



**ORIGINAL RESEARCH PAPER**

**Obstetrics & Gynaecology**

**MATERNAL AND PERINATAL OUTCOME OF PREGNANCIES COMPLICATED WITH SEVERE PREECLAMPSIA AND ECLAMPSIA**

**KEY WORDS:** Eclampsia; Preeclampsia; Fetomaternal outcome; perinatal mortality

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**ABSTRACT**

**Background:** Preeclampsia and eclampsia are serious pregnancy complications characterized by high blood pressure and proteinuria. They can lead to maternal and fetal morbidity and mortality, including seizures and brain damage. Management focuses on delivering the fetus while considering gestational age and fetal viability, or stabilizing the mother's condition and delaying delivery. Early diagnosis and management are essential to reduce the risk of complications and ensure the best possible outcome for both mother and fetus. Hence the study is planned to assess the burden. **Methods:** This prospective observational study collected data using purposive sampling. Pregnant women with severe preeclampsia or eclampsia were included, while those with certain medical complications were excluded. Data collected included demographic and medical history, blood and urine tests, and fetal evaluations. The study assessed perinatal morbidity and mortality using various parameters. Descriptive statistics were used for data summarization. **Results:** Around 43% belonged to the age group of 21-25 years. More than half mothers were primigravida. Unbooked pregnancies accounted for 76%. Only 33% delivered the baby after 36 weeks (term). Most common mode of delivery was vaginal, mostly instrumental. Most common maternal complication was postpartum hemorrhage (34%) followed by DIC, acute renal failure, abruptio placenta etc. Around 9% pregnancies did not cross the period of viability and Perinatal mortality rate was 22.67%. Among the live births, NICU admission rate was 72.8% with 66% having low APGAR score and 59% having low birth weight. **Conclusion:** Eclampsia is a significant cause of maternal and fetal morbidity and mortality. Early recognition and high-quality antenatal care are crucial to preventing complications. Addressing socio-economic disparities and educating women is important to reduce the impact of eclampsia. Further research is needed to explore effective management strategies

**INTRODUCTION**

Preeclampsia and eclampsia are two serious complications that can occur during pregnancy. They are characterized by high blood pressure, proteinuria (excess protein in the urine) and other symptoms that can pose a threat to the health and well-being of both the mother and the fetus. In severe cases, these conditions can lead to significant maternal and perinatal morbidity and mortality.

Preeclampsia is defined as hypertension and proteinuria after 20 weeks of gestation<sup>1,2</sup> in a previously normotensive woman. It affects approximately 2-8% of all pregnancies<sup>1,2</sup> and is a leading cause of maternal and fetal morbidity and mortality worldwide. The exact cause of preeclampsia is still unknown, but it is thought to be related to a problem with the implantation of the placenta and the development of the maternal blood supply to the placenta.

Eclampsia is a rare but serious complication of preeclampsia that is characterized by the onset of seizures in a woman with preeclampsia. The seizures can lead to brain damage, maternal death, and perinatal morbidity and mortality.<sup>3,4,5</sup>

The maternal and perinatal outcomes of pregnancies complicated with severe preeclampsia and eclampsia can be devastating. Maternal complications can include severe hypertension, kidney and liver failure, brain damage, and death. The most common maternal complications of severe preeclampsia and eclampsia are HELLP syndrome (hemolysis, elevated liver enzymes, and low platelet count) and disseminated intravascular coagulation (DIC).<sup>4,5</sup> HELLP syndrome can lead to maternal death, while DIC can result in a bleeding disorder that can pose a significant threat to the life of both the mother and the fetus.

In terms of perinatal outcomes, severe preeclampsia and eclampsia can lead to fetal distress, preterm delivery, low birth weight, and stillbirth.<sup>4,5</sup> The risk of stillbirth increases as the severity of preeclampsia and eclampsia increases, and the risk of preterm delivery is also significantly higher in

women with these conditions.

The management of severe preeclampsia and eclampsia is largely focused on reducing the maternal and fetal morbidity and mortality associated with these conditions. The primary goal of management is to deliver the fetus as soon as possible, while taking into consideration the gestational age and fetal viability.<sup>4,5,6</sup> In cases where the fetus is not yet viable, management may involve stabilizing the mother's condition and delaying delivery until the fetus is mature enough to survive outside the womb.

