OPEN ACCESS ORIGNAL ARTICLE

# AN ASSESSMENT OF FETO-MATERNAL OUTCOME IN PREGNANT WOMEN WITH HYPERTHYROIDISM.

Saba Nadeem[1], Aisha Nazeer[2], Rabia Saeed[3], Tanzila Rafiq[4], Sidra Hameed[5], Samreen Akram[6]

**ABSTRACT**

**BACKGROUND:** Adequate levels of the thyroid hormone are very important for a healthy pregnancy, normal growth of the fetus and maturation, while untreated thyroid issues are associated to several complications affecting both maternal outcomes and growth of a child. **OBJECTIVE:** To evaluate the fetal and maternal outcomes among pregnant women presented with hyperthyroidism**. METHODS:** This prospective cross-sectional study was conducted at Obstetrics and Gynecology department of Bahawal Victoria Hospital, Bahawalpur, from September 2024 to February 2025. All the women during pregnancy, aged 18 to 40 years presented with pre-existing or the gestational hyperthyroidism of either parity were included. The outcomes of the pregnancy including pre-eclampsia, abruptio placentae, gestational diabetes, c-section, and postpartum thyroiditis were evaluated through detailed reviews of medical records, clinical assessments, and laboratory findings, concentrating the frequency and severity of complications. The data was entered and analyzed using SPSS version 26. **RESULTS:** Overall average age of women was 31.62 years. Maternal outcomes noted as 20.8% preeclampsia, 15.2% GDM, 4% abruptio placenta, followed by increased rate of cesarean deliveries at 41.6% and postpartum hemorrhage 12.8%. Additionally, the fetal outcomes were assessed as preterm births 30%, and low birth weight babies 25%. Though, no statistically significant impact was found of maternal age, gestational age, or parity on feto- maternal outcomes ($p = > 0.05$). **CONCLUSIONS:** The hyperthyroidism during pregnancy observed to be a significant clinical concern and contributor to adverse feto-maternal outcomes. Consequently, the early diagnosis, careful monitoring, and individualized management is very important, for better feto-maternal outcome.

**KEYWORDS:** Hyperthyroidism, Preeclampsia, GDM, Abruptio Placentae, Postpartum Thyroiditis.

1. Associate Professor, OBS and Gynae, BVH/ QAMC Bahawalpur.
2. Assistant Professor, OBS and Gynae, BVH/ QAMC Bahawalpur.
3. Associate Professor of pathology CMH Institute of Medical Sciences, Bahawalpur.
4. Associate Professor, OBS and Gynae, CMH Institute of Medical Sciences Bahawalpur.
5. Assistant Professor, OBS and Gynae, CMH Institute of Medical Sciences Bahawalpur.
6. Registrar, Gynae & Obs BVH/ QAMC Bahawalpur.

**Corresponding Author**: **RABIA SAEED,** Associate Professor of pathology CMH Institute of Medical Sciences, Bahawalpur. Email: rabiasaeed85@gmail.com

**How to Cite This Article:** Saba Nadeem[1], Aisha Nazeer[2], Rabia Saeed[3], Tanzila Rafiq[4], Sidra Hameed[5], Samreen Akram[6] **AN ASSESSMENT OF FETO-MATERNAL OUTCOME IN PREGNANT WOMEN WITH HYPERTHYROIDISM.** J Peop Univ Med Health Sci. 2025:15(3), 124-131. http://doi.org/10.46536/jpumhs/2025/15.03.667

Received On 05 Auguest 2025, Accepted On 15 September 2025, Published On 25 September 2025.

