Use of Dexmedetomidine and Ketamine Infusions During Scoliosis Repair Surgery with Somatosensory and Motor-Evoked Potential Monitoring: A Case Report

To the Editor: We read with interest the December 2010 article by Rozanna Penney, CRNA, MSNA, CEN, on a case of scoliosis repair under an anesthetic regimen of dexmedetomidine (dose range, 0.9-1.2 μg/kg per hour), ketamine, fentanyl, and nitrous oxide.1 Regarding the reported use of dexmedetomidine as described in this case, we agree with the author that dexmedetomidine has a minimal effect on somatosensory evoked potentials (SSEP) within the dose range used in this case. However, we would like to caution your readers that the use of dexmedetomidine at clinically relevant target plasma concentrations (0.6-0.8 ng/mL) can significantly attenuate the amplitude of transcranial motor-evoked potentials (tMEP).2,3

The author referred to Tobias et al who described the effect of dexmedetomidine on tMEP and SSEP in 9 patients undergoing posterior spine fusion.4 It should be noted that Tobias et al revised their dexmedetomidine dosing scheme when the first patient experienced a decrease in tMEP amplitude while receiving dexmedetomidine (1 μg/kg) over 20 minutes followed by an infusion of (0.5 μg/kg per hour). The expected blood level of dexmedetomidine after the load in this patient was 0.84 ng/mL. We agree with Penney that the use of dexmedetomidine is desirable as an adjunct to total intravenous anesthesia (TIVA) in procedures requiring intraoperative neurophysiologic monitoring because of its sedative, analgesic, and neuroprotective properties, but the potential risks of adding dexmedetomidine should be assessed before its addition as an adjunct to TIVA in these procedures.

REFERENCES

Kathleen Brennen, CRNA, MSN
Mathias König, MD
Mohamed Mahmoud, MD
Cincinnati Children’s Hospital Medical Center
Cincinnati, Ohio

Response: I thank Brennen et al for their interest in the case report described in the December 2010 AANA Journal and for the letter to the editor in response to it. I agree that the potential risks of using dexmedetomidine as an adjunct to total intravenous anesthesia (TIVA) in procedures requiring intraoperative neurophysiologic monitoring should be assessed before its addition. But I would like to point out that the cases reported by Tobias et al as well as Mahmoud et al,2,3 cited in the letter to the editor, used dexmedetomidine as an adjunct to the propofol-based TIVA. Propofol is known to cause dose-dependent reduction in the motor-evoked potential amplitude, which is why in this case report an alternative to the standard propofol-based TIVA was described.4

Our anesthetic regimen consisted of dexmedetomidine, ketamine and fentanyl infusions. Ketamine is different from propofol in that it enhances the motor-evoked potential amplitude.5-8 Along with the use of 60% nitrous oxide and 40% oxygen, this regimen provided satisfactory conditions for intraoperative SSEP and MEP monitoring. There are limited documented cases of the use of dexmedetomidine without propofol in TIVA, and in this case report the alternative anesthetic management was described as a possible valuable option. Nevertheless, further research is necessary, and I agree that caution should be exercised whenever a new regimen is implemented.

REFERENCES
3. Mahmoud M, Sadhasivam S, Salisbury S,
et al. Susceptibility of transcranial electric motor-evoked potentials to varying targeted blood levels of dexmedetomidine during spine surgery. Anesthesiology. 2010;112(6):1364-1373.


Rozanna Penney, CRNA, MSNA, CEN
Staff Nurse Anesthetist
University of Massachusetts Medical Center
Worcester, Massachusetts