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A Prospective Study on Prevalence, Risk Factors and Current Treatment Strategies for Pregnancy-Induced Hypertension in Various Hospitals-Palakkad

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ABSTRACT

Objective: To determine the prevalence of pregnancy-induced hypertension (PIH) among various hospitals, Palakkad. To assess the risk factors causing pregnancy-induced hypertension. To find out the treatment strategies for pregnancy-induced hypertension. ***Methodology:*** A total of 197 cases were included in this study. From this sample, 50 women were pregnant women with PIH and 147 women were pregnant women without PIH. The study was designed as a prospective study. A Predesigned data collection form was used to obtain the data. A pregnant woman diagnosed by a physician as GDM is the basic criteria to include in this study. ***Results:*** The prevalence of PIH in pregnancy was found to be 25.38% and the prevalence of Non-PIH pregnant women was found to be 74.62%. Gestational hypertension of pregnancy was diagnosed in 34(68%) cases. In our study about 50% of pregnant women with PIH comes within the age limit of 23-27 years. And about 58% of the PIH patients having BMI comes between the limit of 25–30Kg/m^2. In our study population, about 94% of PIH patients having the parity number less than 2 and 44% of PIH patients were having the second gravida. Out of 50 patients, 44(88%) PIH patients were prescribed with monotherapy and 6(12%) PIH patients were prescribed with combination therapy. ***Conclusion:*** The prevalence of PIH was found to be 25.38% among the study population. Age, BMI, gravidity, parity, family history and previous history shows an influence on the development of PIH. In our study the incidence of monotherapy was high. Methyldopa was the commonest prescribed antihypertensive in monotherapy as well as in combination therapy.

INTRODUCTION

The main aim of our study is to determine the prevalence of pregnancy-induced hypertension among various hospitals, Palakkad. To assess the risk factors causing pregnancy-induced hypertension. To find out the treatment strategies for pregnancy-induced hypertension. To determine the frequency and distribution of different types of hypertensive disorders of pregnancy and to assess the drug utilization pattern of antihypertensive drugs in pregnancy.

Pregnancy-induced hypertension affects 2-10% of all pregnancy with results of many maternal and fetal complications. Early detection and treatment may reduce the complications in pregnancy outcome. PIH is a condition of elevated blood pressure level generally detected during pregnancy and become normal soon after delivery, resulting in immediate and long-term effects to both mother and child. Identifying women for the possibility of PIH is depended on the presence of risk factors, PIH is usually confirmed after the 20th week of pregnancy. But PIH can affect in any stage of gestation. The factors that can influence the pregnant women to develop PIH include age, BMI, gravidity, parity, family history and obstetric history[(2)].

PIH is defined as hypertension (blood pressure ≥140/90mmHg) with or without proteinuria (≥300 mg/24 hours) emerging after 20 weeks gestation, but resolving up to 12 weeks postpartum. Also known as "Toxemia of Pregnancy". Hypertension in pregnancy is defined as systolic blood pressure (sBP) ≥ 140 mmHg and/or diastolic blood pressure (dBP) ≥ 90 mmHg, or by ↑ in sBP ≥ 30 mmHg, or in dBP ≥15 mmHg from preconception or first-trimester blood pressure confirmed by two measuring 6 hours apart.[(3)]

Hypertensive disorders during pregnancy are classified into 4 categories, as recommended by the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy: 1) chronic hypertension, 2) preeclampsia, 3) preeclampsia superimposed on chronic hypertension, and 4) gestational hypertension (transient hypertension of pregnancy or chronic hypertension identified in the latter half of pregnancy)[(1)]

Gestational hypertension(GH): GH is diagnosed in women whose blood pressure reaches ≥140/90mmHg for the first time during pregnancy (after 20 weeks gestation), but without proteinuria. Blood pressure normalizes by 12 weeks postpartum.

Preeclampsia (PE): Hypertension (blood pressure ≥ 140 / 90 mmHg) accompanied with proteinuria exceeding 300 mg/24 hours emerges for the first time after 20 weeks gestation, but both symptoms normalize by 12 weeks postpartum.

Superimposed preeclampsia (S-PE): Superimposed preeclampsia is diagnosed in the following three cases. (1) New onset proteinuria (≥ 300 mg/24hours) in hypertensive women who exhibit no proteinuria before 20 weeks gestation. (2) Hypertension and proteinuria documented antecedent to pregnancy and/or detected before 20 weeks gestation, one or both of which progressing after 20 weeks gestation. (3) Renal disease with proteinuria documented antecedent to pregnancy and/or detected before 20 weeks gestation, which is accompanied by new onset hypertension after 20 weeks gestation.

