A retrospective study on evaluation of anti-hypertensive drugs used in gestational hypertension

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Abstract: To evaluate the anti-hypertensive drugs used in pregnancy induced hypertension and to determine the safety of the anti-hypertensive drugs administered in gestational hypertensive patients. Pregnancy induced hypertension are very common in women and if unnoticed may lead to severe complications. The appropriate therapy is very much essential for the welfare of both the mother and the child. Hence this study was undertaken to identify the commonly used and safe drugs in pregnancy induced hypertension. This retrospective study was carried out in the Medical Records Department of a specialized gynecological hospital. Patient details – Name, Age, Sex, Occupation, Body Mass Index (BMI), Social History (SH), Past Medical History (PMH), Diagnosis, mother weight and BP, baby weight, specific anti-hypertensives given, outcome, complication in both mother and baby if any, duration of anti-hypertensive drug use, duration of hospital stay were all recorded in a proforma. Adverse Drug Reactions for anti-hypertensive drugs given were also noted. Nifedipine was the most common drug prescribed both in monotherapy and dual therapy. Adverse drug reaction was seen only in 2% of patients. Pregnancy induced hypertension is one of the riskiest conditions to occur during pregnancy. Dietary modification and lifestyle modification might help in controlling pre-eclampsia.

Keywords: Pre-eclampsia, pregnancy induced hypertension, anti-hypertensive.

INTRODUCTION

Hypertensive disorders in pregnancy (HDP) leads to severe maternal obstetric complications and contributes to maternal mortality (Berg *et al.,* 2010). Pregnancy induced hypertension is a clinical diagnosis and it is defined by the new onset of hypertension (ACOG, 2013). The potential causes of pregnancy induced hypertensions are Abnormal placentation, Vasculopathy and inflammatory changes, Immunological factors, Genetic factors and Nutritional factors (Steegers *et al.,* 2010). The most commonly used antihypertensive medications include labetalol, hydralazine, methyldopa, nicardipine, or nifedipine (ACOG, 2002; Dattel *et al.,* 2005; McCoy and Baldwin, 2009; Barss and Repke, 2012; Vest and Cho, 2012). A study on the incidence of gestational hypertension and drug use pattern of antihypertensive drugs in pregnancy reported that the incidence of hypertensive disorders in pregnancy was high. As methyldopa is the safest drug in pregnancy, it is most commonly prescribed both in monotherapy and in combination (Thadhani *et al.,* 1999). A population based study on the effect of hypertensive disorders in pregnancy on still birth confirmed the excess risk of stillbirths (Abdul-Karim and Assali, 1961).

Hence the main aim of this study was to evaluate the anti-hypertensive drugs used in pregnancy induced hypertension and to determine the safety of the anti - hypertensive drugs administered in gestational hypertension patients.

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MATERIALS AND METHODS

This Retrospective observational study was carried out in the Medical Records Department of a specialized gynecological hospital after obtaining prior permission from the Institutional Ethics Committee [IEC/DOPI/2015/15]. Those records with patient's age ≥ 18 years and those who were diagnosed with Gestational Hypertension were included for the study and the records of patients with a history of chronic hypertension and other co morbidities and who had substance (tobacco, drugs) abuse / addictions were excluded from the study.

Case sheets of 200 pregnant mothers based on the inclusion and exclusion criteria were selected. A separate data entry form (proforma) for incorporating patient details was designed. Patient details – Name, Age, Sex, Occupation, BMI, Social History (SH), Past Medical History (PMH), Diagnosis, mother weight and BP, baby weight, specific anti-hypertensives given, outcome, complication in both mother and baby if any, duration of anti-hypertensive drug use, duration of hospital stay were all recorded. The parameters such as Haemoglobin, Blood Pressure, Random Blood Sugar, Serum fibrinogen, Thyroid Function Tests, Bleeding Time/Clotting Time, urine albumin, urine sugars, urine culture sensitivity were noted. Adverse Drug Reactions for anti-hypertensive drugs given were also noted.

The values obtained were averaged for analysis. The collected data was statistically analyzed using Microsoft Excel.

RESULTS

Among the study population, most of the women were in the age group of 21-24 years (n=78, 39%), followed by 25-29 years (n=59, 29.5%). About 39 (19.5%) patients had maternal history of hypertension (HTN), 25 (12.5%) had paternal history, 10 (5%) had both maternal and paternal history and 126(63%) had no family history of hypertension. Two (1%) patients were diagnosed with PIH in their second trimester and 198 (99%) patients in their third trimester.

