

# Maternal and Perinatal Mortality and Morbidity in Hypertensive Disorder Complicating Pregnancy

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## Abstract

**Introduction:** Hypertensive disorders complicating pregnancy is one of the extensively researched subjects in obstetrics. The pathology should be understood, and the involvement of multi-organ dysfunction should be taken into account.

**Objectives:** To analyze the cases of hypertensive disorder complicating pregnancy and its maternal and perinatal outcome in patients admitted in the Kannur Medical College in Anjarakandy.

**Methods:** A total number of 233 cases of hypertensive disorder complicating pregnancy (gestational hypertension, pre-eclampsia, and eclampsia) admitted to KMCH from 2009 July 1st to 2010 June 30<sup>th</sup>.

**Selection of Cases:** Both booked and referred and all patients who were diagnosed hypertension complicating pregnancy.

**Results:** Hypertensive cases complicating pregnancy accounted for 9.1% of the total deliveries, out of which gestational hypertension accounted for 3 %, pre-eclampsia 5.5%, and eclampsia 0.7%. In this study, a maximum case where seen in the age groups 20-30 in primigravida belonging to low socio-economic strata. The majority of patients detected to have high blood pressure at 32-36 weeks of gestation, and a mean gestational age of 35 weeks. Hemolysis, elevated liver enzymes, and low platelets syndrome was the most common maternal complication and intrauterine growth restriction, the most common fetal complication. 21 cases followed by abruptio placentae, acute renal failure, postpartum hemorrhage, and postpartum eclampsia. Maternal mortality occurred in one case. Prematurity/preterm was the most common cause of perinatal death.

**Conclusion:** Training and continuing medical education of the attending staff and the structuring management protocols relevant to local needs are also an important part in case of hypertension complicating pregnancy.

**Key words:** Eclampsia, Hemolysis, elevated liver enzymes and low platelets, Hypertension, Pre-eclampsia, Pregnancy

## INTRODUCTION

Hypertensive disorders complicating pregnancy are common and form one of the deadly triads, along with hemorrhage and infection resulting in maternal mortality and morbidity.

In Kerala, gestational hypertension continues to be responsible for the largest proportion of perinatal mortality.

Hypertensive disorders in pregnancy are classified as:

- Gestational hypertension
- Pre-eclampsia and eclampsia
- Pre-eclampsia superimposed on chronic hypertension
- Chronic hypertension.

Approximately 70% of hypertensive disorders are due to gestational hypertension - Pre-eclampsia, whereas the other 30% are due to pre-existing and/or undiagnosed hypertension of renal disease.

Incidence ranges from 5 to 15%, 16% in primigravida, and 7% in multigravida. Increases perinatal morbidity and mortality by 10-15% and it still remains high due to pre-eclampsia to the extent of 20-50% and due to eclampsia 30-50% in developing countries. Maternal mortality ranges from 2 to 30%.

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www.ijss-sn.com

**Month of Submission :** 12-2015

**Month of Peer Review :** 01-2016

**Month of Acceptance :** 01-2016

**Month of Publishing :** 02-2016

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Maternal complication includes abruptio placentae, hemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome, acute left ventricular failure with pulmonary edema, acute renal failure (ARF), postpartum hemorrhage (PPH), disseminated intravascular coagulation (DIC), and fetal complication includes intrauterine device (IUD), intrauterine growth restriction (IUGR), prematurity, antepartum, and intrapartum asphyxia.

### Objectives

To analyze the cases of hypertensive disorder complicating pregnancy and its maternal and perinatal outcome in patients admitted in Kannur Medical College in Anjarakandy.

## MATERIALS AND METHODS

A total number of 233 cases of hypertensive disorder complicating pregnancy (gestational hypertension, pre-eclampsia, and eclampsia) admitted to KMCH from 2009 July to 2010 June.

All patients with hypertension, proteinuria, and convulsion beyond 20 weeks were included, and all chronic hypertension cases were excluded.

Both booked and referred and all patients who were diagnosed to have hypertension complicating pregnancy were selected for this study.

## RESULTS

In this study, 73.4% were in the age group of 20-30 years with mean age of 26 years with standard deviation of 4.6 years. The maximum cases were primigravida, 140 cases (60.08%). The majority of the cases had regular antenatal check-up (81.05%). In this study, maximum cases were referred, i.e., 123 (52.8%), these patients were booked outside and referred to KMCH Anjarakandy for further management. In this study, the majority of patients were from low socio-economic status, i.e., blood pressure (BP) load 206 cases 88.4%. This indicates that socio-economic status has a close relationship with pre-eclampsia and eclampsia (Table 1).

The majority of patients detected to have high BP at 32-36 weeks of gestation, mean gestational age at which high BP detected was 35 weeks. Number of cases where systolic BP (SBP) >160 mmHg were 107 (45.9%) and diastolic BP (DBP) >110 mmHg were 44 (18.9%).

