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Pregnancy Complications in Subclinical Hypothyroidism: A Tertiary Care Hospital Study

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Abstract

Background: Subclinical hypothyroidism during pregnancy, though often asymptomatic, has been associated with a range of maternal and fetal complications in various studies. The purpose of this study is to assess the impact of subclinical hypothyroidism on pregnancy complications in a tertiary care hospital setting. ***Aim of the study:*** The aim of the study was to evaluate the impact of subclinical hypothyroidism on pregnancy complications in a tertiary care hospital setting. ***Methods:*** This case-control study was conducted from September 2015 to February 2016 at the Department of Obstetrics and Gynecology, Bangabandhu Sheikh Mujib Medical University, Dhaka. Fifty pregnant women (25 subclinical hypothyroid, 25 euthyroid) were enrolled based on set criteria. Data on demographics, clinical history, and thyroid function were collected and participants were followed through pregnancy to assess maternal and neonatal outcomes. Data were analyzed with SPSS v20. ***Results:*** Among 50 pregnant women, subclinical hypothyroidism cases were older (29.16±6.45 vs. 26.16±4.85 years) with lower socioeconomic status (p=0.035). Obstetric (preeclampsia 24% vs. 4%) and medical complications (GDM 32% vs. 12%) were more frequent but not significant. Cases showed more anemia (48% vs. 44%), oedema (28% vs. 8%), and hypertension (28% vs. 16%). Fetal outcomes included 4% intrauterine death in cases. Low Apgar scores, low birth weight (36% vs. 20%), and neonatal complications like asphyxia (36% vs.16%) were higher in cases, without significant differences. ***Conclusion:*** Subclinical hypothyroidism in pregnancy is associated with increased risks of maternal and fetal complications, underscoring the importance of vigilant monitoring.

Keywords: Pregnancy Complications, Subclinical Hypothyroidism, Tertiary Care.

INTRODUCTION

Optimal thyroid function during pregnancy is essential to safeguard the health of both the mother and the developing fetus [1]. Since the fetus begins producing and secreting its own thyroid hormones only after 20 weeks of gestation, adequate transplacental transfer of maternal thyroid hormones is necessary to support normal fetal growth and development [2,3]. In the first trimester, maternal thyroid hormones play a vital role in regulating key neurophysiological processes and supporting the maturation of various fetal systems. Therefore, evaluating thyroid function during pregnancy is important due to its well-established impact on maternal and fetal outcomes [4].

Subclinical hypothyroidism (SCH) is characterized by elevated serum thyroid-stimulating hormone (TSH) levels alongside normal concentrations of tetraiodothyronine (T4), in the absence of overt clinical symptoms. A meta-analysis estimated the overall prevalence of hypothyroidism among pregnant women in India to be approximately 11.07%, with subclinical and overt forms accounting for 9.52% and 2.74%,

respectively [5]. Various Indian studies report the prevalence of SCH during pregnancy to range between 6.47% and 9% [6,7], while other sources suggest a lower prevalence of around 0.4% [8].

Although frequently asymptomatic, SCH has been associated with a wide spectrum of adverse pregnancy outcomes. These include miscarriage, intrauterine fetal demise, preterm labor, gestational hypertension, placenta previa, and intrauterine growth restriction (IUGR) [9]. SCH also increases the risk of gestational diabetes, preeclampsia, postpartum hemorrhage, and placental abruption. Fetal complications may include impaired neurodevelopment, higher rates of cesarean delivery due to fetal distress, spontaneous abortion, and reduced cognitive performance later in life. Both overt and subclinical thyroid dysfunctions are further linked to anemia, stillbirth, and neurological abnormalities, underscoring the importance of early detection and appropriate management during pregnancy [10].

Despite increasing evidence linking subclinical hypothyroidism with poor pregnancy outcomes, limited data are available from tertiary care settings in South Asia, particularly among resource-constrained populations. Regional variability in prevalence, diagnostic thresholds, and treatment practices further emphasizes the need for locally relevant research. The purpose of this study is to assess the impact of subclinical hypothyroidism on pregnancy complications in a tertiary care hospital setting.

Objective

- To evaluate the impact of subclinical hypothyroidism on pregnancy complications in a tertiary care hospital setting.

METHODOLOGY & MATERIALS

This case-control study was conducted at the Department of Obstetrics and Gynecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh, from September 2015 to February 2016. A total of 50 pregnant women were enrolled, including 25 diagnosed with subclinical hypothyroidism and 25 euthyroid controls, selected based on predefined inclusion and exclusion criteria.

