**Original Research**

# Perinatal Outcomes In Women With Hypertensive Disorders Of Pregnancy: A Cross-Sectional Study From Rural Haryana

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**ABSTRACT:**

**Background:** Hypertension is a major health problem among pregnant women all over the world due to high perinatal morbidity and mortality. Maternal mortality is mostly related to eclampsia, antepartum haemorrhage (placental abruption), HELLP syndrome, pulmonary oedema, acute renal failure, and disseminated intravascular coagulation (DIC). Though treating hypertension would not alter the progression of the disease, however, it has been shown that with proper antenatal care, early recognition of preeclampsia and timely intervention, decreases the frequency of hypertensive crisis and feto-maternal complications. So current study was design to find out the the incidence of hypertensive disorders of pregnancy and associated maternal and fetal mortality and morbidity rates, and to shed some light on factors influencing it.

**Material and methods:** This was a retrospective, cross-sectional, hospital-based study conducted at SGT Medical College in Haryana from January 2019 to April 2021. All pregnant women beyond 20 weeks of gestation complicated by hypertensive disorders of pregnancy, and admitted in our institution for delivery were included in the study. Pregnancies with associated medical complications like diabetes with nephropathy, vascular or renal disease, epilepsy and convulsion disorders secondary to medical causes were excluded from the study. A total 2049 participants were included in the study**.**

**Results:** In this study, 2049 deliveries were conducted in the study period; of which, 115(5.5%) cases had Hypertensive disorder of pregnancy. Incidence of gestational hypertension was 57(2.7%) Preeclampsia 49 (2.3%) eclampsia 6 (0.2%) and chronic hypertension was found in 0.1% of total pregnancies.

**Conclusion**: This study shows that nearly one in 18 pregnant women in rural areas of Haryana suffer from a hypertensive disorder of pregnancy. The knowledge of risk factors for hypertensive disorders in pregnancy may give tracks for prevention in this population. Early diagnosis and treatment through regular antenatal check-up is a key factor to prevent hypertensive complications of pregnancy.

**Keywords:** Pregnancy induced hypertension,, pre-eclampsia, Eclampsia, etc.

## INTRODUCTION

Hypertension is a major health problem among pregnant women all over the world due to high perinatal morbidity and mortality. Globally preeclampsia and eclampsia account for nearly 14% of maternal deaths[1-2] with higher incidence in developing countries, mostly because of inaccessibility to prompt medical care in obstetric emergencies. The incidence of hypertensive disorders of pregnancy increased from 16.30 million to 18.08 million globally, with a total increase of 10.92 % from 1990 to 2019.[3]

Incidence of hypertensive disorders in pregnant women in India is about 7.8 % out of which preeclampsia accounts for 5.4 % and eclampsia for 24% of maternal deaths during pregnancy according to study conducted by FOGSI in 2013.[4] Maternal mortality is mostly related to eclampsia, antepartum haemorrhage (placental abruption), HELLP syndrome, pulmonary oedema, acute renal failure, and disseminated intravascular coagulation (DIC).[5-6]
Though treating hypertension would not alter the progression of the disease, however, it has been shown that with proper antenatal care, early recognition of preeclampsia and timely intervention, decreases the frequency of hypertensive crisis and feto-maternal complications

## OBJECTIVES

This study was conducted at a tertiary care medical college in rural Haryana to determine the incidence of hypertensive disorders of pregnancy and associated maternal and fetal mortality and morbidity rates, and to shed some light on factors influencing it.
The association of adverse maternal and perinatal outcomes with demographic variables like age, parity, and socioeconomic status, type of hypertensive disorder, status of antenatal care received by the patient, gestational age at delivery, mode of delivery and feto-maternal complications were analysed.

## MATERIAL AND METHODS

This was a retrospective, cross-sectional, hospital-based study conducted at SGT Medical College in Haryana from January 2019 to April 2021. All the data was obtained from hospital medical records after approval from ethical clearance committee.
All pregnant women beyond 20 weeks of gestation complicated by hypertensive disorders of pregnancy, and admitted in our institution for delivery were included in the study. Pregnancies with associated medical complications like diabetes with nephropathy, vascular or renal disease, epilepsy and convulsion disorders secondary to medical causes were excluded from the study.
The criteria for classifying into hypertensive disorders was:

**1. Preeclampsia:**

- blood pressure of 140/90 mmHg or above on two occasions at least four hours apart
- with proteinuria or
- In those without proteinuria
  - thrombocytopenia (platelets < 100,000/μL) or
  - impaired liver function (serum liver transaminases to twice the normal level) or
  - New-onset renal insufficiency (serum creatinine >1.1 mg/dL or doubling of serum creatinine without any other renal pathology) or pulmonary oedema or new-onset visual disturbances or cerebral symptoms.

