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A study of maternal and perinatal outcome in pre-eclampsia

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Abstract
Introduction: Preeclampsia is defined as multi-system disorder of unknown etiology characterized by rise of blood pressure to the extent of 140/90 mm of Hg or more taken on at least two occasions 6 hours apart with proteinuria in a previously normotensive and non proteinuric women after 20 weeks of gestation.
Methodology: 100 antenatal women attending antenatal outpatient department as well as women admitted to obstetric ward and labor room were assessed and enrolled in the study as per the formulated inclusion and exclusion criteria after counseling and taking written informed consent.
Results: It was observed that most common complication associated with group 1 was IUGR followed by HELLP syndrome, IUD, abruption placentae, eclampsia. Most common complication associated with group 2 was also IUGR followed by HELLP syndrome, eclampsia, abruption placentae, IUD. Statistically significant complications between two groups were HELLP syndrome, abruption placentae, IUGR & IUD.
Conclusion: Though preeclampsia is not a preventable obstetric condition but the severity of complications associated with early onset preeclampsia and the related morbidity and mortality can be reduced by providing timely and proper antenatal care.

Keywords: preeclampsia, IUGR, HELLP syndrome

Introduction

Preeclampsia is best described as pregnancy specific syndrome which can affect virtually every organ system [1].

Preeclampsia is defined as multi-system disorder of unknown etiology characterized by rise of blood pressure to the extent of 140/90 mm of Hg or more taken on at least two occasions 6 hours apart with proteinuria in a previously normotensive and non proteinuric women after 20 weeks of gestation. Proteinuria is defined by 24 hour urinary protein excretion exceeding 300 mg, a urine protein: creatinine ratio of ≥0.3, or persistent 30 mg/dl (1+dipstick by qualitative urine examination in random urine sample) [2].

Mild-preeclampsia: systolic blood pressure <160 mm of Hg and diastolic blood pressure <110 mm of Hg [3].

Severe preeclampsia: systolic blood pressure ≥160 mm of Hg and diastolic blood pressure ≥110 mm of Hg.

Pregnancy induced hypertension contributes to the number of maternal and perinatal complications.

Preeclampsia is associated with increased risk of maternal mortality and maternal morbidities like convulsions, abruptio placentae, acute renal failure, cerebrovascular and cardiovascular complication, liver hemorrhage, disseminated intravascular coagulation and stroke [4].

The infants of preeclamptic mothers have a significantly higher incidence of pre-maturity, somatic growth retardation, thrombocytopenia, low APGAR scores, delayed adaptation, patent ductus arteriosus and gastro intestinal hypo motility [11]. Prematurity is the most important factor responsible for increased perinatal morbidity and mortality [3].

As extensive research has not yet elucidated the etiology of preeclampsia, there are no rational preventive or therapeutic interventions available. The only rational treatment is delivery which benefits the mother but is not in the interest of fetus if remote from term. Early onset preeclampsia (<34 weeks gestational age) occurs in less than 1% of pregnancies. It is however associated with maternal morbidity as the risk of progression to severe maternal diseases is inversely related with gestational age at onset [5]. Resulting prematurity is therefore the main

cause of neonatal mortality and morbidity in patients with the severe preeclampsia [2]. Although the discussion is on-going, perinatal survival is suggested to be increased in patients with preeclampsia remote from term by expectant, non-interventional management. This temporizing treatment option to lengthen pregnancy includes the use of antihypertensive medication to control Hypertension, magnesium sulphate to prevent eclampsia and corticosteroids to enhance fetal lung maturity [6].

Despite intensive research and improved technology in recent decades the cause and pathophysiology of the syndrome remain enigmatic. Therefore its treatment is empirical and controversial. Expedient delivery initiates the resolution of preeclampsia. In the case of prematurity however it is a major cause of neonatal morbidity and mortality. Identification of patients at risk for preeclampsia is important for several reasons. Firstly it enables the clinician to counsel the patient, if possible even before pregnancy. Secondly it might discriminate preeclampsia, a disorder with life threatening maternal consequences and danger for the fetus, from transient gestational hypertension-medically a generally benign disorder with mild to moderate elevation of blood pressure. A major concern in the identification of the clinical risk factors for women at risk of preeclampsia is the confusion over clinical classification of this syndrome which results in the use of various definitions in the recent years [6].

