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ORIGINAL RESEARCH

To Study the Association Between Maternal Serum Beta Human Chorionic Gonadotropin Levels at 11-20 Weeks of Pregnancy and Pregnancy Induced Hypertension at N.R.C.H. New Delhi

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INTRODUCTION

Pregnancy Induced Hypertension is an enigmatic condition despite exhaustive research andis associated with high maternal and perinatal mortality and morbidity like convulsions,abruption placenta, acute renal failure, liver hemorrhage, cerebrovascular complications,disseminated intravascular coagulation (DIC), prematurity,IUGRand NICU admission. Thisremains a subject of great clinical relevance and intense interest and is a day-to-day problemfor each and every obstetrician [1].

Pregnancy-induced hypertension (PIH) is defined as development of hypertension i.e blood pressure of140/90 mm of hg or more after 20 weeks of pregnancy in a previously normotensive and non proteinuricwomen.PIH includes Gestational Hypertension,Pre eclampsia, Eclampsia, Chronic Hypertension and Pre eclampsia Superimposed on Chronic Hypertension .Despite many active researches for years ,exact aetiology of this potentially fatal disorder remains poorly understood. PIH occurs as a result of abnormal placentation.A number of theories have been put forward where different biochemical markers have been implicated in the casual association of PIH ,but none of them are promising.

The current consensus is that in PIH due to abnormal placental invasion, mid trimester immunological changes occurs in trophoblasts, results in secretory response which is seen as a rise in beta HCG levels. Therefore, an estimationof beta-hCG level as a potential marker for the prediction of the development of preeclampsia warrants further investigation

The present study was planned to investigate the associations, if any, between circulating maternal serum beta HCG levels at 11-20 weeks of pregnancy and the development of pregnancy induced hypertension in pregnant women attending the department of Obstetrics and Gynaecology for safe confinement.

AIMS AND OBJECTIVES

Aim

The aim of the present study was to study the association between Maternal Serum Beta HCG (Human chorionic gonadotropin) levels at 11-20 weeks of pregnancy and PIH (Pregnancy Induced Hypertension).

Primary objective

To study the association between Maternal serum beta human chorionic gonadotropin levels at 11-20 weeks of pregnancy and development of PIH in all patients delivering at NRCH.

Secondary objective

To access the severity of PIH and its association with

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Maternal serum Beta HCG Level.

MATERIALS AND METHODS

The present study was conducted at the Department of Obstetrics and Gynaecology of the Northern Railway Central Hospital,Basant Lane, New Delhi, overa period of 6months,fromMay2023toOctober2023.The study was an institution-based descriptive study with a cross-sectional design conducted among the pregnant women with singleton pregnancies ,term or near term gestation ,admitted to the Department of Obstetrics and Gynaecology of the study institution in order to undergo delivery. A consecutive sampling technique was utilized to select 160 women,who underwent an interview using a pre designed,pre tested,research administered proforma.

Inclusion criteria

The inclusion criteria for the study population were –

1. All booked pregnant women admitted to the maternity ward of the study institution for safe delivery and confinement.
2. Women who had undergone serum beta hCG level estimation at 11-20 weeks of gestation(Dual /Triple marker test)
3. Primi/multigravida
4. Singleton pregnancies

Exclusion criteria

The exclusion criteria for the participants that were considered for the current study were as follows.

1. All pregnant women who had not undergone serum beta HCG level estimation at 11 to 20 weeks of gestation.
2. Pregnant women unwilling to provide written informed consent to take part in the present study
3. Pregnant women suffering from medical conditions complicating pregnancies such as diabetes, anemia, thyroid abnormalities, systemic lupus erythematosus
4. Fetus with suspected or confirmed congenital abnormalities
5. Multiple gestation and molar pregnancy
6. Patients of chronic hypertension
7. Pre-eclampsia superimposed on chronic hypertension

Methodology

The study was conducted after receiving written informed consent from all of the patients and after ethical clearance. The study population consisted of mothers with singleton pregnancies admitted to the department of Obstetrics and Gynaecology of the study institution in order to undergo delivery. A consecutive sampling technique was used to recruit 160 patients. The pregnant women had undergone serum beta hCG assay at 11-20 weeks of gestational age as a part of dual or triple marker test routinely done during antenatal care. For the diagnosis of pregnancy induced hypertension, the patients underwent blood pressure measurement using an aneroid sphygmomanometerat the time of their confinement for delivery.

Statistical Analysis:

The collected data were checked for consistency, completeness and entered into Microsoft Excel(MS-EXCEL, Microsoft Corp.)datasheet. Analyzed with the statistical program Statistical Package for the SocialSciences(IBMSPSS,version22).Datawereorganizedandpresentedusingthe principles of descriptive and inferential statistics. The data were categorized and expressedinproportions.Thecontinuousdatawereexpressedas Mean±SD.Thedatawere graphically presented in the form of tables, vertical bars, horizontal bar, pie diagram. Where analytical statistics were performed, a p-value of <0.05 was considered to be statistically significant for thepurpose of the study. For analytical statistics, Chi-square test was used for categorical data and student's-test was usedfor continuousdata.

RESULT

In the present study, most women belonged to the age group 25-29 years (38.1%). The mean age of the participants was 27.1±4.3 years. 45.6% women were primi mothers. Majority of the women had completed their secondary level of education (39.4%), and were from upper middle class families (58.8%). 73.1% of the women underwent dual marker testing for serum beta-hCG. The mean beta-HCG level of the participants was 19244.8±43179.1 mIU/ml, and the mean bet-hCG MOM value was 1.9±8.1. The mean SBP of the participants at the time of measurement was 123.7±12.6 mmHg and the mean DBP was 78.2±8.3 mmHg. As per the urine dipstick test, 6.3% had trace urine albumin, 2.5% had 1+, and 1.3% had 2+ urine albumin.

It was observed that the incidence of gestational hypertension was 10% and that of pre-eclampsia was 3.8%. when severity of PIH was classified, it was seen that the proportion of mild PIH was 10.6% and that of severe PIH was 3.1%. there was a statistically significant association between beta-hCG MOM value in the participants and the development of PIH in them (p-value <0.001). Both gestational hypertension (36.4% vs 3.1%) and pre-eclampsia (15.2% vs 0.8%) incidence was significantly higher in those with MOM values of ≥ 2. There was also a statistically significant association between beta-hCG MOM value in the participants and the severity of PIH in them. Both mild (36.4% vs 3.9%) and severe PIH (15.2% vs 0%) incidence was significantly higher in those with MOM values of ≥ 2. Gestational hypertension and pre-eclampsia were found to be significantly more prevalent in age 35 years and above (p-value <0.001). Gestational hypertension was found to be significantly more prevalent in primi women (p-value 0.042). No statistically significant association was observed between the socioeconomic status or educational

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status of the participants and the incidence of PIH among them (p-value 0.473 and 0.800 respectively).

CONCLUSIONS

The incidence of PIH was found to be high among the study participants, and the condition was associated with older maternal age and primiparity. Beta-hCG values as measured between 11 and 20 completed weeks of gestation were significantly raised in patients who subsequently developed PIH. This level was found to be associated with both the type as well as the severity of the condition in the women, thus providing further evidence that beta-hCG is an important potential marker of prediction as well as grading of pregnancy induced hypertension in Indian women.

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