



"A PROSPECTIVE STUDY OF MATERNAL AND FETAL OUTCOME IN PREECLAMPSIA AND SEVERE PREECLAMPSIA PATIENTS AT TERTIARY CARE CENTRE"

Obstetrics & Gynaecology

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ABSTRACT

Background: Pre-eclampsia and eclampsia is one of the leading causes of maternal and fetal morbidity and mortality. This study was undertaken to study the effects of pre-eclampsia on the mother and fetus in a tertiary care centre. **Method:** This study was conducted in Department of Obstetrics and Gynecology of Dr V.M. Government Medical College Solapur among all antenatal mother visiting the hospital for regular check-up and planning to delivery at the same institution. In the present study a total of 814 patients with pre-eclampsia was included for final analysis. **Results:** The present study was conducted over a period of 2 years (2020 - 2022) during which a total of 9240 patients delivered at our hospital, of which 814 cases of pre-eclampsia was reported, thus the incidence of pre-eclampsia was 8.8%. Eclampsia was the more common complication seen among pre-eclampsia patients which was seen among 32% of cases. This was followed by partial HELLP and post-partum hemorrhage seen among 10.6% each. Prematurity was the most common neonatal complication which seen among 35.8% of babies. LBW and IUGR was present in 16% and 15.6% newborns respectively. 40.26% newborns needed NICU admission. **Conclusion:** Maternal outcome was favorable in most of the patients with only 2.3% maternal death. The common maternal complications were eclampsia, partial HELLP, and PPH. Most common neonatal complication was preterm, LBW and IUGR. Neonatal death documented in our study was 9.5%.

KEYWORDS

Coagulation, Preeclampsia, Eclampsia, Maternal, Fetal

INTRODUCTION

Preeclampsia is a hypertensive disorder of pregnancy which affects multiple organ systems causing maternal and fetal morbidity and mortality. Physician facing difficulty in making clinical decision relating to preeclampsia due to lack of data in the optimal strategies that is needed in the care of the mother with preeclampsia. Since preeclampsia is a progressive disorder, in certain situation, conducting delivery is the only option to halt the progression of disease and save the mother and fetus.¹ It has been documented that preeclampsia can complicate 6 to 10 percentage of all pregnancies in developed countries like United States, while this proportion is considered to be even higher in the underdeveloped countries.²

The higher incidence in developing countries is due to hypoproteinemia, poor obstetric facilities and malnutrition. Overall around 10 to 15 percent of all maternal deaths are directly associated with either pre-eclampsia or eclampsia. Women with a positive maternal history of this disorder are 2 to 5 times at a greater risk of developing pre-eclampsia.³ The incidence of pre-eclampsia can range from 3 to 7 percentage among healthy nulliparas 4 and 1 to 3 percentage among the multiparas 5 depending on the ethnicity. The incidence of preeclampsia in India has been documented around 8-10 percent among the pregnant women. A study, reported the prevalence of hypertensive disorders in pregnancy to be 7.8 percent with preeclampsia seen in 5.4 percent of the study population in India.⁴

Preeclampsia is detected during the ante partum period and is classified as mild, moderate and severe based on defined criteria of its occurrence after 20 weeks of gestation.⁵ Severe preeclampsia is when the systolic blood pressure is greater than 160 mm Hg or the diastolic blood pressure is more than 110 mm Hg and associated with proteinuria which is greater than or equal to 5 grams per day. While, mild preeclampsia is characterized when systolic blood pressure is less than 160 mm Hg or diastolic pressure is less than 120 mm Hg with proteinuria greater than 300 mg, but less than 5 gms per day.⁶

Several genetic and acquired risk factors have been implicated in the pathogenesis of preeclampsia. Identifying the genetic factors is out of scope in the Indian context while acquired factors such as obesity, diabetes, chronic hypertension, obstructive sleep apnea, chronic kidney disease, gestational diabetes, rheumatoid arthritis, systemic lupus erythematosus, antiphospholipid syndrome, nulliparity, maternal age more than 35 years, multiple pregnancy, hydrops fetalis, hydatidiform moles and assisted reproductive technologies are known to be associated with pre-eclampsia.⁷

