◇ This Month in

ANESTHESIOLOGY

■ "Walking" Epidural Anesthesia: Are Test Doses Necessary? Cohen *et al.* (page 387)

Although the actual benefits of walking during labor are unproven, many women express the desire to walk during labor. Combined spinal-epidural analgesia performed with intrathecal opioids has gained acceptance in this application because it causes minimal motor block. Cohen *et al.* designed a randomized, double-blind study to evaluate analgesic effectiveness and ability to walk after receiving a bolus of either 0.0625% bupivacaine or 0.125% bupivacaine (with sufentanil), with or without previous administration of the traditional lidocaine-epinephrine test dose.

Sixty healthy women in active labor, all of whom requested epidural analgesia and who expressed a desire to walk during labor, participated in the study. Visual analog pain scores were 3 or more, and cervical dilation was between 1 and 6 cm for participants. All subjects received a 3-ml epidural injection (a 1.5% lidocaine-epinephrine test dose or bupivacaine) and 3 min later, 12 ml bupivacaine with 10 μg sufentanil injected in two increments 3 min apart. Maternal blood pressure and visual analog pain scores were recorded before study drug administration and after completion of the bolus injections at 5, 10, 15, 20, 30, and 60 min, and then hourly for 4 h until delivery. Data relating to ambulation, balance, proprioception, and motor block were collected at baseline, 30 min, 1 h, and then hourly until delivery. Ability to walk with little or minimal assistance across the room was rated as either "yes" or "no." Women who walked spent approximately 5–10 min out of bed and usually attempted to void, and then were reassessed for balance, among others.

A high percentage of women in all groups (75–93%) walked at some stage during labor. The group receiving the bolus of 0.125% bupivacaine with sufentanil, without a previous test dose, experienced the best analgesia and walked earlier than women in all other groups. Fewer women walked within 1 h of block placement when they received a test dose before 0.125% bupivacaine. With or without a test dose, 0.0625% bupivacaine with sufentanil provided inadequate analgesia. Women in the two latter groups required additional bupivacaine, which in turn impaired their ability to walk. The authors suggest that, based on these results, walking during the early postblock period would be possible by omitting the lidocaine-epinephrine test dose and using 0.125% bupivacaine for the initial bolus.

■ Determining Critical Level of Oxygen Delivery in Humans. Lieberman *et al.* (page 407)

The threshold of oxygen delivery (the level below which evidence of hypoxia is produced), also defined as the "critical" DO_2, has been determined in anesthetized dogs, rats, and pigs. In an attempt to define the critical DO_2 in conscious, healthy adults, Lieberman *et al.* recruited eight paid volunteers, aged 19–25 yr, and reduced oxygen delivery from 14.0 ± 2.9 ml $O_2 \cdot kg^{-1} \cdot min^{-1}$ to 7.3 ± 1.4 ml $O_2 \cdot kg^{-1} \cdot min^{-1}$ by acute hemodilution followed by β-blockade.

As blood was removed, isovolemia was maintained by infusion of 5% human serum albumin and the subjects' platelet-rich plasma. Cardiovascular measurements were made 30 min after insertion of invasive cannulae and before removal of blood; after hemodilution to a hemoglobin concentration of 5 g/dl (which reduced oxygen delivery to 9.9 ± ml $O_2 \cdot kg^{-1} \cdot min^{-1}$); and again after a further reduction in oxygen delivery to 7.3 ml $O_2 \cdot kg^{-1} \cdot min^{-1}$, achieved by the infusion of esmolol. Arterial and mixed venous blood was also sampled for measurement of pH, oxygen content, oxyhemoglobin saturation, and arterial plasma lactate concentration. At the conclusion of the experiment, all erythrocytes were transfused and subjects were thoroughly examined by a physician before discharge.

Despite increased heart rate and increased stroke volume and cardiac indices, there was no evidence of inadequate systemic oxygenation in any of the subjects. Oxygen consumption and plasma lactate concentrations increased slightly. In addition, one woman subject had a single transient ST-segment change during the study period. However, the incident was not symptomatic and resolved despite a further reduction in DO_2. The researchers were not able to determine the critical level of systemic DO_2, which appears to be less than the value achieved in this study.

■ Is Surgery with Anesthesia an Independent Risk Factor for Stroke? Wong *et al.* (page 425)

Although certain surgeries, such as cardiac, neurologic, and vascular procedures, and risk factors such as cigarette smoking, male gender, and history of transient ischemic attacks have been established as associated with increased incidence of perioperative stroke, no one