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Evaluation of Antihypertensive Therapy of Pregnancy Induced Hypertensive (Pih) Patients in Mahila Chiktsalaya, Jaipur

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ABSTRACT:

This study was carried out for providing the better therapy to the pregnancy induced hypertensive (PIH) patients in India by evaluation of utilization patterns of antihypertensive agents, blood pressure (BP) control and safety profile of the drugs used among pregnancy induced hypertensive patients in the Mahilya Chikitsalaya Jaipur, a tertiary obstetrical referral centre in Jaipur. The incidences and characteristics of pre-eclampsia (PE) and eclampsia were also studied during this study. In this study period 350 prescriptions of PIH patients were analysed carefully to evaluate utilization pattern of different drugs. Patients who have suffered by (PIH) with blood pressure range of above 135-145/90-95mmHg were selected and divided in two groups. First group of patients were administered with the combination of Lebetalol and Nicardipine while Methyldopa and Nifedipine were administered to second group patients. Every 30 minutes of after 4hrs blood pressure monitored and compliance about disease and drugs from patients were collected and recorded. Finally statistically analyzed safety and does. The incidences and types of PE between October 2010 and April 2011 were derived from the pregnancy disease databases. The characteristics of women with PE in relation to the general obstetric population were analysed on the age, race, parity, types of delivery, gestation at delivery and mortality. A total of 350 out of 3016 deliveries were complicated by PIH during the study period. The incidence rate for mild or unspecified PE was 110, while those for moderate PE, severe and eclampsia were 98 cases, 89cases and 53cases, respectively.

Key words: Hypertension, Pregnancy, Pre-eclampsia, Eclampsia

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Introduction:

Generally PIH is defined by systolic blood pressure > 140mmHg or diastolic blood pressure >90mmHg 4 hours or more apart intervals. However a rise in systolic blood pressure of 20-30mmHg or 10-15mmHg of diastolic blood pressure or both from pre pregnant baseline value on two or more occasions four hours or more apart is also diagnostic [1,2,3]. Worldwide, hypertension represents one of the most common complications of pregnancy. Hypertension disorder continue to occur globally, complicating 5-20% of pregnancies. Its incidence varies from 2 to 8% of pregnancies in developed countries reaching 10% or more in developing countries [4, 5]. It is associated with high rates of perinatal morbidity and mortality and is the third most common cause of maternal death worldwide. Pre-eclampsia decreases utero-placental perfusion, which puts the foetus at high risk for problems such as preterm birth and perinatal mortality. It may also lead to maternal hypertension and multisystemic organ dysfunction and damage, including eclampsia [6, 7]. This study was aimed at encouraging the health care professionals to provide a better therapy by continuous monitoring the therapy, reporting of unusual and known effective management of such conditions. The primary objectives of this project were to evaluate and compare utilization of antihypertensive therapies and to assess BP control among PIH patients. The incidences and characteristics of pre-eclampsia and eclampsia in Mahila Chikitsalaya Swai Man Singh Hospital (SMS) Jaipur, was also studied from the period of Oct 1st 2010 to April 30th 2011.

METHODS

1. Designing and preparation of Performa.
2. Identification of patient (who have BP>140/95 mmHg)
3. Selection of patients (a) Inclusion criteria (b) Exclusion criteria
4. Data collection of clinical lab. Test, Blood, urine samples …..etc.
5. Analysis of the final data.

1. **Designing and preparation of Performa:** The Performa we designed for Hypertensive patient which contain patient demographic data, present complaints, past history, allergy, lab test, diagnosis, therapeutic management, ADR etc. We should counselling the entire Hypertensive patient and get the details for completion of Performa.

2. **Identification of patient:** The criteria for entry were a systolic BP of > 140 mmHg and or diastolic BP of > 95 mmHg sustained over 20 min informed consent is obtained for all patients. Supine BP readings were taken with standard sphygmomanometer.

3. **Selection of patient:**
   (a) Inclusion criteria: Subjects must fulfil all of the following criteria to be considered for included in this study.
   - Subjects will provide written informed consent.
   - Negative results of urine & blood test.
   - No abnormalities found in laboratory parameters.
   - New as well as follow-up cases of female outpatients visiting the Mahila Chikitsalaya (Gynaecology and Obestetrician department)
   - Pregnant patients suffering from pregnancy induced hypertension.
   - Primigravida and multigravida pregnant women.
   - Pregnant women also have past history of hypertension and gestational hypertension

   b) Exclusion criteria: The subject well is exuded based on the following criteria.
   - Patient have excluded by predisposing disease like hypertension with diabetic mellitus, hypertension with bronchial asthma, hypertension with tuberculosis, thyroid diseases etc. Subjects incapable of understanding the informed consent
   - Subject who have been on an abnormal diet during the do study period
   - Patients with other co-morbid conditions.