In severe cases of preeclampsia and eclampsia, delivery may need to be performed by cesarean section. This is especially true in cases where the fetus is in distress or where the mother is experiencing seizures. In cases where delivery is not possible, other treatments, such as magnesium sulfate, may be used to control seizures and prevent further complications. To summarize, maternal and perinatal outcomes of pregnancies complicated with severe preeclampsia and eclampsia can be devastating, and it is essential to diagnose and manage these conditions as early as possible to reduce the risk of maternal and fetal morbidity and mortality. Early diagnosis and management can help prevent complications and ensure the best possible outcome for both the mother and the fetus. It is important for healthcare providers to have a good understanding of these conditions and the management options available to ensure that they are able to provide the best possible care to pregnant women for better pregnancy outcome. Hence, to know the common complications associated with preeclampsia in southern city of India, present study is planned.

**MATERIALS AND METHODS**

Prospective observational study design was adopted to study the objectives. Data collection period was around 7 months (November, 2021 to May, 2022). Sample size was not calculated as time-frame sampling was adopted. Sampling technique used was purposive sampling (nonprobability sampling technique) and all the pregnant mothers who

fulfilled the eligibility criteria were taken up for the study.

The study population included all pregnant women suffering from severe preeclampsia and eclampsia, who were receiving antenatal care from PESIMSR tertiary care hospital. Women with medical complications like anemia, chronic hypertension, diabetes, vascular and renal disease, multiple pregnancy, polyhydramnios, cardiac or liver abnormalities, seizure disorders etc. were excluded from the study.

On admission, detailed demographic, personal, medical, obstetric and family history was taken from the pregnant mother or her attendant. General physical examination, systemic, abdominal and pelvic examinations were done. Blood investigations including complete blood picture with platelet counts, coagulation profile, liver function tests, renal function tests were done. Urine routine microscopy was done specially to see proteinuria. After assessment and stabilization of the maternal status, fetal condition was evaluated with the help of fetal heart rate (FHR) recording, Cardiotocography (CTG) tracing and ultrasound (USG).

The decision regarding timing and mode of delivery were individualized. Corticosteroids were administered if gestational age was less than 34 weeks gestation. Magnesium sulphate were given in eclamptic patients and in patient with severe preeclampsia with imminent sign of eclampsia. Antihypertensive drugs Labetalol, Nifedipine etc. were used to control blood pressure levels. Obstetric management was done according to the maternal and fetal condition. The decision to deliver the patient vaginally (either spontaneous or induced) or by caesarean section was individualized and decided as per the hospital protocol and emergency medical team. The patient with uncontrolled hypertension were managed with the help of physician and anesthetist. The outcome of each pregnancy was obtained by examining the patient in labor ward, neonatal care was provided by pediatrician from delivery onwards.

Data collection tool used was a pretested semi-structured questionnaire. Variables included age of the mother, date and time of admission, gestational age. Parameters used for assessing outcome included mode and time of delivery, time interval between admission and delivery; APGAR score and birth weight of the newborn; and maternal and fetal morbidity and mortality. Data related to pregnant mothers and newborns were used only after obtaining informed consent from the pregnant mother.

Perinatal morbidity and mortality assessors used in the present study were as follows:

- Intrauterine fetal demise: Death of the fetus in utero after the period of viability.
- Still born: Death of fetus detected after delivery, mostly occurred during delivery.
- Early neonatal death: Death of live born within 1 week of birth.
- Perinatal mortality: includes intrauterine fetal demise, stillborn & early neonatal deaths.
- Low APGAR score: APGAR score less than 7 at the end of 5 minutes.
- Low birth weight: Birth weight of the new born less than 2500 grams.

**Statistical Analysis**

Data collected was entered and analyzed in Microsoft Excel version 2016. Descriptive statistics were used to summarize the data collected such as frequencies and percentages for categorical data and mean with standard deviation for continuous data. Appropriate graphical representations were used for better representation.

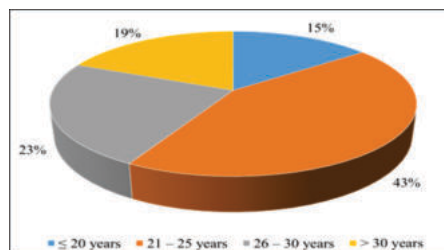
**RESULTS**

Around 150 pregnant mothers were included in the study.

Results are summarized as follows.

