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Original Research Article

Maternal and Perinatal Outcome in Antepartum Eclampsia- A Prospective Observational Study

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Abstract

Background: In this study, we wanted to find out the magnitude and pattern of maternal morbidity, analyse the clinical profile and management of antenatal eclampsia and determine the maternal and perinatal outcome including morbidity and mortality.

Materials and Methods: This was a hospital based prospective observational study conducted among pregnant women admitted with or who developed antepartum eclampsia in the antenatal ward of the Department of Obstetrics and Gynecology, Deben Mahata Sadar Hospital, Purulia, West Bengal, and the new-borns of those antenatal eclamptic mothers, during the study period (September 2018 to August 2019).

Results: Antepartum eclampsia results in adverse maternal outcomes like preterm delivery, stillbirth, caesarean section, maternal complications, and mortality. Further it also results in adverse neonatal outcomes including low birth weight, low APGAR (appearance, pulse, grimace, activity and respiratory rate) score, need for resuscitation, neonatal intensive care unit (NICU) admission, early neonatal complications, and early neonatal death.

Conclusion: Eclampsia is still major cause of not only maternal mortality and morbidity but even neonatal morbidity and mortality in the study area. Antepartum eclampsia results in adverse maternal outcomes like preterm delivery, stillbirth, caesarean section, maternal complications and mortality.

Keywords: Maternal, Perinatal, Antepartum Eclampsia

Introduction

The anatomical, physiological and biochemical adaptation to pregnancy is profound and well-orchestrated. In some cases, this orchestra gets deranged, and women become high risk pregnancies. They develop unexpected complications in the course of otherwise normal pregnancies endangering the health of both, the mother and the foetus. One such dreadful complication is hypertension in

pregnancy and its complications like eclampsia. Pre-eclampsia and eclampsia are two clinical situations that are exclusively associated with pregnancy. [1] Eclampsia occurs in ante-partum period in 35 – 45%, intrapartum in 15 – 20% and in post-partum period in 30 – 45%. 35% of patients who develop eclampsia have pre-eclampsia in subsequent pregnancy. [2] Hypertensive disorders remain among the most significant unsolved problems in obstetrics. They form a deadly triad with haemorrhage and infection contributing to high fetomaternal morbidity and mortality. These contribute to 13% of maternal deaths in India. [3] Eclampsia and other neurologic manifestations like headache, hyper-reflexia, visual symptoms, somnolence are due to cerebral circulatory dysregulation. [4] The incidence of eclampsia in India varies from 0.5% to 1.8%. [5] Symptoms typically begin after the 24th week of pregnancy, and are characterized by arterial hypertension, oedema and proteinuria. In eclampsia, seizures occur. Pre-eclampsia and eclampsia figure among the three most important causes of death in pregnancy. Neurological complications of eclampsia include mental confusion, seizures, cortical blindness, deficits in the visual fields, visual blurring and headaches. At neuroimaging, abnormalities include cortical oedema and sometimes intracerebral haemorrhage. The greater risk of death is when eclampsia develops before 28 weeks of gestation. Perinatal mortality occurs in 5 to 12% of the cases. Most common causes of foetal deaths are prematurity, foetal asphyxia and acidosis. [2]

Aims and Objectives

Aim

This study was aimed to determine maternal and perinatal outcomes in women with antenatal eclampsia.

Objectives

The objectives of this study were;

1. To find out the magnitude and pattern of maternal morbidity.
2. To analyse the clinical profile and management of antenatal eclampsia.
3. To know the maternal and perinatal outcome including morbidity and mortality.

Materials and Methods

This was a hospital-based prospective observational study conducted among pregnant women admitted with or who developed ante-partum eclampsia in the antenatal ward of the Department of Obstetrics and Gynaecology, Deben Mahata Sadar Hospital (now Deben Mahata Government Medical College), Purulia, West Bengal and the new-borns of those antenatal eclamptic mothers within the study period from September 2018 to August 2019.

Inclusion Criteria

- Women with ante-partum eclampsia of any age.

Exclusion Criteria

- Pregnant women with convulsions due to epilepsy or other causes.
- Those who are not willing to participate in the study

Study Procedure

Patients were interviewed and information regarding the demographic data (age, socio economic status, place of residence), presenting complaints, past medical history and obstetric history. The assessment of socio-economic status was based on Kuppswamy index[6] for the study period. These women were subjected to thorough clinical examination and vitals including pulse rate, temperature, blood pressure, and other clinical signs.

