OBSTETRICS

Does route of delivery affect maternal and perinatal outcome in women with eclampsia? A randomized controlled pilot study

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OBJECTIVE: The route of delivery in eclampsia is controversial. We hypothesized that adverse maternal and perinatal outcomes may not be improved by early cesarean delivery.

STUDY DESIGN: This was 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. Composite maternal and perinatal event rates (death and severe morbidity) were compared by intention-to-treat principle.

RESULTS: Groups were comparable at baseline with respect to age and key clinical parameters. Maternal event rate was similar: 10.89% in the cesarean arm vs 7.07% for vaginal delivery (relative risk, 1.54; 95% confidence interval, 0.62–3.81). Although the neonatal event rate was less in cesarean delivery–9.90% vs 19.19% (relative risk, 0.52; 95% confidence interval, 0.25–1.05)–the difference was not significant statistically.

CONCLUSION: A policy of early cesarean delivery in eclampsia, carrying ≥34 weeks, is not associated with better outcomes.

Key words: cesarean delivery, eclampsia, randomized controlled trial, vaginal delivery

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Eclampsia is responsible for about 12% of all global maternal deaths[1] and about 16-31% of perinatal deaths.[2-4] Antihypertensives to control the blood pressure, magnesium sulfate as anticonvulsant, and delivery of the patient after stabilization are well-accepted interventions in this condition. However, there is controversy regarding the mode of delivery–whether vaginal or by cesarean section. Some contend that in eclampsia, delivery should occur within 12 hours of the onset of convulsions.[5] Pritchard et al[2] has advocated delivery of the patient as soon as convulsions are controlled and the patient is conscious, and certainly within 48 hours of the initial convulsion.

★ EDITORS' CHOICE ★

Incidence of cesarean deliveries in eclampsia varies from 26.7-71%.[6,7] Immediate cure does not promptly follow delivery by any route in eclamptic women.[8] In noneclamptic women, serious morbidity is less common when delivery is vaginal. We hypothesized that undertaking cesarean section to achieve immediate delivery when the patient is not in labor, or in early labor, does not produce better outcomes.

The best way to test this hypothesis would be to conduct a randomized controlled trial based on noninferiority design. No randomized clinical trial has ever evaluated the optimum method of delivery for women with eclampsia. We conducted an open-label randomized controlled study to compare maternal and neonatal outcomes of early cesarean section and planned vaginal delivery in cases of antepartum or early intrapartum eclampsia. However, the sample size required to conduct this trial actually with a noninferiority design, that is to establish that planned vaginal delivery would be no worse than cesarean delivery with regard to maternal and neonatal outcome, is very large and we conducted our study with a smaller sample. Therefore we present this study as an exploratory controlled trial.

Materials and Methods

Study setting and approvals

The study was conducted from April 1, 2010, through March 31, 2011, in a rural teaching hospital in West Bengal, India, which serves as a tertiary referral hospital. During this period a total of 542 eclampsia cases were admitted, of which 340 (62.73%) were antepartum and intrapartum eclampsia and 202 (37.27) were postpartum eclampsia. The study protocol was approved by the institutional review board. Since written in-

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formed consent requires a clear mind and many patients were confused or unconscious, we sought written informed consent from next of kin, generally the spouse.

Study participants

The sample consisted of women with clinical diagnosis of antepartum or intrapartum eclampsia, presenting at gestational age ≥34 weeks, with singleton pregnancy, os <3 cm dilated, normal fetal heart rate (by auscultation), cephalic presentation, normal coagulation profile, and no other obstetric complications. We believed that once a patient is in active phase of labor, that is os >3 cm, she is likely to achieve vaginal delivery within a reasonably short period. Cesarean delivery in some of these women would have been inappropriate, although it might also have benefited some of them. The gestational age was determined on the basis of history, antenatal records, clinical examination and, where available, second trimester ultrasonography (USG) records. Women with known contraindication to labor and vaginal delivery (eg, placenta previa, cephalopelvic disproportion diagnosed clinically) or any medical complications such as heart disease, diabetes mellitus, or chronic renal disease or known lethal fetal congenital anomalies, were excluded. Large proportion of patients had USG reports from antenatal period, which allowed exclusion of cases with congenital anomalies. USG was not done at or after admission. We depended on clinical findings, such as grossly small-for-date uterus, excessive uterine tonicity, and fetal heart rate abnormalities on auscultation, to exclude women with compromised fetuses and abruption. HELLP syndrome cases with low platelet count were also excluded as many cases were to undergo cesarean section under spinal anesthesia.

