



THE EFFECT OF MODE OF DELIVERY ON MATERNAL AND FETAL OUTCOME IN WOMEN WITH PRE-ECLAMPSIA-AN OBSERVATIONAL STUDY

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ABSTRACT

Aim: To compare the fetomaternal outcome between planned vaginal delivery and planned cesarean section in women with eclampsia after 34 weeks of gestation **Materials and Methods:** This prospective observational study was conducted in the department of Obstetrics and Gynecology, at a tertiary care medical centre in Maharashtra, India. 182 women with eclampsia carrying 34 weeks or more gestation were allocated to either cesarean (CD) or vaginal delivery (VD) group. The primary measure of outcome was severe maternal outcome. Secondary measures of outcome were perinatal mortality and morbidity **Results:** Hundred antenatal eclamptic patients were selected for the study. For the study, one hundred patients with prenatal eclampsia were chosen. Eclampsia affects a comparatively younger age range of people. Of the 80 patients, 53.7% percent were less than 20 years old, 41.2% percent were primigravidas, and 66.2 percent came from a low socioeconomic background. Sixty percent of patients undergoing cesarean sections and seventy percent of patients undergoing vaginal deliveries lacked prenatal care (ANC). Compared to the group that had a cesarean section (32.5%), the group that had a vaginal delivery (52.5%) had higher maternal morbidity. In both groups, the rate of maternal mortality was 5%. Compared to the group that had a caesarean section, the vaginal delivery group had a higher perinatal mortality rate (35%). **Conclusion:** Instead of initiating labor and giving birth vaginally, there is a growing tendency of performing a cesarean section on a mother with eclampsia who is more than 34 weeks gestation. When a cesarean section is chosen as the delivery mode, there is no increase in mortality or morbidity.

KEYWORDS : Eclampsia, vaginal delivery, Caesarean section operation.

INTRODUCTION

One of the main causes of maternal morbidity and death in the globe is eclampsia. It is responsible for 12% of maternal deaths worldwide¹. At the national level, Nigeria and India are thought to have contributed more than one-third of all maternal fatalities globally in 2015, with over 58,000 (19%) and 45,000 (15%) maternal deaths, respectively². In India, eclampsia accounts for 2.2-2.9% of maternal deaths and for 24.5-48% of perinatal deaths³.

Eclampsia is defined as preeclampsia with one or more convulsions on top of it⁴. Eclampsia is a condition that affects people with preeclampsia who did not receive regular prenatal care, or who did not notice a very sudden increase in blood pressure or the onset of proteinuria. Eclampsia typically manifests slowly, with little to no symptoms up until the patient experiences eclamptic fits. The rate of eclampsia is decreased by a standardized care package for preeclampsia following delivery that includes established interventions⁵. In affluent nations, eclampsia's harmful effects on mothers and their unborn children have decreased as a result of appropriate prenatal care and the management of problems. Eclampsia is a multisystem condition that affects nearly every organ in the body. Its symptomatology is mostly caused by damage to endothelium cells.

Stabilizing the patient's circulatory condition and controlling convulsions are the primary objectives of eclampsia treatment. Intravenous hydralazine or labetalol is used to treat hypertension, and it is then followed by oral nifedipine or atenolol. The pregnancy is quickly terminated, either vaginally or via cesarean section, regardless of the gestational age. A longer induction delivery interval increases the risk of convulsion recurrence. Therefore, when the fetus is alive and the induction delivery interval is predicted to be lengthy, a caesarean section is often preferred. Since the development of effective anticonvulsants like magnesium sulfate and cervical ripening agents like misoprostol, vaginal delivery has become the preferred method of delivery in many circumstances, especially in cases when the fetus is dead or in a condition where it is unlikely to survive, in order to prevent complications from a caesarean section.

It has been demonstrated that the regular application of magnesium sulfate (MgSO₄) for the treatment of eclampsia has a significant impact on maternal mortality. The benefits of a cesarean surgery at an earlier stage of pregnancy should theoretically outweigh those of a vaginal delivery⁶. There is conflicting evidence to support strategies like pregnancy termination for lowering eclampsia-related morbidity and mortality⁷⁻⁹. It has been advised by certain authorities, such as the World Health Organization, that all women diagnosed with eclampsia give birth within 12 hours of being admitted¹⁰. Because of this, treating

obstetricians are increasingly performing cesarean sections on women who arrive with eclampsia at a gestational age greater than 34 weeks. Hence, the aim of the study is to compare the maternal and fetal outcome of both modes of delivery after 34 weeks of gestation

METHODOLOGY

A cross-sectional study was conducted on 100 purposively selected antenatal eclamptic patients. The study was conducted in the Department of Obstetrics and Gynaecology, at a tertiary care medical centre in Maharashtra, India. Institutional ethical clearance was obtained and informed consent was signed from all the patients undergoing the study. Every patient received a thorough explanation of the study. A comprehensive clinical information-based questionnaire was created. Following a meticulous history collection, a comprehensive physical examination was conducted. Following that, the eclampsia ward's urine was analyzed for protein using the heat coagulation method, and instances were identified.