Eclampsia (E): Eclampsia is defined as the onset of convulsions in a woman with PIH that cannot be attributed to other causes. The seizures are generalized and may appear before, during, or after labor.

Treating hypertension does not alter the progression of the disease. However, it has been shown that early treatment decreases not only the frequency of hypertensive crisis but also the rate of neonatal complications. Antihypertensive medications are mainly used to prevent or treat severe hypertension, to prolong pregnancy for as long as safely possible thereby maximizing the gestational age of the infant, and to minimize fetal exposure to medications that may have adverse effects[1].

Objective of the study

- To determine the prevalence of pregnancy-induced hypertension among the study population.
- To assess the risk factors causing pregnancy-induced hypertension.
- To find out the treatment strategies for pregnancy-induced hypertension.
- To determine the frequency and distribution of different types of hypertensive disorders of pregnancy and to assess the drug utilization pattern of antihypertensive drugs in pregnancy
- To study the impact of antihypertensive drugs in pregnancy.

MATERIALS AND METHODS

The study was conducted in two various hospitals, Palakkad. The pregnant women who diagnosed and treated for PIH were taken into the study for the period of six months from October 2015-March 2016. A pregnant women diagnosed by a physician as PIH is the basic criteria to include in this study. Diabetes Mellitus, Hypertension, renal disorder and autoimmune disease women were not included in this study. A specially designed data entry form was used for collecting patient details. Total of 197 patients was included in this study.

RESULTS

Table 1: Prevalence of pregnant women with PIH and without PIH

	Frequency (n=197)	Percentage(%)
PIH	50	25.38
Non-PIH	147	74.62

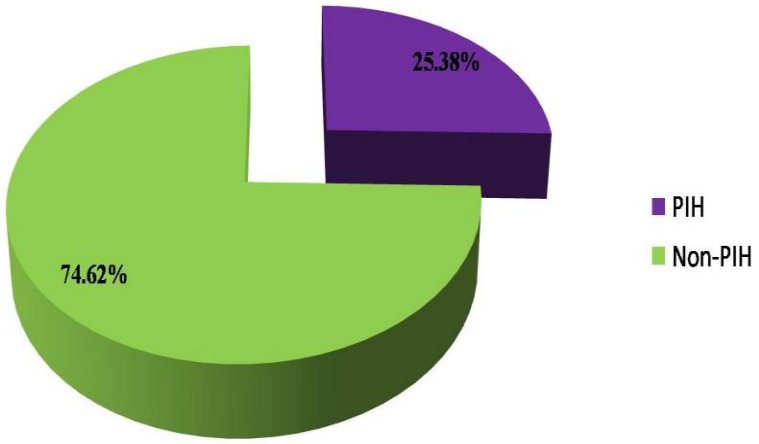

Figure1: Prevalence of pregnant women with PIH and without PIH

Table 1 & Figure 1 shows that the prevalence of pregnant women with PIH was found to be 28.38% among the study population. And the prevalence of pregnant women without PIH was found to be 74.62% among the study population.

Table 2:Age-wise distribution among the study population

Age group (years)	PIH (n=50)	Non-PIH (n=147)
18-22	14(28%)	39(26.53%)
23-27	25(50%)	66(44.89%)
28-32	10(20%)	32(21.77%)
>32	1(2%)	10(6.8%)

