



## STUDY OF THE MATERNAL AND FETAL OUTCOME IN PREGNANCIES COMPLICATED WITH HYPERTENSIVE DISORDERS OF PREGNANCY: A STUDY AT MGM HOSPITAL AND RESEARCH CENTRE, PATNA.

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### Abstract

**Background:** Hypertension is the most common medical disorder encountered during pregnancy, occurring in 5-10% of pregnancies. Women with hypertensive disorders of pregnancy (HDP) are all at increased risk of complications antenatally and in the puerperium.

**Objective:** This study aims to determine the maternal and perinatal outcomes of hospitalized pregnant cases with hypertension.

**Methods:** This was a 18 months prospective cross sectional study conducted in MGM Hospital and Research centre, Patna. Maternal and Perinatal outcomes were compared among the HDP groups and results were analysed and tabulated by SPSS version, using chi square method.

**Results:** 42.5% of the patients had Gestational Hypertension. 32.5% of the patients had Preeclampsia. 11.5% of the patients had Chronic Hypertension In Pregnancy. 8.0% of the patients had PECH. 5.5% of the patients had Eclampsia, PECH had the largest proportion of Maternal Morbidity like PPH and Acute renal failure, and Eclampsia had the largest proportion of Maternal Morbidity( Placental Abruption, Pulmonary Edema, HELLP ,DIC). Maternal Mortality was observed in 1 (0.5%) Patients of eclampsia probably due to intracerebral haemorrhages. Eclampsia had the largest proportion of APGAR Score Category at 5 minutes: <7 and Gestational Hypertension had the largest proportion of APGAR Score Category at 5 minutes: ≥7. Eclampsia had the largest proportion of Neonatal Outcome as NICU Admission and IUD, Neonates 1.2% of the patients in the group of Gestational Hypertension had Died. 6.2% of the patients in the group of Preeclampsia had Died. 9.1% of the patients in the group of Eclampsia had Died.

**Conclusion:** A substantial burden of maternal and perinatal morbidity and mortality is associated with hypertensive disorders of pregnancy, more so in eclampsia and severe preeclampsia group as compared to gestational hypertension and mild pre-eclampsia.

**Keywords:** Hypertension, Maternal outcome, Foetal outcome, Low birth weight, Eclampsia, Severe pre-eclampsia.

## Introduction

Hypertensive disorders during pregnancy remains the most common medical complications, leading to a majority of adverse perinatal and maternal outcomes, despite numerous efforts have been made at early diagnosis, prevention and treatment. The incidence of various hypertensive disorders of pregnancy varies widely from 5 to 10%. Pregnancy-specific PIH is a syndrome that can impact almost all organ systems. It is characterized by an increase in blood pressure of at least 140/90 mmHg after 20 weeks of pregnancy and proteinuria of at least 300 mg/24 hours or  $> +1$  on the dipstick

Maternal consequences may include disseminated intravascular coagulopathy, antepartum hemorrhage, eclampsia, HELLP syndrome, severe renal failure, intracerebral hemorrhage, and even maternal mortality. Cardiovascular morbidity and chronic hypertension are also not uncommon long-term consequences. Intrauterine growth restriction, premature delivery, abrupt intrauterine fetal death, stillbirths, preterm and low birth weight newborns, increased neonatal morbidity and mortality, and more are common fetal problems. Thus early detection and appropriate management of the pregnancy induced hypertension may improve the outcome for both the mother and the baby. Fetal wellbeing is monitored with simple methods like daily fetal kick count, non stress test and fetal biophysical profile which is an essential part of the management of pregnancy induced hypertension.

