

Original Article**Prevalence of Thyroid Disorders among Pregnant Women at Birat Medical College Teaching Hospital**Raj Deb Mahato^{1*}, Ajit Singh¹, Sujeet Singh¹, Manisha Joshi¹, Tarun Pradhan¹, Binod Kumar Yadav²¹Department of Obstetrics and Gynaecology, Birat Medical College Teaching Hospital, Biratnagar, Nepal, ²Madhesh Institute of Health Sciences, Janakpurdham, NepalArticle Received: 12th August, 2023; Accepted: 18th November, 2023; Published: 31st December, 2023DOI: <https://doi.org/10.3126/jonmc.v12i2.61352>**Abstract****Background**

Thyroid disorders Thyroid Disorder are the second most common endocrine disorders seen in pregnancy. Thyroid Disorder is known to be associated with adverse maternal and fetal outcomes.


Materials and MethodsThis was a hospital based descriptive cross-sectional study. All the pregnant women attending the antenatal clinic at Birat Medical College Teaching Hospital from 1st July 2021 to 30th June 2022 were enrolled in the study, irrespective of their gestational age and gravida status. Pregnant women with diagnosed thyroid disorder and are on medication, multiple gestation, Diabetes mellitus, Hypertension and pregnant women with age more than 35 years were excluded from study. Thyroid function status of pregnant women was assessed by measuring serum levels of thyroid stimulating hormone (TSH) and if the TSH value was deranged then they underwent free T3 and free T4 level. Based on the TFT reports they will be classified as euthyroid, subclinical hypothyroidism and overt hypothyroidism, subclinical hyperthyroidism and overt hyperthyroidism.**Results**

A total of 395 pregnant women were enrolled in this study. The mean age and standard deviation of pregnant women was 25.25± 4.76 years. Among 395 pregnant women 93 (23.6%) pregnant women have thyroid disorder. Subclinical hypothyroidism and Overt hypothyroidism were 19% and 1.8% respectively. Subclinical and Overt hyperthyroidism were 1.5% and 1.3% respectively.

Conclusion

The prevalence of thyroid disorder in pregnancy was 23.6%. The most common thyroid disorder observed was Subclinical hypothyroidism comprising significantly observed cases followed by Overt hypothyroidism, Subclinical and Overt hyperthyroidism cases respectively.

Keywords: *Pregnancy, Prevalence, Tertiary Care Centers, Thyroid Diseases*

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Introduction

Thyroid disorders (TD) are the second most common endocrine disorders seen in pregnancy. TD is known to be associated with adverse maternal and fetal outcomes and is often overlooked in pregnant women because of nonspecific symptoms in pregnancy [1]. Endemic iodine deficiency and Hashimoto's thyroiditis remain a major cause of hypothyroidism [2]. Production of thyroid hormones and iodine requirement each increases by around 50% during pregnancy [3]. Pregnancy is a state of relative iodine deficiency because of increased renal loss and transfer of iodine to developing fetuses [4]. Maternal thyroxine is essential for normal fetal brain development and structural organization thus future intellectual development especially before the development of fetal thyroid gland [3]. This insult is likely to occur in the first trimester and therefore, preconceptional optimization of thyroid disorder is important [5]. Maternal thyroxine contribution remains important sources before 12 weeks of gestation after which fetal thyroid synthesized thyroid hormone. The increased demand for thyroid hormone starts very early in pregnancy and reaches a plateau at 16-20 weeks of pregnancy [6]. Pregnancy is a stress test for the thyroid and the physiological changes may result in hypothyroidism in the later stages in women with limited thyroidal reserve with underlying autoimmune disease or iodine deficiency who were euthyroid prior to conception [3]. Serum thyroid stimulating hormone (TSH) levels in early pregnancy decline because of weak TSH receptor stimulation from high quantities of human chorionic gonadotropin (hcG) secreted by placental trophoblast during the first trimester. The TSH level is lowest and FT4 level is highest when hcG levels are peak [2]. The pregnancy-related changes in thyroid physiology make diagnosis of thyroid disorder difficult, because it can simulate signs and symptoms of physiological changes of pregnancy [7]. Symptoms of heat intolerance, inactiveness, fatigue, tachycardia, edema, hair changes, and weight gain are common signs and symptoms of thyroid disease in pregnancy [7]. The management of thyroid disorders is therefore based principally on biochemical measurement of thyroid function. During pregnancy, optimization of maternal thyroid function is essential for both the mother and the fetus [8]. Thyroid dysfunction can have an immense impact on pregnancy outcomes and fetal development. Various adverse effects such as miscarriage, preeclampsia, anemia, low birth weight, preterm birth, increased maternal and fetal morbidity, and mortality is reported [9].

