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Incidence of preterm delivery in gestational diabetes mellitus with and without hypothyroidism

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Abstract
A variety of endocrine disorders complicate pregnancy. Diabetes is reported with increasing prevalence in general and in young people in particular, which has led to increase in the number of Pregnancies complicated with diabetes. Thyroid disorders are one among the common endocrine problems in pregnant women. The present study was done to find out if there is a relationship between the occurrence of these two disorders in pregnancy. The rate of preterm delivery is increased in GDM cases with hypothyroidism compared to the study group and it was statistically significant ($p < 0.05$). The studies also indicate an increased risk of hypothyroidism in women with GDM and maternal thyroid hormone status was related to the degree of metabolic imbalance. The screening for GDM in women during early pregnancy tends to reduce morbidity in fetus and mother through dietary or drug management. Furthermore, the study emphasizes on the importance of evaluation of thyroid function in women with GDM owing to the increase in high perinatal and neonatal morbidity.

Keywords: Subclinical hypothyroidism, gestational diabetes mellitus, neonatal morbidity, preterm delivery

Introduction
A variety of endocrine disorders complicate pregnancy. Diabetes is reported with increasing prevalence in general and in young people in particular, which has led to increase in the number of Pregnancies complicated with diabetes. Thyroid disorders are one among the common endocrine problems in pregnant women.
The present study was done to find out if there is a relationship between the occurrence of these two disorders in pregnancy.

Materials and Methods
In this analytical epidemiological cohort study, 100 pregnant women were selected among all the ANCs aged between 18 to 40 years during second trimester after 24 weeks in the antenatal clinic in the department of obstetrics and gynecology of Rajah Muthiah Medical College and Hospital. Institutional Ethics Committee (IEC) clearance, written consent from the patient was obtained. Inclusion Criteria: Pregnant women with Gestational Diabetes at gestational Age ≥24 weeks, Maternal Age from 18 to 40 years, singleton pregnancy. Exclusion Criteria: Multiple Pregnancies, Maternal Age Between <18 Years and >40 Years, Overt Diabetes Mellitus. Recurrent Miscarriages, Infertility, Other medical and Endocrine Disorders.
The study cases were divided into the cases having GDM with Hypothyroidism, ie Group-A and study cases GDM without Hypothyroidism as Group-B. All the cases with GDM which satisfy inclusion and exclusion criteria were selected. Thyroid profile was done for all my study cases. The thyroid profile values were compared between the two Groups.
At the first antenatal visit (gestational age: 9-13 weeks), maternal serum samples were collected in 10 ml vacutainer tubes, centrifuged, and stored in aliquots at 80°C until assayed. Quantitative analyses of thyroid hormones [TSH] were performed using chemiluminescent microparticle immunoassays. 5ml of venous blood was collected from the pregnant women in the second trimester (after 24 weeks). Samples were collected in EDTA and plain tubes for blood count and other biochemical investigation.
The required information was recorded in a proforma which included complete general and obstetric history, general and obstetrical examination and the routine investigations. All the cases were followed up till delivery and the perinatal and maternal outcome of the cases were studied.

The collected data was analyzed SPSS22 (Statistical Package of the Social Sciences). For the qualitative variables, frequencies and frequency percentages were used, and mean standard deviations were applied for the quantitative variables. The results were subjected to statistical analysis.

Results

Statistical Method and analysis

The statistical package which was used for doing the analysis was SPSS 16.00 version. Raw data were analyzed using cross tabulations and Chi square test the data collected were entered into Microsoft excel 360 in order to create a master chart. The master chart was then loaded into statistical package for social sciences (SPSS) version 26 for further statistical analysis. Both quantitative and qualitative variables were present in the master chart. Both descriptive and inferential statistics were used for analysis. For describing the qualitative variables, frequency and percentages were used. For describing the quantitative data, mean and standard deviation were used. In order to find out difference in distribution of qualitative variable between the GDM and normal group, chi-square test was applied. To find out the difference in mean between the two, independent samples T test was applied. A P-value of less than 0.05 was considered to be statistically significant.

