Assessment of Thyroid disorder during pregnancy in Tertiary level Hospital, Nepal.
Jour of Diab and Endo Assoc of Nepal Vol 8, No. 1, Jan-June, 2024
ISSN Print 2594-3367 ISSN Online 2631-2107

Journal of Diabetes and Endocrinology Association of Nepal

ORIGINAL ARTICLE OPEN ACCESS

Assessment of Thyroid disorder during pregnancy in Tertiary level Hospital, Nepal.

Sapkota K[1], Adhikari BR[2] Dhakal B[13]

[1] Department of Medicine, Bharatpur Hospital, [2] Pushpanjali Hospital, Bharatpur, [3] Nursing College, Bharatpur Hospital

Abstract

Background: Thyroid dysfunctions are most prevalent in women during their most fertile years (15 - 35) and thyroid dysfunction during pregnancy is associated with higher risk of pregnancy and neonatal complications. Routine screening of thyroid dysfunction during pregnancy can help to identify and treat the disorder early and prevent its complication. **Methods:** A hospital based observational study on 400 pregnant women was conducted in tertiary level hospital in Nepal. Participants with abnormal thyroid functions were regularly followed up till the pregnancy outcome. Results: Among 400 cases, 45.3% of the respondents were of age group 21-25 years with mean age 23.84 ±3.5 years. This study had 14.7 % (n 59) women with abnormal thyroid functions. Of these 12.7 % were hypothyroid and 2 % were hyperthyroid. Among 51 cases of hypothyroid 10.5 % were subclinical hypothyroid and 2.2 % were overt hypothyroid. Majority of the pregnant women with thyroid dysfunction had one or more adverse events during pregnancy course. **Conclusion:** Thyroid dysfunction is common during pregnancy. High prevalence of thyroid dysfunction necessitates the standardized screening protocol to pregnant women based on risk categories and early initiation of treatment if significant abnormality is identified and regular follow up for every pregnant woman with abnormal thyroid function.

Key words: pregnancy, hypothyroid, hyperthyroid, risk

Introduction

Thyroid dysfunctions are most prevalent in women during their most fertile years (15 - 35), and for a long-time thyroid dysfunction have been linked with poor reproductive health and pregnancy outcomes[1]. When a female with an uncorrected thyroid dysfunction becomes pregnant, this may have serious adverse effects on fetal and maternal well-being, particularly the neuro-intellectual development of the fetus [2-4].

Thyroid dysfunction is the most frequent endocrine disorder in pregnant women. Many Physiological and pathological conditions can arises during pregnancy which might lead to abnormal thyroid functions. Hypothyroidism complicates up to 3% of pregnancies, of which 0.3–0.5% is overt and 2.0–2.5% is subclinical hypothyroidism[5]. Overt hypothyroidism and even subclinical hypothyroidism increases the risk of obstetric complications: miscarriage, fetal death, gestational hypertension, preterm birth, and low birth weight [6-8]. When occurring early in pregnancy, thyroid disorder can cause cognitive and neurodevelopment retardation in children[9]. Moreover, thyroid autoantibodies in pregnancy are also associated with recurrent miscarriage[7] and with maternal morbidity later in life[6]. Maintaining a normal thyroid function during pregnancy is therefore of predominant importance for the mother and for the child. However, there is limited and conflicting evidence regarding the impact of intervention on improving health outcomes in pregnant women with subclinical hypothyroidism (SH) and with euthyroid autoimmune

Correspondence Author

Dr Kalyan Sapkota MD, FEM, Endocrinology Unit, Department of Medicine, Bharatpur Hospital, Bharatpur-10, Bharatpur, Chitwan, Mob. 9851143296, Email: kalyansapkota@gmail.com

disease in pregnancy[4,10]. Adequately treated hypothyroidism still appears to increase risk of cesarean sections but is not associated with other adverse outcomes [11].

The test for thyroid dysfunctions is not considered in routine screening protocols of pregnant women, or of those planning to get pregnant, even though missing the diagnosis and the delay in managing the thyroid dysfunctions has been proved to have a deleterious effect on the wellbeing of mother and offspring. Thus, this study is designed to assess the thyroid dysfunctions in pregnancy and to provide policy maker with fundamental data necessary for appropriate intervention.