Magnesium sulfate was used to control convulsion in every instance. Following initial care, once the patient's condition was stable, the choice was made to terminate the pregnancy, and the method of delivery was scheduled with the appropriateness of the pelvis, cervical condition, gravidity, and gestational age in mind. Spinal anesthesia was used during operations for patients who need cesarean sections to end their pregnancies. To shorten the time of the second stage of labor, many of the patients who were chosen for vaginal birth were aided vaginally (with forceps or a ventouse).

Patients who had acute pulmonary oedema, renal failure, shock, coagulation failure upon admission, or obstetrical complications requiring an emergency cesarean section (such as cephalopelvic disproportion, placenta praevia, mal-presentation, or obstructed labor) were excluded from both groups. The study included caesarean sections performed for protracted labor, unsuccessful induction attempts, anticipating prolonged induction delivery intervals, and fetal distress. In the eclampsia ward, patients received high dependency care for as long as they requested it. Maternal outcome measures included postpartum hemorrhage (PPH), pulmonary edema, cerebral cerebral accident (stroke), renal failure, obstetric shock, and abruptio placenta. Birth weight, APGAR score, live or stillbirths, and any complications were the parameters for fetal and neonatal outcomes.

The Statistical Package for Social Science (SPSS) was a computer-based program used to analyze the data that had been collected. The Student's t-test was used to analyze quantitative variables, and the Chi-square test was used to analyze qualitative factors. P<0.05 was regarded as the threshold for statistical significance in a result.

RESULTS

According to Table 1, the mean age of patients undergoing vaginal delivery was 22.38±4.44 years, while the mean age of patients undergoing Caesarean section was 22.94±4.94 years. The mean pregnancy duration was 36.11±3.31 weeks for the vaginal delivery group and 36.22±3.0 weeks for the Caesarean section group. In the group that underwent vaginal delivery, the mean number of convulsions before to hospitalization in patients undergoing vaginal delivery was 5.12, but in the group that underwent cesarean surgery, it was 5.08.

In the group undergoing vaginal delivery, the mean time between the first convulsion and hospitalization was 6.14 hours, but in the group undergoing cesarean surgery, it was 5.40 hours. For vaginal delivery, the mean diastolic blood pressure was 107.10 mmHg, while for caesarean section, it was 107.40 mmHg.

The majority of eclamptic patients (52.5% percent of patients undergoing cesarean sections and 55 percent of patients undergoing vaginal deliveries) were under the age of twenty, according to the study population. The majority of patients (47.5%) were single mothers. The majority of patients 67.5% of those undergoing vaginal deliveries and 65% of those undergoing cesarean sections came from low-income backgrounds.

Maximum eclampsia patients i.e. 70% patients of vaginal delivery group and 60% patients of caesarean section group, received no antenatal care

Table 2 indicates that 32.5% of the patients in the vaginal delivery group and 35% of the patients in the cesarean section group had moderate proteinuria. Of the vaginal birth group, only 12.5% experienced severe proteinuria.

Table 3 indicates that the vaginal delivery group had higher rates of maternal morbidity, pulmonary oedema (20%), CVA (10%), and obstetric shock (5%). The rate of maternal death from eclampsia was 5%. One patient died from pulmonary oedema and the other patient died from a cerebrovascular accident out of the two vaginal birth group deaths. Two individuals in the caesarean section group passed away from pulmonary oedema.

Table 4 displays the mean birth weight of the kids in the group delivered vaginally (2.24 kg) and the group delivered by Caesarean section (2.13 kg). The caesarean section group's 1-minute APGAR score (6.29) is higher than the vaginal delivery group's (5.67). Perinatal mortality was greater in the vaginal birth group (35%) compared to the caesarean section group (22.5%). Prematurity accounted for 66.6% of neonatal deaths, while asphyxia caused 33.3% of those deaths.