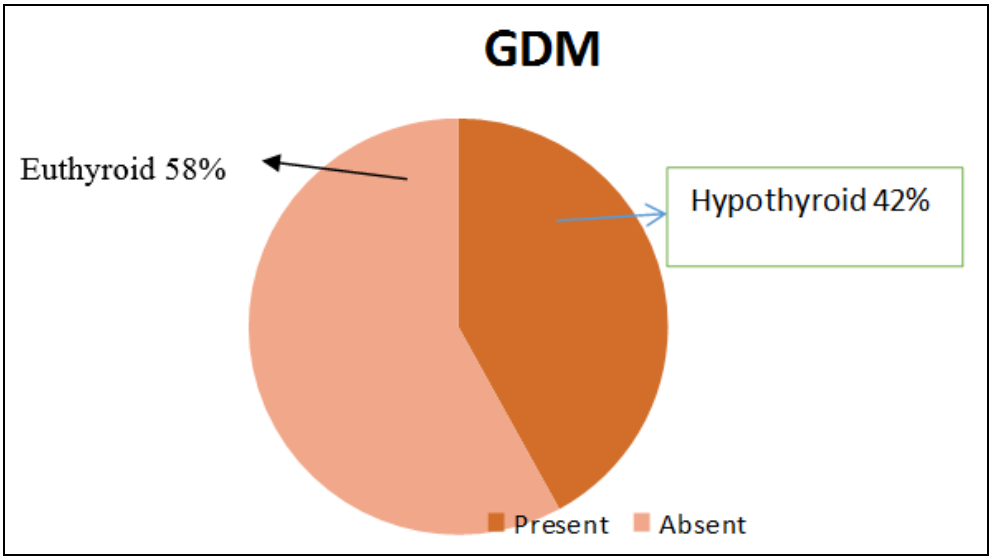

Fig 1: Bar chart showing distribution according to hypothyroid between the groups.

Among the participants in the GDM group, 42% were hypothyroid and 58% remains euthyroid.

