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Research Article

Maternal and perinatal outcome in pregnancy induced hypertension and preeclampsia

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ABSTRACT

Background: Presence of proteinuria in hypertensive disorders of pregnancy has profound effect on maternal and perinatal outcome. Pregnancy induced hypertension is characterized by hypertension and absence of proteinuria. Preeclampsia is characterized by hypertension and proteinuria.
Methods: This is a hospital based prospective comparative study of maternal and perinatal outcome in pregnancy induced hypertension and preeclampsia.
Results: Maternal complications were significant more in preeclampsia group compared to pregnancy induced hypertension group. Preterm deliveries, foetal growth restriction and still birth were more common in preeclampsia group. The rate of vaginal deliveries was more frequent in the group with pregnancy induced hypertension than preeclampsia.
Conclusions: Presence of proteinuria is a predictor for poor maternal and perinatal outcome in hypertensive disorders of pregnancy.

Keywords: Pregnancy, Hypertensive, Preeclampsia, Preterm deliveries, Vaginal deliveries

INTRODUCTION

Hypertensive disorder of pregnancy complicates 5 to 8% of pregnancies and is a major cause of maternal and perinatal morbidity and mortality.[1] Pregnancy induced hypertension is a syndrome of hypertension appearing after 20 weeks of gestation without proteinuria. Preeclampsia is pregnancy complicated with hypertension and proteinuria.[2] This disorder is linked to defective placentation, oxidative stress with release of vasoactive substances, increased thromboxane and/or cytokines triggered vascular and organ dysfunction.

It is well observed that maternal and perinatal outcome are adverse with preeclampsia due to end organ damage as compared to pregnancy induced hypertension, at the same time there are insufficient comparative studies to support the same.[3] Hence this study is contemplated to be carried out in women with pregnancy induced hypertension and preeclampsia in the background of local ethnicity. Study of the role of proteinuria in predicting maternal and perinatal complications will aid in clinical management by identifying the high risk women who may need aggressive management and the low risk women in whom unnecessary interventions may be avoided.

METHODS

This is a hospital based prospective, comparative study. The outcome measures were maternal complications like eclampsia, HELLP/partial HELLP syndrome, abruptio placenta, DIC, acute kidney injury, intracerebral haemorrhage, pulmonary oedema and perinatal complications like preterm births, foetal growth restrictions, low APGAR, still birth, meconium aspiration and neonatal death.

Source of data is patients admitted to the department of obstetrics and gynaecology in a tertiary care teaching hospital.

Sample size n1=100; for patients with pregnancy induced hypertension. n2=120; for patients with preeclampsia.

Inclusion criteria

All pregnant women admitted in the hospital diagnosed as pregnancy induced hypertension and preeclampsia.

Exclusion criteria

- Eclamptic patients
- Hypertension due to other causes like renal disorders, adrenal disorders

Method of study

Pregnant women admitted to the department of obstetrics and gynaecology, in the tertiary care hospital, were categorized into two groups namely pregnancy induced hypertension and preeclampsia as per the International society for the study of hypertension in pregnancy (ISSHP) classification criteria for the definitions of pregnancy induced hypertension and preeclampsia.

Pregnancy induced hypertension was defined as systolic blood pressure of at least 140 mmHg and/or diastolic blood pressure of at least 90 mmHg on 2 occasions at least 6 hours apart after the 20th week of gestation in women known to be normotensive before pregnancy and regressing after delivery. Preeclampsia is onset of hypertension after 20 weeks gestation with proteinuria of more than 300 mg/day and or oedema.

- Demographic and family histories were taken.
- BP was measured in supine position.
- Urine proteins were measured by dipstick method.

1+ :>/= 300mg/l and <1g/l
2+ :>/= 1g/l and <5g/l
3+ :>/= 5g/l

The following investigations were done for all patients: Hb%, PCV, blood group and Rh, VDRL, HIV, HBsAg PIH profile: serum creatinine, blood urea, serum uric acid, liver function test, fundoscopy, NST, and ultrasound scan. These patients were then followed up to study the maternal and perinatal outcome.

Data analysis

Statistical comparison of the two groups was carried out using Pearson's Chi square test and student's t test. A 'p' value of <0.05 was considered statistically significant.

Written informed consent in vernacular language was taken from the study patients.

RESULTS

Table 1: Comparison of baseline data.

Parameter	Pregnancy induced hypertension (n=100) group	Preeclampsia (n=120) group	P value
Maternal age in years	23.29±4.45	24.59±3.68	<0.05
Systolic BP (mmHg)	149.68±13.05	156.97±17.83	<0.01
Diastolic BP (mmHg)	98.57±8.58	102.84±14.01	<0.05
Gravida	1.63±0.81	1.69±1.03	>0.05
Para	0.56±2.52	0.57±1.90	>0.05
Multiple pregnancies (%)	0.02	0.00	>0.05
Gestational age at diagnosis in weeks	33.88±4.59	32.98±4.80	>0.05
Gestational age at delivery in weeks	35.23±2.62	33.70±3.88	>0.05
Caesarean section (%)	16.05	26.37	>0.05
Mean birth weight	2.56±0.79	1.96±0.89	>0.05
Low APGAR score (%)	8.64	26.37	>0.05
Perinatal mortality (%)	2.47	21.9	>0.05
Maternal complications (%)	1.00	17.50	>0.01

A total of 220 pregnant women were studied during this period, of which 100 women had pregnancy induced hypertension and 120 women had preeclampsia. The average age of women with pregnancy induced hypertension was 23.29 years whereas those with preeclampsia was 24.59 years ($p<0.05$). Diastolic blood pressure was significantly ($p<0.05$) greater in preeclampsia group compared to pregnancy induced hypertension group.

