

ORIGINAL ARTICLE

Thyroid Dysfunction in Pregnancy and its Outcome

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ABSTRACT

Objective: To identify the thyroid dysfunction in pregnancy and its outcomes.**Study Design:** Prospective study**Place and Duration of Study:** Department of Obstetrics & Gynaecology, Sheikh Khalifa Bin Zayed Al-Nahyan Hospital/CMH Muzaffarabad Azad Kashmir from 1st October 2021 to 31st March 2022.**Methodology:** Seventeen hundred pregnant women in third trimester were screened. Out of them, 50 were identified to be suffering from thyroid dysfunction. The pregnant women in their third trimester and within the age group of 18-40 years were recruited. By using enzyme linked sorbent assay the serum levels of TSH, Free T₃ and Free T₄ were determined for each woman as a routine clinical health check-up practice. The women who had raised analytical levels as well as correlated clinical history were identified as suffering from thyroid dysfunction. These women were further followed for the outcomes of their pregnancy.**Results:** The prevalence of thyroid dysfunction was 2.9%. There were 42% pregnant women suffering from subclinical hypothyroidism while 36% were having overt hypothyroidism and 12% had subclinical hyperthyroidism.**Conclusion:** The major outcome of thyroid dysfunction in pregnancy in terms of maternal and fetal outcomes was presence of anemia in women and was 4.89%. In women considering fetal outcomes, low birth weight was observed in 32% neonates with a need of neonatal intensive care for 42% of newborns were seen.**Keywords:** Thyroid dysfunction, Pregnancy, Outcome

INTRODUCTION

Thyroid hormones are considered as most important hormone in maintaining the body metabolic functions as well as overall health impact and any disturbances can lead into severe health outcomes.^{1,2} In similar terms pregnancy is also a very sensitive and crucial time where hormonal balance is most specifically required for healthy development of the fetus and also health of the mother. Any disorder of thyroid gland during pregnancy can result into lethal consequences. During pregnancy the thyroid size is already increased by 10% for providing sufficient iodine.³

The physiological as well as the hormonal alteration in pregnancy and human chorionic gonadotrophin hormone, the thyroxine formation and tri-iodothyronine production are escalated up to 50% which leads to daily raise in women iodine requirements. At the same time the level of TSH decreased in the 1st trimester.⁴ These modifications in thyroid hormones are well tolerated in pregnancy due to internal reserves. However, in iodide deficient areas these changes are critical during pregnancy times.⁵ Women who suffer from thyroid hormones deficiency even before pregnancy have a high risk of developing negative pregnancy outcomes or complication during their pregnancy which might hinder both mother and child health.^{6,7}

The prevalence of thyroid dysfunction in pregnancy women is around 2-3% with subclinical thyroid dysfunction to be presented in pregnant women up to 10%.^{7,8} The present study was designed to assess the maternal and fetal pregnancy related outcomes in women who were suffering from thyroid dysfunction during the pregnancy. This study results would assist in better knowledge of thyroid dysfunction outcomes and ways to manage negative outcomes or better mother and child health outcomes.

MATERIALS AND METHODS

This prospective study was carried out at Sheikh Khalifa Bin Zayed Al-Nahyan Hospital/CMH Muzaffarabad Azad Kashmir from 1st October 2021 to 31st March 2022. Seventeen hundred pregnant women in third trimester were screened. Out of them, 50 were identified to be suffering from thyroid dysfunction. The pregnant women in their third trimester and within the age group of 18-40 years were recruited. Those pregnant women who were already known of multiple abortions as a result of thyroid dysfunction,

diabetes or preeclampsia were not included as participant. Informed consent was also received from each participant. Clinical history as well as familial history for thyroid disorders was documented through interviewing each pregnant woman. Other related history including use of iodized salt as well as oligomenorrhea, fecundity details, any related treatments were also documented. A 5cc blood was withdrawn from each participant and serum was generated by centrifugation it at 3000 rpm. The serum was stored at -20 degree Celsius until analysis. By using enzyme linked sorbent assay the serum levels of TSH, Free T₃ and Free T₄ were determined for each woman as a routine clinical health check-up practice. The women who had raised analytical levels as well as correlated clinical history were identified as suffering from thyroid dysfunction. These women were further followed for the outcomes of their pregnancy. Cut-off value of TSH, free T₄ and free T₃ in third trimester was taken as 0.3 -5mIU/L, 0.7 to 1.8 ng/dl and 1.7 to 4.2 pg/ml respectively. Those patients who had normal free T₄ but high levels of TSH were considered as subclinical hypothyroidism. Maternal comorbidities as anemia was taken as Hb level <10 g/dl while preeclampsia as BP >140 by 90 accompanied with proteinuria post 20 weeks of gestation. Low birth weight as fetal outcome was considered as a weight below 2.5kg and decreased Apgar score was considered as 1-minute Apgar<5. The outcomes of the pregnancy were noted and data was analyzed while using SPSS version 26.0 where odds ratio was calculated and p value for significant was generated using chi square test. P value <0.05 was taken as significant.

