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Fetomaternal Outcome in Women with Pregnancy Induced Hypertension versus Normotensive Pregnancy

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ABSTRACT

Background: A hypertensive disorder in pregnancy comprises one of the deadly triad along with hemorrhage and infection-that contributes greatly to maternal morbidity and mortality. The aim of this study was to compare the fetomaternal outcome in pregnancy induced hypertension with normotensive pregnant women.

Methods: A cross sectional prospective study was conducted in Paropakar Maternity and Women's Hospital from 1st February 2018 to 1st May 2018. All pregnant women seeking help for hypertension during this period was included in the study and were followed up to six weeks of postpartum period.

Results: Total 40 patients were enrolled in each arm. The highest number of pregnancy induced hypertension cases was seen in age group 20-24years (32.5%) and were mostly primigravidas (60%). The commonest symptom in Pregnancy induced hypertension was headache 47.5 %. The mean hemoglobin value was 11.91 gm/dl, mean SGPT (Gestational hypertension 25.44 IU/L, preeclampsia 55.25 IU/L and eclampsia 32.17 IU/L) and mean platelet count was 1, 95,140 lakh/cumm in pregnancy induced hypertension. Mean prothrombin time in gestational hypertension was 13.78±0.7 seconds. Most common maternal complication was preterm labor and fetal complication was prematurity. The most common mode of delivery was vaginal.

Conclusions: Pregnancy induced hypertension was more common in primigravida with young age group of 20-24 years and presented commonly with complain of headache. Preterm labor was the most common maternal complication similarly prematurity was the commonest fetal complication seen in pregnancy induced hypertension. Vaginal delivery was the commonest mode of delivery. Blood investigation showed significant thrombocytopenia in eclampsia and decreased prothrombin time in gestational hypertension.

Keywords: Fetal outcome; maternal complications; pregnancy induced hypertension.

INTRODUCTION

Pregnancy induced hypertension (PIH) includes gestational hypertension, preeclampsia and eclampsia. It is one of the major causes of maternal and perinatal morbidity and mortality.¹ This complicates 5 to 10% of all pregnancies. Maternal risks associated with hypertensive disorders are development of superimposed preeclampsia, eclampsia, HELLP syndrome (hemolysis, elevated liver enzymes and low platelets), acute renal, hepatic failure and others. Perinatal complications include preterm delivery, low birth weight, prematurity, intrauterine fetal death, intrauterine growth restriction, fetal asphyxia, stillbirths and neonatal deaths.² Usually PIH resolves by 12th weeks following termination of

pregnancy or delivery.³ The study will help clinicians to better manage and to predict the fetomaternal outcome depending on the severity of symptoms.

METHODS

This study was conducted in Paropakar Maternity and Women's Hospital, Kathmandu, Nepal from 1stFebruary to 1st May 2018. Ethical approval was obtained from Institutional review board (IRB), National Academy of Medical Science (NAMS). Informed consent was obtained from the pregnant women included in the study. All pregnant women seeking treatment for hypertension during this period were included whereas normotensive pregnant women were randomly selected

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among those admitted, in the study. Patients with chronic hypertension, multiple gestations, gestational trophoblastic disease, and preexisting medical disorders like renal disease, thyrotoxicosis, liver disease and hemophilia were excluded from the study.

National High Blood Pressure Education Program working Group on High Blood Pressure in Pregnancy (NHBPEP 2000)⁴ classification of the hypertensive disorder of pregnancy was followed to diagnose PIH.⁵

All Pregnant women were planned for vaginal delivery until indication for cesarean section is met like fetal distress, failed induction of labor, HELLP syndrome, Severe PE or eclampsia with unfavorable cervix. Apgar score was documented for all babies at 1 min and 5 min respectively. Any maternal and fetal complication and management was recorded. Study group was followed up till 6 weeks postpartum.

RESULTS

During the 3 months of the study period total 80 patients were enrolled, with 40 normotensive and 40 PIH

(gestational hypertension 18 case, preeclampsia 16 case and eclampsia 6 cases).

