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Original Research Article

Analytical study on maternal and fetal outcome of pre-eclampsia with severe features at tertiary care hospital

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ABSTRACT

Background: Pre-eclampsia is a multi-system, pregnancy specific disorder that is characterized by the development of hypertension and proteinuria after 20 weeks. Pre-eclampsia is the majority of referrals to tertiary care centre. It is one of the major causes of maternal and perinatal morbidity and mortality.
Methods: A retrospective analytical study done over a period of six months from January 1st 2023 to June 30th 2023. Pregnant women admitted with PE with severe features to Cheluvamba hospital, MMCRI, Mysore during the study were considered and analysed using the proforma. Data was entered into Microsoft excel data sheet and was analyzed. Categorical data was represented in the form of Frequencies and proportions
Results: Incidence of PE with severe features in our hospital was 3.4%. Majority (69%) were between 23-27 years of age and 52.7% were primigravida. Maternal complications were noted in 37.5% attributed to renal dysfunction, postpartum haemorrhage, DIC, placental abruption, HELLP, pulmonary oedema and postpartum eclampsia.
Conclusions: Maternal and perinatal complications are more in patients with severe pre-eclampsia. The incidence of severe pre-eclampsia can be reduced by early referral, better antenatal care, early recognition and treatment of pre-eclampsia

Keywords: PE with severe feature, Pritchard regimen, Primigravida, Mgso4

INTRODUCTION

Hypertension is one among the most important medical disorders to affect as high as 5-10% of all pregnancies.[1] The national high blood pressure education program of the NHLBI classifies hypertensive disorders of pregnancy into the following categories: chronic hypertension, gestational hypertension, pre-eclampsia and pre-eclampsia superimposed on preexisting hypertension.

Pre-eclampsia is one of the most well-known medical conditions that belong to this disease spectrum, which also accounts for one of the most common documented gestational complications, with a prevalence of approximately 2 to 15% of all pregnancies.[2]

It is depicted as a gestational condition with a hypertensive disorder diagnosed after 20 weeks of gestation and coexisting proteinuria or generalized edema, and certain forms of hematologic disorders such as thrombocytopenia or signs of end organ damage including renal impairment, abnormal liver function, pulmonary edema, and cerebral and visual disturbance.[3]

In 2014, the International society for the study of hypertension in pregnancy (ISSHP) has issued an update after reevaluating their consensus statement, stating that pre-eclampsia is defined as the de novo appearance of hypertension after 20th week of gestation along with evidence of maternal organ failure, which includes the following: new-onset proteinuria of >300 mg/day or other indications of renal insufficiency, hematological complications such as thrombocytopenia and liver

dysfunction, or neurological complications such as visual disturbance and/or evidence of utero placental dysfunction such as fetal growth restriction.[4] It is considered severe if blood pressure ≥160/110 mmHg; liver derangement with transaminitis; thrombocytopenia; renal insufficiency; pulmonary edema; new-onset headache; or visual changes.[5]

It has been estimated that pre-eclampsia complicates 2-8% of pregnancies globally and 5-15% in India.[6]

India has a maternal mortality ratio (MMR) of 113 per 100,000 live births as per the sample registration system (SRS).[7] The major complications that account for nearly two-thirds of all maternal deaths is severe bleeding (mostly bleeding after childbirth), infections (usually after childbirth), high blood pressure during pregnancy (pre-eclampsia and eclampsia), complications from delivery and unsafe abortions.[8] In India, high blood pressure contributes to 6.7% of maternal deaths.[9,10]

Pre-eclampsia is a multisystem disorder where release of one or more factors damage the vascular endothelial cells throughout the maternal circulation leading to multi system dysfunction. There is currently no single cost effective and reliable screening test for pre-eclampsia and there are no well-established measures for primary prevention.

The ultimate treatment for pre-eclampsia to prevent potential maternal complications is to deliver the patient. However, delivery is not always in best interest of fetus. The rationale for delaying delivery in these pregnancies, is to reduce perinatal morbidity and mortality by delivery of more mature fetus and to achieve more favorable cervix.

