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Original Research Paper

Thrombocytopenia: A Marker of Maternal and Fetal Outcome in Pregnancy Induced Hypertension

Medical Science

KEYWORDS : Thrombocytopenia, Maternal and fetal outcome, Pregnancy Induced Hypertension

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ABSTRACT

Background and objective: *Pregnancy Induced Hypertension (PIH) is the commonest medical disorder occurring in pregnancy, leading to poor maternal and fetal outcome. (1) Thrombocytopenia (low platelet count) is the most common haematological abnormalitiy seen in these women. (2,3) This study aims to find out the degree of thrombocytopenia in women with PIH and its relationship with the maternal and fetal outcome.*

Materials and methods: *This study was conducted in the department of Obstetrics and Gynecology, Government Medical College, Kozhikode for a period of one year from December 2013. 302 women with PIH were selected and their platelet count was measured serially. They were divided into two groups with Group A having platelet count less than or equal to 1,50000/mm3 and Group B, more than 1,50000/ mm3. Maternal and fetal outcome were compared among the groups.*

Results: *Mean platelet count in severe preeclampsia was 1,42000/mm3 and in eclampsia was 1,34000/mm3. Maternal complications like severe preeclampsia, eclampsia, HELLP syndrome, placental abruption, renal failure and post partum hemorrhage were more among Group A. Poor perinatal outcome was also observed in Group A with low birth weight, intra-uterine growth retardation (IUGR) and intra-uterine death (IUD).It is concluded that thrombocytopenia is associated with poor maternal and fetal outcome in patients with pregnancy induced hypertension.*

INTRODUCTION

Pregnancy Induced Hypertension (PIH) or gestational hypertension is the commonest medical disorder occurring in pregnancy, leading to poor maternal and fetal outcome [(4)]. It is characterized by the development of new hypertension above 140/90 mmHg without proteinuria or other signs of preeclampsia in a pregnant woman after 20 weeks of gestation[(3)]. Preeclampsia usually occurs in the third trimester of pregnancy characterized by high blood pressure and proteinuria. Severe preeclampsia is often associated with hemolysis, low platelet count and elevated liver enzymes, when it is often termed as HELLP syndrome and when associated with seizures, it is called eclampsia[(5)]. These conditions increases the risk of poor outcomes for both the mother and neonate[(6)].

Incidence of PIH in India ranges from 5 -15% of all pregnancies[(7)] and continues to be a major cause of maternal and perinatal morbidity and mortality. It is a multisystem disease of unknown etiology and there is a constant search for better prognostic factors to predict the progression and severity of disease.

A variety of hematological abnormalities can occur in women with PIH, of which thrombocytopenia is the commonest. There is reduced platelet production and life span, reduced antithrombin leading to activation of the coagulation cascade and fibrinolytic system, which leads to a low platelet count, fibrin deposition and increased fibrin degradation products which may progress to microangiopathic hemolytic anemia.

The frequency and intensity of thrombocytopenia vary and is dependent on the severity and duration of disease. In general the lower the platelet count, higher the maternal and fetal complications. Thrombocytopenia with a platelet count less than 100,000/mm3 is considered an ominous sign and the fetus should be delivered as early as possible. Platelet aggregation in preeclampsia could be due to immunological processes or due to platelet deposition at the site of endothelial damage.

The most common cause of isolated thrombocytopenia in pregnancy is gestational thrombocytopenia, where the platelet count falls to 70,000 – 150000/mm3 often in the late second or third trimester. This occurs in about about 15% of pregnant women with no adverse effects either in the mother or the fetus.

Immune thrombocytopenic purpura accounts for about 5% cases of thrombocytopenia in pregnancy which may present for the first time or recur during pregnancy which may require specific treatment if the platelet count falls below 50000/mm3.

Thrombocytopenia of preeclampsia rarely falls below 50000/mm3, and in such cases other causes should be considered. Most patients with HELLP syndrome show decreased platelet counts until 24-48 hours after delivery, and more than 90% cases resolve within fourth postpartum day. Those with severe thrombocytopenia may take about 10 days to reach a platelet count above 100,000/mm3 which is often followed by a marked thrombocytosis.

Shazly et al studied 840 women with severe preeclampsia and showed that low platelet count had significantly higher incidence of maternal complications when compared with normal (8).

AIM OF THE STUDY:

This study was conducted to find out the degree of thrombocytopenia in women with PIH and its relationship with the maternal and fetal outcome.

