Original Article

Fetomaternal outcome in hypertensive disorder of pregnancy in a tertiary care

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Introduction: Hypertension in pregnancy occurs in 12–22% of all pregnancies of which pre-eclampsia remains the leading cause that complicates 10% of all pregnancies. It is defined as new onset of elevated blood pressure (BP) and proteinuria (BP ≥140/90 and ≥0.3 g protein in 24 h urine specimen) after 20 weeks of gestation in a previously normotensive woman. **Aims:** The aim of the study is to evaluate the fetal and maternal outcome in cases of hypertensive disorders in pregnancy in a tertiary care hospital. **Objective:** The objective of the study is to study maternal morbidity in terms of complication, hospital stay, and maternal mortality and to study fetal morbidity in the form of low Apgar score, meconium aspiration syndrome, NICU admission, and fetal mortality. **Material and Methods:** This was a prospective observational study conducted in the department of obstetrics and gynecology at Rohilkhand medical college and hospital, Bareilly between 1st November 2018 and 31st October 2019. **Inclusion Criteria:** Pregnant women who have gestational hypertension or pregnancy-induced hypertension, pre-eclampsia, eclampsia, chronic hypertension, preeclampsia superimposed on chronic hypertension or HELLP syndrome. **Exclusion Criteria:** Birthweight less than 500 g, Multiple pregnancies (higher order), Major fetal anomaly, incompatible with survival, and patients diagnosed with other causes of convulsions in pregnancy such as cerebral malaria and epilepsy. **Results:** From 100 patients, pre-eclampsia and pre-eclampsia superimposed on chronic HTN was among 53% and 3% patients. Eclampsia and gestational HTN was in 37% and 7% of patients. Birth weight >2.5 kg was among 52% and 2.01–2.5 kg was in 36% patients. In our study, 12.7% of neonates needed NICU admission at birth. **Conclusion:** Majority of patients had unbooked deliveries. About half of the patients in the study were of term pregnancy. Majority of patients had emergency LSCS (72%) followed by spontaneous vaginal delivery (28%). Deranged LFT was the most common abnormal maternal investigation (38%). Stillbirths was in 29% in which 21% old IUD and 8 % stillbirth. There were 71% live births.

KEY WORDS: Fetomaternal, hypertension, pregnancy

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INTRODUCTION

Hypertension is the most prevalent medical issue in pregnancy, affecting 12–22% of all pregnancies, with pre-eclampsia being the most common cause, affecting 10% of all pregnancies. After 20 weeks of pregnancy, a previously normotensive lady develops new start of high blood pressure (BP) and proteinuria

(BP ≥140/90 and ≥0.3 g protein in 24 h urine test). Eclampsia is defined as the new onset of generalized tonic-clonic seizure in a woman with severe preeclampsia. The WHO estimated that approximately 60,000 women die each year from pre-eclampsia worldwide Pre-eclampsia and eclampsia account for 24% of all. Maternal deaths in India, mainly attributed to complications of preeclampsia and eclampsia (Odegard *et al*., 2000; Singhal *et al*., 2009).[1,2]

Hypertensive disorders are one of the most important causes of perinatal and maternal mortality and morbidity in both developing and developed countries. Overall, 10–15% of maternal deaths are directly associated with pre-eclampsia and eclampsia. The risk of pre-eclampsia is 2–5 times more in women with maternal history of this disorder. Depending on ethnicity, the incidence of preeclampsia ranges from 3% to 7% in healthy nullipara and 1–3% in multiparas (Carty *et al*., 2010; Uzan *et al*., 2011).[3,4]

The task force of the American College of Obstetricians and Gynecologists continues to utilize the more practical classification it proposed in 1972, which has been amended by the National High BP Education Program and the American Society of Hypertension guidelines (American College of Obstetricians and Gynecologists, 2013).[5] This also considers hypertension during pregnancy in four categories:

1. Pre-eclampsia–eclampsia
2. Chronic hypertension (of any cause)
3. Chronic hypertension with superimposed pre-eclampsia
4. Gestational hypertension.