Access to perinatal care, early detection of the disorder, careful monitoring and appropriate management are crucial elements in prevention of pre-eclampsia related deaths. Pre-eclampsia leads to elevated risk of Disseminated Intravascular coagulation, placental abruption, hepatic failure, acute renal failure, cerebrovascular and cardiovascular complications, pulmonary edema, HELLP syndrome, eclampsia, retinal detachment, aspiration pneumonia and maternal death. Fetal morbidities include preterm delivery, small for gestation, intrauterine growth restriction (IUGR), still birth, low birth weight babies.

Aims and objectives were to determine the incidence of maternal and fetal morbidity and mortality in pre-eclampsia with severe features.

METHODS

A retrospective analytical study was done over a period of six months from January 1st 2023 to June 30th 2023. Pregnant women admitted with PE with severe features to Cheluvamba hospital, MMCRI, Mysore during the study were considered and analyzed using the proforma. Patients were managed as per protocol after proper history, examination and investigations. Anti-hypertensive of choice was oral or intravenous labetalol or oral nifedipine. According Pritchard's regimen magnesium sulphate was used as anticonvulsant. Zuspan regimen was used in when Pritchard regimen was contraindicated

Inclusion criteria

Pregnant women with pre-eclampsia with severe features after 20 weeks of gestation, PE with severe features complicating to antepartum and postpartum eclampsia were included in the study.

Exclusion criteria

Patients with prior existing hypertension due to medical disorder, chronic hypertension, presenting as antepartum eclampsia during admission, gestational hypertension and pre-eclampsia without severe features were excluded.

RESULTS

There were total of 4194 deliveries during the study period, out of which 144 cases were of pre-eclampsia with severe features. Incidence of pre-eclampsia with severe features was 3.4%.

Age

In age group of 18-22 years 42 (29%), between 23-27 years 53 cases (36%), 28-32 years 24 cases (16%), between 32-37 years 17 cases (11%), 38-42 years 8 cases (5%).

Table 1: Distribution of patients based on age.

Age (in years)	N	Percentage (%)
18-22	42	29
23-27	53	36
28-32	24	16
32-37	17	11
38-42	8	5

Parity

Primigravida 76 cases (52%) and multigravida 68 cases (48%), gestational age <28 weeks 11 cases (7%), 29-32 weeks 28 cases (19%), 33-36 weeks 44 cases (30%), >37 weeks 61 cases (42%).

Table 2: Gestational age at presentation to hospital.

Gestational age (in weeks)	N	Percentage (%)
Less than 28 weeks	11	7
29-32 weeks	28	19
33-36 weeks	44	30
More than 36 weeks	61	42

Residence

Residing in rural area 102 (70%), urban area 42 (29%).

Symptoms

Headache in 66 cases (45%), vomiting in 25 cases (17%), high BP recordings >180/110 mmHg in 15 cases (10%), blurring of vision in 16 cases (11%), generalized edema in 8 cases (5%), epigastric pain in 14 cases (9%).

Table 3: Clinical presentation at admission.

Symptoms	N	Percentage (%)
Headache	66	45
Vomiting	25	17
High BP recording >180/110 mmHg	15	15
Blurring of vision	16	11
Generalized edema	8	5
Epigastric pain	14	9

Proteinuria

One+ in 14 cases (9%), 2+ in 35 cases (24%), >3+ in 95 cases (65%).

Table 4: Distribution of patients based on proteinuria.

Proteinuria	N	Percentage (%)
1+	14	9
2+	35	24
3+	95	65

Fundoscopy

The 132 cases (91%) had normal findings; 8 cases (5%) had hypertensive changes out of which 4 cases (2.5%) had papilledema.

Mode of delivery

The 44 cases (30%) by normal vaginal delivery, 5 cases (3%) by instrumental vaginal delivery, 93 cases (64%) by LSCS, 2 cases (1%) underwent hysterotomy.