MATERIALS & METHOD:

This Cohort study was conducted in the department of Obstetrics and Gynaecology, Government Medical College, Kozhikode, Kerala, India over a period of one year from December 2013. 302 women diagnosed to have PIH were included in the study group. INCLUSION CRITERIA: Pregnant women in the age group 18- 35 years with gestational period more than 28 weeks having blood pressure ≥ 140/90mmHg without any other complications were included in the study. EXCLUSION CRITERIA: Women with chronic hyperten-

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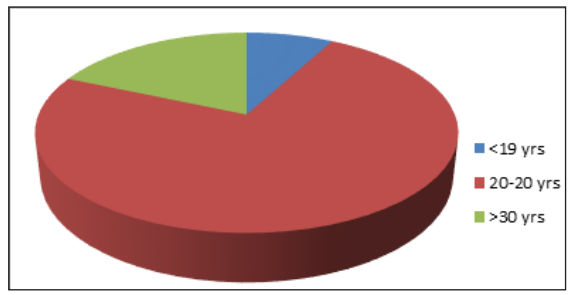
sion, platelet disorder, gestational diabetes, connective tissue disorder, and those on drugs affecting platelet count or function like non-steroidal anti-inflammatory drugs (NSAIDs) were excluded from the study.

Institutional ethical committee approval and informed consent from the patients in local language were obtained. After taking detailed history and clinical examination, patients were reassured and asked to rest for ten minutes. Blood pressure was then measured in the right arm with mercury sphygmomanometer in sitting position using adult blood pressure cuff of 16x30 cm. Systolic blood pressure was recorded as the first clear tapping Korotkoff sound and diastolic blood pressure at the complete disappearance of the fifth phase.

Platelet count was then measured using automated hemocytometer and was also checked manually. Platelet count below 150000/mm3 was taken as abnormal. If the count was lower than this, it was repeated every two days and otherwise repeated weekly. Other investigations like renal and liver function tests and urine examination were repeated weekly if initial values were normal.

The study population was divided into two groups according to platelet count. Group A with platelet count less than or equal to 150000/mm3 and Group B with platelet count more than 150000/mm3. Maternal and fetal outcome were studied and compared in both the groups. Maternal complications studied were severe pre-eclampsia, antepartum, intrapartum and postpartum eclampsia, HELLP syndrome, placental abruption, acute renal failure, liver failure, and post partum haemorrhage. Fetal outcomes studied were birth weight, intrauterine growth retardation, intrauterine death, APGAR score, neonatal intensive care unit admissions and neonatal death.

RESULTS: Out of the total 302 patients in the study group, 222 (73.5%) were in the age group 20-30 years, 56 (18.6%) were above 30 years and 24 (7.9%) below 19 years (Graph 1). Primigravidae constituted 160 (52.9%) and multi gravidae 142 (47.1%). Gestational age was between 28-34 weeks in128 (42.4%), and was above 34 weeks in 174 (57.6%).



Platelet count	Frequency (Percentage)	Blood pressure(mmHg)		Mode of delivery	
		< 160/110	>160/110	vaginal	LSCS
Group A(≤ 150000/ mm^3)	155(51.3)	77(49.7%)	78 (50.3%)	77(49.7)	78(50.3)
Group B(>150000/ mm^3)	147(48.7)	97 (64.6%)	50 (34%)	100(68)	47(32)
Total	302(100)	174(57.6%)	128(42.4%)	177(58.6)	125(41.4)

Table 1:Distribution according to platelet count , blood pressure & mode of delivery

Among the 302 patients in the study, Group A constituted 155(51.3%) with platelet count ≤ 150000/mm^3 and Group B constituted 147 (48.7%) with platelet count > 150000/mm3. Mean platelet count in severe preeclampsia was 142000/mm3 and in eclampsia was 134000 /mm3.

Out of the 302 cases, 128 (42.4%) had blood pressure ≥ 160/110mmHg and 174 had < 160/110mmHg, which was statistically significant (p value 0.023).

In Group A 78 (50.3%) patients needed caesarean section compared to 47 (32%) in Group B, which was statistically significant with p value 0.001(table 1).

Group	Pre-eclampsia			Eclampsia			HELLP syndrome		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
A	113 (72.9%)	42 (27.1%)	155 (100%)	24 (15.5%)	131 (84.5%)	155 (100%)	32 (20.6%)	123 (79.4%)	155 (100%)
B	78 (53.1%)	69 (46.9%)	147 (100%)	8 (5.4%)	139 (94.6%)	147 (100%)	0 (0%)	147 (100%)	147 (100%)

Table 2: Maternal complications Pre-eclampsia, Eclampsia and HELLP syndrome in the study group

Severe pre-eclampsia occurred in 113 (72.9%) patients in Group A whereas it was 78 (53.1%) in Group B. This was statistically significant with p value less than 0.0001. Risk estimate was 1.374 with 95% confidence interval (1.148-1.645).

