

## Analysis of Gestational Hypertension and Foetal Outcome: A Prospective Study in a Tertiary Care Hospital

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### ABSTRACT

**Introduction:** Pregnancy associated hypertensive disorder is on the verge reaching heights in modern day's world which is one among the frontier causes of both the maternal and perinatal morbidity and mortality. When systolic blood pressure finding is more than 140 mmHg and a diastolic pressure of more than 90 mmHg obtained at every 6 hours interval after 20 weeks period of gestation is termed as pregnancy associated hypertensive disorder. The sudden steep elevation of blood pressure in pregnancy was usually related with various maternal complications like convulsions, abruptions, HELLP syndrome, hepatic and renal failure, retinal detachment and also rises the risk of heart attacks, cardiac failure, cerebrovascular accidents affecting the mother. This study was therefore conducted to assess the type of hypertension among the pregnant women and foetal outcome.

**Materials and Methodology:** This is designed to be a prospective study which was done by the Department of Obstetrics & Gynaecology, Jaipur National University Institute for Medical Sciences and Research Centre, Jaipur, Rajasthan, India. 500 pregnant women who had reported to the hospital for delivery and those were diagnosed with hypertension with a recorded blood pressure of more than 140/90 mmHg on at least 2 occasions were basically included as study participants. The blood pressure was noted and any maternal complications during the hospital stay were also noted. Foetal monitoring was performed using Doppler, daily foetal movement count (DFMC), foetal heart rate (FHR) and Non stress test (NST). Adequate rest, dietary changes were advised to the mothers and blood pressure was controlled using antihypertensive drugs. The outcome of the mother and the foetus 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 (V11).

**Results:** 293 (58.4%) women were pregnant for the first time (primi), while 209 (41.6%) 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 145(29%). Most of the patients 467 (93.4%) had singleton pregnancies while 33 (6.6%) had twins. The systolic blood pressure was more than 190 mmHg in 116 (23.2%), women and in 379 (75.8%), the systolic pressure was 140-190 mmHg. Diastolic blood pressure was 90-110 in 316 (63.2%) of the patients and >110 mmHg in 186 (36.8%).

**Conclusion:** Pregnancy associated hypertensive disorder is mostly related with multiple complications in both the mother and baby. Modern days screening modalities usually help in early detection of the diseases and timely intervention of hypertensive disorders that are complicating pregnancy and provision of specialized systemic antenatal maternal care which could reduce the impacts of such complications in the near future.


**Keywords:** Gestational Hypertension, Pregnancy Induced Hypertensive Disorders, Foetal Outcomes.

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### INTRODUCTION

Pregnancy associated hypertensive disorder is on the verge reaching heights in modern day's world which is one among the frontier causes of both the maternal and perinatal morbidity and mortality.<sup>1-3</sup> In the developed countries, this condition ranked as the most common cause of maternal and perinatal morbidity and

mortality, whereas in developing countries like India, anaemia is still the most common condition associated with maternal morbidity and mortality. When systolic blood pressure finding is more than 140 mmHg and a diastolic pressure of more than 90 mmHg obtained at every 6 hours interval after 20 weeks period of

gestation is termed as pregnancy associated hypertensive disorder. The sudden steep elevation of blood pressure in pregnancy was usually related with various maternal complications like convulsions, abruptions, HELLP syndrome, hepatic and renal failure, retinal detachment and also rises the risk of heart attacks, cardiac failure, cerebrovascular accidents affecting the mother. Foetal complication is mainly due to the abnormal blood circulation from the mother to the foetus, which then reduces the oxygen transfer to the developing foetus leading to certain conditions like IUGR, premature delivery, foetal hypoxia to stillbirth and higher rates of recorded neonatal death.<sup>2</sup> Hypertension in pregnancy is most commonly associated bleeding and infection are the most common causes of maternal mortality and morbidity.<sup>4,7</sup> Hypertensive disorder is more common among the nulligravidas and elderly women. Among the elderly women, the type of hypertensive disorder affected is the chronic hypertension superimposed by preeclampsia. Hypertensive disorder is a progressive disorder, which initiates at fertilization and continues its way till the complete expulsion of the placenta. The changes occurring in the body will progress to a state of multi organ involvement increasing the mortality and morbidity in both the mother and the foetus.<sup>4</sup> Medical management of the hypertensive disease usually does not prevent the foetal prognosis, but studies have proven that early detection of the disease and treatment reduces the hypertensive crisis both in the mother and foetus by reducing the complications. The use of antihypertensive drugs is to prolong the pregnancy and slow down the progression of the disease until the period of viability reached in the foetus by not compromising the mother. The choice of the antihypertensive drug poses a great challenge during pregnancy and the dose calculation is cumbersome due to the physiological changes happening at the time of pregnancy and the pathological changes associated with the disease. The severity of preeclampsia, disease length, and amount of proteinuria also play a major role in the foetal complications.<sup>8</sup> There are some complications which include distress to foetus, haemorrhage, low APGAR scores, low birth weight, Intrauterine growth retardation, Intrauterine death, neonatal ICU admissions, neonatal death.<sup>9</sup> This study was therefore conducted to assess the type of hypertension among the pregnant women and foetal outcome.

