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# THYROID FUNCTION IN EARLY PREGNANCY LOSS

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## ABSTRACT

Untreated hypothyroidism in pregnancy has consistently been shown to be associated with an increased risk for adverse pregnancy complications .This study was carried with an aim to focus the relation of subclinical hypothyroidism and TPO antibodies with early pregnancy loss. This hospital based observational study was conducted in Department of obstetrics and Gynecology, Zenana Hospital, SMS Medical College, Jaipur from April 2014 to April 2015. 144 pregnant women with diagnosed early pregnancy loss (<12 weeks) ,with no history of thyroid disease were enrolled. We find that maximum proportion (64%) of cases had miscarriages at 6 – 8 weeks, majority of them were euthyroid (68.2%).Only 4.16% cases had abortions at <6 weeks, majority were in subclinical hypothyroidism group. In subclinical hypothyroidism, most of the women (50%) were overweight and 37.5% cases had normal weight. In TAI group, 65.2% had normal weight, 30.4% were overweight and only 4.3% were obese. Maximum (71%) proportion of cases were in 1.5 – 2µIU/ml range of S.TSH. 50% of ET and 62% of TAI groups had S.TSH in the range of 1.5 – 2µIU/ml.SH cases had S.TSH level >2.5µiu/ml. The difference in mean serum TSH was statistically significant (P<0.001HS). Significant difference in serum TSH level between SH and TAI and between SH and ET group in both early and very early pregnancy loss group. Given these results, it could be useful to perform a preconceptional or an early screening for thyroid disorders, to evaluate the need for hormonal supplementation.

**KEYWORDS:** Euthyroid, Subclinical Hypothyroidism, Abortion, Thyroid Hormone.

## INTRODUCTION

Thyroid disease often manifests itself during the reproductive period of a women's life and is the second most common endocrinopathy that affects women of child bearing age. [1]

Normal pregnancy is associated with significant changes in maternal thyroid physiology. Serum TSH concentration is the most reliable test for assessing thyroid function in pregnancy. A decline in TSH levels in the 1st trimester is seen due to elevation of hCG, which functions as a weak stimulator of the TSH receptor. [2]

Thyroid function tests during pregnancy are also affected by estrogen mediated increase in the level of Thyroid binding globules (TBG) , estrogen increases hepatocyte synthesis of TBG and also prolongs the half-life of TBG from 15 min to 3 days , a few weeks after conception and reaches a plateau during mid-gestation .[2,3,4,5]

Hyperthyroidism occurs in approximately 0.1 – 0.4 % of pregnancies. The most common cause of overt hyperthyroidism in pregnancy is grave's disease. [2]

Clinical or overt hypothyroidism (OH), defined as an elevated TSH with a decreased level of $fT_4$. [2, 6] Affects around 0.5% of all pregnant women. Untreated OH in pregnancy has consistently been shown to be associated with an increased risk for adverse pregnancy complications, as well as detrimental effects on fetal neurocognitive development. [3]

Subclinical hypothyroidism (SH) is defined as an elevated TSH level with a normal level of circulating free $T_4$.[2, 6] Prevalance of SH during pregnancy is estimated to be 0.25 – 2.5%. [2] SH in pregnancy has been associated with adverse maternal and fetal outcomes in observational studies including eclampsia, preeclampsia , placental abnormalities, miscarriages , preterm labour , low birth weight and postpartum thyroiditis.[2,3,7,8,9]

Thyroid autoimmunity in pregnancy has been associated with adverse pregnancy outcomes miscarriages, recurrent abortion, preterm births and low IQ. The majority of women who test positive for thyroid autoantibodies are euthyroid.[2,3,10,11]

Antithyroid antibiodies, Anti TPO antibodies are detected in as many as 5 – 10% of pregnancies.[2,3]

Cut – off values of serum TSH in different trimester are: [2, 12, 5]

1st trimester – <2.5mlU/L

2nd trimester – <3miU/L

3rd trimester – < 3ml/L

Subclinical hypothyroid often remain undiagnosed and the potential obstetric repercussions are associated with untreated hypothyroidism. Thus there is justification for proposing systematic screening for hypothyroidism during pregnancy.[3]

## AIM AND OBJECTIVES

This study was carried with an aim to focus the relation of subclinical hypothyroidism and TPO antibodies with early pregnancy loss, with an objective to evaluate the relation of timing of pregnancy loss with subclinical hypothyroidism and TPO antibodies (Thyroid Autoimmunity).