Eclampsia developed in 24 (15.5%) patients of Group A compared to 8 (5.4%), which was statistically significant with p value 0.005 and risk estimate of 2.85, 95% confidence interval (1.32-6.13) (table 2).

Group	Placental Abruption			Post partum haemorrhage			Acute renal failure		
	yes	No	Total	Yes	No	Total	Yes	No	Total
A	10 (6.5%)	145 (93.5%)	155 (100%)	16 (10.3%)	139 (89.7)	155 (100)	12 (7.7)	143 (92.3)	155 (100)
B	2 (1.4%)	145 (98.6%)	147 (100%)	3 (2%)	144 (98)	147 (100)	0 (0)	147 (147)	147 (147)

Table 3: Maternal complications Placental Abruption, Post partum haemorrhage and Acute renal failure in the study group

Placental abruption was a complication in 10 (6.4%) cases of group A, but only in 2 (1.4%) cases of Group B, with a statistically significant p value 0.001.

There were 2 (1.3%) cases of liver failure in Group A and none in Group B, which was not statistically significant.

In Group A, 12 (7.7%) patients developed acute renal failure and none in Group B. This was statistically significant with p value 0.001.

Postpartum haemorrhage occurred in 16 (10.3%) patients of Group A, compared to 3 (2%) in Group B which was statistically significant with p value < 0.001 (table 3).

Group	Birth weight (Kg)				Intrauterine death		NICU admission		Fetal outcome	
	<1.5	1.5-1.99	2-2.5	>2.5	yes	no	yes	no	Good	NND
A(155) %	46 (29.7)	44 (28.4)	47 (30.3)	18 (11.6)	30 (19.4)	125 (80.6)	74 (59.2)	51 (40.8)	101 (80.8)	24 (19.2)
B (147) %	42 (28.6)	16 (10.9)	49 (33.3)	40 (27.2)	14 (9.5)	133 (90.5)	63 (47.4)	70 (52.6)	118 (88.7)	15 (11.3)
Total (302) %	88 (29.1)	60 (19.9)	96 (31.8)	58 (19.2)	44 (14.6)	258 (85.4)	137 (53.1)	121 (46.9)	219 (84.9)	39 (15.1)

Table 4: Fetal complications in the study group

Low birth weight babies were more in Group A compared to Group B with statistically significant p value < 0.001.

There were 30 (19.4%) intrauterine fetal death in Group A compared to 14 (9.5%) in Group B with statistically significant p value of 0.016. Risk estimate was 2.03, 95% confidence interval (1.123-3.67).

Among 258 live babies 137(53.1%) required NICU admission. Neonatal death was observed in 19.2% cases in Group A compared to 11.3% in Group B. Admission in NICU and neonatal deathamong the groups were not statistically significant in this study. (p value 0.06)

DISCUSSION

Out of 302 patients studied, 222 (73.5%) were in the age group 20-30 years. Sameer et al(9) and Mohapatra et al(10) found mean age group for development pre eclampsia as 24.5 and 25.5 years in their studies respectively. In our study, 52.9% *were primi* gravidae, which was comparable to the study by M A Sameer et al and Shaifali et al (11) who reported primigravida as a risk factor for development of pregnancy induce hypertension.

In our study, the mean platelet count in severe preeclampsia was 142000/mm3 and in eclampsia was 134000/mm3. Srivastava et al (12)reported mean platelet count of 164000/ mm3 in severe preeclampsia and 152000/ mm3 in eclampsia. 24 cases in Group A had eclampsia , of which 4 patients had platelet count < 100000/ mm3 and 20 had platelet count 100000 -150000/ mm3. Caeserean section cases were more in Group A, which was statistically significant in this study. This shows that low platelet count has an association with maternal morbidity due to surgical intervention.

Severity of maternal complications like severe preeclampsia, placental abruption, postpartum haemorrhage and acute renal failure *were propotionate to the severity of thrombocytopenia in this study.* Joshi et al (13) observed marked thrombocytopenia in severe preeclampsia and eclampsia and concluded that thrombocytopenia is directly proportional to the severity of the disease. Annam et al (14) in their study observed that platelet count was significantly lower in preeclampsia and eclampsia and they have suggested platelet estimation as a predictor of severe preeclampsia.

This study shows a significant reduction in birth weight and increase in intrauterine deathin cases of low platelet count.

From this study, it is concluded that thrombocytopenia is associated with poor maternal and fetal outcome in patients with pregnancy induced hypertension. Hence, estimation of platelet count can be considered as an early cost effective simple method to predict the severity of disease and plan management strategies to reduce the maternal and neonatal morbidity and mortality in these patients.

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