



## Original Research Article

# Gestational hypertension and fetal outcome: A prospective study in a tertiary care centre

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## ABSTRACT

**Introduction:** Hypertension in pregnancy is one of the most common threat to the mother and fetus all over the world, contributing to significant morbidity and mortality. It is observed more among the nulliparous women and the elderly ladies, with the chronic hypertension superimposed by preeclampsia, increasing the chances of morbidity and mortality in both mother and fetus.

**Materials and Methods:** 492 pregnant women who had come to the hospital for delivery, and who were diagnosed with hypertension recording a blood pressure of more than 140/90 on at least 2 occasions were included into the study.

**Results:** The most common age group of the expectant mothers with HTN was 21-30 years. Most of the patients had gestational hypertension or pregnancy induced hypertension, while eclampsia was seen in 4.3% of the cases. Preeclampsia was observed in 12.8% and preeclampsia superimposed on chronic hypertension was seen in 5.3%. The most common outcome was preterm delivery in 39.6% of the cases. Low birth weight was seen in 20.9%, IUGR in 13.4%, NICU admission in 23.4%. Mortality was seen in 5.1% of the cases, with 3.9% being in utero and 1.2% within a week of birth.

**Conclusion:** Hypertension during pregnancy results in complications leading to severe fetal morbidity and mortality. Thereby, screening of the expectant mothers during gestation would help to identify the condition at the earliest and prevent complications.

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## 1. Introduction

Hypertension in pregnancy is one of the most common threat to the mother and fetus all over the world, contributing to significant morbidity and mortality.<sup>1,2</sup> The prevalence of hypertension in pregnancy is 6-8% worldwide and in India, this is estimated to be around 5.38%.<sup>3,4</sup> It is said to be the second most common disorder in pregnant women.<sup>5</sup> The disorders caused by hypertension are varied, ranging from a mild variation in blood pressure to a multiple organ failure.<sup>6</sup> 20% of the hypertensive disorders in the expectant mothers result in preterm births.<sup>7</sup>

The perinatal deaths which occur worldwide is around 7.3 million, with most of these in developing countries. In

India alone around 8.9 lakhs of perinatal deaths occur every year with the biggest contribution from rural India.<sup>8</sup>

Hypertension is classified according to American College of Obstetrics and Gynecology and the United Nations Organization as Chronic Hypertension, Pregnancy induced hypertension, Preeclampsia/eclampsia and superimposed preeclampsia/eclampsia.<sup>6,9</sup> Chronic hypertension either precedes pregnancy or is diagnosed within the first 20 weeks of gestation. Gestational hypertension or pregnancy induced hypertension starts after 20 weeks of gestation with an elevated BP of >140/90. Such patients have previously normal BP. Preeclampsia affects multiple organs of the body and results in hypertension (>140/90 mmHg) and proteinuria(>0.3g/24 hours) after 20 weeks of gestation. Eclampsia results in convulsions after preeclampsia.<sup>10</sup>

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The cause of hypertension during pregnancy is not clear, but it is seen to occur in the young women, pregnant for the first time, women with less than 20 years of age, patients with diabetes, with a history of hypertension.<sup>11</sup> The complications in the fetuses maybe due to premature birth or hypoxia due to the uteroplacental insufficiency in the mothers.<sup>12-14</sup>

The cause for the hypertensive disorders is unknown. It is observed more among the nulliparous women and the elderly ladies, with the chronic hypertension superimposed by preeclampsia, increasing the chances of morbidity and mortality in both mother and fetus.<sup>15</sup>

The severity of preeclampsia, disease length, and amount of proteinuria also play a role in the fetal complications.<sup>16</sup> The complications include fetal distress, hemorrhage, low APGAR scores, low birth weight, Intrauterine growth retardation, Intrauterine death, neonatal ICU admissions, neonatal death.<sup>17</sup>

This study was therefore conducted to assess the type of hypertension among the pregnant women and fetal outcome.

