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Prevalence of thyroid disorders in pregnancy among women attending a tertiary hospital of Sudurpaschim province, Nepal

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Abstract

Introduction: Thyroid disorders are the second most common endocrine disorders affecting women in the reproductive period. Women with thyroid disorders during pregnancy are prone to serious maternal and fetal outcomes. To prevent those adverse outcomes, universal screening for thyroid disorders is recommended in the first trimester of pregnancy. This study aims to determine the prevalence of thyroid disorders during pregnancy in women attending a tertiary care hospital.

Method: A descriptive cross-sectional study was done at Dadeldhura Hospital, Dadeldhura, after obtaining ethical approval from the Nepal Health Research Council. Pregnant women aged 18 years or older were enrolled in the study using convenience sampling, irrespective of gestational age, parity, gravida, and prepregnant thyroid status. Participants' thyroid function tests were analyzed to assess their thyroid status. The prevalence of thyroid disorders was estimated, and descriptive statistical analysis of collected data was done using SPSS (Statistical Package for Social Services) version 20.0.

Result: A total of 356 pregnant women were enrolled in this study. The prevalence of thyroid disorders was found to be 30%, with subclinical hypothyroidism being the most common disorder, observed in 60 (16.85%) women. This was followed by overt hypothyroidism in 22 (6.1%) women and subclinical hyperthyroidism in 21 (5.89%) women.

Conclusion: The study identifies a high prevalence of thyroid disorders in pregnancy. Further studies with a larger number of pregnant women and at multiple centers are needed to validate the prevalence of thyroid disorders in pregnancy in Sudurpaschim Province.

Keywords: Pregnancy; Thyroid disorder; Thyroid hormones

INTRODUCTION

Thyroid dysfunction is the most common endocrinological disorder next to gestational diabetes in pregnancy.[1] Physiological changes in thyroid function during pregnancy are due to increased thyroxine-binding globulin (TBG), increased renal loss of iodine, altered peripheral metabolism of thyroid hormones, and a change in iodine transfer to the placenta, which helps the maternal thyroid gland cope with increased physiological demands. Failure to adjust to those physiological changes brings an alteration in thyroid functions, which can lead to substantial adverse feto-maternal and neonatal events such as preeclampsia and preterm birth. That alteration can be easily detected by simple, reliable blood tests and treated.[2] For this purpose, universal screening for thyroid disorders is recommended in all women in their first trimester of pregnancy, as recommended by the Federation of Obstetric and Gynecological Societies of India(FOGSI).[3]

The increasing global prevalence of thyroid disorders has been shown to affect up to one-third of women screened for thyroid disorders during pregnancy, and hypothyroidism is the most common one.[4,5] There is a wide variation in the prevalence of thyroid disorders among the general population in Nepal, extending from 4.32% to 39.3%.[6,7] Studies from Central hospitals in Nepal have reported thyroid disorders to be prevalent in 24.62% of pregnant women attending the hospital.[8]

This study aims to determine the prevalence of thyroid disorders during pregnancy in women attending a tertiary care hospital.

METHOD

This hospital-based descriptive cross-sectional study was conducted among pregnant women visiting the Dadeldhura Hospital in Sudurpaschim Province, Nepal, from May to August 2023, following ethical approval from the Nepal Health Research Council (reference number 20032020) in March 2020.

The study aimed to assess the prevalence and patterns of thyroid disorders among patients attending the obstetrics and gynecology outpatient department. Patients visiting the outpatient department during the study period were screened for eligibility. All pregnant women aged 18 years or older were included in the study, irrespective of gestational age or thyroid status before pregnancy. Those who refused to provide consent were excluded from the study. Eligible participants were selected consecutively until the required sample size was achieved.

Informed written consent was obtained from each participant by the principal investigator, who explained the purpose and procedures of the study. Demographic and pregnancy-related data were retrieved from the antenatal care records by the investigators.

For this convenient sampling, the sample size was calculated using the following formula:

$n = Z^2p(1-p)/e^2 = (1.96)^2 x (0.257) x (1-0.257)/ (0.05)^2 = 355$

where n= sample size

p= (prevalence from previous study by Biloni Shrestha and Adhikari, p at Nepal medical college and teaching hospital Jorpati, Nepal) 25.7%.[9]

e= margin of error (5%), Z 1.96 at 95% CI.

