WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 11, Issue 10, 978-988. Research Article ISSN 2277– 7105

A STUDY TO ASSESS PRESCRIBING PATTERN OF ANTI-HYPERTENSIVES IN PREGNANCY INDUCED HYPERTENSION AND EFFECT OF PIH ON FOETO-MATERNAL OUTCOME AT A TERTIARY CARE TEACHING HOSPITAL, DAVANGERE

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Article Received on
28 May 2022,

Revised on 18 June 2022,
Accepted on 08 July 2022

DOI: 10.20959/wjpr202210-24850

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ABSTRACT

Background: Pregnancy induced hypertension has been recognized as clinical entities since the times of Hippocrates with increasing trends of morbidity and mortality. PIH is also considered with the increased risk of maternal and fetal outcomes. Evaluation of drug prescribing trends of antihypertensives and its diverse maternal fetal outcome is vital. **Aim:** To analyse the prescribing pattern of antihypertensives in PIH patients and the possible feto-maternal outcomes imposed due to PIH. **Methodology:** A prospective observational study was carried out for a period of 6 months in inpatient Obstetrics & Gynecology department of Chigateri District Hospital, Davangere. **Results:** A total of 140 patients were enrolled. Out of which 37 patients (26.4%) were Gestational hypertension, 84(60%) were Preeclampsia, 19(13.6%) were Eclampsia. Most of the patients belongs to the age group of 18-22 years (55.7%) followed by 23-26 years (30%). Among the 140 patients, 79 patients (56.4%) were Primigravidas and remaining 61 patients (43.6%) were Multigravidas. The pattern of drug prescription in hypertension during pregnancy shows that Labetalol (65.1%) was the most utilized Monotherapy followed by Nefidipine (24.4%). Among Combination therapy, 34 patients (63%) were treated with Labetalol+Nefidipine. Most common Maternal and Feotal outcome in our study was Preterm labour(56.4%) and low birth weight (38%) respectively. **Conclusion:** The present study confirms that monotherapy with Labetalol is effective and safer drug for use with adequate control on Blood pressure in PIH. Proper ANC with early diagnosis of PIH could significantly reduce its fetal and maternal outcomes in

patients.

KEYWORDS: *Pregnancy induced hypertension, Gestational hypertension, Preeclampsia, Eclamsspsia.*

INTRODUCTION

Hypertension is the most common medical problem encountered in pregnancy and that remains as an important cause of maternal and foetal morbidity and mortality. It affects almost 10% of all pregnancy.[1] Hypertension in pregnancy is a systolic blood pressure ≥140mmHg or diastolic BP ≥ 90 mmHg or both. Both systolic and diastolic BP rises are important in the identification of pregnancy induced hypertension.[2] Pregnancy induced hypertension is the hypertension that occurs after 20th week of gestation in women with previously normal blood pressure. It includes,

- Gestational hypertension
- Preeclampsia
- Eclampsia[2]

Gestational hypertension that begins after 20th week of gestation with an elevated BP of >140/90 mmHg without proteinuria, with normotensive pre-pregnancy level.

Preeclampsia results in hypertension (140/90 mmHg) and proteinuria (>0.3 g/24 hr) after 20th week of gestation.

Eclampsia results in convulsions when followed by preeclampsia.[3]

Pregnancy when complicated with these condition leads to several foetal and maternal outcomes like prematurity, low birth weight(LBW), intra uterine growth restriction (IUGR), neonatal intensive care unit (NICU) admission, intra uterine foetal death (IUFD), neonatal death and preterm labour, abruption placenta ,post partum haemorrhage, HELLP syndrome, intensive care unit (ICU) admission , maternal death respectively.[3,4] Treating hypertension not only decreases the frequency of disease but also both rate and chances of both maternal neonatal complication. Here comes the salient role of antihypertensives, used to prevent or treat severe hypertension, prolong pregnancy as long as safely possible there by maximizing the gestational age of the foetus.[1]

