

MATERNAL AND PERINATAL OUTCOME IN HYPOTHYROIDISM IN PREGNANCY.

Obstetrics & Gynaecology

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ABSTRACT

BACKGROUND: Pregnancy is a period that places great physiological stress on both the mother and the foetus .This study was conducted to analyse the fetomaternal outcome of pregnant women with hypothyroidism.

The commonest thyroid disorder found in pregnancy is hypothyroidism and it adversely affects the maternal and foetal health in the form of infertility, early pregnancy loss, pre eclampsia , anaemia ,FGR, PROM, preterm labour, neonatal and maternal morbidity and mortality. Routine screening, early detection and confirmation of diagnosis and prompt treatment is required to ensure favourable maternal and foetal outcomes.

METHODS: The present study was conducted in the department of obstetrics and gynaecology of Adhichunchanagiri Institute of Medical Sciences ,B.G Nagara , Mandya from November 2019 to October 2020.All pregnant females who are diagnosed as hypothyroidism , admitted to labour room were included in the study .

RESULTS: In the present study the most common maternal complication is preeclampsia , postpartum haemorrhage and fetal complication is preterm labour.

CONCLUSION: Maternal hypothyroidism is a disorder with great potential to adversely affect maternal and foetal outcomes .If the condition is diagnosed early and prompt initiation of treatment ,adequate follow up is done then the condition can be easy treated with very little detrimental effects to the mother and the foetus. This study concludes that sufficient education of the doctors and the patients about the universal screening, thyroid associated complications along with ease and advantages of prompt management is very much necessary.

KEYWORDS

Hypothyroidism, FGR, Preeclampsia, Postpartum haemorrhage, Preterm labour.

INTRODUCTION

Pregnancy is a period that places great physiological stress on both the mother and the foetus .Thyroid disorders are the most common endocrine disorders in pregnant women among which maternal hypothyroidism is most frequent . Overt hypothyroidism is diagnosed when high serum TSH level is accompanied by low serum Thyroxine level .Subclinical hypothyroidism is a condition where high serum TSH is associated with normal Thyroxine and Tri iodothyronine . There is a wide geographic variation in prevalence of hypothyroidism during pregnancy. Prevalence of hypothyroidism was found to be more in Asian countries compared with the western countries.'The overall prevalence of overt hypothyroidism in general population is 0.2-0.3% and subclinical hypothyroidism is 4-8.5%.

Prevalence of thyroid disorders in Indian pregnant women ranges from 4.8% to 11% in pregnancy, overt hypothyroidism is seen in 0.2% cases and subclinical hypothyroidism in 2.3% cases .Autoimmune thyroiditis is the commonest cause of hypothyroidism during pregnancy. However, iodine deficiency remains one of the leading causes of hypothyroidism worldwide, both overt and subclinical. Fetal loss, foetal growth restriction, pre eclampsia are complications of overt hypothyroidism seen in 2 out of 1000 pregnancies. Untreated maternal overt hypothyroidism is associated with adverse neonatal outcomes including premature birth, low birth weight, and neonatal respiratory distress.¹ Women with hypothyroidism have decreased fertility, even after conception risk of abortion is increased along with increased risk of preeclampsia, anaemia, foetal growth restriction, placental abruption, perinatal and neonatal morbidity and mortality, preterm delivery, small head circumference, low birth weight, impaired neuropsychological development² There may be more foetal and perinatal death, and gestational hypertension may also contribute to the overall increase in neonatal risks. Since hypothyroidism is easily treated, timely detection and treatment of the disorder could reduce the burden of maternal and perinatal outcome. So, this study was designed to evaluate and compare the maternal and perinatal outcome in women who were diagnosed with hypothyroidism during pregnancy.

METHOD

The present study was conducted in the department of obstetrics and gynaecology of Adhichunchanagiri Institute of Medical Sciences,

B.G Nagara, Mandya from November 2019 to October 2020 after taking permission from institutional ethical committee.

All antenatal women >18years of age with singleton pregnancy irrespective of their gravid status (primigravida or multigravida) who are diagnosed as hypothyroid, admitted to labour room were included in the study.

