Original Article

Maternal and perinatal outcome in nulliparious women complicated with pregnancy hypertension

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Abstract

Objective: To evaluate maternal and perinatal outcome in nulliparious women complicated with pregnancy hypertension.

Methods: This descriptive-analytic and case-control study was performed on 100 hypertensive and 100 normotensive nulliparious women who were referred to Imam Reza hospital in 2008. They were compared for maternal and perinatal outcomes. The data was analyzed by SPSS software. $P \leq 0.05$ was considered statistically significant.

Results: In this study, there were no significant differences in maternal age, menstruation condition, delivery mode, placental detachment rate between the studied groups. Gestational age was significantly lower in the case group, especially in severe preeclampsia subgroup ($P<0.001$). Serum creatinine level more than 1.2 mg/dl was significantly higher in mild and severe preeclampsia groups ($P=0.018$). Significant differences were found in neonatal APGAR, need of rescusitation, NICU admission, birth weight and length, LBW and intrauterine growth retardation between the studied groups.

Conclusion: The results of this study revealed that maternal and foetal-neonatal complications mostly appear in pregnancy complicated with induced hypertension especially in severe preeclampsia (JPMA 60:707; 2010).

Introduction

Pregnancy induced hypertension is one of the common outcomes with unknown etiology that causes the most maternal and perinatal morbidity and mortality.[1] Preeclmapsia is characterized by new onset hypertension and proteinuria usually after 20th week of gestation, but the condition is also associated with abnormalities of the coagulation system, disturbed liver function, renal failure, and cerebral ischaemia.[2] Five classes of hypertensive disorders were introduced by the National High Blood Pressure Education Working Group (2000) including preeclampsia, eclampsia, transient hypertension of pregnancy, chronic hypertension, and preeclampsia superimposed on chronic hypertension.[3] Preeclampsia can be classified as mild or severe; cut-offs used to define "severe" are blood pressure (BP) of 160/110 mmHg or higher in the American literature and 170/110 mmHg or higher in the European literature.[4] Hypertensive disorders occur in about 12-22% of pregnancies depending on the population and the diagnostic criteria used that are more prevalent in nulliparious women (25% of nulliparious women are complicated by hypertensive disorders).[5] These disorders remain the main cause of both maternal and perinatal morbidity and mortality throughout the world.[6,7] Approximately, 30% of hypertensive disorders of pregnancy are caused by chronic hypertension and 70% of cases are diagnosed as gestational hypertension/preeclampsia.[8] Moreover, preeclampsia produces potentially lethal complications including placental ablation disseminated intravascular coagulation, intracranial haemorrhage, hepatic failure, acute renal failure, and cardiovascular collapse. Intrauterine foetal growth restriction (IUGR), intrauterine foetal demise and prematurity are the

other related obstetric problems.[9]

The offspring of women with hypertension during pregnancy experience higher rates of prematurity and low birthweight compared to healthy maternal controls. Expectant management with temporizing treatment should be performed to lengthen gestation, which may be associated with enhanced perinatal survival. Maternal and foetal surveillance is conducted at regular intervals and delivery is indicated for worsening maternal and foetal conditions.[10] Special neonatal care is required for such babies, which is associated with emotional and financial stress for both parents and third party payers and long-term infant developmental consequences.[11]

Hauth et al. in 2000 performed the study on hypertensive and normotensive nulliparious women and found that maternal and foetal mortality is significantly higher in hypertensive nulliparious women.[12] The study performed in 2002 showed that pregnant women with severe preeclampsia had increased rate of preterm delivery and low birthweight as compared to mild preeclampsia.[13] The aim of this study was to evaluate maternal and perinatal outcome in nulliparious women complicated with pregnancy hypertension.