**Table 1: Age Distribution Of Pregnant Mothers Included In The Study**

Age group (in years)	Frequency	Percentage
≤ 20	22	14.67 %
21 – 25	65	43.33 %
26 – 30	35	23.33 %
> 30	28	18.67 %
Total	150	100.00 %

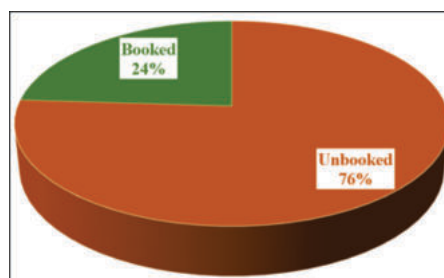


**Figure 1: Age Distribution Of Pregnant Mothers: Pie Chart**

Most mothers belonged to age group of 21 to 25 years (Table & Figure 1). Both teenage pregnancy and elderly pregnancy which are known to be risk factors of eclampsia constituted 15% and 19% respectively (34% in total).

**Table 2: Booking Status Of Pregnant Mothers**

Booking status	Frequency	Percentage
Unbooked	114	76.00 %
Booked	36	24.00 %
Total	150	100.00 %

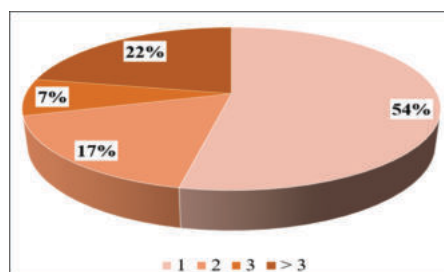


**Figure 2: Booking Status Of Pregnant Mothers: Pie Chart**

Booking status of the pregnant mothers was assessed in the present study; and it was observed that around three-fourth of the pregnancies (76%) were not booked (Table & Figure 2).

**Table 3: Gravida Status Of Pregnant Mothers Included In The Study**

Parity (Gravida)	Frequency	Percentage
1	80	53.33 %
2	26	17.33 %
3	11	7.33 %
> 3	33	22.00 %
Total	150	100.00 %

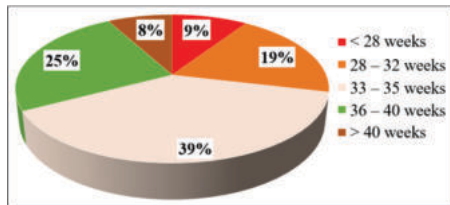


**Figure 3: Gravida Status Of Pregnant Mothers: Pie Chart**

More than half of the pregnant mothers were primigravida while 17% and 7% were gravid for 2<sup>nd</sup> and 3<sup>rd</sup> time respectively. Around one-fifth of the pregnant mothers (22%) had their gravida status count more than three (Table & Figure 3).

**Table 4: Gestational Age Of Pregnant Mothers At The Time Of Delivery**

GA at delivery	Frequency	Percentage
< 28 weeks	14	9.33 %
28 – 32 weeks	29	19.33 %
33 – 35 weeks	58	38.67 %
36 – 40 weeks	37	24.67 %
> 40 weeks	12	8.00 %
Total	150	100.00 %

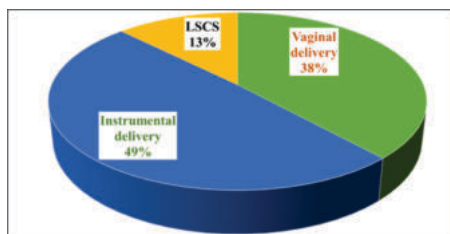


**Figure 4: Gestational Age Of Pregnant Mothers At The Time Of Delivery: Pie Chart**

Gestational age of pregnant mothers at the time of delivery is an important determinant of perinatal outcome. Only one-fourth (25%) of the pregnancies delivered at full term (Table & Figure 4). Around 9% pregnancies terminated before fetus reached the period of viability. Proportions of pregnancies that terminated between 28 to 32 weeks and 33 to 35 weeks were 19% and 39% respectively. Around 8% pregnancies went post-term, which has poor impact on perinatal outcome.

**Table 5: Mode Of Delivery Of Pregnancies That Crossed Period Of Viability**

Mode of delivery	Frequency	Percentage
Vaginal delivery	52	38.24 %
Assisted vaginal (Instrumental) delivery	67	49.26 %
Lower segment caesarean section (LSCS)	17	12.50 %
Total	136	100.00 %



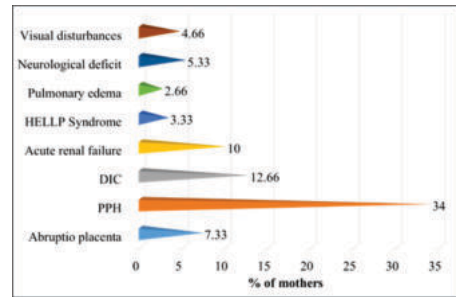
**Figure 5: Mode Of Delivery: Pie Chart**

A total of 136 pregnancies crossed the period of viability. Out of these 136 pregnancies, 38% mothers delivered vaginally with or without episiotomy. Another 49% deliveries required assistance with instrumentation. Remaining 13% pregnancies required caesarean section for delivering babies.

