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Assessing the Maternal and Fetal Outcomes among the Eclampsia Patients Attending at Dhaka Medical College Hospital of Bangladesh: A Cross-Sectional

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ABSTRACT

Eclampsia is a life-threatening emergency that contributes to major causes of serious maternal morbidity and mortality worldwide. This descriptive type of cross-sectional study was conducted among 125 eclampsia patients at Eclampsia ward in Dhaka Medical College and Hospital from January to August 2015. The study was aimed to assess the maternal and fetal outcomes of eclampsia patients in Bangladesh. Data were collected through face to face interview by using a pretested semi-structure questionnaire. Study results showed that majority of the respondents' age was between 20-25 years and a number of respondents (66%) had caesarean delivery. Pulmonary edema, HELP syndrome, obstetric shock was found as maternal complications due to eclampsia and maternal death rate was 0.8%. This study also found that perinatal death due to eclampsia was 8.0% and 6.4% were stillborn and 12.8% were IUD. Birth asphyxia, low birth weight, IUGR, prematurity was evident as important causes of neonatal death among eclamptic mothers.

INTRODUCTION

Eclampsia is a life-threatening obstetric complication characterized by hypertension, proteinuria, and convulsion with unknown etiology (Damien et al., 2003). It is the occurrence of convulsion in association with the features of pre-eclampsia, which requires immediate diagnosis and management (Philip et al., 2004). Eclampsia is a multisystem disorder that involves failure of vital organs, which may lead to deterioration of maternal and fetal condition, resulting in high maternal and perinatal mortality and morbidity (Amaral et al., 2017).

Preeclampsia and eclampsia are major causes of maternal and perinatal morbidity and mortality. Transient neurological deficit is common, but persistent deficits are rare (Ross et al., 2011). Perinatal mortality rates of up to 19.1% are reported from centers in Nigeria in association with eclampsia (Ade-Ojo & Loto, 2008). The incidence varies widely in different countries and even in different zones of the same country. The incidence of eclampsia in developed countries is approximately 1 in 2000 deliveries (Douglas & Redman, 1994). In developing countries, it is from 1 in 100 to 1 in 1700 (Crowther, 2009; Bergström et al., 2012). More than 500,000 women die of pregnancy-related causes each year, and 99% of deaths occur in developing countries (Mahler, 2011; Rosenfield & Maine, 2005). Among them, 50,000 maternal deaths occur due to eclampsia every year (Duley,2012).

In Bangladesh, about 4,500 women die due to eclampsia, which contributes 16% of maternal mortality in one year (Fauveau et al., 2008). At present, the perinatal mortality rate in Bangladesh is 65 per 1,000 live births (Niport et al., 2004). Eclampsia is associated with increased rates of perinatal mortality and morbidity. Two different studies in Bangladesh showed that the perinatal mortality rate due to eclampsia was 28% and 32% (Shamsuddin et al., 2005; Shahabuddin et al., 2016). The causes behind the high incidence of maternal and perinatal mortality and morbidity include lack of antenatal care, low socio-economic status, illiteracy, ignorance of the disease, substandard care, shyness, and religious beliefs. Poor communication facilities and social superstitions are also important factors (Shabnam Rahman et al., 2022).

There are approximately 3.6 million births per year in Bangladesh and over 10,000 women develop eclampsia each year (Tahmina et al., 2014). It is one of the common causes of maternal mortality and responsible for 20% of maternal death (Villar & Sibai, 1988). Low educational status and low socioeconomic condition among the women of Bangladesh is the main cause of absence of antenatal care and development of eclampsia. Eclampsia is a major cause of stillbirth and neonatal death, intra uterine growth retardation (IUGR), low birth weight (LBW), prematurity and neonatal asphyxia are another consequence of eclampsia. Though a number of patients delivered a healthy baby with good outcome, perinatal mortality is high to the extent of 30-50 percent in eclampsia (Connell et al., 1987).