Clinical features of pre-eclampsia vary such as hypertension, proteinuria, renal dysfunction, neurological abnormalities, eclampsia, cardiac dysfunction, pulmonary edema, hepatic dysfunction, hematological abnormality and fetal growth restriction. Additionally, there can be long-term consequences post-delivery especially cardiovascular effects. Research shows that these patients are at a greater risk of developing hypertension, ischemic heart diseases or recurrent coronary syndrome, heart failure, stroke and death.^{8,9}

AIMS AND OBJECTIVES

AIMS:

- To study the effects of pre-eclampsia on the mother and fetus in a tertiary care centre

OBJECTIVES:

- To determine the incidence of preeclampsia
- To study maternal outcomes of pre-eclampsia in a tertiary care centre
- To study impact of pre-eclampsia on fetus in a tertiary care centre

MATERIALS AND METHODS

This study was conducted in Department of Obstetrics and Gynecology of Dr V.M. Government Medical College Solapur among all antenatal mother visiting the hospital for regular check-up and planning to delivery at the same institution.

Based on previous study,¹⁸ taking the incidence of pre-eclampsia to be 8%, with a confidence level of 95%, power of study 90% and degree of precision the sample size was calculated to be 736 using the formula $4pq/d^2$. With an addition of 10% of not response rate the minimum sample size was calculated to be 809. In the present study a total of 814 patients with pre-eclampsia was included for final analysis.

Inclusion criteria:

All pregnant women presenting with hypertension in antepartum, intrapartum and post-partum period after 20 weeks of gestation.

- Those mothers willing to give consent.

Exclusion criteria

- All pregnant women with previous history of hypertension.
- Pregnant women with <20 weeks of gestation with hypertension.

Study procedure:

Based on review of literature a structured questionnaire with details of

demographic information and obstetric data was collected. Patients details collected at the time of admission were age, parity, gestational age, history of pre-eclampsia in previous delivery, family history of eclampsia and presenting complaints. Patient condition with be examined and detailed physical examination, abdominal and pelvic examination was done. Investigation such as complete hemogram, platelet count, kidney function test, liver function test (SGOT, SGPT), serum prothrombin time, clotting time, funduscopy, ultrasound and urine protein with dipstick test was performed. Patients will be managed as per the department protocol.

Maternal outcome was studied in terms of:

1. Respiratory complication
2. Fever
3. Disseminated Intravascular coagulation (DIC)
4. Hepatic dysfunction
5. Renal dysfunction

Fetal outcome was studied in terms of:

