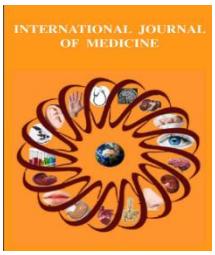

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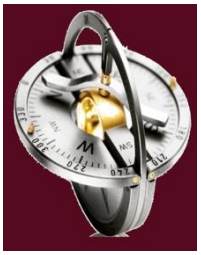

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Original Research

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

Dr. P. Swarnamukhi[1]*, Dr. AR. Vijaya kumari[2], Dr. V. Mary Snigdha[3]

1Assistant Professor, Department of Obstetrics and Gynecology, ACSR Govt Medical College, Nellore, Andhra Pradesh, India.
2Assistant Professor, Department of Obstetrics and Gynecology, Rajiv Gandhi Institute of Medical Sciences, Ongole, Andhra Pradesh, India.
3Assistant Professor, Department of Obstetrics and Gynecology, ACSR Govt Medical College, Nellore, Andhra Pradesh, India.

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Abstract

Background: Hypertensive disorders of pregnancy remain important causes of maternal morbidity and mortality, especially when diagnosis or referral is delayed. *Objectives:* To assess the clinical profile, treatment pattern, mode of delivery, and maternal outcomes among women with hypertensive disorders of pregnancy. *Methods:* This observational study was conducted at ACSR Medical College, Nellore, Andhra Pradesh, India, from February 2021 to July 2021. A total of 100 pregnant women diagnosed with hypertensive disorders of pregnancy were included. Demographic details, obstetric profile, admission blood pressure, symptoms, proteinuria, laboratory abnormalities, treatment requirement, mode of delivery, and maternal complications were recorded. Data were analysed using descriptive statistics. *Results:* The mean age was 25.8 ± 4.6 years, and the mean gestational age at presentation was 35.4 ± 3.1 weeks. Primigravidae constituted 58.0% of the study population. Gestational hypertension was the most common disorder, followed by preeclampsia without severe features and severe preeclampsia. Eclampsia was observed in 8.0% of women. Antihypertensive therapy was required in 64.0%, magnesium sulphate was administered in 32.0%, and caesarean section was performed in 58.0%. Maternal complications occurred in 30.0%, with postpartum haemorrhage, abruptio placentae, HELLP syndrome, and acute kidney injury being the major complications. One maternal death was recorded. *Conclusion:* Hypertensive disorders of pregnancy were common among young women and primigravidae. Severe preeclampsia and eclampsia contributed substantially to maternal morbidity, emphasizing early detection, timely treatment, and close surveillance.

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

Introduction

Hypertensive disorders of pregnancy are among the most frequent medical complications encountered in obstetric practice and remain a major contributor to preventable maternal morbidity. The spectrum includes gestational hypertension, preeclampsia, severe preeclampsia, eclampsia, chronic hypertension, and chronic hypertension with superimposed preeclampsia. Contemporary guidelines define preeclampsia as new-onset hypertension after 20 weeks of gestation with proteinuria or evidence of maternal organ dysfunction, and they emphasize the importance of clinical and laboratory assessment rather than blood pressure alone [1,2]. This approach is relevant in tertiary care hospitals, where women often present with variable severity and require rapid risk stratification.

The global burden of preeclampsia and eclampsia is considerable. Preeclampsia complicates a substantial proportion of pregnancies and is associated with hepatic, renal, neurological, haematological, and placental complications [3,4]. Hypertensive disorders are also an important cause of maternal death worldwide, and their contribution is higher in settings where antenatal detection, referral pathways, intensive care support, and emergency obstetric services remain uneven [5,6]. Apart from immediate complications, preeclampsia is increasingly regarded as a systemic endothelial disorder with long-term implications for cardiovascular and renal health [7,8].

Address for Correspondence P. Swarnamukhi, Assistant Professor, Department of Obstetrics and Gynecology, ACSR Govt Medical College, Nellore, Andhra Pradesh, India.