A study on factors associated with severe preeclampsia and eclampsia in Jahun, Nigeria was found that 16% women had eclampsia who had history of previous preeclampsia and hypertension (Rayamajhi et al., 2003). Maternal and perinatal case fatality rates were 7.89% and 20.73% respectively among eclamptic patients in Tanzania (Onuh & Aisien, 2004). Another study conducted in Nepal was also found that eclampsia is associated with poor fetomaternal outcome (Sultana & Dempsey, 2017). Maternal complications like pulmonary edema, intra-cerebral hemorrhage, disseminated intravascular coagulopathy (DIC), acute renal failures etc. are serious reasons causing maternal mortality and morbidity (Sibai et al., 1990; Connell et al., 1987; Bugalho et al., 2001). The most common cause of foetal deaths are pre-maturity and birth asphyxia (Dare et al., 1998). A previous study was assessed knowledge of pre-eclampsia and eclampsia among women in Bangladesh (Tahmina et al., 2014). Another prospective study was done in Chuadanga Sadar Hospital, to measure the outcome of eclampsia patients in district hospital in Bangladesh (Villar & Sibai, 1988). Research conducted in Sylhet region of Bangladesh was identified the prevalence of preeclampsia and the associated risk factors among the pregnant women (Mou et al., 2021). However, there is limited of data regarding maternal and fetal outcomes among the Eclampsia patients attending at Dhaka Medical College Hospital of Bangladesh. As a consequence, this study was designed to assess the maternal and fetal outcomes among the Eclampsia patients attending at Dhaka Medical College Hospital of Bangladesh. This study may provide some guidelines for establishing plans to improve maternal and perinatal outcomes and could generate interest in further study.

MATERIALS AND METHODS

Study Design & Setting

This descriptive type of cross-sectional study was conducted in the department of Dhaka Medical College Hospital (DMCH) located in the Dhaka city of Bangladesh. The study was conducted during the time period of January to August 2021.

Study population, sample size and sampling strategy

Study population was the eclampsia patients admitted at Dhaka Medical College Hospital (DMCH) during data collection period. A total of 125 samples were taken for data collection. Purposive non-probability sampling technique was used to select the target sample size. Eclampsia patients who were severely ill, non-cooperative and unwilling to participate were excluded from the study.

Data collection procedure and quality control

Data was gathered by using a semi-structured interview questionnaire. The questionnaire's suitability, appropriateness, acceptability, and sequences of the questions were pretested among 15 members of the eclamptic patients who were not sampled. Face-to-face interviews were done with respondents for data collection. Before starting the interview a written informed consent was taken from the respondents and ensured they understood the study's objectives.
The fact that the respondents might choose whether or not to respond to any question was made clear to them. Regarding some ethical issues, they were given complete assurance that the study's findings would never be disclosed to anyone who wasn't participating in it or used for the purpose for which it was intended.

Data analysis

After interviews, each questionnaire was carefully reviewed for accuracy, completeness, and internal consistency to make sure no information was left missing or inconsistent. Prior to coding and analysis, the researchers themselves evaluated and edited all of the data using "Statistical Package for Social Science (SPSS) version 16.0." The analytical strategy was developed while keeping in mind the study's objectives. The data was presented by using tables, graphs, and charts.

Ethical Issue

The study proposal was submitted to 'FAHS Research Ethics Committee, Daffodil International University or approval. Before collecting data, the study volunteers were taken written informed consent from the participants. The participants identities were protected, and they were made aware that they could withdraw at any time during the data collection process. Anonymity and confidentiality was strictly maintained. Administrative approval was also taken from the Dhaka Medical College Hospital authority.

RESULTS

Socio-demographic information of the participants

Table-1 represents the socio-demographic characteristics of the respondent. A total of 125 Eclampsia patients were interviewed. Out of 125 respondents 21(16.8%) of the respondent are 15-19 years of age, 56(44.8%) respondent are 20-25 years, 33(26.4%) respondent are 26-30 years, 15(12.0%) respondent are >30 years. The monthly family income of the majority of respondents 54(43.2%) were between 10,001-15,000 TK, then 27(21.6%) earned <10,000 Tk, and similar 22(17.6%) earned 15,001-20,000 Tk, 22(17.6%) earned >20,000 Tk. Maximum respondents 68(54.4%) were lived in rural areas whereas remaining 57(45.6%) were lived in urban areas. Among 125 respondents 59(47.2%) had

