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Assessing Hypertensive Disorders in Pregnancy and Associated Outcomes: A Cross – Sectional Study in Pakistan

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Abstract: -

Objective: To determine the association between hypertensive disorders and pregnancy outcomes.

Study Design: Cross-sectional study.

Study Location: Benazir Bhutto Hospital, Rawalpindi.

Study Duration: 1 month.

Methods: The study was conducted in the Department of Gynecology from November 15, 2023, to December 15, 2023. Data were collected from 18 pregnant women using a revalidated questionnaire. The data were then entered into SPSS for analysis.

Results: The results showed a significant association between pregnancy-induced hypertension and certain pregnancy outcomes. Parameters such as maternal age, mean blood pressure (BP), mode of delivery, and birth weight of babies were assessed and showed varied results. Pregnant women at higher extremes of age had a greater prevalence of elevated mean blood pressures. Additionally, the results indicated that the higher the maternal age, the higher the likelihood of having a C-section and elevated mean blood pressures. Most babies born had a mean birth weight of around 3 kg. However, birth weight did not show a significant association with BP.

Conclusion: Hypertensive disorders of pregnancy (HDP) are influenced by various factors, with older maternal age and obesity being the most common. The incidence of hypertensive disorders of pregnancy varies based on race, socioeconomic status, age, and parity. Creating awareness of the risks associated with hypertensive disorders of pregnancy is essential. Pregnant women with hypertensive disorders require frequent antenatal visits to ensure appropriate outcomes.

Keywords: Hypertension, Pregnancy, Outcomes.

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Introduction

Hypertension is one of the common problems associated with pregnancy and may lead to complications such as eclampsia, acute renal failure, maternal death, premature delivery, intrauterine growth restriction, and others. Hypertension in pregnancy is a major challenge in antenatal practice due to its significant impact on obstetric and fetal outcomes. It plays a role in up to 15% of complications during pregnancy and the postpartum period.[1]

Hypertensive disorders of pregnancy encompass preexisting (or chronic) hypertension, gestational hypertension, preeclampsia, and eclampsia, with an estimated prevalence of 5% to 10% among women of reproductive age.[2,3] These disorders are significant contributors to maternal and perinatal morbidity and mortality, accounting for 30,000 maternal deaths annually worldwide and 10% to 15% of maternal deaths in low- and middle-income countries.[4,5] A multicenter study conducted in India, Nigeria, Pakistan, and Mozambique found that one out of every ten pregnant women had hypertension.[6]

Studies have identified pregnancy-induced hypertension as a significant independent risk factor for developing gestational diabetes mellitus.[7] Women with a history of raised blood pressure during pregnancy are reportedly at higher risk of developing cardiovascular diseases (CVD) later in life.[8,9,10] This increased risk has been attributed to common CVD risk factors such as type 2 diabetes, chronic hypertension, and elevated blood lipids associated with rapid urbanization and changing lifestyles.[11,12]

The incidence of hypertension during pregnancy is rising and is linked to an increased risk of fetal growth retardation and adverse

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birth outcomes.[13] Research from India indicates that hypertension during pregnancy may contribute to up to one-third of maternal deaths.[14,15] While blood pressure measurement is routinely monitored as part of antenatal care, a better understanding of the burden of hypertension during pregnancy and its associated risk factors is essential. Primary care physicians, often the first point of contact, need to be sensitized about hypertension during pregnancy. Identifying modifiable risk factors is crucial for the primary prevention of this condition and for avoiding adverse maternal and fetal outcomes.

Given this background, the present study aims to assess the prevalence of hypertension during pregnancy and its associated risk factors among pregnant women receiving antenatal care at public sector hospitals in Bengaluru, Southern India. Pregnancy-induced hypertension is a major contributor to maternal and perinatal morbidity and mortality. In the United States, about 15% of maternal deaths are attributable to hypertension, making it the second leading cause of maternal mortality. Severe hypertension increases the mother's risk of cardiac failure, heart attack, renal failure, and cerebrovascular accidents. Additionally, the fetus is at increased risk for complications such as poor placental transfer of oxygen, growth restriction, preterm birth, placental abruption, stillbirth, and neonatal death.[2]

