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Research Article

Maternal and Perinatal Outcome in Hypertensive Disorders in Pregnancy at a Tertiary Care Hospital -

Devika Gupta^{1*}, Swarn Kanta² and Rita Thakur³

¹Department of Obstetrics and Gynaecology, MVJ Medical College and Research Hospital, Bengaluru, Karnataka, India

²Associate Professor, Department of Obstetrics and Gynaecology, Government Medical College, Jammu and Kashmir, India

³Department of Obstetrics and Gynaecology, Government Medical College, Jammu and Kashmir, India

***Address for Correspondence:** Devika Gupta, Department of Obstetrics and Gynaecology, MVJ Medical College and Research Hospital, Bengaluru, Karnataka, India, Tel: +91-941-922-0583; E-mail: drdevikagupta@gmail.com

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ABSTRACT

Background: Hypertensive Disorders In Pregnancy (HDP) remains a major global health issue not only because of the associated high adverse maternal outcomes but there is a close accompaniment of significant perinatal mortality and morbidity. Hypertensive disorders of pregnancy were reported in 6-8% of pregnancies.

Methodology: A non-randomised prospective observational study was conducted in the postgraduate department of obstetrics and gynaecology, SMGS hospital Jammu from November 2018 to October 2019 after getting approval from ethical committee. 300 pregnant females with hypertensive disorders of pregnancy were included in this study. Maternal and perinatal outcome in hypertensive disorders in pregnancy were studied.

Results and Conclusion: Majority of the females were primigravida with ≥ 37 weeks period of gestation. Out of 300 patients, 179 had gestational hypertension, 100 had preeclampsia and 21 had eclampsia. Hypertensive disorders of pregnancy were significantly associated with the low platelet count, deranged LFTs (SGOT, SGPT, S. bilirubin, S. LDH), deranged RFTs (S. creatinine, S. uric acid), deranged coagulation profile (PT/PTI) and albuminuria. 149 (49.7%) patients were induced. Caesarean was the mode of delivery in 57% cases. The complications both antepartum and postpartum, more were seen in eclamptic patients followed by preeclampsia followed by gestational hypertension and is statistically significant at $p < 0.01$. The foetal complications in eclamptic patients were more than the preeclamptic patients and the results are statistically significant at $p < 0.0001$.

Conclusion: Hypertensive disorders of pregnancy is major contributor of poor maternal and foetal outcome. Regular antenatal check-ups, early diagnosis, prompt multidisciplinary treatment, optimum timing of delivery reduces the incidence of complications and the maternal mortality. Early referral to and management of these cases at centres with advanced neonatal facilities will reduce the perinatal mortality.

Keywords: Hypertensive disorders in pregnancy; Eclampsia; Preeclampsia

INTRODUCTION

Hypertensive disorders of pregnancy were reported in 6-8% of pregnancies [1]. THE WORKING GROUP of National High Blood Pressure Education Programme (2000) i.e. NHBPEP classified hypertensive disorders of pregnancy into 4 types: Gestational Hypertension, Preeclampsia – eclampsia, Chronic Hypertension and preeclampsia superimposed on chronic hypertension [2]. Gestational hypertension is the new onset of hypertension after 20 weeks of gestation with BP $> 140/90$ with no proteinuria. Preeclampsia is defined as hypertension after 20 weeks of gestation with one or more of the following: proteinuria, maternal end-organ dysfunction (including renal, hepatic, haematological or neurological complications), or fetal growth restriction. Eclampsia is the development of convulsions in a pre-existing preeclampsia or it may appear unexpectedly in a patient with minimally elevated blood pressure and no proteinuria. Chronic hypertension with superimposed pre-eclampsia includes new onset proteinuria in hypertensive women but no proteinuria before 20 weeks of gestation. Risk of perinatal mortality and morbidity increases in patients of pre-eclampsia and eclampsia. About 70% of hypertensive disorders are due to gestational hypertension and preeclampsia where as 30% due to pre-existing or undiagnosed hypertension. The incidence ranges from 61% in primigravida and 39% in multigravida [3]. Maternal complications include HELLP (4.54%), acute renal failure (7.27%), postpartum haemorrhage (23.63%), Abruption placentae (7.27%), Pulmonary Oedema (0.90%), Cerebral Haemorrhage (0.7%), disseminated intravascular coagulation (2.72%), Thromboembolism and Maternal deaths (0.9%) [4]. Fetal complication includes Intrauterine growth restriction (21.81%), Low birth weight babies (33.63%), Pre term births (54.54%), Low Apgar score < 7 at 1 min (34%), low Apgar score < 7 at 5 min 14.9%, birth asphyxia 12.1%, Meconium aspiration syndrome (4.54%), Acute respiratory distress syndrome (22.72%), Intrauterine death (6.36%), Stillbirths (2.72%) [4].

