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Study of prevalence of pregnancy induced hypertension in pregnancy

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Abstract
Background: Pregnancy induced hypertension is a common medical disorder associated with pregnancy. Though it is on the decline, it is still a public health problem.
Aim of the study: To study prevalence of gestational hypertension in pregnancy in Cure Well Hospital, Srinivas Colony, Warangal, Telangana.
Materials and methods: This was a prospective study done on 70 cases with hypertensive disorders in pregnancy for a period of nine months in the department of Obstetrics and Gynaecology at Cure Well Hospital, Srinivas Colony, Warangal, Telangana.
Results: Among hypertensive disorders during pregnancy, gestational hypertension ie, 61.7% was most common followed by pre-eclampsia 30%, chronic hypertension constituted 5.7% (04/70) and pre-eclampsia superimposed on chronic hypertension occupied 2.8% (02/70). The highest number of patients with Gestational hypertension and Preeclampsia-eclampsia were found in the age group of 23-27 years.
Conclusion: The prevalence of pregnancy induced hypertension among women attending delivery service were 8.3%. It is more prevalent in younger age groups and is associated with multiple complications in the mother and baby. Early diagnosis and treatment through regular antenatal check-up helps to prevent PIH and its complications.

Keywords: Pregnancy induced hypertension, gestational hypertension, preeclampsia, eclampsia

Introduction
Hypertension is one of the most common medical problems encountered in pregnancy and remains an important cause of maternal and fetal morbidity and mortality [1]. It complicates almost 10% of all pregnancies [2].
The pregnancies that develop hypertension have a higher risk of adverse fetal otcome, neonatal and maternal outcomes, which include preterm birth, intrauterine growth restriction (IUGR), perinatal death, acute renal or hepatic failure, antepartum haemorrhage, postpartum haemorrhage and maternal death [3].
Hypertensive disorders during pregnancy are broadly classified into four categories, as recommended by the National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy: These are a) chronic hypertension, b) preeclampsia-eclampsia, c) preeclampsia superimposed on chronic hypertension, and d) gestational hypertension (transient hypertension of pregnancy or chronic hypertension identified in the latter half of pregnancy) [4].
Pregnancy-induced hypertension (PIH) is classified as mild or severe. *Mild PIH* is defined as new-onset hypertension (systolic blood pressure ≥ 140 mm Hg and/or diastolic blood pressure ≥ 90 mm Hg), occurring after 20 weeks of gestation. The majority of cases of mild PIH develop beyond 37 weeks of gestation, and in these cases, pregnancy outcomes are comparable to those of normotensive pregnancies [5, 6, 7].

Aim of the Study
To study prevalence of pregnancy induced hypertension in our local population.

Materials and Methods
This was a prospective observational study done over a period of nine months from June 2019 to February 2020 in the department of Obstetrics and Gynaecology at Cure well Hospital, Srinivas Colony, Warangal, Telangana, India.

Written informed consent was obtained from the all the cases included in the study. There were no ethical issues involved int he study.

Inclusion criteria

Pregnant women who were willing to participate in the study Age 18 years to 36 years Pregnant women with hypertensive disorders

Exclusion criteria

Patients who are unwilling to participate in the study Age less than 18 years and more than 36 years Pregnant women with known past history of hypertension

Method of collection of data

This was a prospective cross sectional observational study done on 70 pregnant women with hypertensive disorders attending antenatal clinic at department of Obstetrics and Gynaecology at Cure Well Hospital, Srinivas Colony, Warangal, Telangana.

The study protocol was explained to all the pregnant women included in the study. A questionnaire was prepared for collection of demographic data that included antenatal registration, maternal age, parity (primigravida, 2nd/3rd multigravida), history of any maternal illness in pregnancy/ high risk factors namely pregnancy induced hypertension, bad obstetric history, premature rupture of membranes > 18 hours, medical diseases in pregnancy (heart disease, diabetes mellitus), others (Anemia, any chronic respiratory diseases), HIV / HBsAg status of mother

Type of delivery: Full term normal delivery,

Instrumentation – forceps/vacuum

Lower segment cesarean section (LSCS)

Blood group with Rh factor

General physical examination was done and examined for pallor, icterus, cyanosis, Clubbing, Koilonychia and lympadenopathy. Blood pressure (BP) was measured thrice and the average was taken. Systolic and diastolic BP were measured in all of the subjects. The diagnosis of hypertension was based on a systolic BP of 140 mmHg or higher and a diastolic BP of 90 mmHg or higher.