Patients and Methods

This is a descriptive-analytic and case-control study. Over one year period (2007-2008), 200 nulliparious women with gestational age of ≥ 34 weeks who were referred to Imam Reza Hospital affiliated to Mashhad University of Medical Sciences were evaluated for maternal and perinatal outcome. The women were divided into two groups: 100 hypertensive nulliparious women as case group (34 hypertension, 17 mild and 49 severe preeclampsia) and 100 normotensive nulliparious women as control group.

Preeclampsia was defined as new onset of blood pressure 140/90mmHg after 20th week of gestation with proteinuria 300mg/24h.

The case group were primigravida women with pregnancy hypertension (blood pressure ≥ 140 mmHg systolic or ≥ 90 mmHg diastolic measured on at least two occasions) with gestational age of ≥ 34 weeks who did not have any history of cardiovascular disorders, renal failure, diabetes, and other problems that may threat mother or foetus. The control group were healthy primigravida women without pregnancy hypertension. Gestational age was defined by last menstrual period confirmed by first trimester ultrasound.

A questionnaire was completed for each woman including: mother's age, obstetric history, parity, gravidity, weight and cause of the hypertension, smoking habits, superimposed preeclampsia, by new onset proteinuria of 300 mg or greater in a 24-h specimen, abruptio placentae, or an increase in blood pressure in a woman whose hypertension had previously been well controlled, and delivery age and mode; data relating to the neonate - weight, death and Apgar score.

Data were processed with SPSS software (version 11). Frequency tables, mean and standard deviation were used for describing data. Comparisons between the groups were made with a conventional chi-square test for qualitative variables and student-t test and one-way ANOVA test for quantitave variables. $P \leq 0.05$ was considered statistically significant.

Results

In this descriptive-analytic and case-control study including 200 women, 100 were in case group and 100 in control group. In case group, most of the patients (49%) were complicated by severe preeclampsia (blood pressure >160/110 and 24-h urine protein >300mg), 17% of patients were in mild preeclampsia group (blood pressure <160/110

Table-1: Mean and standard deviation of the characteristics of mothers and their newborns in the studied groups.

Groups parameters	Case	Control	p-value
Maternal age (year)	22.4±4.62	22.96±4.59	0.392
Gestational age (weeks)	37.37±2.25	38.81±1.71	<0.0001
Birth weight (gm)	2483.08±653.22	2829.41±565.14	<0.001
Birth length (cm)	47.31±3.90	48.68±2.76	0.004

Table-2: The rate of perinatal and maternal outcomes in the studied groups.

Groups parameters	Case			Control	p-value
	Hypertension%	Mild preeclampsia%	Severe preeclampsia%		
Prinatal outcome					
Low birthweight(LBW)	24.2	64.7	68.4	24.2	<0.0001
IUGR	6.1	5.3	27.5	4	0.0001
Need for NICU	3	15.8	17.6	4	0.012
Need for rescusitation	6.1	15.8	21.6	4	0.004
1 minute neonatal APGAR<7	3	17.6	23.5	5	0.001
maternal outcome					
Caesarean Section	39.4	42.1	47.1	3.7	0.4
placental detachment	15.2	5.3	5.9	5	0.233

Table-3: The rate of the chief complaint of the women in the case group.

Parameters	%
Headache	46%
Vision defect	26%
Epigastric pain	27%
Oliguria	5.10%
Creatinine level>1.2	16%
Creatinine level < 1.2	84%
Platelet Level<100000	13.30%
Platelet level > 100000	86.70%
Seizures	5%

and 24-h urine protein >300mg and 34% were in hypertension group (blood pressure >140/90 without proteinuria), respectively.

The mean maternal age was 22.4±4.62 year in case group and 22.96±4.59 in control group. There was no significant difference between case and control group when they were compared with regard to mean maternal age (P=0.392). The mean gestational age was 357.37±2.25 weeks in case group and 38.81±1.71 in control group. They were different in the view of mean gestational age (P<0.0001) (Table-1).

