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ORIGINAL ARTICLE

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Maternal sedation during scheduled versus unscheduled cesarean delivery: implications for skin-to-skin contact

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ABSTRACT
Background: Early maternal skin-to-skin contact confers numerous benefits to the newborn, but maternal sedation during cesarean delivery could have safety implications for early skin-to-skin contact in the operating room. We compared patient-reported and observer-assessed levels of sedation during unscheduled and scheduled cesarean deliveries.
Methods: Laboring women undergoing unscheduled cesarean delivery with epidural anesthesia, and scheduled cesarean delivery with spinal anesthesia were enrolled. Sedation levels, measured using patient-reported (1=least sedated to 10=most sedated) and observer-assessed (0=most sedated to 5=least sedated) scales, were evaluated at baseline and 15, 30, 45, and 60 min following a T4 sensory level. The primary outcomes were patient-reported sedation at 45 min and the areas under the sedation curves.
Results: Patient-reported levels of sedation were greater at 45 min in laboring women undergoing unscheduled (median 7.5, IQR 5–9) versus scheduled cesarean delivery (median 4, IQR 3–6) (difference in medians 3.5, 99% CI 0 to 5). Observer-assessed sedation was not different between groups. The area under the time curve for patient-reported sedation was greater in the unscheduled group, median difference 162 score min (95% CI 52 to 255). The area under the time curve for observer-assessed sedation was greater in the unscheduled group, median difference 26 score min (99% CI 0 to 41). Times to skin-to-skin contact and breastfeeding were not different.
Conclusions: Women undergoing unscheduled cesarean deliveries are more sedated than women undergoing scheduled cesarean deliveries. Skin-to-skin protocols for cesarean deliveries must consider maternal sedation and anesthesiologists should use sedating medications judiciously.

Keywords: Cesarean delivery; Epidural anesthesia; Spinal anesthesia; Sedation; Skin-to-skin

Introduction

Early skin-to-skin contact has important implications for breastfeeding success and neonatal thermoregulation.[1,2] Multiple organizations, including the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) recommend skin-to-skin contact within one hour of birth to promote successful breastfeeding.[3,4] Evidence indicates that breastfeeding is the ideal form of infant nutrition and carries multiple short- and long-term neonatal benefits.[5–7] However, establishing skin-to-skin contact in the operating room (OR) may be challenging.

Neuraxial anesthesia has become the anesthetic of choice for cesarean delivery and is used in over 95% of scheduled cesarean deliveries (SCD);[8] however, both spinal and epidural anesthesia can be associated with a depressed level of consciousness during cesarean delivery.[9–12] Early skin-to-skin contact has important implications for breastfeeding success, but skin-to-skin protocols in the operation rooms may have safety implications for the infant if women have depressed levels of consciousness. Furthermore, women who undergo a cesarean delivery after an attempted labor may be fatigued and more sedated than women undergoing a SCD.

The objectives of this prospective observational study were to: 1) evaluate and compare sedation levels in women undergoing unscheduled (UCD) and SCD with neuraxial anesthesia using validated sedation scales and 2) assess whether timing of skin-to-skin and breastfeeding differed between these two groups. We hypothesized that women undergoing an UCD would be

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more sedated, prolonging the time to skin-to-skin contact, compared to women undergoing SCD.

Methods

This prospective observational study was approved by the Institutional Review Board at Northwestern University (STU00100367) and conducted at Prentice Women's Hospital between September 2014 and May 2015. Study registration was not required because of the observational study design, per University policy. All participants gave written informed consent before transfer to the OR.

Healthy, term women (American Society of Anesthesiologists Physical Status [ASA PS] 2 or 2E) undergoing either SCD or UCD, using neuraxial anesthesia were eligible for study participation. Participants were excluded if they were ASA PS >2 or 2E; obese (body mass index >40 kg/m^2); chronically exposed to opioids or anxiolytics; or received intrapartum magnesium. Women undergoing SCD who met these criteria were enrolled on the day of surgery. Women undergoing UCD, who had a functional indwelling epidural catheter for labor analgesia, were enrolled following a failed trial of labor due to arrest of dilation or of descent. Participants were excluded if they were undergoing an UCD for any indication other than arrest of dilation or descent, or did not have a functioning indwelling epidural catheter. Parturients who experienced a spinal or epidural failure requiring conversion to general anesthesia, or those whose estimated blood loss was >1500 mL, were also excluded from data analysis.