Thus this cohort study was carried out to study the obstetrical outcome in women with PE remote from term and to compare them with late onset PE.

Methodology

100 antenatal women attending antenatal outpatient department as well as women admitted to obstetric ward and labor room were assessed and enrolled in the study as per the formulated inclusion and exclusion criteria after counseling and taking written informed consent. A through clinical history and examination was done. All the women were investigated (routine and specific for PE), followed up till delivery and maternal and perinatal outcomes were noted. The diagnosis of PE was done according to NHBPEP working group on high blood pressure

- Chronic HTN (BP >140/90mm of Hg before 20 weeks of gestation)
- Gestational HTN (BP >140/ 90mm of Hg after 20 weeks)
- Preeclampsia (PIH + Proteinuria >300 mg/dl)
- Eclampsia (Preeclampsia + seizures)
- BP $\geq$160mm of Hg systolic or $\geq$110mm of Hg diastolic
- Proteinuria > 5gm/dl
- Oligouria defined as <500 ml per 24 hours
- Cerebral/visual disturbances
- Impaired liver function
- Thrombocytopenia

Classification criteria were platelet count <150,000/ul, LDH >600 IU, & AST/ALT >40 IU. According to severity of laboratory alterations there are three classes of HELLP syndrome.

The diagnosis of PE was based on clinical examination of raised BP and proteinuria. Hypertension was diagnosed when appropriately taken BP exceeds 140 of Hg systolic and 90mm of Hg diastolic. Korotsk off phase V was used to define diastolic pressure.

Following guidelines for measuring blood pressure during pregnancy were followed

1. Patient conditions

For measurement in the OPD the patient should be in a sitting position with her arm at the level of heart.

For measurement in the hospital the women should be in the semi-recumbent position with the arm roughly at heart level.

2. Equipment

The cuff should encircle and cover 2/3rd of the length of the arm. A large cuff should be used for obese patients.

Technique

Inflate the cuff above the systolic pressure as recognized by the disappearance of the radial pulse Use korotk off V (disappearance of the sound) to determine diastolic blood pressure. If the sound persists when the cuff is deflated use korotkoff IV (muffling of sound) Proteinuria is also a valuable sign of severity and value of $\geq$5gm/dl in 24 hour urine sample is one of the criteria PE as severe.

The proteinuria estimation in urine sample of patients with diagnosed PE was done with the help of uristix which were properly stored.

Trace: 0.1 gm/L
1+:0.3 gm/L
2+: 1 gm/L
3+: 3gm/L
4+: 10gm/L

Depending upon the clinical signs and symptoms like epigastric/right upper quadrant pain, cerebral and visual disturbance/oliguria patient were labelled as mild or severe preeclampsia.

Gestational age of all patients was critically evaluated depending upon their last menstrual period, regularity of menstrual cycle, early USG/clinical examination details. These patients were grouped into two groups as per their gestational age. Only those women who were willing to sign the consent and were willing to deliver in this hospital were included in the study.

Results

Table 1: Association of mode of delivery in between two groups

		No. of women (%)		**Total (%)**		
		Group1		**Group2**		
Mode of	Vaginal	29	(50.9%)	28	(49.1%)	57 (100%)
Delivery	lscs	21 (48.8%)		22	(51.2%)	43 (100%)
Total		50	(50%)	50	(50%)	100 (100%)
Chi Square test value		0.0408				
P Value		0.839925		Non-Significant		

Table 1 shows distribution of mode of delivery in both the groups. 29(50.9%) women in group 1 and 28(49.1%) women in the group 2 delivered vaginally whereas number of women undergoing LSCS were 21(48.8%) and 22(51.2%) in group 1 and group 2 respectively. Mode of delivery was statistically non-significant.

Table 2: Association between obstetrical complications between groups

		No. of women (%)				Total (%)
		Group1		Group2		
	Yes	44	(66.7%)	22	(33.3%)	66(100%)
Compli		6(17.6%)		28	(82.4%)	34(100%)
cation	No					
Total		50	(50%)	50	(50%)	100(100%)
Chi Square test value		21.5686				
P Value		0.00001		Significant		

Table 2 shows association of obstetrical complications in between two groups. 66% women in our study had either maternal or perinatal complications. Out of which 66.7% women were from group 1 and 33.3% women from group 2. When these two groups were compared statistically by applying chi square test the association of complications in these two compared groups was found to be significant giving the 'p' value