Table 5: Methods of delivery.

Mode of delivery	N	Percentage (%)
Vaginal delivery	49	33
Normal	44	30
Instrumental	5	3
LSCS	93	64
Hysterotomy	2	1

Mode of induction

Spontaneous delivery in 22 cases (15%), by vaginal PGE1 in 9 cases (6%), by PGE2 gel in 18 cases (12.5%).

Table 6: Vaginal delivery by various modes of induction.

Mode of induction	N	Percentage (%)
Spontaneous delivery	22	15
PGE2 gel	18	12.5
Vaginal PGE1	9	6

Indication for LSCS

Worsening maternal condition in 24 cases (16%), previous LSCS in 34 cases (23%), failed induction in 8 cases (5%), fetal distress in 22 cases (15%), malpresentation in 2 cases (1%), cephalopelvic disproportion in 2 cases (1%), obstructed labour in 1 case (0.6%).

Table 7: Indication for LSCS.

Indication for LSCS	N	Percentage (%)
Worsening maternal condition	24	16
Previous LSCS	34	23
Failed induction	8	5
Fetal distress	22	15
Malpresentation	2	1
CPD	2	1
Obstructed labour	1	0.6

Maternal complications

Eclampsia in 5 cases (3%), postpartum hemorrhage in 16 cases (11%), abruption in 11 cases (7%), AKI in 3 cases (1.5%), pulmonary edema in 4 cases (2%), HELLP syndrome in 9 cases (6%), DIC in 6 cases (4%).

Out of 5 cases of eclampsia 3 had not completed Pritchard's regimen (2 cases-antepartum and 1 case-postpartum eclampsia), whereas 2 cases had completed Pritchard's regimen (post-partum eclampsia) and were given repeat doses of $MgSO_4$.

There was a total of 4 maternal deaths, 1 case with pulmonary edema and 3 cases with DIC.

Table 8: Maternal outcome in the terms of complications.

Maternal complications	N	Percentage (%)
Eclampsia	5	3
Postpartum hemorrhage	16	11
Abruption	11	7
AKI (pre-renal)	3	1.5
Pulmonary edema	4	2
HELLP syndrome	9	6
DIC	6	4

Fetal complications

Preterm birth in 72 cases (50%), birth asphyxia in 9 cases (6.25%), IUD in 22 cases (15%), fresh stillbirth in 6 cases (4%), neonatal death in 10 cases (6%), admission to NICU 102 cases (70%), PNM 38 cases (26%).

Table 9: Fetal outcomes.

Fetal complications	N	Percentage (%)
Preterm birth	72	50
Birth asphyxia	9	9
IUD	22	15
Fresh stillbirth	6	4
Neonatal death	10	6
Admission to NICU	102	70
PNM	38	26

DISCUSSION

During the study period, there were a total of 4194 deliveries, including 144 cases of PE with severe features.

Out of 144 patients, we report headache as the main symptom in 66 patients (45%) of severe pre-eclampsia, followed by vomiting, blurring of vision, epigastric pain and generalized edema. A study done by Mallick et al showed that 64.6% patients in their study has headache as the main symptom.[11] In our study about 15 patients (13%) had high BP recording of >180/110 mmHg, whereas Mallick et al reported that 22.96% had systolic BP >190 mmHg and 36.8% had diastolic BP>110 mmHg.[11]

In the present study the most common age group of the expectant mothers was 23-27 years with 53 (36%) patients. Most of the women in our study belonged to rural background. This was corroborated by a study by Mallick et al most common age group was 26-30 years with 40.9% patients belonging to the group followed by 21-25 years with 35.8% patients.[11] These findings can be compared with study done by Hemapriya et al with majority (45%) of patients in the age group of 21 to 25 years.[12]

It was found that 52% patients were primigravidas. The findings are in good agreement with observations in a study by Luo et al.[13] Another Study done by Hemapriya et al showed that 50.9% patients were primigravidas.[12] The 58.5% were found to be Primigravida in a study by Mallick et al.[11]