**2. Eclampsia**: development of seizure in women with hypertension, which was not attributed to any other cause.

**3. Gestational hypertension: hypertension** beyond 20 weeks of gestation, in the absence of proteinuria or the systemic findings of pre-eclampsia.

**4. Chronic hypertension**: hypertension prior to pregnancy or prior to 20 weeks of gestation.
All other clinical management including laboratory investigations, decisions regarding fetal monitoring, period of gestation at time of delivery, Spontaneous/induced labour, mode of delivery (Vaginal- spontaneous/instrumental(Forceps or vacuum) /Caesarean – elective or emergency, APGAR at 0,1,5min of birth, Fetal anthropometry, NICU admission, duration of stay and the course till discharge were noted, tabulated and statistically analysed.

## RESULTS

In our study, 2049 deliveries were conducted in the study period; of which, 115(5.5%) cases had Hypertensive disorder of pregnancy. Incidence of gestational hypertension was 57(2.7%) Preeclampsia 49 (2.3%) eclampsia 6 (0.2%) and chronic hypertension was found in 0.1% of total pregnancies.

The prevalence of hypertension in pregnancy was found significantly higher in the age group 25-35 years (47.8%) as compared to <25 years age group (46%) and was least in >35yrs (5.2%). However, no statistical significance was found between hypertension in pregnancy with occupation, educational status and socioeconomic status.

Term or preterm development of hypertensive disorder had no significant association with maternal morbidity. All patients with Hypertensive disorder of pregnancy received antihypertensives treatment as per hospital protocol. In our study, 2.7% cases had pulmonary oedema, 9.2% cases had abruption of placenta, and 5.7% cases had postpartum haemorrhage (PPH). Seven cases required intensive care unit (ICU) admission. All the mothers who required ICU care had either severe preeclampsia or eclampsia. ICU admission was significantly more in women with eclampsia than preeclampsia.
Among patients with hypertensive disorders of pregnancy, 51(44.3%) babies delivered had no neonatal complications during the follow up period. 20(17.3%) patients had preterm delivery. 36(31.3%) babies had fetal growth restriction. Neonatal hypoxia occurred in 13(11.3%) of babies. Neonatal mortality was 4(3.4%)

## ASSOCIATION OF SOCIODEMOGRAPHIC VARIABLES WITH HYPERTENSIVE DISORDERS OF PREGNANCY

| Sociodemographic variable | Hypertension | Normotensive | Total |
|---|---|---|---|
| **Age** | | | |
| **<25yrs** | 54 | 819 | 873 |
| **26-34yrs** | 55 | 768 | 823 |
| **>35yrs** | 6 | 347 | 353 |
| **Education status** | | | |
| **Graduate and above** | 21(7.0%) | 275 | 296 |
| **Below graduate** | 94(5.5) | 1659 | 1753 |
| **Socioeconomic status** | | | |
| **Upper +upper middle** | 17(4.9%) | 324(95%) | 341 |
| **Lower middle + upper lower + lower** | 98(5.7%) | 1610(94%) | 1708 |
| **Booking status** | | | |
| **Supervised** | 38(3.1%) | 1164(96.8) | 1202 |
| **unsupervised** | 77(9.0%) | 770(90.9%) | 847 |

## ASSOCIATION OF INDEPENDENT VARIABLES WITH HYPERTENSIVE DISORDERS OF PREGNANCY

| Variables | Hypertension | Normotensive | Total |
|---|---|---|---|
| **Gravida** | | | |
| **<3** | 54 | 836 | 890 |
| **>3** | 61 | 1098 | 1159 |
| **Parity** | | | |
| **<1** | 83 | 806 | 889 |
| **>1** | 32 | 1128 | 1160 |
| **History of abortions** | | | |
| **Yes** | 38 | 196 | 231 |
| **No** | 77 | 1738 | 1815 |
| **History of still birth** | | | |
| **Yes** | 4 | 41 | 45 |
| **No** | 111 | 1893 | 2008 |
| **Family history of Hypertension** | | | |
| **Yes** | 8 | 116 | 124 |
| **No** | 107 | 1818 | 1925 |
| **History of maternal hypertension** | | | |
| Yes | 3 | 91 | 94 |
| No | 112 | 1843 | 1955 |
| **History of hypertension In previous pregnancy** | | | |
| Yes | 43 | 118 | 161 |
| No | 72 | 1816 | 1888 |

