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Short-Term Pregnancy Outcomes in Women under Treatment of Hypothyroidism

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Abstract
Background: *Hypothyroidism has been linked to pregnancy complications, yet uncertainties remain concerning the severity as well as the influence of autoimmunity of the thyroid. Left untreated, hypothyroidism poses a greater risk of adverse obstetric as well as neonatal outcomes. This observational study aimed to assess the short-term pregnancy outcomes in women under treatment of hypothyroidism.*
Methods: *This prospective observational cross-sectional study was carried out in the Department of Obstetrics and Gynaecology, Combined Military Hospital (CMH), Rangpur, Bangladesh from July 2023 to January 2024. The study included a total of 50 pregnant women diagnosed with hypothyroidism during their antenatal checkup in the first trimester, selected purposively as study subjects. MS Office tools were utilized for data analysis.*
Results: *The majority of mothers exhibited normal thyroid-stimulating hormone (TSH) levels during delivery, with a mean ±SD of 2.99 ± 1.63 mIU/L. About 72% of cases had the caesarian section, with 28% undergoing vaginal delivery. Fetal outcomes showed 56.0% of female babies, with 96.0% having normal TSH levels. Among all babies, the mean ±SD TSH level was 3.22±1.56 mIU/L, fetal weight was 3.43±2.59 Kg, and Apgar score was 7.94±0.66. Only 2% (n=1) of babies died. Maternal complications included 24% gestational diabetes (GDM), 22.0% pregnancy-induced hypertension (PIH), and 10.0% anemia.*
Conclusion: *Most hypothyroidism-treated pregnant women maintain normal TSH levels till delivery, as reflected in newborns. Cesarean section is common, with potential complications like gestational diabetes, pregnancy-induced hypertension, and anemia. Fetal death incidence isn't significantly high.*
Keywords: *Pregnancy outcomes, Hypothyroidism, Gestational age, Urinary tract infection UTI, Intra-uterine growth restricted.*

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I. Introduction

Hypothyroidism stands as one of the prevalent chronic conditions affecting pregnant mothers [1]. The significance of maternal thyroid hormones in fostering fetal growth and brain development throughout pregnancy cannot be overstated [2]. The notion of fetal programming through maternal hypothyroidism presents a biologically plausible hypothesis [3]. Among the array of comorbidities posing a threat to pregnancy, subclinical hypothyroidism (SCH) emerges as a notable concern [4]. As per Iranian guidelines, elevated TSH levels exceeding 3.9 mIU/L in the 1st, or 4.1 mIU/L in the 2nd and 3rd trimesters may increase the risk of negative pregnancy outcomes [5]. According to American guidelines, these thresholds are set at levels exceeding 2.5 mIU/L in the 1st trimester and 3 mIU/L in the 2nd and 3rd trimesters [6]. The untreated subclinical hypothyroidism (SCH) poses significant risks to pregnancy outcomes, including pregnancy loss [7], miscarriage, intrauterine fetal death [8], and placental abruption [9], along with an elevated likelihood of newborn cognitive as well as neurological disorders [10]. Despite the limited evidence gleaned from several systematic reviews as well as various meta-analyses, further exploration in this area is warranted. A notable meta-analysis highlighted a considerable frequency of thyroid disorders, particularly clinical and subclinical hypothyroidism [4]. An additional investigation into pregnancy complications among mothers with subclinical hypothyroidism indicated an increased susceptibility to placental abruption, pregnancy loss, neonatal death, and PROM (Premature rupture of membranes) in comparison to euthyroid women [11]. Although the quantity of studies is restricted, numerous meta-analyses have pointed toward the preventative advantages of levothyroxine therapy in expectant mothers with subclinical hypothyroidism. These findings suggest significant decreases in fetal and maternal complications like miscarriage and even neonatal mortality [12,13]. Many studies have failed

to demonstrate a favorable impact of administering levothyroxine to pregnant women with subclinical hypothyroidism in reducing various maternal and fetal complications or enhancing the intelligence quotient (IQ) levels of children born from such pregnancies [12,14]. Indeed, a meta-analysis revealed that administering levothyroxine was linked to a higher likelihood of preterm labor [12]. Moreover, several studies have indicated a correlation between thyroid autoimmunity and recurrent pregnancy loss [15]. The general objective of this study was to evaluate short-term pregnancy outcomes in women undergoing treatment for hypothyroidism.

