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**Original Research Paper**

# Study of hypothyroidism among pregnant women in the first trimester of pregnancy in a tertiary care hospital

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## INTRODUCTION:

Maternal and fetal thyroid function are intimately related, and drug that affect the maternal thyroid also affect the fetal gland. Thyroid autoantibodies have been associated with increased rates of early pregnancy wastage and uncontrolled thyrotoxicosis. Thyroid autoantibodies and untreated hypothyroidism both are associated with adverse pregnancy outcome. Finally, evidence suggest that the severity of some autoimmune thyroid disorder may ameliorate during pregnancy, only to be exacerbated during postpartum period [1] . Serum TSH levels decline in early pregnancy because of the massive quantity of HCG secreted by placental trophoblast. Because TSH does not cross the placenta, it has no direct fetal effects, during the first 12 weeks of gestation, when HCG serum level are maximal, thyroid hormone secretion is stimulated. The resulting increased serum free thyroxin level acts to suppress hypothalamic thyrotropin releasing hormone (TRH) and in turn limit pituitary TSH secretion. Throughout pregnancy, maternal thyroxin is transferred to the fetus. Maternal thyroxin is important for normal fetal brain development, especially before the onset of fetal thyroid gland function. Maternal source account for 30% of thyroxin in fetal serum at term. Thyroid disorders in pregnancy are associated with poor pregnancy outcome. Both hypothyroidism and hyperthyroidism can lead to adverse obstetric outcome. The prevalence of hypothyroidism reported in India is 12 %, whereas hyperthyroidism is seen in 1.25% in pregnant women [2] . The most common cause of hypothyroidism in pregnancy is Hashimoto thyroiditis. Clinical identification of hypothyroidism is especially difficult during pregnancy because many of the signs or symptoms are also common to pregnancy itself. Thyroid analyte testing should be performed on symptomatic women or those with a history of thyroid disease. Pregnancy is associated with an increased thyroxine demand; this is believed to be related to increased estrogen production. Pregnancy Outcome with Overt Hypothyroidism are–preeclampsia, placental abruption, preterm birth, still birth, cardiac dysfunction and birth weight. The clinical practice guidelines from the endocrine society, the American Thyroid Association, American Association Introduction Page | 4 of Clinical Endocrinologists and American College of Obstetricians and Gynecologists (2017) now uniformly recommend screening only those at increased risk during pregnancy [3] . ATA revised their recommendations in 2017. They recommended that the first trimester upper normal limit cut off should be obtained by deducting ‘0.5 mIU/L’ from pre pregnancy TSH value. But if it is not known then ‘4.0 mIU/L’ should be taken as upper limit of normal cutoff [5] ,This cut off should be maintained at 0.1 - 2.5 miu/ml in the first trimester and at 0.2 -3.0 miu/ml in the second trimester and 0.3 - 3miu/ml in the third trimester as well as endocrinology society guidelines, (2012) [4]. Thyroid disorders in pregnancy

are important causes of adverse pregnancy outcome. So, it is very pertinent that thyroid function is maintained in normal range during pregnancy. Serum thyroid –stimulating hormone (TSH) value is the best indicator for assessing and monitoring thyroid function.

## MATERIAL AND METHODS:

It was a prospective observational study conducted in the Department of Obstetrics and Gynaecology, Rohilkhand Medical College and Hospital, Bareilly U.P. for one year from 1 st November 2018 to 31 st October 2019, after obtaining the approval of ethical committee and also a written informed consent was obtained from all the patient enrolled in the study.

**Inclusion criteria:**

1) All pregnant women in the first trimester
2) All pregnant women without any medical disorder complicating pregnancy.

**Exclusion Criteria**:

All pregnant women with pre-existing medical disorders such as

1. Diabetes with pregnancy
2. Hypertension with pregnancy
3. Renal diseases with pregnancy
4. Liver disease with pregnancy

The reference range used in the study is according to 2017 ATA (American Thyroid Association) guidelines. (TSH estimation was done by Sandwich ELISA method and reading was taken by Erba Manngeim Lisa Scan 2 microplate reader. These test was done in fasting blood sample.)

**Sample Collection method:** (Three ml of patients blood sample was collected. These sample was allowed to clot for 20-30 minutes. The sample was then centrifuged at 2000-3000 rpm for 7-8 minutes. The serum then separated from the blood was used for analysis of T3, T4 and TSH.)