Pre-eclampsia

Is diagnosed by having a BP of ≥140/90 mmHg after 20 weeks of pregnancy and proteinuria of ≥300 mg/24 h or ≥1+ with a dipstick. If the following clinical and laboratory abnormalities are observed, there is a higher likelihood of pre-eclampsia: a BP of ≥160/110 mmHg, proteinuria of 2.0 g/24 h or ≥2+ dipstick, serum creatinine of >1.2 mg/dL unless previously elevated; platelets of 100,000/mm3; micro-angiopathic hemolysis (increased lactate dehydrogenase [LDH]); elevated alanine aminotransferase (ALT) or aspartate aminotransferase; persistent headache or other cerebral or visual disturbance and persistent epigastric pain.

Eclampsia

Pre-eclampsia with the onset of convulsions is called eclampsia. In eclamptics, seizures cannot be attributed to other causes in a woman with pre-eclampsia, which are generalized, and may appear before, during, or after labor.

Hypertensive disorders of pregnancy can also trigger some severe forms of maternal complications such as cardiovascular and cerebrovascular disease, liver and kidney failure, abruptio placentae, disseminated intravascular coagulation, and HELLP syndrome. Under these circumstances, placenta dysfunction may occur leading to fetal growth restriction, fetal distress, preterm birth, intrauterine fetal demise, stillbirth, and neonatal asphyxia.[6] The WHO estimates that at least one woman dies every 7 min from complications of hypertensive disorders of pregnancy.[7] In developing countries, one-quarter of stillbirth and neonatal death are associated with pre-eclampsia and eclampsia. HELLP syndrome may occur in 2–12% of women with preeclampsia.

The HELLP Syndrome

Weinstein regarded signs and symptoms to constitute an entity separated from severe preeclampsia and in 1982 named the condition HELLP (H = Haemolysis, EL = Elevated Liver enzymes, LP = Low Platelets) syndrome. The HELLP is currently regarded as a variant of severe preeclampsia or a complication (Weinstein, 2005; Martin *et al*., 2006).[6,7]

a. Hemolysis: Peripheral smear shows evidence of hemolysis
b. Elevated liver enzymes: Bilirubin more than 1.2 mg/dl, LDH more than 600 u/l, Serum aminotransferases more than 70U/L
c. Low platelet count: Less than 1 lakh/mm^2.

Chronic Hypertension

Are gravidae with hypertension defined as a BP of 140/90 mmHg before pregnancy or diagnosed before 20 weeks' gestation (not due to prenatal trophoblastic illness), or hypertension identified after 20 weeks' gestation and persisting after 12 weeks' postpartum.

Gestational Hypertension has the Following Features

A BP ≥140/90 mmHg for the 1st time during pregnancy, which returns to normal <12 weeks' postpartum and without proteinuria.

Hypertensive disorder of pregnancy can be graded into mild or severe based on clinical abnormalities. Mild hypertensive disorder of pregnancy shows diastolic BP <100 mmHg, trace to 1+ proteinuria, and minimal (if any) hepatic enzyme elevation. Severe HDP exhibits diastolic BP ≥110 mmHg, persistent severe proteinuria, clinical symptoms of eclampsia including convulsions and pulmonary edema, elevated serum creatinine, and hepatic enzymes with thrombocytopaenia and fetal growth restriction (Cunningham, 2014).[8]

The present study was designed to evaluate the fetal and maternal outcome in cases of hypertensive disorders in pregnancy in a tertiary care hospital. Since the hypertensive disorders are responsible for major maternal and fetal sufferings, both morbidity and mortality, the present study is being undertaken to assess the fetomaternal outcome in our institution.

MATERIALS AND METHODS

It was a prospective observational study conducted in the Department of Obstetrics and Gynaecology, Rohilkhand Medical College & Hospital, Bareilly, (U.P.) from 1st November 2018 to 31st October 2019 On All pregnant patients coming to Obstetrics and Gynaecology department and diagnosed as

having hypertensive disorders of pregnancy, during the above-mentioned period.

Inclusion Criteria

Pregnant women who have:

- Gestational hypertension or pregnancy-induced hypertension
- Pre-eclampsia
- Eclampsia
- Chronic hypertension
- Preeclampsia superimposed on chronic hypertension
- HELLP syndrome.

Exclusion Criteria

- Birthweight <500 g
- Multiple pregnancies (higher order)
- Major fetal anomaly, incompatible with survival
- Patients diagnosed with other causes of convulsions in pregnancy such as cerebral malaria and epilepsy.

Methodology

This prospective observational study was conducted in RMCH, in Department of obstetrics and Gynaecology. Ethical clearance was taken from the institutional ethical committee prior to study.

