

## Fetomaternal Outcome in Hypertensive disorders Complicationg Pregnancy- an Analysis

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### Original Research Article

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#### Article History

Received: 08.02.2018

Accepted: 19.02.2018

Published: 28.02.2018

#### DOI:

10.36347/sajb.2018.v06i02.014



**Abstract:** Our objective was to find out incidence, epidemiological factors, complications, and outcome of hypertensive disorder in pregnancy. A prospective study was performed on consecutive 134 cases of hypertensive disorder in pregnancy managed in the department of obstetrics and gynecology in NEIGRIHMS for one and half year. Demographic data, route of delivery any complications and maternal and perinatal outcome were noted. Incidence of hypertensive disorder of pregnancy was 7.3%. Contribution of preeclampsia and eclampsia was 55.2% and 11.2%. Mean age in this study was 23.5 years. 55.9% patients were primigravida, 57.85% were booked, 59.7% were belonged to low socioeconomic status. (50%) were delivered by LSCS. Most common complication was abruptio placentae followed by pulmonary edema. 3 patients (2.23%) succumbed to hypertensive disorder of pregnancy. Incidence of perinatal mortality was 14.9%. Abruptio placentae was the most common cause of perinatal mortality. Most common cause of neonatal mortality was prematurity and RDS. Severe pre-eclampsia and eclampsia still remains the major contributor to poor maternal and foetal outcome. In present study maternal and perinatal mortality was significantly high in unbooked pregnancies. The timely use of antihypertensive drugs, optimum timing of delivery and strict fluid balance, anticonvulsants in cases of eclampsia will help to achieve successful obstetric outcome.

**Keywords:** Hypertensive disorder of pregnancy, preeclampsia, Eclampsia, Perinatal, maternal, outcome, severe, Morbidity, Mortalit.

### INTRODUCTION

Hypertensive disorders complicates 5 to 10% of all pregnancies and together they form one component of lethal triad along with haemorrhage & sepsis [1].

In India according to one of the study in 2006, the incidence of Hypertensive disorders affecting pregnancy was 5.38%, while preeclampsia, eclampsia, and haemolysis, elevated liver enzyme, low platelet (HELLP) syndrome responsible for 44%, 40%, and 7% of complications, correspondingly [2]. Maternal and perinatal mortality have been documented in 5.5% and 37.5% of deliveries, correspondingly [3].

Increased maternal mortality are mainly attributed to eclampsia, abruptio placentae, HELLP syndrome, pulmonary oedema, acute renal failure, and Disseminated coagulation profile (DIC). Despite the fact that mortality has been decreased in developed

countries, it still remains high in the developing world.

The perinatal mortality still remains very high even in developed countries, the perinatal mortality remains to an extent of about 20%, about 50% of which being stillborn [4].

There were no study from North eastern part of India which described in detail about the incidence and the outcome of pregnancy in Hypertensive disorders of pregnancy.

The present study was undertaken to fulfil

following objectives -To note the incidence of hypertensive disorders complicating pregnancy, to study maternal and perinatal outcome and to study the factors influencing perinatal and maternal outcome.

**MATERIALS AND METHODS**

This prospective, cross-sectional, hospital based study was conducted for one and half year in one of the teaching institute of North East India catering population from 7 North-East Indian states.

Ethical clearance was taken from institute ethical clearance committee. Written consent was obtained from the study subjects. Information obtained from patients was held confidentially.

All antenatal women who were diagnosed, admitted and delivered in the department of obstetrics and gynaecology during the study period with diagnosis of hypertensive disorder of pregnancy were included in study. Our Inclusion criteria were patients beyond 20 weeks of pregnancy with hypertensive disorders. Our Exclusion criteria were all chronic hypertension cases, Pregnancy associated medical complications like anaemia, diabetes, vascular or renal disease etc., Multiple gestation, Intrauterine growth restriction (IUGR) babies in previous pregnancy, Previous h/o convulsions secondary to other medical causes.

Data were collected using questionnaire (Proforma) which contained socio-demographic characteristics of mothers, obstetric history, period of gestation, last menstrual period and expected date of delivery, signs and symptoms at presentation, laboratory data and maternal and perinatal outcomes.