Women with multifetal gestation , pre existing renal , hepatic or cardiac or any other chronic illness ,previous bad obstetric history with known cause were excluded from the study .

Detailed history was taken with focus on symptoms of thyroid disorders such as inappropriate weight gain, cold intolerance, dry skin, constipation and fatigue. Menstrual history, obstetric history, past history, family and personal history was taken. A thorough physical examination was done with focus on thyroid and obstetric examination .Patients blood samples were sent for TSH, FT3, FT4 levels.

The reference ranges were as per guidelines of American Thyroid Association for the diagnosis and management of thyroid disease during pregnancy.

1st trimester 0.1-2.5micro units/ml
2nd trimester 0.2-3.0micro units /ml
3rd trimester 0.3-3.0micro units/ml
Normal FT3:1.7-4.2 pmol/ml, FT4:0.7-0.8pmol/L.

The study sample of 120 was divided into group 1 for subclinical hypothyroidism (60) and Group 2 for overt hypothyroidism (60).subclinical and overt hypothyroidism was treated with thyroxine .Patients were followed up until delivery and maternal, perinatal outcome were documented.

RESULTS

The present study was conducted from November 2019 to October 2020.The baseline characteristics 120 patients who were included are shown in table 1. In the present study mean age (in years) is 25.40 for subclinical hypothyroid group and 26.67 for overt hypothyroid group . In Table 1 total number of primiparous patients in Group 1 are 46.7% and Group 2 are 48.3% and multiparous are 53.3% and 51.3% in

Group 1 and 2 respectively.

Table 1: The Distribution Of Patients Based On Parity Index

Parity	Group 1		Group 2	
	N	%	n	%
Primiparous	28	46.7%	29	48.3%
Multiparous	32	53.3%	31	51.7%
Total	60	100.0%	60	100.0%

Table 2: Distribution Of Patients On The Basis Of Serum Tsh Level At The Time Of Diagnosis.

Category	Group 1		Group 2	
	n	%	n	%
First Trimester	40	66.7%	34	56.7%
Second Trimester	9	15.0%	7	11.7%
Third Trimester	2	3.3%	0	0.0%
1-3 years	7	11.7%	10	16.7%
4-6 years	0	0.0%	6	10.0%
7-10 years	2	3.3%	3	5.0%

There is clinical significance between time of diagnosis and serum TSH level ($P=0.04$). As per table 2, In first trimester 66.7% were diagnosed among Group 1 and 56.7% in Group 2. In second trimester 15.0% and 11.7% among Group 1 and Group 2 respectively. In third trimester, 3.3% and 0% among group 1 and group 2 respectively. 11.7% in group 1 and 16.7% in group 2 were diagnosed 1-3 years before conception, 3.3% in group 1 and 5.0% in group 2 were diagnosed 7-10 years before conception.

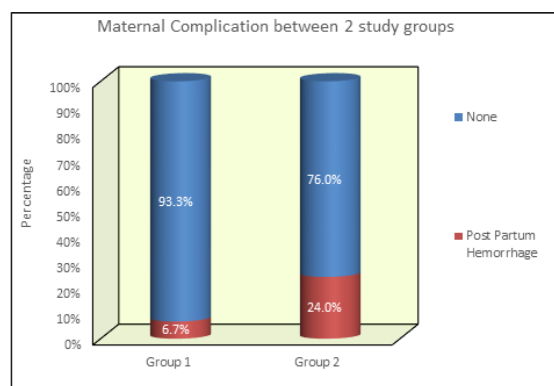
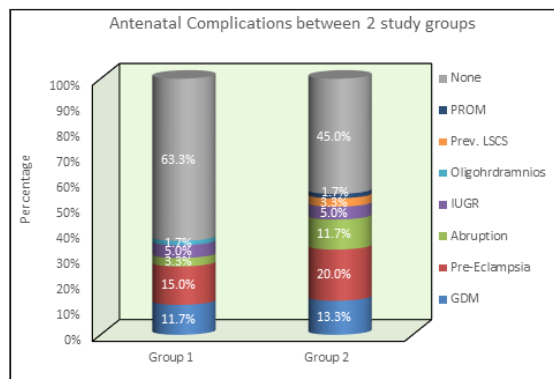