All pregnant women who present with hypertensive disorders of pregnancy during the period 1st November, 2018 to 31st October,2019 were taken for the study.

Written consent was taken from the patients and only those patients were included in the study who were willing to participate.

The patients were divided into 5 groups, namely gestational hypertension, mild pre-eclampsia, severe pre-eclampsia or eclampsia, chronic hypertension and chronic hypertension with superimposed pre-eclampsia or eclampsia.

The patients were followed till delivery and 12 weeks postpartum.

On admission a thorough history taking, clinical examination including general physical examination, built, nutritional status, height, weight, BP, and pulse along with absence or presence of pallor and pedal edema was done.

Abdominal examination was done for height of uterus in weeks, the lie of fetus, presentation, and position of the fetus, fetal heart rate and amount of liquor.

BP monitoring was done every hourly or every 15 min depending on disease severity. 24-h urine albumin was determined.

Blood samples were collected for laboratory investigations. Complete blood count, Renal function test, Liver function test and repeated as and when required.

Fetal status was evaluated with Non-stress test and ultrasonographic color Doppler and biophysical profile as and when indicated.

Treatment included rest, diet, antihypertensives, anticonvulsants indicated in the obstetric management of individual cases.

Termination of pregnancy was the only definitive treatment for severe preeclampsia and eclampsia.

Statistical Analysis

The results are presented in frequencies, percentages and mean ± SD. The Chi-square test was used to compare categorical variables. The $P < 0.05$ was considered significant. All the analysis was carried out on SPSS 16.0 version (Chicago, Inc., USA).

RESULTS

The present study was conducted in the Department of Obstetrics and Gynaecology, Rohilkhand Medical College and Hospital, Bareilly, (U.P.) with the objective to evaluate the foetal and maternal outcome in cases of hypertensive disorders in pregnancy in a tertiary care hospital. A total of 100 patients were included in the study.

Out of 100 patients maximum 41% were in the age group 23–27 years followed by 26% in 18–22 years of age group, 24% in 28–32 years of age group and 9% were in >32 years [Table 1]. Mean ± SD age of patients was 26.28 ± 4.72 years. Maximum patients were nullipara (40%) followed by P2 (27%), P1 (20%), P3 (10%) and multipara (3%) and majority of patients had unbooked deliveries (98%). Majority of patients had emergency LSCS (72%) followed by Spontaneous vaginal delivery (21%) and Induced vaginal delivery (7%).

Pre-eclampsia and Pre-eclampsia superimposed on chronic HTN was among 53% and 3% patients. Eclampsia and Gestational HTN was in 37% and 7% patients [Table 2].

More than half of patients had SBP 140–160 mmHg (53%) followed by 161–180 mmHg (30%), >180 mmHg (9%) and <140 mmHg (8%). The mean systolic BP of patients was 160.33 ± 19.83 mm Hg. More of patients had non severe pre-eclampsia, 62% patients had DBP 90–100 mmHg followed by >110 mmHg (17%) and 101–110 mmHg (15%). The mean ± SD diastolic BP of patients was 100.50 ± 11.64 mm Hg.

Table 1: Distribution of patients according to age

Age group in years	No. (*n*=100)	%
18–22	26	26.0
23–27	41	41.0
28–32	24	24.0
>32	9	9.0
Mean±SD	26.28±4.72	

Table 3 shows More than half of patients had platelet count >1.5 lakhs (68%) followed by 1.0–1.5 lakhs (32%), 0.5–1.0 (6%) and <0.5 (4%) lakhs. The mean platelet count of patients was 1.69 ± 0.69 lakhs. More than one third of patients had PT <14 (47%) followed by 14–17 (35%) and >17 (18%). The mean PT of patients was 15.13 ± 4.44. Also 17 % patient had deranged renal function test. Majority of patients (63%) had normal renal function. The mean ± SD serum creatinine of patients was 1.06 ± 0.67.

More than half of patients had SGPT <70 (62%). The mean SGPT of patients was 87.07 ± 89.36. More than half of patients had SGOT ≥ 40 (77%). The mean SGOT of patients was 82.32 ± 55.50. Majority of patients had ALP >147 (75%). The mean ALP of patients was 273.88 ± 154.07 [Table 4].

