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ORIGINAL ARTICLE

Pregnancy Outcome in Severe Pre-Eclampsia and Eclampsia

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ABSTRACT

Objective: To observe the impact of severe pre-eclampsia and eclampsia on the maternal and fetal outcome.
Study Design: A cross-sectional prospective study.
Place and Duration of the Study: The Department of Obstetrics & Gynecology, Bakhtawar Amin Trust Teaching Hospital, Multan, Pakistan from July 2020 to June 2021.
Material and Methods: During the study period, a total of 121 women with either pre-eclampsia or severe pre-eclampsia were included. Age, parity, period of gestation, maternal vitals, fetal viability, findings of clinical examination, associated complications, mode of delivery and immediate maternal and fetal outcomes were recorded. SPSS version 26.0 was used for the statistical analysis.
Results: During the study period, a total data of 121 patients was collected. There were 97 (80.2%) women with pre-eclampsia and 24 (29.8%) with severe pre-eclampsia. Overall, mean age was 25.4+4.1 years. Significantly more primigravida women had severe pre-eclampsia (35.1% vs. 66.7%, p=0.011). It was noted that 11 (11.3%) of the fetuses from patients with pre-eclampsia and 6 (25.0%) of the fetuses among women with sever pre-eclampsia had already intra-uterine death by the time these patients were hospitalized. Significant association of fetal status was found among women with pre-eclampsia and severe pre-eclampsia (p=0.011). The overall mean APGAR scores were significantly low for the babies born to the mothers with severe pre-eclampsia vs. pre-eclampsia (p<0.05). Significantly more women with severe pre-eclampsia were shifted to ICU following delivery in comparison to those with pre-eclampsia (75.0% vs. 19.6%, p<0.001). All 3 deaths were reported among women with severe pre—eclampsia (p<0.001).
Conclusion: Primigravida women were significantly more prone to have severe pre-eclampsia. Large majority of the women with pre-eclampsia or sever pre-eclampsia delivered preterm newborns. Increased perinatal morbidity and neonatal mortality is found among women with pre-eclampsia or sever pre-eclampsia.
Keywords: Per-eclampsia, primigravida, preterm, outcome.

INTRODUCTION

Pregnancy induced hypertension (PIH) or Pre-eclampsia is considered to be a major health issue that can complicate pregnancy and its outcomes.[1,2] Despite much advancement, this disorder is still a big challenge for Obstetricians since ages. Pre-eclampsia may develop without any clear warnings while high blood pressure as well as protein in the urine are some of its most dangerous presentations.[3] Global data shows that 3-6% of all pregnant ladies develop pre-eclampsia in the 2nd half of the pregnancy.[4] Data from developing countries exhibit that risk of pre-eclampsia is 7-fold higher in comparison to developed countries (2.8% vs. 0.4%).[5] There is striking influence of parity on the incidence; nearly 20% of nullipara develop hypertension during pregnancy.[6]

Women who have PIH are estimated to have 25-50% chance that they might develop it again in the subsequent pregnancy. Extreme age like teenagers or women beyond 45 years of age, hypertension, renal abnormalities, autoimmune diseases, multiple pregnancy, molar pregnancy and diabetes mellitus are some of the other known risk factors for the development of PIH.[6,7] The present study was aimed at finding out the impact of severe pre-eclampsia and eclampsia on the maternal and fetal outcomes.

MATERIAL AND METHODS

This cross-sectional prospective study was done at The Department of Obstetrics & Gynecology, Bakhtawar Amin Trust Teaching Hospital, Multan, Pakistan from July 2020 to June 2021. Approval from "institutional ethical committee" was acquired. Informed and written consent was taken from all women enrolled.

Those subjects in the pre-natal period who fulfilled the criteria for pre-eclampsia or severe pre-eclampsia were selected. Preeclampsia was labeled as new-onset of hypertension with systolic blood pressure (SBP) ≥ 140 mmHg and/or diastolic blood pressure (DBP) ≥ 90 mmHg after 20 weeks of gestation with proteinuria and/or end-organ dysfunction (renal abnormalities, liver dysfunction, central nervous system abnormalities, pulmonary edema, and thrombocytopenia). Severe preeclampsia was labeled when there was SBP > 160 mmHg or DBP > 110 mmHg on at least two occasions at least 6 hours apart with patient at rest and proteinuria of 5 g per 24 hour, oligouria (<400 ml in 24 hours), cerebral or visual disturbance, epigastric pain, pulmonary edema or cyanosis, impaired liver function and thrombocytopenia. Women receiving emergency treatment or unable to communicate were excluded from this study.

