Original Article

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Perinatal Outcomes in Women with History of Chronic Hypertension but Controlled Blood Pressure Before 20 Weeks Gestation

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ABSTRACT

Objective: To determine the perinatal outcome in women with prior history of chronic hypertension but controlled BP before 20 weeks of gestation.

Methodology: A descriptive cross-sectional study was conducted at the Department of Gynaecology, Sheikh Zayed Medical College, Rahim Yar Khan, from November 2019, to May 2020, on patients aged 20 to 40 years old with singleton pregnancy of 20 weeks or more with previous history of hypertension but currently on no treatment for last one month or more and with normal blood pressure irrespective of parity. After taking demographic and clinical information the patients were followed every month to look for small for gestational age (SGA), pre-eclampsia and pre-term birth. Data was entered and analysed using SPSS-version 26.0.

Results: Overall mean age was 28.1 ± 3.2 years. Out of all cases, 22% had fetuses small for gestational age, 21% developed pre-eclampsia, and 23% had urinary protein levels below 300 mg/24 hours, while 77% had raised levels. FSGA was most common at ages 26–30 (50%) and pre-eclampsia at 31–40 years (41.9%), both significantly associated with age and parity (p=0.031, p=0.0497), but not with previous cesarean (p>0.05). Preterm birth was more frequent in ages 26–40 and higher parity, while statistically insignificant (p>0.05).

Conclusion: Women with a history of chronic hypertension, even when blood pressure is controlled before 20 weeks of gestation, remain at increased risk for adverse perinatal outcomes.

Keywords: Chronic Hypertension, Control BP, Preeclampsia, Preterm birth, SGA.

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Introduction

Chronic hypertension is a major global health concern and a leading contributor to both vascular and neurological disorders. It occurs in approximately 3–5% of pregnancies and is linked to greater chances of developing preeclampsia, higher frequencies of cesarean delivery, abruption of placenta, preterm birth, and adverse perinatal outcomes.[1] In the context of pregnancy, it is diagnosed when blood pressure readings exceed 140/90 mmHg either before conception or within the first 20 weeks of gestation.[1,2] Before the Chronic Hypertension and Pregnancy trail, the studies indicated that maintaining blood pressure at lower targets reduced the likelihood of severe hypertension, yet did not show a meaningful decline in preeclampsia or new-born complications. Nonetheless, certain investigations reported a possible rise in cases of small-for-gestational-age.[3,4]

Pregnant women with a prior history of chronic hypertension face an approximately five- to six-times higher likelihood of developing cardiovascular, cerebrovascular, and multiple organ complications compared to women with normal blood pressure.[5,6] Furthermore, research highlights that those with primary hypertension are prone to earlier onset and more severe maternal as well as fetal complications when pregnancy is further complicated by preeclampsia.[5]

Additionally, to its significant prevalence, there are immeasurable, complex risks to both the mother and fetus, beyond those with normotensive pregnancies: chronic hypertension is inextricably linked with substantially increased risks of superimposed preeclampsia, placental abruption, fetal growth restriction, preterm birth, and perinatal mortality. Such increased risks demonstrate the complicated linked between the pathobiology of disease and the profound hemodynamic and placental disturbances, which ensue from the presence of hypertension at all times during the pregnancy.[7,8]

Limited evidence is available regarding pregnancies affected by chronic hypertension as a distinct subgroup.[9] Most previous research has relied mainly on diagnostic codes or medication records to evaluate the risks linked to chronic hypertension in pregnancy. It remains uncertain whether women with a prior history of chronic hypertension, who maintain normal blood pressure without medication during pregnancy, have a heightened likelihood of stillbirth, fetal growth restriction, or other adverse perinatal outcome.[9] to best our knowledge there is limited evidence worldwide on perinatal outcomes in women with chronic hypertension whose blood pressure is well controlled early in pregnancy, and no such data are available at local level. Therefore, this novel local study addresses the gap by evaluating outcomes in women with a history of chronic hypertension but normal blood pressure before 20 weeks of gestation. Its significance lies in determining whether adverse outcomes still occur despite early control, emphasizing that a history of chronic hypertension should not be ignored. The findings will be helpful in guiding comprehensive antenatal care, risk stratification, and management protocols to prevent complications and improve maternal and neonatal health.

