HYPERTENSIVE DISORDERS OF PREGNANCY AND PERINATAL OUTCOME

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SUMMARY

In this randomized case controlled study 250 cases of hypertension complicating pregnancy (study group) and 400 women with normal pregnancy (control group) were studied. Majority of these women were young primigravidae, 80% & 93% in the study group and control group respectively. The mean gestational age was 37 weeks in the study group and 38.5 weeks in the control group. Pregnancy induced hypertension was present in 96% cases and chronic hypertension in 4%. Proteinuric PIH was noted in 108 (43.2%) and non proteinuric hypertension in 132 (52.8%). Hypertension was severe in 108 (43.2%) and mild in 142 (56.8%) casess. The perinatal outcome in the study group compared to control group was, still births 4.8% vs 0.25%; Preterm labour 28.8% vs 3%; Low birth weight 45.6% vs 14%; neonatal death rate 10% vs 0.75%; 40% babies in the study group needed special nursery care against only 9% in the control group Overall perinatal mortality in the study group was 14.8% as compared to 1% in the control group. Neonatal complications such as respiratory distress syndrome (9.6%) and meconium aspiration syndrome (3.2%) were seen more in study group as compared to 6% & nil in control group respectively.

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INTRODUCTION

Hypertension is the most common and serious complication of pregnancy

with a reported incidence of 6.8% and is more commonly seen in young primigravidae (Arias, 1993). It is responsible for a substantial amount of maternal and perinatal mortality and morbidity. The increased perinatal mortality is primarily due to prematurity which can be due to spontaneous or induced preterm labour. (Naeye and Friedman 1979; Sibai 1990; Anantha et al 1995, Fairlie et al 1991; Plovin et al 1986 & Sibai et al 1983). Pregnancy Hypertension is the most common indication for elective termination of pregnancy done in order to prevent maternal and foetal complications resulting from uncontrolled hypertensive process and foetal effects of placental insufficiency. Abruptio placentae, severe IUGR, antepartum and intrapartum foetal distress are the various factors responsible for increased perinatal mortality (Anantha et al 1995; Plovin et al 1986 & Sibai et al, 1983).

The increased incidence of obstetrical interventions required to manage these cases also contributes to an increased foetal and maternal morbidity. This randomized case controlled study was conducted to determine the impact of various hypertensive disorders complicating pregnancy, on perinatal outcome.

MATERIAL AND METHODS

In this randomized case controlled study, 250 cases of pregnancy complicated by hypertension and 400 cases of normal pregnancy were studied, over a period of one year in Safdarjang Hospital, New Delhi. All patients were in third trimester of pregnancy. In the study group hypertension was diagnosed when blood pressure was > 140 90 mmHg on two occassions at leasst 6 hours apart. Inclusion criteria used were singleton pregnancy with hypertension. Patients with any other known risk factors for increased perinatal mortality such as congenital malformations twin pregnancy, pregnancy in Rh negative mothers, diabetes mellitus or any other medical diseases such as heart disease severe anaemia etc, were excluded from the study. Hypertension was graded as to mild (BP from 140/90 to 160/110 mm of Hg. without proteinuria) and severe hypertension (BP > 160/110 mm Hg with or without proteinuria). Hypertension was classified into gestational hypertension, pre-eclampsia, eclampsia and chronic hypertension.

All the patients in the study group were hospitalised. Besides clinical evaluation and routine investigations, special tests done were KFT, LFT, coagulation profile, urine routine examination, culture and sensitivity and fundoscopy. Lupus anticoagulant factor was estimated in indicated cases such as in cases of IUGR, BOH, previous history of hypertension etc These cases were managed as per the hospital regime based on established clinical practice and strict foetal and maternal surveillance was done, the former by serial ultrasonography and latter by regular clinical evaluation and laboratory investigations. Maternal blood pressure was measured regularly. Urinary protein estimation and renal function tests were done at regular intervals. Anti hypertenssive drugs (Methyldopa and Nifedepine) were used to maintain the maternal diastolic blood pressure <100 mm of Hg.