The bar diagram shows that PIH was common in primigravida followed by second gravida ,third gravida and so on. In PIH with gestational hypertension (55.56%), preeclampsia (68.75%) and eclampsia (50%) were primigravida .

Women with PIH commonly presented with complain of headache (47.5%), followed by edema (25%), nausea and vomiting (17.5%), epigastric pain(17.5%), blurring of vision (12.5%) and jaundice (7.5%). Headache was the prominent symptom in preeclampsia followed by blurring of vision and epigastric pain which was seen in case of severe preeclampsia. Jaundice was seen only in cases of eclampsia.

The table above shows that 10% of PIH occur in less than 20 years age group, 32.5% in 20-24 years, 32.5% in 25-29 years, 2% in 36-40 years and 7.5% in 41 years and above. Thus PIH was seen commonly in age group 20-24 years and 25-29 years.

Table 1. Distribution of PIH patient according to age group (n =40).

Age Group	Normotensive (%) n=40	PIH(n=40)		
		Gestational hypertension (%) n=18	Preeclampsia (%) n=16	Eclampsia (%) n=6
Less than 20	5 (12.5%)	2 (11.11%)	2 (12.50%)	0
20-24	14 (35%)	6 (33.33%)	4 (25.00%)	3 (50 %)
25-29	15 (37.5%)	5 (27.78%)	6 (37.5%)	2 (33.33 %)
30-35	6 (15%)	2 (11.11%)	3 (18.75%)	0
36-40	0	1 (5.56 %)	0 (0.00%)	0
41 and above	0	1 (5.56%)	1 (6.25%)	1 (16.67 %)

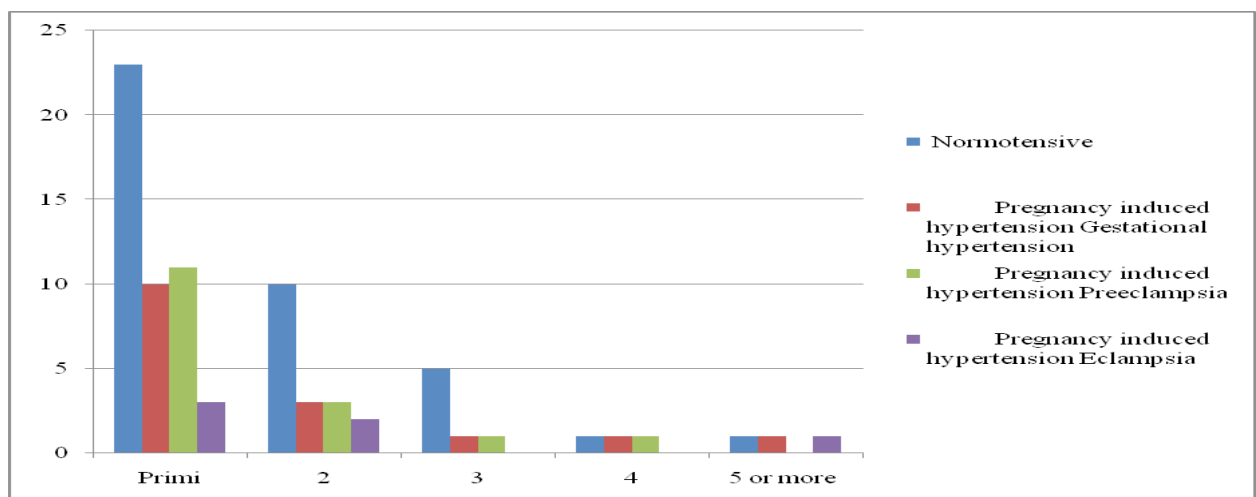


Figure 1. Distribution of PIH and normotensive according to parity.

Table 2. Incidence of different Sign and Symptoms in PIH and normotensive group.