During the study period, a total of 121 women fulfilling the inclusion and exclusion criteria were enrolled. All women enrolled were carefully managed with appropriate anti-hypertensive therapy and anti-convulsants. Age, parity, period of gestation, maternal vitals, fetal viability, findings of clinical examination, associated complications, mode of delivery and immediate maternal and fetal outcomes were recorded. SPSS version 26.0 was used for the statistical analysis. Qualitative data was represented as frequency and percentage and compared employing chi-square test between women with pre-eclampsia and sever per-eclampsia. Quantitative data was represented as mean and standard deviation while comparison between quantitative data was made employing independent sample t-test. P value below or equal to 0.05 was taken as significant.

RESULTS

During the study period, a total data of 121 patients was collected. There were 97 (80.2%) women with pre-eclampsia and 24 (29.8%) with severe pre-eclampsia. There were 77 (63.6%) women who were aged between 21 to 30 years. Overall, mean age was noted to be 25.4+4.1 years. Parity status was significantly different (p=0.011) in between both study groups as there were significantly more primigravida women with severe pre-eclampsia in comparison to women with pre-eclampsia (35.1% vs. 66.7%). Mean gestational age was found to be 31+3 weeks while there

were 59 (48.8%) women who were delivered between 31 to 34 weeks. Significant variation was noted in diastolic blood pressure (p<0.001) as 12 (50.0%) women with sever pre-eclampsia had diastolic blood pressure above 130 mmHg in comparison to 11 (11.3%) women with pre-eclampsia. Table 1 is showing comparison of maternal characteristics and outcome among women with pre-eclampsia and severe pre-eclampsia.

Table 1: Characteristics and Maternal Outcomes in both Study Groups (n=121)

		Pre-Eclampsia (n=97)	Severe Pre-Eclampsia (n=24)	P-Value
Age (years)	<20	11 (11.3%)	6 (25.0%)	0.064
	21-30	60 (61.9%)	17 (70.8%)	
	31-40	23 (23.7%)	1 (4.2%)	
	>40	3 (3.1%)	-	
Parity	Primigravida	34 (35.1%)	16 (66.7%)	0.011
	G_2-G_3	37 (38.1%)	8 (33.4%)	
	G_4-G_5	19 (19.6%)	0	
	G_6 or above	7 (7.2%)	0	
Gestational Age (weeks)	<27	14 (14.4%)	2 (8.3%)	0.745
	27 – 30	21 (21.6%)	8 (33.3%)	
	31 – 34	48 (49.5%)	11 (45.8%)	
	35 – 38	13 (13.4%)	3 (12.5%)	
	39 – 42	1 (1.0%)	-	
Pregnancy Status	Singleton	91 (93.2%)	23 (95.8%)	0.704
	Multi-Fetal	6 (6.2%)	1 (4.2%)	
Fetus	Alive	86 (88.7%)	18 (75.0%)	0.084
	Intra-Uterine Death	11 (11.3%)	6 (25.0%)	
History of PIH in Previous Pregnancies*	Yes	12 (19.0%)	2 (25.0%)	0.690
	No	51 ((81.0%)	6 (75.0%)	
Diastolic Blood Pressure mm (Hg)	<110	-	1 (4.2%)	<0.001
	110 – 120	55 (56.7%)	3 (12.5%)	
	120-130	31 (32.0%)	8 (33.3%)	
	>130	11 (11.3%)	12 (50.0%)	
Evidence of HELLP Syndrome	Yes	26 (26.8%)	11 (45.8%)	0.084
	No	71 (73.2%)	13 (54.2%)	
Mode of Delivery	SVD	34 (35.05%)	5 (20.83%)	0.053
	Assisted Breech delivery	1 (1.03%)	2 (8.33%)	
	Instrumental vaginal delivery	4 (4.12%)	3 (12.5%)	
	Caesarean delivery	58 (59.80%)	14 (58.34%)	

*History of PIH in previous pregnancies was noted in 71 women with past pregnancies.