Cases in which hypertension could be controlled by rest and medical treatment,

pregnancy was continued till term, whereas in severe and uncontrolled hypertension, pregnancy was terminated prior to term, either by induction of labour or caesarean section. Caesarean deliveries were done for obstetrical indications.

The perinatal outcome data documented included, mode of delivery, Apgar score at 5 and 10 minutes of birth, still birth rate, birth weight, neonatal death rate, other neonatal complications and perinatal mortality rate. The perinatal outcomes among the two groups of cases were analysed and compared.

RESULT

There was no significant difference in respect to age, parity and gestational age at the time of delivery among patients of study group and controls. (Table I). Majority of women in both the groups were primigravidae viz 22 (80%) and 372 (93%) in study and control groups respectively. Pregnancy induced hypertension was seen in 240 (96%) cases where as chronic hypertension in 10 (4%). In PIH groups 101 (40.4% had gestational hypertension, 121 (48.4%) preclampsia and 18 (7.2%) eclampsia (Table II). Nonproteinuric hypertension was present in 132 (52.8%) cases and proteinuric hypertension in 108 (43.2%). Hypertension was mild in 142 (56.8%) and severe in 108 (43.2%) cases.

In the study group 81 (32.4%) patients underwent spontaneous vaginal

TABLE I
CLINICAL CHARACTERSTICS OF THE PATIENTS

Clinical Characterstics	Study group (n=250)	Controls (n=400)
Age (yrs)	23.8	22.1
Mean	23.8	22.1
Range	(18-35)	(17.30)
Gravidity/Parity Primi	200 (80%)	372 (93%)
Gestational age * (wks)		
Mean	37	38.5
Range	(28-42)	35-41)

*At the time of delivery.

TABLE II
CLASSIFICATION OF STUDY GROUP CASES ACCORDING TO TYPE OF HYPERTENSION

Type of hypertension	Pt. No.	(%)	Severity of Hypertension (Mild)	(Severe)
Gestational HT	101	(40.4%)#	101 (40.4%)	0
Pre-eclampsia	121	(48.4%)	31 (12.4)#	90 (36.0%) *
Eclampsia	18	(7.2%)*	0	18(7.2%)
Chronic HT	10	(4%)	10(4%)	0
Total	250	(100)	142(56.8%)	108(43.2%)

* Proteinuric PIH
\# Non proteinuric PIH

TABLE III
COMPARISION OF MODE OF DELIVERY

Mode of Delivery	Study group (n = 250)		Control group (n = 400)	
	Pt. no.	%	n	%
Spontaneous Vaginal Delivery	81	(32.4%)	373	(93.25%)
Preterm	12	(4.8%)		
Term	69	(27.6%)		
Inductions	132	(52.8%)	13	(3.25)
Preterm	50	(20%)		
Term	82	(32.8%)		
Caesarean section	37	(14.8%)	14	(3.5%)
Preterm	10	(04%)	0	
Term	27	(10.8%)	14	(3.5%)

delivery of which 12 (4.8%) were preterm and 69 (27.6%) were at term. (Table III). On the other hand in the control group 373 (93.25%) cases had spontaneous vaginal delivery. In 132 (52.8%) cases of hypertensive pregnancy, labour induction was required and of these 50 (20%) were preterm and 82 (32.8%) were at term. In the control group only 13 (3.25%) cases required induction of labour for various reasons and all of these delivered normally.

There were 37 (14.8%) abdominal deliveries in the study group. In 8 (3.2%) cases elective caesarean section was done and in 29 (11.6%) cases it was an emergency operation. Caesarean section was done at term in 10 (4%) cases and preterm in 27 (10.8%). In the control group 14 (3.5%) cases underwent caesarean section. The commonest indication for caesarean section was foetal distress in both the groups viz 11 (4.4%) and 7 (1.4%) cases respectively. Other common indications in study group were non-progress of labour 6 (2.4%) cases; previous caesarean section in 6 (2.4%) cases, and eclampsia 3 (1.2%) cases. In control group 3 (0.8%) caesarean sections were done for malpresentation and 4 (1%) for cephalopelvic disproportion.

