MATERNAL AND PERINATAL OUTCOME IN PREGNANCY INDUCED HYPERTENSIVE MOTHERS IN COMBINED MILITARY HOSPITAL, SIALKOT

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ABSTRACT

Objective: To determine the maternal and perinatal outcome in pregnancy induced hypertensive mothers.
Study Design: Prospective comparative study.
Place and Duration of Study: Conducted in department of Obstetrics and Gynecology, Combined Military Hospital Sialkot, from Jan 2018 to Dec 2018.
Methodology: Data of 200 women with pregnancy induced hypertension after 20 weeks of pregnancy were included in the study group and also enrolled 200 normotensive antenatal women, who remain normotensive till after 12 weeks postpartum as control group. Their demographic data, mode of delivery, maternal and perinatal outcome was recorded.
Results: Out of 2599 deliveries during the study period, incidence of pregnancy induced hypertension was 7.7%. Cesarean section was mode of delivery for 106 (53%) women with pregnancy induced hypertension compared to 52 (26%) of normotensive cases. There were 114 (57%) cases of gestational hypertension, 69 (34.5%) cases of preeclampsia and 17 (8.5%) cases of eclampsia. Intensive care admission was required in 48 (24%) cases of study group compared to 6 (3%) in control group. The maternal mortality was (1.5%) in study group. Preterm deliveries were 66 (35.11%) and 62 (32.98%) neonates were low birth weight, neonatal intensive care was required in 84 (44.68%) neonates and perinatal mortality was 30 (15%) in study group.
Conclusion: Pregnancy induced hypertension not only increases the rate of operative deliveries but also carries high risk of adverse maternal and perinatal outcome.

Keywords: Eclampsia, Hypertension, Preeclampsia, Prematurity.

INTRODUCTION

Hypertensive disorders in pregnancy remains a major health concern due to the associated adverse maternal outcomes alongwith significant perinatal morbidity and mortality. An estimated 6-12% of all pregnancies were complicated by hypertension. It includes chronic and gestational hypertension which are relatively benign and two quite severe conditions of pre-eclampsia or eclampsia[1]. Population-based data indicate that approximately 1% of pregnancies were complicated by chronic hypertension, 5-6% by gestational hypertension (without proteinuria), and 3-6% by preeclampsia[2].

As per Nice guidelines, the word Gestational hypertension is new hypertension present after 20 weeks of pregnancy without significant proteinuria whereas pre-eclampsia is defined as recent onset of hypertension (more than 140 mmHg systolic or over 90 mmHg diastolic) after 20 weeks of pregnancy along with proteinuria[3]. Pre-eclampsia is a disorder of widespread vascular endothelial malfunction and vasospasm that occurs after 20 weeks gestation and can present as late as 4-6 weeks postpartum[4]. In preeclampsia high blood pressure plus proteinuria >0.3 grams in a 24-hour urine specimen, a protein/creatinine (mg/dL) ratio of 0.3 or higher, or a urine dipstick protein of >1+ is required. Eclampsia is defined as seizures that cannot be attributable to other causes in a woman with preeclampsia. HELLP syndrome (hemolysis, elevated liver enzyme, low platelets) may complicate severe preeclampsia[5].

Maternal risks associated with pregnancy induced hypertension or gestational hypertension

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include development of uncontrolled hypertension, preeclampsia, eclampsia, HELLP syndrome, acute renal or hepatic failure, pulmonary edema, abruptio placentae, post partum hemorrhage, and consumptive coagulopathy.

Neonates of pregnancy induced hypertensive mothers are more often small for gestational age with more incidence of low birth weight, prematurity, increased morbidity and higher neonatal intensive care unit (NICU) admission rates than those born to normotensive mothers[6].

Exact pathology of gestational hypertension and preeclamia are still not clear, but the factors involved are genetic (maternal, paternal, thrombophilia), Immunological phenomena, abnormal placental implantation, oxidative stress, impaired angiogenesis, vascular endothelial damage, and poor vascular compliance due to volume expansion needed for an healthy gestation[7].