## MATERIAL AND METHODS

This hospital based observational study was conducted in Department of obstetrics and Gynecology, Zenana Hospital, SMS Medical College, Jaipur from April 2014 to April 2015.
144 pregnant women with diagnosed early pregnancy loss (<12 weeks) with no history of thyroid disease were enrolled. Pregnant women with overt thyroid disease, diabetes, PIH, renal disease, hypertension, extra thyroid autoimmune disorders, assisted reproductive technologies , anatomical abnormalities were excluded.

Pregnant women with diagnosed early pregnancy loss (by USG) were enrolled and categorized into two groups on the basis of Crown Rump Loss (CRL)

- Very early pregnancy loss (VEPL) or embryo loss with CRL ≤ 10mm
- Early pregnancy loss (EPL) or foetal loss with CRL >10mm

Blood samples were taken for assays of $T_4$, TSH and TPO antibodies and patient were subdivided into four groups

- Euthyroid (ET)
- Subclinical Hypothyroidism (SH)
- Overt Hypothyroidism (OH)
- Thyroid Autoimmunity group (TAI)

All these parameters were measured by **Immulite 2000 system Analyser** available in Central Lab of SMS Medical College, Jaipur.

In our study we took following normal values

- TSH – 0.4 – 2.5 µIU/ml
- $fT_4$ – 0.8 – 1.9µIU/ml
- TPO antibodies – Upto 35 IU/ml

All these groups were statistically evaluated and correlated with occurrence and timing of pregnancy loss.

**STATISTICAL ANALYSES**

Statistical analyses were done using computer software (SPSS version 20 and primer). The qualitative data were expressed in proportions and percentages and the quantitative data expressed as mean and standard deviations. The Difference in Proportions were analyzed by using chi square test and the difference in means were analyzed by using student T test and Annova test. Significance level for tests were determined as 95% ($P<0.05$).

**RESULTS AND DISCUSSION**

Table – 1 Shows that majority of the women (more than 50%) belonged to 21 – 25 years age group, out of them majority were Euthyroid (ET) (61%) and 47.8% in thyroid autoimmunity (TAI) group, while in subclinical hypothyroidism (SH) group maximum cases (75%) were found in 26 – 30 years of age group. The mean maternal age of study population was 25.6 ±1.11 years. The mean maternal age of ET group, SH group and TAI group was 25.07 ±3.5, 26.75 ±1.165, 26.26±3.945 years respectively. The difference was not found statistically significant.

Similar study done by Dhanwal et al (2013) studied mean age of subjects was 25.6 ± 1.16 years.[13]

Most of the patient were from urban background (70%), in ET group (66.4%) in SH group (75%) and in TAI group (87%). This reflects the population of the area the hospital covers.

Majority of patients 78.47% were Hindu and rest 21.53% were Muslims . This reflects area the hospital population covers and similar sort of distribution is seen in the general population.

The majority of population 67% were multigravida. In ET group (69%), in SH group (63%), in TAI group (61%) were multigravida. The difference was statistically not significant (P = 0.269 NS).