Participants' characteristics		Frequency	%
Age	15-19 years	21	16.8
	20-25 years	56	44.8
	26-30 years	33	26.4
	>30 years	15	12.0
	Mean ± SD	**24.45 ± 5.2**	
Monthly family income	< 10,000 Tk	27	21.6
	10,001-15,000 Tk	54	43.2
	15,001-20,000 Tk	22	17.6
	>20,000 TK	22	17.6
Residential status	Urban	57	45.6
	Rural	68	54.4
Level of education	Informal education	13	10.4
	Primary School	59	47.2
	Secondary School	37	29.6
	Above Secondary School	16	12.8
Present Occupation	Housewife	108	86.4
	Service holder	6	4.8
	Business	1	0.8
	Others	10	8.0
Husband education	Informal education	1	0.8
	Primary School	56	44.8
	Secondary School	44	35.2
	Above Secondary School	24	19.2
Husband Occupation	Service holder	24	19.2
	Farmer	14	11.2
	Business	34	27.2

	Others	53	42.4

Completed primary education, 37(29.6%) had secondary school, only 16(12.8%) had completed above secondary school, and 13(10.4%) respondents were informal education. Among this study group majority of respondents 108(86.4%) were housewife, 6(4.8%) were service holder, 1(0.8%) had business and 10(8.0%) were others service. 56(44.8%) respondents husband completed primary education, 44(35.2%) husband completed secondary school, 24(19.2%) husband had above secondary school, only 1(0.8%) husband had informal education. Among this study group majority of respondents husband 53(42.4%) were others service, 34(27.2%) were business, 24(19.2%) were service holder and 14(11.2%) were farmer **(Table1)**.

Table 1: Socio-demographic characteristics of the participants

Figure 1 represents religion of the respondents where most of them 119(95.2%) were Muslims and only 6(5%) were Hindu.

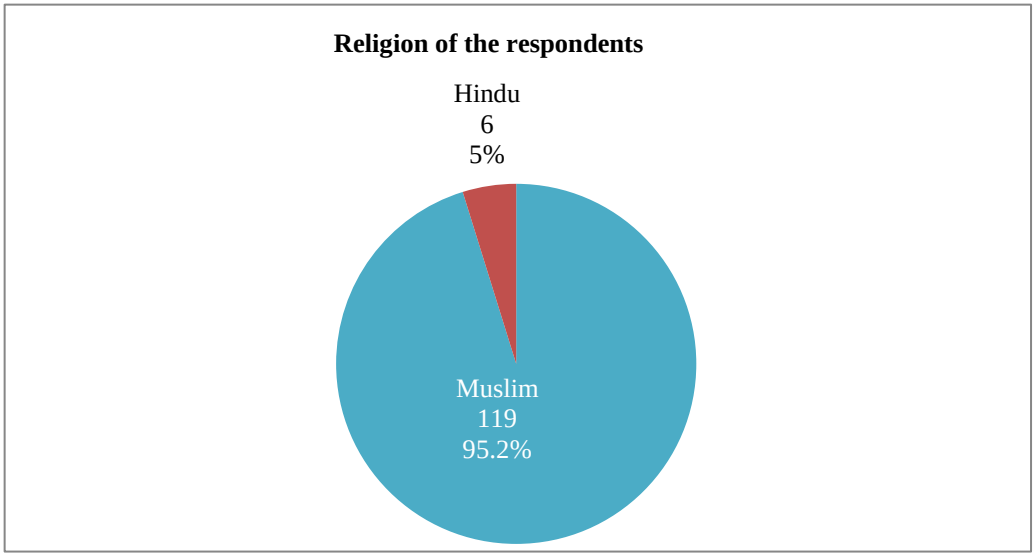

Figure 1: Distribution of respondents according to religion (n= 125)

It can be shown from **figure 2** that 59.2% respondents were belongs to joint family and 40.8% were from nuclear family.

