◇ This Month in

ANESTHESIOLOGY

■ Effects of Normothermia *versus* Hypothermia during Cardiopulmonary Bypass on Postsurgical Cognitive Function. Grigore *et al.* (page 1110)

Despite advances in cardiopulmonary bypass (CPB), central nervous system complications occur in a large percentage of patients. Grigore *et al.* conducted a prospective randomized trial of normothermic *versus* hypothermic CPB to assess whether hypothermic CPB resulted in less neurologic damage after the procedure. They enrolled 300 patients and randomly assigned them to one of two groups: normothermic (35.5–36.5°C) CPB systemic perfusion (warm group) or hypothermic (28–30°C) CPB systemic perfusion (cold group). Both groups received intermittent hypothermic (8°C) antegrade blood cardioplegic solution for myocardial protection during CPB.

A battery of neurocognitive tests was given to participants preoperatively on postoperative days 3–5 and again at 6 weeks after surgery. Global neurologic scores were determined based on the Western Perioperative Neurologic Scale, which assesses 14 items in 8 domains, including speech, motor ability, reflexes, and gait. At the 6-week reassessment, investigators determined whether there were any neurologic changes based on specific outcomes, including the Western Perioperative Neurologic Scale score and clinical evidence of new stroke or neurologic deficit. Of the 300 patients enrolled in the study, 227 completed the 6-week postoperative testing—117 patients from the warm group and 110 patients from the cold group. The authors found that there were no differences in neurologic or neurocognitive outcomes between the two groups. Therefore, the current practice of using hypothermia (at temperatures of 28–30°C) during CPB, followed by rewarming, does not seem to be neuroprotective. Further investigation into the mechanisms of neurologic injury after CPB are necessary to discover other strategies for neuroprotection during CPB.

■ Relation of Tracheal Cuff Pressure to Tracheal Morbidity after Extubation. Combes *et al.* (page 1120)

Even after short-duration anesthesia, laryngotracheal morbidity is common after tracheal intubation. Although the exact cause of postintubation airway symptoms is not known, mucosal damage at the cuff level is believed to be key. Such lesions have been linked to use of nitrous oxide, which diffuses into the tracheal tube cuff and exerts increased cuff pressure. Filling the tracheal tube with saline instead of air can help to maintain low intracuff pressure, thus decreasing the incidence of postoperative laryngotracheal discomfort and injury. Accordingly, Combes *et al.* randomly allocated 50 patients scheduled for surgical procedures of 90 min or more during general anesthesia to one of two groups. The endotracheal cuff in group A patients was inflated with air, and the endotracheal cuff in group S patients was inflated with saline. In both groups, the cuff was initially inflated to achieve a cuff pressure of 20–30 cm H_2O. At the time of extubation, an observer blinded to group assignment performed fiberoptic examinations of patients' tracheas, noting any evidence of mucosal ulcerations. Patients were queried about any laryngopharyngeal discomfort when discharged from the postanesthesia care unit and at 24 h after surgery.

Cuff pressure increased steadily throughout the procedure in group A but remained stable in group S. Incidence of sore throat was lower in group S than in group A patients. Group A patients had a higher incidence of and more severe tracheal mucosal lesions than patients in group S. Incidence of dysphagia and hoarseness was similar for the two groups in the postanesthesia care unit and 24 h after surgery. The authors were able to demonstrate a correlation between tracheal mucosal lesions and sore throat. Although the symptoms were generally moderate, incidence of sore throat could be minimized by monitoring cuff pressure throughout the course of anesthesia.

■ Carbon Monoxide Formation from Volatile Anesthetics Measured during Simulated Clinical Conditions. Wissing *et al.* (page 1205)

Recent clinical reports of increased carbon monoxide (CO) hemoglobin concentrations in children anesthetized with sevoflurane that had passed through dry soda lime seem to contradict the laboratory experience with this anesthetic. To examine discrepancies between laboratory investigations and clinical experiences, Wissing *et al.* designed an experiment to measure CO formation from five different volatile anesthetics passed through an absorber system that permitted temperature changes.

Experiments were conducted in triplicate. Either 2.5% or 5% of five inhalational anesthetics (desflurane, enflurane, isoflurane, halothane, and sevoflurane) were passed for 2 h through an absorber canister filled with dried soda lime. Baseline CO production was first deter-

mined using dry soda lime and a flow of 2 l/min O_2 with no volatile anesthetic and using fresh wet soda lime and a flow of 2 l/min with 5% anesthetic. CO concentrations were continuously measured at the absorber outlet. Additional experiments were conducted to confirm the sevoflurane results because the magnitude of CO production was unexpected and because of the potential of various breakdown products. CO was detected with all anesthetics passed through dry soda lime, but the time course and rate of CO production and the time course of temperature changes differed between the agents. Measurable amounts of CO were found immediately after desflurane, enflurane, or isoflurane came in contact with the soda lime; with sevoflurane, there was a time delay between contact and CO production. CO production peaked initially and was highest with desflurane, followed by enflurane, isoflurane, sevoflurane, and halothane. The temperature of the absorbent increased with all anesthetics, but was highest for sevoflurane. As a result of these experiments, the researchers caution that although CO production is clearly higher than with other agents, some CO—in possibly relevant amounts—is produced by sevoflurane. Adequate precautions should be taken to ensure that soda lime in absorbers does not become desiccated.

■ Dietary Soy and Suppression of Neuropathic Pain: A Preemptive or Palliative Effect? Shir *et al.* (page 1238)

Building on their team's previous work with soy-containing diets and allodynia and hyperalgesia in rats, Shir *et al.* designed a study to investigate whether timing of a soy diet is critical for suppressing sensory disorders produced by nerve injury. In groups of 8–10 each, 12 groups of male rats were fed according to seven different regimens. Diets consisted of either a soy-based or a nonsoy-based food product. In one group, soy was fed to rats 14 days before nerve injury and 14 days thereafter. In other groups, rats received soy food before nerve injury but not afterward; no soy before or after induced injury; or soy foods only after the injury. Behavioral tests, assessing sensitivity to tactile stimuli, mechanical pain, or heat, were conducted 1 day before nerve injury (unilateral partial sciatic nerve ligation), and after injury on days 3, 8, and 14. After partial sciatic nerve ligation injury, rats in all groups had mechanical hyperalgesia, expressed as a significantly increased response duration to pin prick compared with baseline. Rats fed soy diets before partial sciatic nerve ligation injury exhibited significantly blunted postoperative levels of allodynia and hyperalgesia. However, there was no additional suppression of neuropathic pain seen in groups fed the soy diet both preoperatively and postoperatively, and the rats fed nonsoy diets before surgery combined with soy diets after surgery also did not exhibit any pain suppression. The protective effects of a presurgery soy diet seem to be short-lived because switching to a nonsoy diet 15 h before injury deleted the pain suppressing effect. The specific factors in the diet responsible for these changes remain to be identified.

Gretchen Henkel