Table 2: Fetal Outcomes in Both Study Groups (n=121)

		Pre-Eclampsia (n=97)	Severe Pre-Eclampsia (n=24)	P-Value
Fetal Status	Live born fetuses	84 (86.6%)	15 (62.5%)	0.011
	Dead Fetuses	11 (11.3%)	6 (25%)	
	Fresh stillbirth	2 (2.1%)	3 (12.5%)	
Birth weight (grams)	<1000	-	1 (4.2%)	0.086
	1001 – 1500	9 (9.3%)	3 (12.5%)	
	1501 – 2000	11 (11.3%)	6 (25.0%)	
	2001 – 2500	52 (53.6%)	12 (50.0%)	
	2501 – 3000	21 (21.6%)	2 (8.3%)	
	3001 – 3500	4 (4.1%)	-	

It was noted that 11 (11.3%) of the fetuses from patients with pre-eclampsia and 6 (25.0%) of the fetuses among women with sever pre-eclampsia had already intra-uterine death by the time these patients were hospitalized. Significant association of fetal status was found among women with pre-eclampsia and severe pre-eclampsia (p=0.011) as shown in table 2. Fresh stilsbirth were also more frequent among with severe pre-eclampsia versus pre-eclampsia (12.5% vs. 2.1%). In terms of birth-weight, babies born to the eclamptic and severe pre-eclamptic mothers were generally lesser in weight but no significant difference was found among women with pre-eclampsia and sever pre-eclampsia (p=0.086) as shown in table 2.

The overall mean APGAR scores were significantly low for the babies born to the mothers with pre-eclampsia and severe pre-eclampsia (p<0.05) as showin table 3. The main causes for the low APGAR scores were Prematurity, Birth asphyxia and maternal administration of sedatives particularly to the eclamptic mothers.

Table 3: Mean APGAR Score of the live born neonates

Apgar Score	Pre-Eclampsia (n=84)	Sever Pre-Eclampsia (n=15)	P-value
1 minute	4.91+1.78	3.93+0.57	0.038
5 minutes	5.45+0.98	4.73+0.98	0.010
10 minutes	7.52+1.20	6.06+1.48	0.001

Table 4 is showing post-partum recovery. Significantly more women with severe pre-eclampsia were shifted to ICU following delivery in comparison to those with pre-eclampsia (75.0% vs. 19.6%, p<0.001). All 3 deaths were reported among women with severe pre—eclampsia (p<0.001). Out of 3 maternal deaths, one death was prenatal and two deaths were post-partum.

Table 4: Maternal Post-partum Recovery

		Pre-Eclampsia (n=97)	Severe-Preclampsia (n=24)	P-Value
Diastolic B.P dropped to less than 100 mm(Hg)	48 hours after delivery	11 (11.3%)	3 (12.5%)	0.873
	One week after delivery	86 (88.7%)	21 (87.5%)	
Post-Partum Eclampsia		1 (1.0%)	-	0.617
Patients shifted to ICU after delivery		19 (19.6%)	18 (75.0%)	<0.001
Post-Partum Haemorrhage (PPH)		2 (2.0%)	1 (1.0%)	0.553
Maternal deaths		0	3* (12.5%)	<0.001

DISCUSSION

Sever pre-eclampsia was notice significantly more among women with primigravid or nulliparous status as shown in the present study and this finding is consistent with what was found by Grum T et al from Ethiopia where they noted odds of developing preeclampsia or eclampsia to be 2.68 times (95% CI:1.38-5.22).[8] The Chances for recurrence of PIH varies in subsequent pregnancies. The study results showed that 25% and 19% of the sever pre-eclamptic and pre-eclamptic patients respectively had history of PIH in previous pregnancies. Two researchers from Iran concluded that previous history of pre-eclampsia was an independent factor for predicting pre-eclampsia in the present pregnancy.[9,10]

Severe pre-eclampsia and eclampsia endanger the life of fetus in utero, mostly as result of hypoxia due to utero-placental insufficiency.[11] We found that 25% of the fetuses already had intrauterine demise among the sever pre-eclamptic patients while 11.3% had intrauterine death in the pre-eclamptic patients. The overall perinatal mortality rate was 18.2%. There is a marked variation in perinatal loss from different studies ranging from 15-40%.[12] Fetal demise has been reported higher among the mothers developed multi-system organ failure.[13]