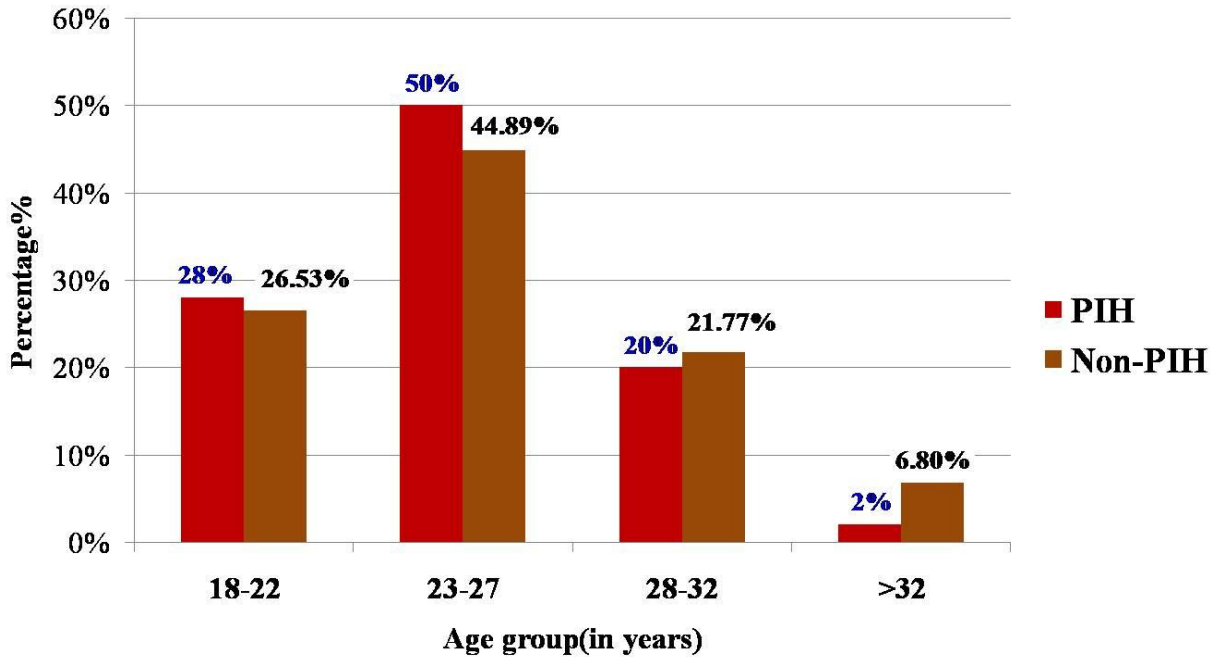

Figure 2: Age-wise distribution among the study population

Table 2 & Figure2 shows that about 50% of the PIH patients comes under the age group of 23-27 years.

Table 3: Distribution based on Body Mass Index among the study population

BMI (Kg/m^2)	PIH (n=50)	Non-PIH (n=147)
<25	4(8%)	103(70.07%)
25-30	29(58%)	29(19.73%)
>30	17(34%)	15(10.2)

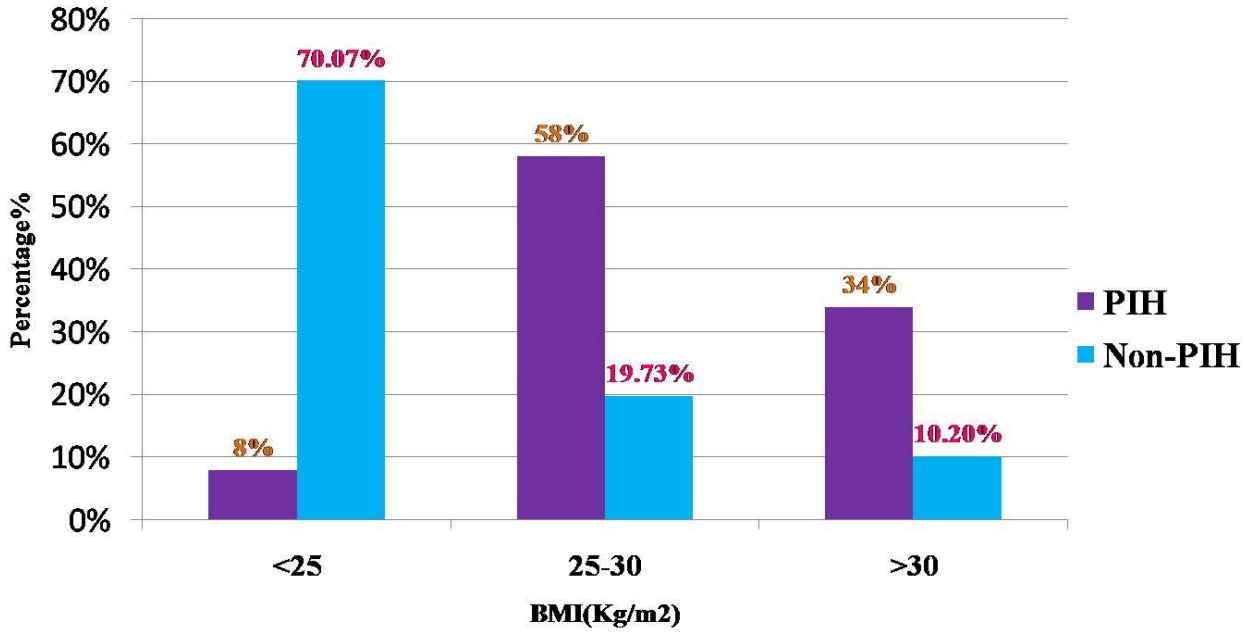

Figure 3: Distribution based on BMI among the study population

Table 3 & Figure 3 shows that about 58% of PIH patients comes under the BMI ranging from 25-30 Kg/m^2 and about 70.07% of Non-PIH patients comes under the BMI <25 Kg/m^2.