Material and Methods

It is a single center hospital based observational study used to assess thyroid disorder and its outcome among pregnant women. All first trimester primigravida women aged 15-45 years attending antenatal OPD without any known thyroid disorder and who agreed to participate in the study were included initially to assess the thyroid function level. Ethical clearance was taken from institutional ethics committee. Participants who had abnormal thyroid function were then followed up throughout the pregnancy to evaluate the outcome.

Socio demographic data were collected by using a detailed structured questionnaire, including socio-demographic information (age, residence, education, and occupation), history of thyroid disease and past medical history (diabetes mellitus, autoimmune disease, hypertension etc.). TSH level was assessed and those patients who had abnormal TSH were evaluated for fT4 level. Those patients who had abnormal thyroid function were followed up throughout the pregnancy to evaluate the pregnancy outcome. During the follow-up patient were observed for presence of any maternal complication like miscarriage, stillbirth, and types of delivery (Normal or Cesarean section (If CS, emergency or elective, and reason for CS).

Collected data were checked and reviewed for accuracy and completeness then entered and analyzed in IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp. Data were analyzed by using descriptive statistics.

Results

Among 400 cases, around half (45.3%) of the respondents were of age group 21-25 years and only (2.8%) were from age group of 31-35 years with mean, standard deviation as 23.84±3.5, minimum age was 17, and maximum was 35 years. (Table 1).

Age Range	Frequency n=400	Percentage
16-20 years	80	20.0
21-25 years	181	45.3
26-30 years	128	32.0
31-35 years	11	2.8
Mean±SD =23.84±3.5, Min=17, Max=35		

Out of 400 participants, 85.3% were euthyroid and 14.7 % had abnormal thyroid functions. Of these 12.7 % were hypothyroid and 2 % were hyperthyroid. Among 51 cases of hypothyroid 10.5 % were subclinical hypothyroid and 2.2 % were overt hypothyroid. (Table 2)

Table2: Prevalence of thyroid dysfunction during pregnancy

Thyroid Status	Frequency n=400	Percentage
Euthyroid	341	85.3
Overt Hypothyroid	9	2.2
Subclinical Hypothyroid	42	10.5
Subclinical hyperthyroid	6	1.5
Hyperthyroid	2	0.5

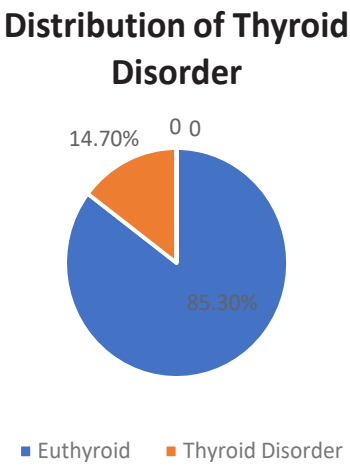

Fig 1: showing distribution of thyroid dysfunction.

Participants with abnormal thyroid functions were treated with appropriate medication based on abnormal thyroid report. The right to treat and follow up were based on treating physician decision. Complication occurrence during the course of pregnancy and childbirth were recorded in all patients with abnormal thyroid function. Among 59 pregnant women with thyroid disorder, 1 pregnant women had threatened abortion, 3 had gestational hypertension/pre-eclampsia, 4 had preterm delivery, 15 had LSCS (5 emergency LSCS and 10 elective LSCS), most common cause for CS being fetal distress, 11 newborn baby admitted in NICU and 2 pregnant women had post-partum hemorrhage. (Table 3).

Table 3: Complications among pregnant women with abnormal thyroid function

Complications	Frequency n=33
Threatened abortion	1
Gestational Hypertension	2
Pre-eclampsia	1
Preterm Delivery	4
LSCS (n=25)	15
Emergency LSCS	5
Elective LSCS	10
NICU Admission of Newborn	11
Post-Partum Hemorrhage	2

Discussion

Thyroid disease during pregnancy includes mainly hypothyroidism, hyperthyroidism and their variants, isolated hypothyroxinemia, autoimmune thyroid disease and different types of goiter. Estimates of the prevalence of thyroid dysfunction depend upon methodological factors, classifications of hypothyroidism, TSH cut-off values and composition of the community examined by age and ethnicity. The prevalence and pattern of thyroid dysfunction depend on ethnic, geographic, and environmental factors including iodine intake status.

Thyroid diseases are one of the common endocrine disorders in pregnancy and are associated with adverse pregnancy and fetal, neonatal complication. However, an early detection of thyroid dysfunction and treatment during pregnancy improves the outcome 4,12. Early detection of thyroid disease during pregnancy is possible if the appropriate thyroid test is done during prenatal visit or soon after the pregnancy is confirmed.

