

A Study of Maternal and fetal Outcome in Early Onset Severe Pre-Eclampsia

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Citation this Article: Dr. Komal Saini, Dr. Ranveer singh Choudhary, Dr. Sandhya Choudhary, Dr. Suchitra Narayan, Dr. Jinesh Saini, “A Study of Maternal and fetal Outcome in Early Onset Severe Pre-Eclampsia”, IJMSIR- June - 2023, Vol – 8, Issue - 3, P. No. 267 – 272.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Hypertensive disorders remain among the most significant and intriguing unsolved problems in obstetrics. Of hypertensive disorders, the preeclampsia syndrome, either alone or superimposed on chronic hypertension, is the most dangerous. New-onset hypertension during pregnancy termed gestational hypertension-is followed by signs and symptoms of preeclampsia almost half the time, and preeclampsia is identified in 4 to 5 percent of all pregnancies. The World Health Organization (WHO) systematically reviews maternal mortality worldwide, and in developed countries, 16 percent of maternal deaths were attributed to hypertensive disorders. In the United States from 2011 to 2013, 7.4 percent of 2009 pregnancy-related maternal deaths were caused by preeclampsia or eclampsia.

Objectives: To study the maternal and neonatal fetal outcome in early onset severe preeclampsia.

Material and method: This prospective study was conducted on 150 patients with pregnancies complicated

by early onset severe preeclampsia (EOP) for a period of one and a half years at RMC, Ajmer during February 2021 – September 2022. All patients who meet the above-mentioned criteria were included in the study and patients were admitted in the intensive care unit. Patient's detailed history, symptoms and signs of severe preeclampsia, imminent eclampsia were noted. General and Obstetric examination was carried out.

Results: Most of the women were in the age group 21 – 30 (60%). Mean age group was 26 Yrs, with a range of 18yrs - 40 yrs. Out of the total 150 babies, 90(60%) babies had complication. Out of 90 babies 25(16.6%) were IUFDs, majority were in women who were referred as IUFDs. Cause of IUFD being abruption in majority of cases. 121 babies were born alive. All were preterm. Major cause for neonatal morbidity and mortality were prematurity and respiratory distress syndrome. Out of 21 babies who had RDS, 13(62%) did not receive steroids and 8(38%) received steroids. Neonatal ICU admission

was needed in 90% of babies. Neonatal deaths were 16(10.6%).

Conclusion: Early onset severe preeclampsia is associated with significant maternal and fetal complications. Early booking is essential for better maternal and fetal outcome.

Decision regarding termination of pregnancy has to be taken based on both maternal and fetal factors. In case of severe uncontrolled blood pressure with complications, termination should be done irrespective of fetal maturity. Good NICU improves the fetal prognosis. In selected cases expectant management in a tertiary care centre limit the impact of serious maternal and fetal complications.

Keywords: Preeclampsia, Eclampsia, Hypertension, fetal outcome, Preterm.

Introduction

Hypertensive disorders remain among the most significant and intriguing unsolved problems in obstetrics. Of hypertensive disorders, the preeclampsia syndrome, either alone or superimposed on chronic hypertension, is the most dangerous.

New-onset hypertension during pregnancy termed gestational hypertension-is followed by signs and symptoms of preeclampsia almost half the time, and preeclampsia is identified in 4 to 5 percent of all pregnancies.

The World Health Organization (WHO) systematically reviews maternal mortality worldwide, and in developed countries, 16 percent of maternal deaths were attributed to hypertensive disorders. In the United States from 2011 to 2013, 7.4 percent of 2009 pregnancy-related maternal deaths were caused by preeclampsia or eclampsia. A similar rate was 10 percent in France from 2003 through 2007. Importantly, more than half of these hypertension-related deaths were deemed preventable.¹

Materials and methods

This prospective study was conducted on 150 patients with pregnancies complicated by early onset severe preeclampsia (EOP) for a period of one and a half years at RMC, Ajmer during February 2021 – September 2022. Informed consent was taken from the patients who included in this study for the selection criteria. The ethical committee of JLN medical college, Ajmer was informed about the intended work and permission was obtained to conduct the work. 150 patients with pregnancies complicated by early onset severe preeclampsia for a period of one and a half years.