Table 2: Comparing maternal outcome.

Maternal outcome/complications	Pregnancy induced hypertension (n=100) group	Pre eclampsia (n=120) group	P value
Eclampsia	Nil	11	<0.01
HELLP/partial HELLP	Nil	03	<0.05
Abruptio placenta	01	02	<0.05
DIC	Nil	Nil	-
Acute renal failure	Nil	Nil	-
Intracerebral haemorrhage	Nil	Nil	-
Pulmonary oedema	Nil	01	<0.05
Others	Nil	10	<0.01
No complications	99	93	<0.05

Table 3: Comparing obstetric outcomes.

Obstetric outcome	Pregnancy induced hypertension (n=100)	Pre eclampsia (n=120)	P value
Vaginal delivery	81	83	<0.05
Operative vaginal delivery	01	06	>0.05
Caesarean section	18	31	>0.05

Table 4: Comparing perinatal outcome.

Perinatal outcome	Pregnancy induced hypertension (n=100)	Pre eclampsia (n=120)	P value
Preterm	44	74	<0.01
FGR	02	13	<0.01
5 min APGAR less than 5	12	33	<0.01
5 min APGAR less than 7	12	32	<0.01
Still birth	02	22	<0.001
Meconium aspiration	13	15	>0.05
Neonatal death	01	03	>0.05

Maternal complications like eclampsia, abruption, pulmonary oedema were significant ($p<0.05$, $p<0.01$) more in preeclampsia group compared to pregnancy induced hypertension group.

As for obstetric outcome, the rate of vaginal delivery was more frequent in the group with pregnancy induced hypertension group compared to those with preeclampsia. 21 women with preeclampsia had perinatal complications whereas only 1 woman with pregnancy induced hypertension had complication associated with delivery ($p<0.05$).

Considering foetal outcome, pre term deliveries, foetal growth retardation (FGR) and still birth was significantly more frequent in women with preeclampsia as compared to those with pregnancy induced hypertension.

DISCUSSION

A retrospective study conducted by Liu CM et al had showed that incidence of maternal complications was higher in women with preeclampsia as compared to those with pregnancy induced hypertension (without proteinuria).[3] They also found that maternal age was a significant predictor of preeclampsia.

This study done to evaluate the role of proteinuria in the maternal and perinatal outcome in PIH and preeclampsia has found that maternal complications are more common in the group with preeclampsia as compared to those with pregnancy induced hypertension.[4,5]

The results of this study are also on similar lines maternal complication in terms of eclampsia was found to be

significantly higher in the group with proteinuria ($p<0.01$). And this study also points towards a significant difference in the average age of women in the two groups

In a study of factors affecting perinatal mortality in eclampsia by Dhananjay BS et al, it was found that the maternal deaths were higher in the group with proteinuria more than 1+. In the present study no maternal deaths were reported in either of the study groups. This might be due to the small study sample and due to the fact that the former above mentioned study included only eclamptic women.[6]

The former group also had increased incidences of FGR, preterm delivery and poor APGAR score ($p<0.01$). The study conducted by Liu CM et al had also shown similar findings. This could be explained by the vascular and placental damage associated with proteinuria in preeclamptic women affecting foetal growth and maturity. Leading to various degrees of foetal morbidity, and foetal damage may be such as to cause foetal death.[6]

The present study has found that the group with proteinuria was 11 times more likely to have stillbirths as compared to those without proteinuria ($p<0.001$; OR=11). These findings are also in accordance with the earlier studies done by Liu CM et al and Dhananjay BS et al.[3,6] Though the incidence of stillbirth was seen to be higher in this study.

This study also found that the average blood pressure was higher in preeclampsia women who again were observed by Liu CM et al. It is possible that the maternal micro vascular damage and endothelial dysfunction associated with high blood pressure may cause the proteinuria, oedema, utero placental vascular insufficiency and the development of other risk factors leading to the adverse perinatal outcome as shown by the higher incidences of stillbirth, FGR, pre term delivery and low APGAR score in the women with preeclampsia.

Another observation in this study is that the frequency of vaginal delivery was higher in the group with PIH as compared to those with preeclampsia. Or in other words women with preeclampsia were more likely to go in for an operational or assisted delivery ($p<0.05$) as compared to the women with pregnancy induced hypertension. This is consistent with the findings of Liu CM et al.

This study has shown a significantly high incidences of maternal complications and poor perinatal and foetal outcomes in women who had proteinuria (preeclampsia) compared to those without proteinuria calling for development of precautionary strategies, well prepared protocols and timely diagnosis of preeclampsia at the earliest possible stage which might improve the pregnancy outcome.[7]

The fact that proteinuria as an independent factor could be responsible for the disease progression, as indicated by this study might aid in clinical management by identifying the highest risk women who may need aggressive management.[8]

Although significant proteinuria was the main diagnostic criteria for preeclampsia, the importance of pregnancy induced hypertension with very high blood pressure or with mild proteinuria cannot be overlooked as pregnancy induced hypertension and preeclampsia could be the two spectrums of the same pathological mechanism.

The strengths of this study were that it was a prospective, comparative study between preeclampsia women (with proteinuria) and women with pregnancy induced hypertension (without proteinuria).

The limitation of this study was the small sample size.

CONCLUSION

The study shows that incidence of maternal complications as well as foetal morbidity and mortality is significantly higher in the group with proteinuria (preeclampsia) as compared to that without proteinuria (pregnancy induced hypertension). The presence of proteinuria is an important predictor for adverse maternal and perinatal outcome.

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