1. Small for gestational age
2. Intrauterine death
3. NICU admission
4. Neonatal mortality
5. Perinatal mortality

OBSERVATIONS AND RESULTS

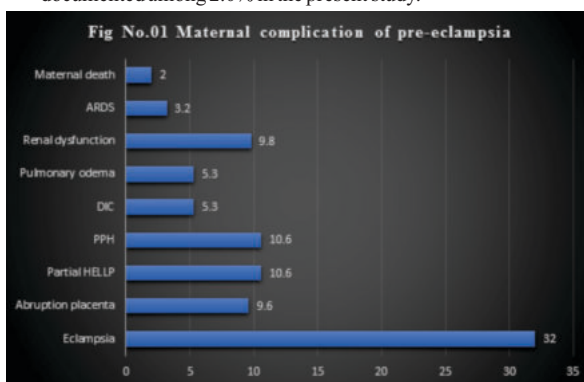
- The present observational study was done for duration of 2 and half years in a tertiary care hospital between 2020 – 2023, to identify the incidence of pre-eclampsia and to study the maternal and fetal outcome of the pre-eclampsia patients.
- During the study period a total of 11436 patients delivered at our hospital, of which 1013 were confirmed with pre-eclampsia, thus the incidence of pre-eclampsia was 8.9%.
- Most of the pre-eclampsia patients belonged to the age group of 21 to 25 years (32.77%), followed by less than 20 years (30.11%) and 26 to 30 years (18.76%) age group. Less than 20% were aged more than 30 years.
- Majority (64.4%) of the patients with pre-eclampsia belonged to the rural area while only 35.6% were from urban area.
- In the present study, 61.1% of patients belonged to the lower class, while 23.9% and 15.0% were from middle class and upper class respectively.
- The percentage of illiteracy was 56.4% while only 43.6% were literate.
- It was seen that 55.4% of patients diagnosed of pre-eclampsia were primigravida with 44.6% being multigravida. 72.3% of pre-eclampsia mothers were booked and only 27.7% were not registered.
- In the present study, 78.9% of pre-eclampsia mothers had received ante-natal care and 21.1% did not receive it. It was documented that 69.5% were referred from other health care centre to our tertiary care hospital while 30.5% only were diagnosed in our hospital.
- Maximum patients presenting with pre-eclampsia belonged to the gestational age of 33 to 36 weeks (36.9%) and more than 37 weeks (34.7%). Around 13.8% belonged to the gestational age group of less than 14.5 weeks and 29 to 32 weeks each.
- Nicardia was the most commonly used anti-hypertensive drug among 42.1% of patients with pre-eclampsia. 26.5% were given labetalol while 23.6% were given combination drug of nicardia and labetalol. 7.6% were not given any anti-hypertensive for management of the condition.
- Most of the patients with pre-eclampsia was given Pritchard regime (71.4%) than zuspan regime (28.6%)
- In the present study 68.41% of pre-eclampsia patients were delivered by LSCS and 28.92% by vaginal delivery. 28 patients i.e 2.67% pre-eclampsia mothers had to undergo hysterotomy for their health condition.
- Most of the babies were live birth i.e 93.87 %. There was 31.79% premature delivery among the pre-eclampsia mothers in the present study. Neonatal death was documented in 9.77% of cases. There was no still birth documented in the study. 3.6% of pre-eclampsia were twin pregnancy.
- The table No.01 shows the number of demise among mother and fetus based on the mode of delivery. The proportion of maternal (2.8%) death was more among the vaginal delivery when compared to the LSCS (1.9%), while the proportion of foetal death was more in LSCS (7.0%) when compared to vaginal delivery (4.5%). Overall there was 21 maternal death. Thus fetal deaths were more than the maternal death.

Table 01: Comparing mode of delivery with maternal and fetal outcome

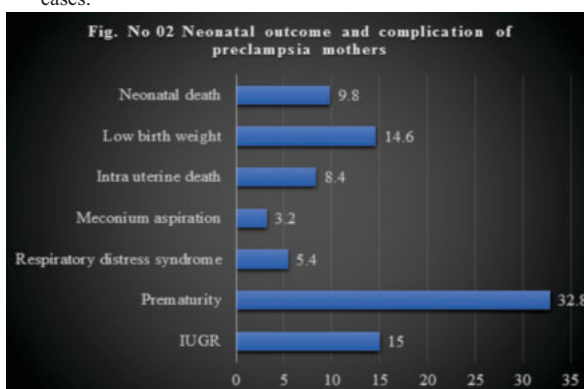
Mode of delivery	Number	Maternal		Fetal*	
		Alive	Dead	Alive	Dead
Vaginal	293	285 (97.2%)	8 (2.8%)	280 (95.5%)	38 (4.5%)
LSCS	693	680 (98.1%)	13 (1.9%)	645 (93.0%)	52 (7.0%)
Hysterotomy	27	27 (100%)	0 (0)	26 (96.3%)	1 (3.7%)
Total		992 (97.9%)	21 (2.1%)	951 (90.4%)	99 (9.6%)

*twins included

- Eclampsia was the more common complication seen among pre-eclampsia patients which was seen among 32% of cases. This was followed by partial HELLP and post-partum hemorrhage seen among 10.6% each. Abruption placenta and renal dysfunction occurred in 9.6% and 9.8% respectively. There was around 5% patients who developed DIC and pulmonary odema. ARDS was seen among 3.2% cases. Maternal death due to pre-eclampsia was documented among 2.0% in the present study.