The levels of vascular endothelial growth factor (VEGF) which plays an important role in mediation of vasculogenesis, angiogenesis, control of the microvascular permeability and vasodilatation are lower in women with pre-eclampsia than control. The clinical syndrome follows abnormal placenta then release of antiangiogenic markers, by the mediation by soluble fms-like tyrosine kinase-1 (sFlt-1) and soluble endoglin (sEng). High levels of sFlt-1 and sEng result in endothelial dysfunction, vasoconstriction, and immune dysregulation, which can negatively impact every maternal organ system and the fetus. Pregnancy complications that occur most frequently include hypertensive disorders during pregnancy (HDP). Age, race, and nulliparity all affect HDP. In 2006, the occurrence of HDP in India was 5.38%, with preeclampsia, eclampsia, and HELLP syndrome (characterized by hemolysis, elevated liver enzymes, and low platelet count) contributing to 44%, 40%, and 7% of the complications, respectively<sup>1</sup> Reports indicate maternal and perinatal mortality rates of 5.5% and 37.5% in deliveries, respectively<sup>1</sup> Preeclampsia and eclampsia are part of HDP, with the former affecting 4% to 5% of pregnancies and being a multisystem disorder of unknown origin.<sup>2,3</sup> Eclampsia, on the other hand, involves seizures in women with preeclampsia and has a maternal mortality rate ranging from 0.5% to 10.0% and an incidence of 0.3% to 0.9%.<sup>4</sup> The precise pathophysiology of HDP remains unclear, but systemic activation and damage to maternal endothelial cells seem to be the primary cause, leading to high blood pressure, proteinuria, systemic inflammation, and the buildup of antiangiogenic agents. These factors appear to cause the disease by depriving glomerular endothelial cells of vital growth factors. The clinical symptoms of the disease are reversed upon pregnancy termination, indicating that trophoblastic invasion plays a significant role in the pathophysiology of preeclampsia.<sup>5</sup> A multicenter study found that prenatal hypertension/preeclampsia accounted for 70% of HDP cases, while chronic hypertension made up about 30%.<sup>6</sup>

As of right now, there isn't a single preeclampsia screening test that is both affordable and trustworthy enough to be used in developing nations. There is insufficient evidence to support the widespread use of uterine artery Doppler study and first trimester maternal blood indicators for the early identification of pre-eclampsia, particularly in settings with limited resources.<sup>7,8,9</sup>

## Objective

The study aims to determine the maternal and perinatal outcomes of hospitalized pregnant cases with hypertension.

## Materials and Methods

The cross sectional study was conducted in department of obstetrics and gynecology, M.G.M Hospital Patna, Bihar after obtaining approval by the Ethics Committees and written informed consent on 200 admitted pregnant women and patient coming in OPD who was presented with Hypertensive disorders in pregnancy for period of 18 months.

### Inclusion Criteria :

The diagnosis of hypertension in pregnant women was based on the criteria defined by working group of the national high blood pressure education program 2000 (NHBPEP) and ACOG as per standard guideline.

Gestational hypertension (GH): BP >140/90 mmHg on two occasions at least 4 hours apart developing after 20 week of gestation in previously normotensive and non-protein uric women and proteinuria nil on dipstick.

Preeclampsia (PE) : BP >140/90 mmHg on two occasion at least 4 hour apart and proteinuria with 2+ on dipstick testing or 300 mg of protein in 24 hour urine collection

Or

● BP  $\geq$  160/110 mmHg ● Proteinuria >5g/l of protein in urine collection of 24 hours ● Oliguria <500mL /24hr ● Cerebral /visual disturbance ● Pulmonary edema ● Epigastric /right upper quadrant pain ● Impaired LFT ● Thrombocytopenia ● Fetal growth restriction

### Eclampsia: Preeclamptic who develop seizure.

Preeclampsia superimposed on chronic hypertension :(PECH) when one or more features of preeclampsia ( e.g. elevated liver enzymes , low platelets , proteinuria) develop for first time during pregnancy after 20 weeks , in a women with pre-existing chronic hypertension.

Chronic Hypertension: (CH) when BP  $\geq$  140/90 mm Hg before pregnancy or diagnosed before 20 weeks gestation not attributable to gestational trophoblastic diseases.

**Exclusion Criteria** Patients who was diagnosed with other causes of convulsions in pregnancy like cerebral malaria and epilepsy. Pregnancies complicated with diabetes mellitus, thyroid disorders, primary renal disease and collagen vascular diseases. Women who are eligible but not willing to give consent.

