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Neonatal Outcomes in Mothers with Hypertensive Disorders during Pregnancy

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Original Research Article

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Abstract: ***Background:*** Hypertensive disorders during pregnancy, including gestational hypertension, preeclampsia, eclampsia, and chronic hypertension, remain significant contributors to maternal and neonatal morbidity and mortality worldwide. Early detection and management are crucial to improving neonatal outcomes. ***Methods:*** This prospective observational study was conducted in the Department of Obstetrics and Gynaecology at BSMMU and Sibchar Health Complex, Madaripur, from April 2016 to March 2017. A total of 100 pregnant women with hypertensive disorders were enrolled. Maternal characteristics and neonatal outcomes, including birth weight, gestational age at delivery, NICU admission, Apgar scores, neonatal complications, and perinatal deaths, were evaluated. ***Results:*** Among 100 mothers, 53% had gestational hypertension, 32% had preeclampsia, 10% had eclampsia, and 5% had chronic hypertension. Preterm births occurred in 38% of cases, and 45% of neonates had low birth weight. NICU admission was required in 32% of cases, while 18% of neonates had low Apgar scores at 5 minutes. Neonatal complications were observed in 43% of cases, with respiratory distress syndrome (46.5%), neonatal jaundice (34.9%), and neonatal sepsis (18.6%) being the most common. Perinatal death occurred in 6% of the cases. ***Conclusion:*** Hypertensive disorders during pregnancy are significantly associated with adverse neonatal outcomes, including higher rates of preterm birth, low birth weight, NICU admission, and neonatal complications. Focused antenatal care, early diagnosis, and appropriate management strategies are critical to minimizing perinatal morbidity and mortality in these high-risk pregnancies.
Keywords: Hypertensive disorders, pregnancy, neonatal outcomes, preeclampsia, gestational hypertension, perinatal mortality.

INTRODUCTION

Hypertensive disorders of pregnancy are among the most common medical complications and remain a major cause of perinatal and maternal morbidity and mortality across the world [1]. The disorders, such as gestational hypertension, preeclampsia, eclampsia, and chronic hypertension, complicate approximately 5–10% of all pregnancies [2, 3]. Despite advancement in prenatal care, hypertensive disorders are still a significant challenge, particularly in developing countries where quality maternal healthcare access is restricted [4]. The pathophysiology of pregnancy hypertensive disorders is multifactorial with the role of abnormal placentation, endothelial dysfunction, and systemic inflammation leading to uteroplacental blood flow impairment and consequent adverse pregnancy outcomes [5].

The neonatal complications of maternal hypertension are typically adverse and include an increased risk of preterm delivery, low birth weight, intrauterine growth restriction, low Apgar scores, NICU admission, and neonatal death [6]. Placental insufficiency secondary to maternal hypertension restricts fetal growth and in some cases may require preterm delivery in order to avoid maternal and fetal compromise, further contributing to prematurity complications in the neonate [7]. These conditions further are more frequently observed in neonates of hypertensive women: respiratory distress syndrome, neonatal jaundice, sepsis, and perinatal asphyxia [8].

It is reported by some studies that burden of neonatal complications resulting from hypertensive pregnancy; however, the magnitude and character of poor outcomes may vary based on population, healthcare infrastructure, and access to timely intervention [9]. In Bangladesh, where indicators of maternal and neonatal health are gradually improving but still continue to face many challenges, hypertensive disorders continue to be an important cause of perinatal complications. Early diagnosis and adequate management of hypertensive

disorders of pregnancy are needed to improve neonatal survival and reduce morbidity [10, 11].

Despite the fact that widespread international literature on the subject exists, corresponding data which are accessible to the Bangladeshi population, especially in the healthcare setting across many of these such as tertiary care and community health complexes, are not available [12]. Therefore, it is essential to understand our context-specific neonatal outcomes of maternal hypertension in order to guide clinical practice and health policy [13].

This study was conducted with the aim of evaluating the neonatal outcomes among pregnant women with hypertensive disorders in a tertiary care center, Bangabandhu Sheikh Mujib Medical University (BSMMU), and a secondary level hospital, Sibchar Health Complex, Madaripur. The findings of this study are expected to highlight the burden of neonatal complications among this high-risk group and underscore the need for specific interventions to improve parental outcomes.

