



Research Article

A COMPARATIVE STUDY OF FETO-MATERNAL OUTCOME IN CESAREAN SECTION VERSUS VAGINAL DELIVERY IN ECLAMPSIA PATIENTS IN A TERTIARY LEVEL HOSPITAL

¹Himani Goyal, ²Sudipta Patnaik, ³Richa Sharma and ⁴Ashish Kumar Gupta

¹senior resident, obgyn department, UCMS, GTBH Delhi.

² Physiology department, SCB Medical College Cuttack, Odisha

³obgyn Department, UCMS, GTBH Delhi.

⁴senior Resident, Radio Diagnosis Department, UCMS, GTBH, Delhi

ARTICLE INFO

Article History:

Received 4th June, 2021

Received in revised form 25th July, 2021

Accepted 18th August, 2021

Published online 28th September, 2021

Key words:

Eclampsia, Fetomaternal Outcome, Mode of Delivery

ABSTRACT

Context: Eclampsia is a multisystem disorder with high blood pressure, proteinuria, and the onset of convulsions. Eclampsia is essentially a disease of low socio-economic status of primigravida, a product of ignorance and neglect. It is a preventable disease. But unfortunately, its incidence is still uncomfortably high in any hospital accepting unbooked cases. It is being a leading cause of worse fetomaternal outcome in our country.

Aims: comparing the fetomaternal outcome and mode of delivery in eclampsia mothers in a tertiary care hospital of West Bengal.

Settings and Design: A comparative observational study was done in the eclampsia ward of our hospital.

Methods and Material: 100 eclampsia patients were taken who undergone cesarean and vaginal delivery and they compared for the fetomaternal outcome.

Statistical analysis used: statistical analyses (chi-square and unpaired student's *t*-test) are done. P-value <0.05 will be taken as minimum Level of significance.

Results: Convulsion delivery interval is the concern in choosing the mode of delivery. Early termination reduces the complications in both mother and fetus. An early decision to cesarean section is better than waiting long for induction for vaginal delivery.

Conclusions: Caesarean section should be done at the optimum time and not as a last resort when conservative management has failed in eclampsia especially in primigravidas after 34 weeks of pregnancy.

Copyright©2021 Himani Goyal et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

The onset of convulsions in a woman with pre-eclampsia that cannot be attributed to other causes is termed eclampsia¹. The spectrum of hypertensive disease in pregnancy, which includes preeclampsia-eclampsia, is one of the leading causes of maternal morbidity and mortality. Reports published from 1976 to 2015 (January–February) reveal that the incidence of eclampsia in India ranges from 0.179 to 5%, the average being 1.5%. It is more common in primigravida and occurs between the 36th week and the term in more than 50%. Detailed analysis of data from 1980 to 2015 (January–February) shows that there is no reduction in the incidence of eclampsia and perinatal mortality rate over the last few decades².

Maternal mortality has shown a slight receding trend. Eclampsia is further associated with increased morbidity due to risks of hypoxic-ischemic brain damage and intracranial

hemorrhage from seizure activity, pulmonary edema, placental abruption, HELLP, aspiration pneumonia, cortical blindness, hepatic damage, myocardial damage, urinary tract infections, postpartum hemorrhage. Renal failure complicating eclampsia may result in prolonged renal insufficiency.

Eclampsia accounted for 67.2% of obstetrics causes of acute renal failure requiring dialysis³.

In the fetus preterm delivery, asphyxia, and intrauterine growth restrictions are commonly associated with the disease. Pregnancy-related complications like abruptio placentae, HELLP syndrome are frequent associations. Pre-eclampsia and eclampsia are independent risk factors for cerebral palsy⁴. Perinatal mortality is increased and neonatal intensive care admission is common.

Termination of pregnancy and delivery of the placenta is the cure and it reverses the problem. So the earlier it is carried out, the better the maternal and fetal outcome. The mode of delivery is determined among other variables by the speed

*Corresponding author: Himani Goyal

Senior Resident, Obgyn Department, UCMS, GTBH Delhi.

with which it must be expedited, the ability of a fetus to withstand labor, and the chances of successful induction of labor at early gestational ages. Vaginal delivery is always to be preferred if it is safe. Faced with this reality, a plan of management has to be evolved. There is limited to no evidence in favour of a particular delivery method for women with eclampsia. Therefore, the delivery method of choice is an individualized decision⁵.