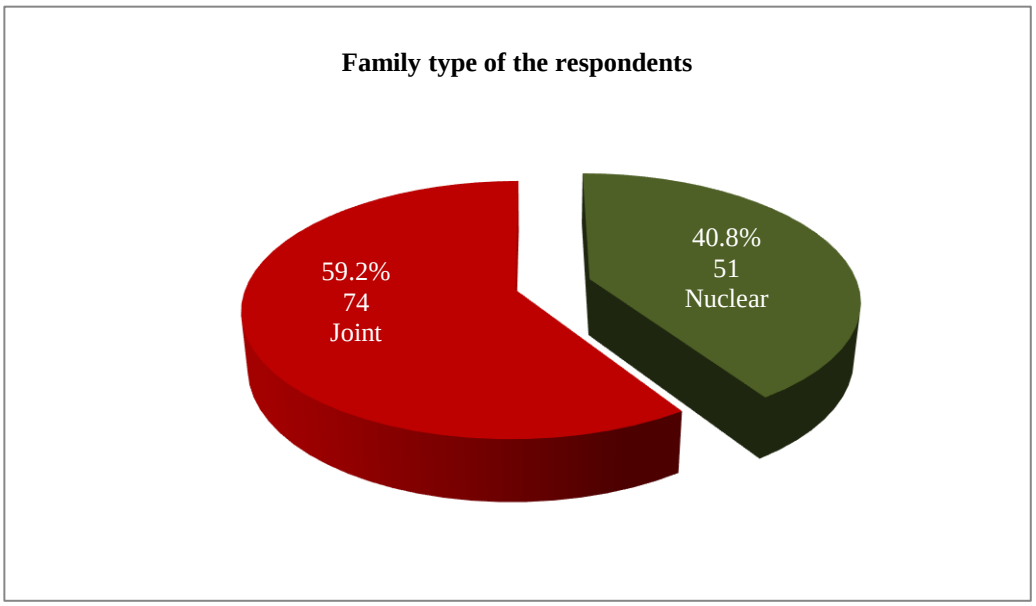

Figure: 2 Distribution of respondents according to family type (n = 125)

Risk factors of eclampsia patients

Table 2 shows the risk factors of eclampsia amomg the women. A total 125 respondents were interviewed, among them a large number of women were primipara 64(51.2%) and 61(48.8%) were multipara, gap between pregnancy was <1year among 7(5.6%) respondents, 1-2years among 32(25.6%) and >2years among 22(17.6%) women. A number of 100(80.0%) respondents had oedema and minority 25(20.0%) had no oedema. Majority of 82(65.6%) the respondents had no anemia and 43(34.4%) had anemia. Most of the respondents 119(95.2%) had no previous history of eclampsia and only 6(4.8%) had previous history of eclampsia. Among 125 respondent's majority of them 119(95.2%) had no diabetes, 113(90.4%) had no hypertension and only 1(0.8%) had renal disease.

Table 2 Risk factors of eclampsia

Risk factors of eclampsia		Frequency	% Distribution
Parity	Primi	64	51.2
	Multi	61	48.8
Inter pregnancy space	<1 year	7	5.6
	1-2 years	32	25.6
	>2 years	22	17.6
History of multiple pregnancy	Yes	4	3.2
	No	57	45.6
Previous history of eclampsia	Yes	6	4.8
	No	119	95.2
Edema	Yes	100	80.0
	No	25	20.0

Anaemia	Yes	43	34.4
	No	82	65.6
Diabetes	Yes	6	4.8
	No	119	95.2
Hypertension	Yes	12	9.6
	No	113	90.4
Renal disease	Yes	1	0.8
	No	124	99.2

Maternal outcome of eclampsia patients

Table 3 showed maternal complications and outcome of eclampsia patients. Study findings revealed that (1.8%) eclampsia patients were developed pulmonary edema, 2.4% had HELP syndrome, 4.0% had obstetric shock and this study also found 0.8% mothers were died due to eclampsia.

Table 3 Maternal complications of eclampsia patients (n=125)

Complications	Frequency	Percent (%)
Disseminated Intravascular Coagulopathy (DIC)	0	0
Acute renal failure	0	0
Pulmonary edema	1	1.8
HELP syndrome	3	2.4
Obstetric shock	5	4.0
Death	1	0.8
None	115	91.0
Total	**125**	**100**

Eclampsia patient's occurrence of fits is shown in figure 3. Majority of the patients fits during their antepartum period (76.8%) [Figure-3].

