

## Fetomaternal Outcome of Pregnancy with Hypothyroidism

Pratima Devi<sup>1</sup>, M. Agalya<sup>2</sup>, Sushma H.P.<sup>3</sup>, Th.James<sup>4</sup>, L. Ranjit Singh<sup>5</sup>

<sup>1</sup>Assistant Professor, <sup>2,3</sup>Post graduate trainee, <sup>4</sup>Senior Resident, <sup>5</sup>Professor & Head, Department of Obstetrics and Gynaecology, Regional Institute of Medical Sciences, Imphal, Manipur, India)

Corresponding Author: Pratima Devi

**Abstract:** Thyroid diseases are common disorders affecting women of reproductive age group and hence constitute the commonest endocrine disorder in pregnancy also. According to ACOG, the prevalence of hypothyroidism in pregnancy is 2- 5%. Women with hypothyroidism are at an increased risk for early pregnancy loss, low birth weight, placental abruption, low IQ babies etc. So early detection and treatment prevents such adverse outcomes.

**Aim And Objective:** To study the fetomaternal outcome among pregnant women with hypothyroidism.

**Study Design:** This is a retrospective study that includes pregnant women from the year June 2017 to May 2018, which consists of 103 patients with hypothyroid in the Department of Obstetrics and Gynaecology, Regional Institute of Medical Sciences, RIMS, Imphal, Manipur.

**Results:** The study consists of 103 patients with hypothyroidism out of 5034 deliveries (2.01%), in which 20 (19.4%) had overt hypothyroidism and 83 (80.5%) had subclinical hypothyroidism out of total hypothyroid patients.

**Conclusion:** The present study shows significant association between hypothyroidism and adverse fetomaternal outcomes. So routine maternal thyroid function testing, especially serum TSH should be done as soon as pregnancy is confirmed.

**Key Words:** Hypothyroid, Pregnancy, Serum TSH.

Date of Submission: 20-05-2019

Date of acceptance: 05-06-2019

### I. Introduction

Hypothyroidism is a condition which affects both maternal and fetal outcome. Children born to untreated or undertreated mothers have profound effect on future intellectual development<sup>1</sup>. Pregnancy is associated with reversible changes in the maternal thyroid physiology. There is moderate enlargement of thyroid gland. There is increase in the levels of thyroid binding globulin which is estrogen mediated. The thyroid stimulation is due to the "spill effect" by HCG, which shares structural similarity with TSH. There is a relative decline in the availability of iodine due to increased renal clearance and losses to fetus and placenta.

The fetal thyroid gland begins synthesizing thyroid hormone after 12 weeks of gestation. Thyroid hormone is supplied to the fetus by the mother before this time, and it is at this time that thyroid hormones are most important for fetal brain development. However, significant fetal brain development continues beyond first trimester, making thyroid hormone also important in later gestation<sup>2</sup>. It has been suggested that the babies of women with hypothyroidism in pregnancy are at increased risk of impaired neurological development<sup>2</sup>. Various studies have showed that in women with normal thyrotropin (TSH) and free thyroxin (ft4), elevated titres of TPOabs (Thyroid peroxidase antibodies) are associated with complications like preterm birth, abnormal fetal growth, and prenatal/postnatal depression symptoms<sup>3</sup>. Maternal thyroid dysfunction in early pregnancy leads to impaired cognition and attention deficit/hyperactivity problems in preschool children<sup>3</sup>.

Women with overt hypothyroidism are at an increased risk for pregnancy complications such as early pregnancy failure, preeclampsia, placental abruption, low birth weight and still birth<sup>4-6</sup>. Treatment of women with overt hypothyroidism has been associated with improved pregnancy outcomes. According to The American Congress of Obstetricians and Gynecologists (ACOG), the prevalence of hypothyroidism in pregnancy is 2 to 5%. There are a few studies from India which show the prevalence of hypothyroidism during pregnancy ranging from 4.8- 11%<sup>7</sup>. Therefore, this retrospective study was conducted to study the fetomaternal outcome among the pregnant women with hypothyroidism.

