The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 3, 2025

FREQUENCY OF PRETERM DELIVERIES IN PATIENTS WITH HYPERTENSIVE DISORDER OF PREGNANCY

Hafsa Baloch[*1], Shazia Naseeb[2]

[*1]*Jinnah Postgraduate Medical Centre Karachi*
[2]*Jinnah Postgraduate Medical Centre (JPMC), Karachi*

[*1]hafsabaloch95@gmail.com, [2]snkhan1975@yahoo.com

DOI: https://doi.org/10.5281/zenodo.15087485

Keywords
Placental insufficiency, Premature birth, Pregnancy complications, Pregnancy Induced Hypertension

Article History
Received on 18 February 2025
Accepted on 18 March 2025
Published on 26 March 2025

Corresponding Author: *

Abstract

OBJECTIVE: *To determine the frequency of preterm deliveries among patients diagnosed with hypertensive disorders of pregnancy and assess associated maternal characteristics and risk factors.*

METHODOLOGY: *A descriptive cross-sectional study was conducted at JPMC, Karachi, on 97 pregnant women (18–40 years) with hypertensive disorders of pregnancy, selected through non-probability consecutive sampling. Inclusion criteria included singleton pregnancies (≥28 to <37 weeks), while women with multiple gestations, diabetes, cardiac disease, or those unwilling to consent were excluded. Preterm delivery (<37 weeks) was confirmed via ultrasound. Data was analyzed using SPSS 26, with $p < 0.05$ considered statistically significant.*

RESULTS: *Among 97 women with hypertensive disorders of pregnancy, preterm delivery occurred in 34 (35%) cases. The mean maternal age was 26.32 ± 5.24 years. Younger age (18–26 years: 73.5% vs. >26 years: 26.5%, OR: 2.691, $p = 0.030$) and booked status (50.0% vs. 27.0%, OR: 2.706, $p = 0.023$) were significantly associated with preterm birth, while BMI, parity, mode of delivery, and socioeconomic status showed no significant impact. Eclampsia was more prevalent in preterm deliveries (26.5% vs. 9.5%), though not statistically significant.*

CONCLUSION: *The findings of current study reported that there is a strong correlation between hypertension disorder of pregnancy and early birth, with gestational hypertension, preeclampsia, or eclampsia as the most common types. Younger mothers and booking status were significant factors. This highlights the roles of screening, awareness, and intervention, additional to the mitigation of preterm birth risk and improved maternal and neonatal outcomes.*

INTRODUCTION

Hypertensive disorders of pregnancy are one of the leading contributors to maternal and neonatal morbidity and mortality. Gestational hypertension and preeclampsia are linked to negative consequences and higher rate of preterm delivery [1]. The rates of premature birth have significantly varied in previous studies, and comparing with normotensive pregnancy, women with hypertensive disorders also have an increased risk for preterm delivery [2]. This is particularly concerning due to a recent meta-analysis finding a strong relationship between hypertensive disorders and preterm birth [3]. Hypertensive

disorders, as a cause of preterm birth, have significant implications for neonatal neurological and respiratory morbidity, including an increased risk for respiratory distress, growth and developmental impairment, and other long-term morbidities [4]. In addition, infants born preterm and requiring prolonged medical care not only pose a considerable financial burden but also an emotional burden for the families and the health care system [5]. In addition, women with a history of hypertensive disorders are at increased risk for future health risk e.g., CVD [5,6]. They should be followed-up during pregnancy and after delivery in order to manage maternal long-term outcomes. Information from pertinent studies indicates that these disorders will be associated with maternal morbidity and mortality [7], reinforcing the urgency for effective screening and prevention strategies.

Moreover, hypertensive disorders of pregnancy are increasing practice, especially in sub-Saharan Africa [8,9].

The results suggest that it can be important to deal with appropriate lifestyle factors in an effort to avoid such circumstances, as dietary practices are related to hypertensive issues and negative outcomes of being pregnant [10].