Symptoms	Normotensive n=40	PIH (n=40)		
		Gestational hypertension n=18	Preeclampsia n=16	Eclampsia n=6
Headache	1 (2.5%)	5 (27.78%)	11 (68.75%)	3 (50%)
Nausea and vomiting	0	0	3 (18.75%)	4 (66.67%)
Blurring of vision	0	0	5 (31.25%)	0
Epigastric Pain	0	0	5 (31.25%)	2 (33.33%)
Jaundice	0	0	0	3 (50%)
Edema	1 (2.5%)	1 (5.56%)	6 (37.5%)	3 (50%)

Table 3. Mean HB, Platelet Count, PT and SGPT values in each group.

Variables	Normotensive n=40	PIH n= 40					
		Gestational hypertension n= 18	P	Preeclampsia n= 16	P	Eclampsia n= 6	P
Hemoglobin (gm/dl)	12.01±1.26	12.23±5.88	0.86	11.46±2.2	0.35	12.12± 2.5	0.92
Platelet Count (lakh/ cumm)	215823±47420	218500±55792	0.87	184938±71319	0.11	152267±68894	0.03
PT(secs)	14.13±0.4	13.78±0.7	0.05	13.87±0.89	0.27	13.83±0.4	0.09
SGPT(U/ml)	21.63±6	25.44±11.8	0.2	55.25±81	0.1	32.17±18.86	0.18

Table 4. Pattern of maternal complication with PIH.

Complications	Normotensive n=40	PIH (n=40)			
		Gestational hypertension n=18	Preeclampsia n=16	Eclampsia n=6	
Preterm Labor	1 (2.5%)	1 (5.56%)	7 (43.75%)	2 (33.33%)	
APH	0	0	0	0	
Retinopathy	0	0	1 (6.25%)	0	
Eclampsia	0	0	0	6 (100%)	
CVA	0	0	0	0	
HELLP Syndrome	0	0	3 (18.75%)	1 (16.67%)	
DIC	0	0	0	0	
ARF	0	0	0	0	
ARDS	0	0	0	0	
Liver Dysfunction	0	0	3 (18.75%)	1 (16.67%)	
ICU admission	0	1 (5.56%)	5 (31.25%)	6 (100%)	
PPH	0	2 (11.11%)	0	0	
Mortality	0	0	0	0	

Table 5. Fetal complication associated with PIH. (n=40)

Complications	Normotensive n=40	PIH (n=40)		
		Gestational hypertension n=18	Preeclampsia n= 16	Eclampsia n= 6
Low birth weight	7(17.5%)	5(27.78%)	8(50%)	3(50%)
Prematurity	5(12.5%)	4(22.22%)	10(62.5%)	4(66.67%)
IUGR	3 (7.5%)	5 (27.78%)	5 (31.25%)	3 (50%)
Birth Asphyxia, Apgar score				
8	30 (75%)	12 (66.67%)	5 (31.25%)	2 (33.33%)
7	9 (22.5%)	2 (11.11%)	4 (25%)	3 (50%)
<6	1 (2.5%)	4 (22.22%)	7 (43.75%)	1 (16.67%)
IUFD		0	1 (6.25%)	0
NICU admission	5(12.5%)	5 (27.78%)	9 (56.25%)	3 (50%)
Neonatal Death	0	0	2 (12.5%)	0

The mean hemoglobin in normotensive patients was 12.01 gm/dl whereas mean hemoglobin in PIH was 11.91 gm/dl. The mean hemoglobin in gestational hypertension was 12.23 gm/dl (P = 0.86), preeclampsia 11.46 gm/dl (P = 0.35), and eclampsia 12.12 gm/dl (P = 0.92). These values were statistically not significant.

The mean platelet count in normotensive was 2, 15,823 lakh/cumm whereas 1, 95,140 lakh/cumm in PIH cases. The mean platelet count in gestational hypertension was 2,18,500 ± 55,792 lakh/cumm (P=0.87), preeclampsia 1,84,938 ± 71,319 lakh/cumm (P=0.11) and eclampsia 1,52,267 ± 68,894 lakh/cumm (P=0.03). Thus there was significant thrombocytopenia in case of eclampsia.