Table 3: Shows association of maternal complication in between two groups

Complications	No. of women (%)			Total	'Z'	'p' value
	Group 1	Group 2				
Hellp	19	11		30	1.7457	0.04006
	(38%)	(22%)		(30%)		Significant
Abruptio	10	4	(8%)	14	1.7292	0.04182
Placenta	(20%)			(14%)		Significant
	9 (18%)	8	(16%)	17	0.2662	0.39358
Eclampsia				(17%)		Nonsignificant
	20	12		32	1.715	0.04363
IUGR	(40%)	(24%)		(32%)		Significant
	11	4	(8%)	15	1.9604	0.025
IUD	(22%)			(15%)		Significant
Pulmonary	0	0		0		
Edema						
DIC	0	0		0		
ARF	0	0		0		
Maternal	0	0		0		
Mortality						

It was observed that most common complication associated with group 1 was IUGR followed by HELLP syndrome, IUD, abruption placentae, eclampsia. Most common complication associated with group 2 was also IUGR followed by HELLP syndrome, eclampsia, abruption placentae, IUD. Statistically significant complications between two groups were HELLP syndrome, abruption placentae, IUGR & IUD as reflected by 'p' value in above table.

It was further observed that maternal complications were noted more in group1 than in group 2. HELLP syndrome was noted in 30(30%) women overall. In group 1, 38% women had HELLP syndrome and when compared with group 2(22%) it was statistically significant. Abruption placentae were noted in 14(14%) women in the study. In group 1, 20% women had abruption placentae as compared to 8% in group 2 and it was found to be statistically significant.

Table 4: Association of perinatal complications between two groups

Complications	No. of women (%)		Total (%)		'Z' score	'p' value
	Group 1	Group 2				
	31 (62%)	14 (28%)	45	(45%)	3.4171	0.00031
LBW						Significa
						NT
NICU	15 (30%)	9 (18%)	24	(24%)	1.4049	0.08076
Admission						Nonsignif
						ICANT
Birth	15 (30%)	11 (22%)	26	(26%0	0.9119	0.18141
Asphyxia						Nonsignif
						ICANT
	11 (22%)	4 (8%)	15	(15%)	1.9604	0.025
Still Birth						Significa
						NT

Table 4 shows the association of perinatal complication in both the groups. It was observed that most common complication associated with group1 as well as in group 2 was LBW. Still birth was also found to be statistically significant complication between two compared groups. Other complications associated with both groups were birth asphyxia and NICU admissions.

Group 1 comprised women having gestational age <34 weeks, so they were ought to have LBW babies unless and they were prolonged & delivered at full term

Discussion

In a study conducted by Baha M Sibai *et al.* [7] in 1984 on 303 preeclampsia patients 57.43 delivered vaginally and 42.57% women underwent LSCS.

In a study conducted by Mandana Saadat *et al.* [8] in dept of Obstetrics and Gynecology, Bandarabbas University of medical science, Tehran, Iran in 2005-2006 where 1235 patients with PE were studied, 70% patients delivered vaginally and in 30% cases LSCS was performed.

In a study conducted by Rathore R, Butt NF *et al.* [9], at King Edward Medical University, Lahore in 2007-2008 regarding complications and outcome of preeclampsia and eclampsia where 100 patients were studied, 85% patients had a vaginal delivery whereas in 15% patients LSCS was performed.

Vithhal Kuchake *et al.* [10] conducted a study in 2010 at department of clinical pharmacy, R.C. Patel institute of pharmaceutical education and research, Shripur, Dhule, India where 73 preeclampsia patients were studied, 34.24% delivered vaginally and 65.75% women underwent LSCS.

In the present study 50.9% women in group 1 and 49.1% women in the group 2 delivered vaginally whereas women undergoing LSCS were 48.8% and 51.2% in group 1 and group 2 respectively.

In a study conducted by Baha M Sibai *et al.* [7] in 1984 on 303 preeclampsia women, abruptio placentae was noted in 5.6% women, HELLP syndrome in 8.5% and DIC in 7.3% women.

In a study conducted by Mandana Saadat *et al.* [8] in Department of Obstetrics and Gynecology, Bandarabbas university of medical sciences, Tehran, Iran in 2006-2007 in which 125 women with PE were studied & they were matched with the control group i.e. 125 normotensive women, abruptio placentae was noted in 8.8% in group 1 & 4% in group 2. The complications observed in group 1 were abruptio placentae-8% eclampsia-0.6%, ARF-3.6%, pulmonary complications in 6.9% as compared to group 2 i.e. control group where it was 4.1%, 0%, 3.2% &5.2% respectively.