Classification of hypertension in pregnancy was done as follows:

Chronic hypertension: BP ≥140 mmHg systolic or 90 mmHg diastolic prior to pregnancy or before 20 weeks gestation and persists >12 weeks postpartum.

Gestational hypertension: High BP that develops after week 20 in pregnancy and goes away after delivery.

Preeclampsia: Both chronic hypertension and gestational hypertension can lead to this severe condition after week 20 of pregnancy. Symptoms include high BP and protein in the urine and can lead to serious complications for both mother and baby if not treated promptly [8].

Blood samples were collected from all the pregnant women included in the study and were sent to central laboratory for relevant investigations that included:

Complete blood count (CBC) was done on 2 ml of blood sample collected in K3 EDTA vials. Peripheral smear examination was done on slides stained by Leishman stain and examined in detail. Reticulocyte count was estimated on New Methylene Blue stained smears and hemolysis was looked for. Direct and indirect Coombs test was done by agglutinition methods. Maternal and neonatal blood group and RH typing were done. Liver function tests and Renal function tests were also done.

All patients with hypertensive disorders of pregnancy in our study were treated with anti-hypertensives. All cases of severe preeclampsia/eclampsia were treated with magnesium sulphate (MgSO4).

Fetal well-being and amniotic fluid volume were evaluated by physical examination and sonography at regular intervals.

The obstetric management done following standard protocols. Maternal outcome in terms of complications like HELLP syndrome, abruptio placenta, pulmonary edema, postpartum hemorrhage and acute renal failure were noted.

Observations and Results

There were a total of 70 pregnant women with hypertension. The patient age ranged from 18 years to 36 years.

Table 1: Age distribution

Age distribution	No. of cases	Percentage (%)
18-24	26	37.1%
25-31	34	48.5%
31-36	10	14.2%
TOTAL	70	100%

In the present study hypertensive disorders were highest in the age group of 25-31 years

Table 2: Distribution based on hypertensive disorders

Hypertensive disorder	No. of cases	Percentage (%)
Gestational hypertension	43	61.4%
Chronic hypertension	04	5.7%
Pre-eclampsia	21	30%
Pre-eclampsia superimposed on chronic hypertension	02	2.8%
Total	70	100%

In the present study, among hypertensive disorders during pregnancy, gestational hypertension was the most common one. The highest number of patients with Gestational hypertension and Preeclampsia-eclampsia were found in the age group of 23-27 years.

Table 3: Distribution based on parity

Parity	No. of cases	Percentage (%)
Primigravida	45	64.2%
Multigravida	25	35.7%
Total	70	100%

Hypertensive disorders in pregnancy were more common in primigravida women.

Table 4: Distribution based on gestational age

Gestational age	No. of cases	Percentage (%)
21-24 weeks	02	2.8%
25-30 weeks	28	40%
31-36 weeks	25	35.7%
>36weeks	15	21.4%
Total	70	100%

In our study, majority of the cases were noted in 25-30 weeks of gestation.

Table 5: Distribution based on symptoms

Clinical symptoms	No.of cases	Percentage (%)
Headache	16	22.8%
Vomiting	10	14.2%
Epigastric discomfort	05	7.1%
Edema feet	04	5.7%
Lower abdominal pain	18	25.7%
Dizziness	10	14.2%
No complaints	07	10%
Total	70	100%

Lower abdominal pain and headache were the most common complaints in the study group. There were 10% asymptomatic cases who had hypertension in pregnancy and were unaware of it.

