

## Perinatal outcome of babies delivered to eclamptic mothers: A retrospective study in a rural teaching hospital of western Maharashtra

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### Abstract

**Background:** Eclampsia is an important cause of significant neonatal morbidity in terms of prematurity, Intrauterine Growth Retardation (IUGR), Low Birth Weight (LBW), and birth asphyxia.

**Objective:** The objective of the study was to assess the perinatal outcome with respect to maternal and neonatal characteristics and to evaluate the neonatal morbidity/ mortality.

**Materials and Methods:** Medical records of 75 cases of eclampsia, 68 liveborn neonates and 39 neonates admitted at the teaching Hospital, situated in rural Maharashtra from January 2020 to November 2020 were analysed and findings were presented in tables.

**Results:** Of 75 eclamptic mothers, 55 (73.33%) were primipara and 20 (26.67%) were multipara. Mean maternal age was 22 years. Mean gestational age was 34 + 6 weeks. Fifty-six (75%) mothers needed lower uterine caesarean section. The majority of eclamptic mothers had less than optimal antenatal care, primigravidae (74.67%) and young (less than 20 years). Out of 68 live born neonates 60.3 % were preterm. One fourth of them were very preterm. Three fourth neonates born were low birth weight (LBW), amongst them 2 were extremely LBW. Nearly one fourth neonates were small of gestational age (SGA). More than half of neonates required specialised care in neonatal unit. Indications for admission were prematurity, respiratory distress syndrome, growth retardation, perinatal asphyxia and early-onset sepsis. Overall neonatal mortality was 5.26% (4/68) and 10% (4/39) amongst admitted newborns. Causes of death were extreme LBW and sepsis.

**Conclusion:** Significant neonatal morbidity has been observed in neonates born to eclamptic mothers in the rural population. Neonatal problems requiring special/intensive neonatal care were prematurity, LBW, IUGR, and birth asphyxia. Neonatal mortality amongst admitted newborns was 10%. Extreme LBW and sepsis were the causes for neonatal death.

**Keywords:** eclampsia, neonatal morbidity, rural population, very preterm

### Introduction

Eclampsia is commonly defined as new onset of general tonic-clonic seizure activity and/or unexplained coma during pregnancy or postpartum in a woman in the absence of underlying neurologic disease. It is the most dangerous complication of preeclampsia [1].

The exact mechanism(s) responsible for the development eclampsia remain(s) unclear [2]. In India, reported incidence of eclampsia varies from 1.82 to 3.82 % [3, 5].

Adverse perinatal outcomes of pre-eclampsia and eclampsia are mainly attributed to preterm delivery, which occurs secondary to maternal or foetal complications, intrauterine growth restriction (IUGR) and foetal death [6].

Eclampsia among rural population of India still remains a significant risk factor for neonatal morbidities like preterm, Low Birth Weight (LBW), Intrauterine Growth Retardation (IUGR), and birth asphyxia [7].

Despite advances in medical practice, eclampsia still remains a leading cause of perinatal morbidity and mortality in developing countries like India. Hence, we planned this study to find out the perinatal outcome in eclamptic mothers and to evaluate the neonatal morbidity and mortality in a rural teaching institution which caters mainly village population largely representing the typical pattern of socioeconomic and demographic characteristics of rural India.

### Materials and Methods

The retrospective study was conducted in a rural medical college Hospital situated in Western Maharashtra over a period of 11 months from January 2020 to November 2020. The study was approved by the Institutional Ethical Committee. All pregnant women presenting with ante-partum and intra-partum eclampsia and who got admitted to the labour ward during study period were included. Pregnant women with post-partum eclampsia were excluded.

The data was collected from the medical records of all the patients included in the study, available at the hospital for the duration of eleven months. Data regarding the demographic parameters of the mothers like antenatal check-up, gestational age (determined by last menstrual period or 1st trimester ultrasound), obstetric problems like preterm labour, mode of delivery were recorded in a structured questionnaire. Neonatal parameters were sex, gestational age, birth weight and the neonatal medical problems like respiratory distress syndrome, congenital pneumonia, meconium aspiration syndrome, perinatal asphyxia and evidence of sepsis were also recorded. During hospital stay neonates with respiratory distress, feeding intolerance, abdominal distension with signs necrotizing enterocolitis (NEC) and clinical signs of sepsis were observed. Preterm birth is defined as delivery before 37 completed weeks of gestation. Low birth weight (LBW) baby is labelled when born with birth weight < 2.5 Kg.,

birth asphyxia defined as baby born with APGAR score at one minute is < 7, early neonatal death (END) is labelled when neonatal death occurs within 7 days of postnatal period, and stillbirth is defined as delivery of dead foetus after 28 weeks of gestation. The collected data was processed through Microsoft Excel and tabulated in the form of tables and analysed in the SPSS (version 25.0) software for appropriate statistical tests.

