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Original Research Article

A Retrospective Epidemiological Assessment of Feto-maternal Outcomes in Cases of Imminent Eclampsia and Eclampsia

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Abstract

Aim: To Study Epidemiology and fetomaternal outcomes in cases of imminent eclampsia and eclampsia- retrospective study.

Materials and Methods: Perinatal mortality rate was defined as the number of all fetal (after 28 weeks of gestation) and neonatal (during the first 28 days after birth) deaths/1,000 births. Data was expressed as mean, percentages, proportions. Chi-square test was used to find association between various categorical variables. p-value <0.05 was considered to be statistically significant.

Results: There were 120 mild and severe pre-eclampsia cases and 80 imminent eclampsia and eclampsia cases. Most of the subjects were in age group of 20-25 years that is 77(38.5%) and 35.5% were either <20 years or >35 years in age. Among the preeclampsia group of patients, 54% delivered vaginally and 44% underwent Caesarean section. Among the imminent eclampsia/ eclampsia group of patients, 59% patients underwent Caesarean section, 37.5% delivered vaginally, 3.5% underwent assisted vaginal delivery and 0.50% required hysterotomy. This finding is significant with chi square = 36.4548 and P- value <.00001. That majority of patients were taken up for Caesarean section in view of previous cesarean delivery (33.5%) and Unfavourable cervix (32%). Other indications for Caesarean section being failed induction (15%), Doppler abnormalities (10%), Cephalo Pelvic Disproportion (CPD) (4%) and abruptio placentae (3%). Maternal complications were seen in 42 (21%) cases. Maternal complications seen were HELLP syndrome (9%), PPH (7%), Abruptio placentae (6%), Pulmonary edema (2%) and HELLP syndrome with AKI in 7% cases, renal failure in 3% cases, DIC in 1.5% cases, ARDS, AKI with DIC, HELLP syndrome with IVH in 1% cases each.

Conclusion: Pre-eclampsia is one of the medical complications which occur during pregnancy and is responsible for significant feto-maternal morbidity and mortality. As pre-eclampsia cannot be fully prevented, diagnosis of high-risk patients and timely treatment can help prevent complications.

Keywords: Pre-eclampsia, imminent eclampsia, outcome

Introduction:

Preeclampsia and eclampsia are multi system pregnancy specific disorder with high maternal and perinatal morbidity and mortality. The World Health Organization (WHO) systematically reviews maternal mortality worldwide, and in developed countries, 16% of maternal deaths were reported to be due to hypertensive disorders. This proportion is greater than three other leading causes that include hemorrhage 13%, abortion 8% and sepsis 2%.[1]

Treatment of hypertension and control of convulsions are the two important initial stratergies in the management of eclampsia. Once the patient condition is stabilized obstetrician has to plan the delivery appropriately.[2,3] Delivery is the ultimate cure for severe preeclampsia and eclampsia, because of worsening of fetal and maternal status. Proper obstetric care is one of the cornerstones of the management, undue delay in the delivery of the fetus and placenta may adversely affect fetal and maternal outcome. Hence, abdominal route of delivery when vaginal route is not imminent will help in improving the maternal/fetal outcome.[4]

Incidence of Cesarean section in eclampsia ranges from 26.7 to 71%.[5,6] Indication of Cesarean section for severe pre-eclampsia and eclampsia is increasing. Controversies still persist regarding early cesarean section and conservative line of management. With early cesarean section there is improved perinatal salvage and maternal outcomes.1 The present study is done to evaluate the feto-maternal outcomes by mode of delivery in severe pre eclampsia-eclampsia.

Material and methods:

This observational prospective study was carried out in the Department of obstetrics and gynaecology, Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India for 9 months. Preeclampsia was defined as blood pressure 140/90 mmHg along with proteinuria of at least 300 mg/24 hour after 20 weeks of gestation. The criteria to diagnose severe preeclampsia were one or more of the following: Blood pressure 160/110 mmHg, proteinuria of at least 5 gram/24 hours, oliguria <600 ml/24 hours or <30– 50 ml/hour, symptoms indicating end organ damage such as headache, visual disturbances, epigastric pain, medical complications such as pulmonary edema, cerebral edema, acute renal failure, hepatic hematoma, and HELLP syndrome.[9] Generalized tonic clonic seizures in a preeclamptic pregnant woman, not associated with other causes was considered to be due to eclampsia.