Similar results were obtained in studies done by Antonio De Vivo et al (2010) that 63.5% women were multiparous, out of total 208 cases studied. [3]

Casey BM et al (2005) found in their study that there was no difference in relation to parity between women with SH and control women. [14]

**Table – 1: Distribution of cases according to Demographic Profile**

| S.no | Characteristics | | Euthyroid Group (ET) | Subclinical hypothyroid Group (SH) | Thyroid Autoimmunity Group (TAI) | Annova test P – value |
|---|---|---|---|---|---|---|
| 1. | Age Group (in years) | | | | | |
| | | 17 – 20 | 2 (1.8%) | 0 | 1(4.40%) | |
| | | 21 – 25 | 69(61.0%) | 2(25%) | 11(47.80%) | |
| | | 26 – 30 | 35(31.0%) | 6(75%) | 8(34.80%) | |
| | | 31 – 35 | 5(4.40%) | 0 | 3(13.0%) | |
| | | >35 | 2(1.80%) | 0 | 0 | |
| | Mean ± SD | 25.6±1.11 Years | 25.07± 3.5 | 26.75± 1.16 | 26.26± 3.945 | 0.17 NS |
| 2. | Residence | Rural | 38(33.6%) | 2(25%) | 3(13%) | |
| | | Urban | 75(66.4%) | 6(75%) | 20(87%) | |
| | | | | | | |
| 3. | Religion | Hindu | 86(76.11%) | 6(75%) | 21(91.3%) | |
| | | Muslim | 27(23.89%) | 2(25%) | 2(25%) | |
| 4 | Gravida | Primigravida | 35(31%) | 3(37%) | 9(39%) | |
| | | Multigravida | 78(69%) | 5(63%) | 14(61%) | |
| | Gravida | $\chi^2$ = 2.626 | d.f. = 2 | P = 0.269 | N | |

Table – 2 shows that there was no significant difference in the distribution of cases according to mean serum TSH between primigravida and multigravida. Mean serum TSH is 1.99±0.82µIU/ml in primigravida and 1.926±0.66µIU/ml in multigravida. The difference was statistically not significant(P 0.557).

Corresponding to the results obtained by Vaidya B et al (2007) found in their study that there was no significant difference in relation to parity with serum TSH levels in different groups.[15]

The mean serum TSH in early pregnancy loss group was 1.78±0.41µIU/ml and in very early pregnancy loss group was 2.73±1.20µIU/ml. The difference was statistically significant (P<0.001 HS).

Similar to the study done by Antonio De Vivo et al (2010) reported a significant difference in serum TSH levels between the VEPL (1.4 ± 1mU/L) and the EPL group (1.1 ± 0.7mIU/ml).[3]

**Table – 2: Comparison of cases according to mean serum TSH**

| S.no | | | Number | Mean Serum TSH ± SD(µIU/ml) | T – test P value |
|---|---|---|---|---|---|
| 1. | Gravida | Primigravida | 47 | 1.99 ± 0.82 | |
| | | Multigravida | 97 | 1.92 ± 0.66 | |
| | | | | | 0.557 NS |
| 2. | Pregnancy Loss | Early pregnancy loss(EPL) | 120 | 1.78 ± 0.41 | |
| | | Very Early Pregnancy loss (VEPL) | 24 | 2.73 ± 1.20 | |
| | | | | | < 0.001 HS |

In table – 3 we find that maximum proportion (64%) of cases had miscarriages at 6 – 8 weeks, majority of them were euthyroid (68.2%) . 21% cases had miscarriages at 8 – 10 weeks of which majority were of TAI group (52%). Only 4.16% cases had abortions at <6 weeks, majority were in subclinical hypothyroidism group. This difference in gestational age at abortion in different groups was statistically significant (P – value < 0.001).

The mean gestational age at miscarriages was 7.96 ± 1.403 weeks for the entire study group. Mean gestational age at miscarriages in ET group was 7.97 ± 1.402 weeks, in TAI group was 8.47 ± 1.129 weeks. Earliest miscarriage occurred in SH group at mean age of 6.3 ± 0.862 weeks. This difference was found to be statistically significant (P < 0.001) HS.