Selected patients are divided in to two groups. Lebetalol with Nicardipine administered for first group of patient and second group of patient treated with Methyldopa and Nifedipine by orally. BP and pulse rate were monitored clinically during the study period of 8 hrs. All new symptoms and signs with in 12 hrs of treatment were recorded.

4. **Data collection:** During this procedure demographic data, standard physical examination with vital signs, clinical lab test on blood and urine samples, ECG and chest X-ray will be done.

Table 1: Prescribing pattern of the drugs in the hospital

Prescribing pattern of the drugs in the hospital			
Single drugs	**Combinations**		
	Two drugs	**Three drugs**	**More than three drugs**
Methyldopa	Methyldopa, Labetalol	Nicardipine, Methyldopa	Hydralazine Nifedipine
Nicardipine	Nicardipine, Methyldopa	-	Magnesium sulphate,
Labetalol	Labetalol Nicardipine	-	-
Nifedipine			-

Table 2: Active principle used in the hospital to treat PIH

Name of drugs	Total prescription	Monotherapy	Polytherapy
Methyldopa	91	8	83
Labetalol	69	4	65
Nicardipine	62	6	56
Nifedipine	58	6	52
Hydralazine	11	0	11
Sodium Nitropruside	6	0	6
Magnesium Sulphate	53	0	53

RESULTS AND DISCUSSION

This study showed the type of prescription pattern used in the hospital which is shown in table 1. Patients with PIH were prescribed a total of 7 antihypertensive medications as shown in table 2, and other neutraceuticals, generally methyldopa, labetalol, nicardipine, nefidipine were prescribed among the PIH patient in the hospital. The most commonly prescribed antihypertensive agent were Adrenergic receptor alpha-2 agonists: Methyldopa, Mixed Alpha + Beta blockers: Labetalol, Nicardipine, nefidipine, hydralazine were also prescribed.

Table 3: Drugs prescribed according to gestational age and B.P. range

Gestational age (weeks)	Range of blood pressure (mm/Hg)	Prescribed drugs
At 20 week	S/D 130-90	Methyldopa
At <24 week	S/D 140-96	Methyldopa, labetalol
28-33 week	S/D150-100	Methyldopa, nicardipine, labetalol
34-36 week	S/D160-110	Hydralazine, nifedipine, methyldopa, nicardipine
>37 week	S180-200,D120-130	Magnesium sulphate, Methyldopa, Labetalol, Nifedipine, Nicardipine

Table 4: BP range of the PIH patients before the administration of the combination of drugs (40 patients)

BP range	BP reading (mmHg) S/D	No. patient	Percentage (%)
Mild	135-145/90-95	10	25%
Moderate	146-160/96-100	18	45%
Severe	161-175/101-105	12	30%

Hydralazine and sodium nitropruside were given by intravascular route, only in severe cases. Magnesium sulphate was given to those patients, which were suffering from seizures or eclampsia. In monotherapy mostly methyldopa was prescribed and after that labetalol and nicardipine were prescribed to the pregnancy induced hypertensive patients. Observations for the kind of drugs prescribed at the different stages of gestational period is shown in table 3. At gestation age of 20 weeks and blood pressure S/D 130-90, methyldopa and age below 24 weeks on blood pressure S/D140-96 methyldopa and labetalol were the therapeutic agent of choice. Gestation week of 28-33 and blood pressure of S/D 150-100 methyldopa, nicardipine and labetalol were given to the PIH patients. If B.P. reaches up to S/D 160-110 that is severe condition at gestational age of 34-36 weeks then hydralazine (i.v) was given and nefidipine, methyldopa, nicardipine were continued. Blood pressure reaches S/D 180-200/120-130 at gestation week 37 then patients suffering from convulsion and high risk of maternal death, to control that condition magnesium sulphate was prescribed and cesarean delivery was performed. Mostly this types of delivery were found to be pre-term delivery. Methyldopa, labetalol, nefidipine and nicardipine were continued.