Methodology:

Data was collected on predesigned, standardised proforma of National Eclampsia Registry. Demographic parameters, gestational age, associated medical diseases such as hypertension, diabetes mellitus, history of smoking, presenting complaints, blood pressure recording at admission, laboratory investigations at admission (complete blood count, liver function tests, blood urea, serum creatinine, serum uric acid and coagulation profile), 24 hours urinary protein excretion were recorded. Complications such as eclampsia, HELLP syndrome, acute renal failure, disseminated intravascular coagulation, abruptio placentae and oliguria were noted. Fetal complications like IUGR, oligohydramnios, and fetal distress was documented. Antihypertensive drugs used were alphamethyldopa, nifedipine and labetalol both orally and parenterally, singly or in combination as needed. Cases of eclampsia received Injection Magnesium sulphate according to Pritchard regimen and

imminent eclampsia received prophylactic Magnesium sulphate as per MAGPIE trial. Mode of delivery, indications for Caesarean section, obstetric factors like preterm labour and premature rupture of membranes, fetal birth weight, APGAR score at one and five minutes and requirement of NICU care were also noted. Perinatal mortality rate was defined as the number of all fetal (after 28 weeks of gestation) and neonatal (during the first 28 days after birth) deaths/1,000 births.

Statistical analysis:

Data was entered in epidata manager and analysed using SPSS 25.0 version. Data was expressed as mean, percentages, proportions. Chi-square test was used to find association between various categorical variables. p-value <0.05 was considered to be statistically significant.

Result:

During the study period, there were 2,000 deliveries. There were 120 mild and severe pre-eclampsia cases and 80 imminent eclampsia and eclampsia cases. The proportion of Pregnancy Induced Hypertension (PIH) cases being 7% and that of imminent eclampsia and eclampsia being 1%. Most of the subjects were in age group of 20-25 years that is 77(38.5%) and 35.5% were either <20 years or >35 years in age. The cases of pre-eclampsia and eclampsia were more in young age group and the relation was statistically significant (chi-square = 670.5797, p value <0.00).(Table 1)

Out of 200 cases, 140 (70%) subjects were primigravidas and 60 (30%) were multigravidas. There was significant co-relation to parity.(chi-square = 185.1352, p value <0.00). 68 (34%) cases were booked and 132 (66%) cases were either unbooked or referred. Out of these, 80 cases of eclampsia were either unbooked or referred. The difference in booking status was statistically significant (chi square =163.668, p-value<0.00) 173(86.5%) patients presented at 29-36 weeks of the gestation, 10 (5%) patients presented at less than 28 weeks of gestation and 17 (8.5%) patients presented at >37 weeks of gestation. More than half of the patients (45%), presented with headache as premonitory symptom, followed by headache and vomiting (30%), and others had headache with epigastric pain (3%), headache, epigastric pain and blurring of vision (2%), headache and blurring of vision (5%), blurring of vision

Table 1: Distribution of cases according to Age of patients

Age groups (years)	Pre-eclampsia	Imminent Eclampsia/Eclampsia	Total (N)	Percentage (%)
<20	12	5	17	8.5%
20-25	47	30	77	38.5%
25-30	43	28	71	35.5%
30-35	10	15	25	12.5%
>35	8	2	10	5%
Total	120	80	200	100%

(0.50%), vomiting (2%), epigastric pain (0.50%) and oliguria (3%). 75% patients had antepartum eclampsia, 10% intra partum and 15% had postpartum eclampsia. 55% of the eclampsia patients had urinary proteins 3 plus. 15% patients had deranged SGOT and SGPT. 12.5% patients had elevated LDH and 14.5% patients had elevated serum bilirubin. 13.5% of the patients had deranged blood urea and serum creatinine. 17.5% patients had raised serum uric acid. 16.5% and 18.5% of the eclampsia patients had

thrombocytopenia and deranged PT INR respectively. There were 80 cases of imminent eclampsia. With increase in proteinuria there was increase in the number of convulsions. There is positive correlation between proteinuria and number of convulsions with chi square statistic 133.4668 and p value < 0.05. That 41.5% patients were treated with nifedipine alone and 31.5% were treated with labetalol alone. 26.5% patients required both nifedipine and labetalol and 7.5% needed nifedipine and alpha methyl dopa for control of hypertension.

