



PERINATAL OUTCOME IN BABIES IN RELATION TO SEVERITY OF MATERNAL HYPERTENSION

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Conflicts of Interest: Nil

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Abstract:

Background and objectives: Hypertensive disorder of pregnancy is a major cause of maternal and neonatal mortality and morbidity worldwide. This study prospectively examined the immediate neonatal outcome of women with hypertensive disorder of pregnancy. Objectives were to study the effects of maternal hypertension on APGAR score at birth and the need for neonatal resuscitation as well as to study neonatal morbidity profile and mortality pattern.

Methods: Observational study was conducted on 125 babies born to mothers with hypertension in the neonatal intensive care unit of jubilee mission medical college. To study the effects of maternal hypertension and perinatal outcome, frequency and percentages were applied. Following parameters like prematurity, IUGR, low birth weight, hypoglycemia, hypocalcemia, hyperbilirubinemia will be studied. Chi square test will be applied for categorical variables and independent two sample t test will be applied for numerical variables.

Results: Study population had male predominance. 60% underwent LSCS. SGA babies maximum with eclampsia (45.5%), IUGR babies maximum with pre-eclampsia (9.4%). Prematurity seen in all babies born to eclamptic and 40.6% born to pre-eclamptic mothers ($p < 0.001$). 1 and 5 minute APGAR were < 7 in 15.9%, 15.6%, 18.2% and 12.2%, 9.4%, 9.1% of babies born to mothers with PIH, pre-eclampsia and eclampsia respectively. Other variables not statistically significant. Death was maximum in babies born to pre-eclamptic mothers (9.4%).

Conclusions: Maternal hypertension was associated with higher risk of adverse perinatal outcomes; necessitating need to strengthen prevention, early diagnosis and management of pregnancy-induced hypertension.

Keywords: APGAR; prematurity; low birth weight; hypoglycemia; hyperbilirubinemia; hypocalcemia; respiratory distress

Introduction

Hypertensive disorders are among the commonest medical disorders complicating pregnancy and continue to be a major cause of maternal and perinatal morbidity as well as mortality. In India incidence of preeclampsia as recorded from hospital statistics vary from 5-10%. (1) Even though the exact etiology remains unknown, the factors that are currently accepted include abnormal trophoblastic invasion of uterine blood vessels, increased vasopressor response, oxidative stress with release of vasoactive substances and genetic abnormalities. The increased occurrence of perinatal morbidity and mortality are due to the need for premature delivery and uteroplacental insufficiency which results in a compromise of the fetal blood flow. (2) The early-onset type (onset earlier than 28 gestational weeks) of pregnancy induced hypertension (PIH) is associated with a higher incidence of intrauterine growth retardation (IUGR), fetal distress, and neonatal hypoglycemia. Moreover, the infants from early-onset type of PIH mothers showed a higher incidence of neurological handicap (cerebral palsy, mental retardation and epilepsy) than late onset type. Proper perinatal management, which includes evaluation of fetal well-being and good timing of delivery could cause an improvement of the outcome of infants from early onset type of PIH mothers. (3) Primary outcome studied was neonatal outcome in terms of APGAR SCORE. (4) The

scoring system described by Dr. Virginia Apgar in 1953 remains a useful clinical tool to classify newborn health immediately after birth and to assess the effectiveness of resuscitative measures. (5) The Apgar score quantitates clinical signs of neonatal depression, such as cyanosis or pallor, bradycardia, depressed reflex response to stimulation, hypotonia, and apnea or gasping respirations. The score is checked at 1 minute and 5 minutes after birth for all infants, and at 5-minute intervals thereafter till 20 minutes for infants with a score less than 7. (6) This protocol will review the perinatal outcomes of infants born to mothers with hypertension and potential strategies to optimize fetal outcomes in pregnancies complicated by preeclampsia.

Aims & Objectives:

1. To study the effects of maternal hypertension on Apgar score at birth (1 and 5 minutes) and the need for neonatal resuscitation
2. To study neonatal morbidity profile and mortality pattern in neonates born to mothers with hypertension

Methodology:

- 1) **Study design:** Observational study
- 2) **Study Period:** 18 MONTHS

3) Setting: Neonatal ICU, Jubilee Mission Medical College & Research Institute, Thrissur

4) Sampling:

A) Sample size:

The prevalence of neonatal outcome observed in an earlier article “ Bokhari ZH, Yasooob M, Intesar A, Haq MF: Neonatal outcome in patients with Preeclampsia :PJMHS VOL 8:No 4 oct-dec 2014” with 95% confidence level and 20% relative allowable error, minimum sample size comes to 125

$$n = \frac{Z_{1-\alpha/2}^2 p \cdot q}{d^2}$$

B) Inclusion criteria:

1. Booked cases of Antenatal women with pre-eclampsia syndrome ,eclampsia (pre-eclampsia with seizures) and gestational hypertension.
2. All neonates born to pre-eclamptic ,eclamptic mothers and mothers with gestational hypertension were included irrespective of the maternal age, sex of the baby, parity of the mother or Mode of delivery.