Table 6: Distribution based on blood pressure

Blood pressure (in mm Hg)	No. of cases	Percentage (%)
Systolic 140 – 160 Diastolic 90 - 110	60	85.7%
Systolic >160 Diastolic >110	10	14.2%
Total	70	100%

Most of the subjects had systolic BP in the 140-160 mmHg range and the diastolic BP in 90-110 range.

Table 7: Distribution based on mode of delivery

Mode of delivery	No. of cases	Percentage (%)
Normal vaginal delivery	30	42.8%
Instrumental	05	7.1%
Caesarean section	35	50%
Total	70	100%

Caesarean section delivery rate was a little high.

Table 8: Distribution of delivery based on gestational age

Gestational age	No. of cases	Percentage (%)
Term delivery	55	78.5%
Preterm delivery	15	21.4%
Total	70	100%

Term births were higher than preterm births.

Table 9: Distribution based on birth weight of neonates

Birth weight	No. of cases	Percentage (%)
<2.5 kg	10	14.2%
2.5 -3.5 kg	45	64.2%
>3.5 kg	15	21.4%
Total	70	100%

Most of the babies were in the 2.5 to 3.5 kg weight group.

Table 10: Distribution based on maternal complications

Maternal complication	No. of cases	Percentage (%)
HELLP syndrome	02	8.6%
Abruptio placenta	05	21.7%
Pulmonary edema	01	4.3%
Postpartum hemorrhage	05	21.7%

Among Preeclampsia cases the present study revealed that HELLP syndrome was seen in 8.6% cases and abruptio placenta affected 21.7% cases.

Prevalence

The prevalence of hypertensive disorders was 8.3%

Prevalence: Total number of cases with hypertensive disorders x 100 divided by Total number of pregnant cases.

= 70 x100/842 = 8.3%

Prevalence of Gestational hypertension was 6.1% and prevalence of Preclampsia was 3.2%.

Discussion

Hypertensive disorders of pregnancy are common and if undetected and untreated can have serious maternal and fetal complications.

Comparative studies related to prevalence of hypertensive disorders of pregnancy

In the present study the prevalence of hypertensive disorders was 8.3%. Gogaram *et al.* in their study [9] observed the prevalence of hypertensive disorders of pregnancy to be 9.2%. Hirpara *et al.* [10] did a case control study with100 pregnant women half of them having hypertension an remaining half were normotensives. Sajith *et al.* [11] and Njukan *et al.* [12] reported a prevalence of 14.5% and 7.8% respectively. Patel *et al.* [13] from Gujarat studied 64 pregnant women with PIH. In the study by Gude *et al.* [14] the prevalence of pregnancy induced hypertension was 7.9%.

Comparative studies related to maternal age

In the present study, majority of the pregnant women were in the age group of 25-31 years ie, 48.5% (26/70) followed by 18- 24 years which constituted 27.1% (26/70) cases. In the study by Gogaram *et al.* [9] highest number of patients were in the age group of 23-27 years (35.57%) and least were above 32 years age group 19.5%). In the study by Hirpara *et al.* [10] majority of women in both groups were in 21 to 30 years. Sajith *et al.* [11] in their study observed highest number of patients in the age group of 18-22 years (41.3%) and least above 32 years age group (3.8%). The mean maternal age at delivery was 23.8 years. Njukan *et al.* [12] observed that over a third of the pregnant women 455 (37.6%) and 390 (32.3%) were between ages ≤24 years and 25-29 years old respectively. The mean/standard deviation (SD) age of participants was 26.9 (+/-5.9) years respectively. Patel *et al.* [13] reported higher percentage of PIH in 18-22 years of age group (51.56%) followed by 23-27 years of age group (28.12%) and 28-32 years of age group (17.18%).

Comparative studies related to parity

In our study, 45 (64.2%) cases were primigravida, and 25 (35.7%) cases were multigravida. Gogaram *et al.* [9] reported 108 primigravida (55.67%) and 86 multigravida (44.33%) in a similar study.