## INTRODUCTION

Adequate levels of the thyroid hormone are very important for a healthy pregnancy, normal growth of the fetus and maturation, while untreated thyroid issues are associated to several complications affecting both maternal outcomes and growth of a child.[1] It is a significant global health problem, especially prevalent

among women of childbearing age. This disorder impacts approximately 2–3% of expectant mothers highlighting the necessity for vigilance and treatment of these conditions in pregnant women. In pregnancies affected by thyroid dysfunction, mothers are at risk of preeclampsia, gestational hypertension, anemia, postpartum hemorrhage, placental abruption, miscarriage, preterm delivery, and a higher likelihood of cesarean section.[1,2] The chosen mode of delivery may further influence the fetal pituitary–thyroid axis. For the fetus, adverse outcomes include low birth weight, preterm birth, neonatal respiratory distress, increased admission to the NICU, perinatal morbidity and mortality, as well as long-term cognitive and neuropsychological impairments.[2,3] although hyperthyroidism is present only in about 0.2%–0.4% pregnancies during gestation,[4,5] making it a relatively unusual thyroid dysfunction affecting pregnancy-related matters but a significant issue by demonstrating its association with maternal and fetal welfare.[3] Numerous physiological changes mysteries the analysis and treatment of hyperthyroidism during pregnancy, both by veiling signs or by imitating them. These modifications require attention to achieve an accurate diagnosis and to provide a suitable therapy.

Thyroid physiology undergoes significant changes from the onset of pregnancy, continuing throughout gestation and reverting to normal in the postpartum period.[6,7] These adaptations are driven by factors such as elevated thyroxine-binding globulin (TBG), increased renal iodine clearance, altered peripheral metabolism of thyroid hormones, and placental iodine transfer, all of which enable the maternal thyroid to meet heightened metabolic demands.[6,8] The prevalence of thyroid disorders in pregnancy and their associated feto-maternal complications, however, shows considerable geographical variation.[6] According to a case control study the women who are suffering from hyperthyroidism during pregnancy, remains at higher risk of numerous complications.[9] The treatment of the pregnancies complicated by the hyperthyroidism requires a careful balancing the risks of the overtreatment, because it may lead to fetal hypothyroidism, while the inadequate treatment may increase further health issues for mother and baby both. The initial treatment is adjusted the antithyroid drugs' doses, with the aim to keeping the normal thyroid levels among mothers while prevent the potential drug related health issues in fetus.[10,11] Some studies have reported complications in antenatal cases with subclinical hyperthyroidism when evaluating pregnancy outcomes in thyroid disorders, highlighting the importance of routine antenatal screening for thyroid hormone levels to prevent adverse maternal and neonatal outcomes.[12] The careful detection and management of subclinical thyroid dysfunction are therefore important for protection of optimal health of both mother and fetus.[12] Though present study has been conducted due to the limited local data and the lack of highlighting on routine thyroid screening during pregnancies. After exploring the impact of hypethyroidism on pregnancy outcomes, it highlights thyroid dysfunction as an additional risk factor for adverse pregnancy outcomes. Meanwhile the pregnancy is already linked to the physiological changes, unrecognized hypothyroidism may further raise these hazards. Thus, the findings may support the need for routine antenatal thyroid screening to enable timely diagnosis and appropriate management, eventually improving the health of mother and fetus.

## MATERIALS AND METHODS

This was a prospective cohort study designed to evaluate the feto-maternal outcomes of pregnant women with diagnosed hyperthyroidism. The study was carried out from September 2024 to February 2025, in the Department of Obstetrics and Gynecology, Bahawal Victoria Hospital, Bahawalpur after

