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Original Article

Clinicodemographic Profile and Maternal-Fetal Outcomes among Pregnant Women with Hypertensive Disorders: An Observational Study

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ABSTRACT

Background: Hypertensive disorders of pregnancy remain a major contributor to maternal and perinatal morbidity and mortality, particularly in low- and middle-income settings where delayed diagnosis and late referral continue to influence outcomes.
Objectives: To evaluate the clinicodemographic profile, clinical spectrum, and maternal-fetal outcomes among pregnant women diagnosed with hypertensive disorders of pregnancy in a tertiary care teaching hospital.
Methods: This observational study was conducted at Maharajahs Institute of Medical Sciences, Nellimarla, Vizianagaram, Andhra Pradesh, India, from January 2025 to December 2025. A total of 100 pregnant women with gestational hypertension, preeclampsia, eclampsia, or chronic hypertension with superimposed preeclampsia were included. Clinicodemographic variables, obstetric characteristics, clinical presentation, and maternal and neonatal outcomes were recorded using a structured proforma and analyzed descriptively.
Results: The mean maternal age was 26.9 ± 4.8 years, and 34.0% of women were aged 25-29 years. Rural residence [62.0%], booked status [72.0%], and multigravidity [56.0%] were common. Half of the women were diagnosed after 34 weeks of gestation. Gestational hypertension was the most frequent disorder [38.0%], followed by preeclampsia without severe features [26.0%]. Severe hypertension at admission was present in 30.0%, and proteinuria in 54.0%. Vaginal delivery occurred in 54.0% and cesarean section in 46.0%. Preterm delivery [32.0%], low birth weight [34.0%], fetal growth restriction [22.0%], NICU admission [18.0%], stillbirth [4.0%], and early neonatal death [3.0%] were notable adverse outcomes. Severe preeclampsia and eclampsia showed poorer maternal and neonatal outcomes than milder disease categories.
Conclusion: Hypertensive disorders in pregnancy were associated with substantial maternal and fetal morbidity in this cohort, with adverse outcomes being more frequent in severe disease. Early antenatal detection, careful monitoring, timely referral, and appropriate intrapartum management are essential to improve maternal and neonatal outcomes.

Keywords: *Hypertensive disorders of pregnancy; gestational hypertension; preeclampsia; eclampsia; maternal outcome; perinatal outcome.*

INTRODUCTION

Hypertensive disorders of pregnancy comprise a heterogeneous group of conditions that include gestational hypertension, preeclampsia, eclampsia, chronic hypertension, and chronic hypertension with superimposed preeclampsia. These disorders remain among the most important causes of maternal and perinatal morbidity across the world and continue to challenge obstetric practice because of their unpredictable onset, multisystem involvement, and potential for rapid deterioration [1-5]. Preeclampsia, in particular, is a complex syndrome characterized by new-onset hypertension after 20 weeks of gestation, often accompanied by proteinuria or maternal organ dysfunction. Current evidence indicates that abnormal placentation, endothelial dysfunction, angiogenic imbalance, oxidative stress, and systemic inflammation contribute to disease development and progression [4,5].

The burden of hypertensive disorders extends beyond elevated blood pressure values alone. These conditions are associated with placental insufficiency, fetal growth restriction, preterm birth, placental abruption, low birth weight, and increased neonatal intensive care admission. On the maternal side, severe hypertension, HELLP syndrome, renal dysfunction, cerebrovascular complications, intensive care requirement, and even death can occur when diagnosis or intervention is delayed [1-3,6-9]. The severity of adverse outcomes often parallels disease severity, with severe preeclampsia, superimposed preeclampsia, and eclampsia showing the greatest contribution to poor maternal and perinatal events [8-12].

Several epidemiological and cohort studies have shown that clinicodemographic determinants such as primigravidity, obesity, chronic hypertension, diabetes, multiple gestation, and previous preeclampsia influence susceptibility to hypertensive disorders of pregnancy [6,7]. At the same time, social and health-system factors such as rural residence, unbooked status, limited antenatal surveillance, and late gestational presentation influence the timing of diagnosis and clinical outcomes, especially in resource-constrained settings [1,10-13]. Indian studies have consistently highlighted the need for early recognition and institutional care, as women presenting with severe disease tend to experience higher rates of preterm birth, operative delivery, fetal compromise, and maternal complications [10-12].

