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HYPOTHYROIDISM IN PREGNANCY -SIGNIFICANCE OF ADEQUATE TREATMENT: A STUDY OF 100 CASES IN NORTH BIHAR

Gynaecology

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ABSTRACT

Pregnancy is a nature's gift of humanity for procreation and continuation of its race. This gift is however fraught with several complications and has potential threat to the mother and the foetus. When pregnancy is compounded by endocrine disorders such as hypothyroidism, the potential for maternal and foetal adverse outcomes can be immense. While a lot of attention has been focused on the adverse foetal outcomes consequent to hypothyroidism, attention is also being gradually directed towards the adverse maternal outcomes of this disorder. Role of antibody positivity in influencing outcomes in a euthyroid woman, also needs further clarification. Prompt diagnosis and treatment of hypothyroidism in pregnancy is very essential. Subclinical hypothyroidism also needs to be detected and treated to prevent adverse outcomes, especially maternal. Since women with hypothyroidism during pregnancy, especially of the autoimmune variety might have a flare up of the disorder post-partum, or might continue to require thyroxine replacement post-partum, adequate follow-up is mandatory. While targeted case finding is generally practised, recent evidence seems to indicate that universal screening might be a better option. In conclusion, routine screening, early confirmation of diagnosis and prompt treatment allied with regular post-partum follow up, is required to ensure favourable maternal and foetal outcomes.

KEYWORDS

TSH – Thyroid stimulating hormone FT4- Free thyroxine level Euthyroid Hypothroid

INTRODUCTION:

Pregnancy is a period that places great physiological stress on both the mother and the fetus in the best of times. Hypothyroidism during pregnancy has an adverse effect on both mother and child. Children born to untreated or undertreated mothers have profound effect on future intellectual development Hypothyroidism is widely prevalent in pregnant women and the rate of detection, especially in a developing country like India, has not kept pace with the magnitude of the problem. Since hypothyroidism is easily treated, timely detection and treatment of the disorder could reduce the burden of adverse foetal and maternal outcomes, which are very commonly encountered.

Pregnancy has a profound physiological impact on the thyroid gland and thyroid function. During pregnancy, the thyroid gland increases in size by 10% in iodine sufficient countries and to a greater extent in iodine deficiency countries. Production of thyroid hormones and iodine requirement both increases by approximately 50% during pregnancy as part of physiology. In addition, pregnancy is a stressful condition for the thyroid gland resulting in hypothyroidism in women with limited thyroid reserve or iodine deficiency.

Data from recently published studies have underscored the association between miscarriage and preterm delivery in women with normal thyroid function who test positive for thyroid peroxidase (TPO) antibodies. Prenatal and postnatal adverse effects including attention deficit and hyperactivity syndrome have been reported in children born to hypothyroid mothers. During the first trimester, approximately 1 in 10 pregnant women develop antibodies to TPO or thyroglobulin and hypothyroidism develops in roughly 16% of these women. The prevalence of hypothyroidism in pregnancy is around 2.5% according to the Western literature. There are a few reports of prevalence of hypothyroidism during pregnancy from India with prevalence rates ranging from 4.8% to 11%. Therefore, this study was carried out in a larger cohort of pregnant women during the first trimester from a government hospital setting catering to majority of women from lower socioeconomic status. Thyroid physiology is perceptibly modified during normal pregnancy. These alterations take place throughout gestation, help to prepare the maternal thyroid gland to cope with the metabolic demands of pregnancy, are reversible post-partum and the interpretation of these changes can pose a challenge to the treating physician.

Pregnancy influences thyroid function in multiple ways. Not only does the maternal hypothalamic-pituitary-thyroid (HPT) axis undergo a series of adjustments, the fetus develops its own HPT axis and the placenta plays an active role in iodide and T_4 transport and metabolism.

The most notable change is the increase in thyroxine-binding globulin (TBG). This begins early in the first trimester, plateaus during mid gestation, and persists until shortly after delivery. This is due to stimulation of TBG synthesis by elevated maternal estrogen levels, and more importantly, due to a reduced hepatic clearance of TBG because of estrogen-induced sialylation. This increased TBG concentration leads to an expansion of the extra-thyroidal pool and results in elevated total T3 and T4 levels due to an increase in maternal thyroid hormone synthesis. Maternal thyroid hormone synthesis is also increased due to an accelerated renal clearance of iodide resulting from the increased maternal glomerular filtration rate.