Randomization

Eligible subjects whose next of kin consented to participate in the trial were randomly allocated to either planned cesarean delivery (group A) or to vaginal delivery (group B) arms. Randomization was done in blocks of 20 using computer-generated random number lists. The delivery mode was noted on cards that were then individually placed in opaque serially numbered envelopes and sealed. A telephone-based alternative to this traditional allocation concealment technique was not logistically feasible in our setting. The mode was revealed immediately prior to commencing the treatment for a subject. The randomization was performed by a statistician not otherwise involved in the conduct of the study.

Baseline characteristics

The baseline parameters recorded for the study were maternal age, parity, whether cared for by health care providers during the antenatal period, first convulsion to admission interval, number of convulsions before admission, blood pressure, and consciousness level at the time of admission. The birthweight was recorded for every baby delivered, even if stillborn.

Treatment protocols

All women received magnesium sulfate as anticonvulsant as per the institutional protocol: 3 g (20%) was given intravenously and 2.5 g (50%) was given intramuscularly in each buttock on admission (total 8 g). Subsequently 2.5 g (50%) was given intramuscularly to alternate buttock every 4 hours. If there was recurrence of convulsions, another 2 g (20%) was administered intravenously. Magnesium sulfate was continued for 24 hours postpartum, with clinical monitoring, that is periodic assessment of respiratory rate, knee jerk, and urine output. Serum magnesium levels were not monitored. Antihypertensive was given if systolic blood pressure was >160 mm Hg or diastolic blood pressure was >110 mm Hg, targeting systolic blood pressure between 140-160 mm Hg and diastolic blood pressure between 90-100 mm Hg. Labetalol was the antihypertensive agent used: 20-80 mg was given intravenously in incremental doses every 20 minutes as needed. After delivery, oral labetalol was used as soon as the patient was able to take drugs orally, and continued in both groups. The blood pressure was controlled, although not normalized in all cases, by use of labetalol. Intravenous fluids were restricted to a maximum of 85 mL/h.

For women allocated to vaginal delivery group, a pre-agreed protocol for management of labor was followed. Induction was achieved with misoprostol 25 μg vaginally every 4 hours for a maximum of 5 doses. Fetal heart rate and condition of cervix were assessed before giving each dose of misoprostol. As soon as the woman went into labor or the Bishop score was >5, misoprostol was stopped. The membranes were ruptured when os was at least 2-3 cm dilated, cervical effacement was >80%, and head engaged. Labor was augmented with intravenous oxytocin if there were ineffective uterine contractions. Oxytocin was administered at least 4 hours after the last dose of misoprostol. Adequate progress of labor in the first stage was defined as cervix dilating at a rate of at least 0.5 cm per hour after the onset of active labor. The fetal heart rate was monitored intermittently by stethoscope (every 15 minutes in the first stage and every 5 minutes in the second stage of labor). If labor failed to progress satisfactorily even after augmentation with oxytocin or if fetal heart rate abnormality occurred, cesarean delivery was undertaken; otherwise labor was allowed to progress and baby was delivered vaginally, either spontaneously or with the help of instruments. Epidural analgesia was not used in labor as this is not used in our institution. Instead, tramadol 100 mg was administered intravenously. The vaginal deliveries were conducted by residents under supervision of senior obstetricians.

Women allocated to cesarean delivery group underwent cesarean section as early as possible after initial stabilization and necessary assessment that included full blood cell count (including platelets) and clotting time (clot observation test) examination. Cesarean delivery was performed by consultants either under spinal anesthesia or under general anesthesia as decided by the anesthetist in charge of the patient. At birth, the neonate was assessed by the pediatrician on call. Mothers and their babies were followed up for 7 days.