Hypertensive disorders are the most common medical complications of pregnancy, with a reported incidence of 5–10%.[6,7] Globally, preeclampsia is a leading cause of maternal and neonatal mortality and morbidity, predominantly in developing countries. The disorder is usually diagnosed in late pregnancy by the presence of high blood pressure with proteinuria and/or edema. Preventing any disease process requires awareness of its prevalence, etiology, and pathogenesis.[8] The World Health Organization estimates that at least one woman dies every seven minutes from complications of pregnancy-induced hypertension disorders. Pregnancy complicated by hypertensive disorders is associated with an increased risk of adverse fetal, neonatal, and maternal outcomes.[9]

Therefore, the objective of this study was to assess pregnancy-induced hypertension and its associated factors among women attending delivery services at Benazir Bhutto Hospital, Rawalpindi.

Methodology

This cross-sectional study was conducted at Benazir Bhutto Hospital, Rawalpindi, a tertiary care hospital. The study duration was from November 15, 2023, to December 15, 2023. The sample size included eighteen pregnant women with pregnancy-induced hypertension (PIH), as evidenced by elevated mean blood pressure recorded every eight hours for two days. Data was collected from department registers using a validated questionnaire. The collected data included information on age, mean blood pressure, gravidity and parity, mode of delivery, and birth weight. After data collection, the information was entered and analyzed using IBM SPSS software version 28.

Results

This research explored the effects of pregnancy-induced hypertension (PIH) on pregnancy outcomes. Data were collected from a tertiary care hospital in Rawalpindi, with a sample consisting of eighteen pregnant women. The parameters recorded and analyzed included age, mean blood pressure (BP), mode of delivery, and birth weight of the baby. Analysis was performed using the Statistical Program for Social Sciences (SPSS).

The results indicated that the minimum mean systolic pressure was 140 mmHg, while the maximum mean systolic pressure was 155 mmHg. The minimum mean diastolic blood pressure was 90 mmHg, and the maximum mean diastolic blood pressure was 110 mmHg. Among the participants, four women had a mean BP of 140/90 mmHg, three women had a mean BP of 145/95 mmHg, three women had a mean BP of 150/100 mmHg, four women had a mean BP of 150/90 mmHg, one woman had a mean BP of 150/95 mmHg, two women had a mean BP of 155/95 mmHg, and one woman had a mean BP of 160/110 mmHg. Overall, 22.2% of the women had a mean blood pressure of 140/90 mmHg, while 5.6% had a mean blood pressure of 160/110 mmHg.

The ages of the pregnant women ranged from 20 to 46 years, with a mean age of 34.1 years. The mean birth weight of the babies was 2.82 kg, with the minimum birth weight recorded at 1.20 kg and the maximum at 3.20 kg.

Statistics

BP		
N	Valid	18
	Missing	0

Statistics

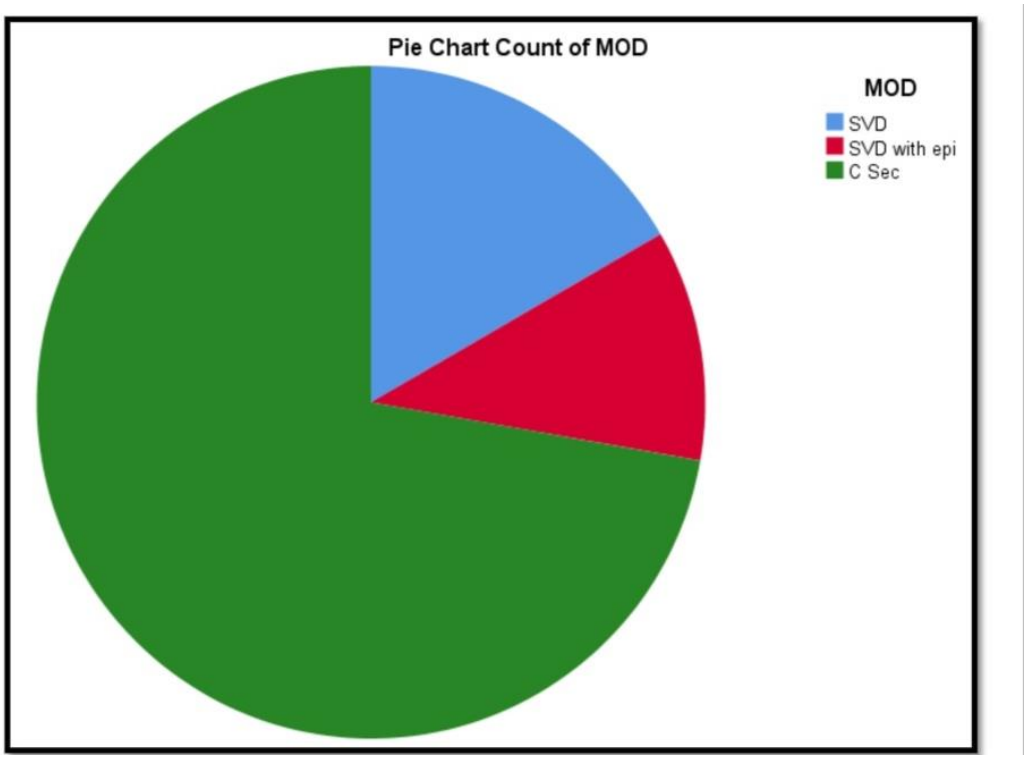
		MOD	BW	BP	AGE	GP
N	Valid	18	18	18	18	18
	Missing	0	0	0	0	0
Mean			2.8278		34.11	
Median			2.9333[a]		35.25[a]	
Mode			3.00		35[b]	
Std. Deviation			.48484		8.145	
Minimum			1.20		20	
Maximum			3.20		46	