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Maternal complications in hypertensive disorders of pregnancy arise through multiple mechanisms. Severe vasospasm, endothelial injury, coagulation activation, and abnormal placentation contribute to thrombocytopenia, elevated liver enzymes, renal dysfunction, placental abruption, pulmonary edema, eclampsia, and HELLP syndrome [7,9]. Eclampsia represents the convulsive end of the disease spectrum and often reflects delayed recognition of clinical warning signs or delayed initiation of magnesium sulphate therapy. Magnesium sulphate remains the established anticonvulsant for seizure prevention and treatment in severe preeclampsia and eclampsia [10,11].

Local clinical data are essential because maternal characteristics, booking status, gestational age at presentation, disease severity, and access to emergency care vary across institutions. A focused observational evaluation helps describe the common presentation patterns, burden of laboratory abnormalities, treatment needs, mode of delivery, and short-term maternal outcomes. Such data support institutional audit, risk-based surveillance, and timely escalation of care for women with severe disease. The present study was conducted to evaluate the clinical profile and maternal outcomes among women with hypertensive disorders of pregnancy admitted to a tertiary care teaching hospital, with specific objectives to describe demographic and obstetric characteristics, classify the type of hypertensive disorder, assess clinical and laboratory abnormalities, and determine treatment requirements, mode of delivery, and maternal complications. In addition, centre-specific data help refine triage practices for women reaching care late in pregnancy.

Methodology

Study design and setting: This hospital-based observational study was conducted in the Department of Obstetrics and Gynecology at ACSR Medical College, Nellore, Andhra Pradesh, India. The study period extended from February 2021 to July 2021. The study was designed to evaluate the clinical profile and maternal outcomes among women diagnosed with hypertensive disorders of pregnancy. The institution is a tertiary care teaching hospital receiving booked and referred obstetric cases.

Study population: A total of 100 pregnant women diagnosed with hypertensive disorders of pregnancy were included. Women presenting after 20 weeks of gestation with gestational hypertension, preeclampsia without severe features, severe preeclampsia, eclampsia, or chronic hypertension with superimposed preeclampsia were eligible for inclusion. The diagnostic classification was based on standard clinical criteria, including blood pressure measurement, proteinuria assessment, and evidence of maternal end-organ involvement [1,2]. Women with non-obstetric causes of convulsions, incomplete essential clinical records, or major medical conditions unrelated to pregnancy that independently explained the maternal outcome were excluded.

Data collection: Demographic variables such as age, gravidity, antenatal booking status, and gestational age at presentation were recorded. Clinical details included systolic and diastolic blood pressure at admission, pedal edema, headache, visual disturbances, epigastric pain, convulsions, and proteinuria. Laboratory parameters included platelet count, liver enzymes, renal function, and coagulation profile. HELLP syndrome was identified using clinical and laboratory evidence of haemolysis, elevated liver enzymes, and low platelet count, consistent with established descriptions of the syndrome [12,13].

Management and outcome assessment: All participants received standard institutional care according to clinical severity. Antihypertensive therapy, magnesium sulphate therapy, blood transfusion, mode of delivery, and need for intensive care admission were documented. The primary outcome was maternal outcome, categorized as uneventful recovery or development of maternal complications. Complications assessed included postpartum haemorrhage, abruptio placentae, HELLP syndrome, acute kidney injury, pulmonary edema, disseminated intravascular coagulation, cerebrovascular accident, and maternal mortality. The role of magnesium sulphate in prevention and treatment of eclamptic seizures was considered in accordance with established evidence [10,11].

Statistical analysis and ethics: Data were entered into a spreadsheet and analysed using descriptive statistics. Continuous variables were summarized as mean and standard deviation. Categorical variables were expressed as frequency and percentage. No inferential comparison was planned because the objective was descriptive profiling of clinical characteristics and maternal outcomes. Institutional Ethics Committee approval was obtained before commencement of the study, and written informed consent was taken from eligible participants or legally acceptable attendants where clinically appropriate.

Results

A total of 100 women diagnosed with hypertensive disorders of pregnancy were included in the study. The mean age of the study participants was 25.8 ± 4.6 years, and the mean gestational age at presentation was 35.4 ± 3.1 weeks. Most women were in the 21-30 years age group. Primigravidae constituted the majority of the study population. The baseline demographic and obstetric profile is shown in Table 1.

