

## A85 (Poster 44)

## Cerebral oxygenation during cesarean section

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Recently the FDA has approved the use of cerebral saturation (rSO<sub>2</sub>) monitors (INVOS®). The monitors are currently being used during carotid vascular surgery.<sup>1</sup> Relative decreases in rSO<sub>2</sub> >20% and absolute values < 50 are associated with neurological dysfunction.<sup>1,2</sup> Cerebral oxygenation monitoring may have useful applications in parturients with preeclampsia where cerebral vasoconstriction is a predominant feature. As normal values of rSO<sub>2</sub> are not available in pregnant subjects, we determined normal values in healthy parturients and observed the trend of rSO<sub>2</sub> during cesarean section in this study. After institutional approval, the strip (1"×4") containing a near infra-red light source and detectors was placed on one side of the forehead in 12 parturients scheduled to undergo elective cesarean section. After baseline measurements of rSO<sub>2</sub> (BS) in left lateral position, spinal anesthesia was administered in the usual fashion by an anesthesiologist other than the investigator. The rSO<sub>2</sub> data was not made available to him/her during cesarean section. Event markers were used to mark various events on the cerebral oxygen trends to denote incidents such as nausea/vomiting and baby delivery. The rSO<sub>2</sub> values immediately after spinal placement (AS), before baby delivery (BD) and after delivery (AD), and towards the end of procedure with patient breathing room air (RA) were obtained from the trend recordings as shown below.

Mean, SD	BS	AS-(O <sub>2</sub> face mask)	BD-(O <sub>2</sub> face mask)	AD-(O <sub>2</sub> face mask)	RA
PR/min	88.8, 15	94, 15	95, 21	99, 16 *	93, 20
SBP mmHg	128, 12	119, 10 *	108, 9 *	114, 8 *	118, 11 *
SpO <sub>2</sub> %	98, 1	99, 0.8 *	99, 1 *	98, 1.4	97.7 1.5
rSO <sub>2</sub> index	68.8, 3.5	68, 5	54, 9 *	74.3, 7 *	64, 6 *

\* significant change from base line-paired t test

The baseline rSO<sub>2</sub> values in parturients are in normal non-pregnant range. Although SBP and SPO<sub>2</sub> remained within normal limits, the rSO<sub>2</sub> decreased by about 20% during the pre-delivery interval from baseline values. Four parturients who developed nausea had a significantly lower (p=0.02 t-test) rSO<sub>2</sub> (45, 4 vs 58, 8) than who did not. The cerebral oxygen saturation increased after baby delivery most likely due to autotransfusion of blood from the uterus.

References: 1. J Neurosurg 1998;89:533-2. J Interventional Cardiology 1998;11:197.

## A87 (Poster 46)

## Can Epidural Saline Promote Recovery from Spinal Anesthesia?

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**Introduction:** With combined spinal-epidural anesthesia, epidural medications, including saline, can affect the blockade characteristics of previously given subarachnoid medications.<sup>1</sup> As the recovery from epidural blockade is enhanced by the use of epidural crystalloid boluses,<sup>2</sup> we hypothesized that the recovery from spinal anesthesia could be promoted with an epidural crystalloid bolus.

**Methods:** In an ongoing prospective, randomized, double-blind fashion, 31 ASA I-II parturients undergoing elective cesarean delivery of singleton, term fetuses were enrolled. On completion of the cesarean delivery, and 75 minutes following placement of the spinal dose (0.75% hyperbaric bupivacaine 12mg, with fentanyl 10 mcg, and morphine 0.2 mg) via a CSE technique, parturients were given either 1mL (control) or 30 mL of sterile saline via the epidural catheter. Data were collected on sensory level and motor blockade of hips, knees and ankles by a modified Bromage score, visual analogue scoring, and times to discharge and first analgesia request.

**Results:** Demographically, there were no differences in the parturients, and all parturients experienced adequate anesthesia for cesarean delivery. 15 and 16 patients were in the 30 mL and 1 mL saline groups, respectively. Initial sensory and motor blockade and recovery profiles demonstrated no differences. Moreover, no difference in readiness for discharge, defined as the bilateral motor recovery of 2 major joints against active resistance, (69 min in the saline group vs. 65 min in the control group) was observed. Finally, no difference in time to first request for analgesia was noted.

**Conclusions:** A 30 mL bolus of epidural saline, given 75 min after initial dosing, does not augment the recovery from spinal anesthesia in parturients undergoing elective cesarean delivery.

**References:**

1. Stienstra R, Dilrosun-Alhadi BZ, Dahan A, et al. Anesth Analg 1999;88:810-4.
2. Johnson MD, Burger GA, Mushlin PS, et al. Anesth Analg 1990;70:395-9.