## Method

After obtaining approval by the Ethics Committees and written informed consent from the patients coming in OPD and admitted in the Department of Obstetrics and Gynecology, M.G.M Hospital Patna, Bihar at , for delivery, over a period of 18 months. 200 subjects of Hypertensive disorders of pregnancy included gestational hypertension, preeclampsia, eclampsia andp reeclampsia superimposed on chronic hypertension and chronic hypertension.

Cases included the subjects who meet the criteria for gestational hypertension or mild/severe preeclampsia or eclampsia or preeclampsia superimposed on chronic hypertension Once selected the following parameters were assessed:

● Selection of the women with Hypertensive disorder in pregnancy ● Detailed obstetric history and examination ● Investigations to rule out complications ● NST and FHR-Auscultation for fetal well being ● Maternal and fetal outcome

The study included all patients with hypertensive disorders during pregnancy who were admitted to our hospital, delivered , and had their medical records completed were divided into 5 groups as, gestational hypertension, preeclampsia, eclampsia, preeclampsia superimposed on chronic hypertension and chronic hypertension according to national high blood pressure education program working group 2000 (NHBPEP) as per standard guidelines.

On OPD basis, complete history of the subjects were taken including her age, parity, period of gestation, menstrual history, obstetric history, medical, surgical and drug history, signs and symptoms, personal and family history. Complete clinical examination were done including vitals, systemic examination, and obstetric examination (per abdomen and per vaginal examination).

BP was taken on patient's right arm in sitting position by using aneroid sphygmomanometer on OPD basis and whose BP were raised included in our study as cases and divided into 5 groups as gestational hypertension, preeclampsia, eclampsia, preeclampsia superimposed on chronic hypertension and chronic hypertension. BP was taken every 4 hours in patients with preeclampsia and every hour in patients with eclampsia by using aneroid sphygmomanometer. Korotkoff phase V or the disappearance of the Korotkoff sounds, were used to measure diastolic blood pressure.

Assessment of edema were done clinically as a part of general examination. Spot urine samples were collected for albumin and sugar by dipstick test. Venous samples were collected from antecubital vein of all subjects for investigations like CBC including platelet count, LFT, RFT, S. electrolytes, S. Uric acid & RBS and sent to laboratory of our hospital.

During admission or on OPD, monitoring of fetus were done by FHR- auscultation, Biophysical profile, USG and Colour doppler .Maternal and fetal outcomes, as well as complications during the hospital stay, were documented. Acute renal failure, proteinuria, and hyperuricemia were noted as renal symptoms. Labor and blood pressure were closely watched Obstetric management were carried out as per standard guidelines. Details of labor whether spontaneous or induced were noted. Method of induction and mode of delivery were recorded. Antihypertensive drugs were given to patients of Hypertensive disorders of pregnancy as per standard guidelines. Magnesium sulfate were administered to control convulsions in patients with eclampsia according to the Pritchard regimen. Patients with eclampsia were intensively monitored and managed according to standard guidelines.

The maternal and fetal outcome evaluated during ANC, delivery, after delivery and 2 weeks postpartum. During follow up, the patients were asked about their complains, development of new symptoms, BP and other vitals were noted, clinical examination were done. urine protein and sugar by dipstick were done and other tests as development of new symptoms were noted.

### Statistical analysis:

All the data were analyzed with appropriate statistical tools SPSS vs 24, and the level of significance p value was calculated. A p-value" should be considered to be non-significant if  $> 0.05$  and significant if  $< 0.05$ . ( $P > 0.05$  statistically insignificant  $P < 0.05$  statistically significant  $P < 0.01$  statistically highly insignificant  $P < 0.001$  statistically very highly significant )

## Results

### Distribution of the Patients in Terms of 'Diagnosis'

Diagnosis	Frequency	Percentage	95% CI
Gestational Hypertension	85	42.5%	35.6% - 49.7%
Preeclampsia	65	32.5%	26.2% - 39.5%
Chronic Hypertension In Pregnancy	23	11.5%	7.6% - 16.9%
PECH	16	8.0%	4.8% - 12.9%
Eclampsia	11	5.5%	2.9% - 9.9%

42.5% of the patients had Gestational Hypertension, 32.5% of the patients had Pre-eclampsia, 11.5% of the patients had Chronic Hypertension In Pregnancy, 8.0% of the patients had PECH, 5.5% of the patients had Eclampsia.