Among 200 patients, 115 (57.5%) had 3-7 days of hospital stay, 76 (38%) had >7 days of hospital stay and 9 (4.5%) patients had less than 3 days of hospital stay.
Monotherapy was prescribed for 102 (51%) patients and dual or triple therapy for 98 (49%) patients. The most commonly prescribed anti-hypertensive was nifedipine, followed by nifedipine and labetalol combination. The anti-hypertensives prescribed among the study population were shown in table 1.

Table 1: Anti-hypertensives prescribed

Drugs given	No. of patients	Percentage (%)
Nifedipine	97	49.5
Methyldopa	7	3.5
Nifedipine + labetalol	72	36
Nifedipine + methyldopa	16	8
Labetalol + methyldopa	0	0
Nifedipine + labetalol + methyldopa	8	4

Other than anti-hypertensives, calcium/ferrous sulphate tablet/B-Complex tablet (Ca/FST/BCT) was most commonly prescribed to women, followed by ranitidine. Drugs other than anti-hypertensives prescribed were shown in table 2.

Table 2: Drugs other than anti-hypertensives prescribed

Other drugs prescribed	No. of patients	Percentage (%)
Ca / FST / BCT	200	100
Ampicillin	26	13
Metronidazole	57	28.5
Ciprofloxacin	29	14.5
Diclofenac	15	7.5
Ranitidine	152	76

Among the study population of 200 patients, 103 (51.5%) patients had controlled HTN after using one drug therapy, 79 (39.5%) patients had controlled HTN using two drug therapies, 6 (3%) patients had controlled HTN using triple drug therapy and 12 (6%) patients had no control of HTN using any of the drugs.

Table 3: Outcome of pregnancy

Outcome of pregnancy	No. of patients	Percentage (%)
Healthy mother & healthy baby	131	65.5
Healthy mother & sick baby	44	22
Sick mother & healthy baby	3	1.5
Sick mother & sick baby	8	4
Sick mother & dead baby	14	7

From the study population, 39 (19.5%) had preterm deliveries, 116 (58%) had late term deliveries and 45 (22.5%) had full term deliveries.There were 128 (64%) babies born with normal body weight and 72 (36%) babies with lean body weight among the study population. Fatigue was the adverse drug reaction seen in 4 (2%) patients. The outcome of pregnancy was categorized into 5 types and the same was depicted in table 3. Majority of the women were healthy and had a healthy baby.

Table 4: Overall characteristics of the study population

Characteristics	Mean	Std. deviation	Median
Age in years	23.9	3.8	24
Period of pregnancy in weeks	34.6	3.2	36
Trimester in which HTN was diagnosed	2.9	0.09	3
Mother's weight at second trimester in Kg	63.1	6.01	64
Mother's weight at third trimester in Kg	65.04	5.8	66
Baby's weight in Kg	2.28	0.5	2.5
Hb at second trimester in g/dl	9.8	0.6	9.8
Hb at third trimester in g/dl	10.5	0.7	10. 2
Duration of hospital stay in days	7.18	3.37	7
Duration of anti-hypertensive drug use in days	8.53	4.27	8

DISCUSSION

Preeclampsia (PE) is a major and serious complication of pregnancy. It usually occurs after 20 weeks of gestation. It may also occur after six weeks from child birth (postpartum). Even organs such as kidney and liver may be damaged (Chesley, 1978). The pregnancy complications caused by preeclampsia are low birth weight, pre-term birth and still births. Preeclampsia can cause further complications to the mother. The leading cause of maternal and perinatal death and disease complications are due to hypertensive disorders of pregnancy (Garovic, 2012).

The development of superimposed preeclampsia in the second half of pregnancy is the major risk of chronic hypertension in pregnancy. This occurs in about 20% of women. Preeclampsia should be considered seriously since the risks to the mother and fetus are more than chronic hypertension alone. All women with hypertensive complication of pregnancy must have a postpartum hypertension follow-up. This follow-up depends on the severity of hypertension and it should be from 2 to 6 weeks after discharge from hospital (Lowe *et al.,* 2014).

In our study, most of the women were in the age group of 21-24 years. This was similar to the study conducted by Iwasaki *et al.,* 2002. Almost all the patients were diagnosed with PIH in their third trimester. This contradicts to the study conducted by Sibai, 1996, in which majority of the women were diagnosed with HTN in the second trimester. In our study, majority of the patients were prescribed with Nifedipine and they had control over HTN on monotherapy. These results were in accordance with Viinikka *et al.,* 1993 and Okosun *et al.,* 2004.

CONCLUSION

Pregnancy induced hypertension is one of the riskiest condition to occur during pregnancy. Nifedipine is safe and effective in pregnancy induced hypertension. Pharmacist must play a role in counselling the patients about the do's and don'ts during pregnancy**.** Dietary modification and lifestyle modification might help in controlling the pre-eclampsia.

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