

Estimation of Raised Mid Trimester Beta HCG as Predictor of PIH

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Abstract: The study of estimation of mid trimester serum Beta HCG for the prediction of PIH is one of the most important mile stone of modern obstetrics, in that it is a non invasive method to predict future PIH. The primary aim of the present study is prediction rather than prognostication. The idea of estimation of B HCG helps us to predict the development of PIH earlier to 20 weeks. Doppler velocimetry is costly when compared with estimation of B HCG. Estimation of mid trimester B HCG can be used to predict the early development of PIH and can be managed before developing the overt disease to give better fetal outcome and to decrease fetal as well as maternal morbidity and mortality. It is concluded in this study that it could be used as a cost effective test which could be easily performed as out patient basis.

Keywords: Doppler, PIH, Prediction of PIH, serum β hCG, uterine artery

I. Introduction

Hypertensive disorders complicating pregnancy are common and is one among triad along with hemorrhage and infections, that results in much of the maternal morbidity and mortality related to pregnancy. Hypertension associated with pregnancy was the most common medical risk factor. Hypertensive disorder was the major hazard in pregnancy and a challenge to the medical and obstetrics health care team. How pregnancy incites (or) aggravates hypertension remains unsolved. Despite the intensive research the exact cause is unknown, however maternal symptoms are through to be secondary to endothelial cell dysfunction.

Several methods of identifying pregnant women who are at risk of pre eclampsia have been proposed. These include Angiotensin II pressor response, roll over test ; isometric hand grip exercise test ; and mean arterial pressure (MAP). But these tests launch the high limitations as screening test in the clinical setting, because of their complexity, the high incidence of false + ve results and subjective nature of result interpretation. Placental function changes in the form of increased serum Beta HCG has been documented and several prospective studies indicates changes in the hormone which may be present before the clinical diagnosis of pre eclampsia.

Human chorionic gonadotropin has been acknowledged as a hormone for years. Recent studies have revealed its immunological face so much that newer applications of HCG are now confined to the immunological face rather than its endocrinal face. Many reasons have been postulated for suspecting the role of HCG in predicting immunological conditions in obstetrics (sayeed et al 1984) The purpose of this study is to determine whether the increased mid trimester serum Beta HCG in the maternal serum is a better predictor of pre eclampsia.

II. Aim And Objective Of The Study

To investigate whether the increased Beta HCG plasma concentration in early second trimester in a population of multiparous female would predict the occurrence of PIH. Maternal serum HCG at mid trimester was considered raised if the levels were more than 2 MOM.

III. Materials And Methods

The present study was undertaken from May 2015 to April 2016 in the department of Obstetrics and Gynecology at Coimbatore Medical College Hospital, Coimbatore. Sixty eight patients were recruited into this study after obtaining a written informed consent.

3.1 Test group:

3.1.1. Inclusive Criteria

Those with past history of

- PIH remote from term.
- Recurrent spontaneous abortion.
- Recurrent still births.
- Accidental Haemorrhage.
- IUGR.

- Those with family history of PIH.
- Elderly primi – Gravida more than 35 years.

3.1.2.Exclusion Criteria :

1. Gestational age < 16 weeks and > 20 weeks.
2. H / O Chronic Hypertension.
3. IVF.
4. Multiple Pregnancies.

3.2 Methods

1. Estimation of Beta HCG at 15 – 20 weeks of gestation. 5 ml of venous blood was taken between 16 – 20 Weeks serum β HCG was estimated by ELISA method. (Chemilumiscene technique)
2. Dating Ultrasound scan at 12th week for confirmation of gestational age.
3. Frequent follow up for BP monitoring for early identification of PIH

All females in the study group were examined once in a month till 28 weeks, once in fortnight till 34 weeks, and there after weekly till delivery. At every visit, BP was recorded and fetal growth was assessed.

4. Urinary Protein and edema
5. Statistical analysis

Chi – squire test was used to check the statistical significance.
p value of <0.05 was considered to be statistically significant.