Women considered high risk for preeclampsia are those with a history of preeclampsia, multifetal gestation, chronic hypertension, diabetes mellitus, renal disease, or an autoimmune disease. Management of these includes recommendation for the possible use of low-dose aspirin (81 mg/day), introduced between 12 and 28 weeks of gestation, to prevent preeclampsia in high risk women[8].

Rationale of our study was to determine the maternal and perinatal outcome of hypertensive disorders among pregnant women obtaining obstetrical services at CMH, Sialkot. The findings of our study may help the healthcare providers to formulate appro-priate interventions in improving maternal and perinatal health especially in resource constraint environment.

METHODOLOGY

This was a prospective comparative study conducted from January to December 2018 at department of Obstetrics and Gynecology, Combined Military Hospital, Sialkot. The study was approved by the Research and ethics committee of the institute (certificate no. A/28/EC-/28/19 dated 2 Nov 2019) and informed consent was taken from all the participants. Study was conducted in 200 antenatal women diagnosed as pregnancy induced hypertensive mothers with blood pressure recording of more than 140/90 mm of Hg on two occasions, four hours apart, they were enrolled as study (PIH) group and 200 normotensive antenatal women, who remain normotensive till after 12 weeks postpartum, enrolled as control group. The women in the study (PIH) group were checked for blood sugar, blood urea, creatinine, hemoglobin, proteinuria and LFT.

Our sampling was done by using non-probability convenience method. We calculated sample size by using open epi sample size calculator with prevalence 38.40 (incidence 6.42%)[9] and CI=95%, n=142. However we keep our sample size higher (n=200) to avoid confounding factors as loss to follow up (which is common issue in Military Hospitals due to posting of their husbands) or late disclosure of chronic diseases.

All pregnant women attending antenatal clinics and intended to deliver in this institution, with singleton pregnancy and having systolic blood pressure of ≥140 mmHg and/or diastolic blood pressure of ≥90 mmHg after 20 weeks of pregnancy were included in the study (PIH) group.

Those pregnant women who were irregular in antenatal visits or having molar pregnancy, multiple gestation and those with chronic illnesses as cardiac disease, diabetes mellitus, renal or liver disorders were excluded from study.

Statistical analysis was performed using SPSS-20; SPSS Inc., Chicago, IL, USA). Categorical data were presented as frequencies and percentages. A chi-square test was performed to analyze the correlation between categorical variables. A *p*-value of ≤0.05 was considered significant.

RESULTS

There were a total of 2599 deliveries during the study period, out of which 200 (7.7%) pregnant women were diagnosed with pregnancy induced hypertension. LSCS was mode of

delivery for 106 (53%) cases of study group compared to 52 (26%) of control group. Most PIH mothers (47%) were at 36 weeks or more of gestation on diagnosis (table-I).

In PIH mothers pre eclampsia was noted in 69 (34.5%) and eclampsia in 17 (8.5%). The study (PIH) group and 6 (3%) in control group. Severe preeclampsia with HELLP syndrome, consumptive coagulopathy, and intracranial hemorrhage with persistent seizures were the causes of 3 maternal deaths. Maternal mortality was 1.5% in PIH mothers (table–II).

Table-I: Maternal variables in study (PIH) and control groups.

Variables	Study group- n- 200 (%)	Control n-200 (%)	*p*-value
Age			
<25 years	40 (20%)	54 (27%)	0.235
25-35 years	108 (54%)	114 (57%)	0.810
≥36 years	52 (26%)	32 (16%)	0.601
Gravida			
Primigravida	48 (24%)	38 (19%)	0.390
Para 1-4	114 (57%)	118 (59%)	0.899
Para ≥5	38 (19%)	44 (22%)	0.629
Gestation on Diagnosis			
25-29 weeks	28 (14%)	-	
30-35 weeks	78 (39%)	-	<0.05
≥36 weeks	94 (47%)	-	
Mode of Delivery			
Cesarean Section delivery	106 (53%)	52 (26%)	
Spontaneous Vaginal Delivery	78 (39%)	136 (68%)	<0.05
Instrumental delivery	16 (8%)	12 (6%)	

Table-II: Breakup of maternal complications among study and control groups.