Keeping this in view an attempt has been made in the present study to ascertain if a cesarean section has any distinct advantage over vaginal delivery in lowering maternal and perinatal morbidity and mortality. In our medical college, a significant number of eclampsia patients have been referred from health centers. Although it is a tertiary teaching hospital and designed in a semi-urban set up it mainly serves a huge rural part of West Bengal.

Aim & Objectives

The present study aims to compare the outcome following vaginal vs cesarean section in eclampsia, to correlate the mode of delivery with maternal and fetal outcome in a tertiary care hospital in West Bengal, and to do critical analysis to implement better management.

Subjects and Methods

A comparative observational study was conducted on 100 eclamptic patients with live fetuses were studied. Group 1, 50 patients with vaginal delivery. Group 2, 50 patients with cesarean section. All primigravida with antepartum and intrapartum Eclampsia at or after 34 weeks of pregnancy with live fetus attending the OPD and emergency of hospital. A predesigned and pre-tested scheduled proforma was used to collect all data.

Methods of data collection

On admission a detailed history was taken regarding Name, age, socioeconomic status, religion and address of the patients, The antenatal check-up, The duration of gestation in terms of months of amenorrhoea, The time of onset of convulsion, total number of convulsion, interval between convulsion, duration of each convulsion, the time of case convulsion, history of loss consciousness & history of frothing longitude, passing urine/stood during a convulsion, Premonitory symptoms like headache epigastric pain nausea, vomiting, and blurred vision, Any history pain abdomen trauma per vaginal leak or bleeding per vaginal, Obstetric menstrual, history, family history, and personal history, Any nature of treatment before hospitalization.

A rapid general examination was subsequently made noting the grade of consciousness of patients, temperature, pulse rate, blood pressure, presence of edema, evidence of injuries, condition of heart, lungs & knee jerk.

A detailed obstetric examination was conducted noting the height of the uterus, presence, frequency, and duration of uterine contraction, lie and presentation of the fetus, relation of the presenting part to the brim, and the rate and regularity of the fetal heart.

The vaginal examination was done and the condition of the cervix - position, consistency, dilatation, effacement, and station of the presenting part i.e., bishop's score was noted.

The presence of a bag of membrane and adequacy of the pelvis was also noted.

The bladder was catheterized and urine output was noted. An IV line was started and 1 pint of ringer lactate was given for hydration. Investigations were sent for complete hemogram, urine analysis, blood grouping, and Rh-typing, renal and liver function tests, and coagulation profile.

Medical management

Anticonvulsants: Magnesium sulfate Pritchard's regime on admission. This was continued for 24 hours after delivery. Antihypertensive, Antibiotics were given immediately and continued for an average of 1 week.

Obstetric management: Then, either induction was done by giving per vaginal misoprostol following conservative obstetric management or were taken up for cesarean section directly with unfavorable cervix as the associated indication. patients who were in labor (augmented with arm or Pitocin or both) who also delivered per vaginam and those who were fully dilated and effaced on admission and went for spontaneous delivery/outlet forceps, were all included under the "V.D. group". The associated indication for cesarean, induction delivery interval in induced vaginal deliveries, total blood loss, and intraoperative/intrapartum complications if any were noted. Baby notes were noted and then details were noted in the proforma. The mother and the neonate were followed till discharge at the hospital.

All the relevant data for each patient will be recorded in a predesigned data collection sheet. Collected data will be compiled and appropriate statistical analyses (chi-square and unpaired student's t-test) are done. P-value <0.05 will be taken as minimum Level of significance.

Ethical consideration is taken from the institutional review board.

RESULTS

The Highest incidence of antepartum eclampsia was seen in the age group of 20-24 years in both groups. Majority of the cases in both the groups were of low socioeconomic status from rural areas with improper antenatal care. 75% had an improper antenatal checkup, rest 25% had no antenatal checkup. Maximum incidence of antepartum eclampsia was seen between 36-40 weeks. Condition on admission: 70% of patients were conscious, 7% were unconscious. They had 1-6 episodes of convulsions before admission. All three signs of toxemia were seen in 78% of cases. Almost all the vaginal deliveries were induced. Outlet forceps were applied in few cases.