Mean prothrombin time (PT) was 14.13 ± 0.4 seconds in normotensive but PT time in gestational hypertension was 13.78 ± 0.7 seconds which was statistically significant. but PT time in preeclampsia and eclampsia were not statistically significant. Mean SGPT in normotensive was 21 ± 6 U/l whereas in PIH which were not statistically significant.

The most common complication seen in PIH was preterm labor 25% (gestational hypertension 5.56%, pre-eclampsia 43.75% and eclampsia 33.33%). Preterm was followed by liver dysfunction, HELLP syndrome, postpartum hemorrhage and retinopathy subsequently.

The most common fetal complication was low birth weight in normotensive (17.5%) and prematurity 45% in PIH.

The common cause of NICU admission in normotensive was prematurity 12.5% which was, similar to PIH 42.5%. Total neonatal death was 2 (12.5%) which was seen in Preeclamptic case.

DISCUSSION

In our study total 80 cases were enrolled 40 cases of normotensive and 40 cases of PIH. This study showed incidence 10% of PIH occur in less than 20 years age group, 32.5% in 20-24 years, 32.5% in 25-29 years, 2% in 36-40 years and 7.5% in 41 years and above. The result was similar to the result of cross-sectional study of the World Health Organization⁶ which showed highest incidence of preeclampsia and eclampsia in age group of 20-35 years. In our study, composite incidence of age group 20-24 years, 25-29 years and 30-35 years showed the highest incidence followed by, group > 35 years i.e., composite incidence of 36-40 years and > 41 years. which was similar to prospective study of Andrews et al.⁷ In our study, composite incidence of pre-eclampsia in age

group 20-24 years and 25-29 years was highest which is similar to Singh et al⁸ and Parveen et al.⁹ The study of Duckitt et al¹⁰ also showed incidence of eclampsia and PIH highest in age group below 25 years.

Gestational hypertension (55.56%), pre-eclampsia (68.75%) and eclampsia (50%) were common in primigravida followed by second gravid and so on. The result was similar to cross-sectional study of the World Health Organization showed highest incidence of normotensive, preeclampsia and eclampsia in primigravida followed by second gravid, third gravida subsequently. The recent descriptive study of Parveen et al,⁷ and the prospective study of Hernandez et al¹¹ Andrews et al¹² showed incidence of preeclampsia highest in primigravida followed by second gravida and third gravida subsequently which is similar to result of our study.

Our study showed Headache and edema as only symptom and signs present in both normotensive (2.5% and 2.5%) and PIH (47.5% and 25%) respectively, whereas other sign and symptoms like nausea and vomiting, blurring of vision, epigastric pain and jaundice were present only in PIH cases, among which most commonly in severe preeclampsia (18.75%, 31.25%, 31.25%, 0%) respectively.

In a prospective study of Singhal et al,¹³ and cross sectional study of Muti et al,¹⁴ pregnant women admitted with severe preeclampsia and eclampsia showed headache as the most common antecedent symptom (44%). In prospective study of Raji et al¹⁵ on eclampsia, they showed highest incidence of preceding symptom as headache that is similar to our study.

Most common maternal complication seen was preterm labor 25% (gestational hypertension 5.56%, pre-eclampsia 43.75% and eclampsia 33.33%). Preterm was followed by liver dysfunction, HELLP syndrome, postpartum hemorrhage and retinopathy subsequently. Since ICU admission is compulsory in eclampsia cases so all eclampsia were admitted in ICU, which was followed by 31.25% in case of preeclampsia and 5.56% in case of gestational hypertension. Most of the complication were seen in case of preeclampsia which shows preterm labor (43.75%), ICU admission (1.25%), liver dysfunction (18.75%) and HELLP syndrome (18.75%) and 1 case of retinopathy was seen in preeclampsia. Similar result was seen in study of Vidyadhar et al,¹⁶ and cross-sectional study of the World Health Organization.

