

Impact of Pregnancy Induced Hypertension on Birth Weight of Newborn at Term

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Abstract

Background: To determine the birth weight of newborns at term born to mothers with pregnancy induced hypertension.

Methods: In this cross sectional study birth weight of 124 newborns, of mothers with pregnancy induced hypertension were recorded within one hour of delivery

Results: In 124 mothers, who fulfilled the inclusion criteria, the incidence of Pregnancy Induced Hypertension was 24.2 %. None of the patients had pre-eclampsia or eclampsia. The average birth weight among the total cases was 3.044 kg. The incidence of low birth weight babies among the pregnancy induced hypertensive pregnancies was 3.33 %. The incidence of normal weight babies, among the pregnancies affected with Pregnancy Induced Hypertension was 96.66%.

Conclusion: Pregnancy Induced Hypertension has no significant effect on birth weight of new born

Key Words: Preeclampsia. Pregnancy. Hypertension

Introduction

Pregnancy-induced hypertension (PIH), especially pre-eclampsia, is a major cause of maternal and perinatal morbidity and mortality. It has been estimated that 5 to 8 % of pregnancies worldwide are complicated by this disorder resulting in a very large disease burden. Gestational hypertension and preeclampsia are risk factors for others forms of maternal morbidities making these diseases of reproductive aged women a particularly important public health problem.¹⁻³

The risks posed by the preeclampsia to the fetus include severe growth retardation, hypoxemia, acidosis, premature birth and death. Maternal complications include abruptio placentae, renal failure, HELLP syndrome (Hemolysis, Elevated Liver Enzymes, and Low Platelets), liver failure, cerebral edema with seizures and rarely death. Risk factors for PIH include nulliparity, multi fetal gestation, black race, young age, obesity, family history of preeclampsia or eclampsia, preeclampsia in a previous

pregnancy, presence of diabetes, thrombophilias, essential hypertension, or renal disease and other contextual factors.⁴⁻⁷

PIH is classified as gestational hypertension, preeclampsia, severe pre-eclampsia or eclampsia. The etiology and pathophysiology of pre-eclampsia is not fully understood and there is no effective prevention and treatment. Delivery remains the mainstay of treatment. Pre-eclampsia is primarily a disorder of endothelial function with associated vasospasm. In some cases, pathology demonstrates evidence of placental insufficiency with associated abnormalities such as diffuse placental thrombosis, an inflammatory placental decidual vasculopathy, and/or abnormal trophoblastic invasion of the endometrium. Evidence also indicates that an altered maternal immune response to fetal/placental tissue may contribute to the development of preeclampsia.⁸⁻¹⁰

PIH has been postulated to increase significantly the risk of low birth weight both by increasing preterm birth as well as reducing fetal growth. Women who delivered low birth weight babies are more likely to have pregnancy induced hypertension. 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.¹¹⁻¹⁴

Patients and Methods

This cross sectional study was conducted at Pediatric Department of Military Hospital, Rawalpindi, in collaboration with Department of Obstetrics and Gynecology, Military Hospital, Rawalpindi from April 2009 to October 2009. During this six month period 124 babies born at term (37 to 42 weeks of gestation) to booked, primigravida mothers were selected with consecutive sampling technique. Mothers with gestational diabetes, chronic

cardiovascular disease, chronic renal disease, chronic hypertension or history of hypertension, psychiatric illness, addiction or smoking and babies with congenital anomalies were excluded from the study. Blood pressure was taken by using appropriate sized cuff twice, 6 hours apart in lying position. Mothers with blood pressure reading less than 130/90 mm of Hg were labeled as normotensive. Mothers with blood pressure reading of more than 130/90 mm of Hg recorded on two separate occasions in the absence of significant proteinuria were labeled as having pregnancy induced hypertension and those with blood pressure reading of more than 130/90 but less than 160/110 mm of Hg on two separate occasion with at least 300 mg of protein in 24 hours collection of urine were labeled as having pre-eclampsia. The birth weight of the babies born to these mothers was taken within 1 hour of delivery without clothes to the nearest decimal of Kg i.e. 0.1 Kg on infant weighing scale . The weighing scale was calibrated on weekly basis against the standard weight. Babies weighing between 2.5 and 4 kg were considered as normal birth weight with lower and upper values taken as low birth weight and high birth weight respectively. Gestational age of babies was determined by assessment of historical date (Last menstrual period). All the information was entered in the proforma.

Results

Among 124 cases, who fulfilled the inclusion criteria, the incidence of PIH was 24.2 % (30 cases). None of the patients had pre-eclampsia and 94 cases had normal blood pressure. Most of the babies were delivered by lower segment cesarean section (54.8 %). Male babies were 63(50.08%) with a male to female ratio of 1.03:1. Low birth weight was found in 14(11.29%) newborns (Table 1). The incidence of low birth weight babies among the Pregnancy induced hypertensive group was 3.33 % (1 case) and in normotensive group was 13.8 % (Table 2&3).