Sample Size Estimation

Sample size for this study was calculated based on the WHO's incidence study formula:

$$N = \left(\frac{Z}{E}\right)^2 = \left(\frac{1.96}{0.2}\right)^2 = 3.84/0.04 = 96$$

Where Z= 95% confidence interval at 5% precision, E= allowable error around the expected incidence of event of interest.

Assuming 10% non-participation / non-response, the revised sample size was 96 +10% of 96=105.

Data collection was planned twice a week and the days were selected randomly using lottery technique of simple random sampling method. One case per day i.e. two cases per week were included in the study. If more cases were seen in any sampled day, then two out of them were chosen via simple random sampling (lottery method). Assuming the fact that there may be days on which there may not be a case for inclusion in the study, the consecutive patients attending on the selected days were included till the sample size for the study was achieved.

Statistical Analysis

The data obtained was coded and entered into Microsoft Excel spread sheet (Annexure III) and master chart was prepared. The data was analysed using Statistical Package for Social Sciences (SPSS) statistical software version 20.0. Categorical data was expressed in terms of rates, ratios and percentages and continuous variable were expressed as mean ± standard deviation (SD).

Results

In the present study, most of the women were aged ≤ 20 years (39.05 %) and the next common age group was 21 to 25 years (25.71 %).

In this study, the common clinical presentations were headache (78.10 %) followed by epigastric pain (43.81 %), vomiting (33.33 %), leaking liquor per vagina (22.86 %), blurring of vision (21.9 %) and bleeding per vagina (14.29 %).

In this study, most of the women (63.91 %) were not registered for antenatal care.

In this study, 43.81 % of the women had period of gestation between 32 to 36.99 weeks.

In the present study, foetal heart sound was audible in majority of the women (80 %).

In this study, cephalic presentation was noted in majority of the women (96.19 %) followed by oblique (1.90 %), breech and transverse lie (0.95 % each).

In the present study, adequate pelvis was noted in 75.24 % of the women.

Table 1

Maternal Age (Years)	**Distribution (n=105)**	
	Number	**Percentage**
≤ 20	41	39.05
21 to 25	27	25.71
26 to 30	19	18.10
31 to 35	15	14.29
36 to 40	3	2.86
Total	**105**	**100.00**
Distribution of Women According to the Maternal Age		
Clinical Presentation	**Distribution (n=105)**	
	Number	**Percentage**
Headache	82	78.10
Epigastric pain	46	43.81

Vomiting	35	33.33
Leaking liquor per vagina	24	22.86
Blurring of vision	23	21.90
Bleeding per vagina	15	14.29
Distribution of Women According to the Clinical Presentation		
Antenatal Care	**Distribution (n=105)**	
	Number	**Percentage**
Booked	38	36.19
Unbooked	67	63.81
Total	**105**	**100.00**
Distribution of Women According to the Antenatal Care		
Period of Gestation (Weeks)	**Distribution (n=105)**	
	Number	**Percentage**
23 to 25	3	2.86
26 to 31	14	13.33
32 to 36.99	46	43.81
≥ 37	42	40.00
Total	**105**	**100.00**
Distribution of Women According to the Period of Gestation		

In the present study, labour was augmented in 71.43 % of the women.

In this study, 70.48 % of the women underwent vaginal delivery and 24.76 % of the women underwent lower segment caesarean section (LSCS).

In the present study, the common indication for LSCS was foetal distress (61.54 %).

In this study, maternal complications were noted in 80.95 % of the women.

Table 2

FoetalHeart Sound	**Distribution (n=105)**	
	Number	**Percentage**
Present	84	80.00
Absent	21	20.00
Total	**105**	**100.00**
Distribution of Women According to the foetalHeart Sound		
Presentation and Lie	**Distribution (n=105)**	
	Number	**Percentage**
Cephalic	101	96.19
Oblique	2	1.90
Breech	1	0.95
Transverse	1	0.95
Total	**105**	**100.00**
Distribution of Women According to the Presentation and Lie		
Findings	**Distribution (n=105)**	
	Number	**Percentage**
Adequate	79	75.24
Not adequate	26	24.76
Total	**105**	**100.00**
Distribution of Women According to the Pelvis Examination		