### Association Between 'Diagnosis' and 'Maternal Morbidity'

Maternal Morbidity	Diagnosis						Chi-Squared Test	
	Gestational Hypertension	Preeclampsia	Chronic Hypertension In Pregnancy	PECH	Eclampsia	Total	$\chi^2$	P Value
No	77 (90.6%)	52 (80.0%)	17 (73.9%)	11 (68.8%)	6 (54.5%)	163 (81.5%)	38.129	0.034
PPH	3 (3.5%)	3 (4.6%)	2 (8.7%)	2 (12.5%)	0 (0.0%)	10 (5.0%)		
Placental Abruption	1 (1.2%)	2 (3.1%)	2 (8.7%)	1 (6.2%)	2 (18.2%)	8 (4.0%)		
Pulmonary Edema	1 (1.2%)	4 (6.2%)	0 (0.0%)	1 (6.2%)	1 (9.1%)	7 (3.5%)		
Acute Renal failure	2 (2.4%)	2 (3.1%)	0 (0.0%)	1 (6.2%)	0 (0.0%)	5 (2.5%)		
DIC	1 (1.2%)	0 (0.0%)	2 (8.7%)	0 (0.0%)	1 (9.1%)	4 (2.0%)		
HELLP	0 (0.0%)	2 (3.1%)	0 (0.0%)	0 (0.0%)	1 (9.1%)	3 (1.5%)		
Total	85 (100.0%)	65 (100.0%)	23 (100.0%)	16 (100.0%)	11 (100.0%)	200 (100.0%)		

There were a statistically significant difference between the various groups in terms of Maternal Morbidity ( $\chi^2 = 38.129$ ,  $p = 0.034$ ). Patients in the group Diagnosis of PECH had the largest proportion of Maternal Morbidity: PPH and Acute renal failure, Patients in the group Diagnosis of Eclampsia had the largest proportion of Maternal Morbidity: Placental Abruption, Pulmonary Edema, HELLP, DIC.

**Figure: Association between Diagnosis and Maternal Morbidity Association Between 'Diagnosis' and 'Maternal Mortality'**

Maternal Mortality	Diagnosis						Fisher's Exact Test	
	Gestational Hypertension	Preeclampsia	Chronic Hypertension In Pregnancy	PECH	Eclampsia	Total	$\chi^2$	P Value
Survived	85 (100.0%)	65 (100.0%)	23 (100.0%)	16 (100.0%)	10 (90.9%)	199 (99.5%)	17.268	0.055
Died	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (9.1%)	1 (0.5%)		
Total	85 (100.0%)	65 (100.0%)	23 (100.0%)	16 (100.0%)	11 (100.0%)	200 (100.0%)		

No statistically significant differences were observed among the groups regarding maternal Mortality distribution( $\chi^2 = 17.268$ ,  $p = 0.055$ ). Maternal Mortality was observed in 1 (0.5%) Patients of eclampsia probably due to intracerebral haemorrhages.

#### Association Between 'Diagnosis' and 'APGAR Score Category at 5 minutes'

APGAR Score Category at 5 minutes	Diagnosis						Chi-Squared Test	
	Gestational Hypertension	Preeclampsia	Chronic Hypertension In Pregnancy	PECH	Eclampsia	Total	$\chi^2$	P Value
<7	18 (21.2%)	28 (43.1%)	9 (39.1%)	8 (50.0%)	8 (72.7%)	71 (35.5%)	17.505	0.002
$\geq 7$	67 (78.8%)	37 (56.9%)	14 (60.9%)	8 (50.0%)	3 (27.3%)	129 (64.5%)		
Total	85 (100.0%)	65 (100.0%)	23 (100.0%)	16 (100.0%)	11 (100.0%)	200 (100.0%)		

A statistically significant difference were observed among the groups regarding the distribution of APGAR Score Category at 5 minutes. ( $\chi^2 = 17.505$ ,  $p = 0.002$ ). Patients in the group Diagnosis of Eclampsia had the largest proportion of APGAR Score Category at 5 minutes: <7. Patients in the group Diagnosis of Gestational Hypertension had the largest proportion of APGAR Score Category at 5 minutes:  $\geq 7$ .