In this study, maximum perinatal mortality was found when the BP was above 160/110 mmHg and proteinuria

3+ and above. Liver function test was abnormal in 19 cases (8.2%), and renal function test was abnormal in 51 cases (21.9%) (Table 2).

Gestational age at delivery divided into 3 groups - 59.7% patients delivered after 36 weeks and 30% between 32 and 36 weeks and 10.3% before 32 weeks. In this study, vaginal deliveries (53.7%) were more than cesarean deliveries (46.3%). In this, 137 cases were induced for termination of pregnancy (Graph 1).

HELLP syndrome was the most common maternal complications. 21 cases followed by abruptio placentae, ARF, PPH, and postpartum eclampsia. Maternal mortality occurred in one case.

Among the neonatal complications preterm labor occurred in 110 cases (46.05%) and the remaining delivered at term (Table 3).

## DISCUSSION

There were 348 patients admitted with hypertensive disorders in pregnancy during this period. Out of this,

**Table 1: Different types of hypertensive disorder complicating pregnancy**

Type of hypertension	Number of cases	Percentage
Gestational hypertension	76	32.6
Mild pre-eclampsia	38	16.3
Severe pre-eclampsia	101	43.3
Eclampsia	18	7.7
Total	233	100

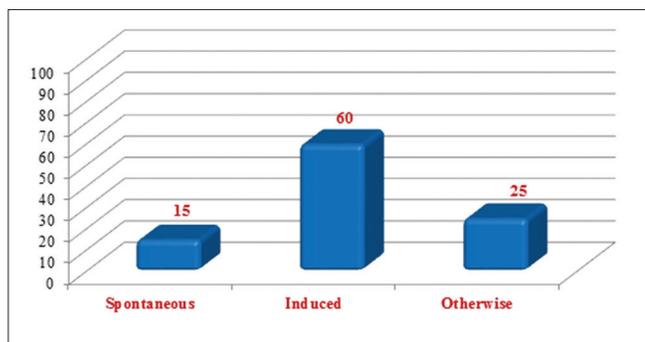
**Table 2: Mode of treatment**

Treatment given	Number of cases	Percentage
Methyldopa	42	18.0
Nifedipine	3	1.3
Methyldopa	70	30.1
Methyldopa, nifedipine, MgSO <sub>4</sub>	61	26.2
No treatment	57	24.4
Total	233	100

**Table 3: Neonatal complications**

Complications	Number of cases	Percentage
IUGR	47	19.6
Birth asphyxia	29	12.1
Intraventricular hemorrhage	4	1.7
Pulmonary hemorrhage	1	0.4
Neonatal jaundice	7	2.9
Sepsis	6	2.5
Metabolic complications	5	2.1
Neonatal death	23	9.5

IUGR: Intrauterine growth restriction



Graph 1: Onset of labor

233 who satisfy the inclusion criteria were included in the study. The overall incidence of hypertensive disorders in pregnancy in this study was 9.1%. According to Alokendu and Geetha,<sup>1</sup> NRS Medical College, Calcutta, hypertension in pregnancy in western population is also almost similar to.

In this study, 73.4% were in the age group of 20-30 years with mean age of 26 years. There was more primigravida consisting of 60.8% compared to multigravida 39.2%. This is comparable to Mac Gillivray<sup>2</sup> study which shows that primigravida has 15 times greater risk compared to multigravida for developing pre-eclampsia. Incidence of pre-eclampsia in nulliparous population is 3-10%.<sup>3</sup>

In the present study, 88.4% of patients belonged to below poverty line. According to Majhi *et al.*,<sup>4</sup> the majority of patients (82%) belonged to low socio-economic status, which indicates that socio-economic status, poor nutrition, and inadequate antenatal care have a close relationship with pre-eclampsia and eclampsia. 81.5% had a regular antenatal check-up. Among patients diagnosed as eclampsia 88% cases were referred. According to Majhi *et al.*, 2001,<sup>4</sup> 82.3% of patients did not have a regular antenatal check-up.

The mean gestational age at which high BP detected was 35 weeks. Gestational age is the variable that is the strongest predictor fetal morbidity and mortality, Shear *et al.*<sup>5</sup> High-risk factors identified in this study were gestational diabetes in 17 cases (7%), twins in 7 cases (3%), anemia in 9 cases (3.9%), thyroid disease 8 cases (3.4%), bronchial asthma 7 cases (3%), and heart diseases 4 cases (1.7%). A Canadian study by Garner *et al.*<sup>6</sup> confirmed that the risk of pre-eclampsia doubled in diabetes. In the about 7% cases was hypertensive disorder associated with gestational diabetes.

History of hypertension in previous pregnancy was observed in 15.5% of cases. This is comparable to study by Shaheen and Tahir<sup>7</sup> where previous of hypertension was found in 10% patients. If women had severe pre-eclampsia, she has 20% risk of developing pre-eclampsia in her subsequent pregnancy.<sup>8,9</sup> If pre-eclampsia presents clinically

before 30 weeks of gestation, the recurrence rate may be as high as 40% by Sibai *et al.*<sup>10</sup> The group of women with DBP more than 110 mmHg was associated with a maximum number of low birth weight (LBW) babies compared to DBP <110 mmHg.<sup>11</sup> The failed to show this association.