According to the American Thyroid Association 2017, trimester specific TSH levels are:

1st trimester---0.1 - 4 mIU/L

2nd trimester---0.2- 4mIU/L

3rd trimester---0.3- 4mIU/L

Targeted screening includes women who either have a positive family history, goitre, type 1 dm, pre existing thyroid disorder, preterm delivery, antibody positivity, or prior therapeutic head or neck irradiation, and so on<sup>10</sup>. Currently, position statements issued by the Thyroid, Endocrine and Obstetric organisations donot recommend universal screening.

## II. Materials And Methods

A Retrospective study was conducted in the Department of Obstetrics and Gynecology, Regional Institute of Medical Sciences, Imphal, Manipur, to find out the fetomaternal outcome in pregnancy with hypothyroidism. All cases of hypothyroid pregnant women in Obstetrics and Gynecology department collected from june 2017 to may 2018. Ethical approval was obtained from the Research Ethics Board, RIMS. We collected the results of thyroid function tests of 5034 women who delivered in the period between june 2017 to may 2018.

## III. Results And Observations

A total of 5034 cases were studied. Out of 5034 cases, 103(2.01%) cases found to be hypothyroid. Among them, 20 (19.4%) had overt hypothyroidism and 83 (80.5%) demonstrated subclinical hypothyroidism.

**Table 1: Distribution of women with hypothyroidism (N=103)**

Age group (yr)	Thyroid status n (%)		Total [N=103] N (%)
	Sub-clinical hypothyroidism (n=83)	Overt hypothyroidism (n=20)	
19-25	26 (89.7)	3 (10.3)	29 (28.2)
26-30	22 (81.5)	5 (18.5)	27 (26.2)
31-34	18 (78.3)	5 (21.7)	23 (22.3)
35-43	17 (70.8)	7 (29.2)	24 (23.3)

In the above table 1 shows, that subclinical hypothyroid prevalence among the age group between 19- 25 years ( 89.7 %), and overt hypothyroid around 10.3 %.

The mean age of sub clinical hypothyroid population was 19-25 years in the current study. The mean age for overt hypothyroid was 35-43 years. Study by Ajmani et al found that maternal age was high in the overt hypothyroid with a mean age of 35 +/- 5 years.

In our study, among 103 hypothyroid women, 26( 26.78%) were below 25 years as compared to 57 ( 58.71%) women above the age of 25 years. This shows increasing prevalence of hypothyroidism as maternal age advances. In the study of Akhter SN et al, it was observed that 62.1% of subclinical hypothyroid patients were in the 15-24 years age group and 66.7% of the overt hypothyroidism patients were in the 25-44 year age group.

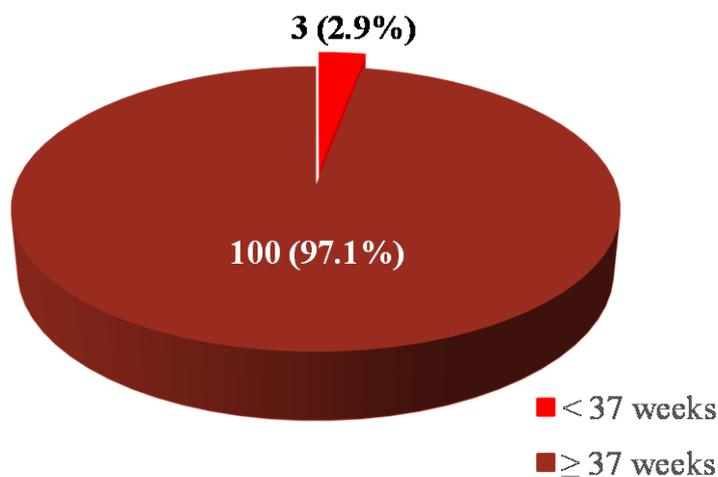


Figure 1 : Distribution of hypothyroid women by period of gestation at child delivery (N=103)