All women received ranitidine 50 mg, metoclopramide 10 mg and a citric acid monohydrate and trisodium citrate dihydrate solution (30 mL) before transfer to the OR. Women undergoing SCD received spinal anesthesia at the L3–4 interspace (± one vertebral interspace) in the sitting position. These patients received intrathecal hyperbaric bupivacaine 12 mg (0.75% bupivacaine in 5% dextrose 1.6 mL), fentanyl 15 μg and morphine 150 μg as a single injection. Women were then placed supine with left lateral tilt and cesarean delivery commenced after confirmation of a T4 sensory level to pinprick. Women received a crystalloid co-load and a phenylephrine infusion at a rate of 25–50 μg/min at the anesthesiologist's discretion.

Women who underwent UCD had labor analgesia initiated using a combined spinal-epidural technique. The epidural space was located with a 17-gauge Tuohy needle and an intrathecal dose was administered consisting of fentanyl 15 μg combined with bupivacaine 2.5 or 1.25 mg, or fentanyl 25 μg without bupivacaine, before threading the epidural catheter (Arrow Flextip® Plus; Reading, PA, USA). Analgesia was maintained with patient-controlled epidural analgesia (PCEA) with 0.0625% bupivacaine and fentanyl 1.95 μg/mL (background infusion 8 mL/h, patient-controlled bolus dose 8 mL, lock-out period 10 min, hourly maximum 32 mL/h). Epidural anesthesia for cesarean delivery was initiated using the indwelling epidural catheter. Women received 15–20 mL of 2% lidocaine with epinephrine 5 μg/mL and bicarbonate in 5 mL increments. Women in the UCD group also received epidural morphine 4 mg following delivery of the infant. In both groups additional intraoperative management, including administration of other medications including intravenous fentanyl, midazolam, meperidine, or ketamine, or epidural fentanyl in the UCD group, was at the discretion of the anesthesiologist.

Data were collected by a physician member of the research staff not involved in the patients' clinical care. Patients were assessed using two sedation scales: a visual analog scale (VAS) for sedation and the Observer's Assessment of Alertness and Sedation (OAA/S) scale. The VAS for sedation is a subjective self-assessment scale that has been used for measuring sedation following cesarean delivery.[11] Participants were asked, "On a scale from one to 10, with one being wide awake and 10 being totally asleep, how sleepy do you feel right now?" A lower number on this scale indicates alertness and a higher number indicates sedation. The OAA/S is a validated objective scale for measuring sedation (Table 1).[13] The OAA/S tool assesses a patient's responsiveness, their facial expression and their ability to repeat a phrase. A lower number on this scale indicates sedation and a higher number on this scale indicates alertness. Patients and the physician observer completed these two scales at five time points: at baseline before transfer to the operating room and at 15, 30, 45, and 60 min following the establishment of surgical anesthesia (T4 sensory level to pinprick). The researcher evaluated the OAA/S before the patient's self-assessment of sedation.

Demographic data were collected, including age, ethnicity, height and weight. Labor characteristics were also collected, including gravidity, parity, gestational age, indication for cesarean delivery, and duration of labor from epidural placement to delivery. Intraoperative hemodynamic values and all administered sedating medications, such as meperidine, fentanyl, midazolam or ketamine, were recorded.

Statistical analysis

The primary outcome of this study was the VAS sedation score at 45 min, and was compared between groups using the Mann-Whitney U-test. Sample size was calculated based on previous literature of patients undergoing elective cesarean delivery.[11] The mean ± standard deviation (SD) sedation score at 45 min following spinal anesthesia (approximately the time of OR discharge) was 4 ± 2.[11] A sample of 18 patients per group would achieve 80% power at an alpha of 0.05 to detect a