TABLE IVA
FOETAL OUTCOME

Foetal Outcome		Study group (n = 250)		Control group (n = 400)	
		Pt. no.	%	Pt. no.	%
Live births		238	(95.2)	399	(99.75)
	Term	166	(66.4)	387	(96.75)
	Preterm	72	(28.8)	12	(3)
Still births		12	(4.8)	01	(0.25)
	Term	02	(0.8)	01	(0.25)
	Preterm	10	(4)	0	(00)
Neonatal deaths		25	(10)	03	(0.75)
	Term	08	(3.2)	01	(0.25)
	Preterm	17	(6.8)	02	(0.50)
Perinatal mortality		37	(14.8)	04	(1)

In the study group there were 238 (95.2%) live births, of which 166 (66.4%) were at term and 72 (28.8%) preterm. There were 12 (4.4%) still births out of which 2 (0.8%) were at term and 10 (4%) preterm. In the control group 399 (99.75%) cases had live births and there was only one (25%) macerated still birth (Table IV).

The average birth weight was 2400 Gms (range 1500-3120 Gms) in the study group, 116 (46.4%) babies weighed <2500 Gms and 50 (20%) babies were <2000 Gms. In the control group the average birth weight was 2630 (range 1500-3800 Gms) and in 344 (86%) cases birth weight was >2500 Gms (Table V). In the study group, 72 (28.8%) cases had low birth weight due to prematurity against 12 (3%) in control group while 42 (16.8%) cases had IUGR against 44(11%) in control group (Table IV B)

In the study group, 24 (9.6%) babies developed respiratory distress syndrome (RDS) and 8 (3.2%) had meconium aspiration syndrome (MAS). In the control group, 24 (6%) developed RDS and none of the babies had MAS. 100 (40%) babies in the study group and 36 (9%) in the control group required admission to specialised neonatal nursery care unit. Neonatal deaths occurred in 25 (10%) cases in the study group, of which 8 (3.2%) were at term and 17 (6.8%) preterm. In the control group there were only 3 (0.75%) neonatal deaths. Thus the total perinatal mortality rate in the study group was 37 (14.8%) and in control group 4 (1%) (Table IV A and IVB)

TABLE IVB
FOETAL OUTCOME - NEONATAL COMPLICATIONS

Neonatal Complications	Study group (n = 250)		Control group (n - 400)	
	Pt. no	%	Pt. no.	%
RDS	24	(9.6)	24	(6)
MAS	08	(3.2)	0	0
Low Birth weight	114	(45.6)	56	(14.0)
Prematurity	72	(28.8)	12	(3)
IUGR	42	(16.8)	44	(11)
Babies with 5 min apgar ≤ 5/10	80	(32)	36	(9)
Babies admitted to nursery	100	(40)	36	(9)

TABLE V
DISTRIBUTION OF CASES ACCORDING TO BIRTH WEIGHT

Birth weight (Gms)	Study group (n - 250)		Control group (n = 400)	
	Mild HT	Severe HT	Pt. No.	%
< 1500	4 (1.6)	8 (2.4)	4	(1)
1500 - 2000	10 (4)	28 (11.2)	8	(2)
2000 - 2500	35 (14)	31 (13.2)	44	(11)
≥ 2500 93	(37.0)	41 (16.4) 3	44	(86)
Total	142 (56.8)	108 (43.2)	400	(100)

All perinatal deaths occurred in cases of proteinuric hypertension, severe preclampsia and eclampsia No foetal loss, RDS or MAS was observed either in cases of gestational hypertension or in chronic hypertension. Also IUGR and preterm deliveries were observed only in cases of proteinuric hypertension.

