

ORIGINAL ARTICLE

Assessment of Obstetric Outcomes in Pregnancy-Induced Hypertension

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ABSTRACT

Background: Pregnancy-induced hypertension is a significant obstetric complication that adversely affects maternal and neonatal outcomes.**Objective:** To assess the obstetric outcomes associated with pregnancy-induced hypertension and evaluate the relationship between the severity of pregnancy-induced hypertension and maternal-fetal complications.**Methodology:** This comparative observational study was conducted at Obstetrics & Gynecology, Shifa International Hospital Faisalabad during January 2023 till July 2023. A total of 178 pregnant women diagnosed with PIH were included in the study. Data were collected through patient interviews, clinical examination, review of antenatal records, and delivery notes.**Results:** 57.3% had mild pregnancy-induced hypertension and 42.7% had severe pregnancy-induced hypertension. Cesarean section was performed in 61.8% of cases, primarily due to fetal distress and failed induction. Maternal complications included postpartum hemorrhage (7.3%), abruptio placentae (3.9%), and HELLP syndrome (3.4%). One maternal death was recorded. On the fetal side, preterm births occurred in 43.8% of cases, low birth weight in 53.9%, intrauterine growth restriction in 20.8%, and neonatal intensive care unit admissions in 32.6%. Severe pregnancy-induced hypertension was significantly associated with higher rates of these adverse outcomes ($p < 0.05$).**Conclusion:** Pregnancy-induced hypertension is strongly associated with increased maternal and neonatal morbidity. The severity of pregnancy-induced hypertension correlates significantly with the likelihood of complications such as preterm delivery, low birth weight, and operative delivery. Early detection and timely intervention are essential to improve pregnancy outcomes and reduce associated risks.**Keywords:** Assessment, Outcome, Pregnancy induced hypertension, Maternal-fetal complication

INTRODUCTION

Pregnancy-induced hypertension (PIH) constitutes a spectrum of hypertensive disorders that occur specifically in the second half of pregnancy, typically after 20 weeks of gestation, in women with previously normal blood pressure. PIH includes conditions such as gestational hypertension, preeclampsia, eclampsia, and chronic hypertension with superimposed preeclampsia.¹ These disorders significantly contribute to adverse maternal and perinatal outcomes, making PIH one of the most serious challenges in obstetric care worldwide. Globally, hypertensive disorders complicate approximately 5-10% of all pregnancies and account for nearly 14% of maternal deaths, particularly in resource-limited settings.² The pathophysiology of PIH is multifactorial and not yet fully understood, but it is widely believed to involve abnormal placentation, endothelial dysfunction, and immunological maladaptation. Inadequate trophoblastic invasion of spiral arteries leads to poor placental perfusion and hypoxia, which in turn initiates a cascade of inflammatory and vasoconstrictive processes.³ These disruptions have systemic effects on maternal organs, particularly the kidneys, liver, brain, and coagulation system, and can seriously compromise fetal development.⁴

The maternal consequences of PIH range from mild hypertension to life-threatening complications such as eclampsia, pulmonary edema, liver dysfunction, and HELLP syndrome (hemolysis, elevated liver enzymes, and low platelet count). From the fetal perspective, compromised uteroplacental blood flow often results in intrauterine growth restriction (IUGR), preterm birth, oligohydramnios, and increased risk of perinatal mortality.⁵ Numerous studies have also linked PIH with an increased incidence of cesarean sections due to non-reassuring fetal status and maternal indications, thus impacting recovery and long-term health. Despite advancements in antenatal screening and maternal healthcare, the management of PIH remains a clinical dilemma, primarily due to the unpredictable nature of its progression.⁶ The timing of delivery must carefully balance maternal well-being against fetal maturity, with preterm delivery often being the only viable intervention in severe cases. The availability of

antihypertensive medications and corticosteroids has improved maternal and fetal outcomes to some extent; however, disparities in care access continue to widen the gap between high- and low-resource settings.⁷ Assessment of obstetric outcomes in women with PIH is vital for several reasons. First, it helps in identifying risk factors and predicting complications, thereby enabling early intervention. Second, it provides insights into the effectiveness of current management protocols and highlights areas for improvement. Lastly, understanding these outcomes is crucial for developing public health strategies and policy frameworks that aim to reduce maternal and neonatal morbidity and mortality.⁸⁻¹⁰