IV. Results And Analysis

The results of the study of estimation of mid trimester serum Beta HCG at 15th, 16th and 17th weeks in a group of 68 women during the period May 2015 to April 2016 has been tabulated and analysed.

Table – I Age group of the patients.

Age	Number
20 - 30	56
>30	12

Out of 68 patients, 56 patients were between the age of 20 – 30 years. 12 patients were more than age of 30 years.

Table – II Parity

Parity	Numbers
Primi gravida	7
G2 A1	30
G3 A2	10
Multi parous	21

Out of 68 patients, 7 were primi and 61 were multi gravida. In 61 multigravidae, 30 of them had one abortion and 10 patients were with a history of previous two abortion and 21 were multiparous.

Time of pregnancy at which \square HCG tested :

10. Women tested at 15th week, 30 women tested at 16th week, 28 women tested at 17th week. Of them 30 had Beta HCG >2MOM, 38 had Beta HCG <2MOM.

The clinical signs and symptoms of PIH manifested after 20th week, but pathophysiological changes starts early at 14th week of gestation itself. So the estimation of serum Beta HCG was carried out between 15th week to 20th week gestation.

Table – III Weeks of pregnancy at which HCG was tested

Weeks Of Pregnancy	No. Of. Cases	>2 MOM	<2 MOM
15 th Week	10	4	6
16 th Week	30	10	20
17 th Week	28	16	12

Subjects with Beta HCG > 2 MOM – 30
 Subjects with Beta HCG < 2 MOM – 38

Development of PIH

12 Subjects developed PIH among 30 subjects with Beta HCG of >2 MOM (40%). 18 subjects did not develop PIH who had Beta HCG > 2 MOM. 5 subjects developed PIH among 38 subjects who had Beta HCG < 2 MOM 13.5 % 33 subjects not developed PIH with Beta HCG < 2 MOM 86.85 %.

Table : IV Development of PIH

Diagnosed as PIH	>2 MOM		< 2 MOM	
	No	%	No	%
Yes	12	40 %	5	13.5 %
No	18	60 %	33	86.85 %

Statistical significance was checked using the “Chi-square test” $X^2 = 4.4$ (N_0 Rejected). The levels of serum hCG was found to be higher in patients with the tendency to develop PIH in the course of pregnancy and this increased levels were found to be statistically significant ($p < 0.05$).

Duration of pregnancy at which PIH developed

Of the 12 subjects who developed PIH with Beta HCG > 2 MOM, 3 developed PIH after 32 weeks. 9 subjects developed PIH between 28 to 32 weeks. Of the 5 subjects developed PIH with Beta HCG of < 2 MOM, 4 had PIH after 32 weeks, 1 developed PIH at 28 to 32 weeks.

Pregnancy outcome is poor in early onset of PIH patients than the patients with late onset of PIH. By the way of estimating serum Beta hCG at mid trimester will predict the early onset of PIH (remote from the term). The pregnancy outcome can be improved by prophylactic measures.

Table : V Duration of pregnancy at which PIH developed :

Weeks	Beta HCG > 2 MOM		Beta HCG < 2MOM	
	Number	%	Number	%
> 32	3	33.5	4	80 %
28 – 32	9	66.5	1	20 %

It is very significant that 9 cases out of 12 with Beta HCG levels > 2 MOM developed PIH between 28 to 32 weeks. 4 out of 5 patients who had Beta HCG of < 2 MOM developed PIH after 32 weeks.

	>32 weeks	28 to 32 weeks	Total
>2 mom	3	9	12
<2 mom	4	1	5
	7	10	17

‘ P ‘ Value is < 0.05. This difference is statistically significant.

Table : Vithe Gestational Age At Delivery (For Those Developed Pih)

Gestational age in weeks	Number
<34	2
34 – 7	7
>37	8

Of the 17 patients who had PIH, two patients delivered at < 34 weeks and seven delivered between 34 – 37 weeks and eight delivered at > 37 weeks.