Table 3

Maternal Outcome	Findings	Distribution	
		Number	Percentage
Labour Augmentation (n=105)	Yes	75	71.43
	No	30	28.57
	Total	**105**	**100.00**
Mode of Delivery (n=105)	Vaginal delivery	74	70.48
	LSCS	26	24.76
	Instrumental	5	4.76
	Total	**105**	**100.00**
Indication for LSCS (n=26)	Foetal distress	16	61.54
	Previous LSCS	4	15.38
	Transverse lie	2	7.69
	Footling and breech	1	3.85
	Oblique lie	1	3.85
	Placenta praevia	1	3.85
	Shoulder presentation	1	3.85
	Total	**26**	**100.00**
Complications (n=105)	Yes	85	80.95
	No	20	19.05
	Total	**105**	**100.00**
Distribution of Women According to the Maternal Outcome			

Table 4

Maternal Mortality	Distribution (n=105)	
	Number	Percentage
Non survivors	3	2.86
Survivors	102	97.14
Total	**105**	**100.00**
Distribution of Women According to the Maternal Mortality		
Pregnancy Outcome	**Distribution (n=105)**	
	Number	**Percentage**
Still birth	21	20.00
Live birth	84	80.00
Total	**105**	**100.00**
Distribution of Women According to the Pregnancy Outcome		

In this study, maternal mortality was noted in 2.86% of the women.
In the present study, 80% of the women had live birth and 20% of the women had stillbirth.

Table 5

Parameters	Findings	Distribution (n=105)	
		Number	Percentage
Birth Weight (Kg)	1.50 to 1.99	15	14.29
	2 to 2.49	36	34.29
	2.5 to 3.49	54	51.43
	Total	**105**	**100.00**
APGAR Score at One Minute	< 7	70	66.67
	≥ 7	35	33.33

	Total	**105**	**100.00**
APGAR Score at Five Minutes	< 7	39	37.14
	≥ 7	66	62.86
	Total	**105**	**100.00**
Requirement of Resuscitation	Required	39	37.14
	Not required	66	62.86
	Total	**105**	**100.00**
Early Neonatal Complications	Birth asphyxia	14	13.33
	MAS	2	1.90
	No complications	89	84.76
	Total	**105**	**100.00**
NICU Admission	Required	66	62.86
	Not required	39	37.14
	Total	**105**	**100.00**
Distribution of Study Population According to Neonatal Outcome - Birth Weight			

In this study, 51.43% of the babies weighed between 2.5 to 3.49 kg. In the present study, Apgar score < 7 was noted in 66.67% of the neonates at one minute and 37.14% of the babies at five minutes. In this study, need for resuscitation was noted in 37.14% of the neonates.

In the present study, birth asphyxia was the early neonatal complication noted in 13.33% of the neonates followed by meconium aspiration syndrome (MAS) (1.9%). In this study, 62.86% of the babies were admitted to NICU.

Table 6

Neonatal Outcome	**Distribution (n=105)**	
	Number	**Percentage**
Survivors	66	62.86
Early neonatal mortality	18	17.14
Still birth	21	20.00
Total	**105**	**100.00**
Neonatal Outcome		
Complications	**Distribution (n=85)**	
	Number	**Percentage**
Preterm labour	68	80.00
PPH	24	28.24
Pulmonary oedema	16	18.82
CCU admission	10	11.76
Abruption placenta	10	11.76
DIC	8	9.41
HELLP syndrome	7	8.24
Wound infection	7	8.24
Obstetric shock	4	4.71
Cerebrovascular accident	3	3.53
Postpartum psychosis	3	3.53
Burst abdomen	3	3.53
Obstructed labour	2	2.35
Distribution of Women According to the Maternal Outcome - Type of Complications		

In the present study, 62.86% of the neonates survived and early neonatal mortality was noted in 17.14% of the neonates while stillbirth was noted in 17.14% of the mothers. In the present study, preterm labour was the common maternal complication (80%) followed by postpartum haemorrhage (PPH) (28.24%).