Welcoming interventions aimed to timely diagnosis and proper management of hypertensive disorders may contribute to maternal and neonate outcome improvement. Blood pressure must be controlled with lifestyle changes and, if necessary, medications. The timing of delivery will be another important consideration as evidence suggests that management of delivery time can significantly affect both maternal and neonatal outcomes [11,12].

Pregnancy complications, particularly hypertensive disorders, have a significant impact on pregnancy outcomes, often leading to adverse effects such as preterm birth and increased maternal and neonatal risks. Effective management of these conditions requires comprehensive therapeutic strategies to improve health outcomes for both mothers and infants. Ongoing research and future studies in this area are essential to provide new insights and guide evidence-based interventions for better maternal and neonatal care.

METHODOLOGY

This was a descriptive cross-sectional study conducted among 97 pregnant women selected through non-probability consecutive sampling in the Department of Obstetrics & Gynaecology, Jinnah Postgraduate Medical Centre (JPMC), Karachi. Participants who were eligible were 18–40 years of age; had a singleton pregnancy; and had a diagnosis of a hypertensive disorder of pregnancy. Women admitted for spontaneous or indicated delivery with (gestational age >28 weeks and 0.3 g in a 24-hour urine collection) after 20 weeks. Preeclampsia was defined as the presence of new-onset hypertension and proteinuria (in the absence of another plausible cause). Eclampsia for those with preeclampsia was defined by convulsions without another cause Chronic hypertension was defined as having high blood pressure before the onset of pregnancy or at less than 20 weeks of gestation. Definitions of superimposed preeclampsia were sudden elevation of blood pressure together with new-onset proteinuria in a woman that had earlier been diagnosed with hypertension.

Spontaneous and induced labor was determined to be the onset of labor without medical intervention (e.g., rupture of membrane, or with oxytocin, etc.) that developed at least beyond 4 cm degree of cervical dilatation. The indication for induction of labor was based on the reason to initiate uterine contractions. Preterm birth was treated as a categorical variable.

Data analysis was performed by SPSS version 26.0. Quantitative variables are represented as mean and SD type and qualitative variables are represented as frequency and percentage. Associations were determined via the Chi-square test where $p < 0.05$ was considered statistically significant.

RESULTS

A total of 97 participants were included in the study, with a mean age of 26.32 ± 5.24 years. The majority (58.8%) were between 18 and 26 years, while 41.2% were older than 26 years. The mean gestational age was 36.01 ± 4.79 weeks, with 35.1% between 24 and 36 weeks and 64.9% beyond 36 weeks. The mean body mass index (BMI) was 27.25 ± 4.10 kg/m², with participants almost equally distributed between BMI 20–26 kg/m² (50.5%) and BMI >26 kg/m² (49.5%). Regarding parity, 56.7% were primiparous, while 43.3% were multiparous. Un-booked cases accounted

for 64.9%, whereas 35.1% were booked. In terms of mode of delivery, 78.4% underwent cesarean section, while 21.6% had vaginal deliveries. Socioeconomic distribution showed 46.4% middle-class, 29.9% upper-class, and 23.7% lower-class participants. Among the hypertensive disorders of pregnancy (HDP), the most common condition was pregnancy-induced hypertension (41.2%), followed by preeclampsia (36.1%), eclampsia (15.5%), chronic hypertension (4.1%), chronic hypertension superimposed (2.1%), and HELLP syndrome (1.0%), as shown in Table I. Among the 97 participants, preterm delivery was significantly associated with age 18–26 years (73.5% vs. 50.8%, OR: 2.691, 95% CI: 1.085–6.672, p = 0.030) and booked status (50.0% vs. 27.0%, OR: 2.706, 95% CI: 1.131–6.475, p = 0.023). All preterm deliveries occurred between 24–36 weeks of gestation (p < 0.0001). However, BMI, parity, mode of delivery, socioeconomic status, and type of hypertensive disorder of pregnancy did not show statistically significant associations with preterm delivery. Notably, eclampsia was more prevalent in preterm deliveries (26.5% vs. 9.5%), though this difference was not statistically significant, as presented in Table II.

