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Original Research Paper

Gynaecology

# THYROID MARKERS IN CORD BLOOD OF HYPOTHYROID WOMEN

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**ABSTRACT**

**Background:** To find out the thyroid markers in cord blood of newborn born to hypothyroid mothers, Post deliverycomplications in hypothyroid mothers, and Fetal outcome of newborn born to hypothyroid mothers.

**Materials and methods:** The study was conducted in the department of Obstetrics & Gynaecology, Maharani Laxmi Bai Medical College, Jhansi in association of department of paediatrics, MLB Medical College, Jhansi. The study was conducted on thyroid markers in cord blood of babies delivered with hypothyroid mothers. The study was cross sectional , epidemiological study conducted from March 2018 to May 2019 on 78 subjects.

**Conclusion:** Hypothyroid patients present with various complications during pregnancy and these haracterized are complex and serious, with a significant increase in maternal morbidity, perinatal mortality.

**KEYWORDS :** Cord blood, Hypothyroidism, TSH

## INTRODUCTION

During pregnancy there are many physiological changes of maternal thyroid function. Hypothyroidism has been reported in around 13.5% of otherwise normal pregnancies. Hypothyroidism, if undiagnosed and untreated, could cause not only obstetric complications, such as hypertension, placental abruption, preterm delivery, low birth weight, but also exposes fetus to low thyroid hormone levels. The lack of maternal thyroid hormone during early pregnancy might have some irreversible effects on fetal development. It is now clear that there is a close relationship between maternal thyroid deficiencies and the neuropsychological development of her child.

Several studies demonstrated that maternal hypothyroidism was associated with impaired psychomotor and intellectual development of the child. In order to reproduce the physiologic changes of thyroid function during gestation, women with known hypothyroidism and receiving L-thyroxine before pregnancy should increase their dosage by 30% to 60% during pregnancy. The most common cause of hypothyroidism during gestation is autoimmune thyroiditis, which is Characterized by the presence of specific thyroid autoantibodies. The presence of thyroid peroxidase antibodies (TPOAb) is frequent associated to thyroiditis in women of childbearing age; TPOAb have been found in 10% of women during or shortly after pregnancy.

Maternal hypothyroidism is associated with increased risks of Abortions, stillbirths, preterm delivery, and Pregnancy induced hypertension Congenital hypothyroidism (CH) is one of the major health problems and the main preventable cause of mental retardation in children. It has an incidence of 1 in 1700 births in various neonatal screening programs in India. If CH is diagnosed promptly and treated early, irreversible mental retardation can be prevented . Because signs and symptoms of CH are often scarce at birth, newborns are screened at birth for early diagnosis of CH.

Neonatal screening programs for detection of CH in neonatal period are widespread in the developed countries for the last three decades and are fast gaining momentum in the developing world as well . In most screening programs blood samples are collected within 5-6 days of age, but with large number of babies being discharged early, cord blood samples are being used as well. In our country, it is very difficult to follow up all babies once discharged. Also, an effective social system whereby babies could be reached at home is practically non-existent. Thus cord blood remains a very practical alternative for screening purposes, and thus is the practice in some Asian countries.

## AIMS AND OBJECTIVES

- To investigate obstetric outcome of pregnant women with Hypothyroidism.
- To find out the thyroid markers in cord blood of newborn born to hypothyroid mothers.
- To find the post delivery complications in hypothyroid mothers.
- To find the fetal outcome of newborn born to hypothyroid mothers.

## MATERIALS AND METHODS:

The study was conducted in the department of Obstetrics & Gynaecology, Maharani Laxmi Bai Medical College, Jhansi in association of department of paediatrics, MLB Medical College, Jhansi. The study was conducted on thyroid markers in cord blood of babies delivered with hypothyroid mothers. The study was cross sectional , epidemiological study conducted from March 2018 to May 2019 on 78 subjects.

### Inclusion criteria

- Hypothyroid mothers(if they purchased thyroid medication within 3 months prior to pregnancy or during pregnancy).
- Neonates born to hypothyroid mothers.

### Exclusion criteria

- Pregnant women with associated comorbid conditions like diabetes mellitus, hypertension, gestational hypertension.
- After taking informed consent, these patient were randomly selected for the study.
- Detailed history and general examination was done. History included regarding sign and symptoms of thyroid

disorder, menstrual history, obstetric, past history, family history, personal history.
- Per abdomen and per vaginum examination done.
- Cord blood of is sent for TSH screening.
- If TSH comes deranged then $FT_3$ and $FT_4$ levels are checked.
- Depending upon the $FT_3$ and $FT_4$ they are grouped as subclinical/overt hypothyroidism or hyperthyroidism.
- If they are subclinical/overt hypothyroidism- thyroxine is started.
- At the end of pregnancy outcome noted.