C) Exclusion criteria

Mothers on any kind of chronic medications other than anti-hypertensives ,mothers suffering from concurrent disease such as diabetes or cardiovascular disorders, Rh-negative or retrovirus positive mothers, hydrops foetalis, cord prolapse, cord abnormalities such as true knots and congenital malformations

D) Sampling procedure

1. All babies born to mothers with hypertension in JMMC will be included in the study
2. Blood sampling for monitoring the serum glucose, calcium, bilirubin will be done routinely in all babies born to mothers with hypertension as per the standard protocol in JMMC.

E) Methods of data collection

Data collected by referring case sheets and investigation forms of infants included under study. Informed consent taken from father /mother. Data presented using tables, graphs and charts.

F) Statistical analysis

Data was entered in Microsoft Excel. Mean and standard deviation was calculated for continuous variables, and proportion was calculated for categorical variables. To study the effects of maternal hypertension and perinatal outcome, frequency and percentages were applied. Following parameters like prematurity, IUGR, low birth weight, neonatal hypoglycemia, hypocalcemia, hyperbilirubinemia were studied. Chi square test was applied for categorical variables and independent two sample t test was applied for numerical variables. P value of <0.05 was considered statistically significant. Data was analyzed by statistical software IBMSPPSS version 25.

Results and analysis:

The study group had male predominance. 56% were males and 44 % were females with male to female ratio 1.27: 1. 63% were appropriate for gestational age, 30 % were small for gestational age and 7 % were IUGR babies. 40 % babies were delivered by normal vaginal delivery, and 60 % by LSCS. 53 % were preterm. 65% of mothers had PIH, 26 % had pre-eclampsia and 9 % had eclampsia

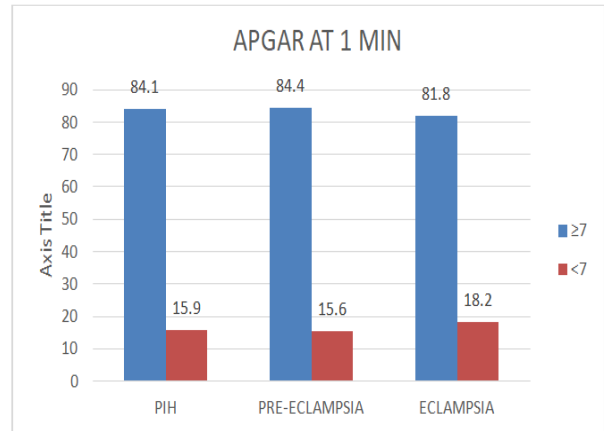


Figure 1: APGAR at 1 minute

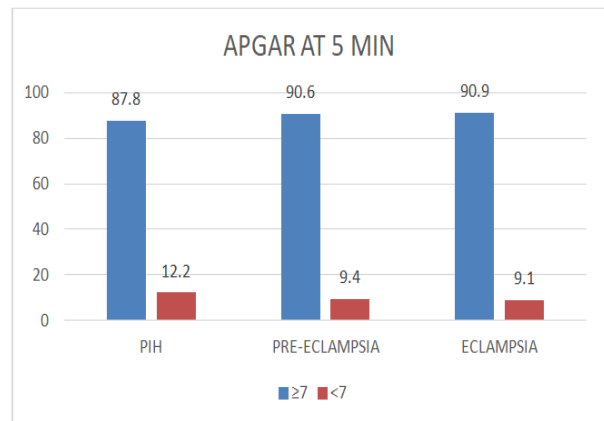


Figure 2: APGAR at 5 minute

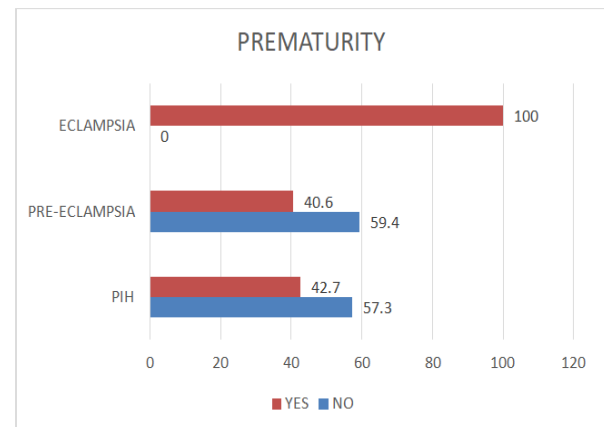


Figure 3: Prematurity and maternal hypertension

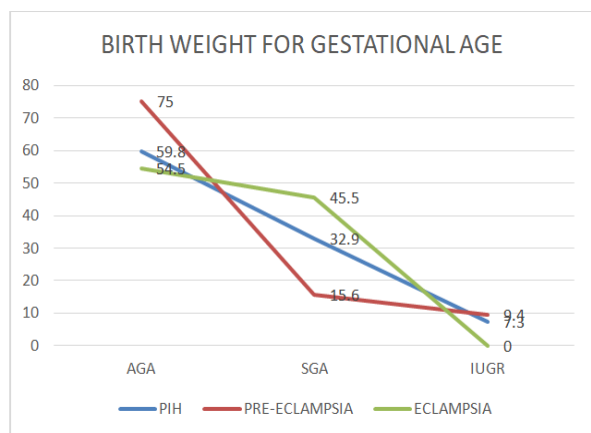


Figure 4: Birth weight for gestational age

In the study population the incidence of SGA babies was maximum with eclampsia(45.5) , while the incidence of IUGR babies was maximum with pre-eclampsia(9.4) ,but it was not statistically significant (p -0.254) .