a. Calculated from grouped data.
b. Multiple modes exist. The smallest value is shown

BP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	140/90	4	22.2	22.2	22.2
	145/95	3	16.7	16.7	38.9
	150/100	3	16.7	16.7	55.6
	150/90	4	22.2	22.2	77.8
	150/95	1	5.6	5.6	83.3
	155/95	2	11.1	11.1	94.4
	160/110	1	5.6	5.6	100.0
	Total	18	100.0	100.0	

In terms of mode of delivery (MOD) three women underwent spontaneous vaginal delivery (SVD), two women had SVD with episiotomy and thirteen women had cesarean section. 16.66 percent women had SVD, 11.1 percent had SVD with episiotomy, and 72.22 percent women underwent cesarean section.



MOD

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SVD	3	16.66	16.66	16.66
	SVD with epi	2	i i.i	i i.i	27.76
	C Sec	13	72.22	72.22	100.0
	Total	18	100.0	100.0	

Minimum recorded birth weight was 1.20 kg and maximum recorded birth weight was 3.20 kg. 77.8 percent babies had birth weight of 3 kg; remaining 22.4 percent babies had birth weights of 1.20 kg, 2 kg, 2.50 kg and 3.20kg.

BW

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.20	1	5.6	5.6	5.6
	2.00	1	5.6	5.6	11.1
	2.50	1	5.6	5.6	16.7
	3.00	14	77.8	77.8	94.4
	3.20	1	5.6	5.6	100.0
	Total	18	100.0	100.0	