Table 2: Distribution of patients according to type of hypertensive disorder of pregnancy

Type of hypertensive disorder of pregnancy	No. (*n*=100)	%
Gestational HTN	7	7.0
Pre eclampsia	53	53.0
Eclampsia	37	37.0
Pre eclampsia superimposed on chronic HTN	3	3.0
Mean±SD	160.33±19.83	

Table 3: Distribution of patients according to platelet count and serum creatinine at admission

Platelet count (in lakhs)	No. (*n*=100)	%	Serum creatinine	No. (*n*=100)	%
<0.5	4	4.0	<0.7	20	20.0
0.5–1.0	6	6.0	0.7–1.1	63	63.0
1.0–1.5	32	32.0	>1.1	17	17.0
> 1.5	68	68.0	Mean±SD	1.06±0.67	
Mean±SD	1.69±0.69				

Distribution of neonates on APGAR score 8,10 was among 53% and 0.0 was in 29% patients. Birth weight >2.5 kg was among 52% and 2.01–2.5 kg was in 36% patients. Mean birth weight of new born was 2.56 ± 0.53 kg.

Foetal distress indication of LSCS was among majority of patients (78%). Previous LSCS with Pre-eclampsia indication of LSCS was in 11% patients. The percentage of other indications of LSCS was less than 5%. Outcome of the pregnancy was Still Births was in 29% in which 21% old IUD and 8 % stillbirth. There was 71% live births. NICU admission requirement at birth was in 12.7% neonates.

Table 5 shows the association of type of hypertensive disorder of pregnancy with maternal mortality. The maternal mortality was 5.7% among whom Pre eclampsia was present. The maternal mortality was 2.7% among whom eclampsia was present.

DISCUSSION

Hypertension associated with pregnancy, whether it is pre-existent or developed during pregnancy, is one of the most common condition encountered by obstetricians. Hypertension increases both maternal and foetal mortality and morbidity, as it virtually involves every organ and system in the body.

The present study was conducted in the Department of Obstetrics and Gynaecology, Rohilkhand Medical College & Hospital, Bareilly, (U.P.) with the objective to evaluate the foetal and maternal outcome in cases of hypertensive disorders of pregnancy in a tertiary care hospital. A total of 100 patients were included in the study.

In the present study, out of 100 patients maximum (41%) were in the age group 23–27 years followed by 26% in 18–22 years of age group. Mean age with SD of patients was 26.08 ± 4.68. Jadav (2012)[9] found the highest (44%) incidence of Hypertension in age group of 21–25 years.

Table 4: Distribution of patients according to SGPT (ALT), SGOT (AST), ALP at admission

SGPT (ALT)	No. (*n*=100)	%	SGOT	No. (*n*=100)	%	ALP	No. (*n*=100)	%
<70	62	62.0	<40	23	23.0	40–147	25	25.0
≥70	38	38.0	≥40	77	77.0	>147	75	75.0
Mean±SD	87.07±89.36		Mean±SD	103.38±92.36		Mean±SD	273.88±154.07	

Table 5: Association of type of hypertensive disorder of pregnancy with maternal mortality

Type of hypertensive disorder of pregnancy	No. of patients	Maternal mortality				*P*-value[1]
		Expired		Alive		
		No.	%	No.	%	
Gestational HTN	07	0	0.0	7	100.0	NA
Pre eclampsia	53	3	5.7	50	94.3	
Eclampsia	37	1	2.7	36	97.3	
Pre eclampsia superimposed on chronic HTN	3	0	0.0	3	100.0	

[1]Chi-square test, NA-Not applicable as>1 0s in a column

In the present study, 45% patients were pre-term at admission and 55% were of term gestation. In Shahzad and Hanif (2013)[10] study, according to them 39% had gestational age of 37 weeks or above and 39% of the patient were presented at gestational age of 31–36 weeks.

The present study found that majority of patients had emergency LSCS (72%) followed by spontaneous vaginal delivery (21%) and induced vaginal delivery (7%)., which was comparable to the study conducted by Gupta *et al*. (2019)[13] who found that 71.2% mothers needed emergency LSCS and 26.9% mothers delivered by vaginally and only 1.9% had forceps delivery.

In our study 53% patient had pre-eclampsia and 3% had pre-eclampsia superimposed on chronic hypertension and 37% had eclampsia. Our study was comparable with study conducted by Chaitra *et al*. (2017)[12] who stated that 14.68% patient had pre-eclampsia, 0.34% had pre-eclampsia superimposed on chronic hypertension and 2.09 patient presented with eclampsia.

