

## CORRESPONDENCE

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### Propofol and Awareness: I

*To the Editor:*—I have read with interest the recent article by Kelly and Roy.<sup>1</sup> Of particular interest were the statements that “[the] patient’s hypertension and tachycardia associated with laryngeal suspension *could have suggested inadequate anesthetic depth*. Autonomic signs, however, are unreliable indicators of awareness secondary to light anesthesia. *We chose to treat this episode with labetalol rather than more propofol.* . . .” (Italics added.) Perhaps we should conclude from this case report only that labetalol provides little or no amnesia when used as an adjunct to light anesthesia.

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#### REFERENCE

1. Kelly JS, Roy RC: Intraoperative awareness with propofol-oxygen total intravenous anesthesia for microlaryngeal surgery. *ANESTHESIOLOGY* 77:207–209, 1992

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### Propofol and Awareness: II

*To the Editor:*—Kelly and Roy<sup>1</sup> report awareness under propofol anesthesia when used as a sole anesthetic for laser surgery to the vocal cords. They tailored the anesthetic technique to ensure a rapid recovery. Propofol has many desirable properties (e.g., rapid elimination, low potential for emesis, versatility) and would seem to be a good choice in this context. I would question, however, the treatment of hypertension and tachycardia with labetalol, rather than deepening the anesthetic. The authors state that autonomic signs are unreliable indicators of awareness secondary to light anesthesia. This would seem to me to be an over-generalization. Surely when a deliberately light anesthetic is being given, particularly with a single agent, we should respond to significant signs of sympathetic activity by increasing the depth of anesthesia. This can be achieved using several different agents, without prolonging recovery time unduly. Merely blocking the autonomic manifestations of awareness or inadequate anaesthesia with a  $\beta$ -blocker is not a logical reaction in my view. I am pleased that the authors have modified their technique in view of this experience.

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1. Kelly JS, Roy RC: Intraoperative awareness with propofol-oxygen total intravenous anesthesia for microlaryngeal surgery. *ANESTHESIOLOGY* 77:207–209, 1992

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### Propofol and Awareness: III

*To the Editor:*—In a recent case report,<sup>1</sup> the authors state the reasons why propofol is a suitable drug for use during microlaryngeal surgery and then describe a method that cannot be considered as normal practice. First, the authors use as an induction dose the low end of the range recommended in the package insert. Second, they use an infusion

at the rate recommended as an adjunct to nitrous oxide 60–70%, although they use no nitrous oxide. Third, they treat surgically induced hypertension and tachycardia with labetalol as a first-line drug.

I use propofol with air and oxygen for a wide variety of procedures but particularly microlaryngeal and bronchoscopic surgery. It gives

excellent results as a sole agent, allowing rapid return of airway reflexes and good quality recovery for day cases.

My concern is that anesthesiologists not familiar with propofol may read this case report as a failing of propofol, and that would be incorrect. I continually point out to my residents that supplemental opioids, benzodiazepines, or inhalational agents will all decrease the dose of propofol required. However, if the decision has been to use propofol as a sole agent, then appropriate doses need to be given to give plasma levels of 5–6  $\mu\text{g}/\text{mL}$ .\*

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\* Kenny GNC: Practical experience with computer-controlled propofol infusion. *Seminars in Anesthesia* 11:S12–S13, 1992.

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*In Reply:*—We appreciate the opportunity to respond to the above letters. Laryngoscopy without intubation causes hemodynamic changes comparable to laryngoscopy plus intubation in young otherwise healthy patients.<sup>1–3</sup> Therefore, we specifically chose a total intravenous anesthetic using propofol as the sole agent, because of its reported superiority over thiopental in blunting the hemodynamic response to laryngoscopy and intubation as well as for its rapid dissipation of effect and lack of significant “hangover” properties in view of our patient’s desire for rapid discharge.<sup>4,5</sup> We fully anticipated that antihypertensive therapy would likely be required at some time during his anesthetic course, as evidenced by our table 1, which clearly documents this patient’s routine requirement for such agents (even with adjunctive use of benzodiazepines and/or fentanyl).<sup>6</sup> Furthermore, the use of intravenous  $\beta$ -blocking agents to attenuate the hemodynamic response to laryngoscopy and intubation is hardly a novel concept, and a number of studies support their efficacy in this setting.<sup>7–9</sup> One of these studies using labetalol found a statistically significant difference from placebo only at a dose of 1 mg/kg.<sup>9</sup> Our single 5-mg dose of labetalol restored hemodynamics to baseline values and seems homeopathic in comparison, especially in the face of sustained laryngeal suspension and initiation of surgery with the CO<sub>2</sub> laser.<sup>6</sup> This fact coupled with absence of other signs of light anesthesia (sweating, lacrimation, piloerection) and use of a high-dose, constant-rate propofol infusion (as alluded to in our Discussion)<sup>6</sup> gave us a false sense of security that our patient’s anesthetic depth was adequate.

Bennett appears to have missed the major teaching point of our case. We reported a patient who was hypertensive and unaware during methohexital-oxygen anesthesia despite multi-drug adjunctive therapy, but who was normotensive and aware during propofol-oxygen anesthesia with a small dose of an antihypertensive administered during laryngoscopy. At equivalent levels hemodynamically, propofol was associated with awareness, whereas methohexital was not. Bennett suggests that we give enough propofol to achieve plasma levels of 5–6  $\mu\text{g}/\text{mL}$ . There are three problems with this recommendation: (1) we currently do not have the ability to measure real-time plasma propofol levels intraoperatively; (2) great individual variability in propofol dose

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\* Edelist G: Propofol for laser endoscopic procedures. *Seminars in Anesthesia* 11(suppl 1):16–17, 1992.

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1. Kelly JS, Roy RC: Intraoperative awareness with propofol-oxygen total intravenous anesthesia for microlaryngeal surgery. *ANESTHESIOLOGY* 77:207–209, 1992

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and resultant plasma levels exists;<sup>10,11</sup> and (3) propofol has a very wide dose-response curve compared with the barbiturates.<sup>10–12</sup> We agree with Bennett that we needed more propofol, but the clinical endpoint to which additional drug should have been titrated remains unclear in our minds. Should we assume that patients rendered unconscious and hypotensive from lower doses of propofol have recall of laryngoscopy and intubation or other intraoperative events? And what is the endpoint for propofol infusions during regional anesthesia—sedation or loss of awareness?

Our case emphasizes the inherent difficulty clinicians face in determining whether our patients are aware during the course of an anesthetic. Refinement of technology, such as auditory evoked potentials, may one day allow us to more closely monitor for the presence of intraoperative awareness.<sup>13</sup>

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