Around half of the respondents (45.3%) belongs to 21-25 years of age group with mean 23.84 (±3.5). The mean age at presentation is similar to study 13 done in India (25.19 ± 4.17), in Nepal 14 24.45±4.4 years but is lower compared to Western studies 29 ± 5 years 15 reflecting early marriage and early conception prevalent in Nepal.

Our study demonstrates a higher incidence of thyroid dysfunction (hypothyroidism and hyperthyroidism). The prevalence of thyroid disorder in this study is 14.7 %, of these 12.7 % were hypothyroid which is higher than that in the western literature (2.5% 5,16, 2.6% 17. But few studies done in Nepal had very high prevalence of hypothyroidism, 25.7% 18 and overt hypothyroidism 13% and subclinical hypothyroidism 31% 19, whereas a study done in eastern Nepal had 19.5% prevalence of hypothyroidism 14. Our findings were similar to various studies done in India which had prevalence of 13.13% 20, 14.3% 21. Assay specific reference ranges according to pregnancy trimester for thyroid hormones were unavailable for the kits used in study, so we could not classify the thyroid status accordingly in the present study. The rate of thyroid dysfunction among pregnant women would increase to 46.3% (n=185) if thyroid dysfunction was classified on the basis of trimester specific recommendation by American Thyroid Association(4) and National Consensus Statement for the Management of Hypothyroidism in Nepal 22 for thyroid function which has suggested first trimester, 0.1–2.5 mIU/L reference range for TSH if no trimester specific reference ranges are available in the laboratory.

Studies systematically assessing the prevalence of thyroid autoantibodies during pregnancy, however, have not been reported from Nepal and India. Iodine deficiency could be a contributory cause for higher prevalence, but this information cannot be generated from our study as urinary iodine estimation was not done. In developing countries, the most frequent cause of hypothyroidism is represented by severe iodine deficiency, while in developed countries it is by chronic autoimmune thyroiditis. Thyroid auto-antibodies are detected in about 50% of pregnant women with SCH and in more than 80% with overt hypothyroidism 23.

Majority of the patient with thyroid dysfunction had some adverse events during the pregnancy or labor, the occurrence was merely or chance or statistically significant could not be assessed as the outcome of euthyroid patient were not known. Similar events of complications during early pregnancy, miscarriages, preterm labor, preeclampsia, neonatal morbidity were observed in other studies as well 19,23,24.

Conclusion

Thyroid dysfunction is common during pregnancy, its actual prevalence might differ in different geographic regions. Trimester specific TSH should be used if available to appropriately screen in high risk pregnant women. All the pregnant women with abnormal TSH should undergo testing of fT4 and thyroid antibodies. High prevalence of thyroid dysfunction necessitates the standardized screening protocol to pregnant women based on risk categories and early initiation of treatment if significant

abnormality is identified and regular follow up for every pregnant woman with abnormal thyroid function.

Acknowledgement
We acknowledge NHRC for providing provincial grant to conduct this study. We also acknowledge the Obstetric and Gynecological department.

