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Original Research Article

Study of the prescribing pattern for antihypertensive drugs used in pregnancy at a tertiary care center

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ABSTRACT

Background: One of the most common health problems encountered during pregnancy is hypertension, which remains to be an important factor to the morbidity and death of both the mother and the fetus. The aim of the study was to examine the antihypertensive medication prescribing practices in tertiary care hospital.
Methods: This cross-sectional observational study involved 150 prescriptions written for pregnant women with primary essential hypertension at the Geetanjali medical college and hospital's gynecology inpatient department in Udaipur, Rajasthan. This study was conducted over six months of period enlisting 150 patients. Pregnant woman of more than 18 years of age and diagnosed with hypertension during pregnancy were willing to participate in the study were included.
Results: Out of 150 patients, the mean age of the patients was 29.97±5.59 years; with a minimum age of 18 years. Among them 13% were from 1st trimester, 9% were from 2nd trimester and 78% were from 3rd trimester. The prescribing pattern of antihypertensive drugs includes monotherapy and combinations therapy. In the current research, the prescribing pattern of antihypertensive drugs was based on the efficacy and safety profile in the pregnancy.
Conclusions: According to the current study, the safest treatment for hypertensive urgency and chronic hypertension is a tablet containing labetalol and magnesium sulphate ($MgSO_4$). If the hypertension is detected in the early stages of pregnancy are treated with less medication.

Keywords: Antihypertensive drugs, Pregnancy, Hypertension, Prescriptions

INTRODUCTION

One of the most common health problems encountered during pregnancy is hypertension, which remains to be an important factor to the morbidity and death of both the mother and the fetus.[1] Approximately 10% of pregnancies are complicated by it.[2] Systolic blood pressure (SBP)≥140 mmHg and/or diastolic blood pressure (DBP)≥90 mmHg, or increased in SBP≥30 mmHg or in DBP≥15 mmHg from preconception or first trimester blood pressure verified by two measurements taken six hours apart, are considered hypertension in pregnancy.[3]

According to national high BP education program working group on high BP in pregnancy's recommendations, hypertensive diseases during pregnancy may be divided into 4 groups. Chronic hypertension, preeclampsia-eclampsia, preeclampsia hypertension on chronic hypertension and gestational hypertension.[4]

Risk factors in preeclampsia

Primi gravida, family history, placenta abnormalities, hyperplacentosis, obesity, pre-existing vascular disease, new paternity and thrombophilia.[2]

According to multicentre research, 70% of cases of hypertensive disorders during pregnancy were classified as gestational hypertension or preeclampsia, while about 30% of cases were caused by chronic hypertension. It is one of the most common causes of morbidity and mortality among mothers and perinatal globally. [2]

The American college of obstetricians and gynaecologists (ACOG) states that women who have the following conditions should consider antihypertensive therapy: Preeclampsia with a chronic BP of 160 mmHg or 110 mmHg in the diastolic or systolic range. Chronic high blood pressure with a DBP of 110 mmHg or a SBP of 160 mmHg and treatment goal of 120-160/80-110 mmHg.

National institute for health and care excellence (NICE) states that women with severe hypertension who requires immediate critical care during pregnancy or after giving birth should get one of the following treatments: Labetalol, oral nifedipine and intravenous hydralazine.[5]

Pregnant women's hypertension must be treated carefully, as the morbidity and death rate among PIH patients rises. Pregnant women with a history of hypertension may be at a higher risk of developing cardiovascular problems in the future. Early detection and treatment of these conditions might help lower the risk of maternal morbidity. [6]

Antihypertensives are used to treat preeclampsia with the intention of reducing and maintaining blood pressure moderate reduce the risk of complications such as placental abruption, cerebral haemorrhage, and maternal heart failure. Additionally, they shouldn't impair the uterine circulation or the fetus in any way. In this study, the management of pregnancy-induced hypertension was examined, drug interactions were identified and their severity was assessed, patients were educated on lifestyle modifications, and prescription drugs for pregnancy were compared to food and drug administration (FDA) and therapeutic good administration (TGA) guidelines.[7]