METHODOLOGY

A non-randomised prospective observational study was

conducted in the department of obstetrics and gynaecology at SMGS Hospital, Jammu, from November 2018 to October 2019. Total of 300 patients with hypertensive disorders in pregnancy were included in the present study after satisfying the inclusion and exclusion criteria.

Inclusion criteria

Patients beyond 20 weeks pregnancy with pregnancy induced hypertension irrespective of age and parity.

Exclusion criteria

Chronic Hypertension, Chronic renal disease, Coarctation of aorta, Endocrine disorder (diabetes mellitus, pheochromocytoma, thyrotoxicosis), Connective tissue diseases (lupus Erythematosus) and patient refusal.

All the patients were subjected to the detailed history taking, general physical examination, thorough systemic and obstetric examination. The women were grouped into 3 main categories: Gestational hypertension, Preeclampsia and Eclampsia based on the clinical presentation at admission. BP was measured using the auscultatory method with standard caliberated, validated instrument. Two BP readings taken 4 hours apart with the value $\geq 140/90$ mmHg were considered as hypertension. Proteinuria of 300mg/dl (1+ dipstick) protein in a random urine sample was considered significant proteinuria. Onset of convulsions in a woman with pre-eclampsia that cannot be attributed to other causes was considered as Eclampsia. Patient with BP reading $\geq 140/90$ mmHg without significant proteinuria was considered as gestational hypertension. Maternal outcome was assessed by maternal age, parity, gestational age at the time of delivery, mode of delivery and complications like HELLP, preterm labour, impending Eclampsia, abruption placentae, DIC, APH, Renal complication, CNS complications and maternal mortality. Perinatal outcome was assessed in relation with birth status, birth weight, Apgar score at 1 min and at 5 min, MAS, admission to NICU and neonatal complications and perinatal mortality.

The data was analysed using software Microsoft Excel, SPSS version 23 for windows and OPENEPI app. Data was reported as mean

± standard deviation and proportions as deemed for quantitative and qualitative variables respectively. The qualitative data was compared using chi square test. A *p*-value of < 0.05 was considered as statistically significant.

RESULTS

The majority of the females, 242 (80.6%) were in the age group of 21-30 years with mean age of 26.34 years (26 years 4 months) ranging from 16 to 48 years (Table 1).

Maximum females were primigravida (154; 51.3%) followed by second gravida (93; 31%), only 5 (1.6%) patients were gravida 5 or more (Table 2).

Maximum number of patients were ≥ 37 weeks gestational age (213; 71%) followed by 34-36 weeks (57; 19%) and ≤ 34 weeks (30; 1%) (Table 3).

Most of the patients in this study had Gestational hypertension (179; 59.7%) followed by Preeclampsia (100; 33.3%) and only 21 (7%) patients had antepartum eclampsia (Table 4).

149 (49.7%) patients were induced and 100 (33.3%) patients went into spontaneous labour (Table 5).

Caesarean section was mode of delivery in 171 (57%) of patients and 123 (41%) patients had vaginal delivery and 6 (2%) patients had instrumental deliveries. The *p*-value is 0.001 (Table 6).

