid Dysfunction Among Pregnant Women in Lubumbashi, Democratic Republic of Congo. result was high prevalence was

associated with iodine deficiency **[8]**. In the present study was overall prevalence of subclinical hypothyroidism was commonest thyroid disorder seen **56%** pregnant women.

In the present study the overall prevalence was **8.41%** of thyroid disorder. Which was similar to the study done by Chaudhary LN *et al*. in the eastern part of Nepal, where the prevalence was 19.5% **[11]**.

Thyroid disorder during pregnancy has deleterious result on both maternal and fetal outcomes **[3]**. We found a statistically significant inverse relation of TSH and fT4 levels at the first half of pregnancy with birth weight, after adjusting for gestational age and other possible confounding Factors **[12]**.

CONCLUSION

This study showed a high prevalence of thyroid disorder (8.41%) especially hypothyroidism in pregnant women, with overall prevalence of all 3 trimester of subclinical hypothyroidism being (56%), and overt hypothyroidism being (27%).although hyperthyroidism was seen in low amount to compared to hypothyroidism .due to the huge effect that the maternal thyroid disorder has on maternal and fetal outcome, prompt identification of thyroid disorders and timely initiation of treatment is essential.

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