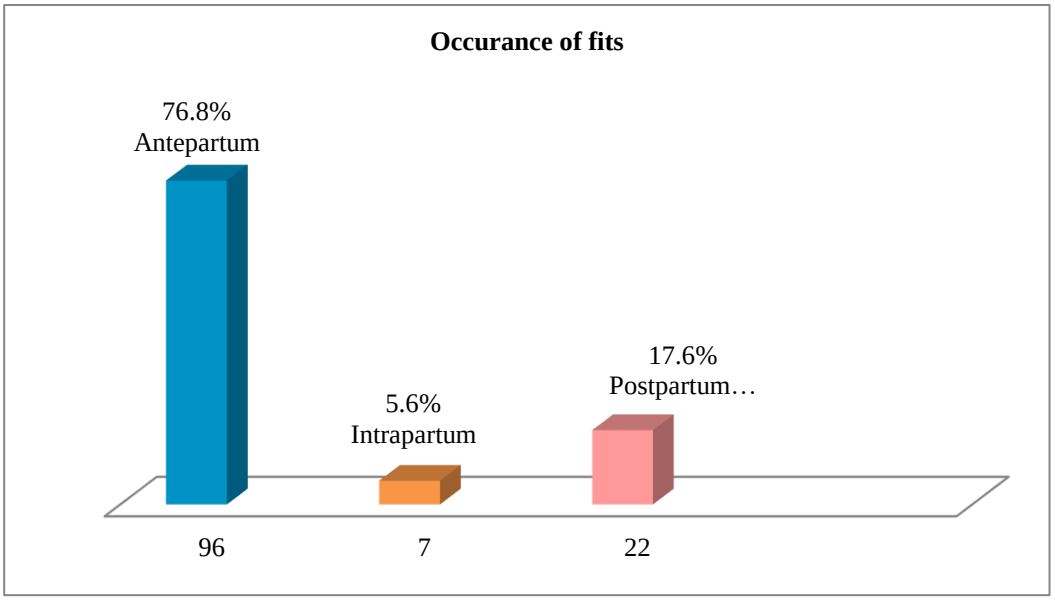

Figure 3: Distribution of the respondents according to occurrence of fits (n=125)

Figure 4 depicts mode of delivery among eclampsia patients. It can be seen that most of the (66%) respondents had caesarean section and 34% had normal vaginal delivery.

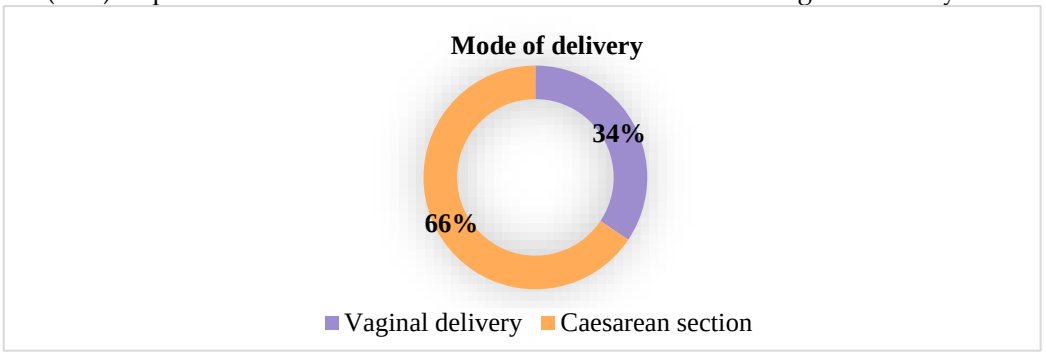

Figure 4: Distribution of the respondents according to the mode of delivery

Neonatal outcomes of eclampsia patients

Neonatal outcomes of eclampsia patients are shown in table 3. 8.0% neonate were dead, 6.4% were stillborn and 12.8% were IUD. Birth asphyxia was present among 48.8% neonates, 66.4% neonates were low birth weight and 68.0% were preterm newborn. Among 125 mothers with eclampsia 28% neonates had Intra uterine growth retardation.

Table 3 Neonatal outcomes of eclampsia patients

DISCUSSION

After PPH, eclampsia is the second most frequent cause of maternal death. In Bangladesh, eclampsia is responsible for approximately 16% of maternal deaths. In the developing world, the mortality rate from hypertension diseases is substantially higher. Death in hypertensive disorders is associated with inadequate or absent prenatal treatment (Ross et al., 2011; Ade-Ojo & Loto, 2008). This study was designed to assess the maternal and fetal outcomes of eclampsia patients in Bangladesh.