Comparative studies related to symptoms

In the present study, majority presented with lower abdominal pain ie, 25.7% (18/60) cases, followed by headache ie, 22.8% (16/70) cases. Vomiting and dizziness were seen in 14.2% cases each, epigastric discomfort was present in 7.1%, pedal edema in 5.7% cases and no complaints were registered in 10% cases. In Sajith *et al.* [11] study, headache was seen in 19.2%, epigastric pain in 17.3%, peripheral edema in 13.5%, blurring of vision in 1.9% patients. They also observed seizures in 4 patients. None of our patients had seizures. In Patel *et al.* [13] study, 48.44% had

lower abdominal pain, 18.75% had vomiting/epigastric discomfort followed by headache (12.50%), convulsion (10.94%), edema feet (9.37%), dizziness (7.81%) and no complaints were seen in 10.94% cases.

Comparative studies related to delivery related to gestational age

In our study, we observed that 78.5% cases had delivered at term gestation and 21.4% had preterm deliveries. Gogaram *et al.* [9] observed in hypertensive mothers, most of the newborns were born preterm. Preterm delivery was the most prevalent among such outcomes. In Patel *et al.* [13] study, 54.69% mothers had preterm delivery and 4.69% had post term delivery.

Comparative studies related to hypertensive disorder

In our study, among hypertensive disorders during pregnancy, gestational hypertension 61.7% cases was most commonly followed by pre-eclampsia 30%, chronic hypertension constituted 5.7%, and pre-eclampsia superimposed on chronic hypertension constituted 2.8%. In the study by Gudet *et al.* [14], 05 (15.2%) were gestational hypertensives, 12 (36.4%) were mild preeclampsia, 15 (45.5%) were severe preeclampsia and 01 (3%) were of eclampsia. In Njukan *et al.* [12] study, 3.4% suffered chronic hypertension (CH), 5.7% suffered preeclampsia superimposed on chronic hypertension (PSCH), 31.8% suffered gestational hypertension (GH), 48.3% suffered preeclampsia (PE) and 10.8% suffered severe preeclampsia. In Sajith *et al.* [11] study, gestational hypertension of pregnancy was diagnosed in 20 (19.2%) cases, and 74 patients (71.1%) and 8 (7.7%) patients appeared to be pre-eclamptic and eclamptic respectively.

Comparative studies related to blood pressure

In our study, 85.7% (60/70) cases had systolic BP 140 -160 mm Hg and diastolic BP of 90 -110 mm Hg. Next, 14.2% (10/70) cases had systolic BP >160 mm Hg and diastolic BP >110 mm Hg. Patel *et al.* [13] noted in their study that out of 64 PIH patients, 85.93% and 98.43% had mild PIH with systolic BP 140-160 mm Hg and diastolic B.P. 90-110mmHg respectively. While 15.51% had sever PIH with systolic BP more than 160 mm Hg. Njukan *et al.* [12] noted 6.4% suffered high blood pressure by elevated systolic blood pressure only, 4.6% suffered high BP by elevated DBP only while 3.4% had both elevated systolic and diastolic blood pressure. Gudet *et al.* [14] noted the mean of systolic blood pressure was 110.72 ± 15.315 with the range of 90 mm Hg to 210 mm Hg and the mean of diastolic blood pressure was 72.71 ± 13.093 with range of 50 mm Hg to160 mm Hg.

Comparative studies related to birth weight

In our study, 64.2% (45/70) had low birth weight and 14.2% (10/70) neonates had very low birth weight. Gudet *et al.* [14] noted 08 (24.2%) were low birth weight and only 02 (6.1%) were very low birth weight neonates, 03 (9.1%) were stillbirths and 06 (1.4%) had birth asphyxia. Patel *et al.* [13] noted 53.12% of babies had low birth weight, 07.81% had intrauterine growth restriction (IUGR). Out of 64 deliveries, 18.75% of babies required NICU admission for various causes, 1.56% were of intrauterine fetal death (IUFD) and 1.56% had neonatal death.
Our findings compare well with those of above authors.

Conclusion

In our study we noted that pregnancy induced hypertension (PIH) is more prevalent in younger age groups and is associated with multiple complications in the mother and baby. Early diagnosis and treatment through regular antenatal check-up helps to prevent PIH and its complications.

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