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Clinical Profile and Maternal-Fetal Outcomes in Women with Hypertensive Disorders of Pregnancy: An Observational Study.

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Abstract

Background: Hypertensive disorders of pregnancy remain important contributors to maternal and perinatal morbidity, particularly in tertiary care settings where women often present with varying disease severity. ***Objectives:*** To evaluate the clinical profile, treatment pattern, mode of delivery, and maternal-fetal outcomes among women with hypertensive disorders of pregnancy. ***Methods:*** This observational study included 100 pregnant women diagnosed with hypertensive disorders of pregnancy at Prathima Institute of Medical Sciences, Karimnagar, Telangana, India, from March 2026 to April 2026. Demographic details, obstetric profile, type of hypertensive disorder, blood pressure status, proteinuria, treatment details, mode of delivery, and maternal and neonatal outcomes were recorded using a structured proforma. Data were analysed using descriptive statistics and expressed as frequencies, percentages, mean, and standard deviation. ***Results:*** The mean age was 26.7 ± 4.8 years, and the mean gestational age at presentation was 35.9 ± 2.8 weeks. Multigravida women constituted 54% of cases. Severe preeclampsia was the most common disorder, affecting 34% of women, followed by gestational hypertension in 28% and mild preeclampsia in 22%. Antihypertensive therapy was required in 86%, and magnesium sulphate was administered in 44%. Caesarean section was performed in 50% of cases. Maternal complications were recorded in 38%, with postpartum haemorrhage, HELLP syndrome, abruptio placentae, and acute kidney injury being noted. Preterm delivery occurred in 45%, low birth weight in 50%, NICU admission in 32%, and overall perinatal mortality was 8%. ***Conclusion:*** Severe preeclampsia and eclampsia contributed substantially to adverse maternal and fetal outcomes. Early antenatal detection, timely referral, standardized management, and neonatal support remain central to reducing preventable morbidity.

Keywords: Hypertensive disorders of pregnancy; Preeclampsia; Eclampsia; Maternal outcome; Perinatal outcome; Low birth weight; NICU admission.

INTRODUCTION

Hypertensive disorders of pregnancy (HDP) include gestational hypertension, preeclampsia, eclampsia, chronic hypertension, and chronic hypertension with superimposed preeclampsia. These conditions are diagnosed after careful blood pressure assessment and evaluation for proteinuria or maternal organ dysfunction, with current classifications emphasizing that preeclampsia is a multisystem disorder rather than a blood pressure abnormality alone [1,2]. In clinical practice, HDP ranges from mild elevation of blood pressure to rapidly progressive disease with neurological, hepatic, renal, hematological, placental, and fetal consequences. This wide spectrum makes routine antenatal surveillance and risk stratification essential in obstetric care.

HDP is one of the common medical complications of pregnancy and is linked with considerable maternal and perinatal disease burden. International data indicate that hypertensive disorders complicate a meaningful proportion of pregnancies and remain a major cause of preventable maternal morbidity, especially where antenatal attendance, early referral, and emergency obstetric care are uneven [3-5]. Global analyses have identified hypertensive disorders among the leading direct contributors to maternal death, along with haemorrhage and sepsis [6]. Systematic estimates show that preeclampsia and eclampsia continue to affect pregnancies across regions, with greater severity and poorer outcomes in low-resource settings [7,8].

The pathophysiology of preeclampsia involves abnormal placentation, impaired maternal vascular adaptation, endothelial dysfunction, exaggerated inflammatory response, and altered angiogenic balance. These mechanisms explain the frequent association of HDP with fetal growth restriction, preterm birth, placental abruption, low birth weight, stillbirth, and neonatal

intensive care admission [4,5]. On the maternal side, uncontrolled hypertension and severe preeclampsia increase the risk of eclampsia, HELLP syndrome, acute kidney injury, pulmonary edema, disseminated intravascular coagulation, cerebrovascular complications, and critical care requirement [1,3].

Management depends on disease type, gestational age, presence of severe features, fetal condition, and availability of maternal-neonatal care facilities. Antihypertensive therapy, seizure prophylaxis with magnesium sulphate, corticosteroids for fetal lung maturity, close laboratory monitoring, and timely delivery are important components of care [1-3,9]. Observational studies from different settings have consistently shown worse maternal and perinatal outcomes among women with severe preeclampsia, eclampsia, and superimposed preeclampsia compared with gestational hypertension [10-14]. Local data from tertiary centres are useful because they reflect referral patterns, disease severity at presentation, and immediate care needs.