Neonatal outcomes		Frequency	Percent (%)
Perinatal outcome	Alive	91	72.8
	Dead	10	8.0
	Still born	8	6.4
	IUD	16	12.8
Birth Asphyxia (n=107)	Present	61	48.8
	Absent	48	38.4
Birth Weight	Normal birth weight	42	33.6
	Low birth weight	83	66.4
Maturity	Preterm	85	68.0
	Full term	40	32.0
IUGR (Intra uterine growth retardation)	Yes	35	28.0
	No	90	72.0

In our study, most of the respondents (44.8%) were between age group 20-25 years. Many studies in Bangladesh found that eclampsia is more prevalent below 25 years of women (Bergström et al., 2012; Shahabuddin, Hasnat, Hamid, & Rahman, 2016). In our study, most of the respondents (44.8%) were between age group 20-25 years. Many studies in Bangladesh found that eclampsia is more prevalent below 25 years of women (Bergström et al., 2012; Shahabuddin, Hasnat, Hamid, & Rahman, 2016). This study showed most of the patients had poor economic condition (43.2%) that is consistent with another finding of the study that 52% of the patients were from poor and lower middle class (Shahabuddin, Hasnat, Hamid, & Rahman, 2016; Villar & Sibai, 1988), a great number of them had primary level of education (47.2%) which was also found similar with another study that 75% patients were either illiterate or got primary education only (Villar & Sibai, 1988; Sibai, Villar, & Mabie, 1990). This study also revealed most of the women were housewives (86.4%), most of them were primi gravida (51.2%) and the majority of them came from rural areas (54.4%) which is in line with another study result (Bergström et al., 2012; Connell, Dalgleish, & Downing, 1987; Rayamajhi, Uprety, Agrawal, & Pokhrel, 2003).

In our research, 76.8% patients were fit during their antepartum period. Begum M. R. and Choudhary P. also showed in their study that >75% of patients were in the antepartum eclampsia group (Rayamajhi, Uprety, Agrawal, & Pokhrel, 2003; Choudhary, 2003). In our study, most of the (66%) respondents had a cesarean section and 34% had normal vaginal

delivery. Another study conducted in Bangladesh in 2014 found that among the antepartum eclamptic patients 90% had spontaneous vaginal delivery and only 10% had delivered by LUCS, which indicates that nowadays cesarean delivery is increasing in Bangladesh (Shahabuddin, Hasnat, Hamid, & Rahman, 2016).

This study observed maternal complications due to eclampsia were pulmonary edema, HELP syndrome, and obstetric shock at 0.8%, 2.4%, and 4.0%, respectively. Begum M. R. also found that pulmonary edema and obstetric shock were 10.3% and 7%, respectively (Bergström et al., 2012). Our study found only 0.8% deaths among eclampsia patients, which is in contrast with another research finding that 8% of mothers died due to eclampsia (Shahabuddin, Hasnat, Hamid, & Rahman, 2016). The difference in the findings may be due to early hospital arrival and availability of better treatment facilities.

Eclampsia not only kills the mother but also kills the fetus. It had been found from our research that 8.0% neonates were dead, 6.4% were stillborn, and 12.8% were IUD. Similar to our findings in Shahabuddin's study, they found that stillbirth was 24.50% and neonatal death was 8.40% among eclamptic patients (Shahabuddin, Hasnat, Hamid, & Rahman, 2016). Neonatal complications found in this research were birth asphyxia among 48.8% neonates, 66.4% neonates were low birth weight, and 68.0% were preterm newborns. Among 125 mothers with eclampsia, 28% of neonates had intrauterine growth retardation. Several studies showed perinatal deaths were higher in low-birth-weight babies (Shahabuddin, Hasnat, Hamid, & Rahman, 2016; Sultana & Dempsey, 2017). In Shahabuddin's study, carried out in Bangladesh, asphyxia was a major cause of neonatal loss with or without prematurity (Shahabuddin, Hasnat, Hamid, & Rahman, 2016). Irin's study showed that the common causes of fetal deaths are birth asphyxia and prematurity (Rayamajhi, Uprety, Agrawal, & Pokhrel, 2003). Our study has significant limitations because we selected a smaller sample size due to time and financial constraints.

CONCLUSION AND RECOMMENDATIONS

This study found that pulmonary edema, HELP syndrome, obstetric shock were most common complications of eclampsia and majority of the patients fits during their antepartum period. Perinatal death rate remains high in eclamptic women. Still birth, prematurity, IUGR and birth asphyxia were found as important causes of perinatal loss among the eclampsia patients. Early diagnosis and management of pre-eclampsia and hypertensive diseases are important to prevent eclampsia. Early referral of eclampsia patients, better obstetric management, early resuscitative measures and good neonatal care facilities can improve the perinatal outcome.

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