Methodology

This descriptive cross sectional study was carried out in the Department of Gynaecology, Sheikh Zayed Medical College/ Hospital Rahim Yar Khan. Study was done with six months' duration from November 2019 to 10th May 2020. All the patients with aged 20 to 40 years old with singleton pregnancy of 20 weeks or more with previous history of hypertension but currently on no treatment for last one month or more and with normal blood pressure irrespective of parity were included in the study. Non probability consecutive sampling technique was used. All the patients with prior history of eclampsia and pre eclampsia and patient with renal impairments or cardiac failure and those who were agreeing to participate in the study were excluded. The sample size was calculated as 155 by keeping the confidence interval equal to 95%, margin of error equal to 5% and the anticipated prevalence of small for gestational age in 11.3% in previous studies.[7] Informed consent was taken from each subject for inclusion in study. Demographic and clinical data like age, weight, age of gestation at presentation, parity, educational status, residential status and history of previous C section were taken and recorded. After that all these cases were followed every month to look for small for gestational age, pre-eclampsia (blood pressure greater than 140/90 mmHg (with both systolic and diastolic raised) on at least one occasion, along with 24-hour urinary protein excretion exceeding 300 mg/dl) and pre-term birth (delivery of the fetus before 37 completed weeks of gestation). The results were noted and recorded on the study proforma. Data was analyzed with help of SPSS-version 26.0. Post stratification Chi square test was applied and a p- value <0.05 was taken as significant.

Results

Overall mean age was 28.1 ± 3.2 years, average weight 64.8 ± 5.0 kg, and mean gestational age 23.1 ± 2.0 weeks. Majority of women were Para III (41%) and Para IV (31%), while 6% were primiparous. Around 45% were educated, 44% had a previous cesarean section, and slightly more lived in urban (53%) than rural areas (47%). Table I

Table I: Descriptive statistics for demographic characteristics. (n=155)

VARIABLES		STATISTICS
Mean age (Mean ±SD)		28.09±3.22 years
Weight(kilograms)		64.80±5.02 kg
Gestational age at presentation		23.14±1.96 weeks
Parity	Primiparous	9(6.0%)
	Para II	34(22.0%)
	Para III	63(41.0%)
	Para IV	49(31.0%)
Educational status	Educated	70(45.0%)
	Uneducated	85(55.0%)
Previous history of C-section	Yes	68(44.0%)
	No	87(56.0%)
Residential status	Rural	73(47.0%)
	Urban	82(53.0%)

Among all patients, 22% had fetuses small for gestational age, 21% developed pre-eclampsia, and 23% had urinary protein levels below 300 mg/24 hours while 77% had levels above this threshold. Table II.

Additionally, preterm birth was most frequent among those aged 26–30 years (43.4%) and 31–40 years

(32.1%), though the association with age was not statistically significant (p=0.190). Higher parity showed a trend toward increased risk, with 41.5% of preterm births occurring in women with four children, but again without significant association (p=0.162). Similarly, a history of previous cesarean section did not show a significant relationship with preterm birth (p=0.669). **Table IV**

Table II: Outcomes of the patients. (n=155)

Foetus small for gestational age	Yes	34(22.0%)
	No	121(78.0%)
Pre-eclampsia	Yes	32(21.0%)
	No	123(79.0%)
24 hours urinary protein	≤ 300 mg	35(23.0%)
	> 300 mg	120(77.0%)

Table IV: Preterm birth with respect to the age, parity and history of previous c section. (n=155)

Age Groups	**Preterm Birth**			
	Yes	No	Total	P Value
20-25	13 (24.5%)	25 (24.5%)	38 (24.5%)	
26-30	23 (43.4%)	57 (55.9%)	80 (51.6%)	P-0.190
31-40	17 (32.1%)	20 (19.6%)	37 (23.9%)	
Parity				
One	1 (1.9%)	8 (7.8%)	1 (1.9%)	
Two	11 (20.8%)	23 (22.5%)	11 (20.8%)	P-0.162
Three	19 (35.8%)	44 (43.1%)	19 (35.8%)	
Four	22 (41.5%)	27 (26.5%)	22 (41.5%)	
H/O Previous Cesarean Section				
Yes	22 (41.5%)	46 (45.1%)	68 (43.9%)	p-0.669
No	31 (58.5%)	56 (54.9%)	87 (56.1%)	

Discussion

Hypertensive conditions during pregnancy are a significant contributor to illness and death among mothers, fetuses, and new-borns, occurring in nearly one-tenth of all pregnancies worldwide.[10] Even when blood pressure is controlled before 20 weeks of gestation, the risk of adverse maternal and fetal outcomes may still persist. Therefore, this study has been done to sort out this association on 155 patients with overall mean age was 28.1 ± 3.2 years, and mean gestational age at presentation was 23.1 ± 2.0 weeks with majority of women were para III (41%) and para IV (31%) and moistly were urban resident**.** In aligns to this study Fikadu K et al[11] reported that the participants had an average age of 25 ±5.5 years and most of the women, 110 in total (65.9%), had age range of 20–34 year. On the other hand Nisar N et al[12] reported that the average age of mothers was 28.57±5.8 years and average gestational age was 35.29±2.6 weeks. However, in aligns to this study Youngstrom M et al[9] reported that the mean age of women was 24.86±5.9 years. There was some variation in the findings for mean age and mean gestational age, which may be due to differences in sample size and selection criteria across the studies.