The present study was conducted with the objective of assessing the clinical profile and maternal-fetal outcomes among women with hypertensive disorders of pregnancy admitted to a tertiary care hospital. The study specifically aimed to describe demographic and obstetric characteristics, classify the type of hypertensive disorder, document treatment and mode of delivery, and evaluate maternal complications, neonatal morbidity, and perinatal mortality.

METHODOLOGY

Study design and setting

This hospital-based observational study was conducted in the Department of Obstetrics and Gynaecology at Prathima Institute of Medical Sciences, Karimnagar, Telangana, India. The institution is a tertiary care teaching hospital that provides antenatal, intrapartum, emergency obstetric, operative obstetric, intensive care, and neonatal support services. Women with hypertensive disorders of pregnancy are managed through a multidisciplinary approach involving obstetricians, anaesthesiologists, physicians, laboratory services, and neonatology support whenever required.

Study period and sample size

The study was conducted from March 2026 to April 2026. A total of 100 pregnant women diagnosed with hypertensive disorders of pregnancy during the study period were included. Consecutive eligible women admitted during the study period were considered for inclusion until the required sample size was reached.

Study population

Pregnant women beyond 20 weeks of gestation with gestational hypertension, preeclampsia, eclampsia, or chronic hypertension with superimposed preeclampsia were included. Diagnosis and classification were based on standard clinical criteria using blood pressure thresholds, proteinuria, symptoms, and evidence of maternal organ involvement as recommended in accepted obstetric guidelines [1,2]. Women with incomplete records, non-obstetric seizures, or hypertension clearly attributable to non-pregnancy-related acute medical conditions were excluded from analysis.

Data collection

After eligibility assessment, demographic details, residence, booking status, gravida status, gestational age at presentation, type of hypertensive disorder, systolic and diastolic blood pressure category, proteinuria, symptoms, and relevant laboratory parameters were entered in a structured study proforma. Treatment-related variables included use of antihypertensive drugs, magnesium sulphate, antenatal corticosteroids, induction of labour, and mode of delivery. Maternal outcomes included postpartum haemorrhage, HELLP syndrome, abruptio placentae, acute kidney injury, pulmonary edema, disseminated intravascular coagulation, ICU admission, and maternal death. Fetal and neonatal outcomes included term or preterm birth, birth weight category, intrauterine growth restriction, birth asphyxia, NICU admission, live birth, stillbirth, neonatal death, and overall perinatal mortality.

Management protocol

Women were managed according to institutional protocol. Blood pressure monitoring, urine protein assessment, complete blood count, liver function tests, renal function tests, fetal monitoring, and ultrasound assessment were performed as clinically indicated. Antihypertensive therapy was administered for blood pressure control. Magnesium sulphate was used for seizure prophylaxis or treatment in severe preeclampsia and eclampsia, consistent with evidence supporting its role in reducing eclamptic seizures [9]. Delivery decisions were individualized according to gestational age, maternal condition, fetal status, cervical favourability, and obstetric indications.

Statistical analysis and ethical considerations

Data were entered and analysed using descriptive statistics. Continuous variables were expressed as mean and standard deviation. Categorical variables were expressed as frequency and percentage. Since the study was descriptive in nature, the primary analysis focused on distribution of clinical characteristics and maternal-fetal outcomes. Institutional ethical

approval was obtained before data collection. Confidentiality of patient information was maintained throughout the study, and data were used only for academic and research purposes.

RESULTS

A total of 100 women with hypertensive disorders of pregnancy were included in the study. The mean age of the study population was 26.7 ± 4.8 years, and most women were aged between 20 and 29 years. Multigravida women constituted 54% of cases, while 46% were primigravida. Most women were booked antenatal cases. The mean gestational age at presentation was 35.9 ± 2.8 weeks. The baseline demographic and obstetric details are shown in Table 1.