#### Association Between 'Diagnosis' and 'Neonatal Outcome'

Neonatal Outcome	Diagnosis						Chi-Squared Test	
	Gestational Hypertension	Preeclampsia	Chronic Hypertension In Pregnancy	PECH	Eclampsia	Total	$\chi^2$	P Value
No	65 (76.5%)	41 (63.1%)	16 (69.6%)	9 (56.2%)	3 (27.3%)	134 (67.0%)	22.482	0.032
NICU Admission	17 (20.0%)	14 (21.5%)	4 (17.4%)	3 (18.8%)	5 (45.5%)	43 (21.5%)		
Ventilator	2 (2.4%)	7 (10.8%)	3 (13.0%)	4 (25.0%)	2 (18.2%)	18 (9.0%)		
IUD	1 (1.2%)	3 (4.6%)	0 (0.0%)	0 (0.0%)	1 (9.1%)	5 (2.5%)		
Total	85 (100.0%)	65 (100.0%)	23 (100.0%)	16 (100.0%)	11 (100.0%)	200 (100.0%)		

There was a statistically significant difference between the various groups in terms of distribution of Neonatal Outcome ( $\chi^2 = 22.482$ ,  $p = 0.032$ ). Patients in the group Diagnosis of Eclampsia had the largest proportion of Neonatal Outcome as NICU Admission and IUD,

Patients in the group Diagnosis of PECH had the largest proportion of Neonatal Outcome as Ventilator.

### Association Between 'Diagnosis' and 'Neonatal Mortlity'

Neonatal Mortlity	Diagnosis						Fisher's Exact Test	
	Gestational Hypertension	Preeclampsia	Chronic Hypertension In Pregnancy	PECH	Eclampsia	Total	$\chi^2$	P Value
Survive d	84 (98.8%)	61 (93.8%)	23 (100.0%)	16 (100.0%)	10 (90.9%)	194 (97.0%)	5.802	0.189
Died	1 (1.2%)	4 (6.2%)	0 (0.0%)	0 (0.0%)	1 (9.1%)	6 (3.0%)		
Total	85 (100.0%)	65 (100.0%)	23 (100.0%)	16 (100.0%)	11 (100.0%)	200 (100.0%)		

No statistically significant differences were observed among the groups regarding Neonatal Mortality distribution. ( $\chi^2 = 5.802$ ,  $p = 0.189$ ). 1.2% of the patients in the group of Gestational Hypertension had Died. 6.2% of the patients in the group of Preeclampsia had Died. 9.1% of the patients in the group of Eclampsia had Died.

### Discussion

In this study 42.5% of the patients had Gestational Hypertension. 32.5% of the patients had Preeclampsia. 11.5% of the patients had Chronic Hypertension In Pregnancy. 8.0% of the patients had PECH. 5.5% of the patients had Eclampsia. This is similar to the studies of , Patel R et al<sup>11</sup>, Ye C et al<sup>12</sup>,IM Xavier et al<sup>13</sup>

Joshi P et al<sup>14</sup> retrospective observational study assessing maternal and perinatal outcome in patients with Hypertensive Disorders of Pregnancy found maximum number of patients were in the age group of 21-25 years i.e., (40%)49 pregnant women.

There were a statistically significant difference between Gestational age and various groups in terms of distribution ( $\chi^2 = 21.797$ ,  $p = <0.001$ ). Patients in the group Diagnosis: Eclampsia had the largest proportion of Gestational Age: <37 Weeks. Patients in the group Diagnosis: Gestational Hypertension and preeclampsia had the largest proportion of Gestational Age:  $\geq 37$  Weeks. This finding was consistent with the studies of Joshi P et al<sup>14</sup>, Patel R et al<sup>11</sup> and Sharma C et al<sup>15</sup>

Joshi P et al<sup>14</sup> retrospective observational study assessing maternal and perinatal outcome in patients with Hypertensive Disorders of Pregnancy observed maximum number of patients were having gestation age > 32 weeks at delivery time. 49 (40.83%)patients of HDP were having gestational age > 36 weeks at delivery time.