DISCUSSION

Maternal hypertension, the most common complication of pregnancy is associated with poor perinatal outcome. Of all perinatal deaths, 22% are attributed to maternal hypertension (Arias, 1993). Perinatal loss is mostly observed in cases of proteinuric hypertension whereas, the perinatal outcome in mild and non-proteinuric PIH and chronic hypertension is similar to that of normal population (Chesley 1985, Sibai et al 1983 and Nacye and Friedman 1979). Hypertensive process is associated with occurence of large placental infarcts, reduced placental growth and abruptio placentae. These pathological lesions of placenta result in decreased placental perfusion, therby leading to foetal malnutrition and foetal hypoxia. A perinatal mortality rate of 14.8% observed in this study confirms the previous reports that proteinuric maternal hypertension is associated with increased perinatal loss (Sibai et al 1983, Sibai 1990, Fairlie et al 1991, and Anantha et al 1995). Nacye and Friedman (1979) also observed a higher perinatal loss of 37.9/1000 births in cases of proteinuric maternal hypertension compared to a perinatal loss of only 17.2/1000 births in normotensive pregnancies. Still-birth rate of 4.8%

observed in this study is comparable to a still-birth rate of 6.3% and 7.3% observed by Plovin et al (1986) and Anantha et al (1995).

All intrauterine deaths occurred in cases of proteinuric PIH, pre-eclampsia, and eclampsia. All still-born infants were low birth weight (<1800 Gms). Of 12 still-births, 10 babies were preterm with gestational age <34 weeks and 2 were IUGR babies born at term.

Neonatal death rate of 10% was observed in this study, 3.2% neonatal deaths were due to RDS and 6.8% due to prematurity. All babies who died of RDS were born preterm at < 34 weeks of gestation and weighed <2000 Gms. Sergio et al (1990) have also reported in their series of 444 cases of maternal hypertension, a neonatal death rate of 5% (22 444) and all these deaths were due to prematurity. They also observed that the neonatal death rate was four times higher in proteinuric hypertension compared to nonproteinuric PIH and chronic hypertension. Perinatal mortality in this study was found to be strongly associated with low birth weight. The low birth weight in majority of cases was due to preterm delivery (25.6%) either spontaneous (4.8%) or electively induced (20.8%). Labour induction is required more frequently in cases of uncontrolled maternal hypertension, in order to prevent maternal and foetal complications. Sibal (1990) has reported a much higher incidence of 66% preterm deliveries in their series of proteinuric hypertension cases compared to 25.6% observed in the present study.

The incidence of caesarean section was high (14.8%) in this study largely due to the increased incidence of foetal distress both antepartum and intrapartum. Besides foetal distress other common reasons for caesarean delivery were failed induction and non-progress of labour. Sibai et al (1983) observed a caesarean rate of 21%, although the incidence of preterm delivery in their series was only 12%. All the babies with apgar score <5/10, at 5 minutes of birth were admitted to nursery.

Due to increased neonatal morbidity more babies required special neonatal nursery care. In the study group 40% babies required nursery care as against 9% in control group.

Neonatal death rate of 10% observed was largely due to prematurity and IUGR. Fairlie et al (1991) in their series of pregnancy hypertension seen at > 30 weeks of gestation reported a perinatal loss of 14% which is comparable to 14.8% observed in our study. Contrary to this Sibai et al (1983) have reported a significantly low perinatal mortality rate of 6.3% in their series.

A high perinatal loss in the present study can also be attributed to the fact that our's is a tertiary level institution and referral centre and thus caters to a high risk population. Another important contributory factor to the increased perinatal loss can be the fact that most of the patients were admitted either in late pregnancy or with advanced disease as emergency cases with severe PIH or eclampsia, and most of them in labour, where there was not much scope for optimum treatment.

It is a universally accepted fact that hypertensive disorders of pregnancy are associated with a poor perinatal outcome. In order to improve the perinatal outcome, enhanced patient education to avail optimum antenatal care, is required. Also better obstetric management of these cases could reduce the risk. Adequate antepartum and intrapartum monitoring and liberal use of various obstetrical interventions such as elective labour induction and increased use of caesarean section, supplemented with the best of nursery care facilities will improve foetal salvage.

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