NICE guidelines amended 2019, affirm labetalol to treat gestational hypertension followed by

nefidipine in whom labetalol is not suitable, and methyldopa if labetalol or nefidipine are not suitable. Offer labetalol to treat hypertension in pregnant women with preeclampsia. Offer nefidipine in whom labetalol is not suitable, and methyldopa if labetalol or nefidipine are not suitable.[5] While in eclampsia, Magnesium sulphate is the drug of choice. Inspite of the anticonvulsants regimen if the blood pressure is more than 160/110 mmhg antihypertensives drugs should be administered. First lines of antihypertensive drugs are labetalol and hydralazine.[6]

METHODOLOGY

Study site, Design and Duration: This prospective observational study was conducted in the obstetrics department of Chigateri District Hospital, Davangere (Tertiary care teaching hospital) for a period of 6 months among 140 PIH patients.

Study criteria: The study was carried out by considering the following inclusion and exclusion criteria.

Inclusion criteria

- Patients with > 20 weeks of gestation period (BP ≥140/90 mmHg with or without proteinuria).
- Patients of age > 18 years.
- Only inpatients of obstetrics department.

Exclusion criteria

- Chronic hypertension patients (BP ≥140/90 mmHg before pregnancy or diagnosed before 20 weeks).
- Patients with K/C/O epilepsy.

Study procedure: Once Institutional Ethical Committee clearance was procured patients were enrolled based on inclusion and exclusion criteria. All the relevant data was entered into a well designed data collection form. The collected data were analyzed for the most commonly prescribed anti-hypertensive with its utilization pattern and also to investigate the possible maternal and foetal outcomes. Data was analyzed using Microsoft Excel and results were presented in graphs and tables.

RESULTS

Result 1: Incidence of Pregnancy Induced Hypertension [PIH]

There were 37 cases of gestational hypertension which is accounted for 26.4% of the total PIH patients.84 women had preeclampsia, constituting 60% and eclampsia 19 (13.6%) of the total PIH patients**.**

Table 1: Incidence of Pregnancy Induced Hypertension [PIH].

Types of PIH	No of patients (n)	Percentage (%)
Gestational hypertension	37	26.4
Preeclampsia	84	60
Eclampsia	19	13.6
Total (N)	140	100%

Result 2: Distribution of PIH patients according to age

Total distribution of patients with respect to age group, the highest was found to be in the age group of 18-22 years (55.7%) and least was above 30 years age group (3.6%).

Table 2: Distribution of PIH patients according to age.

Age (in years)	Gestational hypertension	Preeclampsia	Eclampsia	No of patients(n)	Percentage (%)
18-22	22	45	11	78	55.7
23-26	11	26	5	42	30
27-30	4	9	2	15	10.7
>30	0	4	1	5	3.6
Total (N)	37	84	19	140	100%

Result 3: Gravidity status of PIH patients

In the study, the incidence of PIH was highest among primigravidae. Out of 140 patients, 79 were primigravidas (56.4%) and 61 were multigravidas (43.6%).

Table 3: Gravidity status of PIH patients.

Gravida	Gestational hypertension	Preeclampsia	Eclampsia	No of patients(n)	rcentage(%)
Primigravida	19	48	12	79	56.4
Multigravida	18	36	7	61	43.6
Total (N)	37	84	19	140	100%

Result 4: Parity distribution of PIH patients

The analysis of parity distribution revealed that 81 patients (57.9%) belonged to nulliparous group, 37 patients (26.4%) in primiparous group and 22 patients (15.7%) belonged to multiparous group.

Table 4: Parity distribution of PIH patients.