Conflicts of Interests: None

References

1. Okosieme OE, Lazarus JH. Thyroid dysfunction in pregnancy: Optimizing fetal and maternal outcomes. Expert Review of Endocrinology and Metabolism. 2010;5(4):521-9.
2. Brian MC KJ. Thyroid Disease in Pregnancy: ACOG Practice Bulletin Summary, Number 223. Obstetrics and gynecology. 2020;135(6):1496-9.
3. Chang DLF, Pearce EN. Screening for maternal thyroid dysfunction in pregnancy: A review of the clinical evidence and current guidelines. Journal of Thyroid Research. 2013;2013:8.
4. Alexander EK, Pearce EN, Brent GA, Brown RS, Chen H, Dosiou C, et al. 2017 Guidelines of the American Thyroid Association for the Diagnosis and Management of Thyroid Disease during Pregnancy and the Postpartum. Thyroid. 2017;27(3):315-89.
5. Stagnaro-Green A, Abalovich M, Alexander E, Azizi F, Mestman J, Negro R, et al. Guidelines of the American Thyroid Association for the diagnosis and management of thyroid disease during pregnancy and postpartum. Thyroid. 2011;21(10):1081-125.
6. Haddow JE, Palomaki GE, Allan WC, Williams JR, Knight GJ, Gagnon J, et al. Maternal Thyroid Deficiency during Pregnancy and Subsequent Neuropsychological Development of the Child. New England Journal of Medicine. 1999;341(8):549-55.
7. Pop VJ, Kuijpens JL, van Baar AL, Verkerk G, van Son MM, de Vijlder JJ, et al. Low maternal free thyroxine concentrations during early pregnancy are associated with impaired psychomotor development in infancy. Clinical Endocrinology. 1999;50(2):149-55.
8. Negro R, Stagnaro-Green A. Clinical aspects of hyperthyroidism, hypothyroidism, and thyroid screening in pregnancy. Endocrine Practice. 2014;20(6):597-607.
9. Pop VJ, Brouwers EP, Vader HL, Vulsma T, Van Baar AL, De Vijlder JJ. Maternal hypothyroxinaemia during early pregnancy and subsequent child development: A 3-year follow-up study. Clinical Endocrinology. 2003;59(3):282-8.
10. Glinoer D. The regulation of thyroid function during normal pregnancy: Importance of the iodine nutrition status. Best practice & research Clinical endocrinology & metabolism. 2004;18(2):133-52.
11. Matalon S, Sheiner E, Levy A, Mazor M, Wiznitzer A. Relationship of treated maternal hypothyroidism and perinatal outcome. J Reprod Med. 2006;51(1):59-63.
12. Lazarus JH. Thyroid function in pregnancy. British Medical Bulletin. 2011;97(1):137-48.
13. Nambiar V, Jagtap VS, Sarathi V, Lila AR, Kamalanathan S, Bandgar TR, et al. Prevalence and impact of thyroid disorders on maternal outcome in Asian-Indian pregnant women. Journal of Thyroid Research. 2011;2011.
14. Chaudhary LN, Khatiwada S, Gelal B,

Gautam S, Lamsal M, Pokharel H, et al. Iodine and thyroid function status, and anti-thyroid peroxidase antibody among pregnant women in eastern Nepal. Journal of Nepal Health Research Council. 2017;15(2):114-9.
15. Abalovich M, Gutierrez S, Alcaraz G, Maccallini G, Garcia A, Levalle O. Overt and subclinical hypothyroidism complicating pregnancy. Thyroid. 2002;12(1):63-8.
16. Glinoer D, Riahi M, Grün J-P, Kinthaert J. Risk of subclinical hypothyroidism in pregnant women with asymptomatic autoimmune thyroid disorders. The Journal of Clinical Endocrinology & Metabolism. 1994;79(1):197-204.
17. Vaidya B, Anthony S, Bilous M, Shields B, Drury J, Hutchison S, et al. Brief report: Detection of thyroid dysfunction in early pregnancy: Universal screening or targeted high-risk case finding? Journal of Clinical Endocrinology and Metabolism. 2007;92(1):203-7.
18. Shrestha B, Adhikari P. Screening of Thyroid Disorder among pregnant ladies in a Tertiary Hospital of Nepal. Nepal Medical College Journal. 2019;21(3):235-9.
19. Upadhyaya TL, Kc A, Paudel S. Prevalence and complications of Hypothyroidism during pregnancy in western Nepal. Nepal Journal of Medical sciences. 2014;3(1):48-50.
20. Dhanwal DK, Bajaj S, Rajput R, Subramaniam KAV, Chowdhury S, Bhandari R, et al. Prevalence of hypothyroidism in pregnancy: An epidemiological study from 11 cities in 9 states of India. Indian journal of endocrinology and metabolism. 2016;20(3):387.
21. Dhanwal DK, Prasad S, Agarwal AK, Dixit V, Banerjee AK. High prevalence of subclinical hypothyroidism during first trimester of pregnancy in North India. Indian journal of endocrinology and metabolism. 2013;17(2):281.
22. Shrestha D. National Consensus Statement for the Management of Hypothyroidism in Nepal. Journal of Diabetes and Endocrinology Association of Nepal. 2018;2(2):58-77.
23. Allan WC, Haddow JE, Palomaki GE, Williams JR, Mitchell ML, Hermos RJ, et al. Maternal thyroid deficiency and pregnancy complications: implications for population screening. J Med Screen. 2000;7(3):127-30.
24. Benhadi N, Wiersinga WM, Reitsma JB, Vrijkotte TG, Bonsel GJ. Higher maternal TSH levels in pregnancy are associated with increased risk for miscarriage, fetal or neonatal death. Eur J Endocrinol. 2009;160(6):985-91.