Table 1. Baseline demographic and obstetric profile of the study population

Variable	Category	Frequency (n=100)	Percentage (%)
Age group	<20 years	8	8.0
	20-24 years	34	34.0
	25-29 years	32	32.0
	30-34 years	18	18.0
	≥35 years	8	8.0
Gravida status	Primigravida	46	46.0
	Multigravida	54	54.0
Booking status	Booked	68	68.0
	Unbooked/irregularly booked	32	32.0
Residence	Rural	60	60.0
	Urban	40	40.0
Gestational age at presentation	<34 weeks	20	20.0
	34-36+6 weeks	38	38.0
	≥37 weeks	42	42.0

Preeclampsia was the most common hypertensive disorder observed in the study population. Severe preeclampsia was present in 34% of cases, followed by gestational hypertension in 28% and mild preeclampsia in 22%. Eclampsia was observed in 10% of women. Severe-range systolic blood pressure was recorded in 44% of women, while severe-range diastolic blood pressure was recorded in 40%. Proteinuria of 1+ or more was present in 62% of women. Headache was the most frequent symptom, followed by pedal edema and visual disturbance, as presented in Table 2.

Table 2. Clinical profile and type of hypertensive disorder

Variable	Category	Frequency (n=100)	Percentage (%)
Type of hypertensive disorder	Gestational hypertension	28	28.0
	Mild preeclampsia	22	22.0
	Severe preeclampsia	34	34.0
	Eclampsia	10	10.0
	Chronic hypertension with superimposed preeclampsia	6	6.0
Systolic blood pressure	140-159 mmHg	56	56.0
	≥160 mmHg	44	44.0
Diastolic blood pressure	90-109 mmHg	60	60.0
	≥110 mmHg	40	40.0
Proteinuria	Absent/trace	38	38.0
	1+	24	24.0
	2+	22	22.0
	≥3+	16	16.0
Common symptoms*	Headache	44	44.0
	Pedal edema	41	41.0
	Visual disturbance	18	18.0
	Epigastric pain	12	12.0
	Convulsions	10	10.0

*Symptoms were not mutually exclusive.

Antihypertensive therapy was required in 86% of women. Magnesium sulphate was administered in 44% of cases, mainly among women with severe preeclampsia and eclampsia. Antenatal corticosteroids were given in 40% of women. Caesarean section was the most common mode of delivery and was performed in 50% of cases. Maternal complications were observed in 38% of women. Postpartum haemorrhage, HELLP syndrome, abruptio placentae, acute kidney injury, pulmonary edema, disseminated intravascular coagulation, ICU admission, and maternal death were recorded as shown in Table 3.

Table 3. Treatment details, mode of delivery, and maternal outcomes

Variable	Category	Frequency (n=100)	Percentage (%)
Antihypertensive therapy	Required	86	86.0
	Not required	14	14.0
Magnesium sulphate	Given	44	44.0
	Not given	56	56.0
Antenatal corticosteroids	Given	40	40.0
	Not given	60	60.0
Mode of delivery	Vaginal delivery	46	46.0
	Caesarean section	50	50.0
	Instrumental delivery	4	4.0
Maternal outcome*	No complication	62	62.0
	Postpartum haemorrhage	8	8.0
	HELLP syndrome	6	6.0
	Abruptio placentae	5	5.0
	Acute kidney injury	4	4.0
	Pulmonary edema	3	3.0
	DIC	2	2.0
	ICU admission	7	7.0
	Maternal death	1	1.0

*Individual maternal complications were not mutually exclusive. DIC: disseminated intravascular coagulation; ICU: intensive care unit.

Preterm delivery occurred in 45% of cases. Low birth weight was observed in 50% of neonates, and NICU admission was required in 32%. Intrauterine growth restriction was documented in 24%, while birth asphyxia was noted in 12%. There were 95 live births and 5 stillbirths. Among live births, 3 neonatal deaths were recorded, resulting in an overall perinatal mortality of 8%, as shown in Table 4.

Table 4. Fetal and neonatal outcomes.

Fetal/neonatal outcome	Frequency (n=100)	Percentage (%)
Term birth	55	55.0
Preterm birth	45	45.0
Birth weight ≥2.5 kg	50	50.0
Low birth weight <2.5 kg	50	50.0
Intrauterine growth restriction	24	24.0
Birth asphyxia	12	12.0
NICU admission	32	32.0
Live birth	95	95.0
Stillbirth	5	5.0
Neonatal death	3	3.0
Overall perinatal mortality	8	8.0

Overall, severe preeclampsia and eclampsia were associated with a greater burden of maternal and fetal morbidity. These conditions contributed substantially to maternal complications, preterm delivery, low birth weight, NICU admission, and perinatal mortality

DISCUSSION

The present observational study evaluated 100 women with hypertensive disorders of pregnancy and demonstrated a clinically important burden of maternal and fetal morbidity. The mean age was 26.7 years, with most women in the 20-29-

year age group, reflecting the common reproductive age group attending tertiary obstetric services. Multigravida women formed a slightly higher proportion than primigravida women. Tertiary care cohorts often include multigravida women with chronic hypertension, previous obstetric risk factors, or delayed referral. Similar variability in gravida distribution has been described in hospital-based studies from different regions [10-12].

