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Original Research Article

Fetomaternal outcome in severe preeclampsia and eclampsia: a retrospective study in a tertiary care centre

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ABSTRACT

Background: Hypertensive disorders of pregnancy are a leading cause of maternal and perinatal mortality and morbidity worldwide. In India, they account for the third most important cause of maternal mortality. The objectives of this study were to evaluate maternal and perinatal outcome and complications in cases with severe preeclampsia and eclampsia.
Methods: A retrospective study was carried out on 110 women with severe preeclampsia and eclampsia in a tertiary care referral centre over a period of 15 months. Only those cases with initial B.P reading of ≥160/110 mm Hg or presenting with eclampsia were included in the study. Investigations and management were carried out as per standardized department protocol and maternal and fetal outcomes were analyzed.
Results: 42% of the cases were in the age group of 26-30 years, nearly 61% were primigravidae and the majority (64) were referred from peripheral hospitals. Liver function tests were deranged in 19% of the patients and 17% had abnormal renal function. Nifedipine was the most commonly used antihypertensive and magnesium sulphate was the anticonvulsant used in all the cases. Lower segment caesarean section was the mode of delivery in 64.5% of the cases. Commonest maternal complication was atonic PPH. There was no maternal mortality but there were 3 maternal near-miss cases due to DIC. 65% of the cases had a preterm delivery and 39% of the babies needed NICU admission. There were 10 neonatal deaths.
Conclusions: Accessible health care and health education and awareness regarding antenatal check-ups for all women will lead to early detection of severe preeclampsia. Prompt treatment and management of its complications will certainly improve the maternal and fetal outcome.

Keywords: Eclampsia, Maternal morbidity, Maternal mortality, Perinatal morbidity, Perinatal mortality, Preeclampsia

INTRODUCTION

Hypertensive disorders complicate about 10 % of all pregnancies worldwide. Hypertension, along with haemorrhage and infection form a deadly triad accounting for a major share of maternal morbidity and mortality.[1] The World Health Organisation systematically reviews maternal mortality worldwide and in developed countries 16% of maternal deaths were reported to be due to hypertensive disorders.[2] In India hypertensive disorders account for the third most important cause of maternal mortality.[3]

For classifying and defining hypertensive disorders of pregnancy, The National High Blood Pressure Education Program (NHBPEP) and ACOG (2013 b) evidence based recommendations have been taken into consideration.[4]

Preeclampsia is a multisystem, multifactorial disease defined as Blood Pressure (B.P) reading of ≥140/90 mm Hg on two occasions 4 hours apart and >0.3 g protein in 24 hour urine specimen after 20 weeks of gestation in a previously normotensive woman. Severe Preeclampsia is B.P reading of ≥160/110 mm Hg and >5 g protein in 24 hour urine specimen or symptoms of end organ damage like deranged LFT, thrombocytopenia, oliguria, visual disturbances, pulmonary oedema etc. Eclampsia is defined as generalised tonic clonic seizures and /or unexplained coma in a woman with preeclampsia.

In spite of advances in medicine, preeclampsia and eclampsia continue to remain leading causes of maternal and perinatal mortality and morbidity throughout the world. Severe Preeclampsia can lead to multiple life-threatening complications like eclampsia, cerebral haemorrhage, cardiovascular complications, hepatic failure, acute renal failure, pulmonary oedema, ARDS (Adult Respiratory Distress syndrome), DIC (Disseminated Intravascular Coagulation) HELLP syndrome (Haemolysis, Elevated Liver enzymes, Low Platelet), retinal detachment, cortical blindness, hypoxic cerebral damage and even maternal death.