Despite continuing advances in antenatal screening and evidence-based management protocols, the pattern of hypertensive disorders and their maternal-fetal consequences varies across institutions and populations. Local observational data remain valuable because they help quantify disease spectrum, identify dominant complications, and guide improvements in monitoring, referral pathways, and neonatal preparedness. The present study was therefore undertaken to assess the clinicodemographic profile, clinical presentation, and maternal-fetal outcomes among pregnant women with hypertensive disorders at a tertiary care teaching hospital. The objectives of this study were to describe the clinicodemographic and obstetric characteristics of affected women, classify the spectrum of hypertensive disorders, and evaluate associated maternal, fetal, and neonatal outcomes. locally.

METHODOLOGY

Study design and setting

This hospital-based observational study was conducted in the Department of Obstetrics and Gynecology at Maharajahs Institute of Medical Sciences, Nellimarla, Vizianagaram, Andhra Pradesh, India, from January 2025 to December 2025. The institution serves as a tertiary care referral center receiving booked and referred obstetric cases from urban and rural areas. The study was designed to document the clinical profile and maternal-fetal outcomes of hypertensive disorders during routine care [1-3].

Study population

Pregnant women diagnosed with hypertensive disorders of pregnancy during the study period constituted the study population. A total of 100 eligible women were included. The study considered the major clinical categories of gestational hypertension, preeclampsia without severe features, severe preeclampsia, eclampsia, and chronic hypertension with superimposed preeclampsia according to accepted obstetric definitions [1-3]. Women diagnosed after 20 weeks of gestation and managed or delivered at the study hospital were enrolled.

Inclusion and exclusion criteria

Women with documented hypertensive disorder in pregnancy and complete in-hospital clinical outcome data were included irrespective of age, parity, residence, or booking status. Women with transient blood pressure elevation not fulfilling diagnostic criteria, those with insufficient records for maternal or neonatal outcome assessment, and women managed completely outside the institution were excluded from final analysis.

Data collection

Data were recorded in a structured case record proforma. Variables included maternal age, residence, booking status, gravidity, gestational age at diagnosis, type of hypertensive disorder, presenting symptoms, proteinuria, and blood pressure severity at admission. Maternal outcome measures included mode of delivery, preterm delivery, abruptio placentae, postpartum hemorrhage, HELLP syndrome, acute kidney injury, ICU admission, and maternal death. Fetal and neonatal outcomes included live birth, stillbirth, early neonatal death, low birth weight, fetal growth restriction, Apgar score at 5

minutes, preterm birth, and NICU admission. Clinical and laboratory records routinely maintained in the department were used for outcome documentation [1,2,8,9].

Operational definitions

Gestational hypertension was defined as new-onset hypertension after 20 weeks of gestation without proteinuria or severe features. Preeclampsia was defined as hypertension after 20 weeks associated with proteinuria and/or maternal organ dysfunction. Severe preeclampsia referred to disease with severe blood pressure elevation or major clinical or laboratory severity features. Eclampsia was defined by generalized tonic-clonic seizures in a woman with preeclampsia after exclusion of other neurological causes. Severe hypertension at admission was defined as systolic blood pressure at least 160 mmHg and/or diastolic blood pressure at least 110 mmHg. Preterm delivery was birth before 37 completed weeks, and low birth weight was birth weight below 2500 g [1-3].

Statistical analysis

Data were compiled and entered into a spreadsheet for descriptive analysis. Continuous variables were summarized as mean ± standard deviation, while categorical variables were expressed as frequency and percentage. The present manuscript describes the distribution of clinicodemographic variables, disease categories, maternal complications, and neonatal outcomes in the study cohort. Findings were interpreted against available observational and guideline-based literature [1,3,8-14].

Ethical considerations

The study was conducted in accordance with institutional ethical standards and the principles of the Declaration of Helsinki. Patient confidentiality was maintained throughout data abstraction, analysis, and manuscript preparation. Only anonymized clinical information was used in the study report.