Both thyroid diseases SH and autoimmune disorders are independently associated with early pregnancy loss, but women suffering from SH have a lower gestational age at abortion. Given these results, it could be useful to perform a preconceptional or an early screening for thyroid disorders, to evaluate the need for hormonal supplementation.

Similar to the study by Antonio De Vivo (2010) found mean gestational age at miscarriage was 8.2 ± 1.6 weeks in ET group , 8.2 ± 2.1weeks in the TAI group and 6.5 ± 0.9 weeks in the SH group. A significant difference was found between the ET and SH group (P = 0.016)

and between TAI and SH group (P = 0.037) and no difference was found between ET and TAI group (P = 0.99). [3]

**Table – 3: Distribution of cases according to gestational age at abortion**

| S.no | Gestational Age at abortion (in weeks ) | Euthyroid Group | Subclinical Hypothyroid Group | Thyroid Autoimmunity Group | ANOVA Test |
|---|---|---|---|---|---|
| 1. | <6 | 4(3.50%) | 2 (25% ) | 0 | |
| 2. | 6 – 8 | 77(68.20%) | 6(75%) | 9(40%) | |
| 3. | 8 – 10 | 18(15.90%) | 0 | 12(52%) | |
| 4. | 10 – 12 | 14(12.40%) | 0 | 2(8%) | |
| | Mean gestational age ± SD | 7.97± 1.402 | 6.3± 0.862 | 8.47± 1.129 | |
| | | | | | P < 0.001 HS |

$\chi^2 = 27.070$ d.f. = 6 P<0.001 HS

As shown in Table – 4 that in ET group maximum (80.5%) women had normal BMI (<25 kg/m$^2$), 18.6% women were overweight and only 1 case was obese. In subclinical hypothyroidism, most of the women (50%) were overweight and 37.5% cases had normal weight. In TAI group, 65.2% had normal weight, 30.4% were overweight and only 4.3% were obese.

The women with SH were overweight and women with ET and TAI group had normal weight. Mean BMI in SH was 26 kg/m$^2$ while ET and TAI group had 22.1kg/m$^2$ and 23.2kg/m$^2$ respectively . The difference in mean BMI in different groups was significant (P – value < 0.005).

In EPL group 81.67% cases had BMI <25 kg/m$^2$, whereas in VEPL group maximum cases had BMI between <25 to 30 kg/m$^2$ (92%).

Casey BM et al (2005) found in their study that there was no difference in BMI between subclinical hypothyroid group and women with normal TSH. [14]

Tuija Mannisto et al (2009) reported in their study that thyroid antibody positive mothers had higher BMI (22.7 kg/m$^2$) , than thyroid antibody negative mothers (22.2kg/m$^2$ ).They also found that women of subclinical hypothyroidism have significantly higher BMI 22.6 kg/m$^2$ than mothers of the reference group(22.1kg/m$^2$). [16]

Thus showing that importance should be given on weight reduction specially in case of hypothyroidism associated with infertility and recurrent miscarriages.

**Table – 4: Distribution of cases according to Body Mass Index (BMI)**

| S.no | BMI ($kg/m^2$) | Euthyroid Group | Subclinical Hypothyroid Group | Thyroid Autoimmunity Group | Very early pregnancy loss (VEPL) | Early pregnancy loss (EPL) | T – test P – value LS |
|---|---|---|---|---|---|---|---|
| 1. | Normal (<25) | 91(80.50%) | 3(37.50%) | 15(65.20%) | 11(46%) | 98(81.67 %) | |
| 2. | Overweight (25 – 30) | 21(18.60%) | 4(50%) | 7(30.40%) | 11(46%) | 21(17.5%) | |
| 3. | Obese (>30) | 1(0.90%) | 1(12.50%) | 1(4.30) | 2(8%) | 1(0.83%) | |
| | Mean BMI | 22.1 ± 3.3 | 26 ± 4.6 | 23.2 ± 3.6 | | | P<0.005 S |

As seen in Table – 5 Maximum (71%) proportion of cases were in 1.5 – 2µIU/ml range of S.TSH. 50% of ET and 62% of TAI groups had S.TSH in the range of 1.5 – 2µIU/ml followed by 30% of ET and 30% TAI had S.TSH in the range of 2 – 2.5µIU/ml . SH cases had S.TSH level >2.5µIU/ml.