The most common indication of caesarean section was previous LSCS with a frequency of 51 (29.82%) followed by LSCS for AFD meconium in 37 (21.63%). In 24 (14.03%) patients, the indication was failed induction of labour and in 20 (11.69%) patients was LSCS for AFD bradycardia (Table 7).

The most common complications seen were preterm labour 35 (11.6%), imminent eclampsia 34 (11.3%), HELLP 32 (10.6%), PPH 31 (10.3%), ARF 12 (4%) abruptio placentae 10 (3.3%), DIC in 8 (2.6%) and PRES 4(1.3%). The complications were more seen in eclamptic patients 133%, followed by preeclampsia (116%) followed by gestational hypertension (15.6%) and is statistically significant at *p* < 0.01 (Figure 1).

The Apgar score < 7 at 1 minute was observed in 63 (21%) and ≥ 7 at 1 minute was seen in 265 (79%) newborns. The *p*-value is < 0.00001 (Table 8).

The Apgar score < 7 at 5 minutes was observed in 33 (13%) and ≥ 7 at 5 minutes was seen in 267 (87%) newborns. The *p*-value is < 0.00001 (Table 9).

The fetal complications in eclamptic patients were more than the preeclamptic patients and the result is statistically significant at *p* < 0.0001 (Figure 2).

Table 1: Frequency distribution according to age.

Age (years)	Frequency (No.)	Percent (%)
≤ 20	18	6
21-25	130	43.3
26-30	112	37.3
31-35	31	10.3
> 35	9	3
Total	300	100

Table 2: Frequency distribution according to parity.

Parity	No.	Percent (%)
Gravida 1	154	51.3%
Gravida 2	93	31%
Gravida 3	35	11.60%
Gravida 4	13	4.30%
Gravida 5 or more	5	1.60%

Table 3: Distribution of patients according to gestational age.

POG	No.	Percent (%)
Very preterm < 34 weeks	30	1
Preterm 34-36 weeks	57	19
Term ≥ 37 weeks	213	71

Table 4: Frequency distribution of patients according to type of hypertension.

Hypertension	Frequency	Percent (%)
Gestational hypertension	179	59.7
Preeclampsia	100	33.3
Antepartum eclampsia	21	7
Total	300	100

Table 5: Frequency distribution for the mode of onset of labor.

Mode of Onset of Labor	Frequency	Percent (%)
Spontaneous	100	33.3%
Induced	149	49.7%
EI. LSCS	51	17%
Total	300	100%

Table 6: Relationship of Mode of delivery and type of hypertension.

Hypertension	Mode of Delivery			Total (n = 300)
	G. HTN	Preeclampsia	Eclampsia	
Vaginal	83 (46.3%)	30 (30%)	10 (47.6%)	123 (41%)
LSCS	93 (51.9%)	67 (67%)	11 (52.3%)	171 (57%)
Instrumental	3 (1.6%)	3 (3%)	0	6 (2%)
Total	179 (100%)	100 (100%)	21 (100%)	300 (100%)

Table 7: Frequency distribution for the indication for caesarean.

Indication for Caesarean	Section	Frequency	Percent (%)
Previous LSCS		51	29.82
Fetal bradycardia		20	11.69
Failed Induction		24	14.03
Meconium		37	21.63
NPOL		17	9.94
Severe IUGR/ color doppler changes		11	6.4
CPD		5	2.92
Pprimi breech		2	1.16
Abruptio placentae		4	2.33
Total		171	100