Maternal and fetal monitoring done clinically and with battery of tests. Patients were follow up with Nonstress Test (NST) ,Obstetrics ultrasonography (USG) and Preeclampsia (PET) profile which includes liver function testy Renal function test ,coagulation profile, Complete blood count, 24 hours urinary proteins weekly or biweekly depends on findings. Antihypertensive was started if BP was more than or equal to 150/100.Termination was done at 37 -38weeks for gestational hypertension, mild preeclampsia, at 34weeks for severe preeclampsia and after stabilization of patient in eclampsia at any gestational age. For imminent eclampsia and eclampsia Pritchard regimen was given. Method of induction was depended on Bishop’s score. Cesarean section was done for obstetrics indications.

**Statistical Analysis**

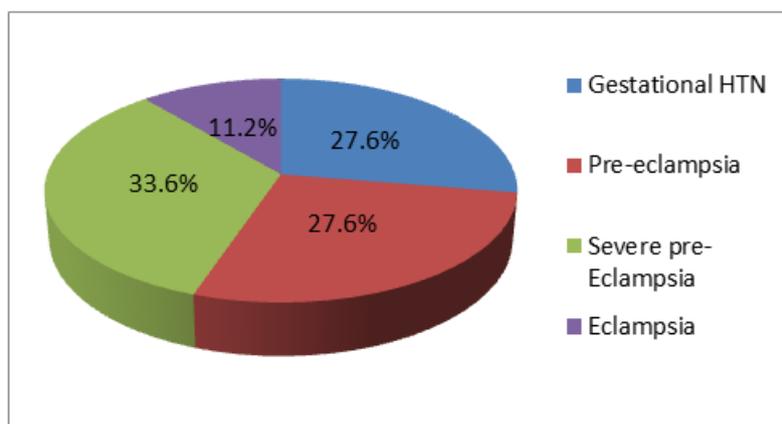
For demographic and obstetric variables descriptive statistics was used to calculate the mean ±sd. Chi square test done for statistical analysis. A 95% limit and 5% level of significance were adopted. P value <0.05 was considered significant. Statistical analysis was performed using the SPSS (Version 14) software package.

**RESULTS**

A total number of 1820 deliveries were conducted in NEIGRHIMS Hospital, during study period, with 134 cases of Hypertension in pregnancy which accounted for 7.3 % of the deliveries conducted (Table-1). Maximum patients belonged to preeclampsia (Graph-1).

**Table-1: Classification of various hypertensive disorder of pregnancy**

Gestational hypertension	37(2.1%)
Preeclampsia	82(4.5%)
Eclampsia	15(0.82%)



**Graph-1: Contribution of Different types of hypertensive disorders**

Demographic profile and obstetrics profile- Mean age in this study was 23.5±4.13 years. Maximum patients (45.5%) were belonged to 21-25year.

In present study 55.9 % were primipara, 58.9% were booked 59.7 % were belonged to low socio-economic status (SES).

37.3 % patients were having systolic BP ≥ 160 mm Hg. 29.9% were having diastolic BP ≥ 110 mm Hg. 28 cases (20.9%) having 3+ proteinuria.

67 pts were delivered vaginally and 67 by LSCS. Out of 134 cases , 40.3 % cases were < 37 wks and 59.7 % were ≥ 37 wks. Mean gestational age was 36.3± 2.49 wks.

Maternal complication-Most common complication was abruption placentae (Table-2).

**Table-2: Showing Maternal Complications**

MATERNAL COMPLICATIONS	NO OF CASES
HELLP Syndrome	2( 1.5 % )
Pulmonary oedema	6 (4.5% )
Cerebral heamorrhage	2 (1.5% )
Acute renal failure	1 ( 0.7 % )
Abruptio placentae	8 (5.9 %)
Post-partum haemorrhage	3 ( 2.2 % )
Post-partum eclampsia	2 (1.5 %)

**Maternal Mortality**

There were 3 maternal deaths out of 134 cases, therefore the maternal mortality in hypertensive disorder of pregnancy was 2.23% of cases. Causes were pulmonary oedema (1) and cerebral haemorrhage (2).