HELLP syndrome (Haemolysis, elevated liver enzymes and low platelet) is a dangerous complication among women with eclampsia and it was observed that 30.6% women in the present study with either pre-eclampsia or sever pre-eclampsia had HELLP syndrome. Only one patient developed clinical disseminated intravascular coagulation who later on expired in the puerperium. The exact relationship of HELLP syndrome with maternal and perinatal health and its presentation in Pakistani population is not known. A 6 year study conducted on Pakistani population at Aga Khan University hospital by Zubairi et al revealed a 30% incidence

of HELLP syndrome in patients with severe Pre-eclampsia / Eclampsia.[14]

The mode of delivery was determined on the basis of fetal condition, gestational age and state of cervix. Delivery of fetus and placenta is the only effective treatment for pregnancy induced hypertension. Since the prolongation of pregnancy was hazardous both for the mother and fetus, hence immediate delivery was planned in their best interest. Preference was for that of the vaginal delivery provided there was no contraindication. Despite that preference, more than half of the cases required caesarian delivery. In majority of the cases delivered with cesarean section, the vaginal delivery was not imminent and that was why they were delivered with Caesarian section. Successful induction was low in the primigravida who were remote from term and had unfavorable cervix. More than 50% of the patients were delivered with Caesarean section and the main reason was that either there was an element of fetal distress or the vaginal delivery was not imminent and there were concerns about maternal conditions. Worldwide, there is an increased trend over the last two decades, for the abdominal deliveries.[15] A study from South Africa reported that 63% of women with pre-term pre eclampsia were delivered through elective cesarean section.[16]

Babies born to the eclamptic and severe pre-eclamptic mothers were generally lesser in weight as compared to those born to the mothers without these problems. In the comparative study of severe Pre-eclampsia vs Eclampsia, babies born to the eclamptic mothers had lesser mean birth weight 2208 ± 414.02 gm and 1990 ± 378.62 gm. This finding is quite different from that reported by Flores NG et al[17] as 1858 ± 654 gm and 1340 ± 427 gm for neonates of sever pre-eclamptic and eclamptic patients respectively, although the mean period of gestation was 31-33 weeks which was almost the same as in this study. Mean APGAR scores were low for the babies born to the mothers with Eclampsia and severe Pre-eclampsia and the figures were close to that reported by Flores NG et-al (1997) [17]. All the live born neonates of eclamptic mothers and more than half of the neonates of pre-eclamptic mothers were shifted to the neonatal ICU after initial resuscitation. Average stay in the neonatal ICU was 8 days. Prematurity of the neonates and the possibly underlying utero-placental insufficiency could be the major cause for the low birth weight.[18,19]

There were three maternal deaths, and all these had eclampsia. One death was prenatal and two expired in the post-partum period. Maternal post-partum recovery was observed in all the patients. Albuminuria disappeared in more than half the cases within one-week post-partum. Also diastolic blood pressure returned to normal (less than 90 mm Hg) within one week after delivery. Only one eclamptic patient developed multi-system organ failure (MSOF) and she later on developed clinical DIC and expired in the post-partum period. Post-partum recovery in cases with HELLP syndrome was not different from those cases without HELLP syndrome.

The study results cannot be true representative of the outcome of the pregnant population as a whole for our part of the world, where many deliveries are conducted at home in the hands of untrained personnel, who are not capable to recognize the high-risk pregnancies prenatally.[20] The incidence of severe Pre-eclampsia / Eclampsia is very low in the communities where the antenatal services are well availed that results in early recognition of the disorder and prompt management. On the other hand the incidences of severe Pre-eclampsia / Eclampsia is much higher in the communities where the effective antenatal care is not available. That results in many of the cases with milder forms of PIH remaining un-noticed and consequently they end up in severe forms of disease associated with worse pregnancy outcomes.

The present study had some limitations. As this was a single center study with a relatively small sample size, our findings cannot be generalized. No data about the antenatal care was analyzed in the present study which would have given us further insight. As no sample size was calculated and convenient sampling technique was adopted in the present study, the sample selection might have some bias.

CONCLUSION

Primigravida women were significantly more prone to have sever pre-eclampsia. Large majority of the women with pre-eclampsia or sever pre-eclampsia delivered preterm newborns. Neonatal mortality is high among women with pre-eclampsia or sever pre-eclampsia.

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