RESULTS

One thousand and seven hundred women were screened for the thyroid dysfunction during pregnancy. Out of these women, thyroid disorder was presented in 50 pregnant women. The age of the women was between 18-40 years. The prevalence of thyroid dysfunction was 2.9% within the pregnant women with majority being in the age group of 29-38 years (Table 1)

There were 42% pregnant women suffering from subclinical hypothyroidism while 36% were having overt hypothyroidism and 12% had subclinical hyperthyroidism. The mean TSH level of former to later thyroid condition was 8.01±1.3, 11.93±5.35 and 0.08±0.04 respectively (Table 2). Oligomenorrhea was observed in

22.08% of the cases while 10.1% took treatment for infertility and 13.0% were having previous history of miscarriages (Fig. 1).

The major outcomes of thyroid dysfunction in pregnancy in terms of maternal and fetal outcomes was presence of anemia in women as 4.89% higher than pregnant women with normal thyroid function tests. Higher risk of preeclampsia was also observed in these women. Considering fetal outcomes low birth weight was observed in 32% neonates with a need of neonatal intensive care for 42% of newborns. There were 3 cases of preterm delivery with 2.4% time higher risk of preterm delivery than pregnant women with normal thyroid function. Low Apgar score was also recorded 3.61 times higher in neonates born to mother who had thyroid

Table 2: Frequency of thyroid status in pregnancy

Thyroid status	Prevalence	Mean TSH (mIU/L)	Mean fT4 (ng/dl)	Mean fT3 (pg/ml)
Subclinical hypothyroidism (n = 26)	42%	8.01±1.3	1.10±0.32	3.08±0.55
Overt hypothyroidism (n = 18)	36%	11.93±5.35	0.37±0.25	0.82±0.67
Subclinical hyperthyroidism (n = 6)	12%	0.08±0.04	1.21±0.11	4.12±0.41

Table 3: Outcomes of thyroid dysfunction in pregnancy

Outcome	N = 50	%	95% CI	Odds Ratio	P value
Anemia	13	26%	1.51-15.8	4.89	0.008
Preeclampsia	8	16%	1.07-19.23	4.53	0.042
Preterm	3	6%	0.254-22.53	2.40	0.412
Oligohydramnios	6	12%	0.03-1.21	0.20	0.071
Caesarean section	14	28%	1.40-14.37	4.48	0.011
Low birth weight	16	32%	2.02-19.55	6.31	0.002
Low Apgar Score	11	22%	1.04-12.71	3.65	0.043
NICU admission	21	42%	0.049-0.392	0.16	0.001

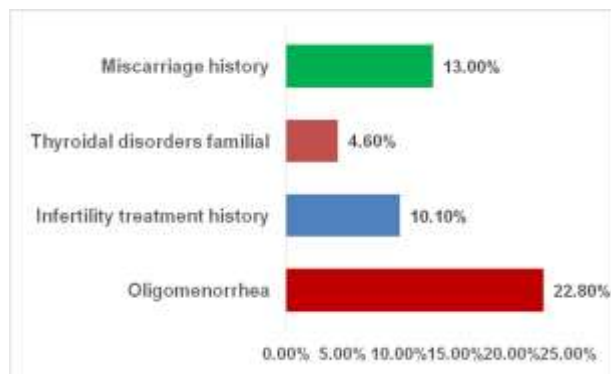


Fig. 1: Clinical history related to thyroid disability in cases

DISCUSSION

Thyroid dysfunction is a commonly reported issue of women in their fecundity time. After diabetes consideration, it is the most prevalent problem in reproductive age women. Various areas of the globe reports different prevalence of thyroid dysfunction in pregnant women despite an extensive research there are still very less number of studies reporting the thyroid dysfunction in pregnant Asian women and the fetomaternal outcomes of their pregnancy.⁹⁻¹¹

In the present study enzyme linked immune sorbent assay was used for analyzing and screening the thyroid dysfunctions. There are studies which facilitate the current research analytical application. However, chemiluminescence method is equally adaptable by other researchers with similarity in the overall results.¹² This study was performed on women who were in their third trimester, therefore the earlier pregnancy stages were not included in the research. Similar selections have been done by another study where only third trimester women were screened for their thyroid status.¹³

The prevalence of subclinical hypothyroidism, overt hypothyroidism as well as subclinical hyperthyroidism is in agreement with another research from India which reported the prevalence of subclinical hypothyroidism as 6.1 % and that of overt hypothyroidism as 07% respectively.^{14,15}

dysfunction in pregnancy than newborns of normal thyroid level mothers (CI: 1.04-12.71) [Table 3].

Table 1: Frequency of thyroid dysfunction related with age of pregnant women (n=1700)

Variable	Present	Absent	P value
Thyroid dysfunction	50 (2.9%)	1650 (97.1%)	0.03
Age (years)			
18 – 28	10 (20%)	550 (33.3%)	0.04
29 – 38	29 (58%)	756 (45.8%)	
> 38	11 (22%)	344 (20.8%)	

Various literature supports the fact that thyroid dysfunction in pregnant women are related with not only preeclampsia, higher risk of cesarean birth and of preterm delivery but also severe complication and low birth weight for neonates.¹⁶⁻¹⁹ In the present study similar findings were analyzed in the results section. Mother and child health are most priority concerns and requires special focus of research.²⁰ The current research was also mean to highlight the same issue.

CONCLUSION

There is a significant increase in negative maternal and fetal outcomes in pregnant women with thyroid dysfunction. Preeclampsia, anemia and preterm delivery are major maternal outcomes while Low birth weight, decreased Apgar score and increased chances of NICU admission are some of the pregnancy outcomes in women with disturbed thyroid hormone.

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