Parity	Gestational hypertension	Preeclampsia	Eclampsia	No of patients(n)	rcentage(%)
Nulliparous	19	48	14	81	57.9
Primiparous	12	22	3	37	26.4
Multiparous	4	14	3	22	15.7
Total (N)	37	84	19	140	100%

Result 5: Distribution of PIH patients as per their Blood Pressure

Patients with systolic blood pressure (SBP) in the range of 140/160 mmHg or diastolic blood pressure (DBP) in the range of 90-100 mmHg were found to be highest with the total of 93 (66.4%) and 90 (64.3%) respectively whereas the least being with SBP >181 mmHg or DBP >111 mmHg in 11 (7.9%) and 14 (10%) patients respectively.

Table 5: Systolic blood pressure.

SystolicBP(in mmHg)	Gestational hypertension	Preeclampsia	Eclampsia	No of patients (n)	rcentage(%)
140-160	31	57	5	93	66.4
160-180	6	22	8	36	25.7
>181	0	5	6	11	7.9
Total (N)	37	84	19	140	100%

Table 5: Diastolic blood pressure.

DiastolicBP (in mmHg)	Gestational hypertension	Preeclampsia	Eclampsia	No of patients(n)	Percentage (%)
90 – 100	32	54	4	90	64.3
101-110	5	22	9	36	25.7
>111	0	8	6	14	10
Total (N)	37	84	19	140	100%

Result 6: Distribution of PIH patient as per medication received

In the study, antihypertensives of total 140(64.8%) and anticonvulsants with 76(35.2%) was prescribed for PIH patients.

Table 6: Distribution of PIH patient as per medication received.

Medication	Gestational hypertension	Preeclampsia	Eclampsia	No of patients(n)	Percentage (%)
Anti-hypertensives	37	84	19	140	64.8
anticonvulsants	12	47	17	76	35.2
Total	49	131	36	N=216	100%

Result 7: Utilization pattern of antihypertensive drugs in pregnancy

According to this study, prescribing pattern of drug therapy was highest among patients with monotherapy, 86 (61.4%) and least was found in patients with combination therapy, 54 (38.6%).

Table 7: Utilization pattern of antihypertensive drugs in pregnancy.

Drug therapy	Gestational hypertension	Preeclampsia	Eclampsia	No of patients(n)	Percentage (%)
Monotherapy	26	48	12	86	61.4
Combination therapy	11	36	7	54	38.6
Total(N)	37	84	19	140	100%

Result 8: Pattern of use of antihypertensive drugs in patients treated withmonotherapy

Patients who were treated with single antihypertensive drug in which 56 (65.1%) of Beta blocker class shown the highest followed by CCB with 21 (24.4%) and the least under centrally acting agent 9 (10.5%).

Table 8: Pattern of use of antihypertensive drugs in patients treated withmonotherapy.

Drugs in Monotherapy	Gestational hypertension	Preeclampsia	Eclampsia	No of patients(n)	Percentage (%)
Beta blocker	18	29	9	56	65.1
CCB	5	13	3	21	24.4
Centrally acting agent	3	5	1	9	10.5
Total(N)	26	47	13	86	100%

Result 9: Pattern of use of antihypertensive drugs in patients treated with combination therapy

Patients who were treated with antihypertensive medications shown CCB + Beta blocker combination 34 (63%) as the most commonly prescribed one followed by beta blocker+Centrally acting agent 8 (14.8%), while the least one in combination with CCB and centrally acting agent 5 (9.2%).

Table 9: Pattern of use of antihypertensive drugs in patients treated with combination therapy.

Drugs in Combinationtherapy	Gestational hypertension	Preeclampsia	Eclampsia	No of patients(n)	rcentage(%)
CCB+Beta blocker	5	24	5	34	63
CCB+Centrally acting agent	1	3	1	5	9.2

Beta blocker +centrally actingagent	3	5	0	8	14.8
CCB+Diuretic	2	4	1	7	13
Total (N)	11	36	7	54	100%

Result 10: Name of antihypertensives used and their frequency

Labetalol 65 (45.2%) was the most commonest prescribed antihypertensives in both monotherapy and combination which was followed by nefidipine 51 (35%), methyldopa 22 (15%) and furosemide 7 (4.8%) respectively.