getting approval from the Institutional Review Board (IRB). The sample size of this study was calculated based on the previous findings in the study by Zhang Y et al[11] 8.9% of preeclampsia among pregnant women with hyperthyroidism with 95% confidence level and 5% precision. All the pregnant women over 18 years of age, with pre-existing or gestational hyperthyroidism (diagnosed through elevated free thyroxine (FT4) and reduced or undetectable thyroid-stimulating hormone (TSH) levels, confirmed by blood tests conducted during pregnancy) confirmed prior to pregnancy or during the current gestation, respectively and signed informed consent form, agreeing to participate in the study were included. All the pregnant women with a history of other serious diseases such as hypertension, diabetes mellitus or acute renal failure not directly secondary to thyroid dysfunction, twin/multiparous pregnancy and pregnant woman who decided not to participate despite the diagnosis of hyperthyroidism were excluded. After obtaining Institutional Review Board (IRB) approval, written informed consent was obtained from each pregnant woman diagnosed with hyperthyroidism before enrollment. A thorough questionnaire, collecting data regarding sociodemographic characteristics of patients and the index pregnancy, diagnosis and management of hyperthyroidism and several feto-maternal outcomes were collected which included preeclampsia defined as the blood pressure that exceeds 140/90 mmHg on two occasions at least 4 hours apart in a previously normotensive woman, accompanied by proteinuria or other end-organ dysfunctions, GDM (diagnosed through glucose tolerance tests, specifically by one or more of the following glucose values obtained from an oral glucose tolerance test (OGTT): fasting plasma glucose ≥92 mg/dL, 1-hour plasma glucose ≥180 mg/dL, or 2-hour plasma glucose ≥153 mg/dL) abruptio placentae (presents with complaints of vaginal bleeding, abdominal pain, and uterine tenderness occurring in the second half of pregnancy. Diagnosis is confirmed by ultrasound or direct observation during delivery), mode of delivery, postpartum hemorrhage defined as the excessive bleeding of more than 500 mL after vaginal delivery or more than 1000 mL after cesarean delivery, occurring within the first 24 hours following birth. It's measured by clinical estimation of blood loss, changes in maternal hemodynamic indicators, and the need for additional treatments to control bleeding), LBW (A birth weight of less than 2,500 grams (5 pounds, 8 ounces), regardless of gestational age, measured immediately after birth). Methods for controlling hyperthyroidism were accurately documented, including the particular medication and dosages of treatment delivered. Thyroid hormone levels were checked regularly during pregnancy to assess disease control. Clinical examinations and comprehensive laboratory tests and ultrasound investigations were carried out for a complete documentation of pregnancy and fetal wellbeing in hyperthyroid women. SPSS version 25 was used for data analysis, where mean and SD calculated for numerical variables. Frequencies and percentages were done for categorical variables. Age, gestational age and parity of pregnant woman were further stratified with applying the chi square test and a P-value $\leq$ 0.05 were considered as statistically significant.

## RESULTS

Overall average age of 125 pregnant women with hyperthyroidism, was 31.62 years (sd = 7.95), and mean gestational age of 21.88 weeks with a standard deviation of 10.69 weeks. Maternal complications were observed including preeclampsia (20.8%), gestational diabetes mellitus (15.2%), abruptio placenta (4.0%), cesarean delivery (41.6%), and postpartum hemorrhage (12.8%), while adverse fetal outcomes were observed in

the form of low birth weight, affecting 13.6% of newborns. Fig: 1

Outcomes including preeclampsia, gestational diabetes, abruptio placenta, postpartum hemorrhage, mode of delivery, and low birth weight were observed across all age groups, but the differences were not significant (p>0.05), while complications like as gestational diabetes, abruptio placenta, and low birth weight appeared more frequent in women of late midlife (35–44 years), the overall distribution did not demonstrate a meaningful association with maternal age. Overall association of feto-maternal outcomes with different age groups showed no statistically significant association as shown in **table: 1.**

Overall feto-maternal outcomes according to gestational age observed statistically insignificant p>0.05. Particularly the preeclampsia was more common in early pregnancy, while gestational diabetes was reported more often in the second and third trimesters, abruptio placenta and low birth weight were slightly higher in the third trimester, and cesarean deliveries were also more frequent in later gestation (p->0.05). **Table: 2**