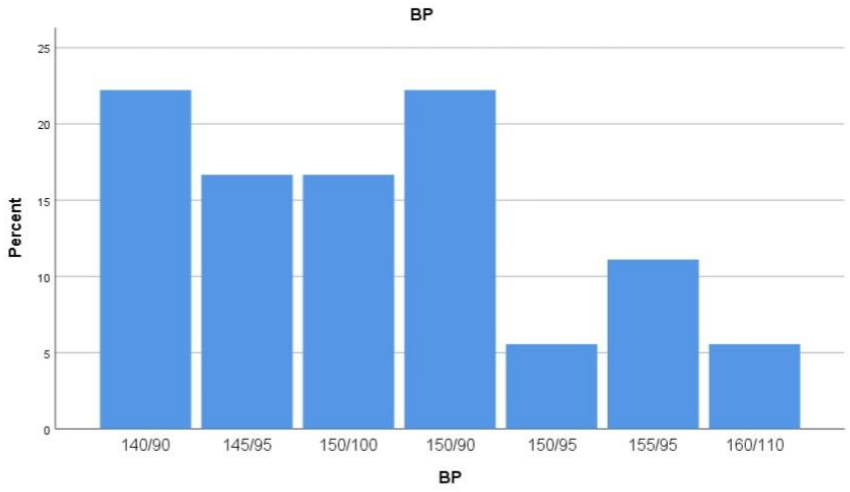
AGE

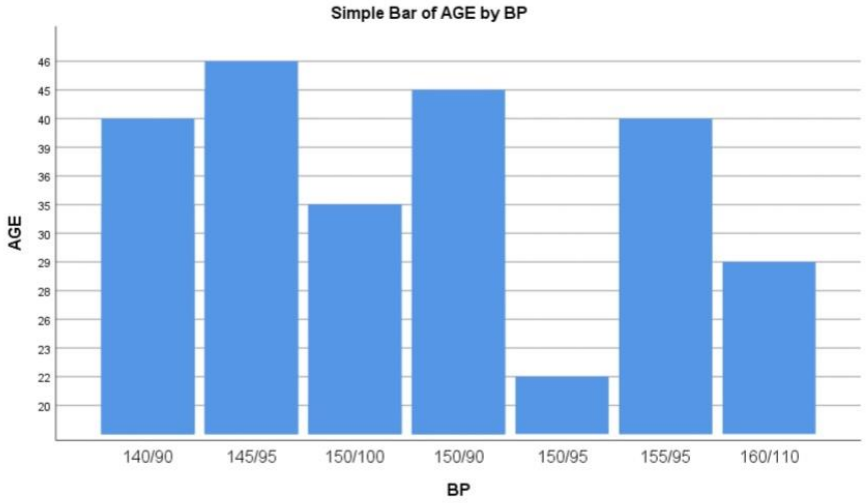
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20	1	5.6	5.6	5.6
	22	1	5.6	5.6	11.1

	23	1	5.6	5.6	16.7
	26	1	5.6	5.6	22.2
	28	1	5.6	5.6	27.8
	29	1	5.6	5.6	33.3
	30	1	5.6	5.6	38.9
	35	3	16.7	16.7	55.6
	36	1	5.6	5.6	61.1
	39	1	5.6	5.6	66.7
	40	3	16.7	16.7	83.3
	45	2	11.1	11.1	94.4
	46	1	5.6	5.6	100.0
	Total	18	100.0	100.0	

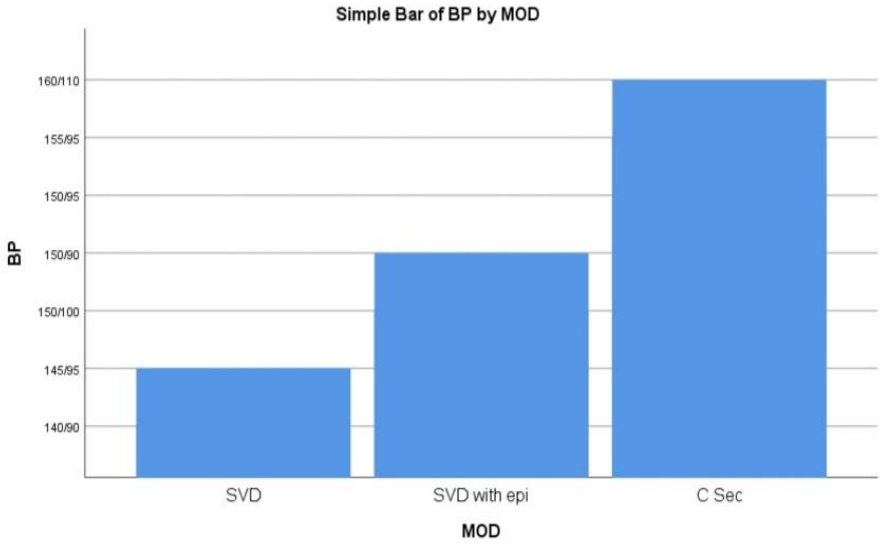
GP

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	G2P0+1	2	11.1	11.1	11.1
	G2P1	4	22.2	22.2	33.3
	G3P1+1	1	5.6	5.6	38.9
	G3P2	1	5.6	5.6	44.4
	G4P3	2	11.1	11.1	55.6
	G5P2+3	1	5.6	5.6	61.1
	G5P4	3	16.7	16.7	77.8
	G8P4	1	5.6	5.6	83.3
	PG	3	16.7	16.7	100.0
	Total	18	100.0	100.0	