Table 1: Pregnancy Induced Hypertension- Birth weights of babies

Birth Weights	Frequency (%)
Low Birth Weight	14(11.29)
Normal Birth Weight	108(87.09)
Overweight	2(1.6)

Discussion

PIH, especially in pre-eclampsia, is a major cause of maternal and perinatal morbidity and

mortality worldwide. It affects about 6-8% of all pregnancies. In present study its incidence was found to be 24.2% which is very high in comparison to other studies. It can be explained by the fact that pregnancy induced hypertension is more common in primigravida and the present study group only comprised primigravida mothers.⁶ Primigravida mothers were selected as they were more regular in antenatal visits and subsequent follow-ups.

Table 2: Pregnancy Induced Hypertension- Association with Birth Weights

Pregnancy Induced Hypertension	Birth Weight Category			Total
	Low Birth Weight	Normal	Over weight	
Yes	1	29	0	30
No	13	79	2	94
Total	14	108	2	124

p value was found to be more than 0.1 (statistically insignificant).

Table 3: Pregnancy Induced Hypertension- Statistical Evaluation Chi- Square Tests

	Value	df	Asymp.Sig (2 sided)
Pearson Chi-square	3.274	2	.195
Likelihood Ratio	4.349	2	.114
Valid Cases	124		

In present study the weight of babies of both groups (normotensive and hypertensive) was found to be almost equal and within normal limits (>2.5 kg and < 4 kg). There was no evidence that PIH has any effect on weight of newborns in full term pregnancies. These results are in accordance with the Canadian study which showed that infant birth weights were similar between preeclamptic and normotensive pregnancies delivered at term.¹³ Results of the present study were unable to demonstrate an increase in birth weight of babies born to mothers with pregnancy induced hypertension as shown in different studies. Another confounding factor is probably the absence of pre-eclampsia in our study group as severe pre-eclampsia is associated with significant fetal growth restriction.¹⁴

The finding that most babies born to mothers with gestational hypertension at term have normal fetal growth can not be reconciled with the currently held belief that reduced uteroplacental perfusion is the unique pathophysiologic process in the pregnancy

induced hypertension and preeclampsia. There is increasing literature supporting the hypotheses of considerable pathophysiologic heterogeneity in preeclampsia.⁹ This shows the limitations of the "ischemic model" as the sole genesis of gestational hypertension and preeclampsia. As birth weight is strongly influenced by many obstetrical and maternal characteristics, any comparative study on fetal birth weight should take these confounding factors into account.

Conclusion

1. Birth weight is determined by both duration of gestation and rate of fetal growth.
2. Preeclampsia is a heterogeneous disorder and at term its pathogenesis is not related to the decreased uteroplacental perfusion.
3. PIH does not result in either low birth weight or high birth weight babies.
4. Gestational period, can more appropriately, be incriminated with causation of PIH
5. Pregnancy induced hypertension and preeclampsia increases the risk of low birth weight mainly through increasing preterm birth.

References

1. Nazli R, Jan MR, Shah J .Changes in lipoprotein concentration in primiparous women with pregnancy induced hypertension. *Pak J Med Res.* 2009;48:83-87.
2. Naz F, Iqbal A, Niaz N. Management and Perinatal Consequences of Pregnancy Induced Hypertension. *Mother & Child* 1999;37:98-102.
3. Peters RM, Flack JM. Hypertensive disorders of pregnancy. *J Obstet Gynecol Neonatal Nurs.* 2004;33:209-20.
4. Ara J, Jamal M, Sultana N. Perinatal, outcome in Pregnancy induced hypertensive mothers. *Pak Armed Forces Med J.* 2004;54:76-78.
5. Tasleem H, Tasleem S, Adil MM, Siddique M, Waheed K. Co-relation of Pregnancy Induced Hypertension with Placental Abruption and effect of antihypertensive therapy. *Rawal Med J.* 2005;30:59-61.
6. Akmal N, Raana G. Women with pregnancy induced hypertension; epidemiological differences between normotensive pregnant women. *Professional Med J.* 2006;13:310-12.
7. Parveen N, Haider G, Sheikh IA, Ujjan ID. Presentation of predisposing factors of pregnancy induced hypertension at Isra University Hospital Hyderabad. *J Liaquat Uni Med Health Sci.* 2009;8:242-44.
8. Baulon E, Fraser WD, Piedboeuf B. Pregnancy-induced hypertension and infant growth at 28 and 42 days postpartum. *BMC Pregnancy and Childbirth.* 2005;5:10.
9. Syed A, Baseer A, Ahmed SS. Pregnancy Induced Hypertension Hyperlipidemia, A cause of Endothelial Damage. *Ann Abbasi Shaheed Hosp* 2000;5:200-04.
10. de Groot CJ, van der Mast BJ, Visser W. Preeclampsia is associated with increased cytotoxic T-cell capacity to paternal antigens. *Am J Obstet Gynecol.* 2010;203:496.
11. Rahman LA, Hairi NN, Salleh N. Association between pregnancy induced hypertension and low birth weight; a population based case-control study. *Asia Pac J Public Health* 2008;20:152-58.
12. Xiong X, Demianczuk NN, Buekens P, Saunders LD. Association of preeclampsia with high birth weight for age. *Am J Obstet Gynecol.* 2000;183:148-55.
13. Rasmussen S, Irgens LM. Fetal growth and body proportion in preeclampsia. *Obstet Gynecol.* 2003;101:575-83.
14. National epidemiological investigation group on pregnancy-induced hypertension. *Chinese J Obstet Gynecol.* 1991;6:67-70.