DISCUSSION

This study highlights a strong association between hypertensive disorders of pregnancy (HDP) and preterm delivery, with 35% of hypertensive pregnancies resulting in preterm birth. The most common hypertensive disorders identified were pregnancy-induced hypertension (41.2%), preeclampsia (36.1%), and eclampsia (15.5%), all of which have been linked to placental insufficiency, endothelial dysfunction, and inflammatory responses, contributing to fetal distress and preterm labor [13].

Our findings align with previous studies, which have consistently identified hypertensive disorders as a major risk factor for preterm birth. Ukah et al. found that hypertensive disorders were associated with an increased risk of maternal complications and preterm birth [13]. Similarly, Wagura et al. showed that have been ranked hypertension at first leading causes of preterm birth [14]. Additionally, de Moura et al. Unfortunately, preeclampsia increased neonatal morbidity particularly when before 34 weeks of gestation emphasizing close monitoring and early intervention [15].

In this study, maternal age (18–26 years) and booked status were significantly associated with preterm delivery (p Value < 0.05). That younger women with HDP are at even higher risk points to potential mechanisms such as greater vascular reactivity or immature cardiovascular adaptation to pregnancy [16]. Likewise, booked women had an increased risk of delivering preterm, most likely due to the early diagnosis of hypertensive complications, which allowed for effective medical treatment, including medically indicated preterm delivery [17].

There were no statistically significant associations between preterm delivery with BMI, parity, mode of delivery and socioeconomic status; however, eclampsia was more common in preterm births (26.5% vs. 9.5%, p = 0.123). In line with the latter, at a gestational age where preterm delivery may not be avoidable, this trend further highlights the apparent clinical significance of severe hypertensive events at this time-point [18], subsequently advocating for the practice of early screening and follow-up of eclamptic mothers to ensure favorable maternal- as well as neonatal outcomes.

Our study's results are consistent with existing literature, but several factors must be considered. The mode of delivery was not a significant predictor of preterm birth, though previous studies have reported higher cesarean rates in hypertensive pregnancies due to fetal distress and placental insufficiency [16]. Additionally, this study did not assess the impact of antihypertensive treatments or magnesium sulfate use, which could influence preterm birth rates. Future studies should explore treatment effects on pregnancy outcomes in hypertensive women [17].

Our subjects included singleton pregnancies (≥28 to <37 weeks) excluding multiple gestations, diabetes and cardiac disease, suggesting that these results are applicable to a more modestly high-risk hypertensive population. Exclusion of high risk comorbidities may have contributed to a lower-than-expected preterm birth rate as compared to other studies [19].

Such findings reiterate the important role of early detection, close antenatal follow-up, and intervention in the management of hypertensive disorder of pregnancy. These findings can help in the recognition of high-risk subgroups, especially young

mothers and mothers with eclampsia, where interventions may be better targeted to avoid premature delivery of infants [20]. Future multi-center studies with larger cohorts should compare maternal and neonatal long-term outcomes, while also assessing the impact of varying management strategies for hypertensive pregnancies [21].

CONCLUSION

The findings of current study reported that there is a strong correlation between hypertension disorder of pregnancy and early birth, with gestational hypertension, preeclampsia, or eclampsia as the most common types. Younger mothers and booking status were significant factors. These findings underscore the importance of screening, vigilance, and timely intervention over and above the reduction of preterm birth risks and better maternal and neonatal outcomes.