## RESULTS:

**Table:-1 Distribution of Cases According to Gravidity**

| GRAVIDA | No. OF CASES | HYPOTHYROIDISM |
|---|---|---|
| G1 | 17 | 29.3 % |
| G2 | 16 | 27.6 % |
| G3 or more | 25 | 43.11 % |
| Total | 58 | 100 % |

Out of 58 cases studied maximum 41 (70.7%) were multigravida, out of which 16(27.6%) were second gravida and 25 (43.1%) gravida three or more and 17(29.3%) were primigravida.

**Table:-2 Age Group Associated with Hypothyroidism (SCH+OH)**

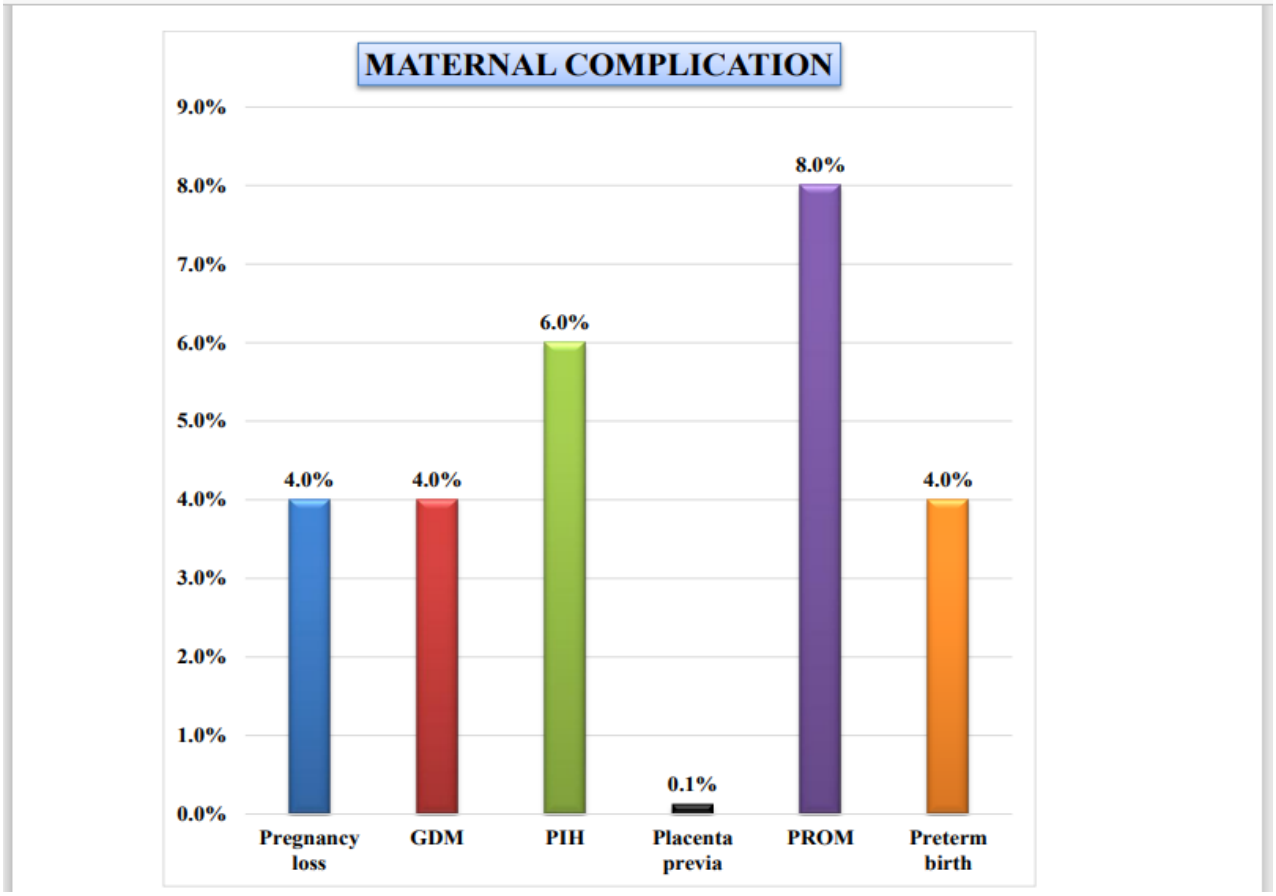
| Age group | Number | Percentage |
|---|---|---|
| 20-25 | 11 | 19 % |
| 26-30 | 30 | 51.7 % |
| 31-35 | 17 | 29.3 % |
| Total | 58 | 100 % |