METHODOLOGY & MATERIALS

This prospective observational study was carried out in the Department of Obstetrics and Gynaecology at Bangabandhu Sheikh Mujib Medical University (BSMMU) and Sibchar Health Complex, Madaripur, Bangladesh, from April 2016 to March 2017. There were 100 pregnant women who were diagnosed with hypertensive disorders during pregnancy enrolled consecutively through a purposive sampling method. Hypertensive disorders included preeclampsia, gestational hypertension, eclampsia, and chronic hypertension, diagnosed according to traditional clinical criteria. Diabetes mellitus, chronic kidney disease, or multiple pregnancies were the exclusion conditions of the study.

After obtaining informed consent, complete maternal data like gestational age at delivery, nature of hypertensive disorder, and parity were recorded. Neonatal outcomes were measured during hospital stay and at the time of birth and consisted of birth weight, gestational age at delivery, 5-minute Apgar, need for admission to the neonatal intensive care unit (NICU), and any neonatal complications such as respiratory distress syndrome, neonatal jaundice, or sepsis. Less than 2500 grams birth weight was classified as low birth weight; preterm birth was birth before 37 completed weeks of gestation. Apgar score less than 7 at 5 minutes was considered as low.

Information was recorded on a proforma and cross-checked from time to time for completeness and consistency. Neonatal complications were defined clinically and confirmed by proper investigations wherever needed. The primary outcome measures captured were the rates of preterm birth, low birth weight, NICU admission, neonatal complications, and perinatal death. All the information was entered into SPSS version 20.0 for analysis. Descriptive statistics like frequency and percentage were used to summarize categorical variables, whereas continuous variables were reported as mean and standard deviation. Results were reported in tables to provide clarity. Ethical approval of the study was obtained from the relevant institutional review board, and confidentiality of participants was strictly adhered to during the research.

RESULTS

Table 1: Maternal Characteristics (n = 100)

Maternal Characteristics	Number (n)	Percentage (%)
Age (years)		
- ≤25 years	31	31%
- 26–30 years	44	44%
- >30 years	25	25%
Parity		
- Primigravida	39	39%
- Multigravida	61	61%
Type of Hypertensive Disorder		
- Gestational hypertension	53	53%
- Preeclampsia	32	32%
- Eclampsia	10	10%
- Chronic hypertension	5	5%

Table 1 presents the maternal characteristics of the study population. Among the 100 mothers, the majority (44%) were aged between 26 and 30 years, while 31% were aged ≤25 years and 25% were above 30 years. Regarding parity, 39% were primigravida and 61% were multigravida. The most common hypertensive disorder was gestational hypertension (53%), followed by preeclampsia (32%), eclampsia (10%), and chronic hypertension (5%).

Table 2: Neonatal Outcomes (n = 100)

Neonatal Outcomes	Number (n)	Percentage (%)
Preterm birth (<37 weeks)	38	38%
Term birth (≥37 weeks)	62	62%
Low birth weight (<2500 g)	45	45%
Normal birth weight (≥2500 g)	55	55%
NICU admission	32	32%
No NICU admission	68	68%
Low Apgar score (<7 at 5 minutes)	18	18%
Normal Apgar score (≥7 at 5 minutes)	82	82%
Neonatal complications	43	43%
No complications	57	57%
Perinatal death	6	6%
Alive at discharge	94	94%

Table 2 summarizes the neonatal outcomes. Preterm birth occurred in 38% of cases, while 62% were term births. Low birth weight was observed in 45% of neonates. NICU admission was required for 32% of newborns, and 18% had a low Apgar score at 5 minutes. Neonatal complications were recorded in 43% of cases, and the perinatal mortality rate was 6%.

Table 3: Types of Neonatal Complications (n = 43)

Type of Complication	Number (n)	Percentage (%)
Respiratory distress syndrome (RDS)	20	46.50%
Neonatal jaundice	15	34.90%
Neonatal sepsis	8	18.60%

Table 3 shows the types of neonatal complications among 43 affected newborns. Respiratory distress syndrome (RDS) was the most common complication, occurring in 46.5% of cases, followed by neonatal jaundice in 34.9% and neonatal sepsis in 18.6%.

DISCUSSION

Hypertension disorders of pregnancy remain a leading cause of maternal and neonatal morbidity globally. In our study, the most common subtype was gestational hypertension in 53% of the patients, followed by preeclampsia (32%), eclampsia (10%), and chronic hypertension (5%). The findings are consistent with those of Uddin et al., and Zahan et al., who reported that the most common subtype among hypertensive pregnancy was gestational hypertension [14, 15].