Table I: Demographic Characteristics of Study Participants (n=97)

Baseline Characteristics	**n** (%)
Age (Mean ± SD)	26.32 ± 5.24
18 – 26 years	57 (58.8%)
>26 years	40 (41.2%)
Gestational Age (Mean ± SD)	36.01 ± 4.79
24 – 36 weeks	34 (35.1%)
>36 weeks	63 (64.9%)
Body Mass Index (Mean ± SD)	27.25 ± 4.10
20 – 26 kg/m^2	49 (50.5%)
>26 kg/m^2	48 (49.5%)
Parity	
Primipara	55 (56.7%)
Multipara	42 (43.3%)
Booking Status	
Booked	34 (35.1%)
Un-Booked	63 (64.9%)
Mode of Delivery	
Vaginal Delivery	21 (21.6%)
C-Section	76 (78.4%)
Socioeconomic Status	
Lower class	23 (23.7%)
Middle class	45 (46.4%)

Table II: Comparison of Maternal Characteristics by Preterm Delivery Status (n=97)

Maternal And Clinical Factors		**Preterm Deliveries**		**OR 95% C. I**	**P-Value**
		Yes (n=34)	**No (n=63)**		
Age Group	18 - 26 years, *n* (%)	25 (73.5)	32 (50.8)	2.691 (1.085–6.672)	0.030
	>26 years, *n* (%)	9 (26.5)	31 (49.2)		
BMI Group	20 - 26 kg/m^2, *n* (%)	17 (50.0)	32 (50.8)	0.969 (0.421–2.231)	0.941
	>26 kg/m^2, *n* (%)	17 (50.0)	31 (49.2)		
Gestational Age	24 - 36 weeks, *n* (%)	34 (100.0)	0 (0.0)	N/A	0.0001
	>36 weeks, *n* (%)	0 (0.0)	63 (100.0)		

Parity	Primipara, n (%)	22 (64.7)	33 (52.4)	1.667 (0.705-3.938)	0.242
	Multipara, n (%)	12 (35.3)	30 (47.6)		
Booking Status	Booked, n (%)	17 (50.0)	17 (27.0)	2.706 (1.131-6.475)	0.023
	Un-Booked, n (%)	17 (50.0)	46 (73.0)		
Mode of Delivery	Vaginal Delivery, n (%)	6 (17.6)	15 (23.8)	0.686 (0.239-1.970)	0.482
	C-Section, n (%)	28 (82.4)	48 (76.2)		
Socioeconomic Status	Lower Class, n (%)	7 (20.6)	16 (25.4)	0.926 (0.523-1.642)	0.833
	Middle Class, n (%)	17 (50.0)	28 (44.4)		
	Upper Class, n (%)	10 (29.4)	19 (30.2)		
Type of Hypertensive Disorder of Pregnancy	PIH, n (%)	12 (35.3)	28 (44.4)	0.736 (0.493-1.100)	0.130
	Preeclampsia, n (%)	10 (29.4)	25 (39.7)		
	Eclampsia, n (%)	9 (26.5)	6 (9.5)		
	Chronic hypertension, n (%)	2 (0.0)	2 (3.2)		
	CHS, n (%)	0 (0.0)	2 (3.2)		
	HELLP, n (%)	1 (2.9)	0 (0.0)		

REFERENCES

Li F, Wang T, Chen L, Zhang S, Chen L, Qin J. Adverse pregnancy outcomes among mothers with hypertensive disorders in pregnancy: a meta-analysis of cohort studies. Pregnancy Hypertens. 2021;24:107-17.

Gemechu KS, Assefa N, Mengistie B. Prevalence of hypertensive disorders of pregnancy and pregnancy outcomes in Sub-Saharan Africa: a systematic review and meta-analysis. Womens Health. 2020 Dec;16:1745506520973105.

Maher GM, O'Keeffe GW, Kearney PM, Kenny LC, Dinan TG, Mattsson M, et al. Association of hypertensive disorders of pregnancy with risk of neurodevelopmental disorders in offspring: a systematic review and meta-analysis. JAMA Psychiatry. 20181;75(8):809-19.

Razak A, Florendo-Chin A, Banfield L, Abdul Wahab MG, McDonald S, Shah PS, Mukerji A. Pregnancy-induced hypertension and neonatal outcomes: a systematic review and meta-analysis. J Perinatol. 2018;38(1):46-53.

Wu P, Gulati M, Kwok CS, Wong CW, Narain A, O'Brien S, et al. Preterm delivery and future risk of maternal cardiovascular disease: a systematic review and meta-analysis. J Am Heart Assoc. 2018;7(2):e007809.