Table : VIIMode of delivery

Mode of delivery	Numbers
Vaginal delivery	11
LSCS	6

Out of 17 patients 11 delivered by labour natural, 6 delivered by LSCS.

Table: Viiiirth Weight

Birth Weight	No
<2.5 kg	2
>2.5 kg	15

Of the 17, 2 babies were less than 2.5 kg and 15 babies were more than 2.5 kg. The babies born with < 2.5 kg are delivered at < 34 weeks.

V. Discussion

If selection criteria is selective, screening the high risk individuals only means, pick up rate might be better. It seems to have a definite role in cases with specified adverse obstetrics out come in the past with strong immunological basis. This study was designed with the specific aim of prediction rather than prognostication.

VI. Conclusion

The study of estimation of serum Beta HCG at mid trimester for the prediction of PIH is one of the most important achievement of modern obstetrics. For the first time the obstetrician has the ability of predict the development of PIH in non – invasive way.

Out of all prediction tests, Doppler velocimetry of uterine arteries (Non invasive method) one of the best method, to predict the development of PIH, that is persistence of the uterine artery notch after 20 weeks usually indicates severe hypertensive disease. The rationale for this is based upon the presumption that the pathophysiology of pre eclampsia includes impaired trophoblastic invasion of spiral arteries leading to obstruction in the utero placental blood flow.

But this method predict the development of PIH only after 20 weeks, when compared with estimation of B HCG help us to predict the development of PIH earlier to 20 weeks. Doppler velocimetry is costly when compared with estimation of B HCG.

Estimation of mid trimester B HCG can be used to predict the early development of PIH and can be managed before developing the overt disease to give better fetal outcome and to decrease fetal as well as maternal morbidity and mortality. Cost effective test which could be easily performed as out patient basis.

References

- [1]. Leon Chesley : Hypertensive Disorders in Pregnancy New York : Appleton Century Crofts, 1978 : 628 PP.
- [2]. Pankaj Desai, Sonal Rao et al 2002 : "Predictive Value of Raised Mid Trimester Beta HCG in PIH" Journal of Obstetrics & Gynaecology of India Vol. 52 No : 1
- [3]. Tanya K. Soremsen M.D, Michell. Williams et al, 1993 " Elevated Second Trimester Human Chorionic Gonadotropin and Subsequent Pregnancy Induced Hypertension". Amj Obstetrics Gynecol 1993 ; 169 ; 834 – 8.
- [4]. Emma J. Davidson et al 2003 : "Meternal Serum Inhibin, Human Chorionic Gondadotropin and Alpha – Feto Protein as Second Trimester Predictor of Pre Eclampsia" British Journal of obstetrics and gynecology Vol. 110.46 – 52.
- [5]. Review Edition Lippman, et al 1993. "An Association Between Elevated Levels of Chorionic Gonadotropin in the Mid Trimester and Adverse Pregnancy Out Come" AMJ Obstet Gynecol : 168 : 1852 – 7.
- [6]. Jaiswal SP, et al 2003 : "Maternal Serum Human Chorionic Gondatropin as a Predictor for Pregnancy Induced Hypertension." J. Obstet Gynaecol Ind Vol 53, No. 6.
- [7]. Gonen - R, et al 1992 " The Association Between Unexplained Second Trimester Maternal Serum HCG Elevation and Pregnancy Complication" Obstet – Gynaecol 1992 Jul : 80 (1) 83 – 6.
- [8]. Gravett, C.P et al 1992 "Elevated Second Trimester Maternal Serum Beta HCG Conclusion and Subsequent Adverse Pregnancy Out Come" AMJ Genet 1992 Nov 1: 44(4) : 485.
- [9]. Said – M-E, et al 1984 "Beta HCG Levels Before and after the Development of Pre Eclampsia". BR – J – Obstet – Gynaecol 1984 Aug : 91 (8) : 772 – 5.