

A Study on Fetomaternal Outcome of Preterm Eclampsia and its Relationship with Mode of Delivery

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DOI: 10.36348/sijog.2023.v06i01.007

Received: 24.12.2022 | Accepted: 27.01.2023 | Published: 28.01.2023

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Abstract

Introduction: Eclampsia (Greek, “shining forth”) is an acute and life-threatening complication of pregnancy, and is characterized by the appearance of tonic-clonic seizure, usually in a patient who had developed pre-eclampsia. Pre-eclampsia and eclampsia are collectively called hypertensive disorders of pregnancy and toxemia of pregnancy. This study aimed to analyze the fetomaternal outcome of preterm eclampsia and its relationship with the mode of delivery. **Methods:** This descriptive type of cross-sectional study was conducted at the eclampsia unit of the Department of Obstetrics and Gynecology, Dhaka Medical College Hospital, Dhaka, Bangladesh. The study was carried out from February 2012 to July 2012. A total of 92 subjects were enrolled in this study as per inclusion criteria. **Result:** In this study, the prevalence of eclampsia was 10.12%, and preterm eclampsia was 1.31%. The majority of the patients (48.91%) were within 20-25 years of age, and only 1.09% were >30 years of age. Most of the patients were primi gravida (78.26%). The majority of the patients (54.35%) reported within 3-5 hours. Most of the patients came at 33-34 weeks gestation, but quite a significant percentage (30%) came at 28-32 weeks of gestation. A large number of patients delivered spontaneously, a fair number of patients were induced & a few patients required LSCS. In both SVD & induced groups, the majority of the patients (62% & 66% respectively) were delivered within 7-12 hours. In the SVD group, 10% of patients were delivered within 6 hours whereas in the cesarean section group 85% of patients were delivered within 6 hours. Maximum patients (81%) had induction delivery intervals between 7-12 hours. 12 (60%) patients had LSCS done due to fetal distress, 2 (10%) due to previous H/O LSCS, 1 (5%) due to primi gravida with a twin pregnancy, and 5(25%) due to primi gravida with breech presentation. Of patients who presented at 28-32 weeks of gestation, among them 16 had SVD, 11 patients had induction of labor, and LSCS was done in only one case & which was stillborn. The majority of the babies in the SVD & induced group developed asphyxia (81% & 90% respectively) and the majority needed admission to NICU (62% & 73% respectively). PND was also high (>50%) in both groups. Of patients who presented at 33-34 weeks of gestation, 19 had SVD, 15 patients had induction of labor, and only 4 patients required LSCS. A significant number of babies in all three groups (42%, 47% & 100% respectively) were healthy. Although in SVD & induced groups a large number of babies developed asphyxia (58% & 47% respectively) and admission was required in NICU 26% in both groups. PND was few in both groups. For patients who presented at 35-36 weeks of gestation, the majority was delivered by LSCS (15) & outcomes of babies were good in this group as well as in the SVD group. Only one baby developed birth asphyxia. The maternal outcome was good in all three groups (85%, 91%, & 100% respectively). No maternal complication occurred in the cesarean section group. In SVD & induced group few maternal complications occurred such as recurrent convulsion (12% & 13% respectively), CVD (single case in both groups), pulmonary edema (1), HELLP syndrome (1), and septicemia (1). Three mothers die in SVD & induced group. **Conclusion:** This study concluded that early-onset eclampsia has been associated with worse perinatal outcomes. Gestational age <32 weeks who do not go into labor spontaneously may offer induction, as the cesarean section does not carry any good prognosis to the fetus but rather increases morbidity to the mother. When gestational age crosses >33 weeks, a complete evaluation of the fetal condition, mental condition, and cervix is necessary to plan for the mode of delivery.

Keywords: Eclampsia, Gestational Age, Pre-eclampsia, HELLP Syndrome, LSCS.

