**Intermittent Epidural Beats Continuous Infusion**

By Miriam E. Tucker

From the annual meeting of the Society for Obstetric Anesthesia and Perinatology

San Antonio — Providing epidural anesthesia in programmed boluses of higher volume with a longer duration between doses decreased total anesthetic consumption and variability without decreasing patient satisfaction in a randomized, controlled, double-blinded study of 180 laboring women.

Increasing evidence suggests that delivery of epidural anesthesia via intermittent bolus provides more effective anesthesia than does continuous infusion, said Dr. Cynthia A. Wong of Northwestern University, Chicago.

In a previous study, Dr. Wong and her colleagues reported that the currently available pumps used for patient-controlled epidural anesthesia (PCEA) also can be programmed to automatically deliver boluses at regular intervals, and that this “programmed intermittent epidural bolus” (PIEB) resulted in similar analgesia but with a smaller bupivacaine dose and better patient satisfaction, compared with continuous epidural infusion (CEI) for maintenance of epidural labor analgesia (Anesth. Analg. 2006;102:904-9).

As a follow-up, the current study investigated the effect of specific combinations of bolus volumes and times to determine which is optimal. The subjects were healthy nulliparous with cervical dilation 2-5 cm. All received combined spinal-epidural anesthesia comprising intrathecal bupivacaine 1.25 mg/fentanyl 15 mcg and a test dose of epidural lidocaine 45 mg/epinephrine 15 mcg.

The epidural maintenance solution consisted of bupivacaine 0.0625% with fentanyl 2 mcg/mL. Breakthrough pain was treated with PCEA and if needed, a manual bolus dose by the anesthesiologist.

The maintenance epidural technique was initiated 15 minutes after the intrathecal injection. Patients were randomized to one of three groups: 66 received 2.5 mL by the pump every 15 minutes (2.5/15), 60 received 5 mL every 30 minutes (5/30), and 54 got 10 mL every 60 minutes (10/60). Thus, all patients received the same total volume of drug but it was distributed differently, Dr. Wong noted.

All of the women had successful analgesia, and there were no differences in maximum oxycodone dose or mode of delivery among the groups.

The primary outcome, total bupivacaine consumption per hour of analgesia, was significantly lower in the 10/60 group compared with the other two, with a mean of 10.3 mg/hr versus 11.3 mg/hr for the 2.5/15 patients and 11.1 mg/hr with 5/30. There was also less variability in dosing from hour to hour in the 10/60 group, she noted.

There were no significant differences in any secondary variable, including Visual Analog Pain score, motor block (Bromage greater than 0), number of PCEA requests, time to first request for manual bolus, number of subjects requiring manual bolus, patient satisfaction score, or extent of sensory blockade, as measured by both cold stimuli and von Frey hair threshold tests.

The mechanism isn’t entirely clear. All studies of PIEB have shown that the technique provides equal or better analgesia than does CEI with a lower dose of drug. But, if as hypothesized, the reason is that boluses provide better spread in the epidural space, then it is “interesting,” Dr. Wong said. The study found no difference in the extent of sensory blockade among the three groups. Indeed, data on the extent of sensory blockade in other studies of PIEB have been inconsistent, she said.

Other variables, such as differences in patient design or patient demographics, might also contribute to the variability in extent of analgesia, she added.

In response to a question from the audience about whether these findings have changed her clinical practice, Dr. Wong noted that there is currently no commercially available pump that delivers both PCEA and PIEB.

However, her institution has “considerably backed off using continuous infusion rate” and now relies more on patient-controlled bolusing, resulting in a lower manual re-bolus rate.

“There’s very solid evidence that giving the drug as a bolus, by whatever means—by the patient, the machine, or the anesthesiologist—is a more efficient technique.”

**Combined Spinal-Epidural Anesthesia Beats Epidural Alone**

By Miriam E. Tucker

From the annual meeting of the Society for Obstetric Anesthesia and Perinatology

San Antonio — Combined spinal-epidural anesthesia was superior to traditional epidural for first-stage anesthesia but there were no differences in second stage or in delivery pain in a randomized, controlled comparison of the two methods among 800 women.

The Epidural Analgesia and Spinal Epidural Analgesia (EASE) study also showed that concerns about epidurals failing with combined spinal-epidural (SE) because of the inability to provide a test dose are unfounded, Dr. David R. Gambling reported.