Table 4: Distribution based on Family History among the study population

Number of patients having positive family history	
PIH (n=50)	**Non-PIH (n=147)**
20(40%)	32(21.76%)

Table 4 shows that about 40% of PIH patients have a family history of hypertension. Hence, it shows that positive family history had an influence on the development of PIH.

Table 5: Distribution based on the previous History among the study population

Number of patients having the previous history of PIH among the study population	
PIH (n=50)	**Non-PIH (n=147)**
12(24%)	29(19.73%)

Table 5 shows that PIH patients having the previous history of PIH were greater(24%) than the pregnant women without PIH (19.73%). Hence, it shows that previous history of PIH in pregnant women shows a significant influence on the development of PIH.

Table 6: Distribution based on Parity number among the study population

Parity number	PIH n=50	Non-PIH n=147
<2	47(94%)	105(71.43%)
2-3	3(6%)	42(28.57%)
>4	0(0%)	0(0%)

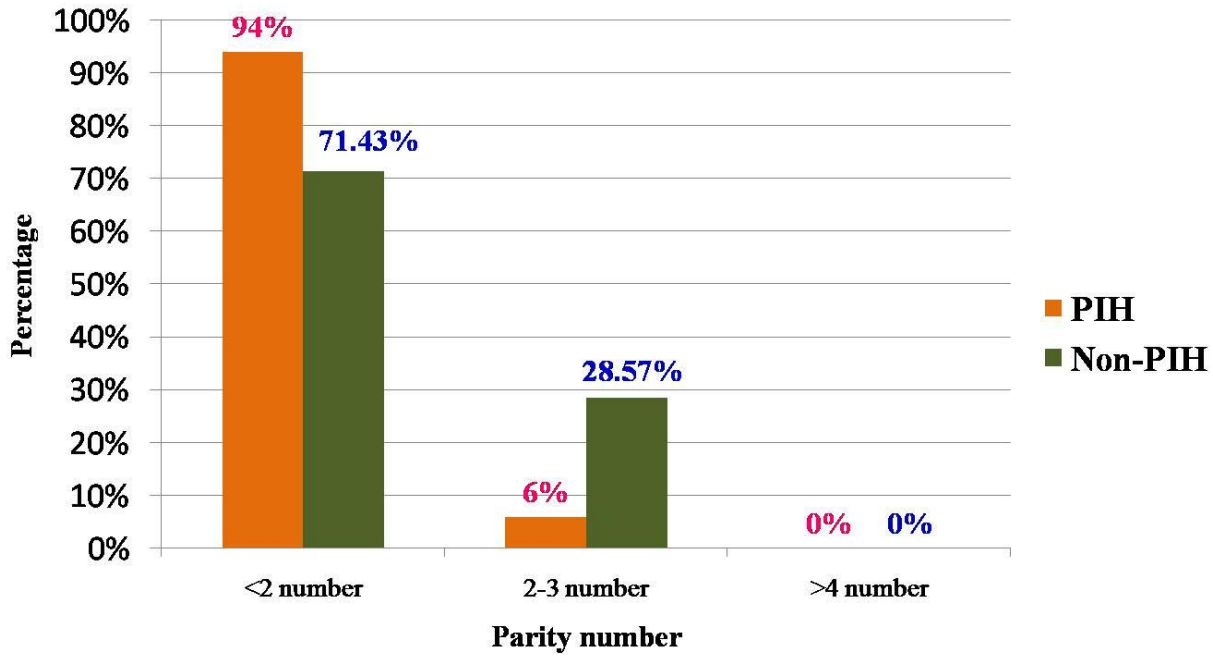

Figure:4 Distribution based on Parity number among the study population

Table 6 & Figure 4 shows that OA is commonly seen in female patients 91(55.15%) than male patients.

