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Neonatal Outcome In Pregnancy Induced Hypertensive Mothers – A Tertiary Care Centre Experience

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Abstract:
Background: *Hypertensive disorders seem to complicate approximately 5-15% of pregnancies[1].Pregnancy induced hypertension (PIH) increases the risk of maternal and perinatal, morbidity and mortality.*
Objective: *Aim of the study was to compare the neonatal outcome in PIH mothers and the control group.*
Methods: *A prospective observational study was done in Niloufer hospital for a period of six months. 73 antenatal women with blood pressure recording of more than 140/90 mm of Hg on two occasions, four hours apart were included in the study (PIH) group and 100 antenatal women with no medical or surgical complications were enrolled in the control group. Neonatal outcome data was recorded and documented .****Results:*** *70.67% of babies born to PIH group were delivered by caesarean section compared to only 27% of their counterparts in control group. 54.67% neonates born to PIH mothers were low birth weight. 63.01% newborns were preterm born to the study group mothers.*
Conclusion: *PIH in antenatal women increases the rate of caesarean sections. Increased risk of preterm deliveries and low birth weight babies is associated with this gestational disorder.*
Keywords: *Caesarean section, Low birth weight, Maternal morbidity, Neonatal morbidity, Neonatal outcome, Pregnancy induced hypertension (PIH), Preterm*.

I. Introduction

Pregnancy induced hypertension (PIH), which is a common complication in antenatal women, is a major cause of maternal and perinatal morbidity and mortality. Perinatal complications include preterm delivery, low birth weight, prematurity, intrauterine foetal death (IUFD), intrauterine growth restriction (IUGR), foetal asphyxia, acidosis, stillbirths and neonatal deaths. Maternal risks associated with gestational hypertension include development of uncontrolled hypertension, superimposed preeclampsia, eclampsia, HELLP syndrome (hemolysis, elevated liver enzymes and low platelets), acute renal and hepatic failure, acute pulmonary edema, cerebrovascular accidents, congestive heart failure, intracranial hemorrhages, proteinuria more than 4-5 grams/day, microangiopathic hemolytic anemia, abruptio placentae, deep vein thrombosis (DVT), occipital lobe blindness, post partum hemorrhages, disseminated intravascular coagulation (DIC) and /or consumptive coagulopathy[2]. PIH has been postulated to increase significantly the risk of low birth weight both by increasing preterm birth as well as reducing fetal growth. On the other hand, PIH has been found to be associated with an increased rate of high birth weight and large-for-gestational age babies. These findings suggest that PIH, more specifically preeclampsia, is a heterogeneous syndrome and that preeclampsia may appear in two forms: restricted fetal growth preeclampsia and normal fetal growth preeclampsia[3].However, the occurrence of these will not be prevented unless induction of labor or caesarean delivery terminates the pregnancy as the central cause of preeclampsia lies within the placenta and resolution of preeclampsia, eclampsia starts with the removal of placenta at delivery[4].

Aim Of The Study: The objective was to study the neonatal outcome in babies born to PIH mothers and compare with the outcome of control group.

II. Methodology

The study is a prospective observational study conducted over a period of 6 months between October 2013 to March 2014, at Niloufer hospital, which is a teaching institute and an allied hospital under Osmania Medical College, Hyderabad. The hospital is a tertiary care referral centre for both obstetric and paediatric patients. The hospital has a Level III NICU for neonatal emergencies. The study includes antenatal mothers having pregnancy induced hypertension and babies born to these mothers who were followed up to 7^{th} day of life.

Antenatal mothers having regular antenatal care (3 or more antenatal visits to the obstetric department) were included in the study. Only those mothers with age group between 18 to 36 years were enrolled for the study. All pregnant women coming to antenatal outpatient department were screened for PIH by measuring blood pressure. If blood pressure is 140/90mm Hg or high, second reading was taken after 4 hrs[5]. And if blood pressure persisted to be more than 140/90 mm Hg, they were included in study as PIH GROUP which is also referred as STUDY GROUP. All the mothers are given regular antenatal care and followed till delivery. They were given drugs and any complications were treated.

Pregnant woman with no medical or surgical illness, with regular antenatal visits and aged between 18 to 36 years, coming for institutional delivery were taken as controls and included in the study as CONTROL GROUP. They were also monitored regularly, and if any medical or surgical complication was detected during the antenatal period they were excluded from the study.

Those mothers who were unregistered or have other medical or obstetric problems are excluded from the study. Chronic diseases like chronic diabetes, chronic renal failure, chronic hypertension, cardiac disease, twin or multiple pregnancy and age below 18 years or above 36 years were taken as exclusion criteria..