As far as neonatal outcomes were concerned, we had a 38% preterm birth, which is comparable to Singh and Rana, with a preterm rate of about 35% in hypertensive pregnancies [16]. Comparable was also Yücesoy et al., who reported a higher preterm delivery rate in association with maternal hypertension [17]. Pathophysiology is mostly due to uteroplacental insufficiency and usually requires preterm delivery in order to prevent maternal or fetal complications [18, 19].

In our group, 45% of neonates were of low birth weight (LBW) (<2500 g). This conforms to the findings of Chaim et al., and Khosravi et al., who showed LBW in hypertensive pregnancies to be between 40% and 48% [20, 21]. Chronic uteroplacental insufficiency limits fetal growth, as accounted for by the high frequency of LBW in our study.

NICU admission was required in 32% of neonates, which is in line with findings of Seyom et al. [22] and Leeman and Fontaine, who found NICU admission in 30%–40% of neonates born to mothers with hypertension [23]. The primary reasons for admission were respiratory distress, jaundice, and sepsis, which are complications associated with prematurity and intrauterine growth restriction [24,25].

Low Apgar score (<7 at 5 minutes) was found in 18% of our neonates, which is comparable to the rates reported by Cruz et al., and Ananth et al., where low Apgar scores were significantly associated with hypertensive disorders, mostly due to perinatal hypoxia and asphyxia [26, 27].

Our total perinatal mortality rate was 6%, slightly lower but comparable to that in Olusanya et al., and Bramham et al.'s reports, where they also noted perinatal mortality rates of 6%–10% in hypertensive pregnancies, particularly in the developing world [18, 28]. This reflects a persistent issue with managing these high-risk pregnancies even with improved perinatal care [29, 30].

In complicated neonates, the most common was respiratory distress syndrome (RDS) in 46.5% of complicated neonates, then neonatal jaundice (34.9%), and lastly neonatal sepsis (18.6%). These findings are congruent with those of Kocijancic et al., and Sivakumar et al., which reported RDS as the most common complication among neonates whose mothers were hypertensive [31, 32]. Premature birth and compromised fetal lung maturity due to placental malfunction are

likely causative factors behind the high prevalence of RDS.

Our study clearly demonstrates that pregnancy hypertensive disorders are associated with significantly increased risks of preterm birth, low birth weight, NICU admission, neonatal complications, and perinatal death. Our findings concur with the observations of Zanette et al., and Poon et al., who highlighted the importance of early screening, close monitoring, and early interventions to improve maternal and neonatal outcomes [33, 34].

Moreover, it is also important to consider that children of hypertensive mothers can have long-term consequences, like neurodevelopmental impairment, as suggested by Tuovinen et al [35]. Thus, intervention and follow-up postpartum are critical.

Finally, as per Çetinkaya et al., and Mautner et al., the impacts of hypertensive disorders do not end at the time of delivery but also extend to maternal physical and mental health, emphasizing the need for holistic perinatal care [36, 37].

Limitations of the study

Our study was conducted in a single center with a relatively small sample size, which may limit the generalizability of the findings. In addition, we could not follow up on the long-term neonatal outcomes beyond the immediate perinatal period. Certain confounding factors such as maternal comorbidities and socioeconomic status were not fully analyzed, which could have influenced neonatal outcomes.

Recommendations

Early identification and strict monitoring of hypertensive disorders during pregnancy are essential to improve neonatal outcomes. Multidisciplinary management involving obstetricians, neonatologists, and anesthesiologists is recommended. Expanding access to quality antenatal care, timely interventions, and postnatal follow-up services could significantly reduce perinatal morbidity and mortality. Future multicenter studies with larger populations and long-term neonatal follow-up are necessary to better understand the full impact of hypertensive disorders on child development.

CONCLUSION

Hypertensive disorders of pregnancy are strongly associated with adverse perinatal outcomes, including increased rates of preterm birth, low birth weight, NICU admission, and neonatal complications such as respiratory distress syndrome. Our study highlights the urgent need for effective antenatal screening, timely management, and coordinated perinatal care to reduce neonatal morbidity and mortality associated with hypertensive pregnancies.

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