RESULTS

A total of 100 pregnant women diagnosed with hypertensive disorders of pregnancy were included in this observational study. The mean maternal age was 26.9 ± 4.8 years. Most women belonged to the 25-29 years age group [34.0%], followed by 20-24 years [28.0%]. Rural residence was noted in 62.0% of participants, while 72.0% were booked cases. Multigravida women constituted 56.0% of the study population and primigravida women accounted for 44.0%. With respect to gestational age at diagnosis, half of the participants were identified after 34 weeks of gestation, indicating that hypertensive disorders were predominantly diagnosed in late pregnancy [Table 1].

Table 1. Clinicodemographic and obstetric characteristics of study participants [n = 100]

Variable	Number	Percentage [%]
Age group [years]		
<20	10	10.0
20-24	28	28.0
25-29	34	34.0
30-34	20	20.0
≥35	8	8.0
Residence		
Rural	62	62.0
Urban	38	38.0
Booking status		
Booked	72	72.0
Unbooked	28	28.0
Gravidity		
Primigravida	44	44.0

Variable	Number	Percentage [%]
Multigravida	56	56.0
Gestational age at diagnosis		
<28 weeks	18	18.0
28-34 weeks	32	32.0
>34 weeks	50	50.0

Among the hypertensive disorders, gestational hypertension was the most common diagnosis, observed in 38.0% of women, followed by preeclampsia without severe features in 26.0%, severe preeclampsia in 18.0%, eclampsia in 8.0%, and chronic hypertension with superimposed preeclampsia in 10.0%. Headache was the most frequent presenting symptom [42.0%], followed by pedal edema [36.0%], visual disturbances [14.0%], and epigastric pain [10.0%]. Proteinuria was documented in 54.0% of cases. Severe hypertension at admission [systolic blood pressure ≥160 mmHg and/or diastolic blood pressure ≥110 mmHg] was present in 30.0% of participants [Table 2].

Table 2. Clinical profile of hypertensive disorders among study participants [n = 100]

Variable	Number	Percentage [%]
Type of hypertensive disorder		
Gestational hypertension	38	38.0
Preeclampsia without severe features	26	26.0
Severe preeclampsia	18	18.0
Eclampsia	8	8.0
Chronic hypertension with superimposed preeclampsia	10	10.0
Presenting symptoms/signs		
Headache	42	42.0
Pedal edema	36	36.0
Visual disturbances	14	14.0
Epigastric pain	10	10.0
Convulsions	8	8.0
Proteinuria present	54	54.0
Severe hypertension at admission	30	30.0

Maternal complications were observed in a considerable proportion of women. Preterm delivery was the most frequent adverse maternal course-related outcome, occurring in 32.0% of pregnancies. Abruptio placentae was documented in 8.0% of cases, postpartum hemorrhage in 6.0%, HELLP syndrome in 5.0%, acute kidney injury in 4.0%, and intensive care unit admission in 7.0%. Cesarean delivery was performed in 46.0% of women, while 54.0% delivered vaginally. Maternal mortality was not recorded in the present study [Table 3].

Table 3. Maternal outcomes among study participants [n = 100]

Variable	Number	Percentage [%]
Mode of delivery		
Vaginal delivery	54	54.0

Variable	Number	Percentage [%]
Cesarean section	46	46.0
Maternal complications		
Preterm delivery	32	32.0
Abruptio placentae	8	8.0
Postpartum hemorrhage	6	6.0
HELLP syndrome	5	5.0
Acute kidney injury	4	4.0
ICU admission	7	7.0
Maternal mortality	0	0.0

Fetal and neonatal outcomes also reflected the burden of hypertensive disorders. Low birth weight was the most common fetal outcome, affecting 34.0% of neonates, followed by fetal growth restriction in 22.0%. Preterm birth occurred in 32.0% of newborns. Apgar score <7 at 5 minutes was observed in 12.0%, neonatal intensive care unit admission in 18.0%, stillbirth in 4.0%, and early neonatal death in 3.0% of cases. Overall, 75.0% of pregnancies resulted in live term or near-term neonates without major complications, whereas 25.0% had significant adverse fetal or neonatal outcomes [Table 4].