II. Methodology

This was a cross-sectional prospective observational study that was carried out in the Department of Obstetrics and Gynaecology, Combined Military Hospital (CMH), Rangpur Bangladesh from July 2023 to January 2024. The study enrolled 50 pregnant women diagnosed with hypothyroidism during their first-trimester antenatal checkup, all of whom were undergoing treatment for hypothyroidism. Participants were selected using purposive sampling techniques. The study collected ethical approval from the mentioned hospital's ethical committee, and properly written consents were taken from all the participants before data collection. The study included singleton pregnancies in both primigravida and multigravida women who were known cases of hypothyroidism and undergoing treatment. The study's exclusion criteria involved the exclusion of multiple pregnancies and pregnant women who were unable to complete the follow-up period. Demographic as well as clinical information of all participants was recorded, and data analysis along with processing was conducted using MS Office tools.

III. Result

Half of our participants were from 26-30 years age group. Besides, 36.0% and 14.0% of cases were from the 20-25- and 31-35-year age groups respectively. The majority of cases (42%) were multiparous, while more than one-third (36.0%) were primiparous, and 22.0% were nulliparous. In examining the gravidity of the cases, the largest proportion (40.0%) were in the 3rd gravida category. Additionally, 34.0% and 18.0% of cases were categorized as 2nd gravida and primigravida, respectively. In the majority of cases (82%), the gestational age at delivery was between 38-40 weeks, while in the remaining cases, it was less than 38 weeks at delivery. It was observed that more than two-thirds of patients (70%) had attended regular antenatal care (ANC) visits, while the remaining patients had irregular ANC attendance. Regarding the distribution of comorbidities among patients, 10.0% had chronic hypertension, while only 2% (n=1) had diabetes mellitus. In the current study, nearly three-fourths of cases (72%) underwent cesarean section, while the remaining cases (28%) underwent vaginal delivery. Among the mothers, a normal TSH level was observed in 96% of cases, with a mean ± SD TSH level of 2.99 ± 1.63 mIU/L. In terms of fetal outcomes, the majority of babies (56.00%) were female, and 96.0% of them had a normal TSH level. The mortality rate among babies was 2%. The mean ± SD TSH level among babies was 3.22 ± 1.56 mIU/L, with a mean fetal weight of 3.43 ± 2.59 Kg and an Apgar score of 7.94 ± 0.66. In the current study, the complication distribution among patients revealed that 24% of cases experienced gestational diabetes mellitus (GDM) as a complication. Additionally, 22.0% of cases were diagnosed with anemia, while 10.0% experienced pregnancy-induced hypertension (PIH), both of which were also notable findings.

Table 1: Ages of participants

Age in year	n	%
20-25	18	36.0%
26-30	25	50.0%
31-35	7	14.0%
Total	50	100%

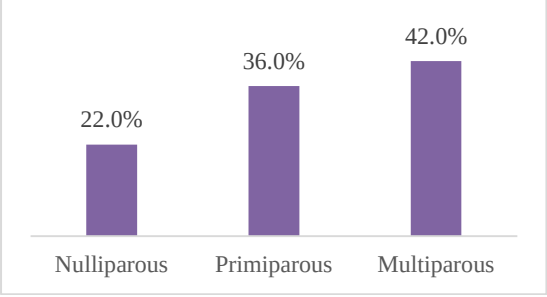

Figure 1: Parity distribution of cases

Table 2: Gravidity distribution of cases

Gravidity	n	%
Primigravida	9	18.0%
2nd gravida	17	34.0%
3rd gravida	20	40.0%
4th gravida or more	4	8.0%