Maternal Complications	Study group n-200 (%)	Control n-200 (%)	*p*-value
GestationalHypertension	114 (57%)	-	
Pre-eclampsia	69 (34.5%)	-	
Eclampsia	17 (8.5%)	-	
Postpartum hemorrhage	18 (9%)	6 (3%)	<0.001
Antepartum hemorrhage	16 (8%)	3 (1.5%)	<0.001
HELLP syndrome	10 (5%)	-	
ConsumptionCoagulopathy	5 (2.5%)	-	
Renal failure	4 (2%)	-	
Intracranial hemorrhage	2 (1%)	-	
ICU admissions	48 (24%)	6 (3%)	<0.001
Intra Uterine Death	8 (4%)	-	
Stillbirth	4 (2%)	-	

maternal complications were post partum hemorrhage, antepartum hemorrhage, HELLP syndrome, Consumption coagulopathy and seizures with intracranial hemorrhage. The PIH mothers with abruption were carefully monitored and causes other than Hypertension as maternal trauma, placental anomalies or cord accidents were excluded. The ICU admissions were 48 (24%) in

There were 8 (4%) IUD's and 4 (2%) still births and in these, all other possible causes of IUD were excluded and the only reason was PIH. We followed 188 neonates of PIH mothers and 200 neonates of normotensive mothers.

There were 66 (35.11%) and 36 (18%) preterm and 62 (32.98%) and 28 (28%) low birth weight neonates of PIH and normotensive mothers

respectively. Neonatal intensive care was needed in 84 (44.68%) neonates of PIH mothers compared to 32 (16%) babies of normotensive mothers (table–III).

Neonatal complications were prematurity with or without respiratory distress syndrome, birth asphyxia, neonatal jaundice, transient tachypnea of newborn, neonatal sepsis, meconium aspiration syndrome, and congenital anomalies (table-IV).

Table-III: Breakup of neonatal outcome in study and control groups.

Neonatal Outcome	Study group n=188	Control group n=200	*p*-value
Preterm	66 (35.11%)	36 (18%)	<0.001
Full term	122 (64.89%)	164 (82%)	
IUGR Babies			
Yes	46 (24.47%)	18 (9%)	<0.001
No	142 (75.53%)	182 (91%)	
Birth Weight			
<2.5 Kg	62(32.98%)	28 (14%)	<0.001
2.5 to 4 Kg	112 (59.57%)	146 (73%)	
>4 Kg	14 (7.45%)	22 (11%)	
APGAR ≤7 at 5 min			
Yes	28 (14.89%)	16 (8%)	0.080
No	160 (85.11%)	184 (92%)	
Admission in NICU			
Yes	84 (44.68%)	32 (16%)	<0.001
No	104 (55.32%)	168 (84%%)	

Table-IV: Breakupof admissions in Neonatal intensive care unit in study and control groups.

Causes of Admission	Study(PIH) group n–84 (%)	Control group n- 32 (16%)	*p*-value
Prematurity with RDS	26 (30.95%)	08 (25%)	<0.001
Birth Asphyxia	16 (19.05%)	02 (6.25%)	<0.001
MAS	8 (9.52%)	03 (9.37%)	0.199
Neonatal sepsis	12 (14.29%)	08 (25%)	0.436
TTN	12 (14.29%)	04 (12.50%)	0.067
Neonatal Jaundice	08 (9.52%)	05 (15.63%)	0.518
Congenital anomalies	02 (2.38%)	02 (6.25%)	0.659

The neonatal deaths were 18 (5.57%) in pregnancy induced hypertensive mothers and 4 (2%) in control group. The overall perinatal mortality in PIH group was 30 (15%) (table-V).

DISCUSSION

Hypertension is the most common medical problem encountered during pregnancy, complicating up to 10% of pregnancies[10]. In developing nations, the incidence of pregnancy induced hypertension is reported to be 4-18%, with hypertensive disorders being the second most common obstetric cause of stillbirths and early neonatal deaths in these countries[11]. In our study incidence of pregnancy induced hypertension was 7.7% and it was 5.5% in another study from Karachi by Perveen *et al*[12] and 5.56% by Nisa *et al*, from Sukkur[13]. A recent review reported that hypertensive disorders of pregnancy complicate around 6% of all pregnancies in Ethiopia[14]. Gestational hypertension predisposes women to increased rate of operative deliveries. In our study 53% women of PIH group compared to 27% of control group has undergone Cesarean deliveries. Similar results were observed by Bonsaffoh *et al*[15] from Ghana where cesarean deliveries were 45.7%, and it was 54% in another study from Karachi by Perveen[12]. However Siromani *et al*[16]

found cesarean deliveries in PIH mothers was 70.62% and 27% in normotensive mothers.