Fetal complications are mainly due to uteroplacental insufficiency leading to IUGR (Intrauterine Growth Restriction), low birth weight babies, IUFD (Intrauterine Fetal death) and complications due to prematurity. There are still no widely accepted biochemical markers for early detection of Preeclampsia but some maternal and pregnancy characteristics have been identified as risk factors, these are nulliparity, previous history of preeclampsia, maternal age over 40, multiple gestation, molar pregnancy, pregestational diabetes, vascular, endothelial or renal diseases, maternal smoking, obesity and certain genetic factors.[5]

Various biological, biochemical and biophysical markers implicated in preeclampsia syndrome have been studied as markers to predict the development of preeclampsia. Uterine artery doppler velocimetry in the late first and second trimesters showing increased resistance may be a predictive test for the development of preeclampsia.[5,6] Currently no other test is reliable, valid or economical and most have met with poor sensitivity and poor positive predictive value.

Various strategies used to prevent or modify the severity of preeclampsia have been evaluated, but none of them have been found to be convincing or reproducible.[1]

Maternal and perinatal mortality and morbidity due to preeclampsia can only be prevented by access to quality antenatal care, early diagnosis and recognition of risk factors, careful monitoring and timely interventions.

The present study was undertaken in a tertiary care referral hospital in South India with the aim of evaluating the maternal and perinatal outcome and complications of severe preeclampsia and eclampsia.

METHODS

This research is a 15 month retrospective study of severe preeclampsia and eclampsia cases in Government medical College, Ernakulam, Kerala from March 2014 to July 2015. A total of 110 women with severe preeclampsia and eclampsia were included in the study and their case records were retrospectively analysed.

Inclusion criteria

B.P reading of ≥160/110 mmHg with 1+ or more albuminuria was the criteria followed for categorising severe preeclampsia. Eclampsia was presence of seizures in women with preeclampsia which could not be attributed to other causes.

Exclusion criteria

Patients with chronic hypertension (before 20 weeks of gestation), chronic renal disease, connective tissue disorders and mild preeclampsia were not included in the study.

A Pro Forma was used to record information on maternal age, parity, booking status, gestational age at diagnosis mode of delivery, treatment given, complications - both maternal and fetal and finally the maternal and fetal outcome.

Investigations and management were carried out in accordance with the standardised department protocol. Investigations that were routinely done for all the cases were complete haemogram, platelet count, liver function tests, renal function tests, coagulation profile, 24 hour urine protein. Ultrasonography with doppler was done after stabilising the condition of the patients in selected cases.

Antihypertensive drugs used were alphamethyldopa, nifedipine and labetalol - both orally and parenterally, singly or in combination as needed. Magnesium sulphate was the anticonvulsant of choice used both as prophylaxis and treatment according to the Pritchard's regime. Preterm delivery was defined as delivery before 37 weeks of gestation. Neonatal morbidity was estimated by number of newborns needing NICU admission. The data was compiled and analysed.

RESULTS

Out of the 110 patients in the present study, preeclampsia was observed in different age groups ranging from 18 to 41, maximum number of cases 47 were in the age group of 26 to 30 years. There were 8 patients over the age of 35. Table I gives the distribution cases vis a vis age of patients.

Table 1: Distribution of cases according to the age of the patients.

Age	No. of cases	%
< 20	18	16.36
21-35	27	24.54
26-30	47	42.12
31-35	10	9.09
> 35	8	7.27

Table 2: Distribution of cases according to their obstetric status.

Gravidity	No. of cases	%
Primigravida	67	60.90
Multigravida	43	39.10

Table 3: Distribution of cases according to their antenatal registration status.

Registration status	No. of cases	%
Booked	86	78.18
Unbooked	24	21.81

This study was carried out in Kerala, where antenatal coverage is very good and so only 21.81% of our patients were unbooked. Out of the total 110 cases, 64 were referred from peripheral hospitals.

Table 4: Distribution of cases according to the investigations done.