**Results**

Total Eighty-two women presented with eclampsia over the study period resulting in an incidence of eclampsia of 9.8 per 1000 deliveries (0.98%), of which 75 women fulfilling inclusion criteria were included in the study.

Demographic details of the study population have been presented in Table 1. The majority of eclamptic mothers were primigravida (73.33%), Mean maternal age was 22 years. Mean gestational age at presentation was 34 + 6 weeks with a range of 28 weeks - 40 weeks and 36% of them reached term. Caesarean delivery was the commonest mode of delivery 56 (74.7%) among the subjects with eclampsia.

**Table 1:** Distribution of women according to age, parity, mode of delivery

Variable	Number	Percent
Age		
< 20 years	12	16
20-25years	50	66.67
> 25 years	13	17.33
Parity		
Nulli-parous	62	82.67
Multi-parous	13	17.33
Mode of Delivery		
Caesarean section	56	74.67
Vaginal	19	25.33

**Table 3:** Neonatal clinico-investigative profile of the neonates at the time of admission.

Extreme LBW/Prematurity	02 (5.13%)	Sepsis clinical	12 (30.8%)
SGA (Growth retardation)	12 (30.8%)	Positive CRP	08 (20.5%)
Very LBW	10 (25.64%)	Reduced total WBC count	06 (15.4%)
Respiratory distress	04 (10.3%)	Positive Blood culture	02 (5.1%)
Perinatal asphyxia	03 (7.7%)	Increased HCT > 65%	02 (5.1%)

Outcomes of foetuses/neonates have been shown in Table-4. Of the total 75 pregnant women, 6 patients were presented with intrauterine death. 2 patients who had presented with live fetuses, had fresh still births and 2 patients had early neonatal deaths. Causes of neonatal death were extreme LBW/prematurity and neonatal sepsis.

**Table 4:** Outcomes of foetuses/newborns in eclamptic mothers

Outcome	N
Intra uterine Death	6
Stillbirth	2
Early Neonatal Death	2
Late Neonatal Death	2

Effect of adequacy of antenatal care (ANC), maternal age, parity and length of gestation has been shown in Table-5. Less than optimum ANC, young age, nulliparity and premature delivery are contributory factors for adverse outcome.

Most of the eclamptic patient (52 %) were below 21 years of age. The highest risk of eclampsia was among the patient with first pregnancy. Eclampsia occurred mostly (53.9%) in 30-36 weeks of gestation followed by 36 % in pregnancies beyond 37 weeks. 10.7% patients had eclampsia before 30 weeks of gestation.

Foetal/neonatal characteristics have been shown in Table-2. The total number of births in our series was 76, which included 74 singleton births and 1 set of twins with a mean birth weight of 1.92 ± 0.66 Kg and a range of 0.99 Kg – 3.16 Kg.

**Table 2:** Distribution of foetuses/new-born's according to different characteristics.

Variable	Foetus (n=8)	Newborns (n=68)	Total (n=76)
Gestational Age			
<32 wks	2	10	12
32-37 wks	6	31	37
> 37 wks	0	27	27
Weight Category			
VV LBW <1.5 Kg.	5	16	21
LBW	3	35	38
NBW	0	17	17
AGA	4	52	56
SGA	4	16	20
Gender			
Male	4	34	38
Female	4	34	38

Neonatal clinic-investigative profile has been shown in Table-3. Of 68 live born; 39 neonates required admission in the special /intensive neonatal care unit. Indications for admission were prematurity 15 (38.5%), sepsis 12 (30.8%), Intra-uterine growth restriction (IUGR) 12 (30.8%) and perinatal asphyxia 3 (7.7%).

**Table 5:** The effect of ante-natal care, maternal age, parity on perinatal mortality

Risk factor	IUD/Stillbirth		Early neonatal death (END)	
	Total births	Stillbirth (%)	Live births	END (%)
Antenatal care				
Optimum	9	0	19	0
< optimum	66	8	49	2
Maternal age				
< 20 years	12	3	09	0
20-25 years	50	5	45	2
> 25 years	13	0	14	0
Parity				
Nulliparous	62	7	54	2
Multiparous	13	1	14	0
Gestational age				
<32 wks	11	2	10	1
32-37 wks	37	6	30	0
> 37 wks	27	0	28	1

Risk factors for perinatal death i.e., IUD/Still birth and Early Neonatal Death (END) have been showed in Table-6. Lower maternal age, lower birth weight, mode of delivery

being vaginal and high maternal serum lactate dehydrogenase (LDH) were associated with increased perinatal mortality.

