



PREVALENCE OF HYPOTHYROIDISM IN SEVERE PREECLAMPSIA AND ECLAMPSIA CASES DURING THE THIRD TRIMESTER IN PREVIOUSLY EUTHYROID PATIENTS

Obstetrics & Gynaecology

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ABSTRACT

Background- Hypothyroidism in pregnancy mainly complicates the maternal and fetal health. Hypothyroidism in eclampsia and preeclampsia is more lethal for the maternal and fetal health. This study was mainly undertaken to find out the prevalence of hypothyroidism in eclampsia and preeclampsia and its effects on maternal health. **Material and Methods-** A prospective study was undertaken in the department of OBG of Shimoga institute of medical sciences, Shimoga. Fifty cases of pregnant women diagnosed with severe preeclampsia and eclampsia during the third trimester and previously euthyroid patients with no history of thyroid disorders were included. Patients with known pre-existing thyroid disorders or those on thyroid medicines and patients with incomplete and insufficient medical records were excluded from the study. The data regarding demographic information, Medical history, results of thyroid function tests and severity of preeclampsia and eclampsia and other relevant clinical history was obtained. The data thus obtained was analyzed using suitable statistical tests. **Results-** Mean age of the pregnant women was 24.8 ± 4.9 years. The prevalence of hypothyroidism was 13% in this study. The mean gestational age was 34.8 weeks. About 58.7% of the pregnant women were primigravida. About 50.0% of the normal cases had a full-term, normal delivery, while 66.7% of the hypothyroidism cases required LSCS. **Conclusion-** The prevalence of hypothyroidism was 13% in pregnant women with severe preeclampsia and eclampsia.

KEYWORDS

Hypothyroidism, Eclampsia, Preeclampsia, Euthyroid, Pregnancy outcome

INTRODUCTION

Due to its possible effects on the health of both the mother and the foetus, hypothyroidism, a common endocrine condition marked by inadequate thyroid hormone synthesis, has attracted more attention in the context of pregnancy. Simultaneously, severe hypertension illnesses specific to pregnancy, such as preeclampsia and eclampsia, present substantial dangers to the health of both the mother and the foetus and frequently require immediate medical attention. Even while each of these illnesses has been well researched separately, new research points to a potential interaction between hypothyroidism and the severity of eclampsia and preeclampsia, especially in the third trimester of pregnancy.¹

Preeclampsia, which is characterised by hypertension and proteinuria beyond 20 weeks of gestation, impacts roughly 2-8% of pregnancies globally and continues to be a primary source of morbidity and mortality among mothers and perinatal. Increased risk is a result of eclampsia, the most severe form of preeclampsia that is characterised by the onset of convulsions. The pathophysiology underpinning preeclampsia and eclampsia is still not fully understood, despite advancements in prenatal care and management techniques. This has led to continued study into suspected contributory variables.²

As thyroid issues are becoming more common worldwide, hypothyroidism has come to light as a possible risk factor for unfavourable pregnancy outcomes, such as eclampsia and preeclampsia. The pathophysiology of hypertensive diseases during pregnancy is linked to characteristics such as vascular tone and cardiovascular function, both of which are significantly influenced by thyroid hormones. Additionally, changes in thyroid function during pregnancy, especially in people who were previously euthyroid, may have an impact on the onset and course of preeclampsia and eclampsia.³

This study was mainly undertaken to study the prevalence of Hypothyroidism in Severe Preeclampsia and Eclampsia Cases during the Third Trimester in Previously Euthyroid Patients.

MATERIALS AND METHODS

A cross-sectional study was undertaken to assess the prevalence of hypothyroidism in severe preeclampsia and eclampsia cases during the third trimester in previously euthyroid patients in Department of Obstetrics and Gynecology, Shimoga Institute of Medical Sciences, Shimoga. About 46 cases constituted the sample size. Clearance from institutional ethics committee was obtained before the study was started. An informed, bilingual consent was obtained from all the patients before including them in to the study.

Pregnant women diagnosed with severe preeclampsia and eclampsia

during the third trimester and previously euthyroid patients with no history of thyroid disorders were included in to the study. The cases with known pre-existing thyroid disorders or those on thyroid medication and Patients with incomplete or insufficient medical records were excluded from the study.

The information regarding demographic information (age, gestational age, etc.), Medical history and obstetric history, results of thyroid function tests (TSH, free T4, etc.) conducted during the third trimester, Severity of preeclampsia and eclampsia (according to established criteria), Other relevant clinical variables (e.g., blood pressure measurements, laboratory results).

RESULTS

The prevalence of hypothyroidism was 13.0% in this study.

Table 1. Distribution According to Age

Age in years	Normal	Hypothyroid	T value	P value, Sig
Mean $\pm$ SD	24.6 ± 5.2	26.0 ± 3.1	0.635	0.529, NS

The mean age of pregnant women with normal thyroid levels was 24.6 years and hypothyroid levels was 26.0 years. This difference was not statistically significant.

Table 2. Distribution According to Parity

Parity	Normal n (%)	Hypothyroid n (%)
Primigravida	23 (57.5)	4 (66.7)
Multi	17 (42.5)	2 (33.3)
Total	40 (100)	6 (100)

χ^2 Value=0.181 df=1 p value, Sig=0.671, NS

About 66.7% of the cases with hypothyroidism were primigravida and 33.3% were multi. About 57.5% with normal thyroid levels were primigravida. This difference was not statistically significant.