Inclusion criteria

1. Gestational age ≥ 24 weeks and < 34 weeks
2. Diastolic BP ≥ 110 mmHg
3. Proteinuria $\geq 3+$ with any of the following
4. Persistent headache
5. Blurred vision
6. Eclampsia
7. Elevated liver enzymes
8. Low Platelets ≤ 6
9. Abruptio Placenta 10. Oligohydromnios 11. IUGR

Exclusion criteria

1. Gestational age < 24 weeks and > 34 weeks
2. Preexisting chronic renal and hepatic disease.
3. Idiopathic haemolytic anaemia
4. Idiopathic thrombocytopenic purpura
5. Epilepsy

Method

All patients who meet the above-mentioned criteria were included in the study and patients were admitted in the intensive care unit. Patient's detailed history, symptoms and signs of severe preeclampsia, imminent eclampsia were noted. General and Obstetric examination was carried out. Urine investigation and PIH profile was done on admission and repeated based upon the progression of

the disease. Obstetric ultrasound with fetal Doppler was performed in patients on expectant management.

In case of any abnormalities like Doppler changes, oligohydromnios and IUGR then expectant management was discontinued and planned for termination. Details regarding treatment (Antihypertensive, Mgso4, steroids) were noted. Details regarding mode of termination and indication for termination, intrapartum, postpartum complications noted. Neonatal assessment done by following the babies in the NICU.

Maternal complications were noted. Follow-up of mother and neonate done up to discharge / death. Collected data tabulated and statistical analysis performed.

Results

Most of the women were in the age group 21 – 30 (60%). Mean age group was 26 Yrs, with a range of 18yrs - 40 yrs. Most of the patients were primigravida in the study. Amongst the total 150 patients studied, 61 % were primigravida and 39 % were multigravida. Majority of the cases were booked (98.7%). Socioeconomic status of patients was given in table 1.

Table 1: Socioeconomic status of the patients

Socioeconomic class	Number of patients	Percentage
I
II
III	01	00.7
IV	85	56.7
V	64	42.6
Total	150	100

This table includes gestational age at which the patient first fulfilled the inclusion criteria for severe preeclampsia. Most of women n = 68 (45.33) were in 32 – 34 weeks Mean gestational age at diagnosis was 31 weeks with a range of 25 to 34 weeks. Most of the

Women weeks 84(56%) underwent termination of pregnancy after 32 Mean gestational age at the time of delivery was 32 weeks.

Table 2: Investigation of patients

Investigations	Number of patients	Percentage
Hyperuricemia	75	52
Altered LFT	33	20
Thrombocytopenia	23	15.3
Altered RFT	31	20
Fundus Change	32	22
DOPPLER Changes	12	8

Out of 150 patients, 105 (70.0%) women received Mgs04, out of which 4 developed seizures 3 of them had Post partum eclampsia. 43 (28.6%) women did not received MgSO4, out of which 11 developed seizures. MgSO4 was given in view of imminent symptoms and signs. In 26 cases MgSO4 was given in view of high BP without imminent symptoms. All women in this study group received oral antihypertensive methyldopa with Nifedipine or Labetalol with Nifedipine) 33 women (22%) required parenteral antihypertensive (Labetalol or Nitroglycerine) for control of blood pressure. Out of 150 women, 72 (48%) women were on oral antihypertensive before admission.

Out of 150 patients, 69 (46%) were induced. Out of 69 patients who were induced, 46 (30.7 %) delivered vaginally and 23 (15.3%) underwent caesarean section. Out of 25 IUFDs, 9 were delivered by caesarean section indication being Abruption for 7 and eclampsia for 2 patients. 81(54%) patients were notpppp5 induced and underwent direct caesarean section. The causes were imminent eclampsia, eclampsia, Abruption, Doppler changes, severe oligohydromnios. Overall, total number of patients who underwent LSCS was 104(69 %).

Both maternal and fetal morbidity and mortality were more during early gestational age, 52.3% and 95.2% at gestational age 24 – 28 weeks respectively. Overall fetal morbidity was more than maternal morbidity.

Out of the total 150 babies, 90(60%) babies had complication. Out of 90 babies 25(16.6%) were IUFDs, majority were in women who were referred as IUFDs. Cause of IUFD being abruption in majority of cases. 121 babies were born alive. All were preterm. Major cause for neonatal morbidity and mortality were prematurity and respiratory distress syndrome. Out of 21 babies who had RDS, 13(62%) did not receive steroids and 8(38%) received steroids. Neonatal ICU admission were needed in 90% of babies. Neonatal deaths were 16(10.6%)

Discussion

Preeclampsia affects both mother and neonate. It is one of the leading causes of maternal and fetal morbidity and mortality. In literature the likelihood of development of preeclampsia is increased by a number of factors in maternal history, including null parity, HIGH BMI, personal and family history. Sixty (60%) of the women in the study group were in the age group of 21 to 30 years, which correlates with the studies of done by Brown MA and Buddle ML², D.R.Hall³ the mean age was 26 years. In our study mean age was 26 years. Leite et al⁴ in 2019, found mean age of control group as 29.8±6.5. In their study age of women developing early onset preeclampsia was significantly higher (33.1) than control group and late onset preeclampsia group.