Among the preeclampsia group of patients, 54% delivered vaginally and 44% underwent Caesarean section. Among the imminent eclampsia/ eclampsia group of patients, 59% patients underwent Caesarean section, 37.5% delivered vaginally, 3.5% underwent assisted vaginal delivery and 0.50% required hysterotomy. This finding is significant with chi square = 36.4548 and p-value <0.001.

That majority of patients were taken up for Caesarean section in view of previous cesarean delivery (33.5%) and Unfavourable cervix (32%). Other indications for Caesarean section being failed induction (15%), Doppler abnormalities (10%), Cephalo Pelvic Disproportion (CPD) (4%) and abruptio placentae (3%). Maternal complications were seen in 42 (21%) cases. As seen in Table 2, maternal complications seen were HELLP syndrome (9%), PPH (7%), Abruptio placentae (6%), Pulmonary edema (2%) and HELLP syndrome with AKI in 7% cases, renal failure in 3% cases, DIC in 1.5% cases, ARDS, AKI with DIC, HELLP syndrome with IVH in 1% cases each.

As the proteinuria increased the number of feto-maternal complications also increased with a significant correlation. For maternal complications, the chi-square statistic is 10.1034. The p value is .006398. For fetal complications, the chi square stastic is 7.3408 and p value is .025467. There were 4 maternal deaths during study period due to eclampsia complications (1%). Patients with pre-eclampsia and eclampsia delivered babies with low birth weight and this finding was found to be statistically significant (chi-square statistic 439.2834; p-value <0.00) with significance of p-value at <0.05. The distribution of cases according to birth weight is shown in Table 3. There were 120 cases of perinatal complications in cases of pre-eclampsia and 80 cases of perinatal complications in eclampsia group amounting to 40% in both the groups. The perinatal complications are shown in Table 4.

Table 2: Maternal complications in patients with imminent eclampsia and eclampsia

Maternal Complication	Number of cases (N)	Percentage (%)
ARDS	2	1%
Pulmonary edema	4	2%
DIC	3	1.5%
Renal failure	6	3%
Abruptio placentae	12	6%
HELLP Syndrome	18	9%
AKI with DIC	2	1%
HELLP Syndrome with Intra Ventricular Hemorhage (IVH)	2	1%
Post Partum Hemorrhage (PPH)	14	7%
HELLP Syndrome with AKI	4	2%
(ARDS- Adult Respiratory distress syndrome)		

Table 3: Distribution of cases according to Fetal birth weight

Birth weight(kg)	Pre-eclampsia cases	Imminent eclampsia/ Eclampsia cases	Total (N)	Percentage (%)
1) <1.5	74	33	107	53.5%
2) 1.5- 2	15	12	27	13.5%
3) 2- 2.5	11	18	29	14.5%
4) >2.5	20	17	37	18.5%

Prematurity was the most common perinatal complication in both the groups. There is significant statistical corelation between perinatal complications and pre-eclampsia and eclampsia (chi-square statistic 43.219; p-value <0.00). The Perinatal mortality was found to be 20%. The no. of cases were analysed per year. There was increase in no. of cases detected in successive years. As the cases of imminent aclampsia and eclampsia were analyzed, it was noticed that more cases were detected with imminent eclampsia than eclampsia though the relation was not significant (chi square= 6.4849, p=.37).

Table 4: Perinatal complications

Complications	Pre-eclampsia	Imminent eclampsia/ Eclampsia	Total(n)	Percentage (%)
Prematurity	3	5	8	26.66%
RDS	15	2	17	56.67%
Birth Asphyxia	7	1	8	26.66%
IUGR/ MAS	5	2	7	23.33%

(MAS- Meconium Aspiration Syndrome).

