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Evaluation of Effects of Subclinical Hypothyroidism on Pregnancy and Its Outcome

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Abstract: ***Objective: To evaluate the effects of subclinical hypothyroidism on pregnancy, pattern of obstetric complications and its outcome. Materials and methods: This prospective observational study conducted from Feb 2011 to Nov 2014 in obstetrics and gynecology department, Vydehi Institute of Medical Sciences and Research Centre, Bangalore. At first antenatal visit pregnant women were screened for TSH and further evaluated for FT4 and FT3 if found elevated TSH above 2.5 milli international units (mIU)/L in first trimester and above 3 mIU/L in second trimester. Following confirmed subclinical hypothyroidism, treatment was initiated with Levothyroxine. Maternal outcomes were studied. Results: Prevalence of subclinical hypothyroidism in pregnancy was 2.07%. TSH was found less than 6 mIU/L in 41 cases, between 6-10 mIU/L in 37 cases, more than 10 mIU/L in 23 cases. Threatened abortion was observed in (44.55%) 45 cases, 25 (24.75%) cases had preterm delivery. Cesarean section rate was 27.7% (28). Intra uterine growth retardation was seen in 5 (5%) cases. Intrauterine death was seen in 15 (15%) cases. Conclusion: Subclinical hypothyroidism in pregnancy is significantly associated with obstetric complications. Early diagnosis, active intervention, multidisciplinary team approach i.e. endocrinologist, skilled obstetrician, physician, anesthetist, and proper facilities for ante partum and intrapartum care is required for the management of hypothyroidism and its complications.***

Keywords: Subclinical hypothyroidism, complications, pregnancy, maternal outcomes

1. Introduction

Maternal thyroid undergoes significant physiological changes during pregnancy. Early in pregnancy increased demand for thyroid hormone secretion owing to fetal thyroid gland becomes functional in the second trimester of gestation. Thyroxin is essential for fetal neurodevelopment, maternal delivery of thyroxin to the fetus is essential early in gestation. Pregnant women are also more likely to be iodine deficient due to increased iodine excretion[1]. The hypothalamic-pituitary-thyroid axis set-point is genetically determined; it's varied in different individuals. These genetic variants have the effect on both blood pressure and serum TSH levels. Therefore, inter individual differences in the hypothalamic-pituitary-thyroid axis set-point might explain the different signs and symptoms. Many of the symptoms and signs of hypothyroidism can overlap with pregnancy akin to lethargy, weakness, weight gain, muscle cramps, constipation, and hair loss etc, Thus it is difficult to relay on symptoms to make a diagnosis of hypothyroidism in pregnancy[2]. This study has been undertaken to analyze the maternal problems associated with subclinical hypothyroidism, evaluation of effects of hypothyroidism in pregnancy and its outcome.

2. Materials and Methods

This was a prospective observational study conducted from February 2011 to November 2014, in the department of obstetrics and gynecology, VIMS&RC, Bangalore. At first antenatal visit pregnant women attending to outpatient department with elevated TSH above 2.5 mIU/L in first trimester and above 3 mIU/L from second trimester were included. Patients with known thyroid disease, overt hypothyroidism, hyperthyroidism, family history of thyroid problems, previous history of thyroid surgery, neck radiation exposure excluded from this study. Detailed history was taken at first ante natal visit. Thorough general and physical examination was done. Other investigations included were blood grouping and Rh typing, hemoglobin, random blood sugar, FT4, FT3, urine for routine and microscopy, ultrasonography. In case of elevated TSH has found FT4 and FT3 were also carried out. The diagnostic criteria for subclinical hypothyroidism were based on Endocrine Society and the American Thyroid Association guidelines[3] (normal serum TSH reference range up to 2.5 mIU/L in the first trimester and up to 3.0 mIU/L in the second and third trimesters). According to the need of the patients liver function tests and renal function tests were done. All patients attained euthyroid state after initiation of treatment. Drop outs not included in this study. Anti-TPO Abs measurement was not done to all patients due to lack of resources. Informed consent has taken from all patients.