**Table 6: Maternal Morbidity**

Maternal complication	Frequency	Percentage
Postpartum hemorrhage (PPH)	51	34.00 %
Disseminated intravascular coagulation (DIC)	19	12.67 %
Acute renal failure	15	10.00 %
Abruptio placenta	11	7.33 %
Neurological deficit	8	5.33 %

Visual disturbances	7	4.67 %
HELLP syndrome	5	3.33 %
Pulmonary edema	4	2.67 %



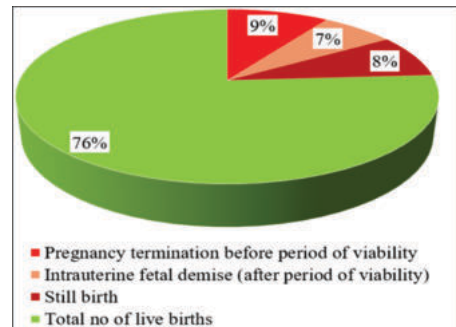
**Figure 6: Maternal Morbidity: Bar Chart**

All the complications observed in mothers were noted down and analyzed. No mortality was reported in 150 study participants. As shown in table and figure 6, most common complication observed were post-partum hemorrhage (34%) followed by DIC (13%), renal failure (10%). Abruptio of placenta was observed in 7% pregnancies. Other complications observed were: Neurological deficit (5%), Visual disturbances (5%), HELLP syndrome (3%), Pulmonary edema (3%) etc.

**Table 7: Perinatal Outcome Of Pregnancy With Respect To Fetal Living Status**

Fetal status	Frequency	Percentage
Pregnancy termination before period of viability	14	9.33 %
Intrauterine fetal demise (after period of viability)	10	6.67 %
Still birth	12	8.00 %
Early neonatal death (within 1 week of delivery)*	12	8.00 %
Total no of live births [LB]	114	68.00 %
Total	150	100.00 %

\*included in live births



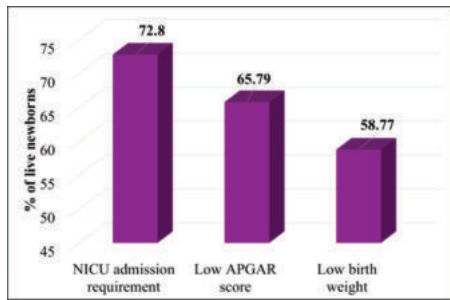
**Figure 7: Perinatal Outcome Of Pregnancy With Respect To Fetal Living Status: Pie Chart**

Table and Figure 7 shows mortality rate of fetus and newborns. With respect to living status of the fetus, around three-fourth (76%) of the pregnant mothers delivered live babies of which 12 (8% of total pregnancies) expired within a week of delivery. Around 9% pregnancies terminated before the period of viability, while IUDF after the period of viability were noted in 7% pregnancies. Out of the total pregnancies, another 8% fetuses were still born. With all these counts, perinatal mortality was reported in a total of 34 deaths out of 150 pregnancies constituting perinatal mortality of 22.67%.

**Table 8: Perinatal Morbidity (n=114)**

Perinatal morbidity	Frequency	Percentage
NICU admission requirement	83	72.80 % (55.33 % overall)

Low APGAR score	75	65.79 % (50.00 % overall)
Low birth weight	67	58.77 % (44.67 % overall)



**Figure 8: Perinatal Morbidity: Bar Chart**

In the present study, perinatal mortality indicators used were NICU admissions, low APGAR scores and low birth weight. They were 73%, 66% and 59% respectively when live born were considered as denominator. When proportions were estimated overall, NICU admission rate, low APGAR score and low birth weight were reported in 55%, 50% and 45% respectively.

**DISCUSSION**

The age group of 21-25 years had the highest incidence of eclampsia, accounting for 43.33% of cases. This finding is consistent with previous studies conducted by Agarwal et al,<sup>7</sup> Mahalaxmi et al,<sup>8</sup> and Kannar et al.<sup>9</sup> The studies suggest that young age is a significant risk factor for developing eclampsia.