Table 7: Gravidity wise distribution among the study population

Gravida	PIH n=50	Non-PIH n=147
Primi	18(36%)	61(41.49%)
Second	22(44%)	66(44.89%)
Third	7(14%)	16(10.88%)
Fourth	3(6%)	4(2.72%)

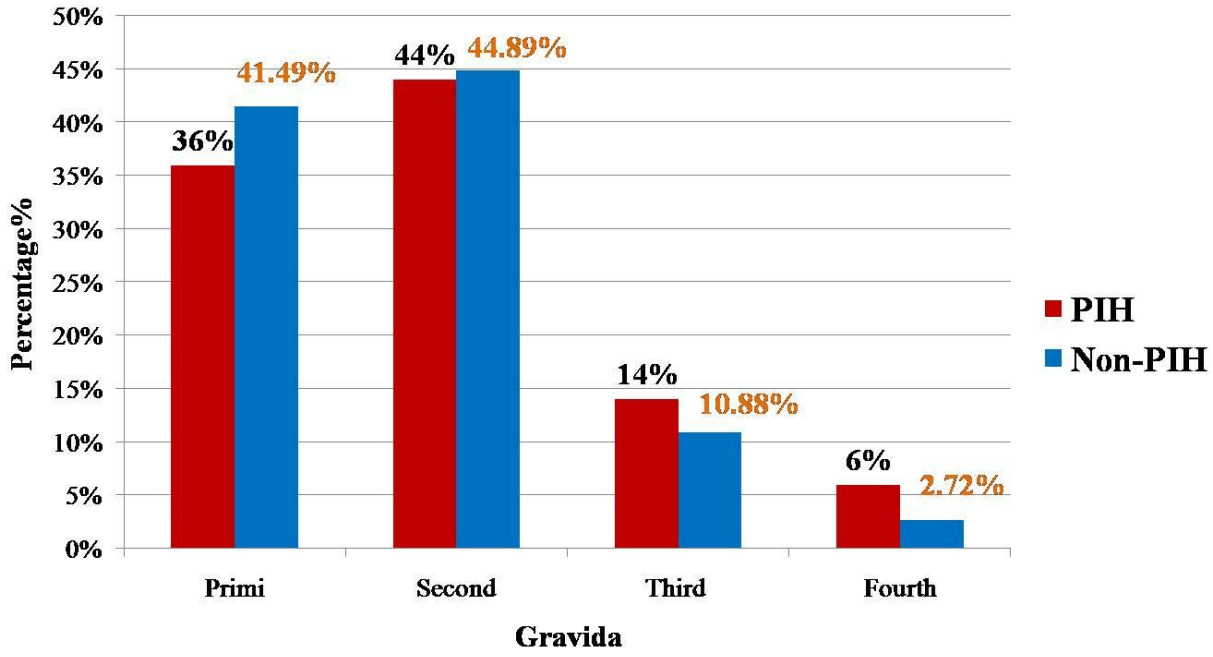

Figure 5: Gravidity wise distribution among the study population

Table 7 and figure 5 shows that about 44% of pregnant women with PIH comes under second gravida.

Table 8: Distribution based on Hypertensive disorders of pregnancy

Category of hypertensive disorders in pregnancy	No. of patients n=50	Percentage
Gestational hypertension	34	68%
Preeclampsia	15	30%
Eclampsia	1	2%
Chronic hypertension	0	0%