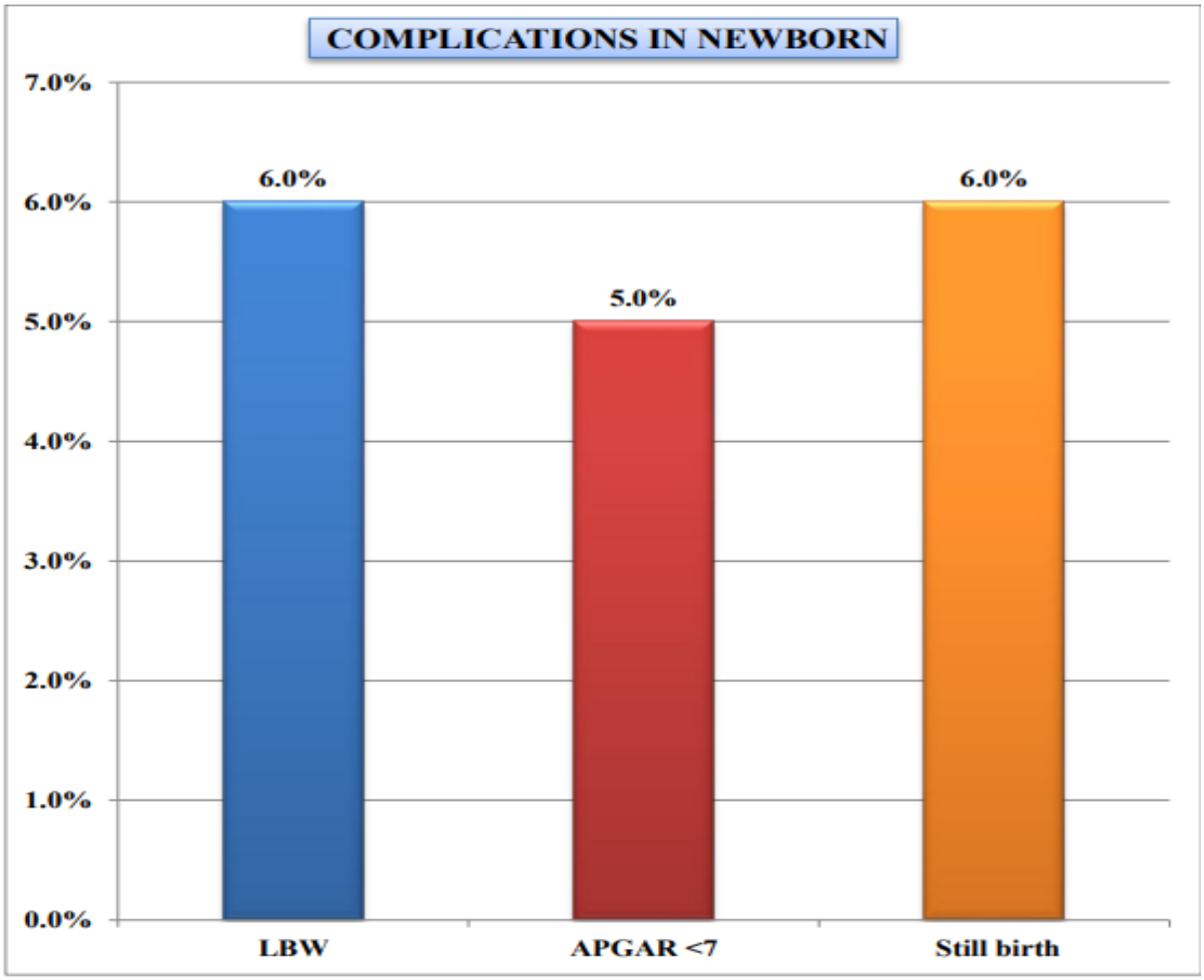
Table 2 shows maximum 30 (51.7%) cases were in age group of 26-30 years followed by 17 (29.3%) cases who were in age group of 31-35 years, 11 (19%) cases were in age group of 20-25 years. Mean age of the cases was 28.52 ± 4.01year.

**Table:-3 Showing Gestational Age in Weeks**

| Gestational age (in weeks) | Number | Percentage |
|---|---|---|
| <6 | 4 | 6.9 % |
| 6-8 | 14 | 24.1 % |
| 8-10 | 21 | 36.2 % |
| 10-13 | 19 | 32.8 % |
| Total | 58 | 100 % |

Table 3 showing - out of 58 cases maximum i.e 21(36.2%) cases had gestational age of 8-10 weeks , 19 (32.8%) cases were 10-13 weeks ,14 (24.1 %) cases were 6-8 weeks and 4(6.9%) cases were less than 6 weeks of gestational age.






