◇ This Month in

ANESTHESIOLOGY

■ Does Ambulatory Epidural Analgesia Shorten Duration of Labor? Vallejo *et al.* (page 857)

Although ambulatory epidural analgesia reportedly adds to maternal comfort and aids labor, its ability to shorten the duration of labor has not been confirmed in a prospective, randomized trial. Vallejo *et al.* recruited 160 nulliparous women and randomly assigned them to one of two groups: epidural analgesia with or without ambulation. For purposes of the study, ambulation was defined as a minimum of 5 min of walking per hour. Patients in the nonambulatory group were confined to bed, with the angle of the head of the bed limited to 45° or less.

Epidural blocks were initiated with 15–25 ml ropivacaine, 0.07%, plus 100 μg/ml fentanyl. After adequate pain relief was achieved, patients received a continuous infusion of 0.07% ropivacaine plus 2 μg/ml fentanyl at 15–20 ml/h to maintain labor analgesia. Modified Bromage scores were obtained before and after epidural insertion and again at hourly intervals. After 1 h, patients in the ambulatory group were assessed in bed for motor function. Ambulation was encouraged if patients were able to stand on one foot and did not have hypotension. The research team recorded the time patients spent sitting or walking, the time interval from epidural insertion to complete cervical dilatation, and the time from epidural to the second stage of labor. The type of delivery (spontaneous, instrumental, vacuum, or cesarean) was also noted, as was each infant's Apgar score at 1 and 5 min after delivery.

The authors found that patients in the ambulatory group walked 25.0 ± 23.3 min, sat upright 40.3 ± 29.7 min, or both. The time to complete cervical dilatation was 240.9 ± 146.1 min, compared with 211.9 ± 133.9 min in the nonambulatory group. Despite conventional wisdom that walking during labor facilitates delivery, these authors found that epidural analgesia with walking or sitting did not shorten the time from initiation of epidural anesthesia to complete cervical dilatation.

■ Complications of Interscalene Brachial Plexus Block Tracked in 9-Month Prospective Study. Borgeat *et al.* (page 875)

To further investigate the acute and chronic effects associated with interscalene brachial plexus blocks (ISB), Borgeat *et al.* evaluated 521 patients after they underwent elective shoulder procedures. One patient sustained iatrogenic nerve damage related to his surgery and so was excluded from the study. Of the remaining 520 patients who completed the study, 234 had an ISB with placement of a catheter, whereas 286 received an ISB with the single-injection technique. All acute perioperative complications were recorded, and patients were observed daily for 10 days for paresthesia, dysesthesias, pain not related to surgery, and muscle weakness. There were two episodes of acute complications: one pneumothorax and one incidence of central nervous system toxicity (incoherent speech). On the 10th day after surgery, 74 patients (14%) reported paresthesia, dysesthesia, or pain apparently not related to surgery. For all of these patients, symptoms were mild, and none had accompanying muscle weakness.

At 1 month after surgery, 41 patients (7.9%) reported persistent symptoms. Thirty of these patients underwent electroneuromyography, and eight cases of sulcus ulnaris syndrome, two cases of carpal tunnel syndrome, and one case of complex regional pain syndrome were diagnosed. Of the patients who had a diagnosis of sulcus ulnaris syndrome, six recovered spontaneously between 1 and 3 months, and the remaining two were treated with surgical decompression of the ulnar nerve. Two patients with carpal tunnel syndrome at 1 month and two with carpal tunnel syndrome at 2 and 3 months after surgery were treated surgically and recovered. By 9 months after surgery, only one patient, who had a plexus lesion, was still symptomatic. Despite the high incidence of transient paresthesias, dysesthesias, and pain not related to surgery, ISB has a high success rate. It is important to detect sulcus ulnaris syndrome, carpal tunnel syndrome, and complex regional pain syndrome to treat these problems. As shown in this study, the remainder of the patients did not have chronic ISB-related problems.

■ Predicting Drug-induced Memory and Sedation Changes Using Auditory Event-related Potentials. Veselis *et al.* (page 896)

Building on the work of researchers who have used specific components of event-related potentials (ERPs) to discriminate between the memory and sedative effects of drugs such as lorazepam and scopolamine, Veselis *et al.* present a new analysis of memory effects using ERPs obtained in a previous study. That placebo-controlled study used 65 healthy volunteers who ran-

domly received intravenously placebo, midazolam, propofol, thiopental, fentanyl with ondansetron, or ondansetron alone in five different stable target concentrations. The concentrations (three increasing, two decreasing) were achieved using a computer-controlled infusion pump to produce mild, moderate, and maximal sedation levels without loss of consciousness. At each target concentration, volunteers were given a list of 16 words to learn. In addition, ERPs were recorded while participants were asked to give a button-press response to a deviant auditory stimulus (target tone, standard oddball paradigm, 80:20 ratio, to elicit a P3 response). Then the researchers determined the predictive probabilities of various ERP components for memory (recognition of the words at the end of the day) and sedation (log reaction time to the deviant stimulus).

Results showed that the N2 latency of the ERP consistently predicted log reaction time in all groups. The N2P3 amplitude of the ERP was most predictive of memory performance for subjects to whom midazolam, propofol, and thiopental were administered. Midazolam and propofol affect memory differentially from their sedative effects, as indexed by specific components of the auditory ERP. Relating electrophysiologic changes to the memory and sedative effects of drugs allows researchers to independently measure these effects without the confounding subjective perceptions of the participants. These changes can then be related to brain images from positron emission tomography or magnetic resonance imaging to more accurately localize and quantify the neuroanatomic regions mediating these drug effects.

■ Researchers Assess Effects of Ketamine on Endotoxin-induced Shock in Rats. Taniguchi *et al.* (page 928)

Taniguchi *et al.* randomly assigned 40 rats to one of five groups of eight rats each: *Escherichia coli* endotoxin alone; saline only (control); ketamine (10 mg · kg^{-1} · h^{-1}) only; pretreatment with ketamine before endotoxin administration; or posttreatment with ketamine 2 h after endotoxin administration. For a 5-h period after endotoxin injection, the team measured hemodynamic parameters, acid–base status, and plasma concentrations of the cytokines tumor necrosis factor α (TNF-α) and interleukin 6 (IL-6) in all rats.

Systolic arterial pressure, arterial *p*H, and bicarbonate concentration all decreased in animals that received endotoxin alone or posttreatment with ketamine after endotoxin injection. Five hours after endotoxin injection, a significantly lower arterial *p*H was observed in the endotoxin-alone group. Acid–base balance was better maintained in groups to which ketamine was administered. Endotoxin injection increased the TNF-α concentration in the endotoxin-alone, pretreatment, and posttreatment groups, but the concentration remained significantly less in the pretreatment group than in the other two groups at 2 h after injection. Ketamine administration inhibited the development of hypotension, metabolic acidosis, and cytokine response in endotoxin-exposed rats. Although further investigation is necessary to determine the mechanisms responsible for these inhibitory effects of ketamine, its use as an anesthetic agent may offer advantages in endotoxemia.

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