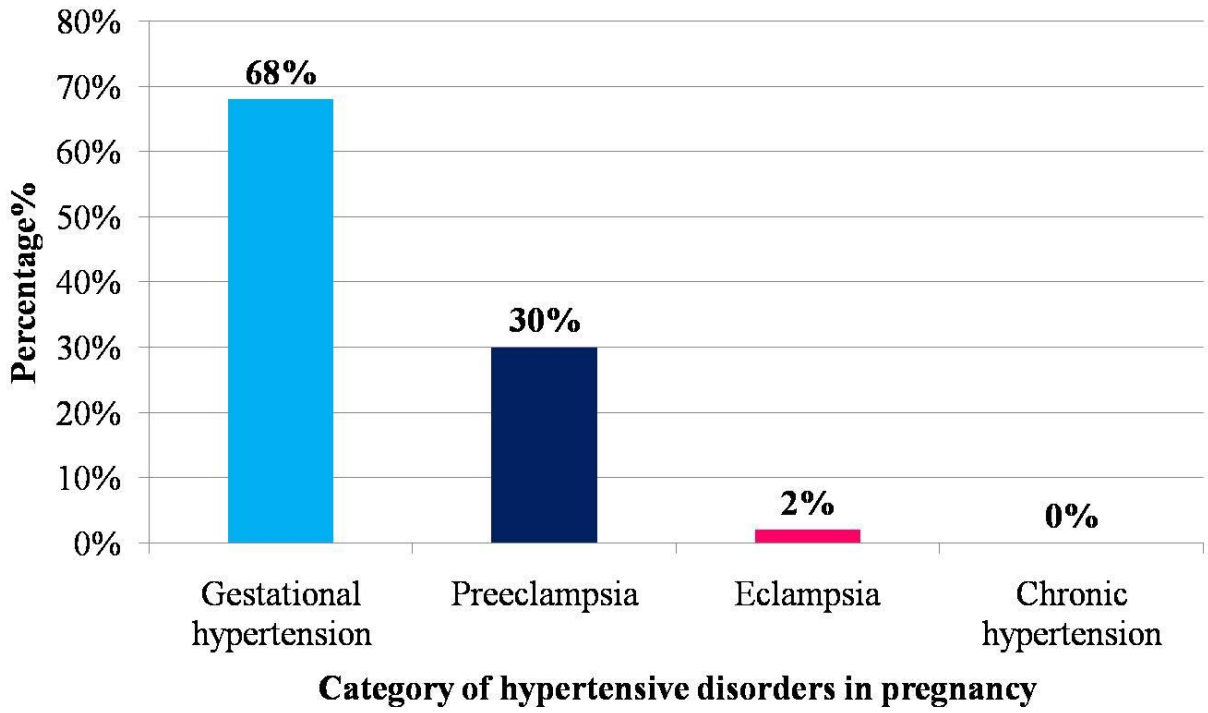

Figure 6: Distribution based on Hypertensive disorders of pregnancy

Table 8 & Figure 6 shows that about 68% of PIH patients have gestational hypertension and about 30% of PIH patients are having the preeclampsia.

Table 9: Utilisation pattern of Anti-hypertensive drugs in pregnancy in PIH patients

Drug therapy	Number of patients (n=50)	Percentage(%)
Monotherapy	44	88
Combination therapy	6	12

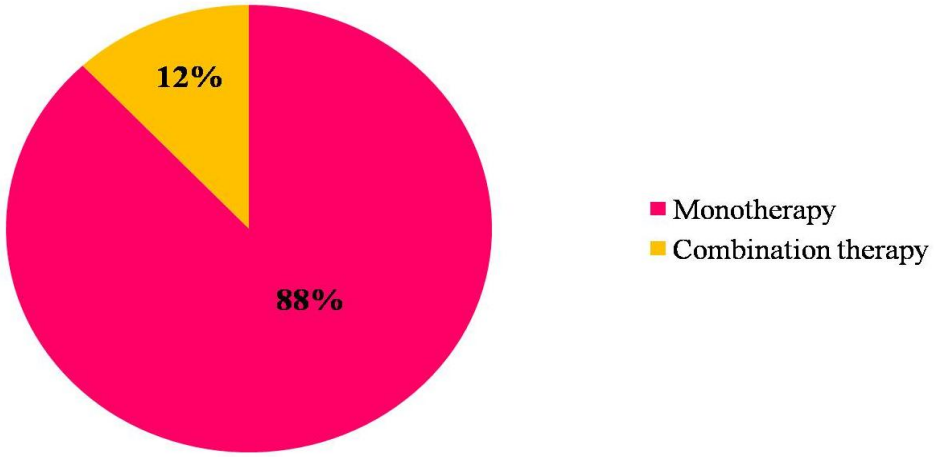

Figure 7: Utilisation pattern of Anti-hypertensive drugs in pregnancy in PIH patients

Table 9 ,Figure 7 shows that out of 50 patients, 44(88%) PIH patients were prescribed with monotherapy and 6 (12%) PIH patients were prescribed with two drugs.

Table 10: Prescription pattern of Anti-hypertensives as monotherapy in PIH patients

Monotherapy	Number of patients(n=44)	Percentage(%)
Methyldopa	32	72.73
Nifedipine	10	22.73
Magnesium sulphate	1	2.27
Aspirin	1	2.27