Patel R et al<sup>11</sup> cross-sectional study assessing that among PIH patients reported out of 64 PIH mother 54.69% had preterm delivery, 4.69% had post term delivery, 53.12% of babies are low birth weight and 7.81% are IUGR.

Joshi P et al<sup>14</sup>72 (60%) of the 120 patients in a retrospective observational study in patients with hypertensive disorders during pregnancy experienced premature delivery. Seven patients gave birth after a lengthy pregnancy, whereas 41 (34.1%) gave birth at term. 39 (32.50%) patients needed LSCS, while 81 (67.5%) patients were delivered vaginally.

Ye C et al<sup>12</sup> multicenter cross-sectional retrospective study found that among 5,869 pregnant women with HDP, 76.95% had cesarean section. Women with HDP had a substantially higher CS rate 53.36% than women without HDP.

There were a statistically significant difference between the various groups in terms of Maternal Morbidity ( $\chi^2 = 38.129$ ,  $p = 0.034$ ). Patients in the group Diagnosis of PECH had the largest proportion of Maternal Morbidity: PPH and Acute renal failure. Patients in the group Diagnosis of Eclampsia had the largest proportion of Maternal Morbidity: Placental Abruption, Pulmonary Edema, HELLP ,DIC. Joshi P et al<sup>14</sup>, Sharma C et al<sup>15</sup>, Ye C et al<sup>12</sup> and Bernardes TP et al<sup>16</sup>, IM Xavier et al<sup>13</sup>, S Panda et al<sup>17</sup> noted similar observations in their studies

Joshi P et al<sup>14</sup> retrospective observational study with Hypertensive Disorders of Pregnancy maternal complication included eclampsia (12.5%), HELLP (12.5%), DIC (5%), APH (4.1%), renal problems (3.3%), and CNS complications (0.8%)

Sharma C et al<sup>15</sup> retrospective study determining the maternal and perinatal outcomes of hospitalized pregnant cases with hypertension reported maternal outcome as 81.6% (169/207) cases presented had no complication. However, significant morbidity was noted in 17.3% (36/207) cases with severe pre-eclampsia and eclampsia group. There were no complications among the women with mild preeclampsia or gestational hypertension. With a p-value of 0.001, this difference was statistically significant.

Ye C et al<sup>12</sup> multicenter cross-sectional retrospective study found that women with HDP had considerably greater rates of preterm birth, placental abruption, postpartum hemorrhage, and cesarean delivery compared to those without HDP. It was also discovered that the six HDP subtypes differed significantly from one another. Comparing the eclampsia, severe preeclampsia, and PECH groups to the GH and normal pregnancy groups, the incidence of adverse pregnancy outcomes were significantly higher. Among women with HDP, the prevalence of major pregnancy complications varies DIC was the lowest (0.12%), whereas placental abruption was the most (3.20%).

Bernardes TP et al<sup>16</sup> In a meta-analysis of 69 women with HDP, 30 (19.6%), 14 (9.2%), 13 (8.5%), 9 (5.9%), 2 (1.3%), and 1 (0.7%) developed eclampsia, hemolysis, raised liver enzymes syndrome, acute renal injury, postpartum hemorrhage, disseminated intravascular coagulation, and pulmonary edema, respectively.

S Panda et al<sup>17</sup> in prospective cross-sectional hospital-based study included all pregnant women over 20 weeks of gestation with HDP complications..HELLP syndrome was seen in 1.9% of patients, pulmonary edema in 3.7%, cerebral hemorrhage in 3.9%, acute renal failure (ARF) in 0.7%, placental abruption in 7.5%, and postpartum hemorrhage (PPH) in 5.7% of cases in this study. No statistically significant differences were observed among the groups regarding maternal Mortality distribution( $\chi^2 = 17.268$ ,  $p = 0.055$ ). Maternal Mortality was observed in 1 (0.5%) Patients of eclampsia probably due to intracerebral haemorrhages. This is consistent with the studies of Sharma C et al<sup>15</sup> and S Panda et al<sup>17</sup>

S Panda et al<sup>17</sup> in prospective cross-sectional hospital-based study included all pregnant women over 20 weeks of gestation with HDP complications.Maternal mortality was caused by cerebral hemorrhage in eight cases (66.6%) and pulmonary edema in four (33.3%). All maternal deaths were in women with severe preeclampsia and eclampsia, with eclampsia being significantly more common.