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INTRODUCTION

Hypertension in pregnancy is a significant management problem for every obstetrician. Pregnant women with hypertension can be broadly divided into one of three categories: chronic hypertension, pregnancy-induced hypertension, and pre-eclampsia [1]. Eclampsia is an extremely severe form of pre-eclampsia characterized by the sudden onset of a

generalized tonic-clonic seizure. Hypertension associated with proteinuria greater than 0.3 g/l in 24-hour urine collection or 1+ by qualitative urine examination, after 20 weeks of gestation is called pre-eclampsia [2]. Eclampsia includes seizures and coma that happen during pregnancy but are not due to pre-existing or organic brain disorders [3]. When eclampsia occurs before 37 weeks gestation is early onset eclampsia/ preterm eclampsia. [4]. Most pre-eclampsia

has an onset near term, but approximately 10% of cases have an early onset before 34 weeks of gestation [5]. It is believed that early-onset eclampsia that requires preterm delivery has underlying pathology that differs and is more severe than that of late-onset pre-eclampsia [6]. Early onset eclampsia has been associated with perinatal outcomes, such as small-for-gestation-age (SGA) infants, than eclampsia that has onset at term [7, 8]. Studies showed that in preterm eclampsia impaired renal function occurred in 10% of cases, coagulopathy in 36%, placental dysfunction in 40%, low birth weight baby in 13%, and the perinatal mortality rate was 18% compared to term eclampsia [8]. Early onset eclampsia is also characterized by increased severity, including developing HELLP (hemolysis, elevated liver enzymes, and low platelet count) syndrome and placental abruption [9]. An increased risk for pre-eclampsia is associated with first-time pregnancies, teenage pregnancies, mothers aged over 40, African-American women, multiple pregnancies, and women with a history of diabetes, hypertension, or renal diseases [10]. Severe pre-eclampsia and eclampsia in a developed country are nearly 5/1000 maternities [11]. Its incidence in developing countries varies from 1 in 100 to 1 in 1700 [12]. A study in a tertiary-level teaching institution in South India shows the incidence of eclampsia was 0.87% of total hospital deliveries and increasing in consecutive years. 70% were primi gravida and 95% of patients had not received antenatal checkups and were alarmingly unaware of any kind of examination during pregnancy. Eclampsia accounted for 20.9% of all maternal deaths and the case mortality rate of 7.8% in India [13]. The incidence of eclampsia is extraordinarily high in Bangladesh is 7.9% according to a result of the house-to-house survey [14] in this country only 2.3% of women end their pregnancy under medical supervision, the rest have no access to obstetric care [15]. In Bangladesh, the current maternal mortality rate is 194 per 1,00,000 live births. Among them, eclampsia is the second leading cause of death [16]. This study aimed to analyze the fetomaternal outcome of preterm eclampsia and its relationship with the mode of delivery.

OBJECTIVE

General Objective

- To determine the maternal and fetal outcome of preterm eclampsia and its relation to the mode of delivery.

Specific Objectives

- To evaluate the mode of delivery of preterm eclampsia.
- To find out the prevalence of preterm eclampsia.
- To find out the maternal & fetal morbidity and mortality associated with preterm eclampsia and its relation with the mode of delivery.

- To prepare a guideline to select the mode of delivery in preterm eclampsia.

METHODS

This descriptive type of cross-sectional study was conducted at the eclampsia unit of the Department of Obstetrics and Gynecology, Dhaka Medical College Hospital, Dhaka, Bangladesh. The study was carried out from February 2012 to July 2012. A total of 92 subjects were enrolled in this study as per inclusion criteria. Data were collected by a pre-structured questionnaire. Informed written consent was obtained from the study subjects before the commencement of the study. Subjects were also assured about their confidentiality and freedom to withdraw themselves from the study at any time. Data were processed and analyzed manually. Ethical clearance was obtained from the ethical committee of Dhaka Medical College Hospital.

Inclusion Criteria

- All patients of eclampsia within gestational age 28-36 weeks were admitted to the eclampsia ward in DMCH.
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Patients of less than 28 weeks gestation and more than 36 weeks gestation.
- Patients with post-partum eclampsia.