Severe preeclampsia was the most common hypertensive disorder in this cohort, followed by gestational hypertension and mild preeclampsia. This pattern is consistent with studies conducted in referral hospitals where complicated cases are preferentially admitted. Xavier et al. reported that preeclampsia and eclampsia were associated with higher adverse maternal and neonatal outcomes than chronic or gestational hypertension [10]. Panda et al. also observed a greater burden of morbidity among women with severe preeclampsia and eclampsia in a prospective hospital-based study from Northeast India [11]. The present findings support the clinical relevance of separating mild disease from severe disease during admission assessment.

Headache, pedal edema, visual disturbance, epigastric pain, and convulsions were the key symptoms in the present study. These manifestations reflect systemic endothelial dysfunction and evolving target-organ involvement. Proteinuria was present in 62% of cases, and severe-range blood pressure was documented in a substantial proportion of women. Such findings have practical importance because high blood pressure, significant proteinuria, neurological symptoms, thrombocytopenia, and biochemical abnormalities are associated with deterioration and adverse perinatal outcome [1-3]. Standardized monitoring of symptoms, blood pressure, urine protein, platelet count, renal function, liver enzymes, and fetal status therefore remains necessary in tertiary care management.

Antihypertensive therapy was required in 86% of women, and magnesium sulphate was administered in 44%. The use of magnesium sulphate is supported by robust evidence showing reduction in the risk of eclampsia among women with preeclampsia [9]. Caesarean section was performed in 50% of cases, reflecting the combined influence of disease severity, fetal compromise, unfavourable cervix, previous caesarean section, and urgent obstetric indications. Maternal complications included postpartum haemorrhage, HELLP syndrome, abruptio placentae, acute kidney injury, pulmonary edema, disseminated intravascular coagulation, ICU admission, and one maternal death. These outcomes are in line with earlier studies describing increased critical care requirement and maternal morbidity in severe HDP [11-14].

Fetal and neonatal outcomes also showed considerable burden. Preterm delivery occurred in 45%, low birth weight in 50%, NICU admission in 32%, and overall perinatal mortality in 8%. These outcomes reflect uteroplacental insufficiency, medically indicated preterm delivery, placental abruption, and fetal growth restriction in severe preeclampsia and eclampsia [4,5]. Seyom et al. and Mengistu et al. reported high rates of low birth weight, preterm delivery, and perinatal loss among pregnancies complicated by hypertension [12,14]. The findings reinforce the need for early diagnosis, referral before severe features develop, protocol-based maternal stabilization, and neonatal intensive care.

Limitations

This single-centre study with a sample size of 100 limits generalisability to wider populations. The observational design restricts causal interpretation. Some outcomes were based on hospital records, creating scope for documentation bias and under-reporting of minor events. Long-term maternal cardiovascular outcomes, postpartum blood pressure control, and neonatal developmental outcomes were not assessed, so the analysis remains confined to immediate hospital-based events.

CONCLUSION

Hypertensive disorders of pregnancy were associated with substantial maternal and fetal morbidity in this tertiary care cohort. Severe preeclampsia was the most frequent disorder, followed by gestational hypertension and mild preeclampsia. A considerable proportion of women required antihypertensive therapy, magnesium sulphate, caesarean delivery, and intensive monitoring. Maternal complications included postpartum haemorrhage, HELLP syndrome, abruptio placentae, acute kidney injury, pulmonary edema, disseminated intravascular coagulation, ICU admission, and maternal death. Fetal morbidity was reflected by preterm birth, low birth weight, intrauterine growth restriction, birth asphyxia, NICU admission, stillbirth, and neonatal death. Strengthening antenatal screening, early referral, protocol-based treatment, and neonatal support can improve pregnancy outcomes in women with HDP.

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