All subclinical hypothyroid patients were referred to endocrinologist for full evaluation and medical treatment, and treatment with Levothyroxine was initiated. Dose adjustments were guided by serum TSH level every 6–8 weeks following initiation of therapy and followed until delivery. Pregnancy was continued till term gestation, unless termination was indicated for maternal or fetal indications. All forms of maternal outcomes were studied, which included but not limited to threatened abortion, recurrent pregnancy loss, preterm delivery, gestational hypertension, gestational diabetes, intra uterine growth retardation, intra uterine death, prolonged pregnancy (beyond expected date of delivery >40 weeks) and mode of delivery.

3. Results

Of 4,864 pregnant women screened 101 pregnant women had subclinical hypothyroidism, with prevalence 2.07%. Mean gestational age at which subclinical hypothyroidism diagnosed was 13.86 weeks. Figure 1 showing shows TSH level distribution in study subjects. 23 patients had severe subclinical hypothyroidism. Figure 2 showed distribution of

age in study subjects. Majority of the patients were in the age group of 20-30 years. Mean age of these cases was 26.6 years. Figure 3 showing literacy statuses. Figure 4 showing gravida statuses. Subclinical hypothyroidism observed more in second gravida. Figure 5 showing maternal complications and outcome. Sharp raise of spontaneous abortions observed in 20-30 years age group women. 45 (44.55%) women had abortions, 25 (24.75%) women had preterm delivery. Cesarean section rate was 28 (27.7%). Intra uterine growth retardation was seen in 5 (5%) cases. Intrauterine death was observed in 15 (15%) cases.

4. Discussion

Subclinical hypothyroidism is the commonest of the gestational thyroid disorders. Increased demand for thyroxin production and iodine intake led the WHO to recommend a daily iodine intake of 250µg for pregnant women, considerably higher than the recommended 150µg a day for the general adult population[4].Many studies have reported maternal complications and adverse perinatal outcomes with subclinical hypothyroidism[5, 6, 7], so early detection and initiation of treatment are very important. Adverse outcomes varied from study to study.

The estimated prevalence of subclinical hypothyroidism in pregnancy is 2-3%[5]. Though, prevalence depends upon several factors such as TSH cut off used to define Subclinical hypothyroidism and dietary iodine deficiency state etc. Prevalence of subclinical hypothyroidism in pregnancy was very high in Dhanwal et al[8] study 14.3% compared to present study 2.07%. Many studies reported that high maternal TSH levels were associated with an increased risk of pregnancy loss[9-11]. Nirmala C et al[12] study showed subclinical hypothyroidism was associated with increased risk of developing threatened abortion, gestational hypertension and increased rate of caesarian section (51.3%). In this study rate of caesarian section was 27.7%.
Study conducted by Guducu et al [13] showed significant associations between low-birth weight neonates with high first trimester TSH levels. In the present study after achieving euthyroid state also in the second trimester with higher TSH levels in the early first trimester had lower birth weight infants in 4.9% of cases. This may be due to mechanism acting earlier, at the time of the trophoblastic invasion. In this study complications may be due to late diagnosis, unawareness of the patients, inadequate treatment, and irregular follow ups.

Management of subclinical hypothyroidism is shrouded with controversies. Treatment of subclinical hypothyroidism is not universally advocated as there are limited data demonstrating a beneficial effect of thyroid hormone therapy on health outcomes. In 2010 Cochrane review[14] provided information about women with subclinical hypothyroidism that is also antithyroid antibody positive with exogenous thyroid hormone in an attempt to improve pregnancy outcomes. Targeted screening of pregnant women will lead to missing of 30–80% of women with overt or subclinical hypothyroidism[15, 16]. The majority of cases of subclinical hypothyroidism in pregnancy are transient, so treatment with L-thyroxin in these patients may not be acceptable after pregnancy. There are no data to indicate whether the treatment for these conditions should be limited only to during the pregnancy or continued long-term, and no advice is provided in the current guidelines. Limitations of this study were thyroid examination using ultrasound, Anti TPO Abs, lack of control group, autoimmunity for other causes of hypothyroidism in these women not done and study was done at single centre.