RESULTS

In this study, the prevalence of eclampsia was 10.12%, and preterm eclampsia was 1.31% [Table 1]. Majority of the patients (48.91%) were within 20-25 years of age, and only 1.09% were >30 years of age [Table 2]. Most of the patients were primi gravida (78.26%) [Table 3]. Majority of the patients (54.35%) reported within 3-5 hours [Table 4]. Most of the patients came at 33-34 weeks gestation, but quite a significant percentage (30%) came at 28-32 weeks of gestation [Table 5]. A large number of patients delivered spontaneously, a fair number of patients were induced & a few patients required LSCS [Table 6]. In both SVD & induced groups, the majority of the patients (62% & 66% respectively) were delivered within 7-12 hours. In the SVD group, 10% of patients were delivered within 6 hours whereas in the cesarean section group 85% of patients were delivered within 6 hours [Table 7]. Maximum patients (81%) had induction delivery intervals between 7-12 hours [Table 8]. 12 (60%) patients had LSCS done due to fetal distress, 2 (10%) due to previous H/O LSCS, 1 (5%) due to primi gravida with a twin pregnancy, and 5 (25%) due to primi gravida with breech presentation [Table 9]. Of Patients who presented at 28-32 weeks of gestation, among them 16 had SVD, 11 patients had induction of labor, and LSCS was done in only one case & which was stillborn. The majority of the babies in the SVD &

induced group developed asphyxia (81% & 90% respectively) and the majority needed admission to NICU (62% & 73% respectively). PND was also high (>50%) in both groups [Table 10]. Of Patients who presented at 33-34 weeks of gestation, 19 had SVD, 15 patients had induction of labor, and only 4 patients required LSCS. A significant number of babies in all three groups (42%, 47% & 100% respectively) were healthy. Although in SVD & induced groups a large number of babies developed asphyxia (58% & 47% respectively) and admission was required in NICU 26% in both groups. PND was few in both groups [Table 11]. In Patients who presented at 35-36 weeks of

gestation, the majority was delivered by LSCS (15) & outcomes of babies were good in this group as well as in the SVD group. Only one baby developed birth asphyxia [Table 12]. Maternal outcome was good in all three groups (85%, 91%, & 100% respectively). No maternal complication occurred in the cesarean section group. In SVD & induced group few maternal complications occurred such as recurrent convulsion (12% & 13% respectively), CVD (single case in both groups), pulmonary edema (1), HELLP syndrome (1), and septicemia (1). Three mothers die in SVD & induced group [Table 13].

Table 1: Prevalence of preterm eclampsia (N= 92)

Total obstetric patients	Total eclampsia patients	Preterm eclampsia patients	Eclampsia (%)	Preterm eclampsia (%)
6990	708	92	10.12	1.31

Table 2: Age distribution of preterm eclampsia patients (N=92)

Age (years)	N	%
15-19	34	36.96
20-25	45	48.91
26-30	12	13.04
>30	01	01.09
Total	92	100

Table 3: Obstetric history of preterm eclampsia patients (N=92)

Obstetric history	N	%
Primigravida	72	78.26
Multigravida	20	21.74
Total	92	100

Table 4: Time interval between onset of convulsions and hospitalization (N=92)

Time interval (hours)	N	%
0-2	36	39.13
3-5	50	54.35
6-10	05	05.43
>10	01	01.09
Total	92	100

Table 5: Gestational age distribution of preterm eclampsia patients (N=92)

Gestational age (weeks)	N	%
28-32	28	30.44
33-34	38	41.30
35-36	26	28.26
Total	92	100

Table 6: Mode of delivery of preterm eclampsia patients (N=92)

Mode of delivery	N	%
Spontaneous vaginal delivery	40	43.48
Induced vaginal delivery	32	34.78
LSCS	20	21.74
Total	92	100

Table 7: Time interval between convulsions to delivery among the different modes of delivery (N=92)