The following outcome were noted
- Maternal
- Fetal

**2) Maternal**
- Postpartum hemorrhage
- Abruption placentae
- Preterm delivery
- Abortion
- Risk of caesarean section delivery
- Puerperal sepsis
- Increased duration of hospital stay

**2) Fetal**
- Low birth weight
- IUGR
- Still born
- Cry after birth(immediate or delayed >_1 minute)
- NICU admission
- Serum TSH level

## RESULTS:

**Table 1: Gestational age at the time of delivery (According to LMP)**

| Gestational age (wks) | Number of cases | Percentage |
|---|---|---|
| 28-30 | 6 | 11.11% |
| 31-32 | 24 | 44.44% |
| 33-34 | 12 | 22.22% |
| 35-36 | 2 | 0.37% |
| 37-38 | 0 | 0% |
| 39-40 | 0 | 0% |
| >40 | 0 | 0% |

**Table 2: Birth weight at the time of delivery**

| Birth weight (gm) | Number of newborn | Percentage |
|---|---|---|
| <1000 | 2 | 3.57% |
| 1001-1500 | 2 | 3.57% |
| 1501-2000 | 10 | 17.85% |
| 2001-2500 | 24 | 42.85% |
| 2501-3000 | 5 | 8.92% |
| >3000 | 5 | 8.92% |

**Table 3: Miscarriages (gestational age according to LMP)**

| Gestational age (wks) | Number of Miscarriage | Percentage |
|---|---|---|
| <6 | 2 | 8.3% |
| 6-12 | 22 | 91.6% |
| 13-22 | 0 | 0% |

**Table 4: Obstetric outcome**

| Obstetric outcome | Number of deliveries | Percentage |
|---|---|---|
| Caesarean delivery | 48 | 61.5% |
| Normal delivery | 30 | 38.46% |

## DISCUSSION

The present study was done in MLB Medical College, Jhansi, UP. A total of 78 patients were screened for thyroid disorders in this study. It was cross-sectional epidemiological study. The main aim of the study was to know the pregnancy outcome of hypothyroid mothers.

The prevalence of thyroid disorders in our study was 12.5% with a CI of 10.5-14.9%.Our findings are consistent with the reports from the study of Sahu MT et al, who studied 633 women in second trimester. In their study the prevalence of thyroid disorders was also 12.7%, which is comparable to our study.

In our study, overt hypothyroidism was associated with complications low birth weight <2500g was 79.16% preterm in or study all neonates were preterm being less than 36 weeks of gestational age, abortions 30.76%, maternal complications like post partum hemorrhage 5.55%, casarean section 61.54%. In a study done by Leung et al 70, the incidence of complications were PE (22%), LBW (22%), SB (4%) in cases of overt hypothyroidism. In a study done by Abolovich et al the complications like LBW (6%), SB (3%) were seen in cases of overt hypothyroidism. The incidence of complications varied in different studies but some studies are comparable.

In a study done by Davis et al in 1988 anemia was associated with hypothyroidism in 31% cases. Similar results were found by Roti et al with prevalence of 34%.

Due to limited no. of cases, hyperthyroidism patient were not divided into subclinical or overt. Prevalence of maternal complication among hypothyroidism were PE (16.6%), PTD (16.6%), IUGR (16.6%), LBW (16.6%), SB (5.6%). In study done by Miller, Kriplani et al and Robert Negro, results were higher than our study.

In a study by Petha A, prevalence of hyperthyroidism was 3.2% in infertile female patient, while in our study it is 4%. Study done by Sharma et al shows prevalence of hypothyroidism to be 20% and 8% by Goswami et al.

Prett et al (1993) found a 31% risk of abortion among hypothyroid patients. Similar result were also seen in studies by Sharma Partha et al and Lueng. Abalovich et al showed that untreated hypothyroid (subclinical +overt) at the time of conception is associated with miscarriage rate of 31.4%,

Our study shows high prevalence of thyroid dysfunction, especially subclinical and overt hypothyroidism among Indian pregnant women with associated adverse pregnancy outcome.

Based on the results of the present study we therefore suggest for a decrease threshold for screening and detection of thyroid dysfunction among Indian pregnant women attending to routine antenatal clinic and to be potentially aware of associated maternal and fetal complications.

In our study the abortion were 24 out of 78 cases taken in study over a period of 13 months.

Hence the risk of abortion was 30.76%, compared to the study conducted by Kluwer medknow the risk came out to be 62% in the mothers of hypothyroidism.

There was no stillborn in our study and the prevalence was 12.5% as per the study conducted by Houston et al done in 2012. Ruchi Kishore et al studied about fetal outcome in hypothyroid women and concluded that 6.2% were IUD and 13% IUGR in hypothyroid patients.

In our study the intrauterine growth retardation as measured by the Ponderal Index was found to be 12.82% (12 out of 48 neonates).

As per the study conducted by S.D. Mahajan, R. Aalinkeel, P.shah out of 200 neonates born to the mother with subclinical hypothyroidism 27.2% were found to have ponderal index less than 2.

In our study the 48 were casarean delivery and the number of caserean was higher than the vaginal mode of delivery. Out of which major indication was fetal distress 3cases 6.25% and other indications being poor bishop score 10 cases 20.83%, non progress of labour 22 cases 45.83% and cephalopelvic disproportion in 13 cases 27.08% As compared to the study conducted by Sapna et al 2017 the LSCS were 65 out of 150 patients taken.

## CONCLUSIONS

Hypothyroid patients present with various complications during pregnancy and these complicatiins are complex and serious, with a significant increase in maternal morbidity, perinatal mortality. So to identify these potential or overt hypothyroid patient thyroid screening is a must during pregnancy. T3, T4, TSH levels should be done during prenatal period, at first booking, thereafter at 8 weeks interval during pregnancy. TSH should be kept less than 2Miu/l for adequate control.

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