Screening of thyroid disorder is expensive even though we screen every pregnant woman for thyroid disorder but actual prevalence of thyroid disorders in pregnancy in this part of Nepal was unknown so this study helped to find the actual prevalence of thyroid disorder in pregnancy in this part of Nepal.

This study was carried out with an objective to find the actual prevalence of thyroid disorder in pregnancy in the Eastern part of Nepal.

Materials and Methods

This was a hospital based descriptive cross-sectional study done in the antenatal clinic at Birat Medical College Teaching Hospital, Biratnagar, Nepal from 1st July 2021 to 30th June 2022. Ethical clearance was taken from the Institutional Review Committee of Birat Medical College Teaching Hospital. Informed consent was taken from all the participants prior to enrollment in the study. All the pregnant women attending antenatal clinics were included in the study irrespective of their gestational age and gravida status by convenient sampling technique. Pregnant women with diagnosed thyroid disorder and are on medication, Multiple gestation, Diabetes mellitus, Hypertension and pregnant women with age more than 35 years were excluded from the study. Sample size was calculated by using Cochran formula, $n = Z^2 pq/d^2 = (1.96)^2 \times (0.24) \times (1-0.24) / (0.05)^2 = 280.28$, where, n= sample size, p= prevalence from previous study, 24.62% [10], q= 1-p, d= allowable error (5%), Z= 1.96 at 95% CI.

A total of 395 pregnant women were enrolled in this study. All the pregnant women were subjected to TSH screening and if the TSH value were deranged then they were investigated for free T3 and free T4 concentration. The reference ranges of the Thyroid function test (TFT) values used in this study were as per the Guidelines of American Thyroid Association (ATA) for the Diagnosis and Management of Thyroid Disease during Pregnancy [11]. Gestational age specific reference range of TFT reports were used as per ATA guideline. Depending on the TFT values, patients were classified into Euthyroid, Subclinical hypothyroidism, Overt hypothyroidism, Subclinical hyperthyroidism and Overt hyperthyroidism. All the pregnant women with thyroid disorder were treated accordingly. Structured questionnaires were used to gather information. Face to face interview and pregnant women TFT reports were used for data collection using a preformed proforma. The collected data were entered in Microsoft Excel and analyzed by using



IBM SPSS version 22. Descriptive statistics in the form of frequencies, percentages and standard deviations were used to describe relevant data.

Results

A total of 395 pregnant women were enrolled in this study. Among which 93(23.6%) pregnant women have thyroid disorder. The mean age and standard deviation of the pregnant women were 25.25 ± 4.76 years. Majority 93.4% of pregnant women follow Hindu religion, 89.4% were housewives and 36.2% were from Brahmin/Chhetri ethnicity as shown in table 1.

Table 1: Sociodemographic characteristics of pregnant woman (n=395)

Variables	Frequency (%)
Age (years)	
<20	16 (4.1)
20-30	320 (81)
31-35	59(14.90)
Ethnicity	
Dalit	6(1.5)
Janjati	111(28.1)
Madhesi	92(23.3)
Muslim	20(5.1)
Brahmin/Chhetri	143(36.2)
Others	23(5.8)
Religion	
Hinduism	369(93.4)
Buddhist	5(1.3)
Muslim	21(5.3)
Education status	
Illiterate	29(7.3)
Literate	266(92.7)
Occupation	
House wife	353(89.4)
Others	42(10.6)

Most of the pregnant women were between age of 20 to 30 years as shown in table 2.

Table 2: Age and number of pregnancy (n =395)

Age	Primigravida	Multigravida	Total
< 20 years	14	2	16
20-30 years	172	148	320
31-40 years	9	55	59
Total	195	200	395

Around half of the pregnant women (49.4%) were primigravida and 50.6% were multigravida as shown in figure 1.