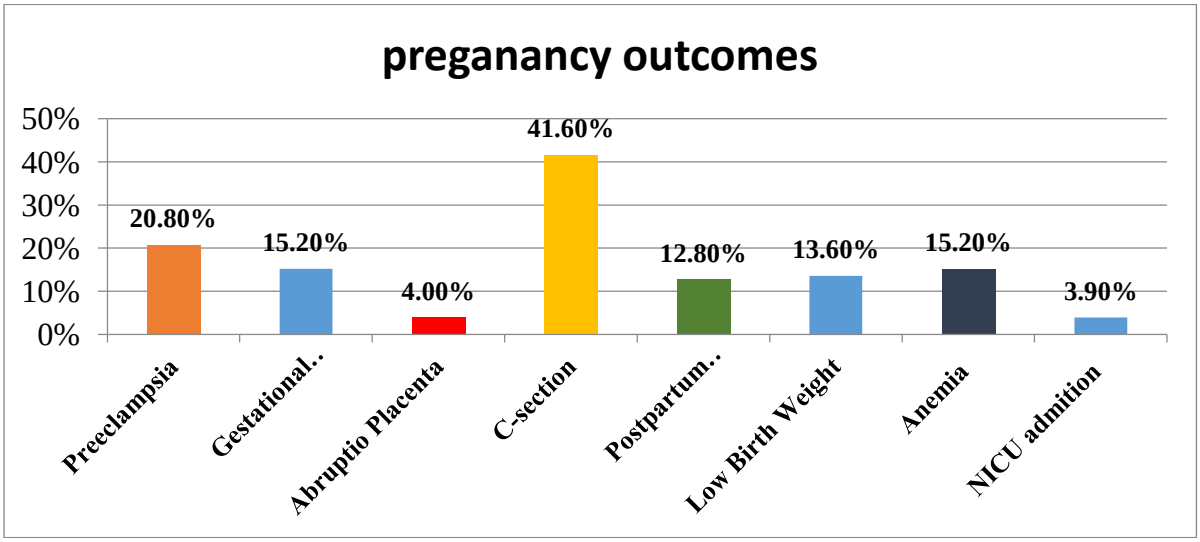


**Fig: 1. Pregnancy outcomes n=125**

**Table: 1. Feto-maternal outcomes according to the age groups of patients =121**

| Feto-maternal outcomes | Status | Age groups Young Adult (18-24 years) | Early Midlife (25-34 years) | Late Midlife (35-44 years) | Total | P value |
|---|---|---|---|---|---|---|
| **Preeclampsia** | No | 21(21.2%) | 40(40.4%) | 38(38.4%) | 99(100.0%) | 0.788 |
| | Yes | 7(26.9%) | 9(34.6%) | 10(38.5%) | 26(100.0%) | |
| **Gestational Diabetes** | No | 24(22.6%) | 45(42.5%) | 37(34.9%) | 106(100.0%) | 0.128 |
| | Yes | 4(21.1%) | 4(21.1%) | 11(57.9%) | 19(100.0%) | |
| **Abruptio Placenta** | No | 27(22.5%) | 45(37.5%) | 48(40.0%) | 120(100.0%) | 0.121 |
| | Yes | 1(20.0%) | 4(80.0%) | -- | 5(100.0% | |
| **Mode of Delivery** | Vaginal | 18(24.7%) | 28(38.4%) | 27(37.0%) | 73(100.0%) | 0.770 |
| | C-section | 10(19.2%) | 21(40.4%) | 21(40.4%) | 52(100.0%) | |
| **Postpartum Hemorrhage** | No | 24(22.0%) | 44(40.4%) | 41(37.6%) | 109(100.0%) | 0.783 |
| | Yes | 4(25.0%) | 5(31.3%) | 7(43.8%) | 16(100.0%) | |
| **Low Birth Weight** | No | 26(24.1%) | 42(38.9%) | 40(37.0%) | 108(100.0%) | 0.497 |
| | Yes | 2(11.8%) | 7(41.2%) | 8(47.1%) | 17(100.0%) | |

**Table: 2. Feto-maternal outcomes according to the gestational age of patients =121**

| Feto-maternal outcomes | Status | Gestational age groups | | | Total | P value |
|---|---|---|---|---|---|---|
| | | Early Pregnancy | Second Trimester | Third Trimester | | |
| **Preeclampsia** | No | 27(27.3%) | 33(33.3%) | 39(39.4%) | 99(100.0%) | 0.100 |
| | Yes | 12(46.2%) | 4(15.4%) | 10(38.5%) | 26(100.0%) | |
| **Gestational Diabetes** | No | 37(34.9%) | 28(26.4%) | 41(38.7%) | 106(100.0%) | 0.064 |
| | Yes | 2(10.5%) | 9(47.4%) | 8(42.1%) | 19(100.0%) | |
| **Abruptio Placenta** | No | 38(31.7%) | 36(30.0%) | 46(38.3%) | 120(100.0%) | 0.623 |
| | Yes | 1(20.0%) | 1(20.0%) | 3(60.0%) | 5(100.0%) | |
| **Mode of Delivery** | Vaginal | 25(34.2%) | 21(28.8%) | 27(37.0%) | 73(100.0%) | 0.676 |
| | C-section | 14(26.9%) | 16(30.8%) | 22(42.3%) | 52(100.0%) | |
| **Postpartum Hemorrhage** | No | 32(29.4%) | 33(30.3%) | 44(40.4%) | 109(100.0%) | 0.508 |
| | Yes | 7(43.8%) | 4(25.0%) | 5(31.3%) | 16(100.0%) | |
| **Low Birth Weight** | No | 34(31.5%) | 32(29.6%) | 42(38.9%) | 108(100.0%) | 0.980 |
| | Yes | 5(29.4%) | 5(29.4%) | 7(41.2%) | 17(100.0%) | |