Mean S.TSH in SH group was 4.5± 0.8µIU/ml while mean S.TSH in both ET and TAI was 1.8 ±0.3µIU/ml. The difference in mean serum TSH was statistically significant (P<0.001HS).

Similar to the study done by Antonio De Vivo et al (2010) found in their study that mean TSH value was 1±0.5mIU/ml in ET group, 1±0.4mIU/ml in TAI group and 3.9 ± 0.1mIU/ml in the SH group (P<0.001). A significant difference was found only between ET and SH group; TAI and SH groups. [3]

Similar results were also seen in study done by Dhanwal et al (2013) [13] and Roberto Negro et al (2010). [12]

Serum $fT_4$ level in the range of 1 – 1.5ng/dl ET group constitutes 52% , SH group 62.5% and 69.57% cases of TAI group; overall 58%. In range of >1.5ng/dl overall 2% cases, Euthyroid 1.8% and SH constitutes 12.5%. The difference was statistically not significant (P = 0.16).
No significant difference was found in mean $fT_4$ levels among the different groups of thyroid status (P = 0.37NS). Mean $fT_4$ in ET, SH, TAI was 1.07 ±0.19ng/dl, 1.17± 0.28ng/dl, 1.10 ± 0.16ng/dl respectively.

Antonio De Vivo et al (2010) reported in their study that difference in $fT_4$ level in ET (16.8± 2.8Pm/L), in TAI (18.1± 1.7Pm/L), SH (16.4±0.6Pm/L) was statistically not significant (P = 0.009). [3]

N Benhadi et al (2009) concluded in their cohort study that the risk of miscarriage and child loss increased with higher levels of maternal TSH but not affected with maternal $fT_4$ levels.[17]

Thus to conclude Serum TSH assay make it possible to diagnose hypothyroidism very early and also allow to monitor thyroid replacement very accurately. So serum TSH level serves as screening test for hypothyroidism. [11]

**Table – 5: Distribution of S.TSH and $fT_4$ level**

| S.no | S.TSH (µIU/ml) | Euthyroid Group | Subclinical Hypothyroid Group | Thyroid Autoimmunity Group | Annova Test |
|---|---|---|---|---|---|
| 1. | <1 | 4(4%) | 0 | 1(4%) | |
| 2. | 1 – 1.5 | 18(18%) | 0 | 1(4%) | |
| 3. | 1.5 – 2 | 57(50%) | 0 | 14(62%) | |
| 4. | 2 – 2.5 | 34(30%) | 0 | 7(30%) | |
| 5. | >2.5 | 0 | 8(100%) | 0 | |
| | Mean ± SD | 1.8± 0.3 | 4.5± 0.8 | 1.8± 0.7 | P<0.001, HS |
| | | | | | |
| | $fT_4$ Level (ng/dl) | | | | |
| 1. | 0.7 – 1 | 48(42.20%) | 2(25%) | 7(30.43%) | |
| 2. | 1 – 1.5 | 63(56%) | 5(62.50%) | 16(69.57%) | |
| 3. | >1.5 | 2(1.80%) | 1(12.50%) | 0 | |
| | Mean ± SD | 1.07± 0.19 | 1.17± 0.28 | 1.10± 0.16 | P = 0.37 NS |
| $\chi^2 = 6.505$ | d.f. = 4<br>P = 0.16 NS | | | | |

Table – 6 shows that majority (55.83%) of cases with early pregnancy loss (EPL) had serum TSH level between 1.5 – 2µIU/ml. Maximum proportion of cases in euthyroid group (54.6%) had serum TSH 1.5 – 2µIU/ml , in SH (100%) had >2.5µIU/ml and TAI (66.6%) had 1.5 – 2µIU/ml respectively. This difference of distribution of cases according to serum TSH level in EPL group was found to be statistically significant (P<0.001).