## 2. Materials and Methods

This hospital based prospective study was done by the Department of Gynecology at PRM medical college and hospital from March 2019 to August 2019. 492 pregnant women who had come to the hospital for delivery, and who were diagnosed with hypertension recording a blood pressure of more than 140/90 on at least 2 occasions were included into the study.

After clearing the study from the Institutional Ethical committee, the procedure of the study was explained to the patients and informed consent was taken from all of them. All the patients who refused to give consent and those who were not admitted for delivery, those who had hypertension, but not related to pregnancy, who were delirious and unable to communicate were excluded from the study. Patients with other diseases such as severe anemia, heart disease, renal disorders, pregnancies complicated with diabetic mellitus, epilepsy, collagen vascular diseases were also excluded from the study.

Demographic details, details of the pregnancy such as gestational age and health of the baby were noted. The blood pressure was noted and any maternal complications during the hospital stay were also noted. The monitoring of the fetus was done using Doppler, Daily fetal movement count (DFMC), fetal heart rate (FHR) and Non stress test (NST).

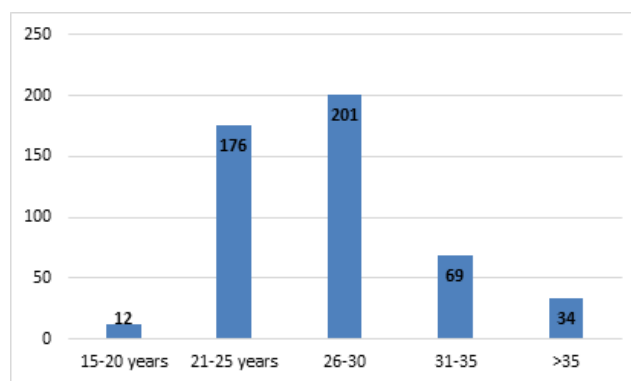
Rest, dietary changes were advised to the mothers, and blood pressure was controlled using antihypertensives. In mild preeclampsia and gestational hypertension, the pregnancy was terminated by inducing labour at 37 weeks. In patients with gestation of less than 37 weeks, if there was a deterioration of maternal condition or fetal distress, termination of pregnancy was done. In case of conditions such as preeclampsia and eclampsia, with unripe cervixes,

caesarian section was done to protect the mother and the fetus. This need was confirmed first by Doppler studies where severe IUGR, fetal distress, meconium staining of liquor was observed. The outcome of the mother and the fetus after the birth was also noted. The number of live births, birth weight, APGAR score, NICU admission or neonatal death was noted.

Statistical analysis was done using Microsoft Excel and SPSS statistical software.

## 3. Results

The most common age group of the expectant mothers was 26-30 years, with 201 women (40.9%), followed by 21-25 years as seen in 176 (35.8%). 69 women (14.02%) were 31-35 years old and 34 (6.91%) were over 35 years of age. 12 women were between 15-20 years of age, with most of them being 18 or 19 years (Figure 1).



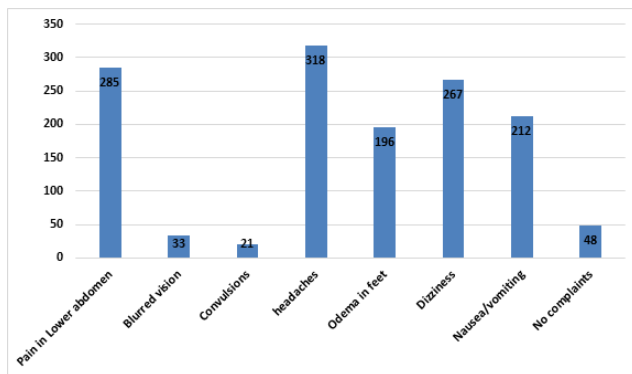
**Fig. 1:** Distribution of patients based on age

Most of the women (85.5%) belonged to the rural community while 81 (16.5%) of them lived in the urban area. 288 (58.5%) women were pregnant for the first time, while 204 (41.5%) were multigravida. The gestational age at the time of termination of pregnancy was <34 weeks in 52 (10.6%) of the patients and 34-36 weeks in 143 (29.1%) of the patients. 297 (60.4%) of the patients carried the fetus full term. Most of the patients 463 (94.1%) had singleton pregnancies while 28 (5.7%) had twins. 1 woman gave birth to triplets. In 113 (23%), women, the systolic blood pressure was more than 190 mmHg, and in 379 (77%), the systolic pressure was 140-190 mmHg. Diastolic blood pressure was 90-110 in 311 (63.2%) of the patients and >110 mmHg in 181 (36.8%) (Table 1).