DISCUSSION

Out of 300 pregnant females enrolled for the study, maximum number of females 242 (80.6%) were in age group of 21-30 years with mean age of 26.34 years ranging from 16 to 48 years (Table 1). In study conducted by Joshi P, et al. [5], majority of the patients were in the age group of 21-30 years [5]. Rajamma CK, et al. [6] also concluded that 73.4% women were in the age group 20-30 years. In our study, maximum females were primigravida (154; 51.3%) followed by second gravid (93; 31%) (Table 2). Study conducted by Rajamma CK, et al. [6] revealed that, PIH was more common among primigravida and constituted 43.15 % of the total cases. Study by Bhattacharya S [7] reported that 65.6% cases were primigravidas. Villar J, et al. [8] and Duckitt, et al. [9] also reported that primigravida was a risk factor for preeclampsia and eclampsia. In our study, Maximum number of patients were ≥ 37 Weeks gestational age (213; 71%) with mean \pm SD = 37.58 ± 2.54 followed by 34-36 weeks (57; 19%) and ≤ 34 weeks (30; 1%) (Table 3). Donimath KV, et al. [10] also concluded that 57% belonged to 37-40 weeks period of gestation [9]. Our study is comparable to the study conducted by Nawaz F, et al. [11] where the mean gestational age was 37.37 ± 2.25 weeks. Study by Gandhi MR, et al. [12] showed 60% patients had gestational age > 36 weeks which is in agreement to our study. In our study, most of the patients had gestational hypertension (170; 59.7%) followed by preeclampsia (100; 33.3%) and only 21 (7%) patients had antepartum eclampsia (Table 4). In study by Kolluru V, et al. [13] total hypertensive cases accounted for 234 of the total deliveries; out of which gestational hypertension were 63 (27.3%) cases, preeclampsia 146 (61.6%) and eclampsia 25 (11.1%) cases which is not in accordance with our study because of more number of booked cases in our study, which allowed early detection and adequate treatment in our tertiary care centre. In our study, the majority of the patients (149; 49.7%) were induced and 100 (33.3%) patients went into spontaneous labor. 51 (17%) El. LSCS was

Table 9: Relation of Apgar score at 5 min with hypertension.

Apgar Score	G. HTN	Preeclampsia	Eclampsia	Total
< 7	10 (5.5%)	19 (19%)	11 (52.3%)	39(13%)
≥ 7	169(94.4%)	81 (81%)	10 (47.6%)	261(87%)
	179	100	21	300

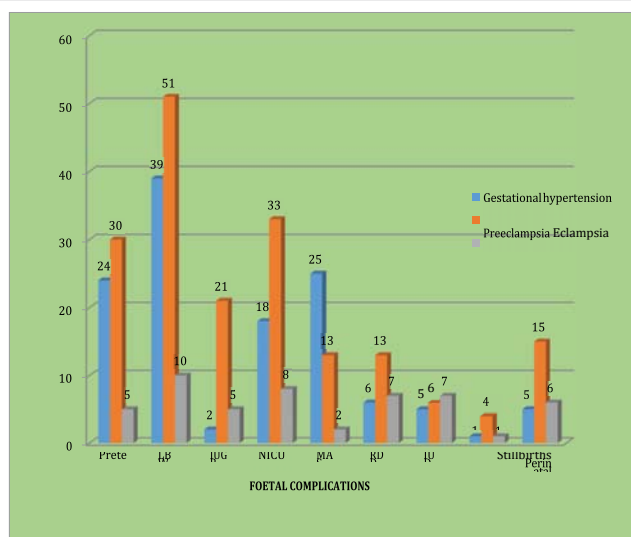


Figure 2: Bar chart showing no. of newborns with complications according to the type of hypertension.