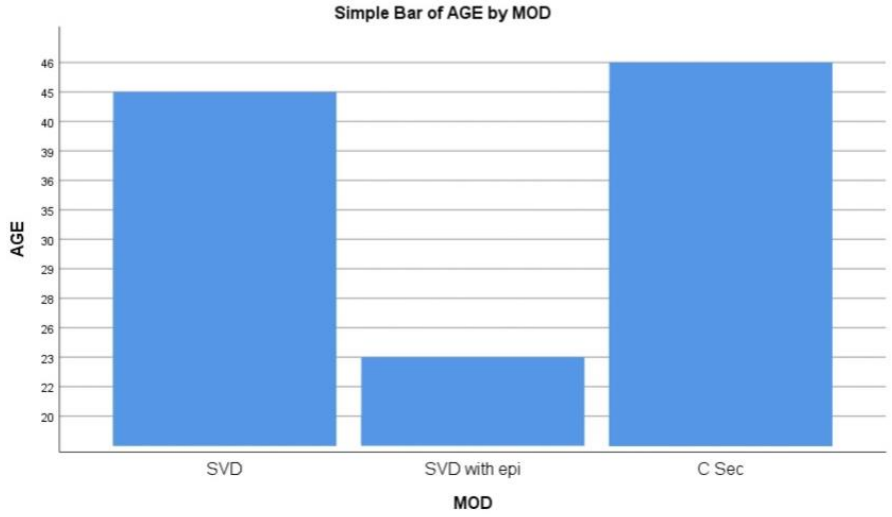




Simple bar chart of age by BP shows that pregnancies with higher extremes of age have greater prevalence of elevated mean blood pressures. However, the highest mean blood pressure of 160/110 mmHg was recorded in a 29-year-old pregnant woman. Further research should be done into the association between age and pregnancy induced hypertension.



Simple bar chart of BP by MOD showed that women with higher mean blood pressures had higher frequency of C-section as compared to those with lower blood pressures. Women with blood pressure greater than 150/90 mmHg had greater prevalence of C-section which warrants further investigation into the association between elevated blood pressures and C-section.



Simple bar chart of Age by MOD shows that high extreme of age was also associated with higher prevalence of C-section. Our results showed that higher extreme of age, the likelihood of having C-section and elevated mean blood pressures are interlinked factors that should be investigated individually as well as collectively through cross sectional and cohort studies to better understand the physiology and pathology of Pregnancy induced hypertension.

Discussion

Pregnancy-induced hypertension (PIH) is a leading cause of morbidity and mortality in Pakistan and worldwide. It is a significant global public health issue influenced by factors such as age, grand multiparity, family history, sedentary lifestyle, obesity, genetics, and a high salt diet (16). Additionally, there is a lack of awareness, health education, and promotion regarding PIH. This issue is often not prioritized, leading to significant neglect and a substantial burden on the healthcare system (17).

PIH has significant adverse effects on maternal and fetal well-being. This study explored the impact of PIH on the mode of delivery and birth weight. Data were collected from the Benazir Bhutto Hospital Rawalpindi, a tertiary care hospital, and analyzed using IBM SPSS Software version 28. The sample included eighteen pregnant women, with data on age, mean BP, gravidity, parity, mode of delivery, and birth weight.

The results showed a higher prevalence of cesarean sections among women with PIH. This finding aligns with other research indicating that hypertensive disorders in pregnancy significantly increase the risk of cesarean sections (18). Numerous studies have demonstrated an association between PIH and the likelihood of cesarean delivery (19). The exact cause is not fully understood but may involve physiological disruptions affecting normal labor mechanisms, failed induction of labor common in PIH cases, practitioner preference, and maternal request (20).

The study found that almost all babies had normal birth weights, which contradicts much of the existing research linking PIH with low birth weight and intrauterine growth restriction (IUGR) (21). Abnormal placentation in PIH can lead to compromised delivery of oxygen and nutrients to the fetus, adversely affecting fetal growth (22). However, this study did not observe such an association.

Conclusion and Suggestions

PIH has a high prevalence and incidence rate in Pakistan and globally. It is associated with a greater risk of cesarean sections and results in both fetal and maternal complications. This issue can be addressed through improved antenatal checkups at the primary healthcare level, health education, and promotion among pregnant women, and early referral of high-risk pregnancies to tertiary care facilities (23).

Limitations

- The sample size was not adequate.
- A causal association could not be established.
- Antenatal data were not available.
- Data on the type of cesarean section (elective or emergency) were not available.

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