## A86 (Poster 45)

## Comparison of cisatracurium-induced neuromuscular blockade between non-pregnant (NP) and immediate postpartum (PP) patients

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**Background:** Cisatracurium (CA), with its predominately organ-independent Hofmann elimination, may behave differently than other muscle relaxant in peripartum patients. This study compared the onset time, clinical duration, and intubating condition of CA between non-pregnant and immediate postpartum patients. **Methods:** After IRB approval and informed consent, GP NP consisted of 22 ASA I-II NP (> 20 weeks from previous delivery) patients scheduled for elective gynecological surgery; GP PP consisted of 22 immediate PP patients (< 48 hours after delivery) scheduled for elective tubal ligation. Induction consisted of thiopental 5mg/kg, fentanyl 0.5 to 1.5 ug/kg, midazolam 0.01-0.02 mg/kg and 0.2 mg/kg of CA. Neuromuscular blocking effects, onset time and clinical recovery were assessed by electromyography and evoked mechanical responses of adductor pollicis from stimulating ulnar nerve with supra-maximal, square wave impulses of 0.2 milliseconds in a train-of-four sequence of 2 hertz repeated every 10 seconds via surface electrode at the wrist. Intubation was attempted at 90 seconds. The intubating anesthesiologist assessed the intubating conditions with 4 variables (from a scale of 0 (worst) to 3 (best)): jaw relaxation, vocal cord immobility and exposure, patient movement and overall intubating impression. Data is analyzed with Chi-squares, unpaired t-test, and ANOVA. P < 0.05 is considered significant.

**Results:** The onset time to 50%, 90% and maximal T1 depression and time to 25% T1 recovery were all significantly shorter in PP GP (68±19 seconds, 110±26 seconds, 147±32 seconds, 60±6 minutes) than in NP GP (80±17 seconds, 131±28 seconds, 181±44 seconds, 69±12 minutes) respectively (P<0.05). All patients were intubated successfully in first attempt at 90 seconds. 91% of NP group and 181% of PP group had excellent intubating conditions. Significantly more patients in GP PP had mild diaphragmatic movement immediately after intubation than in NP group.

**Conclusion:** This is the first published controlled study comparing the effect of cisatracurium between NP and immediate PP patients. Our results conclude that the mean onset time and clinical duration of action of 0.2mg/kg of cisatracurium are significantly shorter in immediate PP than in NP patients. These findings are different from other muscle relaxants, but are expected and most likely due to the combination of the unique organ-independent Hofmann elimination of cisatracurium and the physiological changes associated with peripartum period.

## A88 (Poster 47)

## "Labor Epidural" and the World-Wide-Web: Surfing, sailing, or sinking?

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**INTRODUCTION:** The internet is rapidly becoming a source of medical information for laypeople. It may be difficult to assess the authenticity and accuracy of the information. We undertook this study to identify and categorize information that is currently available about labor epidural analgesia.

**METHODS:** We submitted the term "labor epidural" to six common search engines: Altavista, Excite, Google, Lycos, Snap, and Yahoo. Information regarding website maintenance, authorship, content, dates of creation or update, peer review, scientific documentation/references, presence of a disclaimer, and contact/e-mail were collected (1).

**RESULTS:** 401 query results were obtained, with an URL overlap of 21% (314 unique hits). No single search engine captured all the sites (maximum yield Excite - 26% of unique hits). Web sites were maintained by institutions (20%), consumer groups (29%), peer-reviewed journals (10%), professional societies (16%), magazine/news (3%), individuals (4%), and others (18%). Site authorship was: Laypersons 20%, Anesthesiologists 19%, Midwives/Doulas 9%, CRNAs 2%, other 16%, and was not mentioned in 33%. Content was categorized as general info/review (24%), unrelated (21%), personal experiences or chat (19%), link pages (13%), academic abstracts/articles (8%), new articles/press releases (5%), other (10%). Update and creation dates were displayed on 31% and 30% of sites, respectively. Reviewing process was documented only in 7%, and scientific references were mentioned in 18% of sites. Disclaimers appeared in 29% of sites, but 49% provided an e-mail address.

**DISCUSSION:** The Internet provides a tremendous amount of information about labor epidurals. However, the medical accuracy of this information may be questionable, as only 21% of sites were authored by clinicians trained in anesthesia. In addition, the sheer volume may create a sea of information not easily navigated. For instance, no sites recently recommended as "high quality" (2), were among the 314 sites identified by our searches. Clinicians should take an active role in directing patients to valuable internet sites.

**REFERENCES:** 1) Ling CA. Am J Health-Syst Pharm. 1999; 56: 212-214.  
2) Doyle DJ. Can J Anesth. 1999;46: 994-996.