ISSN- O: 2458 - 868X, ISSN –P: 2458 - 8687

International Journal of Medical Science and Innovative Research (IJMSIR)

IJMSIR : A Medical Publication Hub

Available Online at: www.ijmsir.com

Volume – 3, Issue –1, January - 2018, Page No. : 199 - 203

Association of Beta HCG levels in Pre Eclampsia

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Type of publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Background: Exact etiology of this potentially fatal disorder remains poorly understood. A number of theories have been put forward where different biochemical markers have been implicated in the casual association of pre eclampsia. This study was intended to find the association between serum Beta HcG level and Pre eclampsia.

Methods: This case control study was conducted on 200 pregnant women attending Antenatal OPD of IOG, Chennai between November 2013 and September 2014. The study subjects were selected on the basis of pre defined eligibility criteria.The serum levels of beta HcG were compared between case and control groups as well as between case and control groups as well as between mild and severe preeclampsia

Results: Out of 200 patients, 134 patients had no PIH had mean beta hcg levels of 71205, 45 patients had mild PIH with the beta hcg level of 101178 and 21 patients had severe PIH with the mean beta hcg levels of 154560.

Conclusion: There was a significant difference between the beta hcg levels in mild and severe preeclamptic women compared to the normotensive pregnant women .

Keywords: preeclampsia,serum beta hcg

Introduction

Preeclampsia is a relatively common syndrome, dangerous for mother and infant, UN predictable in its onset and progression and untreatable except through termination of pregnancy. It affects up to 10% of pregnant women and is considered a leading cause of fetal growth restriction and peri natal morbidity and mortality (1). Despite many active researches for years the exact etiology of this potentially fatal disorder remain poorly understood. A number of theories have been put forward where different biomarkers have been implicated in the casual association of pre eclampsia. Several studies have reported an association between serum Beta HcG levels in second trimester of pregnancy and subsequent development of pre eclampsia.(1,2). Human Beta Hc G is a glycoprotein with lipid structure that is expressed in trophoblast and various malignant tumors. Human placenta synthesizes steroid, protein and glycoprotein harmones throughout gestation.(3) The production of HcG by the placenta in early pregnancy is crucial for implantation and maintenance of blastocyst. Since, it is postulated that pre eclampsia is a trophoblastic disorder. It has become essential to understand this disease to investigate the pathologic and secretory reaction of the

placenta. Twin pregnancies and molar pregnancies produce higher levels of HcG and they are associated with a higher incidence of pre eclampsia than uncomplicated singleton pregnancies. Physiological concentrations of HcG is significantly increased in vitro capillary formation and migration of endothelial cells in a dose dependent manner and has a novel function in uterine adaptation to early pregnancy.(3,4 &5). As a possible role HcG in the patho physiology of pre eclampsia is not having good number of studies,we are engaged to determine the association between serum Beta HcG levels and pre eclampsia after 20 weeks of pregnancy.

Objectives of the study

- To study whether serum beta hCG levels during second trimester of pregnancy are associated with the development of pregnancy induced hypertension.

Material and Methods

Source of data

The main sources of data for the study are antenatal cases from the teaching hospital attached to IOG, Madras Medical College, Chennai.

Method of collection of data (including sampling procedure if any)

Total of 200 cases selected for the study from above mentioned hospital from November 2013 to September 2014 with following inclusion and exclusion criteria :

Inclusion criteria

- Primi / Multi gravida with singleton pregnancy with gestational age 14-20 weeks as determined by last menstrual period or ultrasound scan.

Exclusion criteria:

- With multiple pregnancy
- With chronic hypertension
- With diabetes mellitus
- With congenital anomalies.

Results: I

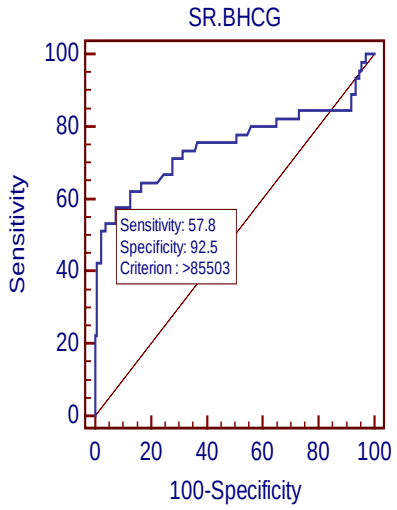
Table: 1 BIOMARKER - NORMOTENSIVE AND PIH GRADESR.BHCG.