MATERIALS AND METHODS

This comparative observational study was conducted at Obstetrics and Gynecology, Shifa International Hospital, Faisalabad during January 2023 till July 2023. A total of 178 pregnant women diagnosed with PIH were included. Pregnant women who received a diagnosis of PIH after week 20 of gestation with singleton pregnancies could enroll through voluntary consent before hospital admission for delivery. Women diagnosed with persistent hypertension twelve weeks before conception combined with multifetal pregnancy and known renal, heart, autoimmune disorders as well as missing data were excluded. Patient interviews combined with clinical examinations and antenatal record evaluations and delivery notes documentation served to collect the data. A standardized pro forma collected demographic data alongside obstetric history details, clinical presentation data, blood pressure readings and lab results and type of delivery and maternal and newborn outcome results. The study collected information about patient age, number of pregnancies, time of PIH onset, hypertension levels, complications of eclampsia or HELLP syndrome and the types of delivery methods used (vaginal, elective or emergency cesarean) and maternal results of recovery or morbidity or mortality. The researchers measured fetal information through gestational age at birth together with birth weight and one-minute and five-minute Apgar scores and admission to NICU along with IUGR identification and assessment of stillbirths and early death of newborns. Data were analyzed using SPSS-17. This research used both Chi-square test and t-test

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to evaluate outcome associations and determined statistical significance at $p < 0.05$.

RESULTS

The mean maternal age among the study population was 26.7 ± 4.1 years, with a predominance of primigravidae (63.5%) compared to multigravidae (36.5%). The majority of women were diagnosed with PIH between 33–36 weeks of gestation (47.2%), followed by those diagnosed at ≥ 37 weeks (30.3%) and 28–32 weeks (22.5%). 57.3% of patients had mild PIH, while 42.7% had severe forms, including 11 cases (6.2%) of eclampsia. This distribution reflects the clinical diversity of hypertensive disorders in pregnancy and emphasizes the potential for progression. Regarding the mode of delivery, cesarean sections were required in 61.8% of cases, with emergency procedures accounting for the majority (38.8%). Vaginal deliveries occurred in 38.2% of the women (Table 1).

Postpartum hemorrhage was the most frequent (7.3%), followed by eclampsia (6.2%), ICU admissions (5.1%), abruptio placentae (3.9%), and HELLP syndrome (3.4%). One case of maternal mortality (0.56%) was reported, underscoring the severity of PIH-related complications even in hospital-managed settings. Fetal outcomes were significantly impacted, with 43.8% of births occurring preterm and 53.9% of neonates classified as low birth weight. Intrauterine growth restriction was identified in 20.8% of cases, while 32.6% of newborns required NICU admission. Stillbirths and early neonatal deaths occurred in 3.4% and 2.2% of cases respectively, and 12.9% of newborns had an Apgar score below 7 at five minutes, indicating compromised neonatal condition at birth (Table 2).

Table 1: Demographic characteristics of study participants (n = 178)

Characteristic	No.	%
Maternal age (years)	26.7 ± 4.1	
Gravida		
Primigravida	113	63.5
Multigravida	65	36.5
Gestational age at diagnosis (weeks)		
28–32	40	22.5
33–36	84	47.2
≥ 37	54	30.3
PIH Category		
Mild	102	57.3
Severe	76	42.7
Eclampsia cases	11	6.2
Mode of Delivery		
Vaginal Delivery	68	38.2
Cesarean Section (Total)	110	61.8
Elective caesarean	41	23.0
Emergency caesarean	69	38.8
Most Common Indication (FHR Abn.)	37	33.6 (of C-sections)

Table 2: Maternal and fetal Complications

Complication	No.	%
HELLP Syndrome	6	3.4
Abruptio placentae	7	3.9
Postpartum hemorrhage	13	7.3
Eclampsia	11	6.2
ICU Admission	9	5.1
Maternal mortality	1	0.56
Fetal Outcome		
Preterm birth (< 37 weeks)	78	43.8
Low birth weight (< 2.5 kg)	96	53.9
Intrauterine growth restriction	37	20.8
NICU Admission	58	32.6
Stillbirth	6	3.4
Early neonatal death (≤ 7 days)	4	2.2
Apgar score < 7 at 5 minutes	23	12.9