Figure 1: Distribution Of Cases As Per Maternal Complications

Figure 1 shows comparison between maternal complications among subclinical and overt hypothyroidism patients. As shown in the above graph 15.0% of subclinical hypothyroidism had preeclampsia whereas 20.0% of overt hypothyroidism had preeclampsia. In addition, 3.3% of subclinical hypothyroidism had abruption whereas, 11.7% of overt hypothyroidism had abruption. Gestational diabetes was seen in 11.7% cases of subclinical and 13.3% of overt hypothyroidism. Occurrence of foetal growth restriction is equal in both subclinical and overt hypothyroidism. Oligohydramnios was seen in 1.7% of subclinical cases but was not seen in overt cases. PROM was seen in 1.7% of overt cases but not seen in subclinical cases which is comparable to Tanuja et al and Jayanti et al where more complications were seen in overt than subclinical cases.^{5,9}

Postpartum haemorrhage was seen as maternal complication in 6.7% cases of subclinical hypothyroidism cases whereas in 24.0% cases of overt hypothyroidism cases which is clinically significant ($p=0.01$)

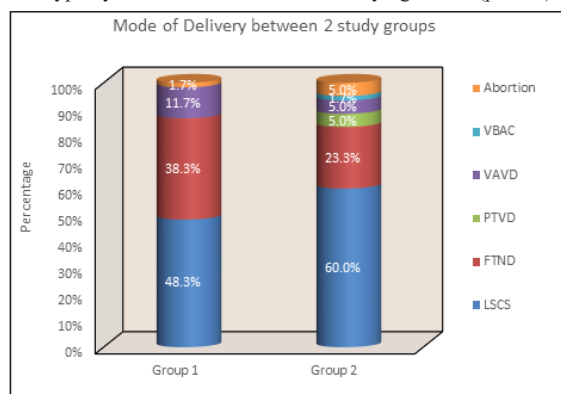


Figure 2 : Distribution Of Cases As Per Mode Of Delivery

Figure 2 shows comparison of mode of delivery between two groups which is statistically significant ($P=0.04$). As shown in above graph 48.3% of subclinical cases underwent LSCS whereas 60.0% of overt hypothyroidism underwent LSCS. 38.3% of subclinical hypothyroidism underwent FTND whereas 23.3% of overt hypothyroidism cases underwent FTND which is comparable to Mahendra and Dhara et al where LSCS rate is more than vaginal delivery.^{4,10} Preterm vaginal delivery was seen in 5.0% cases of overt hypothyroidism but not seen in subclinical cases. Abortion was seen in 1.7% of subclinical cases whereas 5.0% cases of overt hypothyroidism had abortion.

Table 3: Distribution Of Study Group As Per Birth Weight.

Variable	Category	Group 1		Group 2	
		n	%	n	%
Baby Birth Weight	< 2 Kgs.	5	8.5%	6	10.5%
	2-3 Kgs.	34	57.6%	22	38.6%
	3-4 Kgs.	20	33.9%	29	50.9%
	Total	59	98.3%	57	95.0%

As shown in table 3 total number of cases having low birth weight were 11(19%) of which 5 were subclinical (8.5%) and 6 were overt hypothyroidism (10.5%). No significant relation was noted between serum TSH level at the time of diagnosis and birth weight ($p=0.12$) which is comparable to Dhara, Jyanti and Nidhi et al where low birth weight was seen in 13.26 %,24% and 29.73% cases respectively.^{3,4,5} Correlation between preterm and hypothyroidism was seen in many studies, but no separate study done to see effect of hypothyroidism over IUGR.