					95% Confidence Interval for Mean	
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound
NO PIH	134	71205.60	12483.383	1078.400	69072.57	73338.64
MILD	45	101178.49	37804.364	5635.542	89820.80	112536.18
SEVERE	21	154560.05	27929.414	6094.698	141846.73	167273.36
Total	200	86701.72	34547.956	2442.909	81884.41	91519.03

Out of 200 patients, 134 patients had no PIH had mean beta hcg levels of 71205, 45 patients had mild PIH with the beta hcg level of 101178 and 21 patients had severe PIH with the mean beta hcg levels of 154560.

Result II

Diagram 1: Mild preeclampsia vs. No preeclampsia



Sensitivity = 57.8

Specificity = 92.5

Criterion >8553

Area Under Curve(A UC)=0.750249

95% CI= 0.680197 to 0.811818.

Z statistics= 4.691

P<0.0001

Youden statistics = 0.5032.

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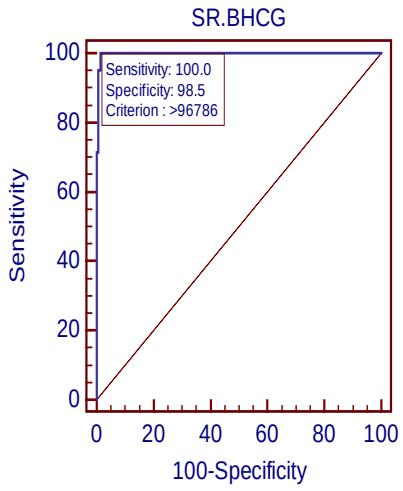
Diagram 2 :Severe preeclampsia vs. No preeclampsia



Sensitivity = 100.0

Specificity = 98.5

Criterion >96786

Area Under Curve(A UC)=0.997512

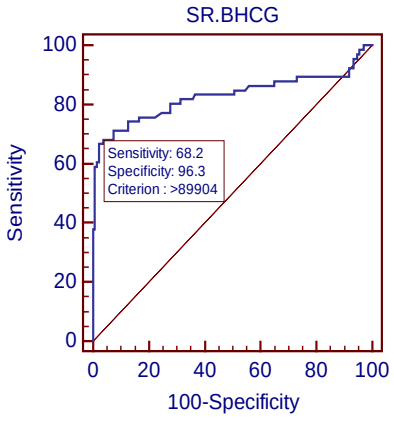
95% CI= 0.680197 to 0.811818.

Z statistics= 211.275

P<0.0001

Youden statistics = 0.9851.

Diagram 3: Mild + Severe Preeclampsia vs No preeclampsia.



Mild+Severe Preeclampsia vs No preeclampsia.

Sensitivity = 68.2

Specificity = 96.3

Criterion >89904

Area Under Curve(A UC)=0.82894

95% CI= 0.769440 to 0.878374

Z statistics= 8.430

P< 0.0001

Youden statistics = 0.6445.

Discussion

Out of 200 patients, 134 patients had no PIH had mean beta hcg levels of 71205, 45 patients had mild PIH with the beta hcg level of 101178 and 21 patients had severe PIH with the mean beta hcg levels of 154560. Patients with Mild and No PIH, Receiver Operating Characteristic curve was applied for Mild PIH(45) and No PIH(134) patients and got sensitivity as 57.8 and specificity as 92.5 for the optimum cut off value of > 85503. Area Under curve=0.750249.

Receiver Operating Characteristic curve was applied for Severe PIH(21) and No PIH(134) patients and got sensitivity as 100 and specificity as 98.5 for the optimum cut off value of > 96786. Area Under curve=0.99752. Receiver Operating Characteristic curve was applied for Mild PIH(Mild+Severe=66) and No PIH(134) patients and got sensitivity as 68.2 and specificity as 96.3 for the optimum cut off value of > 89904.Area Under curve=0.828924

Conclusion

The present study shows elevated maternal serum beta hcg levels in early second trimester was associated with development of pregnancy induced hypertension later in the pregnancy. Elevated levels of serum beta hcg values more than 1 lakh m IU/ml was associated with increased severity of PIH with significant probability values.

In the prediction of severe PIH, serum beta hcg levels is associated with more sensitivity, specificity and Area under curve.(sensitivity 100 specificity 98.5 and Area

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under curve 0.99)than mild PIH.(sensitivity=57.8 specificity =92.5 and Area under curve=0.750249)

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Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee.

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