Preterm delivery was observed in 64.5% of patients with severe PIH compared to only 28.4% in the mild group ($p < 0.01$). Similarly, the incidence of low birth weight was markedly higher in

severe cases (72.3%) than in mild cases (40.2%), also with high statistical significance ($p < 0.01$). NICU admissions occurred more frequently in the severe PIH group (47.3% vs. 21.6%; $p < 0.05$). Additionally, the cesarean section rate was significantly greater among those with severe PIH (72.3%) compared to those with mild disease (53.9%; $p < 0.05$) [Table 3].

Table 3: Comparison of Neonatal and Delivery Outcomes Between Mild and Severe PIH Groups

Outcome	Mild PIH	Severe PIH	p-value
Preterm Delivery	28.4%	64.5%	< 0.01
Low Birth Weight	40.2%	72.3%	< 0.01
NICU Admission	21.6%	47.3%	< 0.05
Cesarean section rate	53.9%	72.3%	< 0.05

DISCUSSION

Pregnancy-induced hypertension significantly contributes to obstetric complications, and its severity has a direct influence on both maternal and neonatal outcomes. The majority of patients in the study were young women in their reproductive prime, with a mean age of 26.7 years. A considerable number were primigravidae, reaffirming the observation that first-time pregnancies are more susceptible to developing hypertensive complications. This demographic trend points to the need for early antenatal engagement and thorough screening protocols, especially for first-time mothers.¹¹

Over 40% of patients were diagnosed with severe PIH, including a subset that progressed to eclampsia. These figures highlight the unpredictable progression of hypertensive disorders and underscore the importance of early and continuous blood pressure monitoring throughout pregnancy. The relatively high number of patients diagnosed between 33 and 36 weeks of gestation suggests a critical window where close surveillance may help identify patients at increased risk for complications.¹² Mode of delivery was significantly influenced by the presence of PIH. A cesarean section was required in over 60% of cases, with emergency cesareans outnumbering elective ones. The most frequent indications included fetal distress and failure to progress in labor, both of which are commonly associated with uteroplacental insufficiency. This outcome reflects the clinical challenges of labor management in hypertensive pregnancies, where quick decision-making is often required to prevent adverse fetal outcomes.¹³

Maternal complications were not uncommon in the cohort. Conditions such as postpartum hemorrhage, abruptio placentae, and HELLP syndrome were observed, with some patients requiring ICU admission. One case of maternal mortality was recorded, emphasizing the potential severity of PIH even in a controlled hospital setting.¹⁴ These outcomes suggest that aggressive management strategies and multidisciplinary care are essential in managing high-risk patients. On the fetal side, the data revealed a clear burden of morbidity. Nearly 44% of births were preterm, and more than half of the neonates had low birth weight. Intrauterine growth restriction was also notable, affecting over one-fifth of the newborns.¹⁵ A significant number required NICU admission, and despite adequate delivery care, stillbirths and early neonatal deaths were recorded. These findings reinforce that PIH affects placental efficiency and fetal development, often resulting in early delivery and compromised neonatal health.¹⁶ A significant association was observed between the severity of PIH and adverse outcomes such as preterm delivery, low birth weight, NICU admission, and higher cesarean rates. These associations highlight the role of early classification of PIH severity in predicting and potentially preventing complications.

CONCLUSION

Pregnancy-induced hypertension (PIH) remains a significant contributor to maternal and perinatal morbidity. The study findings indicate that the severity of PIH is strongly associated with an increased risk of complications such as preterm labor, low birth

weight, intrauterine growth restriction, and higher rates of cesarean delivery. Maternal risks including postpartum hemorrhage, abruptio placentae, and HELLP syndrome were also notably higher among patients with severe PIH. Early detection through regular antenatal check-ups, effective monitoring, and timely intervention are critical in reducing the burden of adverse outcomes.

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