Table 1 Convulsion Delivery Interval and Mode of Delivery

Convulsion-delivery interval	VD group		CD group	
	No. of cases	%	No. of cases	%
0-6 hrs	2	4	5	10
6-12 hrs	25	50	12	24
12-18 hrs	18	36	31	62
18-24 hrs	5	10	2	4
Total	50	100	50	100

P value 0.014 significant

Figure 1: Bishop's score was unfavorable in 96% of cases in the CD group and 80% of cases in the VD group. All these

80% groups who were otherwise not ideal candidates for vaginal delivery were allowed to deliver vaginally either because of poor expectancy of fetal salvage or refusal for cesarean section by the patient's attainer because of poor fetal salvage.

Table-2: 24% of the cases in the C.D. group were delivered within 12 hours of the first fit, while 50% of the cases in the V.D. group did so. 62% of the cases in the V.D. group delivered within 12 hours after the start of induction. 90% of the cases both groups delivered within 18 hours of the first convulsion. More than 60 % of cases were delivered within 12 hours of induction.

Table 2 Perinatal Morbidity

Cause	VD group		CD group	
	No. of cases	%	No. of cases	%
H I E	6	60	1	33.33
Septicemia	1	10	-	-
RDS	1	10	-	-
MAS	2	20	2	66.66

Perinatal outcome

SNCU admission with mode of delivery (19) 39% cases in vaginal delivery and (11) 22% in cesarean delivery group. The mean duration of stay in SNCU in the C.D. group was 5.78 days and in the V.D. group was 3 days. The live birth rate was 94% in the C.D. group, these(3) 6% were neonatal death, stillbirth was 0, and 80% in the V.D. group out of which (8) 16% death occur in NICU and (2)4% were stillbirth. Out of the 19 babies who went to NICU 8 died and 11 survived in the VD group, in the CD group 11 babies went to NICU and 3 died, 8 survived. Perinatal mortality was 6% in the CD group than 20% vaginal group.

Analysis of causes of perinatal mortality

Table -2: The predominant (60%) cause for PNM was intrauterine hypoxia in the V.D. group while it happened to be the second commonest (33%) cause in the C.D. MAS was in (20%) cases of the VD group and (66%) cases of cd group.

PNM increased with an increase in the total number of convulsions, admission-delivery, induction-delivery, and convulsion-delivery intervals. Both PNM and incidence of SNCU admission were lesser when the cesarean section was performed within 6 hours of admission. There was an increase in PNM with an increased total no of convulsion in both the groups.

Table-3: There was a progressive increase in the incidence of maternal complications with an increase in convulsion delivery interval in both groups. The incidence of maternal complications was found to be higher in the VD group.

Table 3 Maternal complications

Maternal complications	Delivery		Total
	Caesarean	Vaginal	
Pulmonary edema	00	01 (2%)	01 (01%)
Placental abruption/HELLP	00	01 (2%)	01 (01%)
UTI	03 (6%)	01(2%)	04 (04%)
PPH	02 (4%)	01 (2%)	03 (03%)
Cerebral infarction	01 (2.0%)	02 (4%)	03 (03%)
Cortical Blindness	01 (2.0%)	01 (2%)	02 (02%)
Nil	43 (86.0%)	43 (86%)	86 (86%)
Total	50 (100%)	50(100%)	100 (100%)

Chi-square – 3.66 p value – 0.72

Table-4: Incidence of maternal death was 4% in vd group while in cd group there was no maternal mortality.

Table 4 Maternal mortality and mode of delivery

Maternal mortality	Delivery		Total
	CD	VD	
Yes	00	02 (4%)	02 (2%)
No	50(100%)	48(96%)	98 (98%)
Total	50(100%)	50 (100%)	100 (100%)

In discussion: post-Millennium Development Goal era, the focus of global health is on not just reducing mortality but also reducing morbidity⁶.

In the present series, 100 primigravidae with 34 weeks and more gestation age with antepartum eclampsia were studied in two groups. VD group CD group.

Age in both the groups the highest incidence was in the age group 21-24 years. Chakraborty *et al* (2011)⁷reported mean eclampsia incidence at a mean age of 20.