5. Conclusion

Studies on benefits of universal screening and treatment intervention for subclinical hypothyroidism on obstetric and perinatal outcomes are still lacking. Pre natal counseling, screening for thyroid disorders, early detection and timely initiation of thyroid replacement therapy adequately for hypothyroidism will improve the perinatal outcome. A multidisciplinary team approach i.e. endocrinologist, obstetrician, physician, anesthetist, pediatrician and proper facilities for ante partum and intrapartum care are required for the management of hypothyroidism and its complications.

References

[1] **Gabbe S G, Neibyl joe J R, Simpson L, London MB, Galan H, L, Jauniaux E R M, Driscoll D A.** Normal delivery and abnormal delivery .6th edn ,2012 :922-961.
[2] **Glinoer D. The regulation of thyroid function in pregnancy:** Pathways of Endocrine adaptation from physiology to pathology1997. Endocr rev 18:404–433.
[3] **Abalovich M, Amino N, Barbour LA, et al.** Management of thyroid dysfunction during pregnancy and postpartum: An Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab 2007; 92: S1–S47.
[4] **World Health Organization,** Technical consultation of experts in Geneva in January 2005. The prevention and control of iodine deficiency in pregnant and lactating women and in children under two years: recommendations of a WHO Technical Consultation. Public Health Nutr, in press
[5] **Casey BM, Dashe JS, Wells CE, et al.** Subclinical hypothyroidism and pregnancy outcomes. Obstet Gynecol 2005; 105:239–245.
[6] **Su P, Huang K, Hao J, Xu Y, Yan S, Li T, Xu Y, and Tao F .**Maternal Thyroid Function in the First Twenty Weeks of Pregnancy and Subsequent Fetal and Infant Development: A Prospective Population- Based Cohort Study in China. J Clin Endocrinol Metab 2011; 96(10):3234–3241.
[7] **Beverley M. Shields, Bridget A. Knight, Anita V. Hill, Andrew T. Hattersley, and Bijay Vaidya.** Five-Year Follow-Up for Women with Subclinical Hypothyroidism in Pregnancy. J Clin Endocrinol Metab 2013; 98(12):E1941–E1945.
[8] **Dhanwal D K, Prasad S, Agarwal A K, Vivek Dixit V, Banerjee A K.** High prevalence of subclinical hypothyroidism during first trimester of pregnancy in North India; Indian journal of Endocrinology and Metabolism 2013 :17(2),281-**284.**
[9] **Negro R, Schwartz A, Gismondi R, Tinelli A, Mangieri T & Stagnaro-Green A.** Increased pregnancy loss rate in thyroid antibody negative women

with TSH levels between 2.5 and 5.0 in the first trimester of pregnancy. Journal of Clinical Endocrinology and Metabolism 2010 95 E44–E48. (doi:10.1210/jc.2010-0340).

[10] **Benhadi N, Wiersinga WM, Reitsma JB, Vrijkotte TG, Bonsel GJ.** Higher maternal TSH levels in pregnancy are associated with increased risk for miscarriage, fetal or neonatal death. Eur J Endocrinol 2009: 160:985–991.

[11] **Allan WC, Haddow JE, Palomaki GE, Williams JR, Mitchell ML, Hermos RJ,Faix JD, Klein RZ Maternal thyroid deficiency and pregnancy complic*ations***: Implications for population screening. J Med Screen 2000: 7:127–130.

[12] **Nirmala C, Jayakumari C, Rajasekharan C, and Nandini VR,** "Maternal Outcome of Hypothyroidism in Pregnancy- a South Indian Perspect." American Journal of Clinical Medicine Research2014, 2(2) (2014): 47-50. doi: 10.12691/ajcmr-2-2-2. 9.

[13] **Guducu N, Gonenç G, Işçi H, Yigiter A and Dunder I.** Higher TSH levels in the first trimester of pregnancy are related to lower birth weight. Eastern Journal of Medicine2013:18, 172-175.