Table 1: Distribution of Preterm deliveries between the GDM and normal group

Preterm	Group A	Group B	X^2	P value
Present	17	10	29.85	0.00001
Absent	25	48		

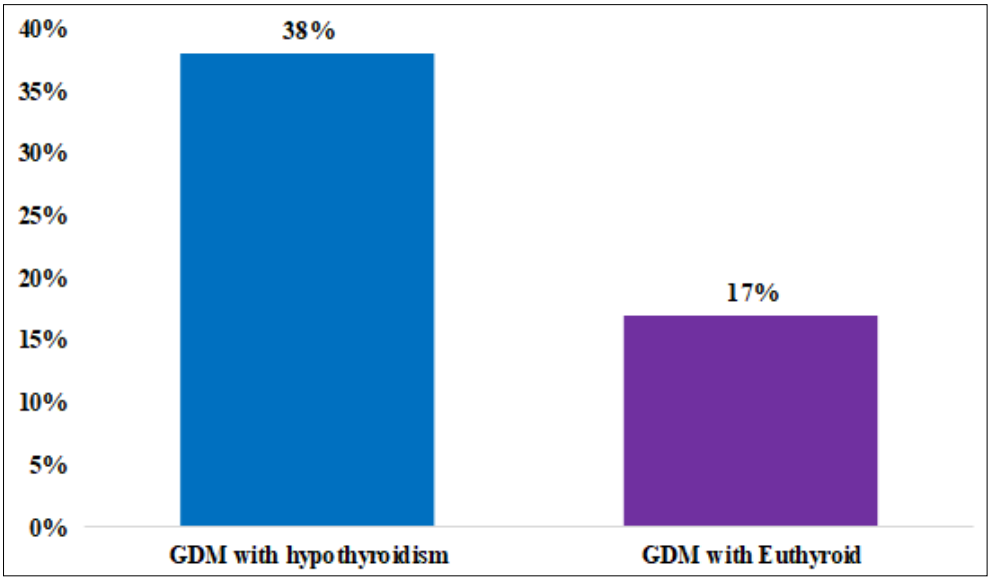

Fig 2: Bar chart showing distribution of Preterm deliveries between the groups

Among the participants in the GDM group with hypothyroidism, 38% had preterm delivery and among those without Hypothyroidism, 17% had preterm birth. The proportion of preterm delivery was more in GDM group than in control group

with P value of less than 0.05, and it is statistically significant. Among the participants in the GDM group with hypothyroidism, 57% has APGAR score of 8 and 43% has APGAR score of 9 at 1 minutes.

Discussion

The total number of pregnant women included in the study were 100. Among 100 women with GDM, 42 pregnant women were newly diagnosed hypothyroid (GROUP-A) and, 58% were euthyroid (GROUP-B). All of them had subclinical hypothyroidism. The incidence of hypothyroidism in GDM patients in our study was 42%. Mahmoud Parham *et al.* [1] study showed that the prevalence of hypothyroidism in GDM patients was 27.5%. In Ester vitacolonna *et al.* [2] study, the incidence of hypothyroidism in GDM was 2%. Lakshmanlal *et al.* [3], has stated that 42% patients in the study group had abnormal thyroid hormone levels, out of which 19% had hyperthyroidism and 23% had hypothyroidism with GDM. Hajiehshahbazian *et al.* [4] in their study found that the incidence of thyroid dysfunction in GDM was 4.5% and 25.6% in Pre Gestational Diabetes Mellitus. Stohl HE *et al.* [5] showed that of the women with hypothyroidism, 14.3% developed GDM. In meta analysis of 7 articles done by Li Li gong *et al.*, described the relationship between hypothyroidism and risk of GDM. It revealed that Relative Risk of GDM was increased in subclinical hypothyroidism with odds ratio of 1.55. The incidence of preterm delivery in Group A was 38% whereas in Group B was 17%, statistically significant with p value 0.00001. When hypothyroidism and GDM exists together as a combined endocrinopathy, the risks for preterm labour is doubled than when they exist alone. In a study conducted by Thomas N *et al.* [6] at CMC Vellore in GDM mothers, the incidence of preterm deliveries was 15.8%. Emmanuel *et al.* [7] in his study has shown the incidence of preterm deliveries in GDM was 3.7%. Amida *et al.* [8] study on maternal and fetal outcome in GDM, preterm labor was seen in 12% of patients. In Sri Latha *et al.* [9] study, preterm labor in hypothyroidism was 3.1%, in Sangitha *et al.* [10] was 11.2% and Sahu MT *et al.* [11] was 4.7% Hypothyroidism is an independent risk factors for preterm labour. Preterm labour in hypothyroidism is due to defective placentation. As a combined endocrinopathy, the risk is even more for preterm labor.

Conclusion

The goal of prenatal care is to ensure good health of mother and giving birth to a healthy baby. Carbohydrate intolerance is the most prevalent metabolic complication during pregnancy. The risk factors associated with GDM can be identified during early stage of pregnancy.

The screening for GDM in women during early pregnancy tends to reduce morbidity in fetus and mother through dietary or drug management. The studies also indicate an increased risk of hypothyroidism in women with GDM and maternal thyroid hormone status was related to the degree of metabolic imbalance. Hence it is very clear that there exists an interlink between diabetes and thyroid disorders. Finally, the present study concludes that hypothyroidism and GDM are interlinked and pose an increased threat of preterm delivery. Furthermore, the study emphasizes on the importance of evaluation of thyroid function in women with GDM owing to the increase in high perinatal and neonatal morbidity.

Conflict of Interest

Not available

Financial Support

Not available

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