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

Variable	Category / Value	Frequency	Percentage
Total sample size	-	100	100.0
Age, years	Mean ± SD	25.8 ± 4.6	-
Age group	≤20 years	14	14.0
	21-25 years	38	38.0
	26-30 years	32	32.0
	>30 years	16	16.0
Gravidity	Primigravida	58	58.0
	Multigravida	42	42.0
Antenatal booking status	Booked	72	72.0
	Unbooked	28	28.0
Gestational age at presentation	Mean ± SD	35.4 ± 3.1 weeks	-
Gestational age group	<34 weeks	24	24.0
	34-36 weeks	34	34.0
	≥37 weeks	42	42.0

Gestational hypertension was the most common hypertensive disorder, followed by preeclampsia without severe features and severe preeclampsia. Eclampsia was observed in 8.0% of women, while chronic hypertension with superimposed preeclampsia was noted in 4.0% of cases. The mean systolic blood pressure at admission was 156.8 ± 18.4 mmHg, and the mean diastolic blood pressure was 100.6 ± 10.8 mmHg. Pedal edema and headache were the most frequent clinical findings. Proteinuria of 2+ or more was observed in 56.0% of women (Table 2).

Table 2. Distribution and clinical profile of hypertensive disorders of pregnancy

Variable	Category / Value	Frequency	Percentage
Type of hypertensive disorder	Gestational hypertension	38	38.0
	Preeclampsia without severe features	26	26.0
	Severe preeclampsia	24	24.0
	Eclampsia	8	8.0
	Chronic hypertension with superimposed preeclampsia	4	4.0
Systolic BP at admission, mmHg	Mean ± SD	156.8 ± 18.4	-
Diastolic BP at admission, mmHg	Mean ± SD	100.6 ± 10.8	-
Pedal edema	Present	56	56.0
Headache	Present	42	42.0
Visual disturbances	Present	18	18.0
Epigastric pain	Present	12	12.0
Convulsions	Present	8	8.0
Proteinuria	Absent/trace	16	16.0
	1+	28	28.0
	2+	32	32.0
	≥3+	24	24.0

Laboratory abnormalities were present in a notable proportion of patients. Thrombocytopenia was the most common abnormality, followed by elevated liver enzymes and renal dysfunction. HELLP syndrome was diagnosed in 6.0% of women. Antihypertensive therapy was required in 64.0% of women, while magnesium sulphate was administered in 32.0% of cases. Blood transfusion was required in 8.0%, and intensive care unit admission was required in 10.0%. Caesarean section was the most common mode of delivery and was performed in 58.0% of women (Table 3).

Table 3. Laboratory abnormalities and treatment profile

Variable	Category	Frequency	Percentage
Thrombocytopenia	Present	18	18.0
Elevated liver enzymes	Present	16	16.0
Renal dysfunction	Present	10	10.0
HELLP syndrome	Present	6	6.0
Abnormal coagulation profile	Present	4	4.0
Antihypertensive treatment	Required	64	64.0
Magnesium sulphate therapy	Given	32	32.0
Blood transfusion	Required	8	8.0
ICU admission	Required	10	10.0
Mode of delivery	Vaginal delivery	42	42.0
	Caesarean section	58	58.0

Maternal complications were observed in 30.0% of women. Postpartum haemorrhage was the most common complication, followed by abruptio placentae, HELLP syndrome, and acute kidney injury. Less frequent but serious complications included pulmonary edema, disseminated intravascular coagulation, and cerebrovascular accident. One maternal death was recorded in a woman with eclampsia complicated by pulmonary edema and multiorgan dysfunction. Overall, 70.0% of women recovered without major complications (Table 4).

Table 4. Maternal outcomes and complications

Maternal outcome / complication	Frequency	Percentage
Uneventful recovery	70	70.0
Any maternal complication	30	30.0
Postpartum haemorrhage	8	8.0
Abruptio placentae	6	6.0
HELLP syndrome	6	6.0
Acute kidney injury	5	5.0
Pulmonary edema	3	3.0
Disseminated intravascular coagulation	2	2.0
Cerebrovascular accident	1	1.0
Maternal mortality	1	1.0

Overall, most women with hypertensive disorders of pregnancy had favourable maternal outcomes. However, women with severe preeclampsia and eclampsia contributed disproportionately to maternal morbidity, requirement for magnesium sulphate therapy, intensive care admission, and serious complications.