- The APGAR score at one minute was documented. 9.5% of newborns had their APGAR score less than or equal to 3. APGAR score between 4 and 6 was seen among 43.2%. Score more than or equal to 7 was documented among 56.35 of babies born to pre-eclampsia mothers.
- Prematurity was the most common neonatal complication which seen among 32.8% of babies. LBW and IUGR was present in 14.6% and 15% newborns respectively. There was 8.4% of intra uterine death and neonatal death each. Respiratory distress syndrome and meconium aspiration was found in 5.4% and 3.2% cases.



- In our study, 41.85% newborns needed NICU admission while 58.14% did not need it.

DISCUSSION

The present study was done over period of two years between 2020 – 2022 in a tertiary care hospital with the objective to identify the incidence of pre-eclampsia and also to study the maternal and fetal outcome of the pre-eclampsia patients.

A total of 11436 patients delivered at our hospital during the study period, of which 1013 were confirmed with pre-eclampsia, thus the incidence of pre-eclampsia was 8.9%. Studies from South Indian¹¹,

Mumbai¹ and Odisha¹² documented 4.9%, 5.6% and 6.5% cases of pre-eclampsia respectively. A study by Bangalet. al.¹³ from Maharashtra reported 7.26% similar to ours. study by Marwah et. al.¹⁴ in New Delhi found a higher incidence of pre-eclampsia of 12.58%, but this study was done COVID-19 positive pregnant patients. Whether COVID-19 increases the risk of needs to be further studied.

Pre-eclampsia patients in our study mostly belonged to the age group of 21 to 25 years (32.7%), followed by less than 20 years (30.1%) and 26 to 30 years (18.76%) age group. Less than 20% were aged more than 30 years. Aabidha et.al.¹¹ and Gandhi et.al.¹⁵ also reported similar findings.

It was seen that 55.4% of patients diagnosed of pre-eclampsia were primigravida with 44.6% being multigravida. Aabidha et. al.¹¹ and Bangal et. al.¹³ also documented greater percentage of primigravida with pre-eclampsia like our study. But Saadat et. al.¹⁶ and Kumar et. al.¹⁷ reported multigravida to be at a greater risk.

In the present study, 78.9% of pre-eclampsia mothers had received some ante-natal care and 21.1% did not receive it. A study by Akaba et.al.¹³ found that 91.3% had received ante-natal care while 8.7% did not receive any. Gandhi et. al.¹⁵ had identified 46% pre-eclampsia no ANC care while 35% and 19% had inadequate and adequate ANC care.

Maximum patients presenting with pre-eclampsia belonged to the gestational age of 33 to 36 weeks (36.9%) and more than 37 weeks (34.7%). Around 11% belonged to the gestational age group of less than 28 weeks and 29 to 32 weeks each. Saadat et. al.¹⁶ had a mean gestational age of 39 ± 2 years. Ayaz et.al.¹⁸ had 86.3% of gestational age between 37 and 40 weeks, 10.9% and 2.7% between 40 to 42 weeks and more than 42 weeks respectively. Both these studies reported women of higher gestational age when compare to our study.

Nicardina was the most commonly used anti-hypertensive drug among 42.1% of patients with pre-eclampsia. 26.5% were given labetalol while 23.6% were given combination drug of nicardina and labetalol. 7.6% did not require any anti-hypertensive for management of the condition. Sajith et. al.⁴ in their study, reported that 32.69% and 67.31% were on monotherapy and combination anti-hypertensive therapy for pre-eclampsia. Methylodopa and nifedipine combination was the most preferred drug. In this study additionally calcium supplements and iron was given to 92.3% and 44.2% patients.