Time interval (hour)	Spontaneous vaginal delivery; n=40 (%)	Induced vaginal delivery; n=32 (%)	LSCS; n=20 (%)
0-6	04 (10.0)	00 (0.0)	17 (85.0)
7-12	25 (62.50)	21 (65.63)	03 (15.0)
13-20	10 (25.0)	08 (25.0)	00 (0.0)
>20	01 (02.50)	03 (09.37)	00 (0.0)
Total	40 (100)	32 (100)	20 (100)

Table 8: Time interval of induction to delivery (n=32)

Time interval (hours)	Vaginal-induced delivery (n)	%
0-6	03	09.38
7-12	26	81.25
13-20	01	03.12
>20	02	06.25
Total	32	100.0

Table 9: Indications of LSCS (n=20)

Indications	n	%
Fetal distress	12	60.0
Previous H/O C/S	02	10.0
Primi twin	01	05.0
Primi breech presentation	05	25.0
Total	20	100.0

Table 10: Neonatal outcome of group A (28-32 weeks) patients (n=28)

Neonatal outcome	Spontaneous vaginal delivery; n=16 (%)	Induced vaginal delivery; n=11 (%)	LSCS; n=01 (%)
Healthy baby	01 (6.25)	01 (9.09)	-
Birth asphyxia	13 (81.25)	10 (90.91)	-
Stillborn	02 (12.5)	-	01 (100)
PND	08 (50.0)	06 (54.55)	-
Admission required in NICU	10 (62.5)	08 (72.77)	-

Table 11: Neonatal outcome of group B (33-34 weeks) patients (n=38)

Neonatal outcome	Spontaneous vaginal delivery; n=19 (%)	Induced vaginal delivery; n=15 (%)	LSCS; n=04 (%)
Healthy baby	08 (42.11)	07 (46.67)	04 (100)
Birth asphyxia	11 (57.89)	07 (46.67)	
Stillborn	-	01 (6.66)	
PND	02 (10.53)	01 (6.66)	
Admission required in NICU	05 (26.31)	04 (26.67)	

Table 12: Neonatal outcome of group C (35-36 weeks) patients (n=26)

Neonatal outcome	Spontaneous vaginal delivery; n=05 (%)	Induced vaginal delivery n=06 (%)	LSCS; n=15 (%)
Healthy baby	05 (100)	05 (83.33)	15 (100)
Birth asphyxia	-	01 (16.67)	-
Stillborn	-	-	-
PND	-	-	-
Admission required in NICU	-	-	-

Table 13: Maternal outcome concerning the mode of delivery (N=92)

Maternal outcome	Spontaneous vaginal delivery; n (%)	Induced vaginal delivery n (%)	LSCS; n (%)
Good recovery	34 (85.0)	29 (90.64)	20 (100)
Recurrent convulsions	05 (12.5)	01 (3.12)	-
CVD	01 (2.5)	01 (3.12)	-
Pulmonary edema	-	01 (3.12)	-
HELLP syndrome	-	01 (3.12)	-
Septicemia	01 (2.5)	-	-
Maternal death	02 (5.0)	01 (3.12)	-