**Table 6:** Risk factors for perinatal death

Risk factor	Survivors (n=66)	Stillbirth + END (n=10)	p-value
Maternal age (Mean + SD)	21.86 + 3.18	20.2 + 1.3	0.0066
Gestational age	35 + 2.99	33.1 + 2.56	0.052
Weight	2 + 0.64	1.31 + 0.41	0.0002
Mode of Delivery Vaginal	3/56 (5%)	7/19 (37%)	<0.001
Maternal LDH	504.6 + 215	920.4 + 374	0.006

## Discussion

Eclampsia is a significant cause of maternal and perinatal morbidity and mortality, particularly in developing countries. A total of 8375 patients delivered at rural hospital attached to medical College in western Maharashtra from 1.1.2020 to 30.11.2020. The incidence of eclampsia in this hospital was 0.98%. 75 patients who fulfilled the inclusion criteria was presented with intra partum eclampsia; of which 55 patients were primigravidae, 13 patients were gravida 2 and 7 patients were gravida 3 or more. Incidence observed in our series was lower than the reported in other parts of India [5, 8].

Eclampsia was more frequently noticed in pregnant women of less than 25 years age (82.7%). Studies conducted earlier have shown similar trend [9, 10]. Majority of cases were primi-gravidae (73.33 %). Similar finding was also reported by Yaliwal *et al.* [3] and Singhal *et al.* [10].

Caesarean section delivery was the common mode of delivery in our study (74.7%) while 25.3% of cases were delivered vaginally. In contrast, vaginal delivery was the common mode of delivery in a conducted by Madhu S *et al.* [5]. In our study, Eclampsia was seen in 36 % of patients at term gestation; which is different from a study done by Khanum M *et al.* [11], wherein it was seen in 53% of patients at term gestation. Intrauterine growth retardation was seen 16 (23.5%) babies in our study. Low birth weight babies were 35 (51.5%) and very low birth weight baby 16 (23.5%) in this study. Therefore total 51 (75 %) neonates were below 2.5 Kg. Similar finding has been reported [12]. The incidence of low birth weight in eclampsia is attributed to prematurity and Intrauterine growth retardation (IUGR).

In this study, more preterm babies were born to eclamptic mothers (60.3%). This is comparable to a study done by Shaheen *et al.* which showed that 62.5% of babies were preterm [13]. Parveen and Akhter reported 59% [14]. Singhal *et al.* also reported preterm births to be 74.5% [10]; while Jha *et al.* found 50% [15] of preterm births in their studies. In contrast, the percentage of preterm births observed by Yaliwal *et al.* was 17% [3], 26.1% by George and Jeremiah [16]. Intrauterine growth retardation was observed in 16 (23.5%) babies born. IUGR could be explained by the vascular and placental damage associated with proteinuria in preeclamptic / eclamptic women affecting foetal growth and maturity. The total number of births in our series was 68, which included 66 singleton births and 1 set of twins with a mean birth weight of 2 ± 0.6 Kg and a range of 0.96 Kg – 3.16 Kg. Thirty-nine babies (57.4%) were admitted into the Neonatal Unit. The indications for admission were; prematurity, Respiratory distress, IUGR / LBW, birth asphyxia, and neonatal sepsis. Similar observation has been reported in other study [17]. Birth asphyxia was indication for admission in 3 (7.7%) newborns. In contrast, a study done

by Yaliwal *et al.* have recorded birth asphyxia in 26% babies [3]. Other study by Singhal *et al.* also reported higher percentage of birth asphyxia in neonates of eclamptic mothers. There were 10 perinatal deaths. These included 8 IUD/still births and 2 early neonatal deaths. Prematurity and sepsis were the causes of neonatal deaths.

Average hospital stay amongst survivors was 17 days with minimum of 5 days and maximum stay was 65 days. Similar observation has been reported in a study conducted by Hasan M *et al.* [12]. Extreme/very LBW/Prematurity was the commonest cause of perinatal mortality in our study.

Low birth weight (LBW) has been shown to be a key determinant of perinatal mortality. In this study LBW babies (Birth weight <2.5kg) significantly fared worse than their normal weight counterparts. This agrees with earlier study [13]. The findings in Table-6 shows the relation between type of delivery and perinatal outcome. The perinatal deaths were higher in the vaginal delivery group. Of the 19 vaginal deliveries, 7 patients presented with intrauterine death. Other study has reported a similar outcome with caesarean section in comparison to the vaginal route [18]. This suggests that babies delivered by Caesarean section had a better perinatal outcome than their counterparts delivered vaginally. There was significant increase in perinatal complications with increasing levels of LDH. Similar results have been reported in many other studies [19, 20].