All 3 patients were unbooked cases. This was statistically significant. Two maternal deaths cases belonged to in low SES group and one in middle SES group. However statistically this was not significant.

**Table 3: Maternal Mortality In Relation To Diagnosis**

DIAGNOSIS	NO OF CASES	MATERNAL DEATHS	PERCENTAGE
Gestational hypertension	37	0	-
Mild preeclampsia	37	0	-
Severe preeclampsia	45	1	0.7 %
Eclampsia	15	2	1.5%
Total	134	3	2.2%

Table-3 Showing eclampsia and severe preeclampsia having higher risk for maternal deaths. This was statistically significant. All mortality cases were having systolic BP ≥160 and diastolic BP ≥110 mm Hg and had proteinuria3+. These findings were statistically significant.

In Present study 10 patients diagnosed with IUD, one was fresh still birth and there were 9 Neonatal mortality. Hence Total perinatal deaths were 20. Incidence of perinatal mortality was 14.9 %.

Abruptio placentae (5.9 % ) and prematurity (4.5 % ) with RDS were major cause of perinatal mortality (Table-4).

**Table-4: Causes of Perinatal Mortality**

CAUSES	NO OF CASES	PERCENTAGE
Abruptio placentae	8	5.9 %
Birth asphyxia	2	1.5 %
Prematurity with RDS	6	4.5 %
MAS	3	2.3 %
Septicemia	1	0.7 %
TOTAL	20	14.9 %

**Table-5: Causes of Neonatal Death**

CAUSES	NO OF CASES	PERCENTAGE
Prematurity with RDS	6	4.5 %
Birth asphyxia	2	1.5 %
Septicemia	1	0.7 %
Total	9	6.7 %

Perinatal deaths were significantly high in low socio-economic group (  $p$  value= 0.012 ) and in unbooked cases (9.7%vs5.2%) (  $p$  = 0.018 ), in patients with systolic BP  $\geq$  160 mm Hg (9.7%vs5.2% (  $p$  = 0.0055 ) and with high diastolic BP  $\geq$  110 mm Hg (9.5%vs5.9%) (  $p$  =0.001) and with increasing magnitude of proteinuria. (  $p$  =0.004). Perinatal mortality was significantly high in patients who didn't received anti-hypertensive treatment (  $p$  = 0.00014 ).

Out of 134 cases , 40.3 % cases were < 37 wks and 59.7 % were  $\geq$  37 wks. Mean gestational age was 36.3 $\pm$  2.49 wks. Perinatal mortality was significantly high when gestational age was <37 wks (  $p$  = 0.05 ). It was significantly high in patients delivered vaginally (  $p$  = 0.00068 ).

Neonatal Complications-Out of 134 babies, 38.8 % babies were normal , 40.3 % babies were premature , 25.3 % babies had respiratory distress syndrome ( all babies with RDS were < 37 wks comprising 62.9 % of preterm babies), 52.2 % babies had birth weight < 2.5 kg, 5.9 % term IUGR

(comprising 31.2 % of term deliveries), 1.5 % had meconium aspiration syndrome, and 10.4 % babies had Apgar score < 7 at 5 minutes. Among neonatal death most common cause was prematurity with RDS (Table-5).

Table-6 showed perinatal complications associated with different types of hypertensive disorders. Total number of normal babies without any complications were 52 (38.8 %), in which cases of GHTN were 25 (67.6%), MPE were 20 (54.1%), SPE were 4 (8.9%), E were 3 (20 %).

Total no of IUGR cases were 19 (14.1 % ) , 8.2 % preterm IUGR and 5.9 % term IUGR, in relation to different type of hypertensive diseases is as follows GHTN ( 8.1 % ) , MPE ( 10.8 % ) , SPE (24.4 % ) and E ( 6.7 % ) .

Total no of hypoxic babies (Apgar score < 7 at 5min ) were 14 (10.5 % ) , 6.8 % were preterm and 3.7 % were term, and in relation to different hypertensive disease as follows GHTN (11.8 % ) , MPE ( 10.8 % ) and SPE ( 15.6 % ) .