Respiratory distress was present in 37.8%, 31.3 % and 63.6% of babies born to mothers with PIH pre- eclampsia and eclampsia respectively. (p-0.160). Hypoglycemia and hypocalcemia was present in 32.9 % , 18.8% , 45.5% and 6.1%, 21.9%, 9.1% of babies born to mothers with PIH , pre- eclampsia and eclampsia respectively. (p-0.176). Jaundice was present in 48.8 % , 43.8% and 45.5% of babies born to mothers with PIH, pre- eclampsia and eclampsia respectively (p-0.883). Stormy hospital stay was seen in 26.8 % of babies born to mothers with PIH, 12.5 % of babies born to pre- eclamptic mothers and 36.4 % of babies born to eclamptic mothers. Death was maximum in babies born to pre- eclamptic mothers (9.4 %) (p-0.086) .

Discussion:

The present study was an observational study on babies born to mothers with hypertension conducted in the neonatal intensive care unit of JMMC, Trissur. The study population had a male predominance with male to female ratio of 1.27 : 1. One and five minute APGAR were <7 in 15.9%,15.6%,18.2% and 12.2%,9.4%,9.1% of babies born to mothers with PIH, pre-eclampsia and eclampsia respectively(p- 0.888). This was in accordance with the study by Aabidha, et al who also stated that hypertensive disorders of pregnancy increase the risk of low APGAR score for infant.(7)

In this study, the frequency of cesarean section was higher in preeclamptic women(60%).This is in accordance with the study by Al-Mulhim et al which showed that vaginal deliveries were less frequent in women with preeclampsia (69.2%)(8). In contrast to our results, Tavassoli et al have reported that severe preeclampsia was not associated with increased cesarean rates.(9) The incidence of SGA (45.5%) and LBW (36.4%) babies were maximum with eclampsia (45.5), while the incidence of IUGR(9.4%), VLBW(12.5%) and ELBW(9.4%) babies were maximum with pre-

eclampsia. A study by Jane et al demonstrated that 39% of women with severe early-onset pre-eclampsia are further complicated by fetal growth restriction(10). All babies born to eclamptic mothers were premature, 40.6 % babies born to pre-eclamptic mothers were premature.(p-0.001). A case-control study by Emma et al showed similar results with a significant positive association between preeclampsia and preterm (11). Therefore it can be postulated from our study that the effect of preeclampsia and gestational hypertension on birth weight is a function of gestational age. The effect of decreased birth weight is found mostly among preterm births.

The incidence of respiratory distress was 37.8% in babies born to mothers with PIH , 31.3 % in babies born to pre-eclamptic mothers and 63.6 % in babies born to eclamptic mothers. Wang, A. *et al*, showed that neonates born to women with hypertensive disorders had neonatal respiratory distress/asphyxia.(12) Hypocalcemia was present in 21.9 % of babies born to pre- eclamptic mothers . Study by Aggarwal et al also confirmed a similar association between hypocalcemia and maternal hypertension. (13). Jaundice was a common presentation in neonates which was similar to study by Boskabadi et al who showed that a common perinatal complication among neonates with jaundice was maternal hypertension (19%) (14)

Stormy hospital stay was seen in 26.8 % of babies born to mothers with PIH, 12.5 % of babies born to pre- eclamptic mothers and 36.4 % of babies born to eclamptic mothers. Death was maximum in babies born to pre-eclamptic mothers (9.4 %). Cande et al , stated that there was a substantial burden of stillbirth and neonatal mortality in association with PIH.(15)

Limitations:

The drawback of the study is that it is a small study group, it is a hospital based study and finding cannot be extrapolated to general population. There is a need for large multi centric study. Also Long term outcomes were not evaluated.

Conclusion:

Hypertensive disorders are among the commonest medical disorders complicating pregnancy and continue to be a major cause of maternal and perinatal morbidity as well as mortality. The study was aimed to look into the effects of maternal hypertension on APGAR score at birth, need for neonatal resuscitation, neonatal morbidity profile and mortality pattern. There was a statistically significant association between prematurity and maternal hypertension .1 and 5minute APGAR were lower in babies born to mothers with hypertension. Neonatal hypoglycemias, hypocalcemia, jaundice, respiratory distress, IUGR were the other adverse outcomes noticed in the study group though not statistically significant. Maternal hypertension was associated with a higher risk of adverse perinatal outcomes. Thus health care providers should strengthen prevention,

early diagnosis and prompt management of pregnancy-induced hypertension to reduce the incidence of adverse perinatal outcomes.

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