At the time of delivery, mode of delivery was noted. Foetal outcome data were documented with respect to birth weight, still birth rate, asphyxia and its degree, gestational age, neonatal complications, neonatal death rate and overall perinatal loss. Anthropometric data of the babies was collected. They were weighed immediately after birth and also on second day of life using digital weighing machine. Other measurements were taken at 24 hrs of life. Length was measured with infantometer and head circumference with stretchable tape. Gestational age was calculated with in 2 hrs of life by new Ballards scoring and/or according to last menstrual period .The newborns were classified by comparing gestational ages employing intrauterine growth curves of Indian standard by means of percentiles. This had allowed them to be classified as Appropriate for gestational age AGA (10^{th} to 90^{th} percentile), Small for gestational age SGA < 10^{th} percentile and Large for gestational age LGA > 90^{th} percentile.

Monitoring: The babies who were normal without any complications at birth like prematurity, VLBW, birth asphyxia, meconium stained liquor, RDS were discharged .Those with complications were noted and admitted in NICU. All babies were monitored upto 7^{th} day of life and if death occurred, cause of death noted.

III. Results

In this prospective observational study, 75 mothers with PIH were included in the PIH group and 100 antenatal mothers with no medical and surgical complications were enrolled as control group.

53 mothers in the study group (PIH group) delivered their newborns through caesarean section while 27 mothers in the control group had caesarean section for delivering their newborns as shown in TABLE 1. This was of statistical significance (p value < 0.05) in this study stating that termination of pregnancy by caesarean section was needed to improve both the foetal outcome and decrease the maternal morbidity.

Table 1

	TOTAL	NVD	LSCS	% OF LSCS	P VALUE
PIH GROUP	n =75	22	53	70.67	<0.00001(<0.05) (SIGNIFICANT)
CONTROL GROUP	n =100	73	27	27	

Neonates of both the study (PIH) group and the control group were assessed for the evidence of low birth weight. 41 babies born to mothers in PIH group were found to be in the low birth weight category (< 2.5kgs) while 23 babies born to control group were less than 2.5kgs as shown in TABLE 2. This result was statistically significant with P value of less than 0.05.

Table 2

	TOTAL	<2.5 KG (LBW)	>2.5KG	% OF LBW	P VALUE 0.000016 (<0.05) (SIGNIFICANT)
PIH GROUP	n =75	41	34	54.67	
CONTROL GROUP	n =100	23	77	23	

Two mothers in the PIH group and one mother in the control group had intra uterine foetal death as shown in

Table 3

	TOTAL	IUD	LIVE BIRTHS	% OF IUD	P VALUE 0.801
PIH GROUP	n =75	2	73	2.67	
CONTROL GROUP	n =100	1	99	1	

Hence rest of the data that was collected was among the remaining 73 and 99 live births of PIH and control group respectively. TABLE 4 shows the number of preterm babies born to the PIH group and control group respectively among the live births. 46 preterm newborns were delivered in our study group where as 23 newborns were preterm in the control group. P value was calculated for this observation which was of statistical significance showing preterm deliveries are more commonly associated with the PIH group of mothers.

Table 4

	TOTAL	PRETERM	TERM	% OF PRETERM	P VALUE <0.05 (SIGNIFICANT)
PIH GROUP	n = 73	46	27	63.01	
CONTROL GROUP	n = 99	23	76	23.23	

Only 11babies out of 73 live births in the PIH group had birth asphyxia, while 7 babies in control group had birth asphyxia. The above results are illustrated in the Table 5 below. This result has no statistical significance (P value is above 0.05) in our study showing that occurrence of birth asphyxia in newborn is not related to the pregnancy induced hypertension in the mother.

Table 5

	TOTAL	PRESENCE OF BIRTH ASPHYXIA(BA)			
		YES	NO	% OF (BA)	P VALUE 0.149
PIH GROUP	n = 73	11	62	15.06	
CONTROL GROUP	n = 99	7	92	7.07	

Similarly our study analysed whether certain neonatal conditions developed in babies like Transient tachypnoea of newborn (TTNB), Meconium aspiration syndrome (MAS), Neonatal sepsis and Hyaline membrane disease (HMD) had any relation with the gestational hypertension in the mother. The results are illustrated in the following tables no 6, 7, 8 and 9. All these results were of no statistical significance in this study.

Table 6

	TOTAL	PRESENCE OF TTNB			
		YES	NO	% OF TTNB	P VALUE 0.3487
PIH GROUP	n = 73	2	71	2.74	
CONTROL GROUP	n = 99	0	99	0	

Table 7

	TOTAL	PRESENCE OF MAS			
		YES	NO	% OF MAS	P VALUE 0.7286
PIH GROUP	n = 73	2	71		
CONTROL GROUP	n = 99	3	96		

Table 8

	TOTAL	PRESENCE OF NEONATAL SEPSIS			
		YES	NO	% OF SEPSIS	P VALUE 0.7893
PIH GROUP	n = 73	2	71	2.74	
CONTROL GROUP	n = 99	1	98	1.01	

Table 9

	TOTAL	PRESENCE OF HMD			
		YES	NO	% OF HMD	P VALUE 0.1499
PIH GROUP	n = 73	9	64	12.33	
CONTROL GROUP	n = 99	3	96	3.03	

However in our study 34.25% of the babies born to PIH group mothers needed NICU admission compared to only 16.16% of babies in the control group. Table 10 shows that the P value for this observation was highly significant.