The 42% cases had term pregnancy and 30% cases had gestational age between 33-36 weeks, these findings are in contrast with study done by Mathew et al where in majority (72.6%) of cases were term pregnancy.[14] Whereas 66% of women had 34weeks of gestation and 10.6% of women had less than 32 weeks of gestation in a study by Hemapriya et al.[12]

On fundoscopy 5% of patients had hypertensive changes and about 2.5% had papilledema, with the rest having normal findings. This can be compared with a study done by Hemapriya et al with 3.7% having hypertensive changes and 0.9% had retinal detachment.[12]

There was increased incidence of caesarean delivery (64%) in these patients. The mode of delivery in these patients was determined on the basis of fetal condition, gestational age and Bishop's score. Out of 33% who delivered vaginally,18% had labour induction done by either PGE1 or PGE2 gel. The high incidence of Caesarean delivery can be similarly correlated in a study by Hemapriya et al with caesarean rate of 69%, the most common indication being hypertension due to which a prolonged trial of labor was avoided.[12]

Most common indication for caesarean delivery was previous LSCS or worsening maternal condition followed by fetal distress, failed induction, malpresentation, CPD, obstructed labor in our study.

In 34.5% maternal complications were seen, postpartum hemorrhage being most common (11%), followed by abruption in 7%, eclampsia in 3%, HELLP syndrome in 6%, DIC in 4%, pulmonary edema in 2%, AKI (pre-renal) in 1.5% with a maternal mortality of 2.7%.

In comparison only 16.4% had maternal complications in a study by Hemapriya et al where eclampsia was the most common followed by abruption, PPH, HELLP syndrome, AKI, DIC with maternal mortality of 1.6%.[12] Whereas another study done by Mathew et al showed PPH to be the most common maternal complication.[14]

The 50% of neonates were preterm birth in our study, 70% requiring NICU admission with perinatal mortality seen in 38 cases (26%) which included IUFD in 22 cases, fresh stillbirth in 6 cases and neonatal deaths in 10 cases.

Study by Hemapriya et al showed 42% to be preterm birth with 20% requiring NICU admission.[12]

The most common outcome in a study by Mallick et al was preterm delivery (39.6%) with 23.4% requiring NICU admission, perinatal mortality was seen in 5.1% of cases including 3.9% IUFD and 1.2% neonatal death.[11]

CONCLUSION

Pre-eclampsia is a leading maternal problem in developing countries. It is listed under the important causes of maternal and perinatal morbidity and mortality which might probably be a result of lack of education and awareness among low socioeconomic people, inadequate and sub optimal antenatal care. The above study attains to be effective and impactful by shedding light on the shortcomings of healthcare for pregnant women, by determining the incidence of pre-eclampsia (3.4%) and the resultant by outlining the maternal and perinatal morbidity and mortality.

This situation demands for appropriate preventive measures such as primary prevention which includes avoiding pregnancy in high-risk women, modifying lifestyles or improving of nutrition; secondary prevention which includes selecting high risk women to detect earlier PE predictors and implementing an effective intervention as early as possible to prevent the disease or complications; tertiary prevention involves using treatment to avoid complications or their treatment. Based on the hemodynamic changes, the situation in pregnancy is essentially dynamic: BP falls first and then rises. Thus, the earliest manifestation of pre-eclampsia is a failure to decrease, or a premature increase, of BP during second trimester, which highlights the importance 1st BP recording as the baseline followed by at regular intervals, and recording of BP in both arms seldom needs to be emphasized. It also needs to be noted that since peripheral health centres aren't equipped with the best of care or technology, to prevent or manage pre-eclampsia and its complications, early referral to higher centre is of utmost importance just as much as detection of the disease. As observed from our study, it is fitting to consider expectant management in pre-eclampsia to be case specific based on maternal risk benefit ratio and the fetal outcome.

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