Table 10: Name of antihypertensives used and their frequency.

Name of Antihypertensives	Gestational hypertension	Pre-eclampsia	Eclampsia	No of patients (n)	Category	Percentage (%)
Labetalol	14	45	7	66	C	45.2
Nefidipine	8	38	5	51	C	35
Methyldopa	7	13	2	22	B	15
Furosemide	2	4	1	7	C	4.8
Total (N)	31	100	15	146		100%

Result 11: Maternal outcome in pregnancy induced hypertension

The present study, preterm labour was the commonest maternal outcome affecting 79 (56.4%) out of total outcomes observed. HELLP syndrome was the next common complication affecting 39 (27.9%) of the total. Whereas, abruptio placentae and PPH was found 12 (8.6%) and 10 (7.1%) respectively.

Table 11: Maternal outcome in pregnancy induced hypertension.

Maternal outcome	Gestational Hypertension	Preeclampsia	Eclampsia	No of patients(n)	centage(%)
Preterm	25	40	14	79	56.4
PPH	0	6	4	10	7.1
Abruptio placentae	0	9	3	12	8.6
HELLP Syndrome	0	33	6	39	27.9
Total (N)	25	88	27	140	100%

Result 12: Fetal outcome in pregnancy induced hypertension

In the study of 140 PIH patients, out of 255 fetal outcomes, LBW 95 (38%) comprises the highest. Preterm 79 (31.6%) marked secondly and the least was neonatal death 1 (0.4%).

Table 12: Fetal outcome in pregnancy induced hypertension.

Fetal outcomes	Gestational Hypertension	Preeclampsia	Eclampsia	No of patients(n)	Percentage (%)
Preterm	25	40	14	79	31.6
LBW	23	56	16	95	38
IUFD	1	5	0	6	2.4
IUGR	3	7	4	14	5.6
NICU	14	27	12	53	21.2
Neonatal death	0	1	0	1	0.4
Others	0	2	0	2	0.8
Total (N)	66	138	46	250	100%

DISCUSSION

Pregnancy induced hypertension, a major worldwide health problem resulting in an increased risk of feto-maternal morbidity and mortality. Thus we can reduce the morbidity and mortality by prevention and proper management of these outcomes. Hence it necessities the need to study the possible maternal and foetal outcome in PIH patients and to assess the ideal therapy of anti-hypertensives in terms of its usage pattern, to see if the current usage is rational, effective, tolerated and in accordance with the current guidelines for treatment of hypertension.

The incidence of hypertension during pregnancy varies as gestational hypertension (n=37,26.4%), preeclampsia (n=84,66%) and eclampsia (n=19,13.6%) which is comparable with the study conducted by Sajith M *et al*,[1] were the incidence of PIH was in the row of preeclampsia, gestational hypertension and eclampsia conducted at Pune.

Age has an important influence on the incidence of PIH. In our study, highest occurrence of hypertension happens among those aged 18-22 years (n=78,55.7%). The probable reason for this could be, majority of conception takes place in this age group in our country. A similar observation was concluded in the study conducted by Sajith M *et al*,[1] at Pune.

Our study shows out of 140 patients 79 was primigravidas (n=79,56.4%5) and 61 were multigravidas (n=61,43.6%). The same pattern was shown in gestational hypertension, preeclampsia, eclampsia of the count 19, 48, 12 for Primigravida and 18, 36, 7 for multigravida respectively which was similar to the study conducted at Pune by Sajith M*et al.*[1]In our study, PIH was more prevalent among Nulliparous (n=81, 57.9%) as compared to primiparous(n=37, 26.4%) and multiparous(n=22, 15.7%). Similar findings was reported by Baria H*et al*[7] in their study conducted at Valsad, Gujarat, India.