Table 1: Comparison of patient characteristics between two study groups

Parameters	Vaginal delivery (n=40)	Caesarean section (n=40)	P value
Age (Years)	22.38±4.44	22.94±4.94	0.451*
Mean± SD			
Range	27-34	17-36	
Parity			
0	15 (37.5%)	19 (42.2%)	
1	19 (42.2%)	14 (35%)	0.245*
2 or more	6 (15%)	7 (17.5%)	
Duration of pregnancy(weeks)			
Mean± SD	36.11±3.31	36.22±3.01	0.814*
Range	26-41	27-42	
Antenatal care			
Regular/irregular	12 (30%)	16 (40%)	0.143*
None	28 (70%)	24 (60%)	
Socioeconomic status			
Low	27 (67.5%)	26 (65%)	
Middle	12 (30%)	13 (32.5%)	0.471*
Upper Middle	1 (2.5%)	1 (2.5%)	

*- Not significant

Table 2: Comparison of different maternal parameters between the two study groups on admission

Parameters	Vaginal delivery (n=40)	Caesarean section (n=40)	P value
Number of convulsions			
Before hospitalization (hours)			0.956*
Mean ±SD	5.12±3.17	5.08±3.92	
Range	1-15	1-15	
Interval between first convulsion and hospitalization (hours)			
Mean± SD	6.14±4.69	5.40±5.34	0.451 *
Range	0.50-24.00	0.50-24.00	
Diastolic blood pressure (mmHg)			
Mean± SD	107.10±14.45	107.40±14.67	0.956*
Range	110-215	95-220	
Urinary albumin			
Trace	3 (7.5%)	4 (10.0)	
Mild	19 (47.5%)	22 (55%)	
Moderate	13 (32.5%)	14 (35%)	0.117*
Severe	5(12.5%)	0	

*- Not significant

Table 3: Maternal Outcome (n=80)

Variables	Vaginal delivery (n=40)	Caesarean section (n=40)	P value
Maternal death	2 (5%)	2(5%)	0.691*
Maternal morbidity			
Pulmonary oedema	8(20%)	6(15%)	
Obstetric shock	2 (5%)	0 (0%)	
Cerebrovascular accident (shock)	4 (10%)	1 (2.5%)	
Wound Infection	1 (2.5%)	3 (7.5%)	
Postpartum Haemorrhage	3 (7.5%)	1 (2.5%)	
Renal failure	1 (2.5%)	0 (0%)	
Abruptio Placenta	1 (2.5%)	0 (0%)	
Hepatic failure	0 (0%)	1 (2.5%)	
Puerperal psychosis	1 (2.5%)	1 (2.5%)	
Total Morbidity	21 (52.5%)	13 (32.5%)	

*- Not significant

Table 4: Comparison of different neonatal parameters between the two study groups

Parameters	Vaginal delivery (n=29)	Caesarean section (n=34)	P value
Birth weight of baby (kg)			
Mean± SD	2.24±0.43	2.13±0.53	0.312*
Range	1.30-3.00	0.90-3.30	
1-minute Apgar score			
Mean± SD	5.67±1.25	6.29±1.57	0.067*
Range	3-8	3-8	
5-minute Apgar score			
Mean± SD	8.04±1.34	8.30±1.43	0.461 *
Range	4-10	5-10	

*- Not significant

Table 4: Perinatal outcome in vaginal delivery and caesarean section groups

	Vaginal delivery	Caesarean section
Live birth	26 (65%)	31(77.5%)

Still birth	11 (27.5%)	6 (15%)
Neonatal death	3 (7.5%)	3 (7.5%)

DISCUSSION

One of the main causes of maternal and fetal morbidity and mortality in expectant mothers is eclampsia. The treatment of preeclampsia is important in the reduction of morbidity and mortality¹¹, the high perinatal mortality associated with this disorder has fallen significantly¹²

Previous research showed that in order to reduce the problems, women with eclampsia, especially those who are older than thirty to thirty-five, overweight, and have a history of hypertension, need to be carefully handled by qualified medical professionals¹³.

Compared to multiparous women, primigravida women experience it more frequently. According to recent epidemiologic research, multiparous women who have diverse partners than those who have the same partner may be more susceptible to preeclampsia. This could be due to a protective effect of repeated exposure to particular antigens¹⁴. The majority of the patients in this study (53.7%) were under the age of twenty. This was consistent with findings from earlier research that the highest prevalence occurred in people aged 20 to 25¹⁵⁻¹⁷

According to Rouf et al¹⁸ research, the majority of eclampsia patients were in the 15–25 age range. In her study, Khatun et al¹⁹ discovered that 55% of the patients were between the ages of 15 and 20, indicating this effects primarily the younger age group.

According to this study, the majority of patients (41.2%) were primigravidae. Similar findings have been reported in other research conducted in this nation¹⁸⁻²⁰. Here, patients with low socioeconomic level made up 65% of the caesarean section patients and 67.5% of the vaginal delivery group.