Proteinuria	≤+1	≥+2	≥+3	
Cases	15	31	64	
%	13.63	28.18	58.18	
LFT	SGOT >70 IU/L	SGPT >70 IU/L	LDH >600	Serum bilirubin >1.2 mg/dl
Cases	21	21	15	16
%	19.09	19.09	13.63	14.54
RFT	Blood urea >40	Serum creatinine >0.8	Serum uric acid >7	
Cases	15	17	17	
%	13.63	15.45	15.45	
Coagulation profile	Platelet count <1 lakh	Deranged PT INR	Peripheral smear with haemolysis	
Cases	16	18	8	
%	14.54	16.36	7.27	

58% of the patients had ≥+3 proteinuria, 17% had abnormal renal function tests. Liver enzymes were elevated in 19% and 7% patients showed evidence of haemolysis on peripheral smear.

It was observed that the majority 44 (40%) of the patients presented at gestational age between 33 to 36 weeks. Extreme preterm presentation before 28 weeks of gestation was noted in 13 (11.81%).

Table 5: Gestational age at presentation.

Gestational age	No. of cases	%
≤ 28 weeks	13	11.81
29-32 weeks	15	13.63
33-36 weeks	44	40.0
≥37 weeks	38	34.54

Table 6: Antihypertensives drugs used in the management.

Drug used	No. of cases	%
Nifedipine	43	39.09
Labetalol	31	28.18
Nifedipine+Alphamethyldopa	9	8.18
Nifedipine+Labetalol	27	24.54

Nifedipine was the most commonly used drug in the present study, either singly or in combination. Alphamethyldopa was used when patients presented with severe preeclampsia before 28 weeks of gestation, but in all the cases it was used in combination with nifedipine. Labetalol was used singly as well as in combination with nifedipine.

Table 7: Mode of delivery.

Mode of delivery	No. of cases	%
Normal vaginal delivery	31	28.18
LSCS	71	64.54
Instrumental	5	4.54
Hysterotomy	3	2.72

Table 8: Indications for caesarean section.

Indication	No. of cases	%
Previous caesarean section	40	36.36
Non-reassuring fetal status	12	10.90
Failed induction	16	14.54
CPD, contracted pelvis	6	5.45
Doppler abnormalities, IUGR, oligohydramnios	12	10.90
Abruption	4	3.63

Previous caesarean section was the commonest indication for caesarean section as these patients presenting with severe preeclampsia or eclampsia were not given trial of labour and repeat caesarean was done after stabilising the patient. In some cases, there was an overlap of Indications like doppler abnormalities along with failed induction and abruption with non-reassuring fetal status.

Atonic PPH was the commonest complication in 26 patients and it was managed with oxytocin and prostaglandin F2 alpha. Bilateral uterine and ovarian artery ligation was needed in 12 cases.

Table 9: Maternal complications and outcome.

Complication	No. of cases	%
Eclampsia	13	11.81
Abruptio placentae	8	7.27
Partial HELLP	21	19.09
HELLP	5	4.54
PPH	26	23.63
DIC	3	2.72
Pulmonary edema	1	0.90
Renal dysfunction	8	7.27
ARDS	0	0

There were 13 cases of eclampsia in the study- 10 antepartum and 3 postpartum. All the 13 cases were treated with magnesium sulphate. Out of the 110 patients, 66 received prophylactic magnesium sulphate. Partial HELLP syndrome was noted in 21 patients. Near- miss cases were there in 3 cases with DIC and 5 cases of HELLP. These near-miss cases were managed by a multidisciplinary team. There was no maternal mortality.

Table 10: Perinatal complications and outcome.

Complication	No. of cases	%
IUGR	24	21.81
Prematurity	71	64.54
Respiratory distress syndrome	25	22.72
Meconium aspiration	5	4.54
Intrauterine death	7	6.36
Still birth	3	2.72
NICU admission	43	39.09
Low birth weight babies	37	33.63
Neonatal death	10	9.09

The number of cases of preterm delivery were quite high at 65% due to the premature induction of labour in cases of severe preeclampsia and eclampsia. NICU admission was needed for 43 babies, 25 had respiratory distress syndrome. In present study, there were 10 neonatal deaths.