Ye C et al<sup>12</sup> multicenter cross-sectional retrospective study Pregnant women with HDP had significantly increased rates of LBW ( less than 2500 g), neonatal asphyxia, and perinatal mortality compared to those without HDP ( $P < 0.001$ ).

A statistically significant difference were observed among the groups regarding the distribution of APGAR Score Category at 5 minutes.( $\chi^2 = 17.505$ ,  $p = 0.002$ ). Patients in the group Diagnosis of Eclampsia had the largest proportion of APGAR Score Category at 5 minutes:  $<7$ . Patients in the group Diagnosis of Gestational Hypertension had the largest proportion of APGAR Score Category at 5 minutes:  $\geq 7$ . There was a statistically significant difference between the various groups in terms of distribution of Neonatal Outcome ( $\chi^2 = 22.482$ ,  $p = 0.032$ ). Patients in the group Diagnosis of Eclampsia had the largest proportion of Neonatal Outcome as NICU Admission. Patients in the group Diagnosis of PECH had the largest proportion of Neonatal Outcome as Ventilator. Patients in the group Diagnosis of Eclampsia had the largest proportion of Neonatal Outcome as IUD These findings were consistent with the study of Joshi P et al<sup>14</sup>



Joshi P et al<sup>14</sup> retrospective observational study assessing Prematurity was the most common perinatal consequence in 72 individuals, or 60% of those with hypertensive disorders of pregnancy, according to maternal and perinatal outcomes. No statistically significant differences were observed among the groups regarding Neonatal Mortality distribution. ( $\chi^2 = 5.802$ ,  $p = 0.189$ ). 1.2% of the participants in the group of Gestational Hypertension had Died. 6.2% of the participants in the group of Preeclampsia had Died. 9.1% of the participants in the group of Eclampsia had Died. This is similar to the studies of Patel R et al<sup>12</sup>, Bernardes TP et al<sup>16</sup>, Sharma C et al<sup>15</sup> and Seyom E et al<sup>18</sup>.

Bernardes TP et al<sup>16</sup> meta-analysis of all perinatal deaths, 35.3% of babies were born weighing less than 2.5 kg, and 64.7% of babies were born preterm. In terms of HDP and consequences, 84.5% of patients with Acute Kidney Injury problems were diagnosed with severe preeclampsia. Unfavorable perinatal outcomes were found to be linked with variables such maternal problems, fetal weight at birth, diastolic blood pressure, ANC use, referral, and mother outcome. Unfavorable perinatal outcomes were found to be independently predicted by maternal outcomes and fetal weight at birth.

Seyom E et al<sup>18</sup> retrospective study deign determining management outcome and factor associated with pregnancy related hypertensive disorder reported fetal management outcomes indicated 120.37 perinatal mortality per 1000 deliveries and a stillbirth rate of 10.2%, low birth weight of 30.5%, and low APGAR score of 18.5%, abortion 10.7% and preterm delivery 31.4%. Fetal complications like low Apgar score and preterm deliveries were statistically significant and associated with fetal management outcomes.

## Conclusion

Hypertensive disorders during pregnancy significantly contribute to maternal and perinatal illness and death, with eclampsia and severe preeclampsia posing a greater risk than gestational hypertension, chronic hypertension, and mild preeclampsia. The World Health Organization recommends routine screening for HDP based on blood pressure measures in all pregnant women. Urinary protein analysis should be performed at every prenatal appointment, if resources allowed, as an addition to normal blood pressure checks.

Determining HDP risk factors might help with early HDP diagnosis in a specific patient population that needs clinical surveillance and the right level of care. Designing efficient HDP preventive and intervention strategies is crucial, especially to lower maternal and perinatal problems and guarantee the safety and health of expectant mothers and their unborn children.

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