[14] **S. M. Reid, P. Middleton, M. C. Cossich, and C. A. Crowther,** "Interventions for clinical and subclinical hypothyroidism in pregnancy," Cochrane Database of Systematic Reviews2010: 7, Article ID CD007752.

[15] **Vaidya B, Anthony S, Bilous M, Shields B, Drury J, Hutchinson S, and Bilous R.** Detection of thyroid dysfunction in early pregnancy: universal screening or targeted high-risk case finding. J Clin Endocrinol Metab2007: 92:203–207

[16] **Wang W, Teng W, Shan Z, Wang S, Li J, Zhu L et al.** The prevalence of thyroid disorders during early pregnancy in China: the benefits of universal screening in the first trimester of pregnancy. Eur J Endocrinol 2011; 164: 263–68.

Figures

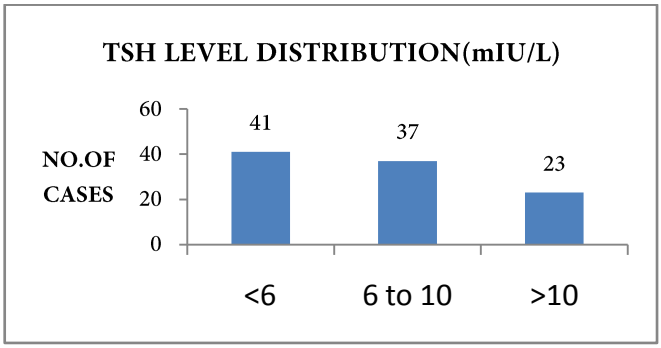

Figure 1: Thyroid stimulating hormone (TSH) level in study subjects

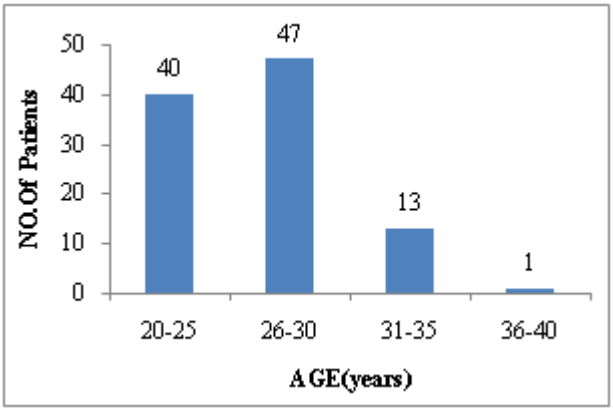

Figure 2: Age distribution in n=101 of cases

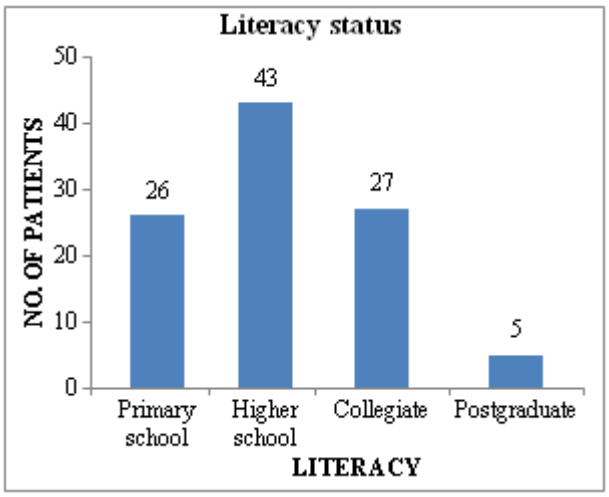

Figure 3: Literacy status in n=101 of cases

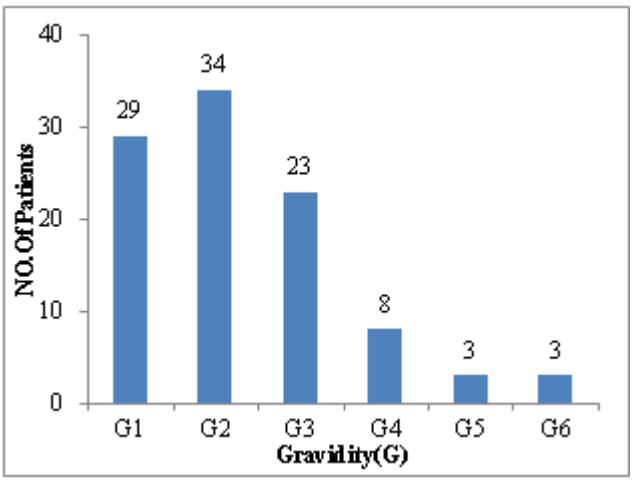

Figure 4: Gravida(G) status in study subjects.