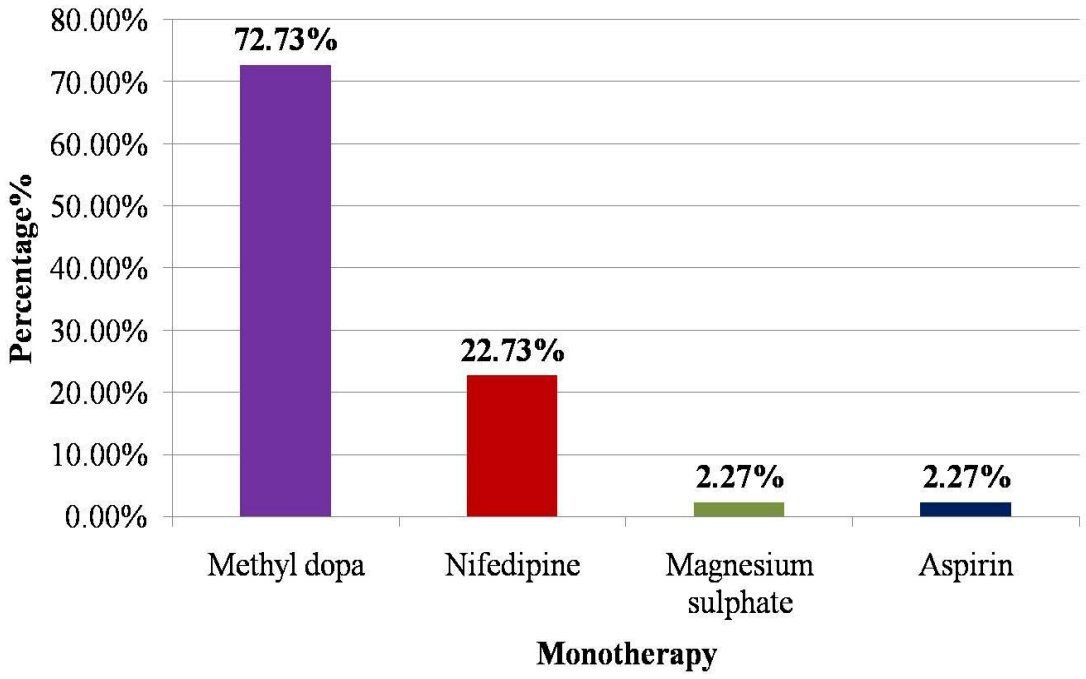

Figure 8 : Prescription pattern of Anti-hypertensives as monotherapy in PIH patients

Table 10 & Figure 8 shows the details of patients treated with monotherapy. Out of 44 patients, 32 (72.73%) patients were prescribed with methyldopa as monotherapy and 10 (22.73%) patients were prescribed with Nifedipine.

Table 11: Prescription pattern of Anti-hypertensives as Combination therapy in PIH patients

Combination therapy	Number of patients(n=6)	Percentage(%)
Methyldopa+Nifedipine	2	33.33
Methyldopa+Labetalol	1	16.67
Methyldopa+Aspirin	3	50