Most of the patients with pre-eclampsia was given Pritchard regime (71.4%) than zupsan regime (28.6%). Magnesium sulfate (MgSO₄) has been the drug of choice in preventing eclampsia.¹⁹ Recent studies state that other anticonvulsant agents such as diazepam should not be given in the prevention of convulsions i.e eclampsia. A loading dose of 4 gm of MgSO₄ is ideal, which should be followed by a maintenance infusion of 1 gm/hour and continued for 24 hours after delivery.¹⁹

In the present study 68.41% of pre-eclampsia patients were delivered by LSCS and 28.92% by vaginal delivery. 27 patients i.e 2.67 % pre-eclampsia mothers had to undergo hysterotomy for their health condition. Saadat et.al.¹⁶ 70% of delivery via LSCS while 30% delivered vaginally similar to our study. On the contrary, Gandhi et.al.¹⁵ and Bangal et.al.¹³ had more number of spontaneous vaginal delivery than LSCS.

Most of the babies were live birth i.e 93.87%. There was 31.79% premature delivery among the pre-eclampsia mothers in the present study. Neonatal death was documented in 9.77% of cases. There was no still birth documented in the study. 3.65% of pre-eclampsia were twin pregnancy. Aabidha et.al.¹¹ had 23.65% of pre-mature delivery, 4.3% of neonatal death and 2.5% still birth. Ajah et. al.²¹ documented high neonatal death of 22.7%. Gandhi et. al.¹⁵ reported 85.9% live birth, 53.3% pre-term and 14.1% to be still birth. Marwah et. al.¹⁴ had preterm delivery of 36.8% which was similar to our study but reported a lesser neonatal mortality rate of 5% when compared to our study. Bangal et. al.¹³ also had lesser neonatal complication percentage in terms of pre-maturity (27%) and neonatal death (3%).

Eclampsia was the more common complication seen among pre-eclampsia patients which was seen among 32% of cases. This was followed by partial HELLP and post-partum hemorrhage seen among 10.6% each. Abruption placenta and renal dysfunction occurred in 9.6% and 9.8% respectively. There were around 5% patients who

developed DIC and pulmonary odema. ARDS was seen among 3.2% cases. Maternal death due to pre-eclampsia was documented among 2.0% in the present study. Mousaet. al.²² identified that patients presenting with pre-eclampsia along with severe features had a greater risk of maternal complication. Their study found 40.5% with maternal complication among those with severe pre-eclampsia while only 1.3% had maternal complications among those with mild to moderate pre-eclampsia. Gandhi et. al.¹⁵ found 16.9% of pre-eclampsia mothers with serious complication with 7.9% of mothers requiring ICU admission. The maternal death documented was 2.3% similar to our study.

Prematurity was the most common neonatal complication which seen among 32.8% of babies. LBW and IUGR was present in 14.6% and 15.0% newborns respectively. There was 8.4% of intra uterine death and neonatal death each. Respiratory distress syndrome and respiratory distress syndrome was found in 5.4% and 3.2% cases. Aabidha et. al.¹¹ reported LBW and IUGR to be 7.5% and 9.6% respectively which was much lower than our study. Ajah et. al.²¹ and Marwah et. al.¹⁴ had a huge percentage of LBW of 44.9% and 42.5% respectively in their study. Gandhi et. al.¹⁵ documented an even higher percentage of LBW of 72.8%. Bangal et. al.¹³ had 14% cases of IUGR and 11% of IUD.

In our study, 41.85% newborns needed NICU admission while 58.14% did not need it. Marwah et. al.¹⁴ reported 28.5% needing NICU admission which is much lesser than our study.

CONCLUSION

The present study has documented the details of maternal and fetal outcomes of pre-eclampsia mothers in our hospital. The incidence of pre-eclampsia during the two year period (2020 to 2022) was 8.8%. Most of the pre-eclampsia patients belonged to the age group of 21 to 25 years, mostly residing in rural area and belonging to lower socioeconomic class. Majority of the preeclampsia patients were primigravida, referred from other centres, who had received ANC care and were booked cases. Maternal outcome was favorable in most of the patients with only 2.3% maternal death. The common maternal complications were eclampsia, partial HELLP, and PPH. Most common neonatal complication was preterm, LBW and IUGR. Neonatal death documented in our study was 9.5%.

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