The mean birthweight in case group was 2483±653.22gm and in control group was 2829.41±565.14gm. They were significantly different in view of birthweight (P<0.001). Moreover, the mean birthlength was different between the studied groups (P=0.004) (Table-1).

In view of perinatal and maternal outcome, the rate of Low Birth Weight (LBW) (68.4%), Intra uterine growth retardation (IUGR) (27.5%), need to Neonatal Intensive Care Unit (NICU) (17.6%), need for rescusitation (21.6%), and neonatal APGAR (23.5%) were higher in the severe preeclampsia group, but the groups were not significantly different in the view of cesarean rate and placental detachment (Table-2).

Headache was the main compliant of the women in the case group (46%). Maternal outcome of the case group is listed in Table-3.

Discussion

Hypertensive disorder of pregnancy is considered to be a major worldwide health problem causing an increased risk of perinatal and maternal morbidity and mortality.[14] A number of different complex mechanisms involving the lipid and protein oxidation, altered nitric oxide production and adhesion molecules and placental glycoproteins playing a role in trophoblastic-endothelial dysfunction may be suggested as the etiopathogenesis of preeclampsia.[15]

The prevalence of hypertensive disorder of pregnancy is different according to geographic regions of the world and ranges from 1.5% in Sweden to 7.5% in Brazil.[16] The differences can be due to racial reasons, socioeconomic status and some other demographic parameters such as age and parity. Moreover, some centers serve as a referral medical facility for an extended number of primary care units of the surrounding rural areas.[17]

The study performed by Buchbinder et al showed that preterm delivery is only associated with severe hypertension and proteinuria does not affect the outcomes.[13] In the present study, gestational age in severe preeclampsia group was significantly lower than control group, mild preeclampsia and hypertension group.

Hypertensive disorder of pregnancy is responsible for significant maternal/perinatal morbidity and mortality. Maternal death associated with preeclampsia/eclampsia assumed more importance since previously frequent etiologies such as infection and haemorrhage became less common.[18] The study performed in 2005 reported that IUGR, low APGAR score and foetal deaths during labour were significantly more frequent in severe preeclamptic women when compared to other groups.[17] Different mortality rates were presented in literature changing in the range of 47-370/1000.[19]

The results of the present study sowed no significant difference between the studied groups in view of the menstrual condition. This result do not correlate with the results of the study performed by Fridstorm et al.[20]

Operative delivery is reported to be increased in hypertensive disorder of pregnancy.[21] Vaginal delivery is recommended for the severe preeclamptic women in the absence of obstetric indication for caesarean section. Elective abdominal delivery may be preferred in cases before 32 weeks with IUGR and oligo-hydramnios.[22] Coppage and colleagues concluded that immediate abdominal delivery did not improve maternal and perinatal outcome in severe preeclampsia and induction of vaginal delivery did not lead to increased morbidity and mortality.[23] Caesarean rate was not significantly different between the groups in this study, but increased rate of caesarean is reported in some studies.[24,25] Lydakis et al in 2001 demonstrated that LBW (low birthweight) is associated with preeclampsia.[24] Their finding is in accordance with the results of the present study. The cause of low birthweight can be prematurity or intrauterine growth restriction. In the present study, 27.5% of the neonates in severe preeclampsia group had been complicated by intrauterine growth restriction. The studied groups were significantly different in this case. Hauth et al (2000) and Lydakis et al (2001) reported the same result.[12,24]

Conclusion

The results of this study revealed that the most maternal and foetal-neonatal complications are associated with pregnancy induced hypertension, especially severe preeclampsia. However, in spite of the recent advances in our public health care unit, much effort and further skilled care is required for effective decline in adverse maternal and perinatal outcome. Early detection of high-risk individuals and mild cases by well-trained personnel, timely referral to advanced tertiary centers, early and timely treatment of preeclampsia cases and correct training of the mothers about fertility age and the importance of care during pregnancy may lead to improved perinatal and maternal outcomes.

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