In the current study, most cases were primigravida (53.33%), which is similar to the findings of Mahale et al<sup>10</sup>, Agrawal et al<sup>7</sup>, Sibai and Efetie et al.<sup>11</sup> Majority of patients were unbooked (76%), which is an important risk factor for developing eclampsia. This highlights the need for proper antenatal care and early diagnosis of preeclampsia to prevent the progression of eclampsia. Furthermore, regular antenatal care received by booked pregnant mothers will help in controlling the severity of hypertensive disorders and hence to reduce the burden of complications, thus working towards better feto-maternal outcome. Poor utilization of antenatal services could be due to inadequate awareness, low socioeconomic status etc.<sup>12</sup>

The most common mode of delivery in the current study was vaginal delivery especially with the assistance of instruments. These results are opposite to principles proposed by Pritchards and Pritchard Chelsey<sup>1</sup>, which recommends caesarean section to reduce maternal and perinatal mortality. However, there are few other studies, such as those by Mahale et al<sup>10</sup>, Arup et al<sup>13</sup>, and Sardesai et al<sup>14</sup>, which report that vaginal delivery is the most common mode of delivery. More vaginal deliveries could be due to the fact that as a complication of hypertensive disorders, women undergo labor before term because of which fetuses will be small; the chances of fetal growth restriction are also higher if mothers have pre-eclampsia.

Postpartum hemorrhage was the most common maternal complication in the current study, whereas hypertensive crisis was the most common in the studies by Agrawal et al<sup>7</sup> and Mahale et al.<sup>10</sup> There was no maternal mortality reported in the current study, which is comparable to the low mortality values reported in the studies by Mahale et al,<sup>10</sup> Arupkumar et al<sup>13</sup>, Sardesai et al,<sup>14</sup> Sumansomegovada et al<sup>15</sup>, and Savita et al.<sup>16</sup> In the current study, most patients were referred and were either unregistered or had fewer antenatal visits, emphasizing the need for proper antenatal care to prevent the development of eclampsia. The complications observed in

the present study were PPH, DIC, Renal failure, pulmonary edema etc. are all having the potential to progress to maternal death. So, all these conditions may be considered as near-miss maternal mortalities. Ideally, the causes for these situations should be assessed with exploratory techniques with an appropriate follow up plan. Such an approach is essential to reduce overall burden of complications and to improve maternal and child health.

Preterm termination of pregnancy was the most common cause of neonatal morbidity in the current study (65%), whereas birth asphyxia was the most common cause in the study by Mahale et al<sup>10</sup>. In Agrawal et al's study<sup>7</sup>, prematurity and intrauterine growth restrictions were the most common causes of morbidity and mortality. Perinatal mortality was 22.67% in the current study, which is lower than the values reported in the studies by Mahale et al<sup>10</sup>, Arupkumar et al<sup>13</sup>, Savita et al<sup>16</sup>, suggesting that perinatal mortality is higher in mothers with eclampsia. Nonetheless, perinatal mortality of 22% among those with hypertensive disorders is higher when compared to perinatal mortality of overall pregnancies, indicating towards preeclampsia and eclampsia being an important subset of high-risk group that requires regular and close monitoring at increased frequencies.

Neonatal morbidities assessed via NICU admission rate in the present study was very high i.e. 73% (55% overall). Most common indications being preterm delivery, low APGAR score and low birth weight. These complication rates are high as compared to various studies such as Budhewar A et al.<sup>17</sup>, Agarwal M et al<sup>7</sup>. These parameters suggest that eclampsia is an important risk factor for poor fetal outcome and requires trained obstetrics care.

To summarize, Eclampsia remains a significant cause of maternal and fetal morbidity and mortality. While it may not be preventable, the early recognition of warning symptoms and signs is crucial to preventing life-threatening complications. To improve maternal and perinatal outcomes, there is a need for high-quality antenatal healthcare services, patient education about warning signs and investigations, timely delivery, and close monitoring in the intrapartum and postpartum periods. Additionally, it is important to educate and empower women and provide accessible healthcare, particularly to socioeconomically disadvantaged and rural populations. Addressing these issues is critical to reducing the impact of eclampsia on maternal and fetal health.

**CONCLUSION**

In conclusion, our study highlights the high rate of perinatal mortality and morbidity in eclampsia and identifies several risk factors associated with adverse fetal outcomes. Further research is needed to explore effective management strategies for eclampsia and to address the underlying causes of this condition.

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