done for previous LSCS (Table 5). In study by Rajamma CK, et al. [6], 137 (60%) majority of cases were induced for termination of pregnancy which is almost similar to our study. The rate of obstetric intervention has been found to be high in hypertensive disorders of pregnancy. Khaskheli MN, et al. [14] the primigravid women with gestational hypertension with labor induction were more frequent 78(56.5%) in comparison with Para 3 and above 35 (25.36%), majority of these women 71 (51.4%) were having gestational period between 35-38 weeks. The results are consistent to our study. In our study, Caesarean delivery was mode of delivery in 173 (57%) of patients and 123 (41%) patients had normal vaginal delivery and 6 (2%) patients had instrumental delivery (Table 6). Study by Hossain N, et al. [1] showed similar results i.e. Cesarean section was the main mode of delivery, with highest rate observed for eclampsia (52%). Similar results were seen by study conducted by Kolluru V, et al. [13], the total number of caesarean deliveries was 117 (50%). Study done by Uddin AW, et al. [15] showed similar results, in which the rate of caesarean section is about 50.8%. Tufnell, et al. [16] reported as high as 72% caesarean section rate. Caesarean section rates of 71% and 78% respectively were reported by Miguel M, et al. [17] and Dissanayake VH, et al. [18]. In our study, the most common indication of caesarean section was previous LSCS with a frequency of 51 (29.82%) followed by AFD meconium in 37 (21.63%). In 24 (14.03%) patients, the indication was failed induction of labour and in 20 (11.69%) patients the indication was AFD bradycardia. LSCS for NPOL was indication in 17 (9.94%) patients and LSCS for CPD was done in 5 (2.92%) patients. LSCS for severe IUGR/ color Doppler changes in 11 (6.4%), LSCS for primi breech was indication in 2 (1.16%) patients (Table 7). In study by Pillai S [4], showed previous caesarean section was the commonest indication for caesarean section as these patients presenting with severe preeclampsia or eclampsia were not given trial

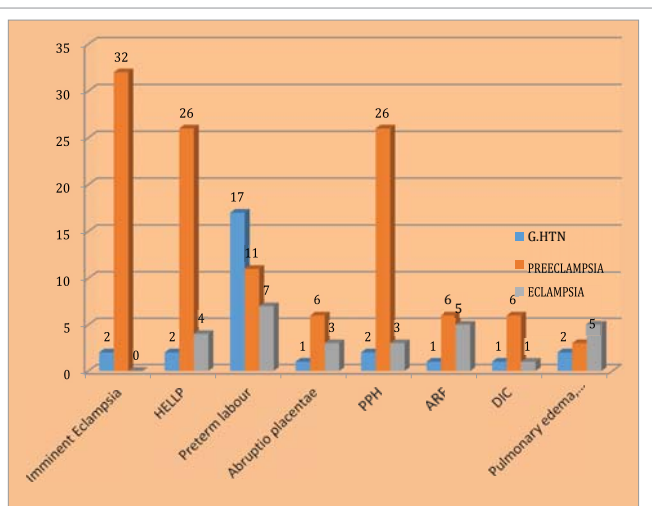


Figure 1: Bar chart showing no. of patients with maternal complications according to type of hypertension.

Table 8: Relationship of Apgar score at 1 min with hypertension.

APGAR Score	G. HTN	Preeclampsia	Eclampsia	Total
< 7	13 (7.2%)	36 (36%)	15(71.4%)	63 (21%)
≥ 7	166 (92.7%)	64 (64%)	6 (28.5)	237(79%)
Total	179 (100%)	100 (100%)	21 (100%)	300