Table 7

Parameters	Distribution (n=105)		Median	Range	
	Mean	SD		Min	Max
Maternal age (Years)	24.18	5.64	23.00	18.00	39.00
Period of gestation at admission (Weeks)	35.51	3.92	36.71	23.57	40.00
Height (cms)	142.43	13.04	146.00	112.00	168.00
Weight (Kg)	56.90	11.68	58.00	34.00	86.00
Pulse rate (/Minute)	87.01	5.68	86.00	72.00	98.00
Respiratory rate (/Minute)	19.34	4.13	18.00	12.00	28.00
Systolic blood pressure (mm Hg)	158.08	14.51	160.00	130.00	220.00
Diastolic blood pressure (mm Hg)	103.56	11.02	106.00	72.00	126.00
Bishop's score	7.82	2.88	8.00	2.00	12.00
Haemoglobin (gm%)	9.65	1.63	10.00	6.00	13.00
Platelet count (/Cumm)	2.05	0.97	2.05	0.60	4.30
SGOT (IU/L)	138.86	113.68	76.00	22.00	450.00
SGPT (IU/L)	159.46	124.81	87.00	26.00	500.00
Serum creatinine (mg/dL)	0.78	0.75	0.60	0.40	5.40
Serum uric acid	4.67	2.60	4.00	3.00	20.00
Admission delivery interval (hours)	4.52	3.13	3.13	1.00	12.00
Seizure to maternal death interval(hours)	44.67	29.14	44.67	14.00	72.00
Maternal hospital stay (Days)	3.98	3.37	2.00	1.00	14.00
Birth weight (Kg)	2.53	0.41	2.50	1.80	3.20
Apgar score (1 minute)	5.17	3.23	6.00	0.00	10.00
Apgar score (5 minutes)	5.83	3.56	7.00	0.00	10.00
Duration of stay in NICU (Days)	0.92	0.93	1.00	0.00	5.00
Maternal and Neonatal Characteristics of the Study Population					

The maternal and neonatal characteristics of the study population are as shown.

Discussion

Eclampsia is a very serious complication of pregnancy responsible for high maternal and perinatal mortality. Eclampsia is a largely preventable condition and is becoming rare in developed countries. Although the incidence of eclampsia has fallen in developed countries and has been reduced to 0.2-0.5 percent of all deliveries.

Furthermore, data on maternal and foetal outcomes in patients with antepartum eclampsia is scant despite being the common condition among the hypertensive disorders of pregnancy.The present study was an attempt to determine the maternal and early neonatal outcomes of antenatal eclampsia so as to reduce maternal and perinatal morbidity and mortality resulting from this common condition in the study area.

In a present study, a total of 105 pregnant women admitted with or who developed antepartum eclampsia were studied for outcome.

Eclampsia usually occurs in patients at both extremes of reproductive age; however, the risk of eclampsia is greatest

in women younger than 20 years. [7] The same was true in the present study. In the present study, age ranged between 18 to 39 years. More than one third of the women were aged ≤ 20 years (39.05%) and the next common age group was 21 to 25 years (25.71%). The mean age was 24.18±5.64 years and median age was 23 years. These observations suggest that most of the women with antepartum eclampsia were young which is in accordance with the socio-cultural practice of early marriage in India.

Further, young age is well a known predisposing factor for preeclampsia and eclampsia. These observations were similar to a recent study by Doley R. et al. [8] (2016) who reported that eclampsia was more prevalent in young pregnant woman in the age group of 20-24 years (52.83%) which is comparable to the other studies. [9, 10] Recently Aabidha PM et al. [11] (2015) also reported that advanced maternal age has been found to be an independent risk factor for pre-eclampsia.

A recent study by Doley R. et al.[8] (2016) reported antepartum eclampsia in 69.81% of the women. Another recent study by Saxena N. et al.[12] (2016) reported that out of 150 patients, 75 patients were referred for convulsions. Headache was the main symptom in 66 patients of severe pre-eclampsia. 11 patients of severe pre-eclampsia later on had convulsions. (8 were antepartum and 3 were postpartum).

In another study by Maji B. et al. [13] (2018), 72% patients had ante-partum eclampsia. However, we could not identify the studies evaluating on women with antepartum eclampsia alone. Hence the direct comparison of the present study with other studies was not done but the results of the present study were compared with studies which have been reported in women with eclampsia. With regard to demographic characteristics, in this study, majority of the women belonged to Hindu religion (88.57%) and were housewives (69.52%).