In study conducted by Poon LC et al⁵ 2009, no significant difference in median age of women was seen between cohort and case group. Median age of women was 32.3 in overall population and median age of women with early onset preeclampsia was 31.7 and median age of women with late onset preeclampsia was 31.5.

In a study conducted by Plasencia et al⁶ 2007 median age of women was 31.1 and IQR 16.2 to 49.6 was estimated in total population and median age of women was 29.1 and IQR 17.6 to 39.7 in women with early preeclampsia and median age 31.1 and IQR 18.1 to 41.9 in women with late preeclampsia.

Out of the total 18 women who developed preeclampsia majority of 14 women were of the age <35 years and the rest of 4/18 women were of the age >35 years. However, 3 in 5 (60%) women above the age of 35 years in our study group developed preeclampsia. Advanced maternal age had statistically significant association with development of preeclampsia in our study (p-value 0.022). In a study conducted Aabidha MP et al 2015⁷ maximum 46.23% of women developed preeclampsia were in age range of 21-25 years.

Rindawati H et al 2021⁸, 35.71% primigravida developed preeclampsia, 16% of Second gravida and 12.5% multi gravida developed preeclampsia. Primigravida was found to be risk factor for preeclampsia on the multivariable analysis. The odds of developing pre-eclampsia were 2.68 times higher in primigravida women compared to multigravida (AOR: 2.68 95% CI: 1.38, 5.22). In contrast, study conducted by Lubis PM⁹ 2019 et al 9.6% primigravida women developed preeclampsia, 12.5% of multigravida developed preeclampsia.

In a study conducted by lubiset al¹⁰ 2019, 60% of women who developed preeclampsia was primigravida and 40% were multigravida. Only 9.6% of primigravida women developed preeclampsia and 12.5% of multigravida women developed preeclampsia.

Compared to a study conducted by Grum T et al 2017¹¹ 60.0% of were primigravida and 40.0% were multi gravida developed preeclampsia. The odds of developing pre-eclampsia were 2.68 times higher in women with primigravida comparing to the women with multigravida

(AOR: 2.68 95% CI: 1.38, 5.22). In a study conducted by Christina et al¹², 51.4% of women who developed preeclampsia were nulliparous. Only forty-three (28.6%) of the women in this study group had risk factors, which includes gestational hypertension in previous pregnancy and family history of hypertension. In the study by D.R. Hall³ 36% of the women had risk factors. Almost Fifty-three (35.33%) women in this study were booked either at our institution or outside. 108 (68%) were booked outside and referred to IOG.

Adequate antenatal care has an important role in reducing the complications by early detection and appropriate management. Though most of the patients in this study were booked, early detection of gestational hypertension was not made because one or two recordings of high blood pressure at early gestational age was not taken into serious consideration and also because of unawareness of the women.

Magnesium sulphate when given to patients with severe preeclampsia reduces the risk of seizures by 58%. But routine prophylaxis in patients with severe preeclampsia is questioned and the decision is based on the method of treatment whether conservative or immediate termination.

In this study all patients received oral hypertensive's either Methyldopa and nifedipine or labetalol and nifedipine. 33 (22%) patients required parenteral antihypertensives in addition to oral antihypertensive.

In all patients who required parenteral antihypertensive magnesium sulphate was given and seizures did not occur.

Most of the women underwent termination of pregnancy at 32- 34 weeks, 84(56%). In the study by D. R. Hall³GA at the time of delivery was found to be 32-34 weeks. Apgar was found to be improving with increasing gestational age.

Fetal morbidity and mortality was found to be high at early gestational age, 38.4% perinatal death at 24 – 28 weeks where as it is 6% at 32- 34 weeks. RDS was high between 24-28 and 28-32 weeks, 30.7% and 13.7% respectively. Maternal indication was found to be the most common cause for termination of pregnancy in 128 (85.3%) patients and the fetal cause in 22(14.7%). Imminent eclampsia was the most common cause of maternal indication for termination. Though preeclampsia is one of the risk factor for prematurity, the cause of prematurity in most of the cases is iatrogenic either induction of labour or caesarean section to prevent morbidity and mortality in mother and fetus

Ultimate goal in the management of severe preeclampsia must first be the safety of the mother and second the delivery of a live infant who will not require prolonged neonatal care.