of labor and repeat caesarean was done after stabilising the patient. Failed induction was indication in 14.54% cases, LSCS for non-reassuring fetal heart status was indication in 10.90% cases. LSCS for color Doppler changes, IUGR and oligohydramnios was indication in 10.90% cases and abruption was indication in 3.63% cases. These results are almost consistent with our study. In our study, most common complications seen were Imminent Eclampsia seen in 34 (11.3%) patients, followed by preterm labor in 35 (11.6%), followed by HELLP syndrome in 32 (10.6%) patients. Abruptio placentae was seen in 6 (2%) patients, PPH in 31 (10.3%) followed by DIC in 8 (2.6%) patients. ARF was seen in 6 (2%) patients, hematoma in 2 (0.06%), PRES in 3 (1%) and pulmonary edema in 2 (0.06%) patients. No maternal mortality was noted. In present study we observed that the rate of maternal complications during pregnancy increased as the severity of hypertension increased. The complication rate was seen to be higher in the cases of severe preeclampsia and eclampsia. The *p*-value is 0.0001 (Figure 1). In study by Pillai SS [4], out of the 110 patients, HELLP syndrome was noted in 23.63% cases. PPH was seen in 23.63% cases. Abruptio was seen in 7.27% cases. 2.72% cases with DIC and renal dysfunction in 7.27% cases. Pulmonary edema was seen in 0.90% cases. There was no maternal mortality. The complications were comparatively less in our study because of early case detection and management of the patient. Study by Rajamma CK, et al. [6] showed the following results: The most common complication in this study was HELLP syndrome 9% cases. The other complication were abruptio placentae in 4.2% cases, postpartum eclampsia 2.5% cases, DIC in 3 cases, PPH in 4 cases, and ARF in 6 cases. These findings are in good agreement to our study. Thus, patients of pre-eclampsia and eclampsia had more dreadful complications as compared to gestational hypertension. In our study, Apgar score < 7 at 1 minute was observed in 63 (21%) and ≥ 7 at 1 minute was seen in 265 (79%) newborns. The *p*-value is < 0.00001. In our study, Apgar score < 7 at 5 minute was observed in 33 (13%) and ≥ 7 at 5 minute was seen in 267 (87%) newborns. The *p*-value is < 0.00001. The result is highly significant at *p* < .01 (Tables 8,9). Study by Adu-Bonsaffoh K, et al. [19] showed APGAR scores, 34.0% and 14.9% of babies had scores of less than 7 at 1 minute and 5 minutes respectively in severe preeclampsia and eclampsia¹⁹. The results were consistent with our study. Study by Rajamma CK, [6] showed that 48 (20%) out of 213 in this study had the Apgar score < 5 at 1 min and 24 (11.2%) out of 213 babies had Apgar score < 7 AT 5 min. These results are consistent to our study. The most common complication seen in our study was low birth weight (100; 30%), followed by preterm delivery (59; 19.6%) which is more in preeclampsia followed by eclampsia. NICU admissions (59; 19.6%) are more in patients with eclampsia followed by preeclampsia. The complication Meconium aspiration syndrome (40; 13.3%) was seen more in patients with preeclampsia than eclampsia due to more induction of delivery time. IUGR (28; 9.3%), RDS (26; 8.6%), IUD (18; 6%), Stillbirths (6; 2%) and perinatal deaths (26; 8.6%) are seen more in patients with eclampsia as compared to the preeclampsia. The fetal complications in eclamptic patients were more than the preeclamptic patients and the results are statistically significant at *p* < 0.0001 (Figure 2). In study by Pillai SS [4], the number of cases of preterm delivery were quite high at 65% due to the premature induction of labor in cases of severe preeclampsia and eclampsia. NICU admission was needed for 43 babies (39.09%), 25 (22.72%) had respiratory distress syndrome. IUGR was seen in 24 (21.81%), MAS in 5 (4.54%), IUFD in 7 (6.37%), stillbirths in 3 (2.72%), LBW in 33.63%. In present study, there were

10 (9.09%) neonatal deaths. In study by Nawaz F, et al. [11] showed that the rate of Low Birth Weight (LBW) (68.4%), Intra uterine growth retardation (IUGR) (27.5%), need to Neonatal Intensive Care Unit (NICU) (17.6%), need for resuscitation (21.6%), and neonatal Apgar (23.5%) were higher in the severe preeclampsia group as compared to the other two groups. In study by Adu-Bonsaffoh K, et al. [19] adverse perinatal outcomes determined include the following: 91 (24.7%) neonates were admitted to the Neonatal Intensive Care Unit, 56 (15.2%) had neonatal respiratory distress/asphyxia with 14 (3.8%) requiring ventilatory support and 80 (21.7%) were delivered preterm. Also, stillbirth, early neonatal death, intrauterine growth restriction and low birth weight occurred in 25 (6.8%), 14 (3.8%), 23 (6.1%) and 91 (24.7%) respectively with a perinatal mortality rate of 106 per 1000 births. Most of the adverse perinatal outcomes were significantly more common in those with preeclampsia compared to other hypertensive disorders. The differences from the other studies of India can be explained because of more number of booked cases in our study, which allowed early detection and adequate treatment in our tertiary care centre resulting in less number of fetal complications.

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