Influence of Nitrous Oxide Use on Surgical Anesthesia Method for Cesarean Delivery

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Background

• Self-administered nitrous oxide during labor provides a high degree of maternal satisfaction but is often not the sole method of pharmacologic anesthesia[1,2]

OBSTETRIC ANESTHESIOLOGY: ORIGINAL CLINICAL RESEARCH REPORT

Nitrous Oxide During Labor: Maternal Satisfaction Does Not Depend Exclusively on Analgesic Effectiveness

Richardson, Michael G. MD*; Lopez, Brandon M. MD*; Baysinger, Curtis L. MD*; Shotwell, Matthew S. PhD†; Chestnut, David H. MD*

Author Information

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Education | July 2018

A Review of the Impact of Obstetric Anesthesia on Maternal and Neonatal Outcomes FREE

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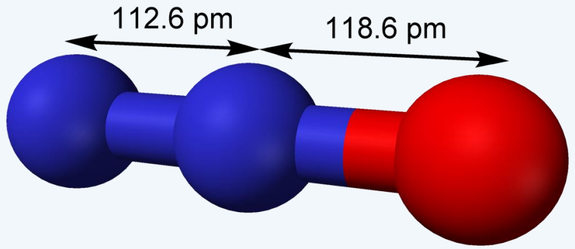
Aims

• Aim 1: Determine method of surgical anesthesia used in patients who first used nitrous oxide and then underwent cesarean delivery (CD)

• Aim 2: Determine method of surgical anesthesia for intrapartum cesarean if nitrous oxide was used during labor as compared to those who did not use nitrous oxide during labor



Study Design and Methods

- Retrospective cohort study from 08/30/2018 to 12/31/2022
- 250 patient charts reviewed
- Data collected:
  - Type of labor
  - Parity of term or preterm deliveries
  - Prior delivery history
  - Time of analgesia initiation relative to stage of labor
  - Conversion from nitrous oxide to alternate form of anesthesia
  - Anesthesia method during cesarean
  - Estimated blood loss during cesarean section
- Inclusion criteria: Adult female patients at least 18 years old
- Descriptive statistics, logistic regression, and Cox proportional hazard models

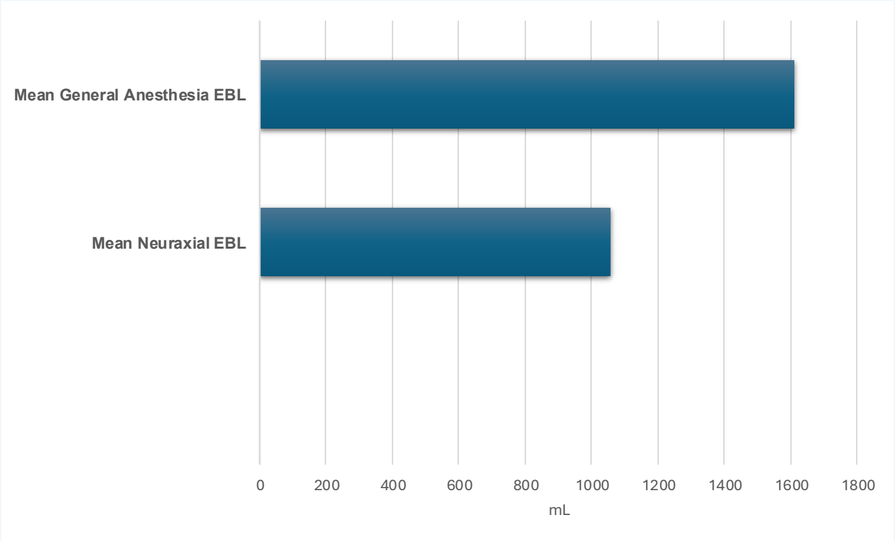
Table 1. Patient Demographics

***Categorical variables:* N** ***Continuous variables:* mean**	
Patients	250
Age (years)	29
Body mass index (kg/m2)	33.8
ASA Physical Status	2.2
Parity of Term or Preterm Deliveries	
0	121
1	58
>1	71

Results

- 188/250 patients converted from nitrous oxide to alternate form of anesthesia
- 61/62 patients who did not convert to neuraxial anesthesia did not undergo cesarean delivery
- Of 188 conversions, 36 patients underwent cesarean delivery
  - Epidural anesthesia: 29
  - Combined spinal-epidural anesthesia: 2
  - Spinal anesthesia: 3
  - General anesthesia: 2
- Mean EBL:
  - Postpartum hemorrhage in cesarean delivery with general anesthesia: 1613 mL
  - Postpartum hemorrhage in cesarean delivery with neuraxial anesthesia: 1055 mL
- Failed or difficult intubation: 0
- No incidence of postpartum wound infection in both groups

Figure 1. Estimated Blood Loss During Cesarean Delivery



Discussion and Conclusion

- Use of general anesthesia during cesarean delivery is associated with increased risk of complications including postpartum hemorrhage (PPH) (blood loss > 1000 mL)
  - PPH seen in 100% of patients who received general anesthesia
  - PPH seen in 41% of patients with received neuraxial anesthesia
- Appears likely that intrapartum use of nitrous oxide will not impact surgical anesthesia method if intrapartum cesarean delivery is used

- Next steps:
  - Addition of comparison group who initiated analgesia with labor epidural anesthesia and had intrapartum cesarean delivery without utilizing nitrous oxide
  - Compare neonatal outcomes between those who only used nitrous oxide and those who converted to another form of pharmacologic labor analgesia

References:
1. Richardson MG, Lopez BM, Baysinger CL, Shotwell MS, Chestnut DH. Nitrous Oxide During Labor: Maternal Satisfaction Does Not Depend Exclusively on Analgesic Effectiveness. Anesth Analg. 2017;124(2):548-553. doi:10.1213/ANE.0000000000001680
2. Lim G, Facco FL, Nathan N, Waters JH, Wong CA, Eltzschig HK. A Review of the Impact of Obstetric Anesthesia on Maternal and Neonatal Outcomes. Anesthesiology. 2018;129(1):192-215. doi:10.1097/ALN.0000000000002182