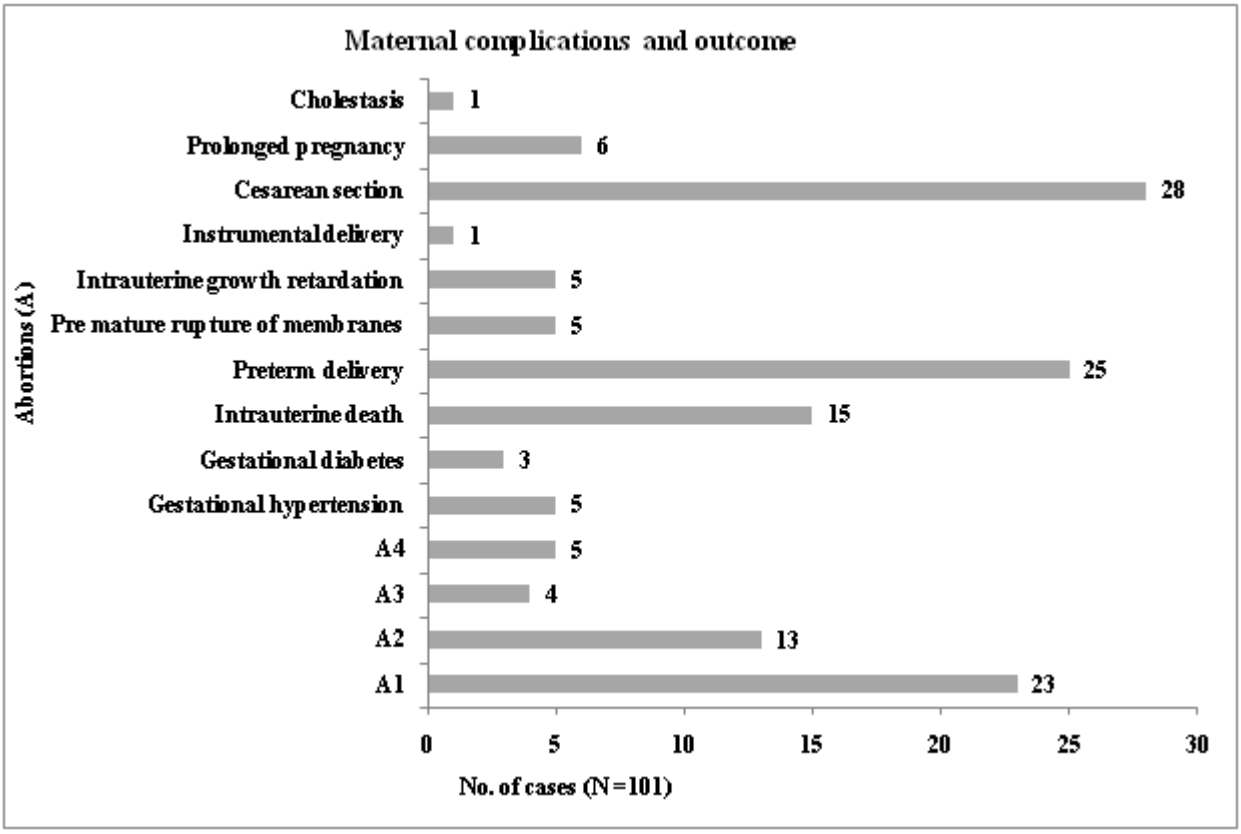

Figure 5: Showing maternal complications and outcome.

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