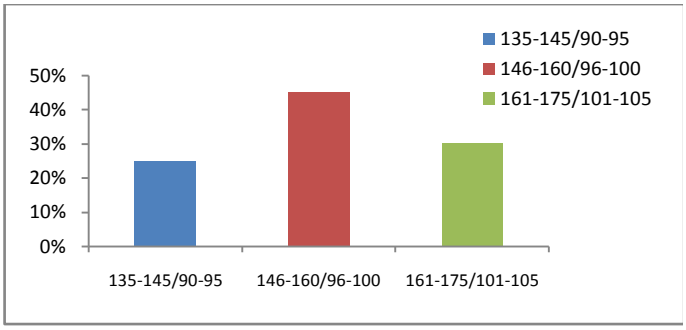

Figure 1: For the efficacy of the combination of drugs before the administrations of combination of drugs

Table 5: After the administration of combination of drug (Labetalol+Nicardipine) (20 patients)

Combinations	BP reading (mmHg) S/D	No. patients	Percentage (%)
Labetalol + Nicardipine	110-115/85-90	7	35%
	116-120/91-95	6	30%
	121-125/96-100	5	25%
	126-130/101-105	2	10%

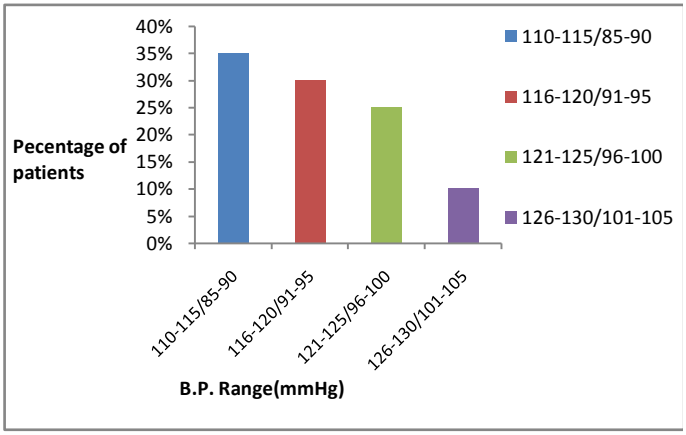

Figure 2: After the administration of combination of drug (Labetalol+Nicardipine)

Table 6: After the administration of combination of drugs (Methyldopa+Nefidipine) (20 patients)

Combinations	BP reading (mmHg) S/D	No. patient	Percentage (%)
Methyldopa + Nefidipine	110-115/85-90	6	30%
	116-120/91-95	5	25%
	121-125/96-100	5	25%
	126-130/101-105	4	20%

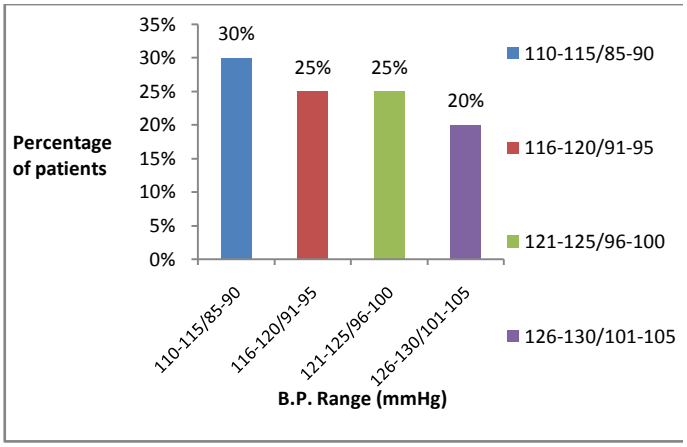

Figure 3: After the adminstration of combination of drugs (methyldopa+nefidipine)

Table 7: Classification of patient according to types of pre-eclampsia and eclampsia

BP range	BP reading (mmHg) S/D	No. patient	Percentage (%)
Mild	135-145/90-95	110	31.42%
Moderate	146-160/96-100	98	28%
Severe	161-175/101-105	89	25.42%
Eclampsia	< 180/110	53	15.14%

Table 8: Incidence of PIH according to age of the patients

Age (in yrs)	No. Of Patients(Pregnant women)				Total	%
	PIH (+)	%	PIH (-)	%		
18-21	140	40.00	726	27.23	866	28.71
22-25	35	10.00	613	22.99	648	21.48
26-29	34	9.70	646	24.23	680	22.54
30-34	38	10.85	483	18.11	521	17.27
35-38	58	16.56	145	5.43	203	6.73
39-42	45	12.85	53	1.98	98	3.24
TOTAL	350	100.0	2666	100.0	3016	100.0