Ying W, Catov JM, Ouyang P. Hypertensive disorders of pregnancy and future maternal cardiovascular risk. J Am Heart Assoc. 2018;7(17):e009382.

Garovic VD, White WM, Vaughan L, Saiki M, Parashuram S, Garcia-Valencia O, et al. Incidence and long-term outcomes of hypertensive disorders of pregnancy. J Am Coll Cardiol. 2020;75(18):2323-34.

Berhe AK, Kassa GM, Fekadu GA, Muche AA. Prevalence of hypertensive disorders of pregnancy in Ethiopia: a systemic review and meta-analysis. BMC Pregnancy Childbirth. 2018;18:1-1.

Mersha AG, Abegaz TM, Seid MA. Maternal and perinatal outcomes of hypertensive disorders of pregnancy in Ethiopia: systematic review and meta-analysis. BMC Pregnancy Childbirth. 2019;19:1-2.

Kibret KT, Chojenta C, Gresham E, Tegegne TK, Loxton D. Maternal dietary patterns and risk of adverse pregnancy (hypertensive disorders of pregnancy and gestational diabetes mellitus) and birth (preterm birth and low birth weight) outcomes: a systematic review and meta-analysis. Public Health Nutr. 2019;22(3):506-20.

De Siqueira Guida JP, Surita FG, Parpinelli MA, Costa ML. Preterm preeclampsia and timing of delivery: a systematic literature review. Rev Bras Ginecol Obstet. 2017;39(11):622-31.

Bernardes TP, Zwertbroek EF, Broekhuijsen K, Koopmans C, Boers K, Owens M, et al. Delivery or expectant management for prevention of adverse maternal and neonatal outcomes in hypertensive disorders of pregnancy: an individual participant data meta-analysis. Ultrasound Obstet Gynecol. 2019;53(4):443-53.

Ukah UV, De Silva DA, Payne B, Magee LA, Hutcheon JA, Brown H, et al. Prediction of adverse maternal outcomes from pre-eclampsia and other hypertensive disorders of pregnancy: a systematic review. Pregnancy Hypertens. 2018;11:115-23.

Wagura P, Wasunna A, Laving A, Wamalwa D, Nganga P. Prevalence and factors associated with preterm birth at Kenyatta National Hospital. BMC Pregnancy Childbirth. 2018;18:107.

de Moura MD, Margotto PR, Costa KN, Novaes MR. Hypertension induced by pregnancy and neonatal outcome: results from retrospective cohort study in preterm under 34 weeks. PLoS One. 2021;16(8):e0255783.

Barrett PM, McCarthy FP, Kublickiene K, Cormican S, Judge C, Evans M, et al. Adverse pregnancy outcomes and long-term maternal kidney disease: a systematic review and meta-analysis. JAMA Netw Open. 2020;3(2):e1920964-.

Mulualem G, Wondim A, Woretaw A. The effect of pregnancy induced hypertension and multiple pregnancies on preterm birth in Ethiopia: a systematic review and meta-analysis. BMC Res Notes. 2019;12:1-7.

Wu R, Wang T, Gu R, Xing D, Ye C, Chen Y, et al. Hypertensive disorders of pregnancy and risk of cardiovascular disease-related morbidity and mortality: a systematic review and meta-analysis. Cardiology. 2020;145(10):633-47.

Jaleta DD, Gebremedhin T, Jebena MG. Perinatal outcomes of women with hypertensive disorders of pregnancy in Jimma medical center, southwest Ethiopia: retrospective cohort study. PLoS One. 2021;16(8):e0256520.

Nikhat A, Naheed F, Farheen S. Hypertensive disorders of pregnancy and its associated fetomaternal complications. J Surg Pak. 2019;24(4):176-80.

Nisa SU, Shaikh AA, Kumar R. Maternal and fetal outcomes of pregnancy-related hypertensive disorders in a tertiary care hospital in Sukkur, Pakistan. Cureus. 2019;11(8).