METHODS

It was cross sectional observational study involving 150 patients who were suffering from hypertension during pregnancy in the Inpatient ward in department of obstetrics and gynaecology ward of Geetanjali medical college and hospital, Udaipur, Rajasthan. This study was conducted December 2023 to June 2024. The main purpose of the study was explained in written in informed consent form (both Hindi and English) which was signed by the patients. Institutional ethical committee approval was obtained before starting the research. Predesigned data collection form and google form was used to collect the relevant details. Demographic details, medications history, current therapy, history of allergy other information collected from the record of patient data. Exclusion criteria included patients below the age of 18 years. Inclusion criteria included pregnant women diagnosed with hypertension during pregnancy and patients with gestational age of 7 to 40 years.

Data analysis was conducted using IBM SPSS statistics 29.0 (trial version) and MS excel. Descriptive statistics were applied to summarize demographic details. Continuous variables are presented as means with standard deviations. Before statistical analysis, all continuous variables were evaluated for normality to assess their distribution within the sample population.

RESULTS

During the complete study period; data of 150 patients were analysed which were diagnosed with hypertension during pregnancy. The mean age of the patients was 29.97 years. Among them 13% of the population presented with BP in 1st trimester followed by 9% in 2nd trimester and 78% in 3rd trimester as shown in Table 1.

Out of 150 patients 67% of the population were on tablet labetalol, 20% of the population were on tablet labetalol + tablet nifedipine, 12% of the population were on injection labetalol (STAT)+tablet labetalol and only 0.6% of the population were on injection labetalol; in which 27% of the population were also given with $MgSO_4$ to manage their high BP / prophylaxis of eclampsia. The prescribing pattern of antihypertensives which includes both monotherapy as well as combination therapy as shown in Table 2.

Doses of the medications were evident that tablet labetalol was given at a dose of 100 mg, tablet labetalol + tablet nifedipine was given at a dose of 100 mg+5 mg, injection labetalol (STAT)+tablet labetalol was given at a dose of 20 mg+100 mg, injection labetalol was given at a dose of 20 mg, injection $MgSO_4$ was given at a dose of 4 gm and tablet amlodipine+tablet atenolol was given at a dose of 5 mg+50 mg as shown in Table 3.

During six months of the study, it was evident that 18% of the patients presented with complaints of high BP, 26% of the patients BP were elevated during hospital stay, 31% of the patients BP were elevated before the surgery, 5% of the patients BP were elevated during surgery and 21% of the patients BP were elevated after the child birth as shown in Figure 1.

While observing the study it was found that 9% were diagnosed with hypertension from the 2nd months of pregnancy. The 3% of the patients were from the 3rd months, 2% of the patients were from 4thmonths, 6% of the patients were from 5th months, 25% of the patients were diagnosed from hypothyroidism and 55% of the population had no relevant past history as shown in Figure 2.

There were 31% of the patients presented with BP in gravida 1, 39% in gravida 2, 22% in gravida 3, 7% in

gravida 4, 0.6% in gravida 5, 0.6% in gravida 6 and 0.6% in gravida 8 as shown in Figure 3.

Table 1: Age group of the patients (n=150).

Age group (in years)	N	Mean±SD
18-20	4	29.97±5.59
21-25	33	
26-30	42	
31-35	45	
36-40	21	
41-45	5	

Table 2: Initial choice of drugs to the patients when admitted to hospital (n=150).

Initial drug of choice	N	Percentages (%)
Tab. labetalol	101	67
Tab. labetalol + tab. nifedipine	30	20
Inj. labetalol (STAT) + tab. labetalol	18	12
Inj. labetalol	1	0.6

Table 3: Doses of the medication with frequency.