Additionally, in this study out of all patients, 22% had fetuses small for gestational age, 21% developed pre-eclampsia, and 23% had urinary protein levels below 300 mg/24 hours while 77% had levels above this threshold. In aligns to this study only one similar study by Youngstrom M et al[9] found in the literature which concluded that the regardless having normal baseline blood pressure without medication before 20 weeks of gestation, women with chronic hypertension remain at higher risk of adverse perinatal outcomes compared with those without hypertension. In the parallel of this study Harper LM et al[13] reported that the women with an average blood pressure below 130/80 mmHg had fewer adverse perinatal outcomes (19.3% vs 46.5%, RR 0.43, p<0.01), including lower risks of severe preeclampsia, preterm birth before 35 weeks, NICU admission, and small-for-gestational-age infants, with no significant differences in cesarean delivery or perinatal death.[13]

In the comparison of this study Nzelu D, et al[14] conducted a study on chronic hypertension and first-trimester blood pressure control, reporting a stepwise rise from group 1 to group 3 in severe hypertension (10.6%,

Table III: FSGA and pre-eclampsia with respect to the age, parity and history of previous C-section. (n=155)

Age groups	**FSGA**			**Pre-eclampsia**		
	Yes	**No**	**p-value**	**Yes**	**No**	**P-value**
20-25	6 (17.6%)	32 (26.4%)		6 (19.4%)	32 (25.8%)	
26-30	17 (50%)	63 (52.1%)	0.337	12 (38.7%)	68 (54.8%)	0.031
31-40	11(32.4%)	26 (21.5%)		13(41.9%)	24 (19.4%)	
Parity						
One	2 (5.9%)	7 (5.8%)		1 (3.2%)	8 (6.5%)	
Two	6 (17.6%)	28 (23.1%)	0.0497	5 (16.1%)	29 (23.4%)	0.0497
Three	15 (44.1%)	48 (39.7%)		12(38.7%)	51 (41.1%)	
Four	11 (32.4%)	38 (31.4%)		13 (41.9%)	36 (29.0%)	
H/O Previous Cesarean Section						
Yes	13 (38.2%)	55 (45.5%)		11 (35.5%)	57 (46.0%)	
No	21 (61.8%)	66 (54.5%)	0.454	20 (64.5%)	67 (54.0%)	0.293

22.2%, 52.1%), preterm preeclampsia <37 weeks (7.0%, 15.9%, 20.4%), and small-for-gestational-age infants (13.1%, 17.7%, 21.1%), while rates of term preeclampsia ≥37 weeks showed no significant difference (9.5%, 9.1%, 6.6%).[14] The active treatment lowered adverse outcomes (30.2% vs 37.0%), preeclampsia (24.4% vs 31.1%), and preterm birth (27.5% vs 31.4%), while rates of small-for-gestational-age infants, maternal, and neonatal complications were similar between groups.[15] In the study by Mitchell CJ et al[16] conducted on chronic hypertension with blood pressure maintained below 140/90 mmHg and reported that the risk of small-for-gestational-age infants were not significantly higher in women with mean systolic BP <120 mmHg compared to those with systolic BP 120–129 mmHg. According to another study by Magee LA et al[17] reported that the in the Control of Hypertension in Pregnancy Study, 961 women (97.4%) showed that higher blood pressure was significantly associated with adverse maternal and perinatal outcomes ($p<0.001$), while in 913 women (92.5%) with follow-ups, greater BP variability increased the odds of severe hypertension and preeclampsia ($p<0.01$); however, higher diastolic variability appeared linked to fewer adverse perinatal outcomes.[17]

However, no further relevant studies were identified in the available literature, making this work novel at the local level by addressing a largely ignored issue of chronic hypertension history with normal blood pressure in pregnancy. This study has some important limitations, including a relatively small sample size, absence of a control group, and lack of comparison with other potential risk factors. Therefore, larger national and international studies are strongly recommended to validate these findings and to establish effective management strategies, as women with a history of chronic hypertension, even with normal blood pressure and not on antihypertensive medication, still remain at considerable risk of adverse perinatal outcomes.

Conclusion

Study revealed that the women with a history of chronic hypertension, even when blood pressure is controlled before 20 weeks of gestation, remain at increased risk for adverse perinatal outcomes. A significant proportion suffered from fetal small for gestational age, pre-eclampsia, and preterm birth, particularly among multiparous women and those in older age groups. Additionally, the strong correlation between proteinuria, preterm birth, and hypertension highlights the importance of routine urine protein screening as an essential component of antenatal care in women with hypertensive pregnancies. Based on the significant limitations of the current study, future research should prioritize evaluating long-term maternal and neonatal outcomes in hypertensive pregnancies, as well as assessing the effectiveness of different management strategies across diverse healthcare facilities.

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