Discussion:

In our study 74.34% of the patients belonged to age group between 20-30 years. Similar findings were reported by Shrivastava A et al. (76%) and Singh A et al. (76.8%). 8,9 Majority of patients (40.35%), belonged to age group of 26-30 years. The findings of our study are consistent with the findings of the study done by Pillai SS et al.who ndings are similar documented 42.72% patients in the age group of 26-30 years. [10] These findings are related to the fact that most women conceive first time in this age group. [11]

Two third of the subjects (69.11%) were primigravidas and approximately one third of them (30.89%) were multigravidas. Our findings are similar to study done by Pillai et al. and Patel et al. who documented 60.90% and 71% patients in their study group being primigravidas respectively.[10,12] Duckitt K reported nulliparity as one of the risk factors in their systemic review of risk factors for preeclampsia.[13] Frequent occurrence of pre-eclampsia in primigravidas may be related to failure of normal invasion of trophoblastic cells leading to maladaptation of spiral arterioles. [9]

In our study 68.04% cases were either referred or unbooked and 31.96% were booked patients. Findings of our study are similar to the findings of study done by Raji

C. et al. (68.49%) and Patel J. et al.(68.75%). 14,12This could be attributed to the lack of proper antenatal care and follow up. [11]

In present study 84.29% cases presented at gestational age between 29-36 weeks, 6.58% patients presented at <28 weeks gestation and

9.12% patients presented at >37 weeks gestation. Our study findings are consistent with the findings of study done by Patel J. et al. (87% - 28-37 weeks, 4% - <28 weeks and 9% - >37 weeks gestation)and Singh A. et al. (82.1% - > 34 weeks, 12.5%- 30-34 weeks and 5.4% - <30 weeks). [12,9]

We observed that more than half of the patients of eclampsia had headache (56.96%) as premonitory symptom followed by a quarter having headache and vomiting (28.48%) as premonitory symptoms. Similar findings were found by Raji C. et al.and Shrivastava A. et al. 14,8 Raji C. et al. 14 found 58.20% patients having headache as premonitory symptom and 29.07% patients having headache and vomiting while Shrivastava A 8 found that 58% had headache and 25% had headache and vomiting.

Though delivery is the definitive treatment of eclampsia, but convulsions do occur in post-partum period. In present study, eclampsia presented in antenatal period in 74.4% cases, intrapartun in 9.14% and post-partum in 16.46%. The findings are similar to that presented by Raji et al. (77.4% ante partum, 2.7% intra partum & 19.9% post partum). [14] Anjani et al presented more No. of antepartum cases(92%) while review by Nobis showed 50.7% cases in antenatal period and 29.37 and 20% respectively in intrapartum & post partum period. [11,8] It is difficult to differentiate between antepartum and intrapartum eclampsia. In our study increasing proteinuria was linked to increase in no. of convulsions and in turn to maternal and fetal complications. In our study, we found that 59.22% cases had 3+ proteinuria, 28.48% had proteinuria of 2+ (87.7% patients having significant proteinuria) and only 12.3% patients had proteinuria of 1+. Pillai SS. et al. found similar results (58.18%- 3+, 28.18%- 2+ and 13.63%- 1+).[10]

Parmar M. et al. also documented significant proteinuria in 87% patients in their study.[15] Deranged LFTs in the form of deranged SGOT and SGPT were found in 18.77% patients and deranged LDH and serum bilirubin were found in 13.59% and 14.24% patients respectively. Our study findings are similar to the findings reported by Pillai SS. et al. (Deranged SGOT and SGPT-19.09%, deranged LDH- 13.63% and deranged serum bilirubin-14.03% cases).10 Devi SA. et al. reported deranged Liver function in 20% of cases and Singhal S. et al. in their study had deranged liver function in 20% of patients.[16,17] Abnormal Renal Function Tests that is blood urea and serum creatinine were noted in 13.59% patients and raised uric acid (>7 mg%) was noted in 15.21% patients in our study. Pillai SS. et al. observed similar findings (Raised blood urea, serum creatinine and uric acid in 13.63%, 15.45% and 15.45% patients respectively).[10] Devi SA. et al. also reported deranged renal function in 20% of cases.16 Platelet count less than one lakh/cmm was seen in 17.80% patients and deranged PT INR in 18.77% patients. Pillai SS. et al. showed similar findings i.e. platelet count less than 1 lakh/ cmm in 14.54% patients and deranged PT INR in 16.36% patients.[10]