**Table-6: Showing perinatal complication in different hypertensive disorder of pregnancy**

Perinatal outcome	Gestational hypert (%)	Mild PE (%)	Severe PE (%)	E (%)	Total (%)
Normal	25 (67.6 %)	20 (54.1 %)	4 (8.9 %)	3 (20 %)	52 (38.8 %)
Preterm with RDS	6 (16.2 %)	10 (27 %)	15 (33.4 %)	3 (20 %)	34 (25.3 %)
Preterm IUGR	1 (2.7 %)	3 (8.1 %)	6 (13.3 %)	1 (6.7 %)	11 (8.2 %)
Preterm hypoxic	3 (8.1 %)	2 (5.4 %)	4 (8.9 %)	-	9 (6.8 %)
Term IUGR	1 (2.7 %)	-	-	-	1 (0.74 %)
Term IUGR with hypoxia	1 (2.7 %)	1 (2.7 %)	3 (6.7 %)	-	5 (3.7 %)
Term IUGR with MAS	-	-	2 (4.4 %)	-	2 (1.5 %)
IUD	-	-	6 (13.3 %)	5 (33.3 %)	11 (8.2 %)
END	-	1 (2.7 %)	5 (11.1 %)	3 (20 %)	9 (6.8 %)
TOTAL	37 (27.6 %)	37 (27.6 %)	45 (33.6 %)	15 (11.2 %)	134 (100 %)

## DISCUSSION

Hypertensive disorder in pregnancy is a common condition which is responsible for major chunk of maternal and fetal morbidity and mortality. The incidence of hypertensive disorder in pregnancy (especially pre-eclampsia and eclampsia) and the total number of deaths from the same have come down dramatically in developed countries. This is totally attributed to improvements in prenatal care and management. However, in developing countries it still stands as one of the major complications of pregnancy. In present study the overall incidence of hypertensive disorders in pregnancy was 7.3 %.

According to National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy reported, Hypertensive disorders complicating pregnancy was 6%–8% of pregnancies and may affect as many as 20% of pregnancies [5]. High incidence (10%) was also present in one of the study from Kolkata [6], Incidence in this study was on the lower side which may be attributed to the fact that number of booked cases were more compared to other studies and patients had received adequate ante-natal care. Incidence of pre-eclampsia alone in this study was 4.5%. Similar incidence's was reported by other studies [7,8]. The incidence of eclampsia in this study was 0.8 %. Similar incidence

was found in the other studies [4, 9, 10].

In this study most of the women (59.7 %) had come from the low socio-economic status. All patients with eclampsia were from low socio-economic status. Perinatal mortality was significantly high in low socio-economic group. According to one more study (82%) also majority of the patients belonged to low income group [9].

This indicates that socioeconomic status, poor nutrition and inadequate antenatal care, have close relationship with hypertensive disorders complicating pregnancy and increase perinatal and maternal mortality.

In the present study booked cases (58.9 %) were more compared to the number of unbooked cases. This may be the reason of lower incidence of preeclampsia and eclampsia in this study as unbooked cases were less compared to other recent studies. One study reported 82.3% of unbooked cases in their study [9].

According to Tekula *et al.* and Mekbeb *et al.* showed significant association between severity of illness and lack of antenatal care [11, 12].

In the present study maternal and perinatal mortality was high in unbooked patients. In a descriptive study Igberase GO *et al.*, also reported most of the deaths (89.5%) were in unbooked women [13].

It has been unanimously established that the adequate level of antenatal care has enormous value in reducing the incidence of preeclampsia, eclampsia by its early detection and its prompt management.

In this study 73.9% were in the age group of  $\leq 25$  years with mean age of 23.50 years. Audrey *et al.* concluded that maternal age less than 20 years was the strongest risk factor for both preeclampsia and eclampsia [14].

In index study, 55.9 % were primigravidas. Study by Bhattacharya S reported that 65.6% cases were primigravidas [15]. Jose Villar *et al.*, and Duckitt *et al.*, also reported that primigravida was a risk factor for preeclampsia and eclampsia [16, 17]. In present study mean gestational age of hypertensive patients was 36.3 weeks, One of the study also reported gestational age was  $>35$  weeks in 45% cases [10].