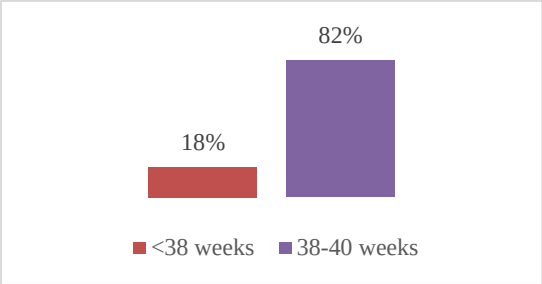

Figure 2: Gestational age distribution

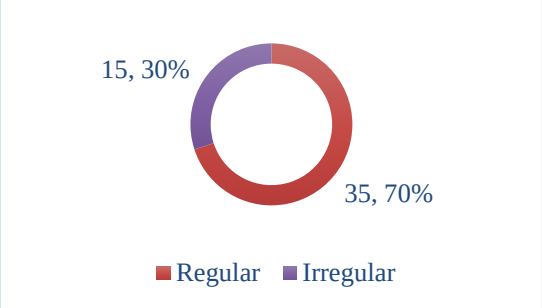

Figure 3: Frequencies of ANC visits

Table 3: Outcome distribution

Outcomes	n	%
Maternal outcomes		
Caesarian section	14	28%
Vaginal delivery	36	72%
TSH (Normal)	48	96%
TSH (Abnormal/high)	2	4%
Mean ±SD TSH mIU/L	2.99±1.63	
Fetal outcomes		
Male baby	22	44.00%
Female baby	28	56.00%
TSH (Normal)	48	96.00%
TSH (Abnormal/high)	2	4.00%
Fetal death	1	2.00%
Mean ±SD TSH mIU/L	3.22±1.56	
Mean ±SD Fetal w (Kg)	3.43±2.59	
Mean ±SD Apgar score	7.94±0.66	

Table 4: Complications distribution

Complications	n	%
Urinary tract infection (UTI)	2	4.0%
Intra-uterine growth restricted	2	4.0%
Premature rupture of membranes	4	6.0%
Pregnancy-induced hypertension	5	10.0%
Anemia	11	22.0%

Gestational diabetes mellitus	12	24.0%

IV. Discussion

Half of our participants fell into the 26-30 years age group, while 36.0% and 14.0% were from the 20-25 and 31-35-year age groups respectively. These proportions were similar to those reported in another study [16]. Regarding parity, 42% of cases were multiparous, 36.0% were primiparous, and 22.0% were nulliparous. A different study [17] reported a higher proportion of multiparous cases (57%) compared to primiparous cases (43%), which aligns with our findings. Our participants' gravidity status also concurred with the results of a previous study [16]. In this study, the majority of patients (82%) delivered at a gestational age of 38-40 weeks, with the remaining cases delivering before 38 weeks. Comparable findings were reported by Kulkarni et al. [17], who noted a mean gestational age of 39.6 (±1.3) years in their participants. Concerning antenatal care (ANC) attendance, more than two-thirds of our patients (70%) attended regular ANC visits, while the rest had irregular attendance. This contrasts with findings from another study [18], where 99.2% of patients attended regular ANC visits, indicating higher adherence compared to our cohort. In our current study, the majority of cases (72%) underwent cesarean section, while the remaining cases (28%) opted for vaginal delivery. This distribution differs from findings reported in another study [19], where 22.1% underwent cesarean section, 13.3% had assisted delivery, and 64.6% opted for vaginal delivery. In our study, the distribution of complications among patients revealed that 24% of cases experienced gestational diabetes mellitus (GDM). Additionally, 22.0% of cases were diagnosed with anemia, while 10.0% experienced pregnancy-induced hypertension (PIH), notable findings within our cohort. In various studies, the prevalence of gestational diabetes mellitus (GDM) was reported to be 6.4% [20], while pregnancy-induced hypertension (PIH) was found in 14.5% of cases [21], and anemia was identified in 14.1% of cases [22]. Variations in geographical locations could explain the differences observed. In this study, concerning fetal outcomes, the majority of babies (56.00%) were female, with 96.0% of them exhibiting a normal TSH level. The mortality rate among babies was 2%. The mean ± SD TSH level among babies was 3.22 ± 1.56 mIU/L, with a mean fetal weight of 3.43 ± 2.59 kg and an Apgar score of 7.94 ± 0.66. However, some dissimilarities were noted in our findings compared to those of previous studies [17-19]. These variations could be attributed to differences in geographic locations and disparities in medical facilities.

Limitation of the study:

The study's single-center design and limited sample size, coupled with its short duration, may limit the generalizability of findings to the entire country. Therefore, caution is advised when extrapolating the results, as they may not accurately reflect the broader scenario nationwide.

V. Conclusion

In hypothyroidism-treated pregnant women, the maintenance of normal TSH levels until delivery is often observed, with corresponding normal levels reflected in newborns. Despite this favorable result, cesarean delivery remains widespread among these individuals, potentially resulting in complications like gestational diabetes, pregnancy-induced hypertension, and anemia. However, the incidence of fetal death isn't significantly elevated in this population. These findings underscore the importance of vigilant monitoring and comprehensive management of hypothyroidism during pregnancy, aiming to optimize maternal and fetal health outcomes while mitigating the risks associated with cesarean delivery and its potential complications.

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Conflict of interest: No conflicts of interest were declared.

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