The difference in mean serum TSH was found to be statistically significant between SH and ET (P<0.001) and between SH and TAI (P<0.001). Mean serum TSH level in SH group was 4.0±0.8µIU/ml and mean serum TSH level in both ET and TAI groups was 1.8 ± 0.3µIU/ml. Similar study done by Antonio De Vivo et al (2010) reported in their study that in EPL group a significant difference was found in serum TSH level between SH and TAI (3.8±0.2mU/ml v/s 1.0±0.5mU/ml; P< 0.001) and between SH and ET(3.8±0.2mU/L v/s1.0±0.5mU/ml ; P<0.001) and no difference found between TAI v/s ET (P= 0.99). [3]

Maximum proportion (54%) of cases with very early pregnancy loss (VEPL) had serum TSH level between 2 – 2.5µIU/ml and majority of them were euthyroid group (68.75%). While 25% cases had serum TSH >2.5µIU/ml, all of them were of subclinical hypothyroidism. This difference in distribution of serum TSH levels in different thyroid status groups in VEPL group was found to be statistically significant (P< 0.04).

Mean serum TSH in SH group (4.62±0.787µIU/ml was significantly different from mean serum TSH in ET (2.08±0.319µIU/ml) and TAI (2.21±0.099µIU/ml)groups (P<0.001, HS). Early identification and treatment of pregnant women with subclinical hypothyroidism will improve maternal and foetal outcome.

Similar results were seen in study done by Antonio DE Vivo et al (2010). They also found significant difference in serum TSH level between SH and TAI and between SH and ET in VEPL group. [3]

**Table – 6: Distribution of cases according to S.TSH in EPL & VEPL Group**

| S.no | S.TSH (µIU/ml) | Euthyroid Group | Subclinical Hypothyroid Group | Thyroid Autoimmunity Group | Annova – test |
|---|---|---|---|---|---|
| **Early Pregnancy Loss** | | | | | |
| 1. | <1 | 4(4.0%) | 0 | 1(4.76%) | |
| 2. | 1 – 1.5 | 17(17.50%) | 0 | 1(4.76%) | |
| 3. | 1.5 – 2 | 53(54.64%) | 0 | 14(66.67%) | |
| 4. | 2 – 2.5 | 23(23.86%) | 0 | 5(23.81%) | |
| 5. | >2.5 | 0 | 2(100%) | 0 | |
| | Mean ±SD | 1.8 ±0.4 | 4.0 ± 0.8 | 1.80 ± 0.5 | P<0.001HS |
| $\chi^2$ =97.063 | d.f. = 8<br>P<0.001 HS | | | | |
| **Very Early Pregnancy Loss** | | | | | |
| 1. | <1 | 0 | 0 | 0 | |
| 2. | 1 – 1.5 | 1(6.25%) | 0 | 0 | |
| 3. | 1.5 – 2 | 4(25%) | 0 | 0 | |
| 4. | 2 – 2.5 | 11(68.75%) | 0 | 2(100%) | |
| 5. | >2.5 | 0 | 6(100%) | 0 | |
| | Mean ± SD | 2.08 ± 0.319 | 4.62 ± 0.787 | 2.21± 0.099 | P <0.001HS |
| $\chi^2$ = 12.72 | d.f. = 6<br>P<0.001 HS | | | | |

Table – 7 shows that maximum proportion (91.3%) of antibody positive cases had early pregnancy loss and 8.7% had very early pregnancy loss. Thyroid antibody negative cases also had early pregnancy loss (82%) in majority and very early pregnancy loss in 18%. This difference was not found statistically significant (P = 0.263).