**Table: 3. Feto-maternal outcomes according to the parity of women =121**

| Feto-maternal outcomes | Status | Parity | | | Total | P value |
|---|---|---|---|---|---|---|
| | | Nulliparous | Primiparous | Multiparous | | |
| **Preeclampsia** | No | 19(19.2%) | 19(19.2%) | 61(61.6%) | 99(100.0%) | 0.159 |
| | Yes | 6(23.1%) | 9(34.6%) | 11(42.3%) | 26(100.0%) | |
| **Gestational Diabetes** | No | 23(21.7%) | 22(20.8%) | 61(57.5%) | 106(100.0%) | 0.397 |
| | Yes | 2(10.5%) | 6(31.6%) | 11(57.9%) | 19(100.0%) | |
| **Abruptio Placenta** | No | 25(20.8%) | 27(22.5%) | 68(56.7%) | 120(100.0%) | 0.470 |
| | Yes | -- | 1(20.0%) | 4(80.0%) | 5(100.0%) | |
| **Mode of Delivery** | Vaginal | 12(16.4%) | 16(21.9%) | 45(61.6%) | 73(100.0%) | 0.443 |
| | C-section | 13(25.0%) | 12(23.1%) | 27(51.9%) | 52(100.0%) | |
| **Postpartum Hemorrhage** | No | 24(22.0%) | 24(22.0%) | 61(56.0%) | 109(100.0%) | 0.335 |
| | Yes | 1(6.3%) | 4(25.0%) | 11(68.8%) | 16(100.0%) | |
| **Low Birth Weight** | No | 20(18.5%) | 26(24.1%) | 62(57.4%) | 108(100.0%) | 0.393 |
| | Yes | 5(29.4%) | 2(11.8%) | 10(58.8%) | 17(100.0%) | |

## DISCUSSION

Despite a long history of association between diseases of increased thyroid hormone and pregnancy outcome, the interplay between hyperthyroidism and endpoints in pregnancy represent a relatively poorly understood scenario from endocrinological and obstetric standpoints owing to potential significant feto-maternal sequelae.[13] This study was conducted on 125 pregnant women with hyperthyroidism, with an overall mean age of 31.62 ± 7.95 years, aimed at exploring the relationship of hypothyroidism with fetal and maternal outcomes. Our findings are comparable to those of Nazarpour S. et al.[14], who reported a slightly younger mean age of 27.4 ± 5.3 years, possibly due to differences in study population or regional reproductive age trends. On the other hand, another study by Kiran Z et al[15] reported a mean age of 31 ± 4.73 years, which is consistent with our results; however, some some difference in mean age across the study may due to the cultural difference for age at marriage and studies sample selection criteria.

In this study the mean gestational age was 21.88 ± 10.69 weeks, placing the evaluation predominantly in mid-pregnancy. The such timeframe is crucial in understanding the onset of complications and the timing of interventions, and is consistent with the findings of Zhang Y. et al[16] and Kiran Z et al.[15] Overall, our findings add to the growing body of evidence on the effects of hyperthyroidism during pregnancy, underscoring mid-gestation as a particularly important period for surveillance and timely management to reduce adverse outcomes.