Table 10

	TOTAL	NEED FOR NICU ADMISSION			
		YES	NO	% of Nicu admissions.	
PIH GROUP	n = 73	25	48	34.25	P VALUE 0.006 (SIGNIFICANT)
CONTROL GROUP	n = 99	16	83	16.16	

No neonatal deaths were reported in the control group whereas as in PIH group only 2 early neonatal deaths occurred.

Table 11

	TOTAL	EARLY NEONATAL DEATHS	NO DEATHS	% OF EARLY NEONATAL DEATHS	
PIH GROUP	n = 73	2	71	2.74	P VALUE 0.348
CONTROL GROUP	n = 99	0	99	0	

Table 12 shows that 32.8% newborns of the study group had Apgar score of less than 8 at birth compared to the babies born to the control group mothers where only 10.11% had Apgar score < 8. P value in this result was also significant.

Table 12

	TOTAL	APGAR > OR =8	APGAR<8	% OF APGAR<8	
STUDY GROUP	n = 73	49	24	32.8	P VALUE 0.0002096 (SIGNIFICANT)
CONTROL GROUP	n = 99	89	10	10.11	

IV. Discussion

Hypertensive disorders of pregnancy have been identified as a major worldwide health problem, associated with increased perinatal morbidity and mortality[5]. Studies have shown that hypertensive disorders of pregnancy predispose women to acute or chronic uteroplacental insufficiency, there by having an effect on perinatal and neonatal outcome that may result in ante or intra partum anoxia that may lead to foetal death, intrauterine growth retardation and/or preterm delivery[6]. Some studies have shown that there is an increased incidence of caesarean sections in the mothers with PIH, and increased incidence of birth asphyxia, transient tachypnoea of newborn (TTNB), hyaline membrane disease (HMD) and neonatal sepsis in newborns of these mothers.

In our study, 70.67%of the PIH group mothers underwent caesarean section compared to only 27% in the control group mothers. In many cases PIH alone and in some case others associated factors were indicated for caesarean section. Other studies like J.Nadkarni etal (35.6%), Solange Regina etal (66.7%) and Aleem Arshad etal (54.8%) also showed similar results stating an increase incidence of caesarean sections in PIH group of antenatal mothers[1,5,7].

In the present study, 54.67% of the babies born to PIH study group mothers were Low birth weight compared to 23 % in control group. This observation in our study was highly significant. Nadkarni etal study had similar experiences in their study with an incidence of 51.7% LBW babies[5].

There is an increased incidence of Preterm deliveries in our study. 63.01% of the study group mothers had preterm babies compared to 23.23% of their counterparts in control group. Nadkarni etal study showed 44.3% preterm deliveries while Yadav etal study had 28.85% and Solange Regina study had 10.9%[1,7,8].

In the present study 34.25% babies born to PIH group needed NICU care as compared to 16.16% in control group. It is a significant outcome of this study .Most of the babies needed special nursing care in neonatal unit either because of their preterm nature or because of low birth weight. Other co-morbid conditions like TTNB, HMD, MAS, birth asphyxia and neonatal sepsis were also the reasons for NICU admissions. Similar results were obtained in other studies like Attiya Ayaz (26.02%) and Jehan Ara study (42%) study[9,10]. However, morbid conditions like MAS, TTNB, and HMD etc in newborns when considered individually, showed no specific association with PIH in mothers in our study. But studies have done by Nadkarni etal showed increased risk of birth asphyxia (14%), neonatal sepsis (7.5%) and HMD (7.3%). In one study done by Swetha Anand etal showed increased association of MAS in neonates (5.4%) born to mothers with PIH[11].

Study also assessed and compared the Apgar scores recorded at 5 minutes after birth in the babies born to both the PIH group and control group. Apgar scores were less than 8 in 32.88% of the newborns in the PIH group. In a study conducted by Attiya Aziz etal, 42,46% of the neonates born to PIH mothers had Apgar scores of less than 6[9].

V. Conclusion

PIH is a common complication in antenatal women and is a major cause of maternal and foetal, morbidity and mortality. Our study concludes that there is a significant rise of caesarean sections in mothers having PIH and also there is an increased risk of delivering low birth weight and preterm babies. The study highlights the importance of institutional deliveries of women combined with effective antenatal care. Hence health education and awareness among the people and primary health workers regarding this health issue is necessary in bringing down the maternal and neonatal morbidity and mortality.

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