Similar to study done by Ghalia Ashoor et al (2010) reported in their study that prevalence of antithyroid antibody positive was not significantly different in the foetal loss group compared to that of normal pregnancies (15.3 % v/s 16.8%). [18]

Athina Kaprara et al (2008) studied the relation of thyroid autoimmunity to miscarriage. [19] Most studies have shown a significant positive association between the presence of thyroid autoantibodies and miscarriage rate. It is of interest that women with high titers do not show a higher miscarriage rate when compared with women having low titres, although there is no general agreement on the issue.There are three possible explanations for the assumed association of thyroid autoimmunity with miscarriage

1. Pregnancy loss is an epiphenomenon and not a direct effect of the thyroid autoantibodies, the presence of thyroid autoantibodies reflecting a generalized activation of the immune system
2. Delayed conception from the presence of thyroid autoantibodies ; hence, when women with thyroid autoimmunity become pregnant , face a higher risk of miscarriage because of older age
3. The pregnancy loss is secondary to a subtle deficiency in thyroid hormone concentrations or a lower capacity of the thyroid to adequately adapt to the demands of pregnancy

**Table – 7: Distribution of cases according to TPO Antibodies Levels in pregnancy outcome Group**

| S.no | Group | TPO Antibodies <35 U/ml | TPO Antibodies >35 U/ml |
|---|---|---|---|
| 1. | VEPL | 22(18%) | 2(8.70%) |
| 2. | EPL | 99(82%) | 21(91.30%) |

$\chi^2 = 1.25$ d.f. = 1 P = 0.263 NS

## CONCLUSION

Pregnancy influences thyroid functions and it may bring to light mild and latent disorders. American Association of clinical Endocrinologists recommended in 2002 that routine TSH levels be performed preconceptionally or during the first trimester in all pregnant women. [20]

Based on current literature thyroid testing in pregnancy should be performed on symptomatic women and those with personal history of thyroid disease or other medical conditions associated with thyroid disease (eg Diabetes mellitus) without evidence that identification and treatment of pregnant women with subclinical hypothyroidism improves maternal or infant outcomes, routine screening for subclinical hypothyroidism currently not recommended.[2, 21]

Joint guidelines from American Association of clinical Endocrinologist and American Thyroid association 2012 says that universal screening is not recommended for patients who are pregnant or are planning pregnancy , including assisted reproduction. Aggressive case finding, rather than universal screening , should be considered for patients who are planning pregnancy.[2]

The highly sensitive immunometric assay of TSH provides the most accurate information about the thyroid status during pregnancy. Serum TSH assay makes it possible to diagnose hypothyroidism very early and also allow to monitor thyroid replacement very accurately. So serum TSH level serves as screening test for hypothyroidism.[11]

S.TSH will be raised and $fT_3$ and $fT_4$ level will be normal or reduced. A combination of free $T_4$ and TSH provide adequate information for accurate diagnosis in majority of patients.[11]

If during pregnancy serum TSH is >2.5µIU/ml treatment should be started irrespective of clinical condition and antimicrosomal antibodies. The patient should be started on synthetic levothyroxine in dose of 1.7 (1 – 2) µgm/kg body weight. Monitor S.TSH and $T_4$ level every 3 – 4 weeks during first half of pregnancy and every 6 weeks therafter. When levothyroxine dosage achieves equilibrium, resume monitoring TSH alone and adjust levothyroxine dosage to maintain serum TSH <2.5 µIU/ml by 25 to 50 µg increment.[5, 22]

**REFERENCES**

1. Neale D, Burrow G. Thyroid disease in pregnancy. Obstet Gynecol Clin N Am, 2004; 31: 893 – 905.
2. Donny L. F. Chang and Elizabeth N. P. Screening for maternal thyroid dysfunction in pregnancy: a review of the clinical evidence and current guidelines. J Thyroid Res, 2013: 851326.s