In this study according to the maternal complications were observed including preeclampsia (20.8%), gestational diabetes mellitus (15.2%), abruptio placenta (4.0%), cesarean delivery (41.6%), and postpartum hemorrhage (12.8%). In aligns to this study Sreelatha S et al reported that the maternal complications included abortion (2.1%), anemia (4.2%), oligohydramnios (16.7%), hypertensive disorders (14.7%), gestational diabetes (4.2%), preterm labor (3.1%), postpartum hemorrhage (6.3%), and LSCS (22.9%. In the comparison of this study Mahadik K et al[18] also reported that the women with hypothyroidism, significant complications included anemia (26.3%), preeclampsia (15.8%), cesarean delivery (26.3%), low birth weight (31.6%), low Apgar scores (21.1%), and NICU admissions (42.1%). Consistently in the study by Bathula UR et al[19] reported that the cesarean delivery was most frequent (35.29%), followed by anemia (15.29%), preeclampsia (11.77%), and oligohydramnios with IUGR (5.88%) and GDM occurred in 4.11% of women while preterm labor and intrauterine fetal death were observed in 3.53% and 0.59% of cases, respectively.

In this study the adverse fetal outcomes were observed in the form of low birth weight, affecting 13.6% of newborns, low Apgar score was 12.0% and NICU admission in only 2 cases. Consistently Kiran Z et al.[15] reported that the neonatal jaundice was the most commonly observed condition (37.6%), typically identified within the first 1–3 days of life. Sepsis was noted in 6.5% of neonates, 25 newborns had appropriate birth weight and were delivered at term, while 7 were term but had low birth weight. Consistently in the study by Bathula UR et al[19] reported that Regarding neonatal outcomes, low birth weight was seen in 8.24%, NICU admissions in 11.76%, and hyperbilirubinemia in 3.53% of newborns. In aligns to this study Dharmavijaya MN et al[20] reported that the 68.75% (11 out of 16) of inadequately treated hypothyroid mothers developed complications, while only 6.66% (1 out of 15) of adequately treated patients were affected. Additionally, conclusively they highlighted that the importance of early diagnosis and proper management of maternal hypothyroidism to reduce complications such as abortion, preeclampsia, IUGR, placental abruption, oligohydramnios, and low birth weight. Similarly, in our study, inadequately treated hypothyroid women had a threefold higher risk of preeclampsia, along with a significantly increased incidence of abortion and fetal growth restriction.[20] Present study highlights the broad-ranging influence of hyperthyroidism on obstetric outcomes and highlights the importance of effective strategies of management that adequately address both the thyroid conditions and the unique demands of pregnancies. Overall studies support the requirements for an integrated care model involving routine screenings, early interventions, and individualized treatment. Though, the interpretation of findings of this study is limited by the relatively limited small sample size of the study, not compared the control group, and the lack of follow-up of neonatal outcomes beyond the period of immediate postpartum. Therefore, further large-scale studies are recommended to validate the findings and should focus on effective management strategies, explaining the underlying pathophysiological mechanism, and developing standardized protocol that

can be adapted across diverse healthcare settings.

## CONCLUSION

The pregnant women with hyperthyroidism observed at hogher risk of complications such as preeclampsia, GD, LBW and preterm birth, highlighting the need for alert monitoring and specialized care throughout pregnancy. Findings of the study for these complications appear across various maternal ages and stages of pregnancy indicating the risk remains consistent throughout pregnancy, highlighting the need for universal screening and quick adequate management. Generally, the results contribute to the growing body of knowledge on thyroid disorders during pregnancy and highlight the need for reliable, evidence-based care strategies that improve pregnancy outcomes.