Medication	Doses	Frequency
Tab. labetalol	100 mg	1-0-1
Tab. labetalol + tab. nifedipine	100 mg +5 mg	(1-1-1-1) + (1-0-1)
Inj. labetalol (STAT) + tab. labetalol	20 mg+100 mg	1-0-1
Inj. labetalol	20 mg	1-1-1-1
Inj. $MgSO_4$	4 gm	STAT
Tab. amlodipine + tab. atenolol	5 mg+50 mg	1-0-1

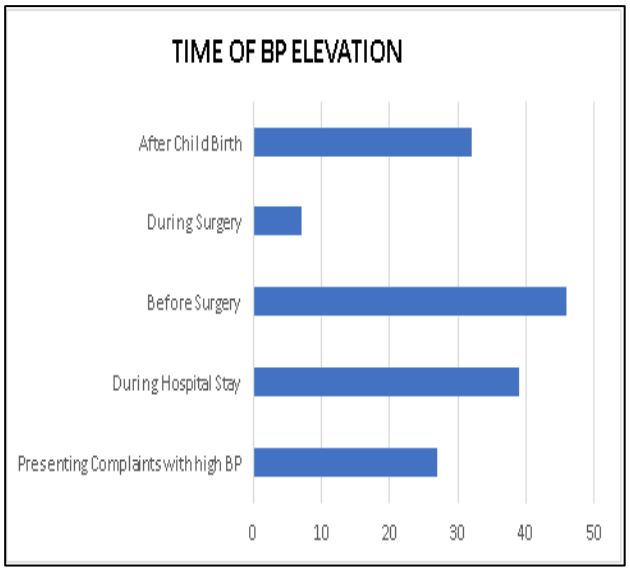

Figure 1: Time of BP elevation.

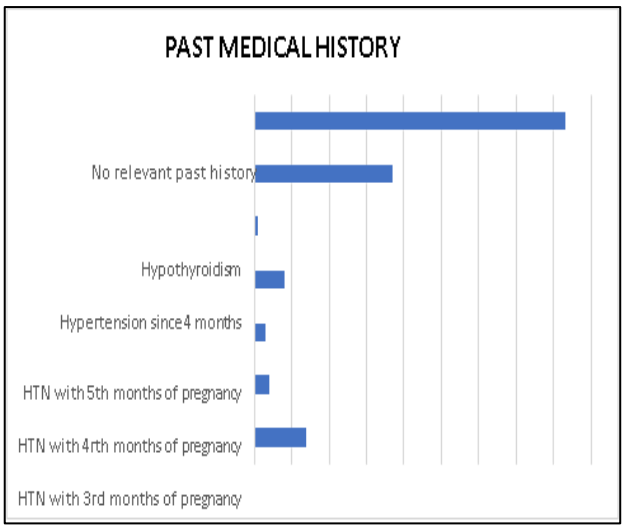

Figure 2: Past medical history.

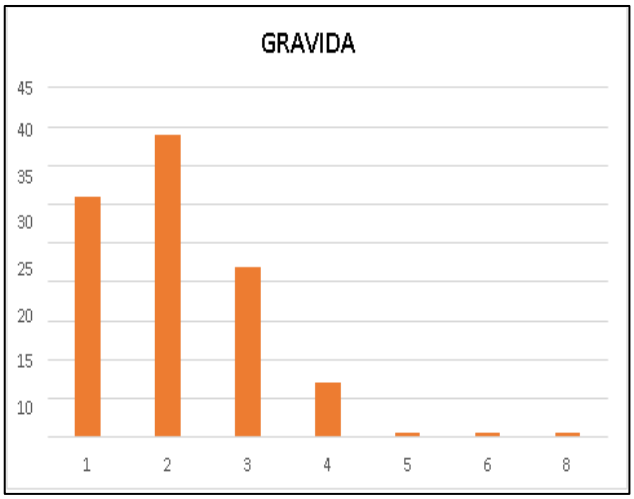

Figure 3: Gravida.