Drugs were preferred to be prescribed mostly in combination, as our study also revealed that the combination of labetalol and nicardipine was very effective in lowering the blood pressure as compared to the methyldopa and nefidipine. Table 4 and figure 1 shows the BP range of the PIH patients before the administration of the combination of drugs. All patients were recorded after 30 min interval with reduction of systolic BP and diastolic BP this fall in SBP was significant not only after 30 mins but even at 4th hr. 30% of patients were found to be 110-115/85-90 mmHg of BP after administration of methyldopa and nifedipine as shown in table 5 and figure 2. 35% patients BP reduced 110-115/85-90 mmHg after treated with combination of nicardipine and labetalol as shown in table 6 and figure 3. Thus, by using combination therapy, we can have efficacy and safety both going in the same direction, providing us with the two most important criteria in the management of pregnancy induced hypertension. The simplification of regimen of the antihypertensive agents is critical in the management of hypertension. Wherever possible, a fixed dose combination should be used by clinicians to simplify the dosing regimen. It has been shown that more rapid control of BP results in fewer cardiovascular events than BP controlled over longer periods of time. This improves patient compliance and decreases PIH, resulting in fewer events. More rapid control is always achieved by using combination therapy than can be achieved by monotherapy, even at higher doses. Another advantage of combination therapy is its ability to control BP similarly across all PIH patients. During the study period, 350 consecutive PIH hypertensive patients were identified. Distribution of patients based on BP control and number of antihypertensive medication utilized is shown in Figures and tables. The incidence rate for mild or unspecified PE was 110, while those for moderate PE, severe PE and eclampsia were 98 cases, 89 cases and 53 cases, respectively shown in table 7. Table 8 shows incidence of PIH according to age of the patients. Higher chance PIH were found below age of 21 and above 35 years as shown in figure 4. The risk of PE increased with maternal age from 4% or 140 cases below 21 years of age to 16.56% for 35-38 years. PIH occurs mostly in teenage and above 35 years. Table 9 shows incidence of PE increased with multiple pregnancies from 2.28% in singletons and 55.14% were found in primigravida pregnancy, 42.57% were in multigravida pregnancies. Table 10 shows complication due to pregnancy induced hypertension and it was observed caesarean section (CS) rate for PE cases were 62 out of 350. The proportion of prematurity or preterm birth were 35.14%, stillbirth rate 20%, neonatal death 11.71%, maternal mortality 5.42%, only 10% deliveries were found to be normal from a total of 350 patients as shown in figure 5. The babies from all the PE cases were of low birth weight and premature also having some abnormalities and which were under observation for a specific required time period.

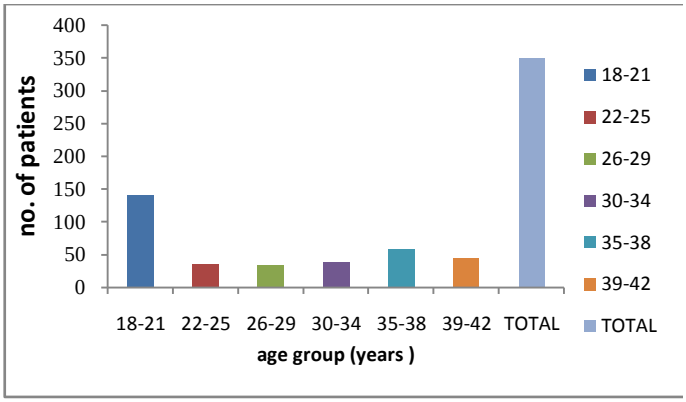

Figure 4: Incidence of PIH according to age of the patients

Table 9: Incidence of PIH according to stage of pregnancy

Pregnant women	Number of patients(n)	Percentage (%)
Primigravida	193	55.14
Multigravida	149	42.57
Multiple pregnancy but primigravida	8	2.28
Total	350	100

Table 10: Complication due to pregnancy induced hypertension (PIH).