Inclusion Criteria

- Pregnant women with singleton pregnancy attending antenatal checkup
- Admitted pregnant women diagnosed with subclinical hypothyroidism during antenatal checkup

Exclusion Criteria

- Women with overt thyroid disorder
- Women with multiple pregnancy
- Women with previous or current use of thyroxine or anti-thyroid drugs
- Women with other autoimmune diseases
- Women with congenital heart disease
- Women with essential hypertension
- Women with diabetes

Data were collected using a pretested structured questionnaire through interviews and physical examinations, recording baseline demographic, clinical, obstetric, and laboratory data, including thyroid function tests (TSH and free T4). Blood samples (5 ml) were collected and analyzed using an automated biochemistry analyzer. Eligible participants provided written informed consent prior to enrollment, followed by detailed history taking and physical examination. Participants were monitored throughout pregnancy and delivery to document maternal outcomes such as preterm labor, gestational hypertension, and cesarean section, as well as neonatal outcomes including birth weight, respiratory distress, and hyperbilirubinemia. Data were coded, cleaned, and analyzed using SPSS version 20, applying descriptive and inferential statistics to compare the two groups. Quality assurance was maintained through regular data verification. Ethical approval was obtained from the BSMMU Ethical Review Board, and all participants were assured of confidentiality and their right to withdraw from the study at any time.

RESULTS

Table 1: Baseline Demographic and Clinical Characteristics of the Study Participants (n = 50)

Variable		Control (n=25)		Case (n=25)		p-value
		n	%	n	%	
Age group (years)	< 25	9	36.0	6	24.0	0.266
	25–30	10	40.0	11	44.0	
	> 30	6	24.0	8	32.0	
	Mean ± SD	26.16 ± 4.85		29.16 ± 6.45		
	Range	19–36		18–43		
Education	Secondary	16	64.0	14	56.0	0.386
	College/University	9	36.0	11	44.0	
Socioeconomic condition	Lower middle (12,000–30,000 Tk/month)	19	76.0	20	80.0	0.035*
	Upper middle (30,000–50,000 Tk/month)	6	24.0	5	20.0	

Variable		Control (n=25)		Case (n=25)		p-value
		n	%	n	%	
Gestational age at admission	30–33 weeks	1	4.0	0	0.0	0.510
	34–37 weeks	10	40.0	11	44.0	
	38–40 weeks	14	56.0	14	56.0	
	Mean ± SD	37.36 ± 2.11		37.12 ± 1.90		
	Range	30–40		34–40		

Table 1 presents the distribution of respondents by age, education, socioeconomic condition, and gestational age at admission. The mean age was 26.16±4.85 years in the control group and 29.16±6.45 years in the case group, with most participants aged 25–30 years in both groups. No significant age difference was observed (p = 0.266). Most respondents had secondary education, followed by college/university, with no significant difference (p = 0.386). A significant difference was found in socioeconomic status (p = 0.035), with the majority belonging to the lower middle-income group. Gestational age at admission was similar in both groups, with mean values of 37.36±2.11 and 37.12±1.90 weeks, and most admitted between 38–40 weeks (p = 0.510).

Table 2: Distribution of Respondents by Obstetric and Medical Disorders (n=50)

Variable		Control (n=25)		Case (n=25)		p-value
		n	%	n	%	
Obstetrics disorders	PE	1	4.0	6	24.0	0.859
	APH	1	4.0	0	0.0	
	Gestational hypertension	3	12.0	0	0.0	
	Abruptio placenta	0	0.0	1	4.0	
	Polyhydramnious	0	0.0	1	4.0	
	None	20	80.0	17	68.0	
Medical disorders	UTI	2	8.0	1	4.0	0.738
	GDM	3	12.0	8	32.0	
	Hepatitis	0	0.0	1	4.0	
	HbEtrait	0	0.0	1	4.0	
	No	20	80.0	14	56.0	

Table 2 shows the distribution of obstetric and medical disorders among the respondents. Obstetric complications like PE (24.0% vs. 4.0%) and others were more frequent in the case group, though not statistically significant (p = 0.859). Similarly, medical conditions such as GDM (32.0% vs. 12.0%) were more common in the case group, but the overall difference was not significant (p = 0.738).

Table 3: Distribution of Respondents by Clinical Symptoms (n=50)

Symptoms	Control (n=25)				Case (n=25)			
	Present		Absent		Present		Absent	
	F	%	F	%	F	%	F	%
Anemia	11	44.0	14	56.0	12	48.0	13	52.0
Jaundice	0	0.0	25	100.0	0	0.0	25	100.0
Dehydration	0	0.0	25	100.0	1	4.0	24	96.0
Oedema	2	8.0	23	92.0	7	28.0	18	72.0

Table 3 illustrates the presence of clinical symptoms among the respondents. Anemia was the most common symptom in both groups (44.0% in control vs. 48.0% in case). Oedema was more frequently observed in the case group (28.0%) compared to the control group (8.0%). Jaundice was absent in both groups, while dehydration was reported in only one case (4.0%).

