

ANESTHESIOLOGY

■ A Relationship between Obstructive Sleep Apnea and Postoperative Morphine Requirement in Children? Brown *et al.* (page 806)

To explore possible associations between obstructive sleep apnea (OSA) and postoperative morphine requirements, Brown *et al.* culled through a retrospective database of 102 consecutive adenotonsillectomy cases treated over a 2-year period at their institution.

The authors compared the preoperative oxygen saturation nadir with postoperative doses of morphine in 46 children who fulfilled their study's inclusion criteria. Besides the diagnosis of OSA requiring an adenotonsillectomy, those criteria included no concomitant pathology, intraoperative administration of short-acting opioid drugs, endotracheal extubation on awakening in the operating room, and use of morphine as the parenteral postoperative analgesic. The diagnosis of OSA in all study patients had been established by using polysomnography, cardiorespiratory sleep studies, and overnight oximetry, performed either at home or in the hospital.

The authors found a significant correlation between age, preoperative oxygen saturation nadir, and the morphine dose required for analgesia. In four of the children, aged 26.5 ± 13.2 months, and with a preoperative oxygen saturation of $70.3 \pm 12.9\%$, no postoperative morphine was required. Drawing from animal studies done in young pigs, the authors speculate that chronic exposure to OSA-induced hypoxemia might increase the binding of a specific agonist to μ -opioid receptors in the brainstem. This mechanism might explain the heightened sensitivity to postoperative morphine seen in children with chronic OSA. Clinicians might be well advised, they suggest, to use preoperative oxygen desaturation testing in children with OSA to identify those with a possible increased sensitivity to opioid drugs and to adjust dosing accordingly.

■ Identifying Predictors of Perioperative Complications in Adults with Mediastinal Mass. Bécharde *et al.* (page 826)

Although the risk of cardiorespiratory complications during anesthesia has been established in pediatric patients presenting with a mediastinal mass, the incidence of complications attributable to such masses in adults has not been extensively studied. Accordingly, Bécharde *et al.* undertook a retrospective analysis of adult patients

scheduled for surgery and general anesthesia who also presented with an anterior or middle mediastinal mass.

From a review of cases treated between January 1994 and July 2000, the authors identified 98 patients who were administered a total of 105 anesthetics. Mass volume and extent of tracheal compression from the mass was calculated from the results of computed tomographic scans. Patients had also undergone pulmonary function testing to establish peak expiratory flow rates. The authors used multivariate logistic regression to identify predictors of intraoperative, postoperative, and perioperative complications. Intraoperative complications were defined as inability to ventilate or a peak pressure of 40 cm H₂O or greater, severe pulmonary shunt, and hemodynamic instability. Postoperative complications included incidents requiring additional medical treatment such as reintubation, bronchoscopy, or inhalation therapy. Perioperative complications were simply the summation of the other two categories of complications.

The authors found that intraoperative complications (4 incidents out of 105) were predicted by the presence of preoperative pericardial effusion. Predictors of problems in the postoperative period (11 incidents in 105 anesthetics), included a greater than 50% tracheal compression on computed tomographic scan and mixed pulmonary syndrome shown by pulmonary function testing. Although obstruction of the airway in the adult population is rare in the intraoperative period, caution is still warranted in screening for the risk of potentially life-threatening respiratory complications in the early postoperative period. Clinicians should screen for cardiopulmonary signs and symptoms at presentation, combined obstructive and restrictive pattern on pulmonary function testing, pericardial effusion, and/or tracheal compression greater than 50% on computed tomographic scans.

■ Influence of Fluid Infusion on Concentration of Propofol Studied in Hemorrhagic Swine Model. Kurita *et al.* (page 871)

Kurita *et al.* investigated the influence of fluid infusion associated with blood loss on the pseudo-steady-state propofol concentration. They assigned 27 swine to receive one of three different infusions (lactated Ringer's solution, hydroxyethylstarch, or threefold lactated Ringer's solution) every 30 min following stepwise bleeding.

The hemorrhage and infusion were induced after 180 min of steady-state infusion of propofol, administered at a rate of $2 \text{ mg} \cdot \text{kg}^{-1} \cdot \text{h}^{-1}$. Hemodynamic parameters and plasma propofol concentration were recorded at each of the bleeding steps. The investigators also collected 400 ml of blood after the first two bleeding steps, and 200 ml at step intervals thereafter.

Plasma propofol concentrations increased 6, 9, and 39% from baseline at the 400-, 800-, and 1,000-ml steps in the lactated Ringer's group. In the group receiving hydroxyethylstarch infusions, plasma propofol concentrations decreased approximately 22, 30, 34, 42, and 47% from baseline at 400, 800, 1,000, 1,200, and 1,400 ml, respectively. The concentrations of propofol also decreased from baseline values in the threefold lactated

Ringer's group. The results suggest that plasma propofol concentrations will increase, rather than decrease, in a linear fashion with hematocrit, even if cardiac output is normal, when high-volume blood loss is not adequately managed by fluid infusion. In contrast, aggressive volume replacement will result in decreasing propofol concentrations. The authors concede that their study results are limited by the omission of a normovolemic control group. They also did not assess whether isovolemia was maintained, nor did they pinpoint the time at which hypovolemia occurred during fluid infusion periods. Further investigation into the pharmacodynamics of fluid infusion and blood loss will be necessary.

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