Bispectral index-guided sedation with dexmedetomidine in intensive care: A prospective, randomized, double blind, placebo-controlled phase II study


Objective
To compare dexmedetomidine vs. placebo with respect to the amount of additional propofol and morphine used for bispectral index-guided sedation and analgesia in mechanically ventilated, intensive care patients after surgery.

Design
Prospective, randomized, double blind, placebo-controlled, phase II clinical trial.

Setting
General surgical and cardiac surgical intensive care units.

Patients
Thirty patients scheduled for major surgery requiring mechanical ventilation for a minimum of 6 hrs were included in the study.

Interventions
Patients were assigned randomly to receive either dexmedetomidine (loading infusion, 6.0 µg·kg⁻¹·hr⁻¹ for 10 mins; maintenance infusion, 0.1-0.7 µg·kg⁻¹·hr⁻¹) or placebo after intensive care unit admission.

Measurements and Main Results
Sedation was guided by using the electroencephalographic parameter bispectral index, a new noninvasive method to estimate the level of sedation. We aimed at maintaining bispectral index ranges between 60 and 70 during mechanical ventilation before starting weaning, 65 and 95 during weaning, and 85 to 95 postextubation. Additional sedative and analgesic medication was given (propofol and morphine) as clinically indicated and within the previously mentioned bispectral index ranges. Patients receiving dexmedetomidine required significantly less propofol during mechanical ventilation (0.87 ± 0.21 vs 1.52 ± 0.30 mg·kg⁻¹·hr⁻¹; p<0.01) and weaning (0.17 ± 0.06 vs 0.62 ± 0.21 mg·kg⁻¹·hr⁻¹; p<0.001) to maintain the target bispectral index range. During study drug administration, morphine requirements for dexmedetomidine-treated patients were reduced by 58% (p=0.05). Hemodynamic stability during weaning and after extubation was better.
maintained in patients receiving dexmedetomidine.

Conclusions
Dexmedetomidine reduced propofol requirements and improved hemodynamic stability during bispectral index-guided intensive care unit sedation.

Crit Care Med 2002; 30(5):1007

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