In both groups, 80% of cases belong to low socioeconomic status. The highest incidence was found between 37-40weeks. 70% in the CD group and 38% in the VD group. Most of the referrals constituted term gestation with the viable fetus and poor cervical score. However, almost 80% of the cases in both groups had thrown less than 6 convulsions. Most of them (70%) were conscious on admission. All three signs of toxemia were seen in 78% of cases. 7% came in an unconscious state. A cervical factor was the indication in 84% of cases. 12 cases were operated for unfavorable cervix, cervical factors top the list of indications for cesarean section 42. The next commonest indication was fetal distress accounting for 8 (16%) cases. However, the presence of eclampsia itself is not an indication of cesarean section.

Savita Rani Singhal⁸ reported fetal distress in 59.28% cases, followed by nonprogress in 12.5%, poor bishop score in 18.75% cases as an indication.

Outlet forceps were applied the commonest indication being cut short second stage of labor followed by fetal distress. All the cases with VD were induced of which required more than twelve hours for delivery. 62% cases delivered in 6 – 12 hours of induction. In women with eclampsia, the cesarean section has been the preferred mode of delivery when the cervix is unfavorable and early delivery is unlikely. This practice is based on a recommendation that all women with eclampsia should deliver within 12 hours of admission⁹.

This is comparable to the study done by Kuljit Kaur *et al*¹⁰. In the study 608 consecutive cases of antepartum and intrapartum eclampsia were analyzed, cesarean section rate was very high (71.05%). Both maternal mortality rate and perinatal mortality rate were much lower with early cesarean section (0.95% and 3.80% respectively) than with vaginal delivery. Both also steadily increased with increasing admission--delivery interval, apparently independent of the mode of delivery indicating that improved fetomaternal outcomes associated with early cesarean section resulted from prompt delivery¹¹.

Perinatal Mortality

Total PNM was 13%. The incidence in the C.D. and V.D. group of live births was 94% and 80% respectively, of

stillbirths was nil and 4% respectively and that of neonatal deaths was 6% and 16% respectively. The striking difference in the incidence of live birth and stillbirths in the two groups could be partly attributed to the comparatively increased rates of, low birth weight and preterm babies in the V.D. group. However, still, the difference was considerable. The PNM figures in the C.D. and V.D. groups were 6% and 20% respectively.

Barret M.(2007)¹² perinatal mortality was 38%. In the vaginal group, it was 12%, while in a cesarean group it was 7%.

Taj¹³ studied 100 patients with eclampsia, among them 71 patients were normal vaginal delivery, 25 patients needed a cesarean section. Maternal mortality was 2% perinatal mortality was 38%. Perinatal mortality was higher in the vaginal group at 12% than in the LSCS group at 7%.

Sunitha T.H¹⁴ reported perinatal mortality among eclamptic patients 184/1000. Total birth was 102, out of which 94 were alive, 8 stillborn, 11 neonatal death.

Savita Rani Singhal¹⁵ reported a high incidence of prematurity 67.33%, low birth weight in 71.43%, birth asphyxia in 21% of cases. Perinatal mortality was 36.73%.

Factors affecting PNM

PNM increased in proportion to increases in the number of convulsions, increased progressively with an increase in the induction delivery interval beyond 24 hours. PNM also increased proportionately as the first convulsion-delivery interval increased in both groups. PNM was decreased when a cesarean section was performed within 6 hours and was when performed after 6 hours of admission.

Maternal Outcome

While limited resources present a major challenge to taking care of the critically ill patients, patients presented to our facility already critical or moribund stages because of delay in seeking health care by the patient themselves, providers failure to recognize and manage a critical situation at peripheral health facilities, and poor infrastructure preventing the timely transport of patients to a higher facility.

Maternal complications were encountered in 14% of the cases in the C.D. group and 14% of the cases in the V.D. group. The complications were:

1. **Postpartum hemorrhage** was seen in 2% of the cases in the V.D. group, all of which were controlled with oxytocin and carboprost. In CD group had postpartum hemorrhage intraoperatively but was controlled with B-lynch sutures.
2. **Abruptio placenta** was seen in 2% of the cases in the V.D. group. However, they improved after component therapy.
3. **Cerebral infarction**: One case in the C.D. group, on the third postoperative day, developed cerebral infarction in the occipitoparietal region. 2 cases in the VD group on the 4th postnatal day developed cerebral infarction. One patient expired despite CCU monitoring and management. One patient recovered uneventfully with conservative treatment.