In this study, the whole of percentage as such was higher in the range of systolic BP 140-160 mmHg (n=93, 66.4%) and the least being in >181 mmHg (n=11, 7.9%). Now considering the severity gestational hypertension was concentrated more within 140-160 mmHg whereas in the case of preeclampsia much more number was found both in systolic BP 160-180 mmHg and >180 mmHg when compared to gestational hypertension. Now in case of eclampsia the scenario is seen different as the number of patients was more in systolic BP 160-180 mmHg and >180 mmHg range. Now taking into account of diastolic BP 90-100 mmHg (n=90,64.3%) had the highest number of patients and the least being in >111 mmHg (n=14,10%). A similar pattern was observed in the study conducted at Vijaypur, India by Anwar A *et al.*[8]

In our study among PIH mother 140(64.8%) received only antihypertensive medication while 76(35.2%) of patients received both anticonvulsant and antihypertensive medication during present pregnancy. A similar pattern was drawn out by Baria H *et al*[7] in their study conducted at Valsad, Gujarat, India.A majority of patients 86(61.4%) in 140 were on monotherapy whereas 54(38.6%) were on combination therapy in accordance to the study conducted by Divyashree N *et al*[9] in Mandya, Karnataka. In contrast to this studies from Sajith M *et al*[1] showed that combination utilization pattern of antihypertensive drugs was prescribed more frequently than monotherapy. This shows that utilization pattern differs from hospitals, prescribers and among countries also.

Beta blocker (n=56, 65.1%) was the drug predominantly used as an antihypertensive agent in our study. A similar prescribing pattern of monotherapy was studied by Anwar A *et al*[8] and Kanafileskookalayeh S *et al.*[10] Since beta blocker was the drug of choice antihypertensive, CCB was added when BP was not controlled with labetalol (n=34,63%) resulting both as the commonest prescribing pattern of combination therapy in our study. Similarly in a study by Pillai S S*et al.*[11] Second most prescribed in our study was found to be beta blocker+Centrally acting agent(n=8,14.8%) in opposition to the study by Pillai S S *et al*[11] where CCB+Centrally acting agent was secondary due to the reason Nefidipine being the most common drug of choice in their study. In the current research, prescribing pattern of antihypertensive was based on the efficacy and safety of people in pregnancy. Accordingly labetalol(n=66,45.2%) and nefidipine(n=51,35%) were frequently administered to the patients which is similar to Kanafileskookalayeh S *et al*[10] conducted at Coimbatore, India and contrast in Divyashree N *et al*,[9] nefidipine being the highest conducted at tertiary care

hospital, Karnataka.

Maternal outcome: In the present study, incidence of preterm labour was 79(56.4%) which was similar to Madkar S C *et al*[12] who also reported highest maternal outcome as preterm labour. Fetal outcome: in our study, the overall incidence of fetal outcome falls under LBW(n=95,38%) but when considering gestational hypertension individually, preterm shows the highest rather than LBW in comparison to Pradhan S *et al.*[13] whereas preeclampsia and eclampsia shown rapport with Cooly V *et al*[13] both highlighting LBW as the commonest among other fetal outcome.

CONCLUSION

PIH is one of the commonest health problem women's encountered during pregnancy. We noted that PIH is more spotted in younger age groups and Nulliparous mother. Predominance of Systolic blood pressure was equipped in 140-160 mmHg and Diastolic blood pressure in 90-100 mmHg. Our study mainly focused on the prescribing pattern of various Anti-hypertensives in pregnancy with respect to Gestational HTN, Preeclampsia and Eclampsia, the 3 key types of PIH. The incidence of monotherapy with utility of labetalol drug was high. We also studied the various maternal and fetal outcomes as a consequence with PIH disease. The analogy between various maternal outcomes thus ended up with preterm labour as the highest outcome. Whereas LBW as the fetal one. This indicates that timely necessary investigations should be done in patients & closely monitored so that untowardly outcomes can be prevented. Patient counseling can make a good impact to prevent the happening of outcomes in current as well as subsequent conception.

ACKNOWLEDGEMENT

We authors want to thank the staff of SCS College of Pharmacy, Harapanahalli for their support during the study.

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