In this study, severe proteinuria  $\geq 3+$  were found in 62 cases (26.6%). In this study, maximum perinatal mortality was found when BP was above 160/110 mmHg and proteinuria 3+ and above. In this study, hypertensive cases complicated by HELLP syndrome had overall abnormal liver and renal function tests and 33 among HELLP syndrome had overt thrombocytopenia.

In this study, all cases with gestational hypertension (excluding severe cases) were not given any treatment, 57 out of 76 cases of gestational hypertension. A total number of babies born in this group (no treatment) without any complications were 45. A total number of babies born with IUGR were 3 cases, and a total number of neonatal deaths in this group were 2.

The mild cases of pre-eclampsia usually do not require any antihypertensive.<sup>12</sup> In this study, methyldopa was given when DBP was more than 100 mmHg, methyldopa, and nifedipine combination was started only when DBP was >105 mmHg and SBP more than 160 mmHg. As recommended by the working group - National High Blood Pressure Education Program 2000<sup>13</sup> indication of antihypertensive agents is when SBP more than 160 mmHg and DBP more than 105 mmHg. Methyldopa was the predominantly used drug in this study when BP was not controlled nifedipine was added. MgSO<sub>4</sub> as an anticonvulsant was used in all cases of impending eclampsia and eclampsia - MgSO<sub>4</sub> regime (according to our protocol was followed for 61 cases - total babies born without any complication were only 16, IUGR babies were 13.

The overall perinatal mortality was 27 cases, out of which, number of IUDs were 12, and early neonatal death were 15. Out of the 61 cases were MgSO<sub>4</sub> was used, 18 cases were eclampsia.

In this study, 137 cases (57.9%) of patients were induced for termination of pregnancy. The overall cesarean rate was 46.3%, most common indication was fetal distress (9.4%), followed by failed induction (8.5%) success rate was 66%. Coppage and Polzin<sup>14</sup> concluded that immediate abdominal delivery did not improve maternal and perinatal outcome in severe pre-eclampsia and induction of labor did not lead to increased morbidity and mortality. The most common complication in this study was HELLP syndrome 21 cases, Pal *et al.*,<sup>15</sup> had reported an incidence of 4% for

HELLP syndrome. The other complications were abruptio placentae in 10 cases, postpartum eclampsia 6 cases, DIC in 3 cases, PPH in 4 cases, and ARF in 6 cases. There was only 1 maternal death due to severe pre-eclampsia.

### Perinatal Outcome

The total preterm deliveries were 110 (46.05%). Severe pre-eclampsia was responsible for a maximum number of preterm deliveries (30.4%). The study performed by Buchbinder *et al.*,<sup>16</sup> showed preterm deliveries associated with severe hypertension. In the birth weight of most of the babies were in the group more than 1.5-2.5 kg. Mean birth weight 2.1 kg. Lydakis *et al.* in 2001<sup>17</sup> demonstrated that LBW is associated with pre-eclampsia. The cause may be prematurity or IUGR. 48 (20%) out of 213 babies in this study had (27 out of 240 were IUD's) the APGAR <5 at 1 min and 24 out of 213 babies had APGAR <7 at 5 min. In this study, 98 babies (40.8%) needed neonatal intensive care unit admission, out of which 23 needed ventilator support. IUGR was the most common complication totally up to 47 cases followed by birth asphyxia, neonatal jaundice, and neonatal death. Total number of IUD in this study was 27, and a total number of early neonatal deaths were 23. So that, perinatal mortality in this study was 50 (20.8%), perinatal mortality due to pre-eclampsia (mild and severe) in this study was 36 cases. Perinatal mortality in eclampsia is 8 cases (3.3%). The incidence in the perinatal mortality in this study by Gregg<sup>18</sup> was 5%. A poor perinatal outcome in this study is due to the high contribution of prematurity.

### CONCLUSION

Hypertensive disorders complicating pregnancy is one of the extensively researched subjects in obstetrics. The pathology should be understood, and involvement of multi-organ dysfunction should be taken into account.

The early use of antihypertensive drugs, optimum timing of delivery and strict fluid balance, anticonvulsants in cases of eclampsia will help to achieve a successful outcome.

Early transfer to the specialist center is important, and the referral centers should be equipped to treat such critically ill patients.

Training and continuing medical education of the attending staff and the structuring management protocols relevant to local needs are also an important part in case of hypertension complicating pregnancy.

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**How to cite this article:** Rajamma CK, Sridevi P. Maternal and Perinatal Mortality and Morbidity in Hypertensive Disorder Complicating Pregnancy. *Int J Sci Stud* 2016;3(11):206-209.

**Source of Support:** Nil, **Conflict of Interest:** None declared.