At the time of admission, 318 (64.6%) of the patients had headaches, 285 (57.9%) had pain in the lower abdomen. Dizziness was observed by 267 (54.3%), nausea and vomiting in 212 (43.1%) and edema in 196 (39.8%). Convulsions were seen in 21 (4.3%) of the patients and blurred vision was observed in 33 (6.7%) of the cases (Figure 2).

**Table 1:** Parity and gestational age of mothers

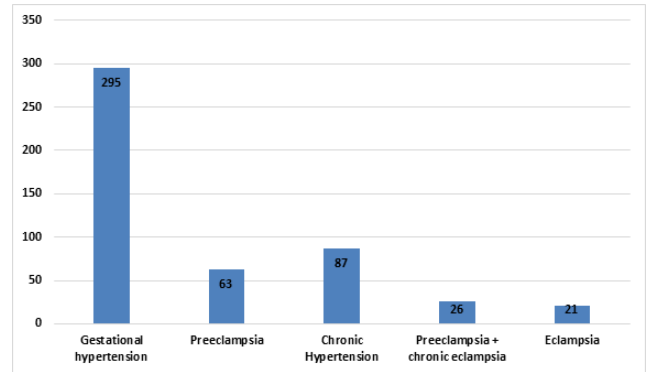
Parameters	Number	Percentage
<b>Residential Status</b>		
Urban	81	16.5%
Rural	411	85.5%
<b>Parity</b>		
Primi	288	58.5%
Multigravida	204	41.5%
<b>Gestational age</b>		
<34 weeks	52	10.6%
34-36 weeks	143	29.1%
>37 weeks	297	60.4%
<b>No of fetuses</b>		
Single	463	94.1%
Twins	28	5.7%
More than Twins	1	0.2%
<b>Systolic Blood pressure (mmHg)</b>		
140-190	379	77.03%
>190	113	22.96%
<b>Diastolic Blood Pressure (mmHg)</b>		
90-110	311	63.2%
>110	181	36.8%



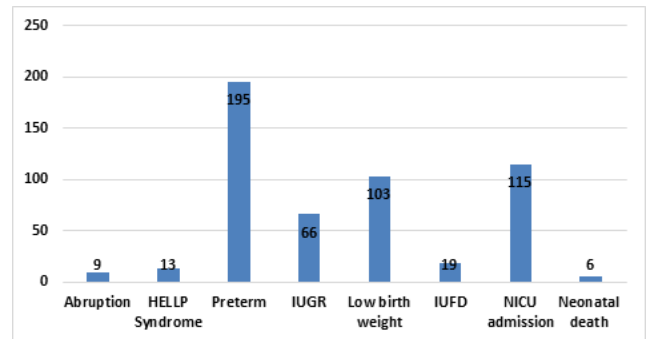
**Fig. 2:** Clinical presentation during present pregnancy

The predominant hypertension observed among the patients in the study was gestational hypertension as seen in 295 (60%) of the patients. Chronic hypertension was seen in 87 (17.7%), preeclampsia was seen in 63 (12.8%), preeclampsia superimposing on chronic hypertension in 26 (5.3%) of the patients. Eclampsia was seen in 21 (4.3%) of the patients (Figure 3).

The most common outcome of the fetus was preterm as seen in 195 (39.6%) of the cases, followed by NICU admission of the neonates in 115 (23.4%). Low birth weight was observed in 103 (20.9%), intra uterine growth retardation (IUGR) was seen in 66 (13.4%), intrauterine fetal death was seen in 19 (3.9%), while 6 (1.2%) of the neonates died (Figure 4).