## MATERIALS AND METHODS

This is designed to be a prospective study which was done by the Department of Obstetrics & Gynaecology, Jaipur National University Institute for Medical Sciences and Research Centre, Jaipur, Rajasthan, India. The study period was set to be 6 months. 500 pregnant women who had reported to the hospital for delivery and those were diagnosed with hypertension with a recorded blood pressure of more than 140/90 mmHg on at least 2 occasions were basically included as study participants. After obtaining the approval from the Institutional Ethical committee, the procedure of the study was clearly explained to the patients and informed consent was taken from all of them who were included as study participants.

Exclusion criteria include all patients who refused the 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 properly. Patients with other diseases such as severe anaemia, heart disease, renal disorders,

pregnancies complicated with diabetic mellitus, epilepsy, collagen vascular diseases were also excluded from the study. All the demographic details, pregnancy details such as gestational age and health of the baby were recorded. The blood pressure was noted and any maternal complications during the hospital stay were also noted. Foetal monitoring was performed using Doppler, daily foetal movement count (DFMC), foetal heart rate (FHR) and Non stress test (NST). Adequate rest, dietary changes were advised to the mothers and blood pressure was controlled using antihypertensive drugs. The outcome of the mother and the foetus 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 (V11).

## RESULTS

The most common age group of the expectant mothers was 26-30 years, with 205 women (41%), followed by 21-25 years as seen in 180 (36%). 70 women (14%) were 31- 35 years old and 35 (7%) were over 35 years of age as tabulated in table – 1. Most of the women (83.2%) belonged to the rural community while 86 (17.2%) of them used to live in the urban areas. 293 (58.4%) women were pregnant for the first time (primi), while 209 (41.6%) 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 145(29%). Most of the patients 467 (93.4%) had singleton pregnancies while 33 (6.6%) had twins. The systolic blood pressure was more than 190 mmHg in 116 (23.2%), women and in 379 (75.8%), the systolic pressure was 140-190 mmHg. Diastolic blood pressure was 90-110 in 316 (63.2%) of the patients and >110 mmHg in 186 (36.8%) (Table 1).

At the time of in-patient admission, 320 (64%) of the patients had headaches, 286 (57.8%) had pain in the lower abdomen. Dizziness was observed by 269(53.8%), nausea and vomiting in 212 (42.4%) and pedal oedema in 198 (39.6%). Convulsions were seen in 21 (4.2%) of the patients and blurred vision was observed in 33 (6.6%) of the cases as given in Table – 2.

The predominant hypertension observed among the patients in the study group was gestational hypertension which is present in 300 (60%) of the patients. Chronic hypertension was seen in 88 (17.7%), preeclampsia was seen in 64 (12.8%), preeclampsia superimposing on chronic hypertension in 28 (5.3%) of the patients. Eclampsia was seen in 20 (4.3%) of the patients in the study group as shown in Table - 3. The most common outcome of the foetus was preterm as seen in 197 (39.6%) of the cases which is followed by NICU admission of the neonates in 115 (23.4%). Low birth weight was observed in 104 (20.9%), intra uterine growth retardation (IUGR) was seen in 66 (13.4%), intrauterine foetal death was seen in 19 (3.9%), while 6 (1.2%) of the neonates died in the course of the study period. (Table 4)

**Table 1: Distribution of patients based on age**

Age in years	Number of women
15 – 20 years	12
21 – 25 years	180
26 – 30 years	205
31 – 35 years	70
>35 years	35