Comparable findings have been found in the studies by Alam²⁰ and Chowdhury²¹. For instance, Chowdhury's²¹ study revealed that 95% of the patients were from low socioeconomic backgrounds. In this study, a large number of patients (70%) in vaginal delivery group and patients who had caesarean sections (60%) were unable to take use of the prenatal care option.

According to Alam's²⁰ study, 53.3% of patients had irregular ANC and 29% of patients received none at all. In this study, moderate proteinuria was present in the majority of patients undergoing vaginal delivery (47.5%) and caesarean section (55%). Additionally, earlier research revealed a greater percentage of mild to moderate proteinuria (68%)²¹. In this study, maternal complications were more in vaginal delivery group (Table 3), pulmonary oedema (20%), CVA (10%) and obstetric shock (5%) were more in vaginal delivery group. Another study also shows higher percentage of pulmonary oedema (28%) and CVA (10%) in vaginal delivery group²¹. 2.5% percent patients of vaginal delivery group developed renal failure. In this study, wound infection was higher (7.5%) in caesarean section group. Maternal death in vaginal delivery group and caesarean section group was same (4%). Out of 2 maternal deaths in vaginal delivery group, one was due to pulmonary oedema and one was due to cerebrovascular accident. In caesarean section group, two maternal deaths were due to pulmonary oedema. Another trial yielded results that were almost identical²¹. According to Witlin et al²², operational caesarean delivery in eclamptic pregnancies decreased problems for both the mother and the fetus. The majority of the babies were underweight; the mean birth weight of those delivered vaginally was 2.24 kg, while the mean birth weight of those delivered via caesarean section was 2.13 kg.

In his study, Alam²⁰ demonstrated that 75% of the infants weighed less than 2.5 kg. The caesarean section group's 1-minute Apgar score (6.28%) is higher than the vaginal delivery group's (5.64%).

Table 4 shows that perinatal mortality was higher in vaginal delivery group (35%) compared to caesarean section group (22.5%). Compared to vaginal birth groups, the perinatal mortality rate for caesarean section patients was lower (26%) according to other studies²¹.

Perinatal death was higher in the VD group than in the CD group (25.8% versus 8.33%; $p = 0.002$), according to Kumari and colleagues²³. Singh et al.'s study showed better perinatal salvage by LSCS (72.91%)²⁴.

Prematurity accounted for 66.6% of neonatal deaths, while asphyxia

caused 33.3% of them. In their study, Shahabuddin et al²⁵ demonstrated that preterm and hypoxia were the main causes of prenatal loss (92%). Prematurity was found to be the most common cause of neonatal death (53.65%) by Alam²⁰

Srujana A et al²⁶ in her study also observed the predominant cause of perinatal mortality to be intrauterine hypoxia resulting in fresh stillbirths. Similar finding was observed in other studies²⁷⁻²⁹. Nanda et al also asserted that increased induction delivery interval is associated with adverse perinatal outcome because of increased duration of exposure to fetal asphyxia²⁸. Mortality was decreased when caesarean section was performed within 6 hours. So, early decision for caesarean section when delivery is not anticipated within 6 hours of admission helps in improving fetal outcome.

Early cesarean sections for eclamptic patients have been recommended by Arora et al, at least in the referral facilities³⁰. This is due to their findings in their series showing that the maternal mortality rate in the group undergoing cesarean section was 4.3%, nearly half that of the group undergoing vaginal delivery, which had a mortality rate of 7.1%. According to Zuspanet³¹, the condition of the cervix can indicate the prognosis of the fetus and poses a challenge to obstetricians regarding the optimal method, timing, and technique of delivery.

In this study, the group of patients receiving cesarean delivery had fewer maternal problems and a better maternal outcome than the vaginal delivery group. In terms of fetal outcome, there were fewer stillbirth babies in the group that underwent cesarean section than in the group that underwent vaginal delivery.

CONCLUSIONS

One of the main causes of maternal and neonatal mortality, especially in underdeveloped nations, is eclampsia. There is increasing trend of delivering the eclampsia mother at >34 weeks of gestation by caesarean section instead of inducing labor and delivering vaginally. When used as a delivery procedure, cesarean sections do not result in higher rates of morbidity or mortality. Since eclampsia has such a high mortality and morbidity rate (for both the mother and the child), it is unlikely that hospital therapies can further improve the prognosis; instead, the disease's outcome is determined by factors at the community level. Many times, a Caesarean section is decided because we lack the necessary equipment for intra-natal monitoring and because the patients and fetus may not be able to withstand the stress of labor.

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