Complications	No. of cases	Percentage
Maternal Mortality	19	5.42
Stillbirth	70	20
Neonatal death	41	11.71
Preterm Birth	123	35.14
Cessarian Delivery	62	17.71
Normal Delivery	35	10

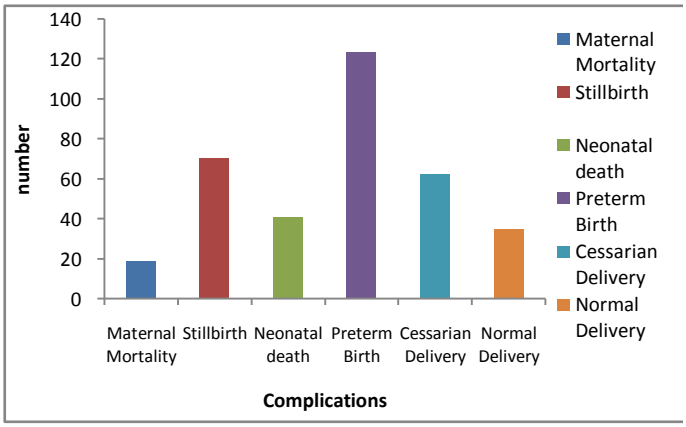

Figure 5: Complication due to pregnancy induced hypertension (PIH).

Table 11: Socio-demographic data of patients

(PIH) Patient Characteristics	Number of Patients (%)
Education Level	
Uneducated	21 (6%)
Below matriculation	56 (16 %)
Matriculation	98 (28%)
High Secondary	121(34.52%)
Graduate	35 (10%)
Post Graduate	19 (5.44%)
Family Income (Monthly)	
Below 5000	69 (19%)
5000 -10000	105 (30%)
10,000 -15000	150 (42.85%)
Above 15000	26 (7.42%)

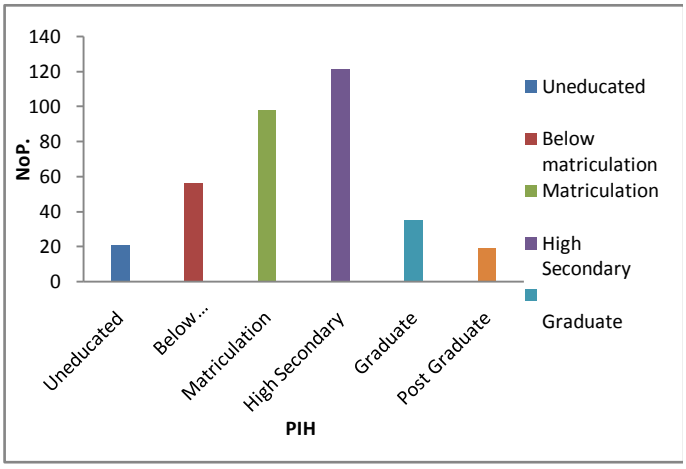

Figure 6: Socio-demographic data of patients

Obesity were found in 26.57% patients, patients in which family history play a role for pregnancy induced hypertension were 24.57%, weight more than 100 kg were found in 29.14% patients, unknown reasons of PIH were in 19.71% patients. Table 11 reveal the socio demographic data of the patients, figure 6 showed that uneducated patients were 6%, below matriculation, matriculation, high secondary, graduate and post graduate were 16%, 28%, 34.52%, 10%, and 5.44% respectively. The incidence of PE was 11.6% of total deliveries. PE risk was increased with age, primiparity, multiple pregnancies. PE was associated with as higher prematurity, low birth weight and higher perinatal mortality. The incidence of eclampsia was 15.14%, while PE is still common with incidences remaining relatively static over the last halfcentury,

eclampsia has become a very rare outcome concomitantly, the clinical outcome of eclampsia cases also showed significant improvement.

Epidemiology of pregnancy induced hypertension in the Mahila Chikitsalaya (Sawai Man Singh) Hospital, Jaipur during the study was 11.60%. Total 350 cases of pregnancy induced hypertension were evaluated out of 3016 patients. Out of 350 patients 297 were of pre-eclampsia patients and 53 patients were eclampsia.

CONCLUSION

In conclusion, our current approach to the management of pregnancy induced hypertension. The use of combination therapy as first line treatment, or treatment much earlier in the course of treating pregnancy induced hypertension, appears to be much more efficient than the stepped care approach. The use of combination therapy will provide greater efficacy, fewer side effects and greater convenience than can be achieved with monotherapy and, most importantly, will significantly increase control rates. It would appear that a change in paradigm in the treatment of PIH, may be the most significant change that we can make in order to improve worldwide control rates, which will ultimately impact PIH. On the basis of this study we can also conclude that the incidence of PIH is increasing. This study provide a little help to the healthcare professionals in management of pregnancy induced hypertension in the hospital and rational use of drugs and also given a favourable support in better therapy to the pregnancy induced hypertensive patients.

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