A study by Maji B. et al. [13] (2018) where 63.55% patients with eclampsia belonged to rural area. In this study, majority of the women presented with headache (78.10%) followed by epigastric pain (43.81%), vomiting (33.33%), leaking liquor per vagina (22.86%), blurring of vision (21.9%) and bleeding per vagina (14.29%). These observations suggest that headache is the common presentation of antepartum eclampsia.

With regard to obstetric history, in the present study, more than half of the women reported primigravida (55.24%) suggesting that highest occurrence of antepartum eclampsia in women with primigravida.

Hernandez *et al.* [14] (2009) in his study found that the risk of pre-eclampsia was 4.1% in the first pregnancy and 1.7% in later pregnancies overall. The risk for multiparous women without a history of pre-eclampsia was around 1%.

In this study, majority of the women (63.91%) were not registered for antenatal care. This observation was strongly in agreement with a study by Saxena N. et al. [12] (2016) where more than half of the patients (59%) were unbooked/transferred.

The observations from the present study were also comparable to the study by Khanum M. et al.15 (2004) where 53% of the women were near to term (32 to 37 weeks) and 34% were at term (>37 weeks). On the contrary, in a study by Doley R. et al.[8] (2016) highest numbers of eclamptic patients were found in the gestational age ≥37 weeks (45.28%) followed by below 37 weeksgestation (30.19%).

Pertaining to other risk factors, in the present study, history of consanguineous marriage was reported by 20.95% of the women and previous history of eclampsia was noted in 5.71% of the women while

family history of eclampsia was noted in 0.95% of the women.

On clinical examination, in this study, pallor was seen in nearly half of the women with antepartum eclampsia (48.57%) followed by pedal oedema (35.24%). Foetal heart sound was audible in majority of the women (80%).

With regard to investigations, in this study, urine examination revealed most of the women with 2+ albumin and sugar was present in 37.14% of the women. Elevated live profile and foetal heart rate (FHR) abnormalities were noted in 49.52% and 47.62% of the women respectively while abnormal oral glucose challenge test/glucose tolerance test (OGCT/GTT) and abnormal coagulation profile were noted in 7.62% and 6.67% of the women respectively. Deranged liver functions were noted by Saxena N. et al. [12] (2016) in 24% of the cases and also PT INR was deranged in 12% patients which was partly in agreement with the present study. [15] In the present study, labour was augmented in majority of the women (71.43%). However, majority of the women underwent vaginal delivery (70.48%) while nearly one fourth of the women (24.76%) underwent LSCS and few women (4.76%) had instrumental delivery.

However, unlike the present study, higher rate of vaginal delivery was reported in studies conducted by Pal et al. [16] (2011) (58.3%), Khan A. et al. [17] (2014) (65.4%) and Khanum M. et al. [15] (2004) (71%). The rate of vaginal delivery sharply correlated with the study by Khanum M. et al.15 (2004). Although the rate of vaginal delivery reported by Pal et al. [16] (2011) (58.3%) and Khan A. et al. [17] (2014) (65.4%). were high, the rate of vaginal delivery in the present study was still higher (70.48%) compared to the studies by Khan A. et al. [17] (2014) and Pal et al. [16] (2011) which can be attributed to timely diagnosis, prompt management with multidisciplinary approach.

In the present study, the rate of stillbirth was 20%. These observations sharply corroborated with a study by Khanum M. et al. [15] (2004) who reported stillbirth at the rate of 21%. Lower rate of stillbirth was reported by Doley R. et al. [8] (2016) (13.21%).

However, Doley R. et al. [8] (2016) in their study reported the percentage of early neonatal death as 9.43% which was less than the present study. Another study by Maji B et al. [13] (2018) reported perinatal death rate of 5.6%. [18]

Overall, the present study showed that eclampsia is one of the grave diseases, peculiar to pregnancy, which is still major cause of not only maternal mortality and morbidity but even neonatal morbidity and mortality in study area. From present study it is evident that antepartum eclampsia results in adverse maternal outcomes like preterm delivery, stillbirth, caesarean section, maternal complications, and mortality.

Conclusion

Eclampsia is still a major cause of not only maternal mortality and morbidity but even neonatal morbidity and mortality in the study area. From present study it is evident that antepartum eclampsia results in adverse maternal outcomes like preterm delivery, stillbirth, increased caesarean section rate, maternal complications, and mortality. Further it also results in adverse neonatal outcomes including low birth weight, low Apgar score, need for resuscitation, NICU admission, early neonatal complications, and early neonatal death.

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