4. **Pulmonary edema** was seen in one case in the V.D. group (2%) and did not respond to the medical line of therapy. Patient died on the second postnatal day.
5. Cortical **blindness** was encountered in both VD and CD groups. They however regained back their vision within 4 days in the VD group and 5 days in the CD group.
6. **Urinary tract infection** was seen in 6% of the cases in the C.D. group and 2% cases in the vaginal group for which cases are treated according to culture and sensitivity.

In a study postpartum hemorrhage, cerebrovascular accident, renal failure seen high in the vaginal group 46% than cesarean group 16%¹⁶.

Kuljit Kaur¹⁰ observed maternal complication in her study DIC in 3.8% blurring of vision 7.8%, renal failure in 3.8%.

Maternal Mortality

Maternal deaths occurred in 4% of the cases in the V.D. group while there were no maternal deaths in the C.D. group.

Barret M (2007)¹² reported maternal mortality was 2%.

Sheuly Begum¹⁶ reported maternal complications in vaginal group 46%, in cesarean group 16%, maternal mortality in vaginal group 6%, in cesarean group none.

Sunita T.H.¹⁴ (2006) found maternal mortality of 11.7%. In the vaginal group out of 50, 49 were alive and 1 dead, in the cesarean group 43 were alive and 2 were dead out of 45. One died undelivered. Out of 4 maternal death, 3 occurred who has >5 convulsions before starting treatment and 1 died in a comatose state. This is comparable to our study.

Cause for Maternal Deaths: 2 Women out of a total of 50 in the V.D. group died, accounting for maternal mortality of 4%.

One woman had pulmonary edema following induction of labor. The induction delivery interval was ten hours. She delivered the dead male baby. Her pulmonary edema did not respond to oxygen inhalation, Diuretic therapy. Later developed acute respiratory distress syndrome died 22 hours following delivery. One patient expired due to a cerebrovascular accident despite CCU monitoring and ventilator support.

Relation of Maternal Mortality to First Convulsion-Delivery Interval:

In the present series, the mothers who died had an induction-delivery interval of more than 10 hours and convulsion-delivery interval of more than 14 hours.

Sunita T.H.¹⁴ (2006) observed that maternal mortality increased with an increase in the first convulsion-delivery interval.

In a randomized controlled exploratory trial carried out in a rural teaching institution. In all, 200 eclampsia cases, carrying 34 weeks, were allocated to either cesarean or vaginal delivery. The maternal event rate was similar: 10.89% in the cesarean arm vs 7.07% for vaginal delivery although the neonatal event rate was less in cesarean delivery-9.90% vs 19.19%¹⁷.

In a secondary analysis of a stepped-wedge cluster randomized controlled trial undertaken in sub-Saharan Africa, India, and Haiti. There were 2,692 women with eclampsia (0.5%). In total 6.9% ($n = 186$; 3.47/10,000 deliveries) of women with

eclampsia died, and a further 51 died from other complications of hypertensive disorders of pregnancy (0.95/10,000)¹⁸. Nearly 1 in 5 (17.9%) women with eclampsia, stroke or a hypertensive disorder of pregnancy causing intensive care admission or maternal death experienced a stillbirth or neonatal death. A third of eclampsia cases (33.2%; $n = 894$) occurred in women under 20 years of age, 60.0% in women aged 20–34 years ($n = 1,616$), over half (55.1%) of first eclamptic fits occurred in a health-care facility, with the remainder in the community.

Thereby, we infer, that both the maternal and perinatal outcome may be considerably improved in primigravid eclamptic if an early decision for cesarean section is taken, in cases where delivery is not anticipated within 6 hours of admission or 12 hours of the first fit, whichever is earlier.