DISCUSSION

Out of the 110 cases of severe preeclampsia and eclampsia in the present study, 67 were primigravidae and 18 were less than 20 years of age. The highest number of cases were in the age group of 26-30 years. Severe preeclampsia was seen more commonly in primigravidae. Other studies notably by Sibai and Cunningham also support this view.[7] Nulliparity as a separate risk factor for severe preeclampsia has been reported in studies by Saxena et al in India and by Conde-Agudelo in Latin American women.[8,9]

About 75% of the cases presented at gestational age >33 weeks. Singhal et al also reported similar findings.[10] Unlike other studies, in the present study, 78% were booked cases, but 58% of cases were referred from peripheral hospitals. The incidence of severe preeclampsia and eclampsia are higher among unbooked patients. In a study from rural Gujarat by Gandhi et al 72.6% of total cases of preeclampsia were unbooked patients.[11]

The most common mode of delivery was lower segment caesarean section in 64.5% of the cases and the most common indication was previous one or more caesarean sections. The mode of delivery was determined by severity of maternal condition, Bishop's score, gestational age, fetal condition, USG and laboratory investigations. Singhal et al reported 33% caesarean section rate. [10] Tufnell et al reported as high as 72% caesarean section rate in BJOG.[12] Caesarean section rates of 71% and 78% respectively were reported by Miguel M et al and Dissanayake VH et al.[13,14] The high rate of caesarean section in the present study is due to more than 36 % cases being previous caesarean section and also due to emergency delivery approach taken to prevent further maternal and fetal complications due to severe preeclampsia or eclampsia especially in cases where the cervix is unfavourable for induction.

10.9% of cases had LSCS for reversed or absent end diastolic flow in umbilical artery. Uteroplacental insufficiency seen in severe preeclampsia and eclampsia is the major cause of IUGR seen in 21.8% of the cases in the present study. Prematurity was the most common complication among the neonates seen in 64.5% of the cases. Tufnell et al reported 65.3% incidence of prematurity.[11] The high incidence of preterm delivery could be attributed to the early intervention and induction of labour or LSCS done to avert further maternal and perinatal complications.

Main factors affecting perinatal mortality and morbidity were prematurity, IUGR and irregular antenatal visits. Being a tertiary care centre we have an efficient team of neonatologists and neonatal intensive care unit (NICU) back up. The perinatal mortality rate in our study was 18 % i.e. 20 in number of which 7 were intrauterine fetal deaths 3 stillbirths and 10 neonatal deaths all due to prematurity and respiratory distress syndrome. A perinatal mortality rate of 22.7% was reported from south-east Nigeria and Shahin et al from Pakistan reported perinatal mortality of 41.6%.[15,16]

The main factors determining maternal morbidity are associated risk factors like diabetes, anaemia, nulliparity, advanced maternal age, early onset preeclampsia, severe preeclampsia and previous history of preeclampsia. In this study, postpartum haemorrhage was the most common maternal complication seen in 23.6% of cases followed by partial HELLP in 19.09% cases and eclampsia in 11.81% cases. Various studies have reported abruptio placenta and HELLP syndrome as more common complications. A study by Farid M et al had 11% incidence of HELLP syndrome and 10% incidence of abruptio placenta.[17] In a ten year study done by

Igberase et al the important causes of maternal mortality in severe preeclampsia were acute renal failure, disseminated intravascular coagulopathy (DIC), cardiac arrest, pulmonary edema and cerebrovascular accidents.[18] In the present study, there was no maternal mortality, however there were 3 maternal near-miss cases due to DIC and 5 cases of HELLP syndrome. These were managed in the intensive care unit of the hospital by a multidisciplinary team.

CONCLUSION

Preeclampsia and eclampsia continue to be significant causes of maternal and fetal morbidity and mortality. Though prevention is not possible, it is important to recognise early warning symptoms and signs so that life threatening complications can be averted. Provision of quality antenatal health care services, increasing patient awareness about warning symptoms, investigations, timely delivery and intensive monitoring in the intrapartum and postpartum period have the potential to improve maternal and perinatal outcome. Education and empowerment of women and accessible health care especially to the socioeconomically deprived and rural population is the need of the hour.

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