**Fig. 3:** Types of hypertensive disorders among the expectant mothers



**Fig. 4:** Maternal and fetal outcomes

#### 4. Discussion

The main reason for checking for hypertension during pregnancy is to reduce morbidity and mortality of the mother and child. The most common complications that occur during pregnancy when the mother is hypertensive is premature growth of the fetus, preterm deliveries, low birth weight, low APGAR scores, admission into NICU, fetal and neonatal death.

In the present study the most common age group of the expectant mothers with HTN was 21-30 years. Most of the women in our study belonged to rural background. This was corroborated by a study by Patel et al, who observed o high prevalence of HTN among the 18-22 years age group followed by 23-27 years.<sup>11</sup> In contrast to our study, a study by Parmar et al reported than HTN is more common among women less than 20 years of age, while Gandhi et al reported a prevalence of HTN in more than 48% in the 21-25 year age group.<sup>18,19</sup>

58.5% of the pregnant mothers in our study were primi. In a study by Gandhi et al., 43.25% of the women were primiparous, similar to our study and Parmar et a reported 55% to be primigravida.<sup>18,19</sup> In another study by Khosravi et al. also, primigravidas were reported to be more affected with HTN.<sup>20</sup>

Most of the women in the present study (60.4%), carried the fetus to full term i.e above 37 weeks of gestation, while 10.6% delivered before 34 weeks.

The systolic pressure was 140-190 mmHg in 77% of the women, while the diastolic was 90-110 in 63.2%. >190 mmHg systolic pressure was seen in 23% of the cases and more than 110 diastolic was observed in 36.8%. An average blood pressure of 163/108.8 mmHg was observed in another study by Buga et al.<sup>21</sup>

Most of the patients in our study had gestational hypertension or pregnancy induced hypertension, while eclampsia was seen in 4.3% of the cases. Preeclampsia was observed in 12.8% and preeclampsia superimposed on chronic hypertension was seen in 5.3%. In a study by Shah et al, a very high prevalence of eclampsia (43.24%) and preeclampsia (25.23%) was observed out of the total hypertension disorders among pregnant women which was very high compared to our study.<sup>22</sup> In studies in Haiti, prevalence of preeclampsia and eclampsia were estimated to be between 7-18%.<sup>23-25</sup> Although we had not done a prevalent study, Shah et al. reported a prevalence of 5.56% of hypertensive disorders among pregnant women. In another study, a very high prevalence of 22% was observed.<sup>26</sup> Some of the reasons stated for such a high prevalence was stated to be lack of education, superstitions, lack of nearby hospitals and other resources, awareness etc.<sup>27</sup>

The most common outcome in the present study was preterm delivery in 39.6% of the cases. Low birth weight was seen in 20.9%, IUGR in 13.4%, NICU admission in 23.4%. Mortality was seen in 5.1% of the cases, with 3.9% being in utero and 1.2% within a week of birth. In a study by Vats et al., a preterm delivery was seen in 26.53% of the cases, while Yadav et al. reported 28.8% and Bangal et al. reported 37% which was in accordance to our study.<sup>28-30</sup> Vats et al. reported 6% intrauterine death, out of which 2 mothers also died.<sup>28</sup> Low birth weight was observed in 56.33% of the cases in a study by Sachan et al.<sup>31</sup> while Gawde et al. reported 25% of the neonates to be born with low birth weight.<sup>32</sup> HELLP was seen in 2.6% of the case in our study, while in a study by Chaitra et al, HELLP syndrome was observed in 4.54%, Eshetuet reported 12.4% and Prakash et al. reported 7.5%.<sup>33-35</sup>

## 5. Conclusion

Gestational hypertension results in severe complications in both mother and fetus. Thus screening of these high risk mothers during the antenatal check ups at the earliest and monitoring of the blood pressure in each visit, is very essential. Since many of the patients are from the rural background, awareness and education on the importance of regular antenatal checkups and timely intervention is crucial.

## 6. Source of Funding

None.

## 7. Conflict of Interest

The author(s) declare(s) that there is no conflict of interest.

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