Enhanced metabolism of T4 in the second and third trimesters, due to a rise in placental type II and type III deiodinases, which convert T4 to T3 and T4 to reverse T3 and T2 respectively, act as further impetus to T4 synthesis. Plasma iodide levels decrease due to both increased thyroxine metabolism and increased renal iodide clearance. All these changes lead to an increase in the size of the thyroid gland in 15% of pregnant women, which returns to normal in the post-partum period.

Serum HCG has intrinsic thyrotropic activity, which increases after fertilization and peaks at 10 to 12 weeks. Hence, in the first trimester , free T3 and T4 levels increase slightly and TSH levels decrease in the first trimester with a readjustment in the second and third trimesters, when HCG levels decrease. As a consequence, cut-offs to determine hypothyroidism in pregnancy are different in the first trimester and the rest of the pregnancy.

MATERIAL AND METHODS:

This was a cross-sectional study conducted at Darbhanga Medical College, Under the supervision of Dr. Asha Jha (Professor and Head of Department, Obstetrics and Gynae,DMCH). The study was conducted from July 2018 to December 2019 . All women were subjected to detailed history and clinical examination using a predesigned Performa. Blood samples were collected in outpatient department settings. Complete blood count (hemogram), total cholesterol, triglycerides, serum creatinine, and blood urea nitrogen were evaluated for all subjects. Estimation of thyroid stimulating hormone (TSH), free T4, and anti-TPO antibodies was carried out using Roch modular kit using ECLIA technology. respectively.

The average age group was 20-40 years including primigravidae and multigravidae. Their serial estimation of STSH was repeated at 8 weeks interval and postpartum. The first test was done as soon as pregnancy was confirmed.

In patients having excess weight gain and pregnancy induced hypertension STSH was repeated. Women whose STSH was > 3miu/ml were given L thyroxine in empty stomach with adequate dose so as to keep the STSH between .5 – 2 miu/ml. Patients having low FT4 and those with increasing TSH value were treated with L thyroxine.

RESULTS:

Among the 100 pregnant patients of North Bihar, 75 were primigravidae and 25 were multigarvidae. According to the level of STSH these women were grouped in 3 categories. Category A had STSSH > 3 miu/ml , Category B had STSH between 2-3 miu/ml and Category C had STSH level below 2 miu/ml

Category A - 62(primi 49 and multi 13)
Category B - 24(primi 14 and multi 10)
Category C – 14(primi 10 and multi 4)

According to thyroid status these women were categorised in to euthyroid (true, euthyroid 32 , potential hypothyroid 6) and overt hypothyroid groups. Overt hypothyroid were grouped in two categories- those who were adequately treated(52) and those who were not adequately treated(8) and 2 were not treated.

Euthyroid & adequately treated hypothyroids had no difference in their pregnancy outcome. Inadequately treated and potentially hypothyroid patients developed pregnancy complications i.e miscarriage and pregnancy induced hypertension(PIH). Nine women had PIH six in inadequately treated patient and two in potentially hypothyroids and one in untreated hypothyroid. Six women had miscarriages.

Table-1 Showing distribution according to STSH level

No. of pregnant pateints	Category A STSH > 3miu/ml	Category B STSH 2-3 miu/ml	Category C STSH <2 miu/ml
100	62	24	14
	Primi - 49	Primi -24	Primi - 10
	Multi - 13	Multi - 10	Multi - 4

Table-2 Distribution according to thyroid status

No. of patients	Euthyroids		Hypothyroids		
100	Normal Euthyroid	Potential Hypothyroids	Adequately treated	Inadequately treated	Untreated
	32	6	52	8	2

CONCLUSION:

In conclusion, maternal hypothyroidism is a disorder with great potential to adversely affect maternal and foetal outcomes and is also associated with multiple other conditions which can affect maternal and foetal health. If the condition is detected early, it is easy to treat, with very little detriment to the mother and the foetus. Hence, this condition needs early detection, prompt initiation of treatment, adequate follow-up and most importantly, sufficient education of the doctors and the patients regarding these objectives, the importance of this condition and the ease and advantages of prompt management.

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