Table 4: Distribution of Respondents by Blood Pressure Status (n=50)

Blood pressure mm of Hg	Control (n=25)		Case (n=25)	
	F	%	F	%
Normotensive	21	84.0	18	72.0
Hypertensive	4	16.0	7	28.0
Total	25	100.0	25	100.0

Table 4 shows the distribution of blood pressure status among the respondents. In the control group, 84.0% were normotensive and 16.0% were hypertensive, while in the case group, 72.0% were normotensive and 28.0% were hypertensive. Hypertension was more prevalent in the case group compared to the control group.

Table 5: Distribution of Respondents by Fetal Outcome at Birth (n=50)

Fetal outcome, birth	Control (n=25)		Case (n=25)	
	F	%	F	%
Live	25	100.0	24	96.0
IUD	0	0.0	1	4.0
Stillbirth	0	0.0	0	0.0
Total	25	100.0	25	100.0

Table 5 presents the fetal outcomes among the respondents. In the control group, all births (100.0%) were live births. In the case group, 96.0% were live births, and 4.0% resulted in intrauterine death (IUD). No stillbirths were reported in either group.

Table 6: Distribution of Respondents by Apgar Scores at 1 and 5 Minutes (n=50)

Variable		Control (n=25)		Case (n=25)		p-value
		n	%	n	%	
Apgar score at 1 min	≤6	8	32.0	16	64.0	0.317
	≥7	17	68.0	9	36.0	
Apgar score at 5 min	≤6	3	12.0	9	36.0	0.166
	≥7	22	88.0	16	64.0	

Table 6 shows the Apgar scores at 1 and 5 minutes after birth. At 1 minute, 32.0% of newborns in the control group and 64.0% in the case group had scores ≤6. At 5 minutes, 12.0% of newborns in the control group and 36.0% in the case group had scores ≤6. Though lower Apgar scores were more frequent in the case group, the differences were not statistically significant.

Table 7: Distribution of Respondents by Birth Weight (n=50)

Birth weight	Control (n=25)		Case (n=25)		P value
	F	%	F	%	
<2.5 kg	5	20.0	9	36.0	0.212
≥2.5 kg	20	80.0	16	64.0	
Total	25	100.0	25	100.0	
Mean ± SD (kg)	2.80 ± 0.532		2.80 ± 0.532		

Table 7 illustrates the distribution of birth weights among newborns. Low birth weight (<2.5 kg) was observed in 20.0% of the control group and 36.0% of the case group, while the majority in both groups had weights ≥2.5 kg. The mean birth weight was identical in both groups (2.80 ± 0.532 kg), and the difference between groups was not statistically significant.

Table 8: Distribution of Respondents by Neonatal Complications (n=50)

Complications	Control (n=25)				Case (n=25)				P value
	Yes		No		Yes		No		
	F	%	F	%	F	%	F	%	
Asphyxiated	4	16.0	21	84.0	9	36.0	16	64.0	0.076
Jaundice	5	20.0	20	80.0	6	24.0	19	76.0	0.16
Birth trauma	0	0.0	25	100.0	0	0.0	25	100.0	
Admission in NICU	4	16.0	21	84.0	7	28.0	18	72.0	0.285
Cord blood sample hypothyroid	2	8.0	23	96.0	0	0.0	25	100.0	

Table 8 summarizes neonatal complications observed in both groups. Asphyxia occurred in 16.0% of the control group and 36.0% of the case group, while neonatal jaundice was reported in 20.0% and 24.0% respectively. NICU admission was required for 16.0% of control and 28.0% of case group neonates. No birth trauma was reported in either group. Cord blood hypothyroidism was found in 8.0% of control neonates but none in the case group. None of the differences reached statistical significance.

DISCUSSION

Subclinical hypothyroidism (SCH) during pregnancy has been associated with a range of adverse maternal and fetal outcomes. Despite the absence of overt symptoms, SCH may contribute to complications such as gestational hypertension, preeclampsia, and low birth weight. The present study aimed to evaluate the impact of SCH on pregnancy complications in a tertiary care hospital setting. A total of 50 pregnant women were enrolled at the Department of Obstetrics and Gynecology, Dhaka Medical College Hospital, divided equally into two groups: euthyroid pregnant women (control) and pregnant women with subclinical hypothyroidism (case).