In our study maternal morbidity and mortality was seen in 38.6%. Eclampsia and abruption were highest accounting to 17(11.3%) and 14(9.3%) respectively. Other complications were HELLP, DIC, and ARF. In our study maternal mortality was 6 (4%) In majority of the patients BP control was achieved within a week. Only 7 patients were discharged with antihypertensive.

Most of the women required hospitalisation for 2 to 3 weeks with a minimum of 7 days and a maximum of 31 days. Mean of postpartum hospital stay was 16 days. Early onset severe preeclampsia is associated with significant maternal and fetal complications. Early booking is essential for better maternal and fetal outcome. Decision regarding termination of pregnancy has to be taken based on both maternal and fetal factors.

In case of severe uncontrolled blood pressure with complications, termination should be done irrespective of fetal maturity. Good NICU improves the fetal prognosis. In selected cases expectant management in a tertiary care

centre limit the impact of serious maternal and fetal complications.

References

1. Hypertensive disorders. Cunningham F, &Leveno K.J., & Bloom S.L., & Spong C.Y., &Dashe J.S., & Hoffman B.L., & Casey B.M., & Sheffield J.S.(Eds.), (2013). Williams Obstetrics, Twenty-Fourth Edition. McGraw Hill. [https:// access medicine. mhmedical.com/ content. asp? Bookid =1057§ionid=59789184](https://accessmedicine.mhmedical.com/content.aspx?Bookid=1057§ionid=59789184)
2. Brown MA, Buddle ML Hypertension in Pregnancy: Maternal and neonatal outcome according to laboratory and clinical features. *Med J Aust.*1996; 165(7): 360-7
3. D. R. Hall, H. J. Odendaal, G. F. Kirsten, J. Smith, D. Grove. Expectant management of early onset, Severe pre-eclampsia maternal and perinatal outcome. *BJOG* 2000; 107: 1252-1264.
4. Leite JF, Lobo GAR, Nowak PM, Antunes IR, Araujo Júnior E, Pares DBDS. Prediction of preeclampsia in the first trimester of pregnancy using maternal characteristics, mean arterial pressure, and uterine artery Doppler data in a Brazilian population. *Obstet Gynecol Sci.* 2019 Nov;62(6):391-396.
5. Poon LC, Kametas NA, Pandeva I, Valencia C, Nicolaides KH. Mean arterial pressure at 11+ 0 to 13+ 6 weeks in the prediction of preeclampsia. *Hypertension.* 2008 Apr 1;51(4):1027-33.
6. Plasencia W, Maiz N, Bonino S, Kaihura C, Nicolaides KH. Uterine artery Doppler at 11 + to 13 + 6 weeks in the prediction of pre-eclampsia. *Ultrasound Obstet Gynecol.* 2007;30(5):742-9.
7. Aabidha PM, Cherian AG, Paul E, Helan J. Maternal and fetal outcome in pre-eclampsia in a secondary care hospital in South India. *J Family Med Prim Care.* 2015 Apr-Jun;4(2):257-60
8. Rindawati H. The Relationship Between Gravida With The Incidence Of Preeclampsia. In ASEAN/ Asian

Academic Society International Conference Proceeding Series 2016 May 12.

9. Demers S, Boutin A, Gasse C, Drouin O, Girard M, Bujold E. First-trimester uterine artery Doppler for the prediction of preeclampsia in nulliparous women: the Great Obstetrical Syndrome study. *American journal of perinatology.* 2019 Jul;36(09):930-5.
10. Lubis MP, Lumbanraja SN, Harriman H, Bachtiar A. The Role of Uterine Artery Diastolic Notch and Uterine Artery Pulsatility Index to Predict the Event of Early Onset Preeclampsia. *Parity.* 2020; 57(91.9):1-000a.
11. Grum T, Seifu A, Abay M, Angesom T, Tsegay L. Determinants of pre-eclampsia/Eclampsia among women attending delivery Services in Selected Public Hospitals of Addis Ababa, Ethiopia: a case control study. *BMC pregnancy and childbirth.* 2017 Dec;17(1):1-7.
12. Christina KH, Smith GC, Papageorghiou AT, Cacho AM, Nicolaides KH, Fetal Medicine Foundation Second Trimester Screening Group. An integrated model for the prediction of preeclampsia using maternal factors and uterine artery Doppler velocimetry in unselected low-risk women. *American journal of obstetrics and gynecology.* 2005 Aug 1;193(2):429-36.