In the figure 1 shows, that around 2.9 % of hypothyroid women delivered by less than 37 weeks of gestation. A study conducted by Nirmala et al found that preterm labour was seen in 25.6% of cases and 20,5% of controls and the difference was not significant.<sup>15</sup> A study of Ajmani et al observed that the incidence of preterm birth in overt hypothyroidism was higher (33%) than the present study and in subclinical hypothyroidism, the incidence was 11.2% compared to euthyroid women.<sup>16</sup>

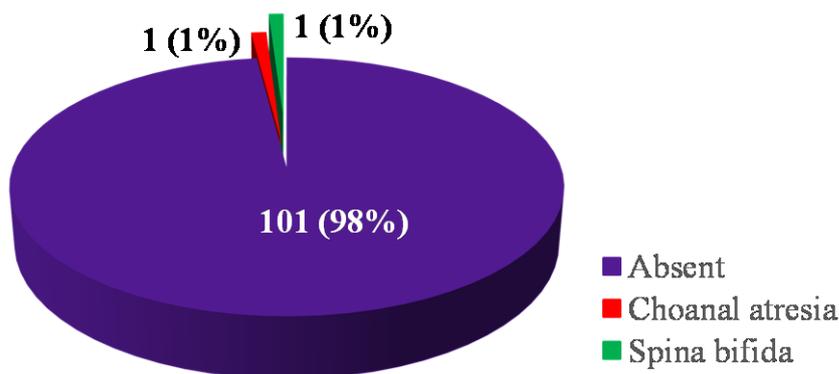


Figure 2: Distribution of baby of hypothyroid women by presence of congenital anomaly (N=103)

Figure 2 shows , that around 1 % of congenital anomalies occurred in hypothyroid women. A study conducted by Bamforth et al, shows 1% of congenital anomalies developed among hypothyroid women.

Table 2: Distribution of hypothyroid women according to complications associated with pregnancy (N=103)

Complications	n (%)
Nil	73 (70.9)
Pre-eclampsia	12 (11.7)
Placenta praevia	4 (3.9)
IUGR	4 (3.9)
GDM	3 (2.9)
H/O Infertility	2 (1.9)
Severe pre-eclampsia	1 (1.1)
Overt DM	1 (1.1)
Uterine fibroid	1 (1.1)
Thrombophilia	1 (1.1)
Oligohydramnios	1 (1.1)
Polyhydramnios	1 (1.1)
SLE	1 (1.1)
Severe anaemia	1 (1.1)
IUD	1 (1.1)
H/O Thyroidectomy	1 (1.1)



The above table 2 shows, that hypothyroidism in pregnancy has been associated with adverse maternal outcomes in observational studies including preeclampsia, placental abnormalities, preterm labour, miscarriages, low birth weight etc.<sup>4,5,13,14</sup>

A study done by Rao et al. demonstrates that hypothyroidism has a statistically significant relationship with recurrent pregnancy loss in the first trimester and suggests that diagnosis of hypothyroidism could help couples with recurrent pregnancy loss to have a successful outcome in subsequent pregnancies.<sup>12</sup>

#### IV. Discussion

During the last 20 years, it has been appreciated that thyroid physiology changes significantly during gestation. Uncorrected thyroid dysfunction in pregnancy has adverse effects on maternal and fetal wellbeing. Thyroid disorders are the second most common disorders found in pregnancy.

The present study was done in Regional Institute of Medical Sciences, Imphal. A total of 5034 hypothyroid pregnant women were taken into the study. This was a retrospective study.

Sahu et al. have done thyroid function during second trimester in high risk pregnant women and reported that prevalence of thyroid disorders, especially overt and subclinical hypothyroidism, was 6.4%. Further, significant adverse effects on maternal and fetal outcome were seen emphasizing the importance of routine antenatal thyroid screening.<sup>13</sup>

Uncorrected thyroid dysfunction in pregnancy increases the incidence of miscarriages, low birth weight, fetal death, and still birth. In the above table 2 shows, there was a prevalence of pre eclampsia, diabetes mellitus, placenta previa, intrauterine growth restriction, uterine anomalies etc. The deleterious effects of thyroid dysfunction can also extend beyond pregnancy and delivery to affect the intellectual development in the early life of the child. Thus any delay in the diagnosis and treatment of hypothyroidism may ultimately result in a progeny with educational, socioeconomic and public health consequences.