3. Antonio De Vivo A, Mancuso A, Giacobbe Ad. Thyroid function in women found to have early pregnancy loss. Thyroid function in women found to have early pregnancy loss. Thyroid, 2010 Jun; 20(6): 633 – 7.
4. Arafah BM. Increased need for thyroxine in women with hypothyroidism during estrogen therapy. N Engl J Med, 2001 Jun 7; 344 (23): 1743 – 9.
5. Pieto Cignini, Ester V C. Thyroid Physiology and common diseases in pregnancy : Review literature . J of Prenatal Med, 2012 Oct – Dec; 6(4): 64 – 71.
6. Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Rouse DJ, Spong CY. Abortion. Williams Obstetrics . 23rd ed.Mc Graw Hill 2010; 1130: 1131, 1132.
7. Wasserstrum N, Anania CA. Perinatal consequences of maternal hypothyroidism in early pregnancy and inadequate replacement. Clin Endocrinol (Oxf), 1995; 42: 353.
8. Leung AS, Millar LK. Perinatal outcome in pregnancy in hypothyroid pregnancies. Obstet Gynecol, 1993; 81: 349.
9. Davis LE, Leveno KJ, Cunningham FG. Hypothyroidism complicating pregnancy.Obstet Gynecol , 1988; 72 : 108 – 112.
10. Stagnaro GA, Roman SH, Cobin RH. Detection of at risk pregnancy by means of highly sensitive assays for thyroid auto antibodies. J of American Medical Association, 1990; 264.
11. Montoro MN. Management of hypothyroidism during pregnancy. Clin Obstet Gynecol, 1997; 40: 65 – 80.
12. Negro R, Schwartz A, Gismondi R. Increased pregnancy loss rate in thyroid antibody negative women with TSH levels between 2.5 – 5.0 in the first trimester of pregnancy. J Clin Endocrinol Metab , 2010 Sep; 95(9) : E44 – 8.
13. Dhanwal DK, Prasad S , Agarwal K. High prevalence of subclinical hypothyroidism during first trimester of pregnancy in North India. Indian J Endocrinol Metab, 2013 Mar – April; 17(2): 281 – 284.
14. Casey BM, Dashe JS, Wells CE. Subclinical hypothyroidism and pregnancy outcomes. Obstet Gynecol, 2005; 105: 239 – 45.
15. Vaidya B, Anthony S. Detection of thyroid function in early pregnancy: Universal screening or targeted high risk case finding? J. Clin Endocrinol Metab, 2007 Jan; 92 (1): 2003 – 07.
16. Tujjo Mannisto , Marja V, Anneli P.Perinatal outcome of children born to Mothers with Thyroid dysfunction or antibodies : A prospective Population – Based Cohort study. The J of Clin Endocrinology & Metabolism, March 1, 2009; 94(3): 772 – 779.

17. Benhadi N, Wiersinga WM. Higher maternal TSH levels in pregnancy are associated with increased risk for miscarriage, fetal or neonatal death. Eur J Endocrinol , 2009 Jun; 160(6): 985 – 91.
18. Ashoor G, Kametas NA. Maternal thyroid function at 11 – 13 weeks of gestation. Fetal Diagn Ther, 2010; 27(3): 156 – 63.
19. Athina Kaprara, Gerasimos EK. Thyroid autoimmunity and miscarriage. Hormones, 2008; 7(4): 294 – 302.
20. AACE Thyroid Task Force, American Association of Clinical practice for the education and treatment of hyperthyroidism and hypothyroidism. Endocr Pract, 2002; 8: 457 – 69.
21. ACOG Committee. Subclinical hypothyroidism in pregnancy. Oct 2007. Number 381.
22. Raut VS, Chauhan A R. Fogsi Focus, Thyroid womb to tomb : Thyroid disorders in pregnancy, 2006; 32 – 36.