The most common fetal complication seen was low birth weight in normotensive (17.5%) whereas prematurity 45% in PIH, (gestational hypertension 22.22%, pre-

eclampsia 62.5% and 66.67% in eclampsia) which was similar to finding of cross-sectional study of the World Health Organization.

In cross-sectional study of the World Health Organization shows Apgar scores at 5 min were > 7 in 97.4% of normotensive, 92.1% of preeclampsia and 79.8% of eclampsia, < 6 (2.6%, 7.9% and 18.2%) respectively which was similar to our finding of Apgar score at 5 min > 7 (97.5% of normotensive, 56.25% of preeclampsia and 83.3% of eclampsia, < 6 (2.5%, 43.75% and 16.67%) respectively.

The retrospective, observational study of Singh et al⁸ study of Singh et al,¹⁷ and study of Sibai et al¹⁸ showed prematurity or preterm delivery as commonest fetal complication. 21.4% of babies had birth asphyxia, whereas perinatal mortality was seen in 12.5% of patients which is similar to our finding of prematurity of 62.5%, birth asphyxia (< 6) 43.75% and neonatal mortality 12.5%. Birth asphyxia was high in our study. Commonest fetal complication was preterm delivery which was 45 % in our study which is similar to 44.3% in the study of Nadkarni et al.¹⁹

In the study of Vats et al,²⁰ Apgar score < 7 and > 7 was seen 24.5% and 75.5% of cases and 13% and 87% of control respectively whereas in our study Apgar score < 7 and > 7 were 30% and 70% in case, and 2.5% and 97.5% in control respectively, which is comparable.

There was NICU admission in 25.5% of cases and 11.2% of control which was lesser than our finding of 42.5% of case and 0 of control, this may be due to our hospital protocol of NICU admission of babies of all eclampsia patients till they stay in ICU.

In our study, the mean hemoglobin in normotensive patients was 12.01 gm/dl whereas mean hemoglobin in PIH was 11.91 gm/dl. In study of Meshram et al,²¹ mean platelet count in preeclampsia and eclampsia was 1.60 ± 0.51 lakh/cumm ($P < 0.001$) and 1.51 ± 0.68 lakh/cumm ($P < 0.001$) whereas, in our study mean platelet count was 1.81 ± 0.7 lakh/cumm ($P = 0.87$), and eclampsia 1.55 ± 0.68 lakh/cumm ($P < 0.05$). This showed that in both studies there were significant reduction in platelet in comparison to normotensive in eclamptic patient. PT was prolonged in 7 cases (4 of severe preeclampsia and 3 of eclampsia). In our study also PT was prolonged in case of preeclampsia with HELLP syndrome but statistically they were not significant.

In study of Meshram et al,²¹ the mean value of PT was 13.86 ± 1.76 seconds similar to our study where mean

PT in preeclampsia was 13.87 ± 0.89 and eclampsia 13.87 ± 0.4 indicating that there was no significant change in values of PT. In contrast to study of Meshram et al.²¹ PT time in gestational hypertension was 13.78 ± 0.7 seconds which was statistically significant ($p = 0.05$).

This study was hospital based, which was conducted within a short duration of time. Sample size was too small especially in case of eclampsia which causes over estimation of fetomaternal outcome in eclampsia. Only singleton pregnancies were included in the study as multifetal gestation is one of the risk factor for pregnancy induced hypertension. The patients were not screened for the high risk factors like socioeconomic status, paternal factors, smoking or BMI. Since all cases of eclampsia and severe preeclampsia were admitted to ICU thus the overall ICU admission was quite high.

CONCLUSIONS

The incidence of PIH was common in the age group of 20 to 29 years and in primigravidas. Headache, nausea, vomiting and edema were the commonest symptoms and sign among these patients. Preterm labor was the commonest associated maternal morbidity and there was a higher rate of premature delivery in PIH. Among the subgroup of PIH thrombocytopenia was more common in eclampsia. A significant decrease in the PT was seen in gestational hypertension but no such change was seen in the values of hemoglobin and SGPT.

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