#### V. Conclusion

All the above studies have shown a very high prevalence of hypothyroidism in Indian population. Universal screening for hypothyroidism may benefit both mother and the fetus. The present study supports universal thyroid screening to improve maternal and fetal outcomes.

#### References

- [1]. Dhanwal DK, Prasad S, Agarwal AK, Dixit V, Banerjee AK (2013) High prevalence of subclinical hypothyroidism during first trimester of pregnancy in North India. *Indian J Endocrinol Metab* 17: 281-284.
- [2]. Brain M (2006) Thyroid disease in pregnancy. *Obstetrics and gynecology* 108: 1283-1292.
- [3]. Kuijpers JL, Vader HL, Drexhage HA, Wiersinga WM, van Son MJ, et al.(2001) Thyroid peroxidase antibodies during gestation are a marker for subsequent depression postpartum. *Eur J Endocrinol* 145: 579-584.
- [4]. Davis LE, Leveno KJ, Cunningham FG (1988) Hypothyroidism complicating pregnancy. *Obstetrics and Gynecology* 72:108-112.

- [5]. Leung AS, Millar LK, Koonings PP, Montoro M, Mestman JH(1993) Perinatal outcome in hypothyroid pregnancies. *Obstetrics and Gynecology* 81: 349-353.
- [6]. Casey BM, Dashe JS, Wells CE, McIntire DD, Byrd W, et al. (2005) subclinical hypothyroid and pregnancy outcomes. *Obstetrics and Gynecology* 105:239-245.
- [7]. Jagtap VNVS, Sarathi V, Lila AR, Kamalanathan S, Bandgar TR, et al. (2011) Prevalence and impact of thyroid disorders on maternal outcome in Asian -Indian pregnant women. *J Thyroid Res* 2011:429097.
- [8]. Chang DLF, Pearce EN (2013) Screening for maternal thyroid Dysfunction in Pregnancy: A Review of the Clinical Evidence and current Guidelines. *Journal of Thyroid Research* 2013.
- [9]. Subclinical Hypothyroidism in Pregnancy (2007) ACOG Committee opinion 381.
- [10]. Sahay RK, Nagesh VS (2012) Hypothyroidism in pregnancy. *Indian Journal of Endocrinology and Metabolism* 16: 364-370.
- [11]. Vaidya B, Anthony S, Bilous M, Shields B, Dury J, et al. (2007) Detection of thyroid dysfunction in early pregnancy: Universal screening or targeted high risk case finding? *J Clin Endocrinol Metab* 92: 203-207.
- [12]. Rao VR, Lakshmi A, Sadhnani MD( 2008) Prevalence of hypothyroidism in recurrent pregnancy loss in first trimester. *Indian J Med Sci* 62: 357-361.
- [13]. Allan WC, Haddow JE, Palomaki GE, Williams JR, Mitchell ML, et al. (2000) Maternal thyroid deficiency and pregnancy complications: implications for population screening. *Journal of Medical Screening* 7:127-130.
- [14]. Abalovich M, Gutierrez S, Maccallini G, Garcia A, et al. (2002) Overt and subclinical hypothyroidism complicating pregnancy. *Thyroid* 12:63-68.
- [15]. Nirmala CV. Maternal outcome of hypothyroidism in pregnancy- a south Indian prespective *Am J Clin Med Res* 2014; 2 (2): 47-50.
- [16]. Casey BM, Dashe JS, Wells CE, McIntire DD, Byrd W, Leveno, K J, et al. Subclinical hypothyroidism and pregnancy outcomes, *Obstet Gynecol.* 2005; 105 (2): 239-45.

Pratima Devi. "Fetomaternal Outcome of Pregnancy with Hypothyroidism." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, vol. 18, no. 6, 2019, pp 29-33.