In the present study 37.3 % had systolic BP  $\geq 160$  mm Hg, 29.8 % had diastolic BP  $\geq 110$  mm Hg And 20.9 % had proteinuria  $\geq 3+$ . All the maternal and perinatal mortality had BP  $\geq 160 / 110$  mm Hg and proteinuria 3+. Similar results have been shown in other studies [18-20].

In the present study, all eclampsia patients were hypertensive and all patients had edema and proteinuria. Contrary to these findings Sibai Baha M *et al.*, reported 32% did not have oedema, 23% had relative hypertension, and 19% did not have proteinuria at the time of convulsions [21].

In the present series perinatal mortality was high (60 %) when the duration of gestation was  $< 37$  weeks. Similar observations were made by Dhanajaya *et al.*, Therefore prematurity is of the main cause of high perinatal mortality [18].

In this present series rate of vaginal deliveries 67 (50%) was equal to the rate of caesarean deliveries 67 (50%). In the other studies vaginal delivery were high.

In the present study perinatal mortality was significantly high in babies delivered vaginally. In the recent years, caesarean section has been opted for the mode of delivery especially in salvageable babies. This has resulted in a better perinatal outcome. Other studies have reported a similar outcome with caesarean section in comparison to the vaginal route [22-24].

In this study all cases with gestational hypertension (excluding severe cases) and mild preeclampsia (22.4%) were not given any antihypertensive treatment. The mild cases of pre-eclampsia usually do not require any anti-hypertensives [25].

As recommended by the working group – “National High Blood Pressure Education Programme – 2000 – indication of Anti-hypertensive agents is – systolic BP  $>160$  mmHg and diastolic BP more than 105 mmHg. [5]

In the present study perinatal mortality was significantly high in patients who did not receive any anti-hypertensive treatment antenatally.

In this present series out of 52 cases where Pritchard's regime was used, 15 cases were eclampsia cases. Out of these 15 eclampsia cases no patient had repeat convulsions with Pritchard's Regime.

According to Sibai the incidence of repeat convulsions was 14.9 % [26]. In the present study , abruption placantae was commonest complication affecting 8 pregnancies (5.9% ), 5 cases had severe preeclampsia and 3 had eclampsia. Next common complication was pulmonary oedema (4.5%) Similar findings were seen by Farid M *et al.*, and Al- Mulhim A. A *et al.*, [27, 28].

The incidence of maternal mortality in this study was 2.2%. Similar incidence was found in study by Menon [29]. Maternal mortality from eclampsia was 11.28% in one of the study [9].

In the present study prematurity was commonest complication (40.3%) followed by birth asphyxia (10.5 %), IuGR (5.9 %), MAS (1.5 %). A study by Vidyadhar B. Banbal *et al.*, showed similar findings [30].

Perinatal mortality was 14.9 %, abruption placantae (5.9 %) and prematurity with RDS (4.5 %) were commonest causes. Total NICU admissions were 52 (38.8 %), majority of admissions were due to prematurity. Contrary to present study Majhi *et al.*, reported very high perinatal mortality. (39.9%) Incidence of perinatal mortality was low in this study compared to other studies as the number of booked patients were more than unbooked patients [9].

### CONCLUSION

The fact that pre-eclampsia, eclampsia is largely a preventable disease is recognized by the reduced incidence of pre-eclampsia and eclampsia with proper antenatal care and prompt treatment of pre-eclampsia. In our study Incidence of hypertensive disorder of pregnancy was 7.6% but the incidence of pre-eclampsia and eclampsia is on the lower side. Maternal mortality was only 2.23%.

Eclampsia and severe preeclampsia having higher risk for maternal deaths. Perinatal deaths were significantly high in low socio-economic group, in unbooked cases in patients with systolic BP  $\geq$  160 mm Hg and with high diastolic BP  $\geq$  110 mm Hg) and with increasing magnitude of proteinuria. Perinatal mortality was significantly high in patients who didn't received anti-hypertensive treatment. The timely use of antihypertensive drugs, optimum timing of delivery and strict fluid balance, anticonvulsants in cases of eclampsia will help to achieve successful obstetric outcome.

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