Thyroid function tests (T3, T4, and TSH) were performed in the hospital laboratory using a chemiluminescence immunoassay (CLIA) method on a fully automated analyzer, following standard laboratory protocols and quality control procedures in the Dadeldhura hospital laboratory. The tests were prescribed in accordance with the FOGSI antenatal screening protocol adopted at the Dadeldhura Hospital Obstetrics and Gynecology Department.

The reference ranges of the test values used in this study are recommended as per 2017 guidelines of the American Thyroid Association for the diagnosis and management of thyroid disease during pregnancy and the postpartum: TSH= 0.1 to 3 uIU/ml (TSH upper reference limit of 2.5 mIU/L in the 1st trimester, and 3.0 mIU/L in the 2nd and 3rd trimesters), FT3= 2-4.20 pg/ml, FT4=8.90 to 17.20 pg/ml. Pregnant women with thyroid disorders were categorized into five groups according to the American Thyroid Association (ATA) guideline 2017. [10]

1. Subclinical hypothyroidism: High serum TSH level with normal T4 and T3 levels,
2. Overt hypothyroidism: High serum TSH level with T4, T3 level less than the normal range,
3. Normal/ Euthyroid: Normal TSH, T3, and T4 levels,
4. Subclinical hyperthyroidism: Low serum TSH level with normal T3, T4 level,
5. Overt hyperthyroidism: Low serum TSH level with T3 and T4 more than the normal range

The prevalence of thyroid disorders was estimated by descriptive analysis of collected data in SPSS (Statistical Package for Social Sciences) version 20.0.

RESULT

A total of 356 pregnant women were enrolled in this study, with ages ranging from 21 to 39 years. The majority of participants were in the 30–34-year age group(Table 1).

Table 1. Distribution of pregnant women with thyroid disorders by age group(n=356)

Age group	n (%)
19-24	64(18.1%)
25-29	102(28.8%)
30-34	186(52.5%)
25-40	2(0.6%)

Thirty-two (39.50%) pregnant women with a thyroid disorder in the study were primigravida, and 49(60.49%) of them were multigravida.

Among 356 pregnant women, one third of them, 108(30%), had thyroid disorders. Subclinical hypothyroidism was observed in the majority of them, comprising 60(16.85%) cases, followed by 22(6.1%) cases of overt hypothyroidism, 21(5.89%) cases of subclinical hyperthyroidism, and 5(1.4%) cases of overt hyperthyroidism during pregnancy (Table 2).

Table 2. Thyroid disorders in pregnant women attending Dadeldhura hospital (n=356)

Type of disorders	Cases n (%)
Euthyroid	248(70%)
Subclinical hypothyroid	60(16.85%)
Overt hypothyroidism	22(6.10%)
Subclinical hyperthyroidism	21(5.89%)
Overt hyperthyroidism	5(1.40%)

DISCUSSION

Thyroid disorder during pregnancy is often missed in pregnancy. Identification of thyroid disorders in early first trimester and their treatment improves the feto-maternal outcome of pregnancy.[11]

The prevalence of thyroid disorders among pregnant women in this study was found to be 30%, which is considerably higher than the global average of 18%.[4] The prevalence of subclinical hypothyroidism in our study was 16.85%, aligning with the 19.5% prevalence reported by Chaudhary LN et al. in the eastern region of Nepal.[12] These findings are consistent with a similar study from western Nepal.[13] In contrast to our finding, Sahu MT, et al. have reported a lower prevalence of hypothyroidism in pregnancy of 6.47%, probably due to screening of pregnant women only in the second trimester of pregnancy in their study.[14]

As it was a non-randomized cross-sectional study, selection bias cannot be excluded. Additionally, the study was conducted in a single center with a limited sample size, which may restrict the generalizability of the findings to broader populations. Despite these limitations, the study provides valuable baseline information and contributes to the understanding of the prevalence of thyroid disorders in pregnancy in the local context. Hence, a multicenter study with a large sample size is needed for validation.

CONCLUSION

The study highlights a high prevalence (30%) of thyroid dysfunction among pregnant women, with subclinical hypothyroidism as the predominant condition. Further studies are needed to determine the prevalence of thyroid disorders in pregnancy in Sudurpaschim Province.

DECLERATIONS

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Conflict of Interest
The author does not have any conflict of interest to declare.

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None

Ethical Clearance
The ethical clearance was taken from the Nepal Health Research Council with reference no 20032020.

Consent of publication from the author
All the authors and participants consented to the publication of the findings.

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