In our study control of Blood pressure was achieved using Nifedipine in 38.15% cases, Labetalol in 29.77% patients, 24.31% patients required Nifedipine with Labetalol and in only 7.77% patients Nifedipine with Alpha Methyl Dopa was used. Similar findings were stated by Pillai SS et al.i.e. use of Nifedipine in 39.09%, Labetalol in 28.18%, Nifedipine with Alpha Methyl Dopa in 8.18% and Nifedipine with Labetalol in 24.54% cases.[10]

As the definitive treatment of eclampsia is delivery; 60.19% eclampsia patients were delivered by Cesarean compared to 42.03% pre-eclampsia patients. 35.92% eclampsia patients were delivered vaginally compared

to 57.97% pre-eclampsia patients (p= <.00001). 3.24% and 2% of the eclampsia patients delivered by assisted vaginal delivery and by hysterotomy respectively. Our findings are similar to the findings of Raji C. et al. who reported LSCS in 61.65%, normal vaginal delivery in 33.51%, Assisted instrumental vaginal delivery in 3.42% and hysterotomy in 0.68% cases and Pillai et al.(LSCS in 64.54% cases, normal vaginal delivery - 28.18%, Assisted vaginal delivery -4.54% and hysterotomy in 2.72% cases.10,14 Most common indication for Caesarean section was previous LSCS (37.61%), followed by Unfavourable cervix (31.88%), failed induction (13.82%), Doppler abnormalities (8.97%), Cephalo-Pelvic Disproportion (CPD) (4.73%) and abruptio placentae (2.99%). The higher rate of Caesarean section in eclampsia is due to early delivery approach to prevent further maternal and fetal complications especially when the cervix was Unfavourable for induction.

In spite of early delivery, maternal complications were seen in 21.68% cases. Maternal complications in present study are compared with complications in earlier studies. We also observed that increasing proteinuria had significant corelation to maternal complications (p value = .006398)

There were 4 maternal deaths (1.3%) during the study period due to eclampsia and related complications. Madhuri CH. et al., Patel J. et al. and Yucesoy G. et al. documented 1.3%, 2% and 1.17% maternal deaths respectively in their studies. [17,12,18]

With regards to fetal outcomes, it was observed that 68.09% babies had birth weight <2.5 kg. Our findings are similar to study done by Raji C et al.where in they reported 60% babies having birth weight less than 2.5 kg and Josh P. et al.observed 68.54% babies with birth weight of < 2.5 kg. [14,19]

19.41% babies had perinatal complications. Perinatal complications also had significant corelation to increasing proteinuria (p= <.00). Prematurity was the most common perinatal complication. Our findings are similar to that reported by Raji C et al.[14]

Perinatal mortality was found to be 18% (6.98% neonatal deaths and 11.03% still births). Our findings are similar to the results reported by Pillai SS. et al and Madhuri CH. et al.who reported Perinatal mortality of 18% each.[10,17]

The incidence of eclampsia was analysed over 4 years. There was no significant change in the incidence of eclampsia over four years. Nobis et al. also reported that there is no reduction in incidence of eclampsia in India over the decades.[8] It is appropriate to mention that our data is hospital based and hence does not reflect the entire population. Also following introduction of National Rural Health Mission (NRHM) and Government of India's Policy regarding hospital delivery, there is increase in the number of hospital delivery and that of eclampsia in hospital practice. Eclampsia usually follows preeclampsia; to prevent eclampsia, preeclampsia has to be prevented.

Conclusion:

Pre-eclampsia is one of the medical complications which occur during pregnancy and is responsible for significant feto-maternal morbidity and mortality. As pre-eclampsia cannot be fully prevented, diagnosis of high-risk patients and timely treatment can help prevent complications.

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