**DISCUSSION:**

1) In the present study Maximum 30(51.7%) cases were in age group of 26-30 years followed by 17(29.3%) cases who were in age group of 31-35 years, 11(19%) cases were in age group of 20-25 years. Mean age of the cases in our study was 28.52 ±4.01years.The findings of the present study in term of age was similar to study done by Beenish et al (2017) [5] in which the mean age was 28.52±42years,Kh Paikhomba et al (2015)[6] in which the mean age was 26.8±8 years, M Dieguez et al (2016)[7] in which the mean was 32 years, Verma et al (2019) [8] in which the mean was 26±5.1years,Saeed et al (2015) [9] in which mean age was 26.43 ± 5.1 .

2) In the present study, out of 58 case, maximum 41(70.7%) cases were multigravida and 17(29.3%) were primigravida. The present study was similar in term of gravidity with the study done by Gedan et al (2018) [10] in which maximum cases 68.3% were multigravida, Dhanjani et al (2018) [11] in which maximum cases 63.16% were multigravida, Hassan et al (2016) [12] in which maximum cases 66.2% were multigravida.

3) In the present study; out of 58 cases in our study, maximum 21(36.2%) cases had gestational age of 8-10 weeks and 19(32.8%) cases were 10-13 weeks ,14 (24.1 %) cases were 6-8 weeks,4(6.9%) cases were less than 6 weeks of gestational age. The present study corresponded with the as study done by Sarla devi et al (2016**)** [13] in which POG was <12 weeks , Goel et al (2016**)** [14] in which POG was 12, Pillai et al (2018) [15] in which POG was 6-10 weeks , Dieguez et al (2016) [7] in which POG of 4-13 weeks , Gedan et al (2017) [10] in which POG was 6-12weeks.

4) In the present study ,the incidence of maternal complications was GDM (4%),pregnancy loss(4.0%),placenta previa(0.1%),PROM(8.0%),preterm birth (8.0%),PIH(6.0%) .In the study done by Dhanjani et al (2018) [11] incidence of complications in pregnant women with hypothyroidism was GDM (5.6%) ,PROM (7.01%),preterm birth (13.15%),PIH(17.5%). In the study done Ezzeddin et al (2017) [16] incidence of complications in pregnant women with hypothyroidism was GDM (5.1%), pregnancy loss (4.5%), preterm birth (12.7%), PIH (6.4%). In the study done by Saeed et al (2015) [9] incidence of complications in pregnant women with hypothyroidism was, preterm birth (6.4%). In the study done by Sarla devi et al (2016) [13] the incidence of complications in pregnant women with hypothyroidism was pregnancy loss (4.68%), preterm birth (7.81%). In the study done by Qin Wu et al (2019) [17] incidence of complications in pregnant

women with hypothyroidism was placenta previa (11.77%), PROM (18.14%), preterm birth (0%), PIH (7.41%).

5) In the present study, the incidence of fetal complications was stillbirth (6%), low birth weight (LBW), APGAR <7 (5% ) In the study done by Ezzeddin et al (2017) [16] the incidence of fetal complications in pregnant women with hypothyroidism was low birth weight (12.3%), APGAR <7 (3.7 %) . In the study done by Saeed et al (2015) [9] incidence of fetal complications in pregnant women with hypothyroidism was stillbirth (2.1%). In the study done by Sarla devi et al (2016) [13] the incidence of fetal complications in pregnant women with hypothyroidism was stillbirth (1.56%), low birth weight (4.68). In the study done by Burcu et al (2016) [18] the incidence of fetal complications in pregnant women with hypothyroidism was stillbirth (1.56%), low birth weight (4.68)

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**CONCLUSION:**

Hypothyroidism is common among women of childbearing age. The impact of this condition on adverse outcome in pregnancy is unclear and universal screening before or during pregnancy is also much debated. Pregnant women should be aware to maintain a normal thyroid hormone level in pregnancy to prevent the children from having poor intellectual function. The National Neonatal Screening Program has started in most of the developing countries and routinely all the new borns are screened for hypothyroidism. It is still a dilemma that whether all the pregnant women should be screened for hypothyroidism.

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