## Conclusion

Eclampsia among rural population of India still remains a significant risk factor for neonatal morbidities like preterm, LBW, IUGR and birth asphyxia. Young age, nulliparity, mode of delivery being vaginal and high maternal serum LDH levels were risk factors for adverse perinatal outcomes. This study emphasises the need to prevent development of eclampsia at a community level through optimal antenatal care.

## References

1. Warrington JP. Placental ischemia increases seizure susceptibility and cerebrospinal fluid cytokines. *Physiol Rep.* 2015; 3(11).
2. Bell MJ. A historical overview of preeclampsia-eclampsia. *J Obstet Gynecol Neonatal Nurs.* 2010; 39:510-8.
3. Yaliwal RG, Jaju PB, Vanishre M. Eclampsia and perinatal outcome: A retrospective study in a teaching hospital. *J Clin Diagn Res.* 2011; 5:1056-9.
4. Pannu D, Das B, Hazari S. Maternal and perinatal outcome in eclampsia and factors affecting the outcome: a study in North Indian population. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology.* 2014; 3:347-51.

5. Madhu Sinha, Sanjay Kumar Sinha. Perinatal and Maternal outcomes of Eclampsia in Darbhanga District, Bihar, India. *International Journal of Contemporary Medical Research*. 2018; 5(2):B1-4.
6. Moodley J, Kalane G. A review of the management of eclampsia: practical issue. *Hypertension in pregnancy*. 2006; 25:47-62.
7. Bandyopadhyay S, Das R, Burman M, Datta AK. Neonatal outcomes of eclamptic mothers in a tertiary government rural teaching hospital of Eastern India. *Indian J Child Health*. 2019; 6(12):665-668.
8. Dhananjay BS, Dayananda G, Sendilkumaran D, Murthy N. A study of factors affecting perinatal mortality in eclampsia. *J Pharm Bioallied Sci*. 2009; 22:2-5.
9. Patel PC, Kathawadia KK, Saini HB. A Study of foeto-maternal outcome in eclampsia-A case control study. *National Journal of Medical Research*. 2017; 7(1):5-8.
10. Singhal S, Deepika A, Nanda S. Maternal and perinatal outcomes in severe pre-eclampsia and eclampsia. *South Asian Fed Obstet Gynecol*. 2009; 1:25-8.
11. Khanum M, Ashraf F, Sahrin H. A Clinical Study of 100 Cases of Eclampsia in Rajshahi Medical College Hospital. *TAJ*. 2004; 17:80-3.
12. Hassan M, Begum M, Haque SMZ, Jahan N, Yasmeen BHN, Mannan A. et.al. Immediate Outcome of Neonates with Maternal Hypertensive Disorder of Pregnancy at a Neonatal Intensive Care Unit Northern International Medical College Journal. 2015; 6(2):57-60.
13. Shaheen B, Hassan L, Obaid M. Eclampsia, a major cause of maternal and perinatal mortality: A prospective analysis at a tertiary care hospital of Peshawar. *J Pak Med Assoc*. 2003; 53:346-50.
14. Parveen AI, Akhter S. Perinatal outcome of eclampsia in Dhaka medical college hospital. *Banglad J Obstet Gynaecol*. 2008; 23:20-4.
15. Jha R, Verma S, Jha SK. Eclampsia in Janakpur zonal hospital, Nepal: Favourable outcome with magnesium sulphate. *Nepal J Obstet Gynaecol*. 2007; 2:17-9.
16. George IO, Jeremiah I. Perinatal outcome of babies delivered to eclamptic mothers: A prospective study from a Nigerian tertiary hospital. *Int J Biomed Sci* 2009; 5:390-4.
17. Nadkarni J. Bahl P. Parekh. Perinatal Outcome in pregnancy associated Hypertension. *Indian Pediatric*. 2001; 38:174-78.
18. Kamilya G, Barracharrya SK, Mukherji J. Changing trends in the management of eclampsia from a teaching hospital. *J Indian Medical Association*. 2005; 103(3):134-35.
19. Andrews L. Correlation of serum lactate dehydrogenase and pregnancy induced hypertension with its adverse outcomes. *Int J Res Med Sci*. 2016; 4(5):1347-50.
20. Deshmukh VL, Kollur A, Gadappa SN. A correlation of lactate dehydrogenase (LDH) enzyme levels in hypertensive disorders of pregnancy with severity of disease, maternal and perinatal outcome. *The New India Journal of OBGYN*. 2020; 7(1):20-5.