The PIH mothers were also predisposed to other pregnancy related complications. In a recent JAHA (Journal of the American Heart Association) article by Riise *et al*[17] the hazard ratio for risk of CVD associated in pregnancy induced hypertension with small for gestational age and/ or preterm delivery was higher for pregnancy induced hypertension alone. In our study 34.5% preeclampsia and 8.5% eclampsia was observed, and similarly it was 32% in a study by Perveen[12]. In our study commonest complication was post partum hemorrhage (9%) and antepartum hemorrhage (8%), however in a study by Nisa *et al*[13] from Sukkur higher incidence of postpartum hemorrhage (27%) and antepartum hemorrhage (17%) was reported. The maternal mortality in our study (PIH) group was 1.5% however it was 4% in a review study by Mersha *et al*, in Ethopia[18] and 6% in a study by Perveen[12] from Karachi.

We found 32.98% low birth weight babies in PIH mothers compared to 14% in control group, and higher results was noted 54.67% by Siromani *et al*[16] in India and 40.7% by Bonsaffoh[15] from Ghana. Keeping in view findings mentioned earlier by Riise *et al*[17] our data highlighted high risk of CVD in PIH mothers. We found incidence of preterm deliveries 35.11%, however higher incidence of preterm deliveries 63.01% was reported by Siromani *et al*[16]. Contrary to this, preterm deliveries were lower in another regional studies by Perveen[12], its 24.4% and 22% in Lahore by Bokhari *et al*[19]. In our study IUGR babies were 24.47%, and it was 32% by Bokhari *et al*[19].

In our study 44.68% neonates of study group comparative to 16% neonates of control group were needed neonatal intensive care, which shows higher complications in neonates of pregnancy induced hypertensive mothers. Similarly 34.25% by Siromani *et al*[16] and 24% by Bokhari *et al*[19] was neonatal intensive care admissions. It was a significant outcome of these studies, as most of these babies needed special nursing care with high financial drain of resource constraint countries.

In our study there were 15% perinatal deaths in PIH cases compared to 2% perinatal deaths in the normotensive cases and similarly Berhe *et al*[20] in Ethopia found 15% and 2.5% perinatal deaths in gestational hypertension and normotensive mothers respectively but Bokhari *et al*[19] from Lahore observed 22% perinatal deaths in PIH mothers.

Table-V: Breakup of perinatal mortality in study and control groups.

Cause of Death	Study group n-200	Control group n–200	*p*-value
Prematurity/Respiratory Distress Syndrome	10 (5%)	3 (1.5%)	0.043
Birth Asphyxia	4 (2%)	-	
Neonatal sepsis	3 (1.5%)	1 (0.5%)	0.579
Meconium aspiration syndrome	1 (0.5%)	-	
Intrauterine deaths	8 (4%)	-	
Stillbirths	4 (2%)	-	
Neonatal deaths	18 (9%)	4 (2%)	<0.001
Perinatal mortality	30 (15%)	4 (2%)	<0.001

Numerous reasons have been identified for the high prevalence of eclampsia and preeclampsia in the local literature, including lack of education, awareness, resources, and superstitious beliefs regarding seeking medical aid[21]. Another major challenge is a delay in seeking medical advice, which accounts for high maternal and perinatal complications as well as mortality, which is otherwise preventable.

CONCLUSION

Our study concludes that the adverse maternal and perinatal outcome is a key indicator of maternal health and a reflection of the quality of obstetric and pediatric care. Awareness and preventive approach with special emphasis on

PIH mothers at each level of Health care facility and timely referral for specialized care is necessary in bringing down the overall maternal and neonatal morbidity and mortality.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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