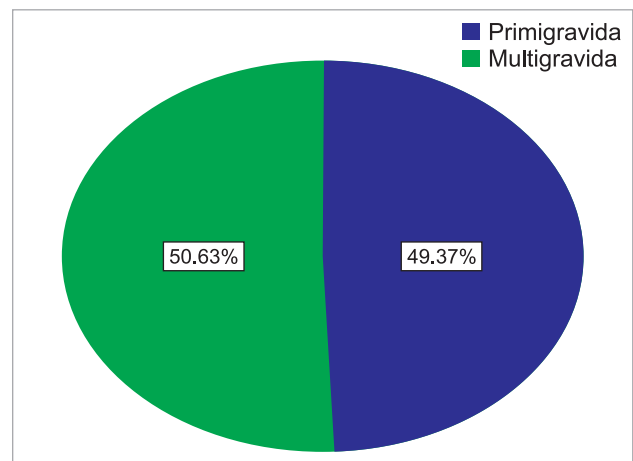


Figure 1: Obstetric score

Prevalence of thyroid disorder was 23.6%. The most common thyroid disorder observed was Subclinical hypothyroidism comprising 19% cases followed by Overt hypothyroidism comprising 1.8% cases followed by Subclinical and Overt hyperthyroidism 1.5% and 1.3% cases respectively as shown in table 3.

Table 3: Classification of thyroid disorders (n =395)

Type of thyroid disorder	No. of cases	Percentage (%)
Euthyroid	302	76.4
Subclinical hypothyroidism	75	19
Overt hypothyroidism	7	1.8
Subclinical hyperthyroidism	6	1.5
Overt hyperthyroidism	5	1.3
Total	395	100

Thyroid disorders (TD) are the second most common endocrine disorders seen in pregnancy and are associated with adverse maternal and fetal outcomes [12, 13]. Children born to hypothyroid mothers have a poor intellectual function in the latter part of their life [14]. There is an increased risk of preeclampsia placental, abruption, intrauterine growth restriction, prematurity and intrauterine fetal demise [2]. Thyroxine is essential for fetal neurodevelopment, maternal delivery of thyroxine to the fetus is essential early in gestation [15]. The prevalence of thyroid disorders in pregnancy varies greatly in different regions depending upon many factors. We enrolled 395 pregnant women in the present study. Among them, the mean age and standard deviation of 25.25 ± 4.76 years. The prevalence of thyroid disorder was 23.6%. Subclinical hypothyroidism and Overt hypothyroidism were 19% and 1.5% respectively. Subclinical and Overt hyperthyroidism was 1.8% and 1.3% respectively. The finding is con-

sistent with the study done by Khakurel G et al. [10] in Kathmandu, Nepal showing the prevalence of thyroid disorders is 24.62 %. The most common thyroid disorder was subclinical hypothyroidism comprising 19.75 % cases followed by overt hypothyroidism 2.43%. This may be because of similar areas of location study. In contrast to this study a study done by Sharma SK et al. [16] showed the prevalence of thyroid disorder in pregnancy was 39.48%. This is because this study includes pregnant women only in the first trimester of pregnancy. Beta-HCG has a mild thyrotropic activity and shares 85% sequence homology with TSH beta subunit. During the first trimester of pregnancy, beta-HCG is at its greatest concentration, while serum TSH drops [17]. A study done in western Nepal by Upadhyaya TL et al. [18] shows that prevalence of Thyroid disorders was higher than present study which shows the prevalence of subclinical hypothyroidism is around 31% and overt hypothyroidism is 13% in pregnancy in western Nepal. This may be because this study was done in hilly region of Nepal. Dietary Iodine deficiency is an important underlying cause of thyroid disorder, especially in hilly regions [19]. A study done by Gupta P et al. [20] in Indore, India shows the prevalence of thyroid disorder was 10.4% in which the prevalence of subclinical hypothyroidism, overt hypothyroidism, subclinical hyperthyroidism and overt hyperthyroidism is 5.50% and 0.92%, 3.12% and 0.81% respectively, where the prevalence is less than this study because Nepal lies in the endemic area of iodine deficiency. Iodine deficiency is a major cause of thyroid disorders worldwide [21].

Conclusion

The prevalence of thyroid disorder in pregnancy was 23.6%. The most common thyroid disorder observed was Subclinical hypothyroidism comprising 19% cases followed by Overt hypothyroidism comprising 1.8% cases followed by Subclinical and Overt hyperthyroidism 1.5% and 1.3% cases respectively.

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Conflict of interest: We declare no conflict of interest.

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