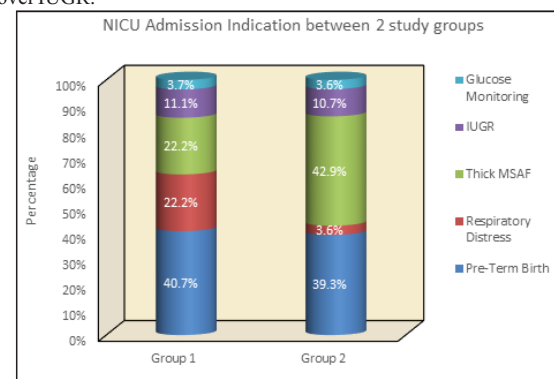


Figure 3: Distribution Of Cases As Per Indication For Nicu Admissions

Among 59 cases of subclinical hypothyroidism 27 babies i.e. (45.8%) got admitted to NICU after delivery whereas among 59 cases of overt hypothyroidism 28 i.e. (50%) babies got admitted to NICU. Most common indication for NICU admission is prematurity i.e.40.7% subclinical and 39.3% among overt hypothyroidism. Respiratory distress was indication in 22.2% cases of subclinical whereas 3.6% cases of overt hypothyroidism. Thick MSAF were found as indication for NICU admission in 22.2% cases of subclinical and 42.9% cases of

overt hypothyroidism. 2 babies were admitted for glucose monitoring.

Table 4: Mean Tsh Levels Among Neonates In Different Thyroid Disorders

Babies serum TSH level	N	Mean TSH Level
Subclinical hypothyroid	59	3.38
Overt hypothyroid	57	6.12

In the present study we evaluated new-born TSH, FT3, FT4 levels, which were estimated after 72 hours of birth in all babies whose mother had thyroid dysfunction. The mean TSH level in babies whose mother was subclinical hypothyroid was 3.38 whereas mean TSH level in babies whose mother was overt hypothyroid was 6.12, which is statistically significant ($p=0.001$)

DISCUSSION

Thyroid disorders are one of the most common endocrine disorders in pregnant women and are associated with adverse maternal and foetal outcome in pregnancy. Early detection of thyroid disorders and treatment improves outcome. This study was done in tertiary care centre, Mandya to gain insight into the impacts of subclinical and overt hypothyroidism on maternal and perinatal outcomes. In the present study 120 cases were studied, out of which 60 had subclinical hypothyroidism and 60 had overt hypothyroidism. Mean age of study population in subclinical study group was 25.4 years and among overt cases 26.67 years which is comparable to Nidhi et al.³

Thyroid dysfunction has deleterious effect to both mother and foetus. In the current study, subclinical hypothyroidism is associated with complications like preeclampsia 15%, gestational diabetes 11.7%, foetal growth restriction 5%, abruption 3.3%, oligohydramnios 1.7% and abortion 1.7%. It was compared with the study performed by Sahu et al in which the women having subclinical hypothyroidism had complications like preeclampsia 9.8%, preterm 10.3%, FGR 2.4% and stillbirth 2.5%.⁶ In the study conducted by Taghvi et al, the complications in women with subclinical hypothyroidism was preeclampsia 2.7%, preterm delivery 2.7% which was less when compared to present study.⁷

In the present study, pregnant women with overt hypothyroidism were associated with a complication like preeclampsia 20%, gestational diabetes 13.3%, abruption 11.7%, FGR 5% and abortion 5% which was comparable with the study conducted by Sahu et al and Leung et al.^{6,8}

In the present study total patients delivered by caesarean section are more compared to vaginal delivery, which is comparable to study conducted by Dhara et al but in Nidhi et al vaginal delivery were more.^{3,4} The most common indication for caesarean section in the present study was foetal distress or non-progress of labour but in study by Dhara et al it was bad obstetric history.⁴

In the present study total number of babies admitted in NICU among subclinical cases were 45.8% and in overt group were 50%. the most common indication for admission was meconium stained amniotic fluid, which was comparable to study by Jyanti et al but in Nidhi et al only 13.5% babies were admitted to NICU.^{3,5}

CONCLUSION

Maternal hypothyroidism is a disorder with great potential to adversely affect maternal and foetal outcomes. If the condition is diagnosed early and prompt initiation of treatment, adequate follow up is done then the condition can be easily treated with very little detrimental effects to the mother and the foetus. This study concludes that sufficient education of the doctors and the patients about the universal screening, thyroid associated complications along with ease and advantages of prompt management is very much necessary.

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