In a study condeucted by Tavassoli Fatemeh *et al.* [11] at department of OBGYN, Masshad university, Iran in 2008 where 100 patients of PE were studied and compared with 100 normotensive women. These 100 women with PE were again divided into mild and severe group and complications associated were studied according to severity. They observed abruptio placentae in 5.9%, HELLP syndrome in 13% cases, Eclampsia in 5% cases, ARF was noted in 5.1% and IUGR was seen in 27.5% cases in severe form of PE. Whereas abruptio placentae was observed in 5.3% cases and IUGR was noted in 5.3% cases in mild form of PE. In group with mild PE they didn't observe any of the complications such as HELLP syndrome, Eclampsia, ARF and DIC.

In a study conducted by Rathore R, Butt *et al.* [9] at king Edward Medical University, Mayo hospital, Lahore in 2010 where 100 patients of PE were studied they observed abruptio placentae in 4% cases, HELLP syndrome in 25% cases, Eclampsia in 26% cases, ARF in 30% and DIC in 6% cases.

In a study conducted by Vitthal Kuchake *et al.* [10] in 2010 at department of clinical pharmacy, R.C.Patel Institute of Ppharmaceutical Education and Research, Shripur, Dhule, India HELLP syndrome was seen in 8% cases and eclampsia was noted in 10% cases.

In the present study, most common maternal complication in Group 1 was IUGR (40%) followed by HELLP syndrome (38%), IUD (22%), Abruptio Placenta (20%) & Eclampsia (18%) whereas most common maternal complication in Group 2 was IUGR (24%) followed by HELLP syndrome (22%), Eclampsia (16%), IUD (8%) & Abruptio Placenta (8%).

In a study conducted by Baha M Sibai *et al.* [7] in 1984 on 303 preeclampsia patients they found the neonatal complications such as birth asphyxia in 24% cases and perinatal mortality in 9.24% cases.

In another study conducted by Ovali F *et al.* in 1996 on 1484 preterm deliveries LBW was seen in 20.7% case, birth asphyxia was noted in 17.9% and NICU admission were required in 45.9% cases and perinatal mortality was observed in 38.9% cases.

Mandana Saadat *et al.* [8] conducted a study in department of Obstetrics and Gynecology, Bandarabbas university of medical sciences, Tehran, Iran in 2006-2007 in which they observed that there was a high incidence of LBW, Birth asphyxia was seen in 6.9% of cases whereas perinatal mortality was noted in 5.6% cases.

In a study conducted by Tavassoli Fatemeh *et al.* [11] at department of obstetrics and gynaecology, Masshad University, Iran in 2008 where 100 patients of PE were studied and compared with 100 normotensive women, it was observed that incidence of LBW was 68.4% and that of birth asphyxia was 23.5%. NICU admission were observed in 17.6% cases of severe PE.

In a study conducted by LU LM *et al.* [12] at department of obstetrics and Gynaecology, Peking University First Hospital, Beijing 100034 China, in 1999-2009 over a period of ten years on effects of gestational age on perinatal outcomes in patients complicated with early onset severe preeclampsia they found birth asphyxia in 26% cases and perinatal mortality was observed in 43% cases.

In a study conducted by Vitthal Kuchake *et al.* [10] in 2010 at department of clinical pharmacy, R.C. Patel Institute of Pharmaceutical Education and Research, Shripur, Dhule, India in which 73 preeclamptic women were studied the mean birth weight observed was 1.7±0.18 kg and perinatal mortality was seen in 13.69% cases.

In the present study LBW was seen in 62% cases, NICU admission in 30% cases, Birth Asphyxia in 30% cases & Still Birth in 22% cases in Group 1 whereas LBW was seen in 28% cases, NICU admission in 18% cases, Birth Asphyxia in 22% cases & Still Birth in 8% cases in Group 2.

Conclusion

This study concludes that women with Preeclampsia remote from term i.e. early onset preeclampsia is associated with more maternal and perinatal complications, the relative risk of developing obstetrical complications in preeclampsia remote from term is 2 times more than in late onset preeclampsia.

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