In the present study, the majority of women in both groups were aged 25–30 years, consistent with Mukhtar *et al.,*[11] and Kumar *et al.,*[12], who also reported a predominance of SCH among women in this age range. While no significant difference in educational status was observed (p = 0.386), Kumar *et al.,*[12] suggested education may influence thyroid status awareness or detection. Socioeconomic status differed significantly between groups (p = 0.035), with most participants belonging to the lower middle-income bracket, echoing socioeconomic disparities noted by Kumar *et al.,*[12]. Gestational age at admission was predominantly between 38 and 40 weeks in both groups, paralleling findings from Kumar *et al.,*[12] of late gestational presentation in SCH cases.

Obstetric and medical disorders were more frequent in the SCH group, with higher rates of preeclampsia (24% vs. 4%) and gestational diabetes mellitus (32% vs. 12%). These findings align with Das *et al.,*[13] who reported increased hypertensive disorders in SCH pregnancies, and Jia *et al.,*[14], who identified an elevated risk of GDM, particularly in the presence of antithyroid autoantibodies. Although statistical significance was not achieved here, likely due to sample size limitations, these trends reinforce the established associations between SCH and adverse pregnancy complications, highlighting the need for routine thyroid screening and monitoring.

Anemia was present in 48.0% of women with SCH compared to 44.0% in controls, supporting reports by Singh *et al.,*[15] and Monika *et al.,*[16], who noted a significant link between hypothyroidism and anemia during pregnancy. Moreover, oedema occurred more frequently in the SCH group (28.0%) compared to the control group (8.0%), potentially reflecting hypothyroid-related fluid retention or early hypertensive manifestations. Other symptoms such as jaundice and dehydration were rare, underscoring the importance of vigilant clinical assessment in SCH pregnancies.

Hypertension was more prevalent among SCH women (28.0%) than controls (16.0%), with fewer normotensive cases in the SCH group. Though not statistically significant, this suggests a possible relationship between SCH and elevated blood pressure during pregnancy.

Regarding fetal outcomes, live births occurred in all control pregnancies, while one intrauterine death (4%) was noted in the SCH group, with no stillbirths reported. This concurs with Kumari *et al.,*[17], who documented increased intrauterine growth restriction, low birth weight, and stillbirths among SCH pregnancies, emphasizing the potential fetal risks posed by SCH and the critical need for close management.

Neonates born to SCH mothers exhibited a higher proportion of low Apgar scores at 1 and 5 minutes (64.0% and 36.0%, respectively) compared to controls, though differences lacked statistical significance. These observations are consistent with Mahadik *et al.,*[18], who reported increased low Apgar incidences in hypothyroid pregnancies, and a Lebanese study which found no significant Apgar score differences [19], underscoring variability in neonatal outcomes and the need for further research.

Low birth weight (<2.5 kg) was more frequent in the SCH group (36.0%) than controls (20.0%), yet mean birth weights were identical (2.80 ± 0.532 kg) across groups, suggesting a trend towards increased low birth weight in SCH pregnancies without overall impact on average birth weight.

Neonatal complications such as asphyxia (36%) and jaundice (24%) were more common in the SCH group compared to controls, consistent with findings from Finland reporting increased odds of neonatal asphyxia and jaundice in hypothyroid pregnancies [20]. Similarly, Kiran *et al.,*[21] identified neonatal jaundice as the most prevalent complication among neonates from hypothyroid mothers, with a notable proportion requiring NICU admission. In our study, NICU admissions were higher in the SCH group (28%) than controls (16%), reflecting these prior observations. Collectively, these findings suggest maternal SCH may increase neonatal risks, highlighting the importance of meticulous fetal and neonatal surveillance.

Limitations of the study

This study focused on comparing maternal and fetal outcomes between euthyroid and subclinical hypothyroid pregnant women at a tertiary care hospital. Participants were recruited from a single hospital. While this research addresses an important and understudied area, it has some inherent limitations:

- The study place was purposively chosen, so the findings may not be representative of the broader population, limiting the generalizability of the results.
- Due to time and resource constraints, the sample was restricted to one hospital. Including

multiple hospitals could have strengthened the findings.

- Since the study was not community-based, its potential to influence broader public health improvements is limited.

CONCLUSION

The study found that subclinical hypothyroidism in pregnancy was associated with a higher prevalence of obstetric and medical complications, including preeclampsia, gestational diabetes, edema, and hypertension, although these differences were not statistically significant. Women with subclinical hypothyroidism also showed increased rates of adverse fetal outcomes such as intrauterine death, lower Apgar scores, low birth weight, and neonatal complications like asphyxia, compared to controls. Overall, subclinical hypothyroidism may negatively impact pregnancy outcomes, highlighting the need for close monitoring in affected pregnancies.

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