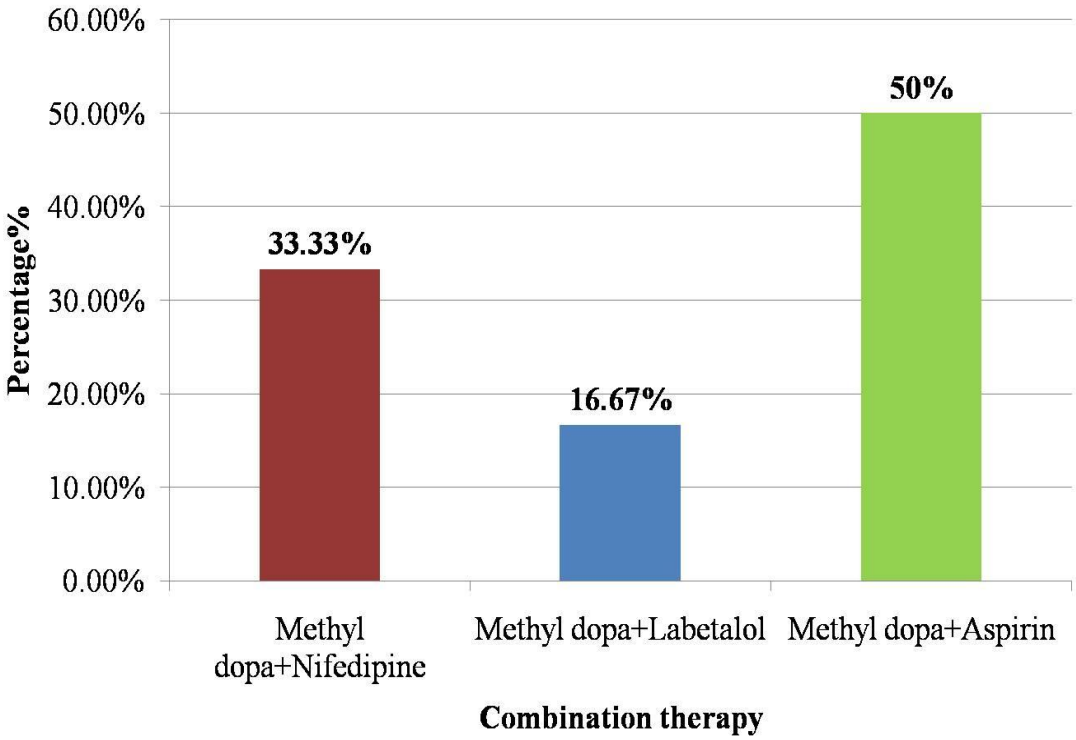

Figure 9: Prescription pattern of Anti-hypertensives as Combination therapy in PIH patients

Table 11, & Figure 9 shows details of patients treated with combination therapy, out of 6 patients, 3 (50%) patients were prescribed with Methyldopa and Aspirin as combination therapy followed by Methyldopa and Nifedipine(33.33%).

DISCUSSION

In our study, totally 197 cases were included. Among which 50 PIH cases were reported for a period of six months (Oct 2015- March 2016).

Prevalence

The prevalence of the hypertensive disorder in pregnancy was found to be 25.38% and the prevalence of Non-PIH pregnant women was found to be 74.62%. The distribution of different hypertensive disorders of pregnancy was that Gestational hypertension of pregnancy was diagnosed in 34 (68%) cases. 15 patients (30%) and 1 patient (2%) appeared to be pre-eclamptic and eclamptic respectively.

Age

In our study 2% of the study population was over 32 years of age, 20% of women fall in between the age group of 28-32 years of old whereas 50% of women comes under the age group of 23-27 years , and 28% of pregnant women with PIH reported within the range of 18-22 years old. From the above data, I have concluded that about 50% of pregnant women with PIH comes within the age limit of 23-27 years which was in accordance with the study conducted by Velusamy Sivakumar and Ayyalu Rajasekeran.

Body Mass Index

BMI shows significant influence on the development of PIH. When the BMI is increasing , the probability of early development of PIH is high[2]. In our study about 58% of the PIH patients having BMI comes between the limit of 25 – 30Kg/m^2.

Family History

In our study population among the PIH patients about 40% of pregnant women having positive family history of hypertension. By comparing both PIH and Non-PIH Pregnant women, the number of patients having positive family history was comparatively higher in PIH patients than Non- PIH Pregnant women which were in accordance with the study conducted by Velusamy Sivakumar and Ayyalu Rajasekeran.

Previous History

In our study population, the number of patients having the previous history of hypertension was higher in PIH patients (24%) than in Non-PIH pregnant women(19.73%).

Parity number

A study by Velusamy Sivakumar and Ayyalu Rajasekeran reported that nulliparity and primiparity women show significant influence on the development of PIH. In our study population, about 94% of PIH patients having the parity number less than 2. Hence our result is similar with the above mentioned study.

Gravidity

A study by Velusamy Sivakumar and Ayyalu Rajasekeran, reported that Primigravida shows significant influence on the development of PIH than multigravida. In our study about 44% of PIH patients were having the second gravida.

Drug Therapy

Out of 50 patients, 44(88%) PIH patients were prescribed with monotherapy and 6 (12%) PIH patients were prescribed with two drugs. Out of 44 patients, 32 (72.73%) patients were prescribed with methyldopa as monotherapy and 10 (22.73%) patients were prescribed with Nifedipine. Out of 6 patients, 3 (50%) patients were prescribed with Methyldopa and Aspirin as combination therapy followed by Methyldopa and Nifedipine(33.33%).

CONCLUSION

The study was conducted to determine the prevalence of Pregnancy-induced Hypertension and to assess the risk factors of PIH and also to find out the current treatment strategies for Pregnancy-induced Hypertension. The prevalence of PIH was found to be 25.38% among the study population. Age, BMI, gravidity, parity, family history and previous history shows an influence on the development of PIH. Assessing these risk factors provides an understanding to identify those women as a high-risk group for PIH. Early diagnosis and treatment through regular antenatal check-up is a key factor to prevent PIH and its complications. In our study the incidence of monotherapy was high. Methyldopa was the commonest prescribed antihypertensive in monotherapy as well as in combination therapy.

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