Table 3. Distribution According to Gestational Age

Gestational age in weeks	Normal	Hypothyroid	T value	P value, Sig
Mean $\pm$ SD	34.6 ± 3.3	35.8 ± 2.3	0.834	0.409, NS

Mean gestational age of normal subjects was 34.6 weeks and hypothyroid cases was 35.8 weeks. This difference was not statistically significant between the two groups.

Table 4. Distribution According to Blood Pressure

Outcome	Normal n (%)	Hypothyroid n (%)
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Total	40 (100)	6 (100)
FTND	20 (50.0)	1 (16.7)
LSCS	11 (27.5)	4 (66.7)
PTND/ LSCS	1 (2.5)	0
PTVD	8 (20.0)	1 (16.7)

Mean systolic blood pressure in normal cases was 157 mm hg and hypothyroid cases was 158.3 mm Hg. Mean diastolic blood pressure in normal cases was 104.5 mm Hg in normal cases and 101.7 mm Hg in hypothyroid cases. This difference was not statistically significant for both systolic and diastolic blood pressures.

Table 5. Distribution according to Outcome

Blood pressure (Mean $\pm$ SD)	Normal	Hypothyroid	T value	P value, Sig
Systolic	157.0 $\pm$ 10.7	158.3 $\pm$ 16.0	0.267	0.791, NS
Diastolic	104.5 $\pm$ 7.5	101.7 $\pm$ 9.8	0.83	0.411, NS

χ^2 Value=3.904 df=3 p value, Sig=0.272, NS About 66.7% of the cases with hypothyroidism underwent LSCS and 50.0% of the normal cases had full term normal delivery. This difference was not statistically significant.

Fetal Growth Restriction (FGR)

The incidence of FGR was found to be 42.9% (3/7) among babies born to hypothyroid mothers, compared to 25.6% (11/43) among babies born to euthyroid mothers.

Birth Weight

The incidence of low birth weight was 42.9% (3/7) among babies born to hypothyroid mothers, compared to 32.6% (14/43) among babies born to euthyroid mothers.

DISCUSSION

In the present study, this study was undertaken to study the prevalence and outcome of hypothyroidism in cases with severe preeclampsia and eclampsia. The prevalence of hypothyroidism was 13.0% in this study. The prevalence of subclinical hypothyroidism was 9.6%, overt hypothyroidism was 2.45% and sub clinical hyperthyroidism was 1.5% in a study by Kanawala et al.⁴ In a study by Monika et al, hypothyroidism was present in 7.1% of the cases with pregnancy induced hypertension.⁵ In a study by Nwabudike et al, the prevalence of sub clinical hypothyroidism in 2nd trimester was 33.3% and overt hypothyroidism was 30.8%. The prevalence of subclinical hypothyroidism was 66.7% and 69.2% in overt hypothyroidism.⁶

The mean age was 24.6 years in normal cases and 26.0 years in hypothyroid cases. In a study by Monika et al, the sub clinical hypothyroidism ranged from 19 to 25 years. The age of overt hypothyroid was between 35 to 43 years.⁵

Majority of the normal and hypothyroid cases were primigravida In cases of hypothyroidism, the mean gestational age was 35.8 weeks, while in normal patients it was 34.6 weeks.

There was no statistically significant difference in systolic and diastolic blood pressures in normal cases and hypothyroid cases in this study.

About 50.0% of the normal cases had a full-term, normal delivery, while 66.7% of the hypothyroidism cases required LSCS. In a study by Kanawala et al, caesarean section was done in 18.6% of the cases with sub clinical hypothyroidism and 36.4% in overt hypothyroidism cases.⁴

CONCLUSIONS

In conclusion, our study found a prevalence of hypothyroidism of 13% in pregnant women with severe preeclampsia and eclampsia. Hypothyroid patients had a higher incidence of adverse outcomes, including LSCS, low birth weight, and FGR. These findings suggest a potential link between hypothyroidism and disease severity in this population. Our study highlights the importance of considering thyroid function in the management of high-risk pregnancies and supports the need for further research to elucidate the underlying mechanisms and potential benefits of thyroid function screening in this population.

Future Research Directions

Our Study had a Few Limitations.

Firstly, the sample size was relatively small, which may limit the

generalizability of our findings. Secondly, our study was cross-sectional, and we did not investigate the temporal relationship between hypothyroidism and preeclampsia/eclampsia. Finally, we did not control for potential confounding variables, such as maternal age and comorbidities.

Further Research is Needed to: -

- Investigate the causal relationship between hypothyroidism and preeclampsia/eclampsia.
- Examine the impact of hypothyroidism on maternal and fetal outcomes in a larger cohort.
- Explore the potential benefits of thyroid function screening in high-risk pregnancies.
- Elucidate the underlying mechanisms linking hypothyroidism and preeclampsia/eclampsia

Addressing these limitations and research gaps will provide valuable insights into the complex relationship between hypothyroidism and preeclampsia/eclampsia, ultimately informing better management strategies for high-risk pregnancies.

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