DISCUSSION

A total of 6990 patients were admitted, among them 708 were eclamptic and 92 were preterm making the incidence of eclampsia 10.12 %, among them preterm eclampsia was 12.99%. The prevalence of preterm eclampsia was 1.31%. One study showed an incidence of eclampsia of 9% [17]. Another study showed early onset pregnancy-induced hypertension/eclampsia contributed 6.3% of all cases of hypertensive disorders in pregnancy with an incidence of 1:141 deliveries which is similar to this study [18]. In this study majority of the patients (48.91%) were within 20-25 years of age, only 1.09% were >30 years of age and most of them were primi gravida (78%) followed by multipara 22% which was similar to study done by another author and showed that, majority of the patients were in the age group between 20- 30 years (53.8%) [19]. Another study found that primi gravida was most frequent i.e. 52.83% followed by multipara (parity2-4) at 39.6% & grand multipara at 7.5% [20]. In this study, the majority of the patients presented in gestational age 33-34 weeks (41%) which differs from another study where most cases of early-onset eclampsia presented at between 28-32 weeks gestation (78.34) [18]. Sometimes the patient party delay in deciding to seek medical assistance and has difficulty in getting transportation to reach the hospitals. This study revealed that 39.13% of patients came to the hospital within 2 hours, 54.35% came in 3-5 hours, 5.43% came in 6-10 hours and 1.09% came after >10 hours. Termination of pregnancy is the only definitive treatment of eclampsia but the decision of mode of delivery is crucial. In this study 40(43.44%) patients delivered per vaginally spontaneously, 32(34.78%) patients required induction, and 20(21.74%) patients underwent LUCS. A study showed cesarean section was the mode of delivery in 58.7% of cases [18]. The chance of fetal survivability is less in preterm eclampsia when the gestational age is less than 33/34 weeks. Eclampsia itself is not an indication of a cesarean section. Cesarean section was done only for an obstetric indication as 12(60%) patients for fetal distress, 2(10%) had a previous history of LSCS, 1(5%) for twin pregnancies with prolonged 1st-stage of labor, and 5(25%) patients had a breech presentation. In preterm pregnancies, the cervix remains unfavorable. So caesarian section is a common mode of termination of pregnancy but the chance of fetal survivability is less in

preterm eclampsia when gestational age is less than 32wks. Cesarean section also carries higher morbidity and mortality in these hemodynamically unstable patients. As misoprostol is available for induction, especially in the unripe cervix and it significantly reduces the induction delivery interval [17]. In this study majority of the babies in the SVD & induced group developed asphyxia (81% & 90% respectively) and the majority needed admission to NICU (62% & 73% respectively). PND was also high (>50%) in both groups. Another study observed that, for women presenting with a live fetus, the perinatal outcome was better for cases that had cesarean section 52.1% survival rate, compared to 40% for those that had failed induction & cesarean section and 28.6% for women with induction of labor & vaginal delivery [18]. As the gestational age increases the chance of fetal outcome is good and perinatal morbidity is less. So in this study healthy babies were delivered 42.11%, 46.67% & 100% in spontaneous, induced vaginal delivery & LSCS and 100%, 83.33% & 100% in spontaneous, induced delivery & LSCS group at 33-34weeks & 35-36 weeks respectively. Chance of PND was also reduced in the near term showing 10.15%, 6.66%, & none in the spontaneous, induced & LSCS group at 33-34 weeks and no PND at 35-36 wks. In this study overall maternal outcome was good; 85%, 90.64%, & 100% in spontaneous induced and LSCS groups respectively. Maternal death occurred in 5%, 3.12% & none in spontaneous induced and LSCS groups respectively, which is much less (10.44%) than that of another study [19].

Limitations of the Study

The study was conducted in a single hospital with small sample size. So, the results may not represent the whole community.

CONCLUSION

The prevalence of pre-term eclampsia is still high in Bangladesh. The results of this study indicated that fetal outcome was worse in gestational age far from term irrespective of the mode of delivery. So, gestational age <32 weeks who do not go into labor spontaneously may offer induction, as the cesarean section does not carry any good prognosis to the fetus but rather increases morbidity in the mother. When gestational age crosses >33 weeks, a complete

evaluation of the fetal condition, mental condition, and cervix is necessary to plan for the mode of delivery.

Funding: No funding sources.

Conflict of Interest: None declared.

Ethical Approval: The study was approved by the Institutional Ethics Committee.

RECOMMENDATION

The fetal and maternal outcome can be improved by judicious management of preterm eclampsia patients, as well as a proper antenatal checkup, and by adopting some preventive measures like avoiding teenage marriage & teenage pregnancy, and increasing health education to the population. To improve perinatal outcomes, there is an urgent need to establish regional centers with facilities for antenatal maternal, and fetal monitoring where cases can be referred to optimum care.