## MATERNAL COMPLICATIONS

| Type of HDP | No. Of cases *(among HDP)* | *incidence* | Pulmonary oedema (%) | Abruptio placentae (%) | PPH (%) | ICU admission (%) |
|---|---|---|---|---|---|---|
| **Gestational hypertension** | 57(49.5) | 2.7 | - | - | 1 | 1 |
| **Preeclampsia** | 49(42.6) | 2.3 | 3(6.1%) | 9(18.3) | 8(16.3) | 2(4.0) |
| **Eclampsia** | 6(5.2) | 0.2 | 3(50%) | 2(33.3) | 2(33.3) | 4(66.6) |
| **Total** | 115 | 5.5% | 6(5.2) | 11(9.5) | 11(9.5) | 7(6.0) |

## PERINATAL OUTCOMES

| Perinatal outcome | Gestational hypertension (%) | preeclampsia | Eclampsia | Total N |
|---|---|---|---|---|
| **Healthy** | 38(74.5%) | 11(21.5%) | 2(3.9%) | 51 (44.3%) |
| **Preterm births with RDS** | 1(0.8%) | 3(2.6%) | 1(0.8%) | 5(4.3%) |
| **Preterm births with FGR** | 3 (2.6%) | 16 (13.9%) | - | 19(16.5%) |
| **Preterm births with hypoxia** | 2(1.7%) | 5(4.3%) | - | 7 (6.0%) |
| **Term births with FGR** | 14(12.1%) | 3(2.6%) | - | 17(14.7%) |
| **Term births with FGR and hypoxia** | 1(0.8%) | 5(4.34%) | - | 6(5.2%) |
| **Neonatal death** | - | 2(1.7%) | 2(1.7%) | 4(3.4%) |

Among patients with hypertensive disorders of pregnancy, 51(44.3%) babies delivered had no neonatal complications during the follow up period. 20(17.3%) patients had preterm delivery. 36(31.3%) babies had fetal growth restriction. Neonatal hypoxia occurred in 13(11.3%) of babies. Neonatal mortality was 4(3.4%)

## DISCUSSION

All women complicated with hypertensive disorder of pregnancy over a period of 2 years from January 2019 to April 2021 were studied. Prevalence of hypertensive disorders in pregnancy was found to be 5.5% in our study. Sachdeva et al.7 reported incidence of hypertensive disorders to be 15 % among rural women in Gujrat. This incidence was very high as compared to our study, which may

be attributed to the fact that it was a hospital-based study and also women in rural settings attend hospital mostly when they have some complications or when they are referred from the peripheral centres.
Evidence shows that high doses of calcium intake during pregnancy reduces the risk of hypertensive disorders of pregnancy.[8-9] On dietary history, patients in our community had good dietary calcium supplements and therefore, this can be used as supportive local evidence for low incidence of Hypertensive disorders in our study.

Sachdeva *et al*.,findings were congruent with our findings of higher incidence of pre eclampsia among literates, though the difference was not significant in our study. Higher incidence observed in literate women correlates with a report which states that those with college education had a 19% great chance of having preeclampsia and eclampsia.[7]

In the present study, prevalence of hypertension in pregnancy was found significantly higher in women with history of hypertension in previous pregnancy (37.3%) compared to those with no history of hypertension in previous pregnancy (5.5%). Logistic regression analysis showed that hypertension in pregnancy was about 11times more likely to occur in women with history of hypertension in previous pregnancy. Similarly, Tebeu *et al*[10] *and* Nisar *et al*[11] found significant association between history of hypertension during previous pregnancy and hypertension in the current pregnancy.

This study revealed significant association of hypertension in pregnancy with history of paternal hypertension, but no association with history of maternal hypertension. Logistic regression analysis showed paternal hypertension is a very important predictor of hypertension in pregnancy with adjusted OR of about eight times.

## LIMITATIONS

As, this was a cross-sectional study, the study subjects were not followed-up after delivery. The possibility that some of the subjects might have chronic hypertension and were mis classified as Gestational hypertension is there.

## CONCLUSION

Our study shows that nearly one in 18 pregnant women in rural areas of Haryana suffer from a hypertensive disorder of pregnancy. The knowledge of risk factors for hypertensive disorders in pregnancy may give tracks for prevention in this population. Early diagnosis and treatment through regular antenatal check-up is a key factor to prevent hypertensive complications of pregnancy. Therefore, it is the need of hour to devise a sound screening strategy to find out hypertension in pregnancy cases and comprehensive strategy for management of hypertension in pregnancy as well as maternal and neonatal complications.

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