

## ANESTHESIOLOGY

### ■ How Common Is Propofol Infusion Syndrome during Radiofrequency Ablation? Cravens *et al.* (page 1134)

Case reports have established that propofol infusion syndrome, characterized by metabolic acidosis, is associated with prolonged infusion of high dose propofol. However, the incidence of the syndrome is still not known. Cravens *et al.* performed a retrospective review of case records for patients sedated with propofol during catheter-based radiofrequency ablation for atrial fibrillation. For a comparison group, the team used records of carotid endarterectomy patients who did not receive propofol, but who had had arterial blood gases (ABGs) drawn during their procedures.

There were 301 radiofrequency ablation cases from 1999 to 2001 in which patients received propofol; of these, 55 cases had had an ABG drawn. Of the carotid endarterectomy patients included for comparison purposes, 267 had an ABG drawn. Results showed that 50 of the 55 radiofrequency ablation patients, or 91%, had at least one ABG documenting metabolic acidosis. The carotid endarterectomy group had only an 8.2% incidence of metabolic acidosis as documented by ABG. In radiofrequency ablation patients with no apparent cause of metabolic acidosis other than propofol, 13 of the 55 had a base excess of at least  $-2$ , versus 22 of 267 in the CEA patients. Although this study is limited by its retrospective design, lack of a control group, and lack of baseline and continuous ABG sampling, it does provide evidence that even in a noncritically ill population, prolonged high-dose propofol infusion is associated with unexplained metabolic acidosis. More study is needed to verify the incidence of this syndrome in the population at large, and to ascertain whether metabolic acidosis could worsen other disease processes.

### ■ Behavioral and Electrophysiological Effects of Isoflurane and F6 Compared in Rats. Perouansky *et al.* (page 1168)

In an attempt to further understand how anesthetics and nonmobilizers disrupt memory formation, Perouansky *et al.* compared amnesic doses of isoflurane and the nonmobilizer F6 in 13 adult male rats. After a one-week recovery period after implantation with multichannel depth electrodes to measure the microelectroencephalogram, the rats' baseline electroencephalograms were obtained. Animals were exposed to a range of concen-

trations of isoflurane (0.035% to 0.77%) and F6 (0.5% to 3.6%); five animals also underwent control experiments without drug injection. During the experiments, a blinded observer scored the rats' behaviors as immobile, exploring, grooming, or undefined, and they were also videotaped for *post hoc* analysis.

After completion of the experiments, the rats were killed and their brains removed for histologic examination. The postmortem examination confirmed that electrodes had been successfully implanted into the CA1 region of the dorsal hippocampus in 10 of the rats, so only data from these animals were used for the field-potential analysis. Only the signals from the electrodes closest to the hippocampal fissure were used for analysis of hippocampal  $\theta$  oscillations.

The investigators found that both isoflurane and F6 disrupted hippocampal  $\theta$  oscillations, but in qualitatively different ways. Isoflurane slowed  $\theta$  oscillations and caused sedation, whereas F6 reduced the amplitude but not the frequency of  $\theta$  oscillations at amnesic concentrations, without producing sedation. These results lead the authors to surmise that although drug-induced changes in  $\theta$  oscillations may be a common basis for amnesia produced by F6 and isoflurane, the different patterns suggest that the drugs alter network activity by acting on different molecular and/or cellular targets.

### ■ Continuous Wound Infusion for Postcesarean Analgesia Investigated. Lavand'homme *et al.* (page 1220)

Lavand'homme *et al.* enrolled 92 parturients in their study to compare continuous intrawound infusion of diclofenac or ropivacaine versus saline control for relief of postoperative pain after cesarean delivery. All study participants were premedicated with intravenous ranitidine, metoclopramide, and oral sodium citrate and given standard intrathecal bupivacaine with sufentanil before their cesarean procedures. After incision closure at the completion of surgery, surgeons placed catheters, which were connected to elastomeric pumps set to deliver 5 ml/h for 48 h, superficial to the fascia in each patient. The pumps were filled with either saline, 0.2% ropivacaine, or 300 mg diclofenac in 240 ml isotonic saline. In the patients to receive saline and ropivacaine, intravenous diclofenac was administered every 12 h, whereas in the diclofenac group saline was provided. Intravenous patient-controlled analgesia was begun in all patients immediately after recovery from spinal analgesia.

Early postoperative pain and wound hyperalgesia were assessed according to the cumulative postoperative dose of morphine (*via* the patient-controlled analgesia); needs for paracetamol at 12, 24, and 48 h; visual analog scale pain scores for wound pain at rest and upon sitting on the edge of the bed; and global visual analog scale assessment of pain from uterine cramping at 12, 24, and 48 h. The area around the surgical incision was also assessed for hyperalgesia. At 1 month and 6 months after surgery, patients were telephoned by a research nurse and queried regarding any incidence of side effects, pain, or medication usage.

Results from the 90 patients who completed the study showed that continuous diclofenac infusion significantly reduced postoperative morphine consumption compared with saline infusion, and that local diclofenac infusion was as effective as local ropivacaine infusion with systemic diclofenac. Diclofenac may have peripheral analgesic properties in addition to systemic effects, mediated through cyclooxygenase inhibition, decrease of prostaglandin production, or other local mechanisms.

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