REFERENCES

- Dewhurst, Hypertensive disorders, Edmonds. D.K, Textbook of Obstetrics & Gynaecology, 7th, Blackwell Publishing, Oxford, 2007, Pp227-233.
- Arias, F., Daftary, S. N., & Bhide, A. G. (2008). Hypertensive Disorders in Pregnancy. Meenakshi K. Practical Guide to High-Risk Pregnancy & Delivery: A South Asian Perspective. 3rd. Elsevier. India. Pp397-8.
- Chesley, L. C. (1971). Hypertensive Disorders in Pregnancy, in Williams Obstetrics, 14th Edition. Appleton Century Crofts, New York (1971), page 700.
- What is early onset pre-eclampsia?definition and meaning www.medical-glossary.com/definition/early-onset-pre-eclampsia.html -
- Maternal Mortality Rate down in Bangladesh. News Desk, Daily Star. Publication Date: 14.02.11.
- Lain, K. Y., & Roberts, J. M. (2002). Contemporary concepts of the pathogenesis and management of preeclampsia. *J Am Med Assoc*, 287, 3183–6.
- Moldenhauer, J. S., Stanek, J., Warshak, C., Khoury, J., & Sibai, B. (2003). The frequency and severity of placental findings in women with preeclampsia are gestational age dependent. *American journal of obstetrics and gynecology*, 189(4), 1173-1177.
- Ihle, B. U., Long, P., & Oats, J. (1987). Early onset eclampsia: Recognition of underlying Renal disease. *BMJ*, 294.
- Sibai, B. M. (1996). Hypertension in pregnancy. In: Gabbe SG, Niebyl JR, Simpson JL, editors. *Obstetrics: Normal and Problem Pregnancies*. New York: Churchill Livingstone; pp. 935–96.
- Incidence of eclampsia. www.health.am/encyclopedia/eclampsia.html
- Management of severe pre-eclampsia and eclampsia, Royal College of Obstetricians and Gynecologists (2006). www.patient.co.uk/pre-eclampsia-and-eclampsia/Doctor/Patient/UK
- Knight, National perinatal epidemiology unit, university of oxford, oxford. *The UK.BJOG*.-2007, 114(9):1072-8.
- Ratnam, S. S. Rao K B. Arulkumaran. Treatment of Eclampsia. *Obstetrics & Gynaecology for postgraduates*. 2nd. Orient Longman. India.
- Arora, R., Ganguli, R. P., Swain, S., Oumachigui, A., & Rajaram, P. (1994). Determinants of maternal mortality in eclampsia in India. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 34(5), 537-539.
- BIRPERT: Bangladesh Institute of Research for Promotion of Essential & Reproductive health and Technologies. Proceedings of Dissemination workshop on maternal morbidity study. Hotel Sheraton, Dhaka; 1994.
- Yeasmin, H. A., Rahman, M. H., & Chowdhury, F. K. (1995). Baseline survey for assessment of emergency obstetric care service in Bangladesh. *BIRPERT*, 10.
- Begum, M. R., Begum, A., Quadir, E., Akhter, S., & Shamsuddin, L. (2004). Eclampsia: still a problem in Bangladesh. *Medscape General Medicine*, 6(4). www.ncbi.nlm.nih.gov
- Ebeigbe, P. N., & Aziken, M. E. (2010). Early onset pregnancy induced hypertension/eclampsia in Benin City, Nigeria. *Nigerian journal of clinical practice*, 13(4), 388-393.
- Singh, S., & Behera, A. (2010). Eclampsia in Eastern India: incidence, demographic profile and response to three different anticonvulsant regimes of magnesium sulphate. *Internet J Gynecol Obstet*, 15(2), 7708. DOI: 10.5580/124a
- Siddiqui, S. A., & Soomro, N. (2010). Eclampsia: depicting a challenge of unmet need for prenatal care. *Medical Channel*, 16(2), 244-48.