Table 2: Parity and gestational age of mothers

Parameters	Number	%
<b>Residential status</b>		
Urban	86	16.8%
Rural	416	83.2%
<b>Parity</b>		
Primi	293	58.6%
Multi-gravidae	209	41.8%
<b>Gestational age</b>		
<34 weeks	52	10.4%
34 – 36 weeks	145	29%
>37 weeks	303	60.6%
<b>No of foetus</b>		
Single	467	93.4%
Twins	32	6.4%
More than twins	1	0.2%
<b>Systolic blood pressure</b>		
140 190 mmHg	384	76.8%
>190 mmHg	116	23.2%
<b>Diastolic blood pressure</b>		
90 – 110 mmHg	316	63.2%
>110 mmHg	186	37.2%

Table 3: Clinical presentation during present pregnancy

Symptoms	Numbers
Pain in abdomen	286
Blurred vision	33
Convulsions	21
Headaches	320
Pedal oedema	198
Dizziness	269
Nausea/vomiting	212
No complaints	49

Table 4: Types of hypertensive disorders among the expectant mothers

Types of hypertensive disorder	Numbers
Gestational hypertension	300
Preeclampsia	64
Chronic hypertension	88
Preeclampsia with Chronic eclampsia	28
Eclampsia	20

Table 5: Maternal and Foetal outcomes

Maternal and foetal outcome	Numbers
Abruption	10
HELLP Syndrome	14
Preterm	197
IUGR	66
Low birth weight	104
IUFD	19
NICU admission	115
Neonatal death	6

## DISCUSSION

The major reason attributing for screening the hypertension during pregnancy is to decrease the rate of morbidity and mortality of the mother as well as child. The most common complications that occur during pregnancy when the mother is hypertensive is premature growth of the foetus, preterm deliveries, low birth weight, low APGAR scores, admission into NICU, foetal and neonatal death. In the current study, the most common age group of the expectant mothers with HTN was ranged to be around 21-30 years. Majority of the women in our study group belonged to rural background. This was corroborated by a study conducted by Patel et al who observed a high prevalence of HTN among the 18-22 years age group followed by 23-27 years.<sup>10</sup> The study by Parmar et al reported that HTN is more common among women less than 20 years of age and this finding is not similar to what we found in our study, while Gandhi et al reported a prevalence of HTN in more than 48% in the 21 - 25 years age group.<sup>11,12</sup> 58.5% of the pregnant mothers in our study were primi. In a study by Gandhi et al reported with 43.25% of the women were primiparous which is similar to our findings in the study and Parmar et al reported 55% to be primigravida.<sup>11,12</sup> In another study by Khosravi et al, primigravidae were reported to be more affected with HTN when compared to multigravidae.<sup>13</sup>

Many women in the present study (60.4%), carried the foetus to full term i.e., above 37 weeks of gestation, while 10.6% delivered before 34 weeks. The systolic pressure was reported to be 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>14</sup> Most of the patients in our study had gestational hypertension or pregnancy induced hypertension, while eclampsia was seen in only 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, high prevalence rate of eclampsia (43.24%) and preeclampsia (25.23%) was observed out of all the hypertensive disorders among pregnant women which was very high when compared to the results obtained from our study.<sup>15</sup> In certain studies, prevalence of preeclampsia and eclampsia was estimated to be between 7-18%.<sup>16-18</sup> and 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>19</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>20</sup> The most common outcome in the present study was preterm delivery in 39.6% of the cases. Low birth weight was resulted in 20.9%, IUGR in 13.4%, NICU admission in 23.4%. There were some reported mortality which 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>21-23</sup> Vats et al reported 6% intrauterine death, out of which 2 mothers also died.<sup>21</sup> Low birth weight was observed in 56.33% of the cases in a study by Sachan et al<sup>24</sup> while Gawde et al reported 25% of the neonates to be born with low birth weight.<sup>25</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%, *Eshetu* reported 12.4% and Prakash et al. reported 7.5%.<sup>26-28</sup>

## CONCLUSION

Pregnancy associated hypertensive disorder is mostly related with multiple complications in both the mother and baby. Modern days screening modalities usually help in early detection of the diseases and timely intervention of hypertensive disorders that are complicating pregnancy and provision of specialized systemic antenatal maternal care which could reduce the impacts of such complications in the near future.

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