Discussion

The present observational study describes the clinical profile and maternal outcomes among 100 women with hypertensive disorders of pregnancy managed at a tertiary care teaching hospital. The mean age was 25.8 years, and most women were between 21 and 30 years of age. This pattern reflects the common reproductive age group in Indian obstetric practice and is clinically relevant because young maternal age does not exclude severe hypertensive disease. Primigravidae formed 58.0% of the study population, supporting the known association between first pregnancy and preeclampsia risk [1,8].

Gestational hypertension was the single most common diagnosis, but preeclampsia with or without severe features together accounted for half of the cases. This distribution indicates that a large proportion of women presenting with hypertension had systemic disease rather than isolated blood pressure elevation. The mean systolic and diastolic pressures at admission were high, and proteinuria of 2+ or more was seen in 56.0% of women. Current guidelines stress that severe features, symptoms, and laboratory abnormalities are central to risk classification because maternal deterioration can occur even when the initial presentation appears moderate [1,2].

Headache, pedal edema, visual symptoms, epigastric pain, and convulsions were important clinical findings in this study. These symptoms represent warning signs of disease progression and are repeatedly emphasized in clinical recommendations for preeclampsia and eclampsia [5,14]. Eclampsia was observed in 8.0% of women, indicating the need for strong antenatal detection, timely referral, and early magnesium sulphate use in severe disease. Evidence from randomized trials and systematic reviews supports magnesium sulphate as the anticonvulsant of choice for preventing and treating eclamptic seizures [10,11].

Laboratory abnormalities were common. Thrombocytopenia, elevated liver enzymes, renal dysfunction, and coagulation abnormalities reflect multisystem involvement. HELLP syndrome was present in 6.0% of women and remains one of the most serious variants of preeclampsia

because it is associated with haemostatic disturbance, hepatic involvement, renal injury, and increased risk of adverse maternal outcomes [12,13]. The 5.0% frequency of acute kidney injury in the present study reinforces the need for renal function monitoring in women with severe preeclampsia, eclampsia, and HELLP syndrome.

Caesarean section was performed in 58.0% of women. The higher operative delivery rate is understandable in a tertiary hospital population where severe hypertension, unfavourable cervix, fetal concerns, and need for timely delivery influence obstetric decision-making. Maternal complications occurred in 30.0% of women, with postpartum haemorrhage, abruptio placentae, HELLP syndrome, acute kidney injury, pulmonary edema, and disseminated intravascular coagulation being the major contributors. One maternal death was recorded. These findings highlight that hypertensive disorders of pregnancy require not only blood pressure control but also coordinated obstetric, anaesthetic, laboratory, transfusion, and intensive care support. Institutional protocols, early identification of danger signs, prompt magnesium sulphate administration, and postpartum surveillance are essential to reduce avoidable maternal morbidity and mortality [1,5,14].

Limitations
This study was limited by its single-centre design and modest sample size. The findings describe hospital-based outcomes and do not represent the true community burden of hypertensive disorders of pregnancy. Neonatal outcomes and long-term postpartum cardiovascular follow-up were not evaluated. Laboratory testing was based on routine clinical availability, which restricted detailed biomarker-based risk stratification. Severity-specific subgroup analysis was not performed.

Conclusion
Hypertensive disorders of pregnancy in this study were commonly observed among young women and primigravidae, with many presenting in the late third trimester. Gestational hypertension was the most frequent diagnosis, but preeclampsia and severe preeclampsia together formed a substantial clinical burden. Maternal morbidity was mainly related to postpartum haemorrhage, abruptio placentae, HELLP syndrome, acute kidney injury, pulmonary edema, and coagulation abnormalities. Most women recovered without major complications; however, severe preeclampsia and eclampsia required greater clinical vigilance, magnesium sulphate therapy, and intensive care support. Early antenatal detection, timely referral, structured monitoring, and protocol-based management remain central to improving maternal outcomes. These findings support routine clinical audit in obstetric units managing high-risk pregnancies.

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