Previous studies comparing the techniques had mixed results. A Cochrane review showed that CSE had less rescue analgesia and less urinary retention. But more research is needed (Cochrane Database Syst. Rev. 2007 [doi:10.1002/14651858.CD003401.pub2]). Compared with low-dose epidural anesthesia (EA), combined SE had faster-onset analgesia, more pruritus, and lower umbilical cord artery pH, but there was no mention of progress of cervical dilation, noted Dr. Gambling of the Sharp Mary Birch Hospital for Women and Newborns and the University of California, San Diego.

In EASE, 389 women received EA, consisting of 10 mL of 0.125% bupivacaine with 2 mcg/mL fentanyl in two 5-mL doses via epidural needle, followed by 5 mL of the same solution via epidural catheter (total dose 15 mL). The 402 in the SE group were given 2.5 mL 0.125% isobaric bupivacaine plus 2 mcg/mL fentanyl via 26-gauge spinal needle prior to epidural catheter placement.

In both groups, medications were administered at first request for neuraxial anesthesia. Labor was managed by registered nurses and obstetricians who were blinded to group assignment.

There were no significant differences in the groups in age, height, weight, body mass index, estimated gestational age, cervical dilation at epidural insertion, or pre-epidural verbal analog scale (VAS) pain scores. However, the time to complete analgesia (from initial EA and SE injection until patient reported VAS scores of 0 or 1) was significantly less with the SE group, 11 vs. 16 minutes.

The second stage of labor was statistically significantly shorter with EA (68 vs. 78 minutes), but the difference may not be clinically significant. There were no significant differences in time from epidural induction until cervical dilation reached 10 cm, duration of pushing, or rate of cervical dilation. There were also no differences in the use of instrument with vaginal delivery or need for cesarean section.

During the first stage of labor, the mean VAS pain score was significantly less in the SE group, compared with EA (1.36 vs. 1.89). The proportion of women with Apgar scores of 7 or less at 1 minute was 20.8% in EA vs. 18% in SE. The proportion of women with Apgar scores of 7 or less at 5 minutes was 5.6% in EA vs. 4.6% in SE. The proportions of women with severe crying at delivery were 42% in EA vs. 31% in SE.

There were no significant differences in the incidence of maternal or neonatal complications, Dr. Gambling reported. All of the women had successful analgesia, he said. There were no differences between the two groups.

**Major Finding:** During the first stage of labor, mean verbal analog scale pain score was significantly less in the SE group compared with EA (1.36 vs. 1.89), but the difference was not significant by the end of the second stage.

Disclosures: Dr. Gambling said he had no financial disclosures to report.

**Patient satisfaction with their mode of analgesia did not differ between the two groups.**

Dr. Gambling

There was currently no commercially available pump that delivers both PCEA and PIEB.

Dr. Wong

Dr. Gambling said he had no financial disclosures to report.

**Major Finding:** Total bupivacaine consumption per hour of analgesia was significantly lower among patients who received 10 mL over 60 minutes (10.3 mg/hour), compared with 11.3 mg/hour for those receiving 2.5 mL/15 minutes and 11.1 mg/hour for 5 mL/30 minutes.

*Data Source:* Randomized, controlled, double-blinded trial of 180 laboring women.

*Disclosures:* Dr. Wong said she had no financial conflicts of interest.

**Major Finding:** Total bupivacaine consumption per hour of analgesia was significantly lower among patients who received 10 mL over 60 minutes (10.3 mg/hour), compared with 11.3 mg/hour for those receiving 2.5 mL/15 minutes and 11.1 mg/hour for 5 mL/30 minutes.

*Data Source:* Randomized, controlled, double-blinded trial of 180 laboring women.

*Disclosures:* Dr. Gambling said he had no financial disclosures to report.

**Major Finding:** Total bupivacaine consumption per hour of analgesia was significantly lower among patients who received 10 mL over 60 minutes (10.3 mg/hour), compared with 11.3 mg/hour for those receiving 2.5 mL/15 minutes and 11.1 mg/hour for 5 mL/30 minutes.

*Data Source:* Randomized, controlled, double-blinded trial of 180 laboring women.

*Disclosures:* Dr. Gambling said he had no financial disclosures to report.

**Major Finding:** Total bupivacaine consumption per hour of analgesia was significantly lower among patients who received 10 mL over 60 minutes (10.3 mg/hour), compared with 11.3 mg/hour for those receiving 2.5 mL/15 minutes and 11.1 mg/hour for 5 mL/30 minutes.

*Data Source:* Randomized, controlled, double-blinded trial of 180 laboring women.

*Disclosures:* Dr. Gambling said he had no financial disclosures to report.