**ETHICS APPROVAL:** The ERC gave ethical review approval. NO: 2358/DME/QAMC BAHAWALPUR DATED 09/02/2024.

**CONSENT TO PARTICIPATE:** written and verbal consent was taken from subjects and next of kin.

**FUNDING:** The work was not financially supported by any organization. The entire expense was taken by the authors.

**ACKNOWLEDGEMENTS:** We are thankful to all who were involved in our study.

**AUTHORS' CONTRIBUTIONS:**

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

**CONFLICT OF INTEREST:** No competing interest declared.

## REFERENCES

1. Korevaar TI, Medici M, Visser TJ, Peeters RP. Thyroid disease in pregnancy: new insights in diagnosis and clinical management. *Nat Rev Endocrinol.*2017;13:610–622.
2. Mahadik K, Choudhary P, Roy PK. Study of thyroid function in pregnancy, its feto-maternal outcome; a prospective observational study. BMC pregnancy and childbirth. 2020 Dec 10;20(1):769.
3. Dulek H, Vural F, Aka N, Zengin S. The prevalence of thyroid dysfunction and its relationship with perinatal outcomes in pregnant women in the third trimester. Northern Clinics of Istanbul. 2019;6(3):267.
4. Omar J, Qureshi MA, Durrani HM, et al. Association of Neonatal Outcome with Maternal Thyroid Dysfunction. J Soc Obstet Gynaecol Pak. 2024;14(2):
5. Sheehan PM, Nankervis A, Araujo Júnior E, Da Silva Costa F. Maternal thyroid disease and preterm birth: systematic review and meta-analysis. J Clin Endocrinol Metab. 2015;100(11):4325-4331.
6. Kumar R, Bansal R, Shergill HK, Garg P. Prevalence of thyroid dysfunction in pregnancy and its association with feto-maternal outcomes: A prospective observational study from a tertiary care institute in Northern India. Clinical Epidemiology and Global Health. 2023;1;19:101201.
7. Sahay RK, Nagesh VS. Hypothyroidism in pregnancy. Indian journal of endocrinology and metabolism. 2012 May 1;16(3):364-70.
8. Alemu A, Terefe B, Abebe M, Biadgo B. Thyroid hormone dysfunction during pregnancy: A review. International journal of reproductive biomedicine. 2016 Nov;14(11):677.
9. Vella K, Vella S, Savona-Ventura C, Vassallo J. Thyroid dysfunction in pregnancy-a retrospective observational analysis of a Maltese cohort. BMC Pregnancy and Childbirth. 2022 Dec 15;22(1):941.
10. MA Khalid, A Munawar, Z Mehmood et al. An understanding of Thyroid Problems during Pregnancy. P J M H S. 2022;16 (06): 998.
11. SH Ali, Liaqat K, Rasool S. Thyroid Dysfunction in High Risk Pregnancies. Annals Punjab Med Coll. 2018;12(1):77-9.
12. Sreelatha S, Nadagoudar S, Devi AL. The study of maternal and fetal outcome in

pregnant women with thyroid disorders. Int J Reprod Contracept Obstet Gynecol. 2017;1;6(8):3507-13.
13. Riaz A, Rana M, Mushtaq A, Ahmad UR, Khawaja SR, Rasheed A. Effect of Treatment of Subclinical Thyroid Dysfunction on Pregnancy Outcome in Patients with 1st Trimester Recurrent Miscarriages. PJMHS. 2022;16 (03): 1147.
14. Nazarpour S, Ramezani Tehrani F, Rahmati M, Amiri M, Azizi F. Effects of isolated maternal hypothyroxinemia on adverse pregnancy outcomes. Archives of Gynecology and Obstetrics. 2022 Apr;305(4):903-11.
15. Kiran Z, Sheikh A, Humayun KN, Islam N. Neonatal outcomes and congenital anomalies in pregnancies affected by hypothyroidism. Annals of medicine. 2021 Jan 1;53(1):1560-8.
16. Zhang Y, Li Y, Shan Z, Xu Y, Li C, Xie X, et al. Association of Overt and subclinical hyperthyroidism during weeks 4–8 with adverse pregnancy outcomes. J Womens Health. 2019;28(6):842-848
17. Sreelatha S, Nadagoudar S, Devi AL. The study of maternal and fetal outcome in pregnant women with thyroid disorders. Int J Reprod Contracept Obstet Gynecol 2017;6:3507-13.
18. Mahadik K, Choudhary P, Roy PK. Study of thyroid function in pregnancy, its feto-maternal outcome; a prospective observational study. BMC pregnancy and childbirth. 2020 Dec 10;20(1):769.
19. Bathula UR, Kathari JR. Pregnancy with hypothyroidism and its adverse pregnancy outcomes. IAIM. 2022 Jan 1;9(1):4853.
20. Dharmavijaya MN, Reddy GP. To study the prevalence of hypothyroidism in pregnancy and the pregnancy outcome. IJGS. 2024;6(2):36-9.