In our study, more than half of the patients had systolic BP 140–160 mmHg (53%). The mean ± SD systolic BP of patients was 160.33 ± 19.83 mmHg. The results of our study were almost similar to the Raji *et al*. (2016)[14] who stated that maximum patients 43.5% had systolic BP 140–160 mmHg. In the present study, more than half of patients had diastolic BP 90-110 mmHg (77%).

The present study revealed that more than half of patients had platelet count >1.5 lacs (68%). The mean platelet count of patients was 1.69 ± 0.69 lacs. Our study was almost similar to the study conducted by (Tayrab and Saladdin, 2016)[15] who deduced that mean platelet count in the women with pre-eclampsia was (211.19 ± 93 × 0.6 × 10^9/L).

The present study showed that mean±SD PT and INR of patients was 15.13 ± 4.44 and 1.15 ± 0.50. In the present study the patients had mean serum creatinine of 1.06 ± 0.67, which was comparable to the study conducted by (Tayrab and Saladdin, 2016)[15] in whom mean S. creatinine was (0.68 ± 0.36 mg/dl).

In our study there was significant increase in all liver enzymes specially SGPT (ALT) and SGOT (AST) by 38% and 77% respectively which was consistent with that found by (Tayrab and Saladdin, 2016)[15] who stated that mean of SGOT (AST) in the women with pre-eclamsia was 63.88 ± 112.23 IU/L and mean of SGPT (ALT) was 32.10 ± 49.91 IU/L which was significantly higher than the normal pregnancy.

In our study majority of patients had ALP >147 (75%). The mean ALP of patients was 273.88 ± 154.07 which was comparable to the study conducted by (Tayrab and Saladdin, 2016)[15] who found that the mean of ALP in the women of pre-eclampsia was 130.70 ± 46.12U/L, which was significantly higher than with normal pregnancy.

In our study maximum neonates had APGAR >7 (53%) and APGAR ≤7 (47%). Swain *et al*. (2016)[16] who stated that maximum number of neonates 63.97% with eclampsia had neonates born with APGAR score 8,10.

The present study showed that the birth weight >2.5 kg was among 52% of neonates. Mean birth weight of new born was 2.56 ± 0.53 kg. In contrast to present study Madhuri and Varalakshmi (2019)[17] revealed that the number of cases of low birth weight were quite high at 41.47% due to premature induction of labour in cases of Severe Preeclampsia and Eclampsia.

In our study 29% neonates were still birth and 71% neonates were live born. Our study was similar to the findings given by Gupta *et al*. (2019)[11] with 78.8% live birth and 21.2% neonatal deaths.

The present study showed association of type of hypertensive disorder of pregnancy with maternal mortality the maternal mortality was 5.7% among whom Pre eclampsia was present and 2.7% among whom eclampsia was present. In Subki *et al*. (2018)[13] study, the overall prevalence of maternal complications and mortality may have been underestimated and is a limitation of this study.

CONCLUSION

Delivery is the only cure for preeclampsia and eclampsia. Corticosteroids are administered to accelerate fetal lung maturity. Interventionist management advocates induction or cesarean delivery 12–24 h after corticosteroid administration.

The present study was conducted in the Department of Obstetrics and Gynaecology, Rohilkhand Medical College and Hospital, Bareilly, (U.P.) with the objective to evaluate the foetal and maternal outcome in cases of hypertensive disorders in pregnancy in a tertiary care hospital. A total of 100 patients were included in the study. The following are the conclusions of this study:

1. Out of 100 patients maximum 41% were in the age group 23–27 years followed by 26% in 18–22 years of age group
2. Mean ± SD age of patients was 26.28 ± 4.72 years
3. Maximum patients were nullipara followed by P2
4. Majority of patients had unbooked deliveries
5. About half of patients in the study were of term preganancy
6. Majority of patients had emergency LSCS (72%) followed by Spontaneous vaginal delivery (28%)
7. APGAR score 8,10 was among (53%) and 0,0 was in (29%) of new-borns
8. Mean birth weight of new borns was 2.56 ± 0.53 kg
9. Foetal distress was the indication of LSCS among majority of patients (78%)
10. NICU admission at birth was in 12.7% neonates
11. Deranged LFT was the most common abnormal maternal investigation (38%). Visual disturbance was the second most common maternal complication (31%)
12. Severe pre-eclampsia and eclampsia were the two important causes of maternal morbidity and mortality in the present study.

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