References

1. Williams Obstetrics, 24th Ed., McGraw Hill Co. Inc., 2014: 728-779 pp.
2. Nobis PN, Hajong A. Eclampsia in India Through the Decades. *J Obstet Gynaecol India*. 2016;66(Suppl 1):172-176. doi:10.1007/s13224-015-0807-5
3. Miquil M, Salmi S, Moussaid I, Benyounes R. Acute renal failure requiring dialysis in Obstetrics. *Nephrol Theor*. 2011;7(3):178–181. [PubMed] [Google Scholar]
4. Kulak W, Okurowaska-Zawada B, Sienkiewicz D, Pasko-Patej G, Krajewsk-Kulak E. Risk factors for cerebral palsy in term infants. *Adv Med Sci*. 2010;55(2):216–221. [PubMed] [Google Scholar]
5. ACOG Committee on Obstetric Practice (April 2002). "ACOG practice bulletin. Diagnosis and management of preeclampsia and eclampsia. Number 33, January 2002. American College of Obstetricians and Gynecologists". *International Journal of Gynaecology and Obstetrics*. 77 (1): 67–75. ISSN 0020-7292. PMID 12094777
6. Maru S, Nirola I, Thapa A, Thapa P, Kunwar L, Wu W-J, *et al*. An integrated community health worker intervention in rural Nepal: a type 2 hybrid effectiveness-implementation study protocol. *Implement Sci*. 2018; 13:53. <https://doi.org/10.1186/s13012-018-0741-x> PMID: 29598824
7. Chakraborty B, Dasgupta S *et al*. How much Magsulph in eclampsia? - A prospective trial on low dose regime, *Indian J. of Perinatol Reprod Bio* 2011; 1: 14-16.
8. Savita Rani Singhal, Deepika, Anshu, Samiti Nanda. Maternal and Perinatal Outcome in Severe Preeclampsia and Eclampsia. *South Asian Federation of Obstet Gynecol* 2009;1(3):25-28.
9. Mathai M, Sanghvi H, Guidotti RJ. Managing complications in pregnancy and childbirth: a guide for midwives and doctors. Geneva: Department of Reproductive Health and Research, World Health Organization 2000:S43.
10. Kuljit Kaur, R. D. Srivastav, Veena Rahatgaonkar, U. T. Bhosale(2008) Study of Fetal and Maternal Outcome in Eclampsia. 2014; ISSN 11(1):42-44pp
11. Alauddin M, Bal R, Kundu MK, Dey S, Biswas A. Current trends in delivery of eclampsia patients. *J Indian Med Assoc*. 2009 Oct;107(10):672-4. PMID: 20469739
12. Barret M. Schroeder *Am J Obstet & Gynaecol*. 2007; June 196(6) ; 514.e1-9.
13. TAJ, Clinical study of 100 cases eclampsia Dec 2004;17(2) 80-83.
14. Sunita T. H., Rathnamala M. Desai. Eclampsia in a Teaching Hospital: Incidence clinical profile and response to Magnesium Sulphate by Zuspan's regimen. *ISOSR- JDMS Volume 4, Issue 2;2013*
15. Savita Rani Singhal, Deepika, Anshu, Samiti Nanda. Maternal and Perinatal Outcome in Severe Preeclampsia and Eclampsia. *South Asian Federation of Obstet Gynecol* 2009;1(3):25-28.
16. Sheuly Begum, Ferdousi Islam, Arifa Akter Jahan, Fetomaternal Outcomes In Cesarean Section Compared to Vaginal Delivery in Eclamptic Patients in a Tertiary Level Hospital, *Journal of Enam Medical College*, Vol 3 No 2 July 2013.
17. women with eclampsia? A randomized controlled pilot study Subrata Lall Seal, MD, DNB Debduutta Ghosh, MD Gourisankar Kamilya, MD, DNB Joydev Mukherji, MD Avijit Hazra, MD Pratima Garain, MD Published: April 09, 2012 DOI: <https://doi.org/10.1016/j.ajog.2012.04.009>
18. Vousden N, Lawley E, Seed PT, Gidiri MF, Goudar S, Sandall J, *et al*. (2019) Incidence of eclampsia and related complications across 10 low- and middle-resource geographical regions: Secondary analysis of a cluster randomized controlled trial. *PLoS Med* 16(3): e1002775. <https://doi.org/10.1371/journal.pmed.1002775>

How to cite this article:

Himani Goyal *et al* (2021) 'A Comparative Study of Feto-Maternal Outcome in Cesarean Section Versus Vaginal Delivery in Eclampsia Patients in a Tertiary Level Hospital', *International Journal of Current Advanced Research*, 10(9), pp. 25193-25197. DOI: <http://dx.doi.org/10.24327/ijcar.2021.25197.5028>