DISCUSSION

Hypertension is the one of the most common problems that happens during pregnancy, which can affect the both mother and the fetus. Nearly about 5% to 10% of the pregnancies are complicated by the hypertension.[10,11] Hypertension are classified as, if a patient having SBP is more than 140 mmHg and DBP is more than 90 mmHg. If the pregnant women having SBP is more than 160 mmHg and DBP is more than 110 mmHg then the patients having the severe hypertension.[12,13] Hypertension is a medical condition of pregnancy which can seriously affects the morbidity and mortality of the patients as well as mother also. Globally, hypertensive diseases cause 14% of the maternal deaths.[14] According to multicentre research, 70% of cases of hypertensive disorders during pregnancy were classified as gestational hypertension or preeclampsia, while about 30% of cases were caused by chronic hypertension. It is one of the most common causes of illness and mortality among mothers and perinatal globally.[2]

From our study it is evident that most of the patient belonged to the age group of 31-35 with mean±SD of 29.97±5.59, followed by patients belonging to age group of 26-30, 21 25, 36-40, 41-45 and 18-20 (n=42, n=33, n=21, n=5 and n=4). Similar results were observed in the study conducted by Liu et al who concluded that risk of developing preeclampsia and eclampsia in teenage pregnancy.[15]

DOC after child birth

For many individuals, calcium channel blockers are first-line treatment. For every drug examined, milk had very low drug levels. The medications were not detected in the rare instances where blood level assessments were performed on breastfed babies. Amlodipine, diltiazem, nicardipine, nifedipine, nimodipine, and verapamil are among the medications under study. There hasn't been any research done on other calcium channel blockers when nursing. The largest body of safety data pertains to nifedipine, whereby countless infants exposed via breast milk-including those whose mothers were receiving treatment for Raynaud phenomenon of the nipple-have not reported experiencing any negative responses. Similar observations are seen in the study that most of the patients were on tablet amlodipine + atenolol (77%; n=115), 3% (n=5) were on the tablet labetalol and 20% (n=30) patients were on the tablet labetalol + tablet nifedipine.[9]

Time of BP elevation

From our study it is found that most of the patients were high BP before the surgery 31% (n=46), and 26% (n=39) of the patients were high BP during hospital stay and 21% (n=32) of the patients were high BP after child birth, 18% (n=27) of the patients were present their complaints with high BP 5% (n=7) of the patients were high BP during the surgery. From our study it found that 25% (n=37) of the patients had a past medical history of hypothyroidism, and 20% (n=30) of the patients were already diagnosed with hypertension and 55% (n=83) were had no relevant past history. Similar study was done by Kiran et al to Scottish research, the majority of pregnant women in our study (89.7%) had a diagnosis of hypothyroidism before to conception, and even in those situations, fewer TSH tests were conducted in our cohort (53.2, 56.7, 61.7, and 66.6% of cases in preconception, 1st, 2nd, and 3rd trimester periods). In her population, they discovered that autoimmune thyroiditis was the most prevalent cause of hypothyroidism, despite the fact that the etiology was unclear in most instances. This finding is consistent with related research that was published in the literature.[8]

Limitations

Although this study has notable strengths, certain limitations should be recognized. The sample size was relatively small and sourced from a single hospital, potentially restricting the applicability of the results to other populations or settings.

CONCLUSION

Hypertension is one of the main causes of maternal and neonatal death 13 and morbidity is pregnancy-induced hypertension. One of the most serious conditions in a pregnant woman's life is hypertension. In our study concluded that age group of 31-35 with mean±SD of 29.97±5.59. Among 150 patients 78% of the patients developed their hypertension in 3rd trimester. The prescribing pattern is presented which includes both monotherapy and combination therapy. In the monotherapy tablet labetalol (100 mg) is prescribed to 60% of 13 the patients and in combination therapy 20% of the patients were on tablet labetalol + tablet nifedipine (100 mg+5 mg) and rest 12% of the patients of injection labetalol (STAT)+tablet labetalol (20 mg+100 mg). The use of multidrug therapy is more rationale. In our study out 150 patients 41 patients are diagnosed with severe hypertension, I.V. magnesium sulphate (4 gm) can be given by slow infusion over two minutes. In our study almost every woman was prescribed with beta-blockers agents but after the child birth the woman prescribed with calcium channel blocker. From our study it is found that 25% of the patients were diagnosed with hypothyroidism and 20% of the patients were diagnosed with the hypertension. Out of 150 patient's majority of the patients (39%) who diagnosed with the hypertension were from the gravida 2.

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