Table 4. Fetal and neonatal outcomes among study participants [n = 100]

Variable	Number	Percentage [%]
Live birth	93	93.0
Stillbirth	4	4.0
Early neonatal death	3	3.0
Preterm birth	32	32.0
Low birth weight	34	34.0
Fetal growth restriction	22	22.0
Apgar score <7 at 5 min	12	12.0
NICU admission	18	18.0

On subgroup assessment, severe preeclampsia and eclampsia were associated with poorer maternal and fetal outcomes compared with gestational hypertension and preeclampsia without severe features. The frequency of cesarean section, preterm delivery, low birth weight, and NICU admission was notably higher among women with severe disease. These findings indicate that worsening severity of hypertensive disorder was associated with an increased risk of adverse maternal and neonatal outcomes.

DISCUSSION

The present study describes the clinicodemographic pattern and outcome profile of 100 pregnant women with hypertensive disorders managed at a tertiary care teaching hospital. Most women were in the age group of 25-29 years, were from rural areas, and were diagnosed during late gestation. Gestational hypertension formed the largest diagnostic category, whereas severe preeclampsia and eclampsia together contributed substantially to disease burden. These observations are broadly consistent with published hospital-based studies showing that hypertensive disorders often present in the third trimester and that severe disease categories account for the greatest burden of complications [1-3,10-12].

In the present cohort, headache, pedal edema, proteinuria, and severe hypertension at admission were common clinical features. This pattern corresponds with current understanding of the syndrome, in which abnormal placentation, endothelial dysfunction, and maternal organ involvement result in symptomatic disease and measurable maternal risk [2,4,5]. Severe

hypertension at presentation is clinically important because earlier studies have linked marked blood pressure elevation with worse maternal morbidity, higher perinatal mortality, and increased critical care need [10,11]. The predominance of diagnosis after 34 weeks also indicates that continued surveillance in late pregnancy remains essential even when earlier antenatal visits are unremarkable.

Maternal outcomes in this study reflected meaningful morbidity. Preterm delivery was frequent, nearly half of the women required cesarean section, and complications such as abruptio placentae, HELLP syndrome, acute kidney injury, and ICU admission were documented. These findings align with population-based evidence showing that hypertensive disorders increase the likelihood of medically indicated birth, operative delivery, placental abruption, and major adverse maternal outcomes, particularly in early-onset and superimposed disease [8,9,12]. The absence of maternal mortality in this series probably reflects timely institutional management and availability of escalation of care when complications evolved.

Fetal and neonatal morbidity was also substantial, with low birth weight, preterm birth, fetal growth restriction, low Apgar score, NICU admission, stillbirth, and early neonatal death recorded in this cohort. These outcomes are expected in pregnancies complicated by placental insufficiency and uteroplacental hypoperfusion, which impair fetal growth and increase the likelihood of fetal compromise and premature delivery [4,5,9]. Recent cohort data have similarly shown that preeclampsia, especially with severe features or earlier onset, is associated with increased risks of perinatal death, low birth weight, and preterm birth [9,13,14].

An important observation in the present analysis was the poorer outcome profile among women with severe preeclampsia and eclampsia compared with those having gestational hypertension or preeclampsia without severe features. This mirrors prior Indian and international literature, where severe disease consistently shows greater maternal organ involvement and worse neonatal compromise [10-14]. Taken together, the findings support early antenatal registration, regular blood pressure and urine protein assessment, identification of warning symptoms, timely referral, and coordinated obstetric-neonatal care in order to reduce avoidable maternal and perinatal morbidity.

Limitations

This study was conducted at a single tertiary care center with a sample size of 100, which limits external applicability to broader populations. The observational design did not include a normotensive comparison group. Outcomes were described primarily through descriptive analysis, and adjustment for confounding variables was not performed. Long-term maternal cardiovascular follow-up and long-term neonatal developmental outcomes were not available within the study framework.

CONCLUSION

Hypertensive disorders of pregnancy constituted a substantial cause of maternal and neonatal morbidity in this institutional cohort. Most women presented in late gestation, and gestational hypertension was the commonest subtype, while severe preeclampsia and eclampsia carried the greatest burden of adverse outcomes. Preterm delivery, low birth weight, fetal growth restriction, NICU admission, and maternal complications such as placental abruption and ICU requirement were notable findings. The study underscores the importance of early antenatal registration, vigilant blood pressure monitoring, timely recognition of warning symptoms, and prompt referral to adequately equipped centers. Strengthening antenatal surveillance and multidisciplinary intrapartum care can improve maternal and fetal outcomes in pregnancies complicated by hypertension.

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